

ENVIRONMENTAL IMPACT



MANAGEMENT SERVICES

SCOPING REPORT

PEMBANI COAL CAROLINA (PTY) LTD.
AMENDMENT TO MINING RIGHT AND AN
AMENDMENT TO MINE WORKS PROGRAMME

DMR REFERENCE NUMBER:

MP 30/5/1/2/2/112 MR

EIMS REFERENCE NUMBER:

1156

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**SCOPING REPORT
PEMBANI COLLIERY
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mineral resources
Department:
Mineral Resources
REPUBLIC OF SOUTH AFRICA

SCOPING REPORT

**FOR LISTED ACTIVITIES ASSOCIATED WITH MINING RIGHT AND/OR BULK SAMPLING ACTIVITIES
INCLUDING TRENCHING IN CASES OF ALLUVIAL DIAMOND PROSPECTING**

SUBMITTED FOR ENVIRONMENTAL AUTHORIZATIONS IN TERMS OF THE NATIONAL ENVIRONMENTAL MANAGEMENT ACT, 1998 AND THE NATIONAL ENVIRONMENTAL MANAGEMENT WASTE ACT, 2008 (IF APPLICABLE) 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).

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IMPORTANT NOTICE

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

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

In terms of Section 16(3)(b) of the EIA Regulations, 2014, 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 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 SCOPING PROCESS

- 1) The objective of the scoping process is to, through a consultative process-
 - a) Identify the relevant policies and legislation relevant to the activity;
 - b) Motivate the need and desirability of the proposed activity, including the need and desirability of the activity in the context of the preferred location;
 - c) Identify and confirm the preferred activity and technology alternative through an impact and risk assessment and ranking process;
 - d) Identify and confirm the preferred site, through a detailed site selection process, which includes an impact and risk assessment process inclusive of cumulative impact and a ranking process of all the identified alternatives focusing on the geographical, physical, biological, social, economic, and cultural aspects of the environment;
 - e) Identify the key issues to be addressed in the assessment phase;
 - f) Agree on the level of assessment to be undertaken, including the methodology to be applied, the expertise required as well as the extent of further consultation to be undertaken to determine the impacts and risks the activity will impose on the preferred site through the life of the activity, including the nature, significance, consequence, extent, duration and probability of the impacts to inform the location of the development footprint within the preferred site; and
 - g) Identify suitable measures to avoid, manage, or mitigate identified impacts and to determine the extent of the residual risks that need to be managed and monitored.

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ABBREVIATIONS

DMR	Department of Mineral Resources
EAP	Environmental Assessment Practitioner
EIA	Environmental Impact Assessment
EMPr	Environmental Management Programme
I&AP	Interested and Affected Party
MPRDA	Mineral and Petroleum Resources Development Act
NEMA	National Environmental Management Act
NOMR	New Order Mining Right Application
PCD	Pollution Control Dam
PPP	Public Participation Process

EXECUTIVE SUMMARY

The Applicant, Pembani Coal Carolina (Pty) Ltd (Pembani) (formerly Worldwide Coal Carolina (Pty) Ltd), has an approved mining right and Environmental Management Programme (EMPR) in terms of the Minerals and Petroleum Resources Development Act (Act 28 of 2002, as amended) (MPRDA) for the mining of coal at the Pembani Colliery. The Applicant held a Prospecting Right (PR) (MP30/5/1/1/2/14360 PR) and an Environmental Management Plan (EMP) in terms of the MPRDA for the prospecting of coal on the farm Zandvoort 10 IT.

Pembani wish to amend the approved mining right (MP 30/5/1/2/2/112 MR) to include the following:

- Amend the Mining Right boundary to include Portions 1 and RE of the farm Zandvoort 10 IT (hereafter referred to as Zandvoort) for the purposes of underground mining of coal; and
- Pembani proposes to amend their existing mining works programme (within the approved mining right boundary) to include the mining of additional coal resources.

In order to amend the current Mining Right to include Zandvoort it is necessary that an Environmental Authorisation (EA) application, supported by a Scoping Report and an Environmental Impact Assessment Report (EIAR) are submitted to the DMR. Pembani is required to assess any new environmental impacts associated with the change in the mining programme, and area, and to establish appropriate mitigation measures to address the impacts. Consequently a revised consolidated EMPR is required.

The proposed amendments aim to allow for the continuation of mining operations currently underway and extend the Colliery's current Life of Mine (LoM) by an additional ten (10) years to a total of 30 years. Coal will be transported and processed according to the existing mines current approved operations.

Pembani has an approved existing old order Mining License (ML) in terms of the Minerals Act (MA), over Portion 5 of the farm Groenvallei 40 IT (MP 30/5/1/2/2/221 MR OT 5/3/2/600), as well as an approved EMPR, dated March 2003. An application for conversion to a New Order Mining Right (NOMR), in terms of the MPRDA, was lodged with the DMR on 19 April 2007. An EMP amendment, for the inclusion of underground mining, the Imbani Wash Plant (previously referred to as the Carolina Coal Wash Plant), co-disposal and pollution control dams (PCD's), was submitted on 28 July 2009, as supporting document to the conversion. The old order mining licence is to date still awaiting conversion.

The Pembani Colliery and Zandvoort area are situated east of Carolina, immediately north of the R38, in the Mpumalanga Province, South Africa. The Pembani Colliery has been in operation since approximately 2008 and is situated in the magisterial district of Carolina and falls under the Chief Albert Luthuli Local Municipality, situated in the Gert Sibande District Municipality.

PURPOSE OF THIS DOCUMENT

Pembani Colliery has recently commenced with underground mining and wishes to extend their underground mining footprint to include the proposed Portions 1 and RE of the farm Zandvoort 10 IT. Furthermore, Pembani want to amend the existing Mine Works Programme (MWP) to include additional underground and opencast mining at Pembani Colliery.

It is the intention of this Scoping Report to provide the necessary information regarding the proposed inclusion of additional areas within the existing Pembani Colliery Mining Right, as well as to provide information on the proposed changes with regards to amendment of the existing MWP.

Due to the changes in the MWP, to include additional mining areas, and proposed mine design (including Zandvoort into the NOMR), it is important that Interested and Affected Parties (I&AP's) are provided with an opportunity to review and comment on the scoping report, thereby contributing to the Environmental Impact Assessment (EIA) Process and assisting in identify any additional risks or impacts that may be experienced. As such this document shall be available to I&AP's for review and comment for a period of 30 days before it is finalised to include the results of the consultation and submitted to the competent authority for adjudication.

MINE INFRASTRUCTURE

At present the Pembani Colliery consists of the following main infrastructure:

- Opencast pits in various stages of rehabilitation;
- Haul roads;
- Storm water management infrastructure;
- Contractors camp including workshop, diesel storage, offices and ablution facilities;
- Raw water dams and Pollution Control Dams (PCD's);
- Water pipelines and associated water management infrastructure;
- Co-disposal facility
- Imbani Wash Plant;
- Administrative offices;
- Security and fencing;
- Product stockpiles;
- Discard and overburden stockpiles;
- Topsoil stockpiles;
- Monitoring boreholes;
- Highwall entrance to underground;
- Underground mining sections; and
- Site camp associated with underground mine entrance.

ALTERNATIVES

As an existing operational mine, the Pembani Colliery has been subject to several previous environmental processes. These processes have, where relevant, considered various alternatives prior to approval. The alternatives considered and discussed in this scoping report, including location, technology, activity, design or layout, operational and the no go alternative.

ENVIRONMENTAL SPECIALIST STUDIES

A comprehensive baseline assessment was undertaken during the EIA in support of the Mining Right Application from 2004 – 2006. In addition to these baselines studies, specialist studies have been conducted over the years

for various environmental applications. Three additional specialist studies were undertaken in 2015 on Zandvoort, namely:

- Heritage and Palaeontology Assessment;
- Fauna and Flora Assessment; and
- Soils, Land Use and Land Capability Assessment.

PUBLIC PARTICIPATION PROCESS

The Public Participation Process (PPP) for the proposed project has been undertaken in accordance with the requirements of the MPRDA, and NEMA in line with the principles of Integrated Environmental Management (IEM). The PPP commenced on the 17th November 2016 with an initial notification and call to register, ending on the 9th of January 2017. This scoping report will be made available for public review and comment for a period of 30 days. The comments received from I&AP's during these commenting periods will be captured in an Issues and Response summary table included in the scoping report to be submitted to the competent authority (Department of Mineral Resources) for consideration and decision making purposes. The comments received from I&APs during these commenting periods will be captured in an Issues and Response summary table included in the scoping report to be submitted to the competent authority (Department of Mineral Resources) for consideration and decision making purposes.

On acceptance of the scoping report from DMR, an EIA Report, including an Environmental management Programme (EMPR), will also be compiled and presented for public comment as part of this EIA process during which time further stakeholder engagement will take place. An EIA Report, including an EMPR, will also be compiled and presented for public comment as a step of this EIA process during which time further stakeholder engagement will take place.

ENVIRONMENTAL IMPACT ASSESSMENT

A screening assessment was undertaken to identify all the potential risks and impacts associated with each phase of the mining operations. The background information from existing EIA and specialist studies undertaken for the site were consulted as well as a screening of all the activities underway and planned for the mine to ensure that all of the potential impacts have been identified. For the existing mining operation, there are no construction phase related impacts to be assessed and therefore only operational, decommissioning, and rehabilitation and closure impacts have been assessed. Each of the identified risks and impacts for these phases was assessed using the EIMS impact assessment methodology described in the body of the report. The assessment criteria include the nature, extent, duration, magnitude/intensity, reversibility, probability, public response, cumulative impact, and irreplaceable loss of resources.

The most significant risks and impacts identified were those that remain high in terms of significance even post mitigation measures being considered. The following impacts were determined to have a high negative final significance:

- Impacts on geology;
- Pollution of surface water resources/decreased water quality;
- Dewatering of groundwater aquifers;

- Pollution of groundwater/decreased water quality;
- Acid Mine Drainage (AMD);
- Decant from underground workings;
- Loss and disturbance of wetland habitat; and
- Destruction/damage of heritage resources.

In terms of positive impacts, the following key benefits have been identified:

- Discovery and preservation of fossils;
- Coal supply for energy security;
- Economic growth; and
- Employment Opportunities.

MITIGATION MEASURES

The negative impacts of the proposed amendment to the Mining Right and the amendment of the MWP to include additional mining areas, will be further assessed during the EIA phase of the project. Potential mitigation measures have been identified and will be refined based on input from the EAP, public consultation, and specialist assessments during the EIA phase of the project. The EMPR will, identify appropriate mechanisms for avoidance and mitigation of the negative impacts and enhancing the positive

1. INTRODUCTION

The Applicant, Pembani Coal Carolina (Pty) Ltd (Pembani) (formerly World Wide Coal (Pty) Ltd) (WWC), has an approved Mining Right (MR) and Environmental Management Programme (EMPR) in terms of the Minerals and Petroleum Resources Development Act (Act 28 of 2002, as amended) (MPRDA) for the mining of coal at the Pembani Colliery. The Applicant held a Prospecting Right (PR) and Environmental Management Plan (EMP) in terms of the MPRDA for the prospecting of coal on the farm Zandvoort 10 IT (hereafter referred to as Zandvoort).

Pembani has an approved existing old order Mining License (ML) in terms of the Minerals Act (MA), over Portion 5 of the farm Groenvallei 40 IT (MP 30/5/1/2/2/221 MR OT 5/3/2/600), as well as an approved EMP, dated March 2003. An application for conversion to a NOMR, in terms of the MPRDA, was lodged with the DMR on 19 April 2007. An EMP amendment, for the inclusion of underground mining, the Imbani Wash Plant (previously referred to as the Carolina Coal Wash Plant), co-disposal and pollution control dams (PCD's), was submitted on 28 July 2009, as supporting document to the conversion. The old order mining licence is to date still awaiting conversion and as such is not included in this EA application but is referred to in this report as a comprehensive description of the entire mining operation.

The Pembani Colliery and Zandvoort prospecting area are situated east of Carolina, immediately north of the R38, in the Mpumalanga Province, South Africa. The Pembani Colliery has been in operation since 2008 and is situated in the magisterial district of Carolina and falls under the Chief Albert Luthuli Local Municipality, situated in the Gert Sibande District Municipality.

The Pembani Colliery is situated within the northern part of the Ermelo Coalfield, which forms part of the coal-bearing Vryheid Formation of the Ecca Group. The B Seam and the E Seam are the main economic coal seams present within the mining area and these are exploited by means of opencast and underground mining operations. The average depth of the E seam is 53 metres (m) and 27.6 m for the B seam.

As an existing operational mine, the Pembani Colliery has been subject to several environmental approval processes in terms of the following legislation:

- MPRDA;
- Minerals Act, 1991 (MA, Act 50 of 1991);
- National Environmental Management Act (NEMA, Act No. 107 of 1998); and
- National Water Act (NWA, Act No. 36 of 1998).

The Pembani Colliery has been in operation for several years and as such there have been numerous EIA studies and a number of licenses and authorisations are held by the mine. The following rights, licenses, authorisations and approvals are currently in place and have been considered in the compilation of this report:

Table 1: Approval and Authorisation History

Document	Consultant	Applicable Properties	Reference Number
MA EMPR (2003)	Clean Stream Environmental Services	Portion 5 (a Portion of Portion 1) of Groenvallei 40 IT	(Mining Licence (ML)) MP 30/5/1/2/2/221 MR
MPRDA EMP (2006)	Ingwe Collieries (Pty) Ltd	Portions Remaining Extent (RE) and 1 of Zandvoort 10 IT	(PR) MP 30/5/1/1/2/415 PR
MPRDA EMPR (2006)	Digby Wells and Associates (Pty) Ltd (Digby Wells)	Portions 3, 4, 8, 9, and 10 of Twyfelaar 11 IT; Portions 1, 6, 7, 8, 16, and 17 of Groenvallei 40 IT; Portions 2 and RE of Paardeplaats 12 IT; Portions RE, 1, and 2 of Droogvallei 41 IT; Portions RE, 2, 3, 4, and 5 of Haarlem 39 IT; Portions RE and 9 of Appeldoorn 38 IT; Leeuwpoort 13 IT; Portions RE, 1, 2, and 3 of Hawerfontein 7 IT; and Portion RE of Kwaggafontein 8 IT	(MR) MP 30/5/1/2/2/112 MR
MPRDA EMPR (2009)	Cabanga Concepts	Portion 5 (a Portion of Portion 1) of Groenvallei 40 IT; and Portion 7 (a Portion of Portion 3) of Paardeplaats 12 IT	(ML) MP 30/5/1/2/2/221 MR OT 5/3/2/600 (pending)
NEMA S24G (2011)	Cabanga Concepts	Portions RE, 4, and 5 of Haarlem 39 IT; Portions 16 and RE of Portion 1 of Groenvallei 40 IT;	(EA) 17/2/4/G (GS) -33

Document	Consultant	Applicable Properties	Reference Number
		Portion RE of Portion 8 of Twyfelaar 11 IT; and Portion 8 of Kwaggafontein 8 IT	
NWA IWUL (2011)	Cabanga Concepts	Portion 9 of Appeldoorn 38 IT; Portions 5, 7, and 16 of Groenvallei 40 IT; Portion RE of Haarlem 39 IT; Portions 2 and 7 of Paardeplaats 12 IT; Portion 8 of Twyfelaar 11 IT; and Portion 1 of Zandvoort 10 IT	(IWUL) 05/X11D/AGJ/466
NEMA BAR (2012)	Cabanga Concepts	Portions RE and 4 of Haarlem 39 IT	(EA) 17/2/3 GS-78
NEMA EIA (2012)	Cabanga Concepts	Portions RE, 9, and 10 of Appeldoorn 38 IT; Portions RE 1, 5, RE of Portion 7, RE of Portion 8, RE of Portion 11, 12, 13, 14, 15, 16,17, and 19 of Groenvallei 40 IT Portions RE, 2, 3, 4, and 5 of Haarlem 39 IT; Portions RE of Portion 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, and 13 of Haverfontein 7 IT; Portions RE of Portion 6, RE of Portion 7, 8, 9, 10, and 11 of Kwaggafontein 8 IT; Leeuwpoort 13 IT;	(EA) 17/2/3/GS-44

Document	Consultant	Applicable Properties	Reference Number
		Portions RE, 2, 4, 5, and 7 of Paardeplaats 12 IT; Portions 3, 4, RE of Portion 5, 6, 10, 11, 12, and 13 of Twyfelaar 11 IT; and Portions RE and 1 of Zandvoort 10 IT	
NWA IWULA Amendment (2014)	Cabanga Concepts	Portion 9 of Appeldoorn 38 IT; Portion RE of Portion 4 of Haarlem 39 IT; Portions RE of Portion 1, RE of Portion 5, RE of Portion 7, 8, 16, and 17 of Groenvallei 40 IT; Portions 2, 3, and 7 of Paardeplaats 12 IT; Leeuwpoort 13 IT; Portion 3, 9, and 11 of Twyfelaar 11 IT; Portion 8 of Kwaggafontein 8 IT; and Portions RE and 1 of Zandvoort 10 IT	(IWUL) 16/2/7X100/C180 (Updated IWUL, Licenced 07 July 2016, Licence No. 05/X11B/ACGIJ/4704)
Prospecting Right, Environmental Authorisation Application (2016)	EIMS	Portions RE and 1 of Zandvoort 10 IT	Pending MP30/5/1/1/2/14360PR

In addition to the approved authorisations and licenses listed in **Table 1**, Pembani also wish to amend their approved mining right (MP 30/5/1/2/2/112 MR) to include their proposed prospecting right (MP30/5/1/1/2/14360PR) for Portions 1 and RE of the farm Zandvoort 10 IT (hereafter referred to as Zandvoort). The inclusion of these properties into the mining right will allow for the continuation of underground mining operations currently underway and extend the operations current Life of Mine (LoM) by an additional ten (10) years to a total of 30 years. Furthermore, Pembani proposes to amend

their existing mining works programme (within the approved mining right boundary) to include the mining of additional coal resources. Coal will be transported and processed according to the existing mines current approved operations. Pembani is required to assess any new environmental impacts associated with the change in the mining programme, and area, and to establish appropriate mitigation measures to address the impacts. Environmental Impact Management Services (Pty) Ltd. (EIMS) has been appointed by Pembani as the independent Environmental Assessment Practitioner (EAP) to manage the Application.

1.1. REPORT STRUCTURE

This report has been compiled in accordance with the 2014 NEMA EIA Regulations. A summary of the report structure, and the specific sections that correspond to the applicable regulations, is provided in Table 2 below.

Table 2: Report Structure

Environmental Regulation	Description	Section in Report
NEMA Regulation 982 (2014)		
Appendix 2(2)(a):	Details of – i) The EAP who prepared the report; and ii) The expertise of the EAP, including a curriculum vitae;	1
Appendix 2(2)(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; iii) Where the required information in items (i) and (ii) is not available, the coordinates of the boundary of the property or properties;	2
Appendix 2(2)(c):	A plan which locates the proposed activity or activities applied for 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; or ii) On a land where the property has not been defined, the coordinates within which the activity is to be undertaken;	2
Appendix 2(2)(d):	A description of the scope of the proposed activity, including – i) All listed and specified activities triggered; ii) A description of the activities to be undertaken, including associated structures and infrastructure;	3
Appendix 2(2)(e):	A description of the policy and legislative context within which the development is proposed including an identification of all legislation, policies, plans, guidelines, spatial tools, municipal development	4

	planning frameworks and instruments that are applicable to this activity and are to be considered in the assessment process;	
Appendix 2(2)(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;	5
Appendix 2(2)(h):	<p>A full description of the process followed to reach the proposed preferred activity, site and location within the site, including –</p> <ul style="list-style-type: none"> i) Details of all 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 – <ul style="list-style-type: none"> aa. Can be reversed; bb. May cause irreplaceable loss or resources; and cc. Can be avoided, managed or mitigated; vi) 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; vii) 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; viii) The possible mitigation measures that could be applied and level of residual risk; ix) The outcome of the site selection matrix; 	7, 8, 9, 10 and 11

	<ul style="list-style-type: none"> x) If no alternatives, including alternative locations for the activity were investigated, the motivation for not considering such; and xi) A concluding statement indicating the preferred alternatives, including preferred location of the activity; 	
Appendix 2(2)(i):	<p>A plan of study for undertaking the environmental impact assessment process to be undertaken, including –</p> <ul style="list-style-type: none"> i) A description of the alternatives to be considered and assessed within the preferred site, including the option of not proceeding with the activity; ii) A description of the aspects to be assessed as part of the environmental impact assessment process; iii) Aspects to be assessed by specialists; iv) A description of the proposed method of assessing the environmental aspects, including a description of the proposed method assessing the environmental aspects to be assessed by specialists; v) A description of the proposed method of assessing duration and significance; vi) An indication of the stages at which the competent authority will be consulted; vii) Particulars of the public participation process that will be conducted during the environmental impact assessment process; and viii) A description of the tasks that will be undertaken as part of the environmental impact assessment process; ix) Identify suitable measures to avoid, reverse, mitigate or manage identified impacts and to determine the extent of the residual risks that need to be managed and monitored. 	12
Appendix 2(2)(j)	<p>An undertaking under oath or affirmation by the EAP in relation to –</p> <ul style="list-style-type: none"> i) The correctness of the information provided in the report; ii) The inclusion of comments and inputs from stakeholders and interested and affected parties; and 	15

	iii) Any information provided by the EAP to interested and affected parties and any responses by the EAP to comments or inputs made by interested or affected parties;	
Appendix 2(2)(k):	An undertaking under oath or affirmation by the EAP in relation to the level of agreement between the EAP and interested and affected parties on the plan of study for undertaking the environmental impact assessment;	16
Appendix 2(2)(l):	Where applicable, any specific information required by the competent authority; and	11
Appendix 2(2)(m):	Any other matter required in terms of section 24(4)(a) and (b) of the Act.	13

1.2. DETAILS OF THE EAP

EIMS was founded in 1993 and has steadily grown to be a significant player in the environmental management consulting industry in South Africa and the rest of Africa. EIMS and its resources have been involved with many significant EIA projects and offers access to a broad body of knowledge and experience with the various Integrated Environmental Management tools (EIA; EMPR; EMP; SEA; EMF; etc.). EIMS is responsible for project management and the compilation of the Environmental Management Programme (EMPR) and EIA/EMP for the Pembani project.

For the purposes of this Scoping Report the following person can be contacted at EIMS:

Sonja van de Giessen

011 789 7170

011 787 3059

pembani@eims.co.za

1.3. EXPERTISE OF THE EAP

1.3.1. QUALIFICATIONS OF THE EAP

In terms of Regulation 13 of the 2014 EIA Regulations (Government Notice R. 982), 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:

- 1) Objective and independent;
- 2) Has expertise in conducting EIA's;
- 3) Comply with the NEMA, the Regulations and all other applicable legislation;
- 4) Takes into account all relevant factors relating to the application; and
- 5) 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 EA process and the compilation of this report are attached as Appendix A.

1.3.2. SUMMARY OF THE EAP'S PAST EXPERIENCE

EIMS is a private and independent environmental management-consulting firm that was founded in 1993. EIMS has in excess of 20 years' experience in conducting EIAs, including many EIA's for mines and mining related projects. Please refer to the EIMS website (www.eims.co.za) for examples of EIA documentation currently available.

Sonja van de Giessen is a senior consultant with more than three years of experience in environmental impact assessments and environmental management. Her core experience and expertise is in the mining industry

sector, focusing on Environmental Impact Assessments, Environmental Management Programmes, Water Use Licence Applications and Integrated Water and Waste Management Plans, and Environmental Auditing. Her involvement in such projects varies from project management, to the compilation of technical and environmental documentations and reports. Sonja is registered as a trainee certified natural scientist in the field of environmental science with SACNASP.

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 EA / Scoping process process and the compilation of this report are attached as Appendix A.

1.3.3. SPECIALIST CONSULTANTS

Specialist studies have been done for the previous assessments and additional studies were only done for Zandvoort, where the EAP identified this necessary to support this application. Specialist studies were undertaken to address the key issues that required further investigation, namely the impact on biodiversity, groundwater, heritage, and soils, land use and land capability.

The specialist studies involved the gathering of data relevant to identifying and assessing environmental impacts that may occur as a result of the proposed project. These impacts were then assessed according to pre-defined rating scales (see Section 10). Specialists also recommended appropriate mitigation / control or optimisation measures to minimise potential negative impacts or enhance potential benefits, respectively.

Further specialist studies are also recommended where relevant.

Table 3: List of Specialists Appointed to Zandvoort

Component	Company Responsible
Biodiversity	David Hoare Consulting CC
Ground water	Irene Lea Environmental and Hydrology
Heritage	PGS Heritage and Grave Relocation Consultants
Soils, land use and land capability	Agricultural Research Council – Institute for Soil, Climate and Water

2. DESCRIPTION OF THE PROPERTY

The existing Pembani Colliery covers approximately 17 302 ha and the proposed Zandvoort Project area covering about 471 hectares (ha). Table 4 below indicates the farm portions that fall within the Mining Right Area and includes the Mining Right Application Area, as well as the properties for which Pembani is amending its Mining Works Programme (refer to Figure 1 below).

Table 4: Locality Details

Farm Name	<u>Mining Right holder</u>
	<p>Pembani Coal Carolina (Pty) Ltd. is the holder of a Mining Right in respect of the following properties within the existing Pembani Colliery:</p> <ul style="list-style-type: none"> • Appeldoorn 38 IT Remaining Extent (RE); Portion 9 and Portion 10; • Groenvallei 40 IT Remaining Extent (RE) of Portion 1; RE of Portion 7; (RE)

	<p>of Portion 8; (RE) of Portion 11; Portion 12; Portion 13; Portion 14 Portion 15; Portion 16; Portion 17 and Portion 19.</p> <ul style="list-style-type: none"> • Haarlem 39 IT Remaining Extent (RE); Portion 2; Portion 3; Portion 4 and Portion 5. • Hawerfontein 7 IT Remaining Extent (RE) of Portion 1; Portion2; Portion 3; Portion 4; Portion 5; Portion 6; Portion 7; Portion 8; Portion 9; Portion 10 and Portion 13. • Kwaggafontein 8 IT Remaining Extent (RE) of Portion 6; (RE) of Portion 7; Portion 8; Portion 9; Portion 10; and Portion 11. • Leeuwpoot 13 IT Remaining Extent (RE); • Paardeplaats 12 IT Remaining Extent (RE); Portion 2; Portion 4; Portion 5; Portion 6; Portion 10; Portion 11; Portion 12 and Portion 13. • Twyfelaar 11 IT Portion 3; Portion4; Portion 6; Portion 11; Portion 12 and Portion 13; RE of Portion 5 and RE of Portion 8. <p>The farm portions which are proposed to be added to the existing Pembani Colliery as part of this Project are as follows:</p> <ul style="list-style-type: none"> • Zandvoort 10 IT Remaining Extent (RE); and Portion 1. 																										
Application Area (Ha)	<p>The properties within the Zandvoort Project area cover about 471 hectares (ha). The existing Pembani Colliery covers approximately 17 302 ha, and therefore, the addition of the proposed areas would increase the Pembani Colliery to a size of approximately 17 773 ha.</p>																										
Magisterial District	<p>Magisterial District of Carolina</p>																										
Distance and direction from nearest town	<p>The Pembani Coilliery is situated east of Carolina, immediately north of the R38, in the Mpumalanga Province, South Africa. The Pembani Colliery is situated in the magisterial district of Carolina and falls under the Chief Albert Luthuli Local Municipality, situated in the Gert Sibande District Municipality. The closest town to the mining area is Carolina, situated approximately 3 km to the West of the proposed mining sites. Table 5 below indicates the distances and directions of the mine to the closest towns.</p>																										
21 digit Surveyor General Code for each Portion	<table border="1"> <thead> <tr> <th>Farm Name:</th> <th>Portion:</th> <th>SG Codes:</th> </tr> </thead> <tbody> <tr> <td>1. Appeldoorn 38 IT</td> <td>RE</td> <td>T0IT00000000003800000</td> </tr> <tr> <td>2. Appeldoorn 38 IT</td> <td>9</td> <td>T0IT00000000003800009</td> </tr> <tr> <td>3. Appeldoorn 38 IT</td> <td>10</td> <td>T0IT00000000003800010</td> </tr> <tr> <td>4. Groenvallei 40 IT</td> <td>RE of 1</td> <td>T0IT00000000004000001</td> </tr> <tr> <td>5. Groenvallei 40 IT</td> <td>RE of 7</td> <td>T0IT00000000004000007</td> </tr> <tr> <td>6. Groenvallei 40 IT</td> <td>RE of 8</td> <td>T0IT00000000004000008</td> </tr> <tr> <td>7. Groenvallei 40 IT</td> <td>RE of 11</td> <td>T0IT00000000004000011</td> </tr> </tbody> </table>	Farm Name:	Portion:	SG Codes:	1. Appeldoorn 38 IT	RE	T0IT00000000003800000	2. Appeldoorn 38 IT	9	T0IT00000000003800009	3. Appeldoorn 38 IT	10	T0IT00000000003800010	4. Groenvallei 40 IT	RE of 1	T0IT00000000004000001	5. Groenvallei 40 IT	RE of 7	T0IT00000000004000007	6. Groenvallei 40 IT	RE of 8	T0IT00000000004000008	7. Groenvallei 40 IT	RE of 11	T0IT00000000004000011		
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1. Appeldoorn 38 IT	RE	T0IT00000000003800000																									
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4. Groenvallei 40 IT	RE of 1	T0IT00000000004000001																									
5. Groenvallei 40 IT	RE of 7	T0IT00000000004000007																									
6. Groenvallei 40 IT	RE of 8	T0IT00000000004000008																									
7. Groenvallei 40 IT	RE of 11	T0IT00000000004000011																									

	8. Groenvallei 40 IT	12	TOIT00000000004000012
	9. Groenvallei 40 IT	13	TOIT00000000004000013
	10. Groenvallei 40 IT	14	TOIT00000000004000014
	11. Groenvallei 40 IT	15	TOIT00000000004000015
	12. Groenvallei 40 IT	16	TOIT00000000004000016
	13. Groenvallei 40 IT	17	TOIT00000000004000017
	14. Groenvallei 40 IT	19	TOIT00000000004000019
	15. Haarlem 39 IT	RE	TOIT00000000003900000
	16. Haarlem 39 IT	2	TOIT00000000003900002
	17. Haarlem 39 IT	3	TOIT00000000003900003
	18. Haarlem 39 IT	4	TOIT00000000003900004
	19. Haarlem 39 IT	5	TOIT00000000003900005
	20. Hawerfontein 7 IT	RE of 1	TOIT00000000000700001
	21. Hawerfontein 7 IT	2	TOIT00000000000700002
	22. Hawerfontein 7 IT	3	TOIT00000000000700003
	23. Hawerfontein 7 IT	4	TOIT00000000000700004
	24. Hawerfontein 7 IT	5	TOIT00000000000700005
	25. Hawerfontein 7 IT	6	TOIT00000000000700006
	26. Hawerfontein 7 IT	7	TOIT00000000000700007
	27. Hawerfontein 7 IT	8	TOIT00000000000700008
	28. Hawerfontein 7 IT	9	TOIT00000000000700009
	29. Hawerfontein 7 IT	10	TOIT00000000000700010
	30. Hawerfontein 7 IT	13	TOIT00000000000700013
	31. Kwaggafontein 8 IT	RE of 6	TOIT00000000000800006
	32. Kwaggafontein 8 IT	RE of 7	TOIT00000000000800007
	33. Kwaggafontein 8 IT	8	TOIT00000000000800008
	34. Kwaggafontein 8 IT	9	TOIT00000000000800009
	35. Kwaggafontein 8 IT	10	TOIT00000000000800010
	36. Kwaggafontein 8 IT	11	TOIT00000000000800011

	37. Leeuwpoot 13 IT	RE	TOIT00000000001300000
	38. Paardeplaats 12 IT	RE	TOIT00000000001200000
	39. Paardeplaats 12 IT	2	TOIT00000000001200002
	40. Paardeplaats 12 IT	4	TOIT00000000001200004
	41. Paardeplaats 12 IT	5	TOIT00000000001200005
	42. Twyfelaar 11 IT	3	TOIT00000000001100003
	43. Twyfelaar 11 IT	4	TOIT00000000001100004
	44. Twyfelaar 11 IT	6	TOIT00000000001100005
	45. Twyfelaar 11 IT	10	TOIT00000000001100006
	46. Twyfelaar 11 IT	11	TOIT00000000001100008
	47. Twyfelaar 11 IT	12	TOIT00000000001100010
	48. Twyfelaar 11 IT	13	TOIT00000000001100011
	49. Twyfelaar 11 IT	RE of 5	TOIT00000000001100012
	50. Twyfelaar 11 IT	RE of 8	TOIT00000000001100013
	51. Zandvoort 10 IT	RE	TOIT00000000001000002
	52. Zandvoort 10 IT	1	TOIT00000000001000001

Table 5: Distances and directions to neighbouring towns

Town	Distance	Direction
Carolina	4.6 km	West
Badplaas	41.6 km	East
Machadodorp	45 km	North
Chrissiesmeer	23 km	South

A description of the Title Deeds, registered landowners, and existing authorisations for each of these 52 properties is provided in Table 6 below.

Table 6: Description of the land on which the Pembani Colliery is located.

Farm Name	Portion	21 digit Surveyor General Code	Title Deed	Registered Landowner	Existing Authorisations
Appeldoorn 38 IT	Remaining Extent	T0IT0000000000380000	T31304/1966	Karel Jan Doyer	(MR) MP 30/5/1/2/2/112 MR
	Portions 9	T0IT0000000000380000	T31304/1966	Karel Jan Doyer	(MR) MP 30/5/1/2/2/112 MR (EA)17/2/3 GS-44
	Portion 10	T0IT0000000000380001	T10647/1983	Anton Uys	(MR) MP 30/5/1/2/2/112 MR
Groenvallei 40 IT	Remaining Extent of Portion 1	T0IT0000000000400000	T155494/2000	Groenvallei Landbougrond CC	(MR) MP 30/5/1/2/2/112 MR (EA) 17/2/4 G (GS) - 33
	Remaining Extent of Portion 7	T0IT0000000000400000	T170532/2003	Van Rensburg Family Trust	(MR) MP 30/5/1/2/2/112 MR
	Remaining Extent of Portion 8	T0IT0000000000400000	T170532/2003	Van Rensburg Family Trust	(MR) MP 30/5/1/2/2/112 MR (EA)17/2/3 GS-44
	Portion 1	T0IT0000000000400000	T155494/2000	Groenvallei Landbougrond Pty Ltd	(EA)17/2/3 GS-44
	Portion 5	T0IT0000000000400000	T45546/2002	Carolina Coal Pty Ltd	(ML) MP 30/5/1/2/2/221 MR (IWUL) 05/X11D/AGJ/466
	Portion 7	T0IT0000000000400000	T170532/2003	Van Rensburg	(EA)17/2/3 GS-44
	Remaining Extent of Portion 11	T0IT0000000000400001	T7060/2014	Nkosi Jane Promise	(MR) MP 30/5/1/2/2/112 MR
	Portion 12	T0IT0000000000400001	T3829/1991	Goss Jan Francois	(MR) MP 30/5/1/2/2/112 MR
	Portion 13	T0IT0000000000400001	T3392/1923	Preddy Charles	(MR) MP 30/5/1/2/2/112 MR

Farm Name	Portion	21 digit Surveyor General Code	Title Deed	Registered Landowner	Existing Authorisations
	Portion 14	T0IT00000000004000014	T3829/1991	Goss Jan Francois	(MR) MP 30/5/1/2/2/112 MR
	Portion 15	T0IT00000000004000015	T98948/2007	Potgieter Eduard Willem	(MR) MP 30/5/1/2/2/112 MR
	Portion 16	T0IT00000000004000016	T38096/1995	Luus Familie Trust	(MR) MP 30/5/1/2/2/112 MR (EA) 17/2/4 G (GS) - 33
	Portion 17	T0IT00000000004000017	T94002/1992	Groenvallei Landbougrond CC	(MR) MP 30/5/1/2/2/112 MR
	Portion 19	T0IT00000000004000019	T9713/2013	Uys Roule	(MR) MP 30/5/1/2/2/112 MR
Haarlem 39 IT	Remaining Extent	T0IT00000000003900000	T13851/2008	Worldwide Coal Carolina Pty Ltd	(MR) MP 30/5/1/2/2/112 MR (EA) 17/2/4 G (GS) - 33 (EA) 17/2/3 GS-78
	Portion 2	T0IT00000000003900002	T14436/1985	St. Louis Trust	(MR) MP 30/5/1/2/2/112 MR
	Portion 3	T0IT00000000003900003	T1905/2013	National Government of the Republic of South Africa	(MR) MP 30/5/1/2/2/112 MR
	Portion 4	T0IT00000000003900004	T129297/2006	Imbani Coal Pty Ltd	(MR) MP 30/5/1/2/2/112 MR (EA) 17/2/4 G (GS) - 33 (EA) 17/2/3 GS-78
	Portion 5	T0IT00000000003900005	T17145/2008	Worldwide Coal Carolina Pty Ltd	(MR) MP 30/5/1/2/2/112 MR (EA) 17/2/4 G (GS) - 33
Hawerfontein 7 IT	Remaining Extent of Portion 1	T0IT0000000000700001	T46737/1984	Hawerfontein Boerdery Belange Pty Ltd	(MR) MP 30/5/1/2/2/112 MR
	Portion 2	T0IT0000000000700002	T121625/2007	Niehaus Diederich Wilhelm	(MR) MP 30/5/1/2/2/112 MR

Farm Name	Portion	21 digit Surveyor General Code	Title Deed	Registered Landowner	Existing Authorisations
	Portion 3	T0IT00000000000700003	U B Trust	T121624/2007	(MR) MP 30/5/1/2/2/112 MR
	Portion 4	T0IT00000000000700004	T28420/2006	Niehaus Diederich Wilhelm	(MR) MP 30/5/1/2/2/112 MR
	Portion 5	T0IT00000000000700005	T121625/2007	Niehaus Diederich Wilhelm	(MR) MP 30/5/1/2/2/112 MR
	Portion 6	T0IT00000000000700006	T5101/1995	Uys Johannes Cornelis Isak	(MR) MP 30/5/1/2/2/112 MR
	Portion 7	T0IT00000000000700007	T2342/2011	Khulamnotfo Co-Operative LTD	(MR) MP 30/5/1/2/2/112 MR
	Portion 8	T0IT00000000000700008	T18980/2008	F J van Rensburg Trust	(MR) MP 30/5/1/2/2/112 MR
	Portion 9	T0IT00000000000700009	T4088/1927	Transnet LTD	(MR) MP 30/5/1/2/2/112 MR
	Portion 10	T0IT00000000000700010	T2342/2011	Khulamnotfo Co-Operative LTD	(MR) MP 30/5/1/2/2/112 MR
	Portion 13	T0IT00000000000700013	T50568/2002	Kruger Aletta Elizabeth Dorothea Regina	(MR) MP 30/5/1/2/2/112 MR
Kwaggafontein 8 IT	Remaining Extent of Portion 6	T0IT00000000000800006	T12843/2000	McGinn Helen Jennifer	(MR) MP 30/5/1/2/2/112 MR
	Remaining Extent of Portion 7	T0IT00000000000800007	T12843/2000	McGinn Helen Jennifer	(MR) MP 30/5/1/2/2/112 MR
	Portion 8	T0IT00000000000800008	T6984/2009	Worldwide Coal Carolina (Pty) Ltd	(MR) MP 30/5/1/2/2/112 MR (EA)17/2/3 GS-44 (EA) 17/2/4 G (GS) - 33
	Portion 9	T0IT00000000000800009	T93133/2001	Wet Jan De Bruin De	(MR) MP 30/5/1/2/2/112 MR

Farm Name	Portion	21 digit Surveyor General Code	Title Deed	Registered Landowner	Existing Authorisations
	Portion 10	T0IT00000000000800010	T157814/2002	Taute Jan Hendrik Stander	(MR) MP 30/5/1/2/2/112 MR
	Portion 11	T0IT00000000000800011	T121624/2007	U B Trust	(MR) MP 30/5/1/2/2/112 MR
Leeuwpoort 13 IT	The entire farm	T0IT00000000001300000	T70525/2007	Worldwide Coal Carolina (Pty) Ltd	(MR) MP 30/5/1/2/2/112 MR
Paardeplaats 12 IT	Remaining Extent	T0IT00000000001200000	T15680/2010	National Government of the Republic of South Africa	(MR) MP 30/5/1/2/2/112 MR (IWUL) 05/X11D/AGJ/466 (EA)17/2/3 GS-44
	Portion 2	T0IT00000000001200002	T15314/1996	Versfeld-Schoeman Familie Trust	(MR) MP 30/5/1/2/2/112 MR (IWUL) 05/X11D/AGJ/466 (EA)17/2/3 GS-44
	Portion 4	T0IT00000000001200004	T14436/1985	St Louis Trust	(MR) MP 30/5/1/2/2/112 MR
	Portion 5	T0IT00000000001200005	T77628/2000	Arents Trust	(MR) MP 30/5/1/2/2/112 MR
	Portion 7 (A portion of portion 3)	T0IT00000000001200007	T140320/2000	Asithandaneni Communal Property Assoc	IMBANI WASH PLANT (ML) MP 30/5/1/2/2/221 MR OT 5/3/2/ 600 (pending)
Twyfelaar 11 IT	Portion 3	T0IT00000000001100003	T70525/2007	Nick Viljoen Familie Trust	(MR) MP 30/5/1/2/2/112 MR
	Portion 4	T0IT00000000001100004	T70525/2007	Nick Viljoen Familie Trust	(MR) MP 30/5/1/2/2/112 MR
	Remaining Extent of Portion 5	T0IT00000000001100005	T155560/2003	M J Pieterse Trust	(MR) MP 30/5/1/2/2/112 MR
	Portion 6	T0IT00000000001100006	T16021/2008	Carolina Ontwikkelings Trust	(MR) MP 30/5/1/2/2/112 MR

Farm Name	Portion	21 digit Surveyor General Code	Title Deed	Registered Landowner	Existing Authorisations
	Remaining Extent of Portion 8	T0IT00000000001100008	T6985/2009	Worldwide Coal Carolina (Pty) Ltd	(MR) MP 30/5/1/2/2/112 MR (EA)17/2/3 GS-44 (EA) 17/2/4 G (GS) - 33
	Portion 10	T0IT00000000001100010	T6985/2009	Worldwide Coal Carolina (Pty) Ltd	(MR) MP 30/5/1/2/2/112 MR (EA)17/2/3 GS-44
	Portion 11	T0IT00000000001100011	T173727/2003	Ekwaluseni Farming Enterprises	(MR) MP 30/5/1/2/2/112 MR
	Portion 12	T0IT00000000001100012	T34412/2005	Tau Kwena General Construction CC	(MR) MP 30/5/1/2/2/112 MR
	Portion 13	T0IT00000000001100013	T6984/2009	Worldwide Coal Carolina (Pty) Ltd	(MR) MP 30/5/1/2/2/112 MR (EA)17/2/3 GS-44
Zandvoort 10 IT	Remaining Extent	T0IT00000000001000002	T5103/1977	Davel Johannes Stephanus- Trustees	(EA)17/2/3 GS-44 (PR) MP 30/5/1/1/3/7/1/415 EM
	Portion 1	T0IT00000000001000001	T5103/1977	Davel Johannes Stephanus- Trustees	(EA)17/2/3 GS-44 (PR) MP 30/5/1/1/3/7/1/415 EM

2.1. LOCALITY MAP

Figure 1 below indicates the locality of the Pembani Colliery, as well as the old mining licence, the prospecting right and the existin mining right boundaries.

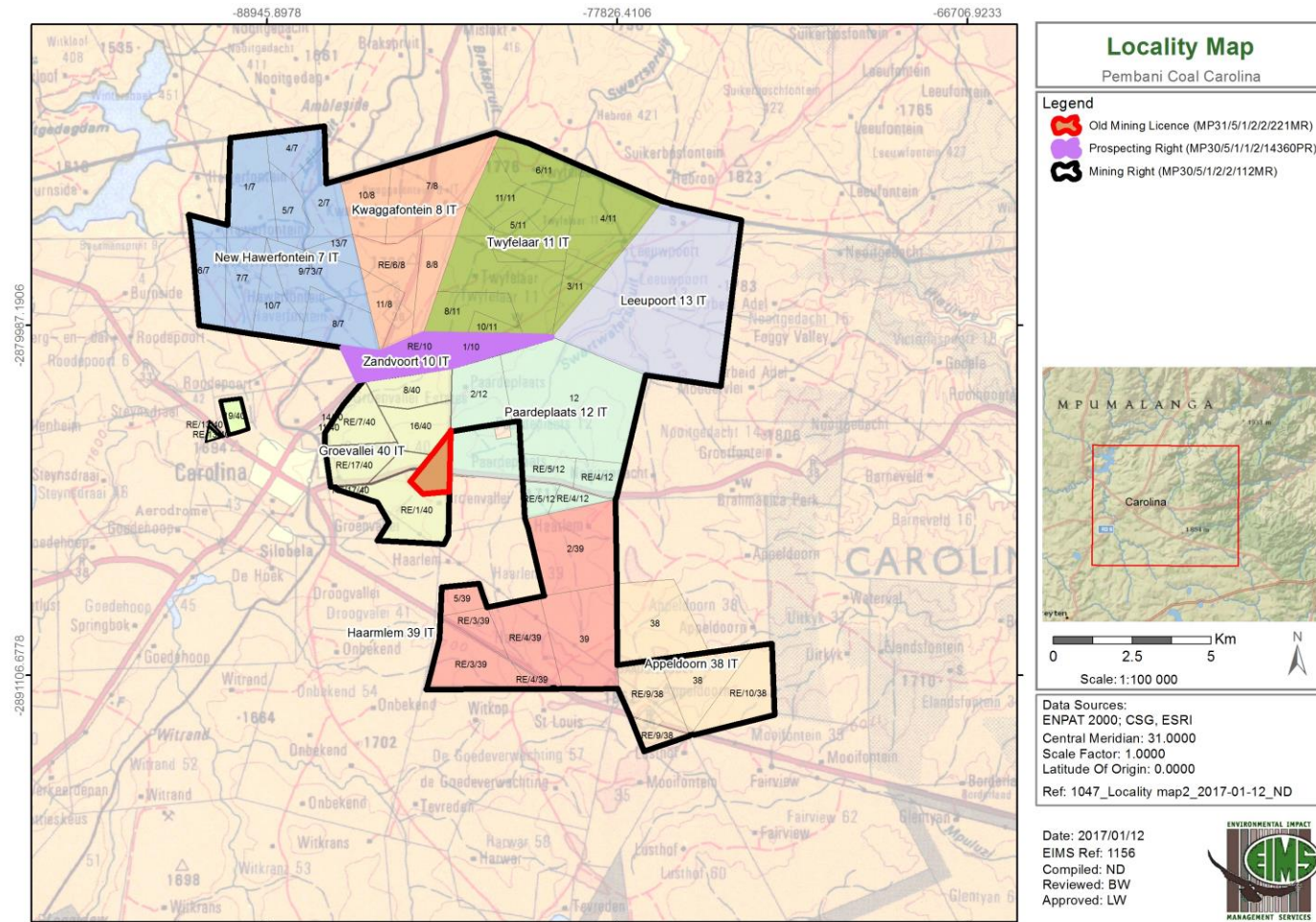


Figure 1: Locality Map

3. DESCRIPTION AND SCOPE OF THE PROPOSED OVERALL ACTIVITY

Pembani has an approved mining right (MP 30/5/1/2/2/112 MR) and EMPR in terms of the MPRDA for the mining of coal at the Pembani Colliery. Additionally, the Applicant has applied for a prospecting right (MP 30/5/1/1/2/14360 PR) and EMP in terms of the MPRDA for the prospecting of coal on Zandvoort. Furthermore, Pembani proposes to amend their existing mining works programme (within the approved mining right boundary) to include the mining of additional coal resources. Coal will be transported and processed according to the existing mines current approved operations.

Opencast mining has taken place on a number of properties and the mining areas are in various stages of rehabilitation at present. The mine has recently commenced with underground mining and wishes to extend their underground mining footprint to include Zandvoort and also wish to make an amendment to the existing mining works programme to include the mining of additional coal resources by opencast and underground mining. As such a S102 amendment process is being undertaken by the mine to include the proposed Zandvoort prospecting right into the existing mining right (MP 30/5/1/2/2/112 MR). Pembani is also required to undergo an EA process including an Environmental Impact Assessment to assess any new impacts associated with the change in the extent of the approved mining area, and also to consolidate the numerous authorisation processes that have been undertaken to date to produce a single overarching EMPR for holistic management of the Pembani Colliery going forward.

The approved mining right area is illustrated in Figure 2 below. The S102 application and the EA process is being undertaken to incorporate Zandvoort into the mining right and to amend the existing mining works programme to include the mining of additional coal resources. Entrance to the underground reserves on Zandvoort will be accessed via existing underground workings and as such, no surface infrastructure will be constructed on this property. Coal will be transported and processed according to the existing mines current approved operations. It should be noted Pembani has an approved existing old order Mining License (ML) in terms of the Minerals Act (MA), over Portion 5 of the farm Groenvallei 40 IT (MP 30/5/1/2/2/221 MR OT 5/3/2/600) as well as an approved EMP, dated March 2003. An application for conversion to a NOMR, in terms of the MPRDA, was lodged with the DMR on 19 April 2007. An EMP amendment, for the inclusion of underground mining, the Imbani Wash Plant (previously referred to as the Carolina Coal Wash Plant), co-disposal and pollution control dams (PCD's), was submitted on 28 July 2009, as supporting document to the conversion. The old order mining licence is to date still awaiting conversion and it is referred to in this report as a comprehensive description of the entire mining operation.

The following rights, authorisations and approvals are currently in place and have been considered in the compilation of the report:

- Mining Right (MR) MP 30/5/1/2/2/112 MR, granted to Imbani Coal (Pty) Ltd (Imbani), in terms of Section 23 (1) of the MPRDA;

- Prospecting Right (PR) MP 30/5/1/1/2/415 PR, granted to Ingwe Collieries Limited, in terms of Section 17(1) of the MPRDA has lapsed and following consultation with the DMR a new application has been submitted (MP 30/5/1/1/2/14360 PR);
- Mining License (ML) MP 30/5/1/2/2/221 MR OT 5/3/2/600, granted to World Wide Coal (Pty) Ltd (WWC), in terms of the Mineral Act, 1991 (Act 50 of 1991) (MA), application for conversion to NOMR and inclusion of Imbani Wash Plant submitted 2007;
- NEMA Environmental Authorisation (EA) 17/2/4/G (GS) -33;
- NEMA Environmental Authorisation (EA) 17/2/3/GS-44;
- NEMA Environmental Authorisation (EA) 17/2/3 GS-78; and
- NWA IWULA (IWUL) 05/X11D/AGJ/466, amendment application (IWUL) 16/2/7X100/C180 submitted 2014 and granted on 07 July 2016, (Licence No. 05/X11B/ACGIJ/4704).

The existing mine infrastructure includes:

- Opencast pits in various stages of rehabilitation;
- Haul roads;
- Storm water management infrastructure;
- Contractors camp including workshop, diesel storage, offices and ablution facilities;
- Raw water dams and PCD's;
- Water pipelines and associated water management infrastructure;
- Co-disposal facility
- Imbani Wash Plant;
- Administrative offices;
- Security and fencing;
- Product stockpiles;
- Discard and overburden stockpiles;
- Topsoil stockpiles;
- Monitoring boreholes;
- Highwall entrance to underground;
- Underground mining sections;
- Conveyors (underground conveyors transporting coal to surface); and
- Site camp associated with underground mine entrance.

The mine infrastructure is illustrated in the master plan map series indicated in Figure 2 to Figure 9 below.

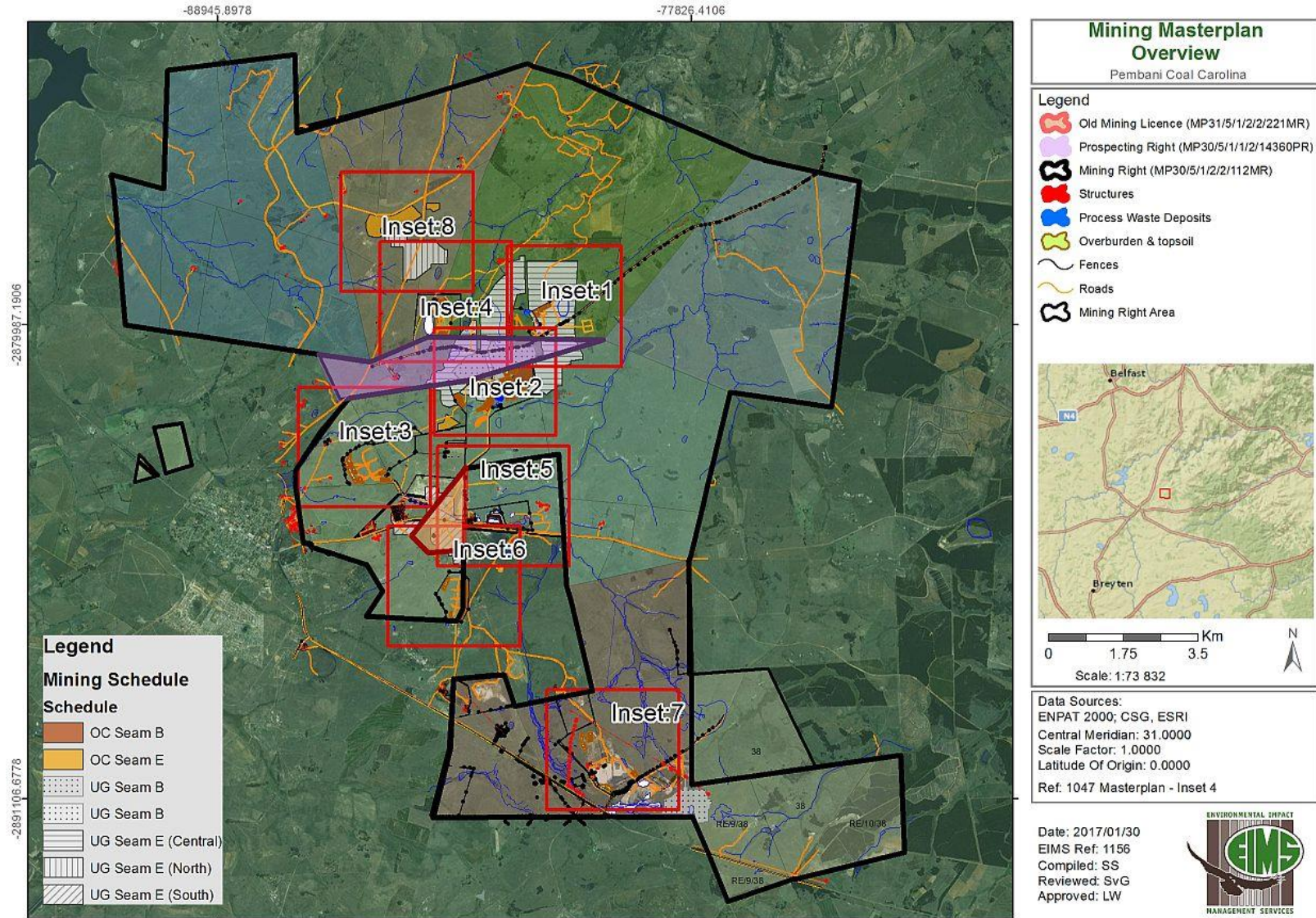


Figure 2: Master Plan showing mine infrastructure - Overview

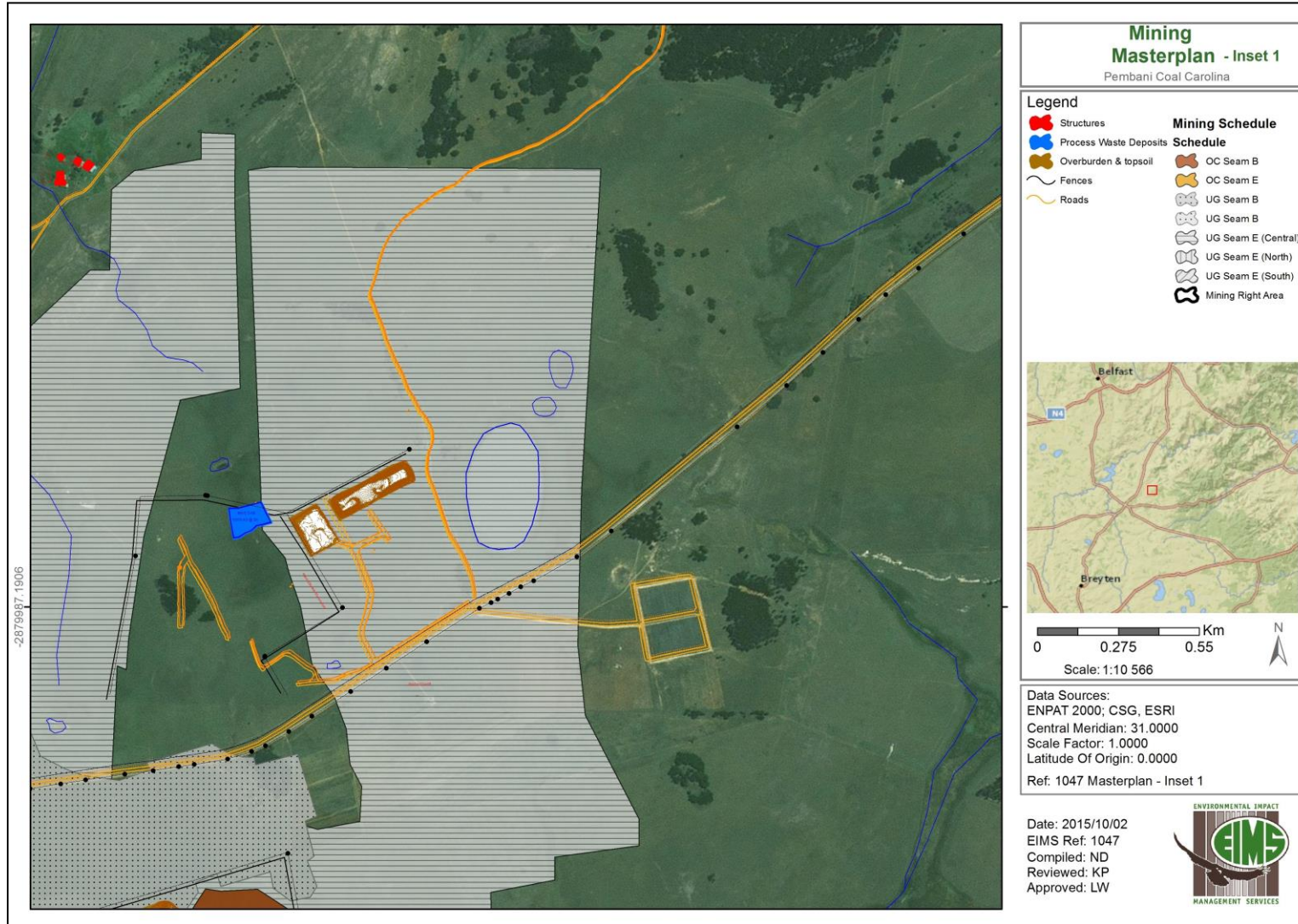


Figure 3: Master plan showing mine infrastructure - Inset 1

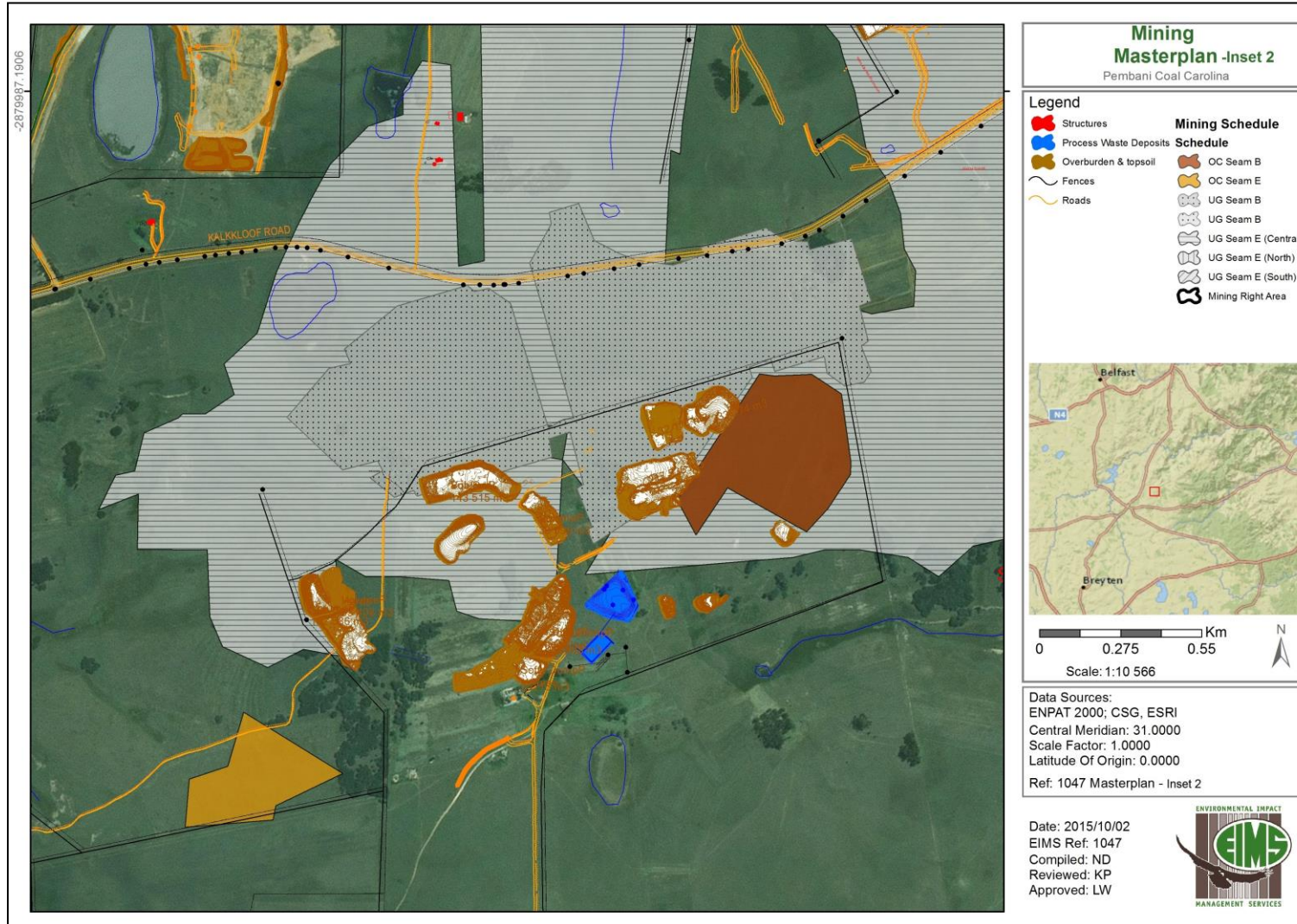


Figure 4: Master plan map showing mine infrastructure - Inset 2

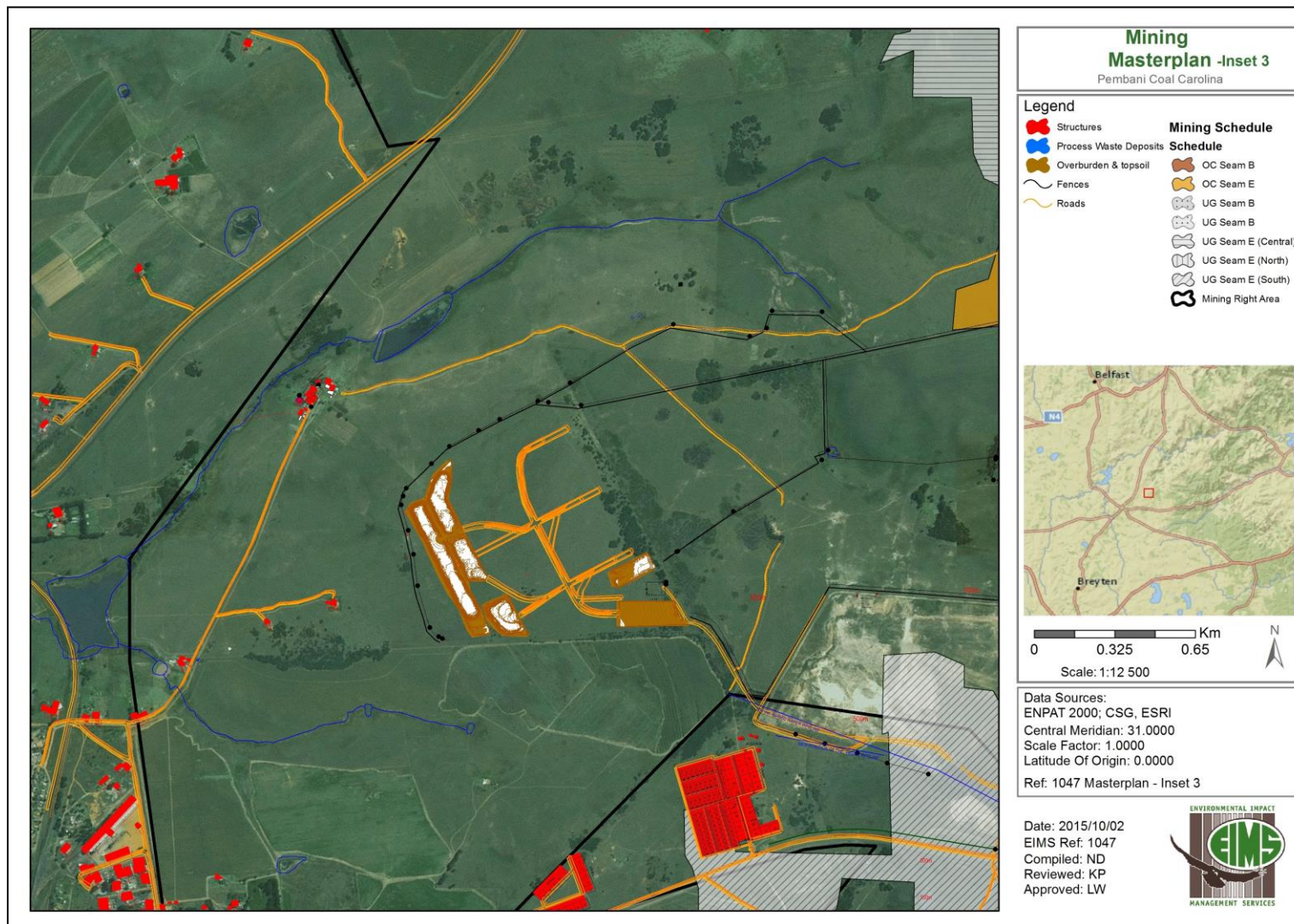


Figure 5: Master plan map showing mine infrastructure - Inset 3

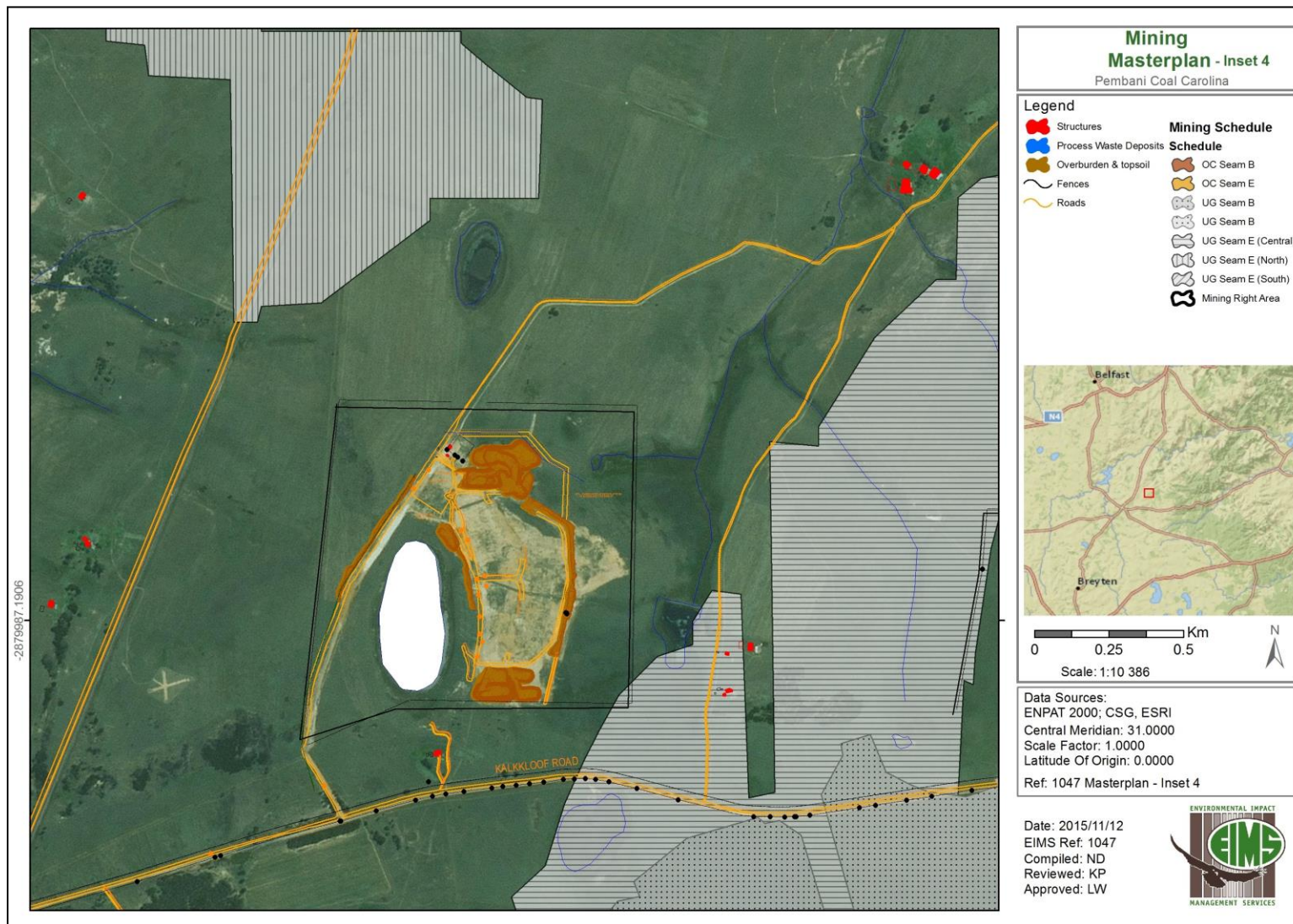


Figure 6: Master plan map showing mine infrastructure – Inset 4

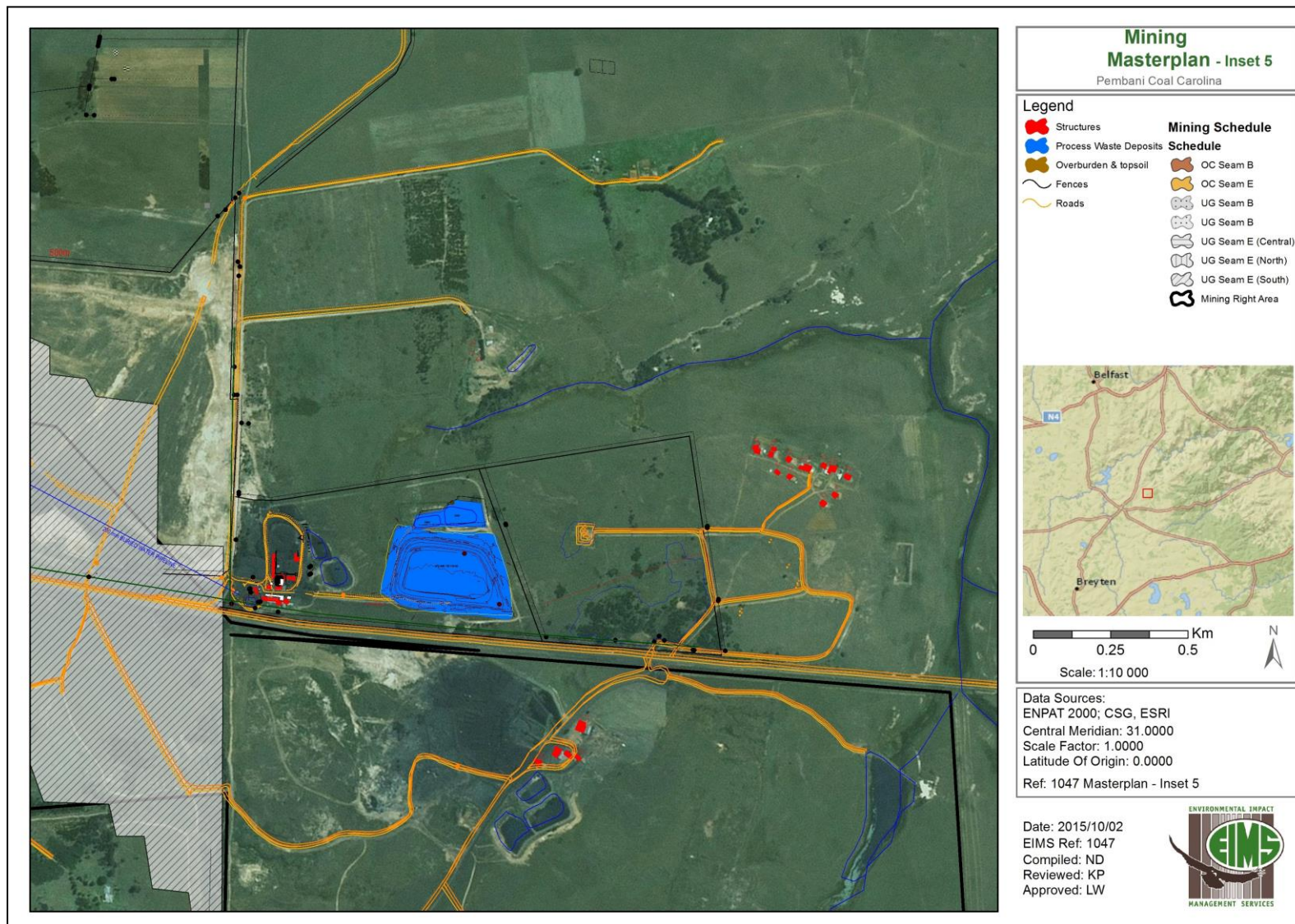


Figure 7: Master plan map showing mine infrastructure - Inset 5

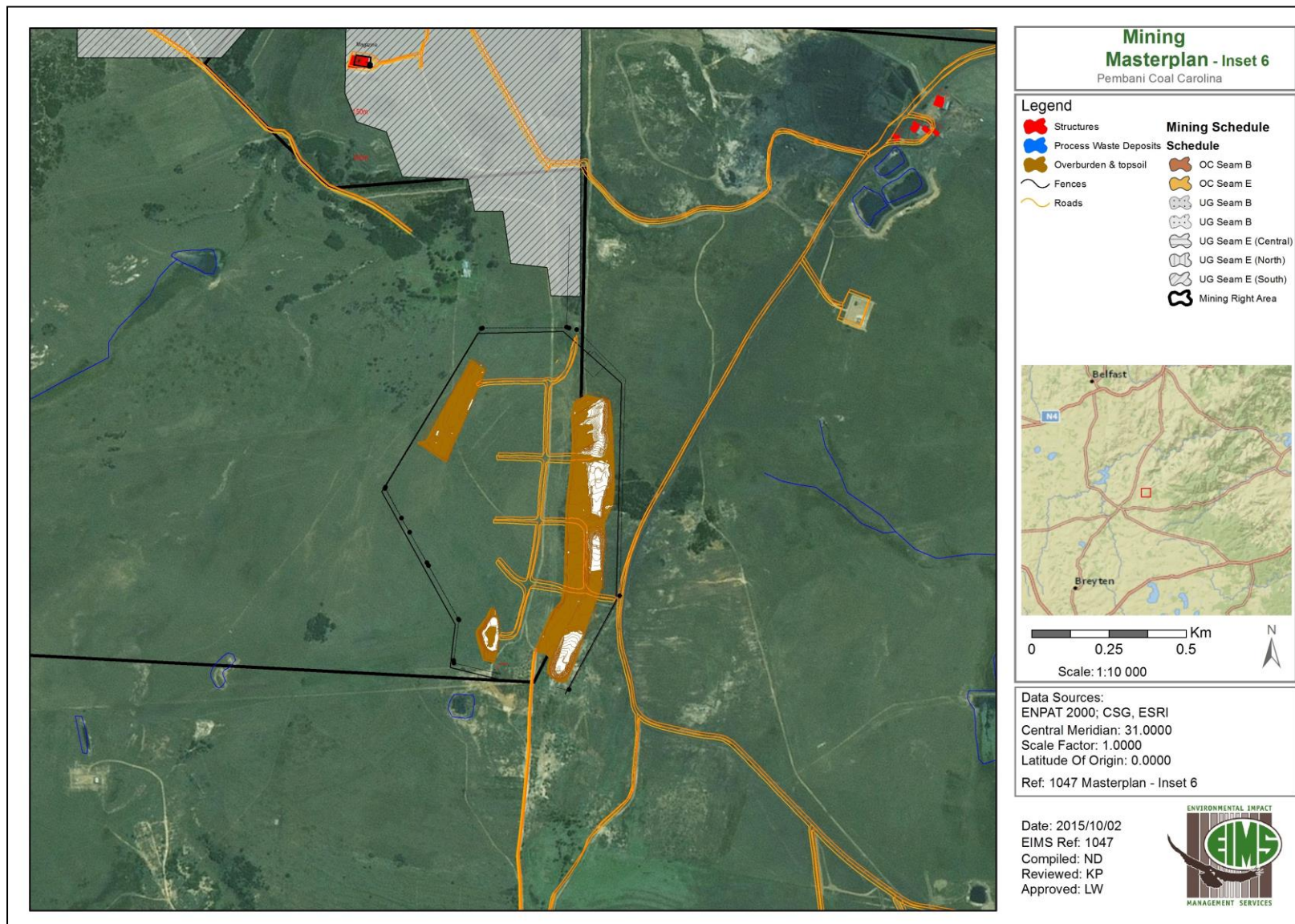


Figure 8: Master plan map showing mine infrastructure - Inset 6

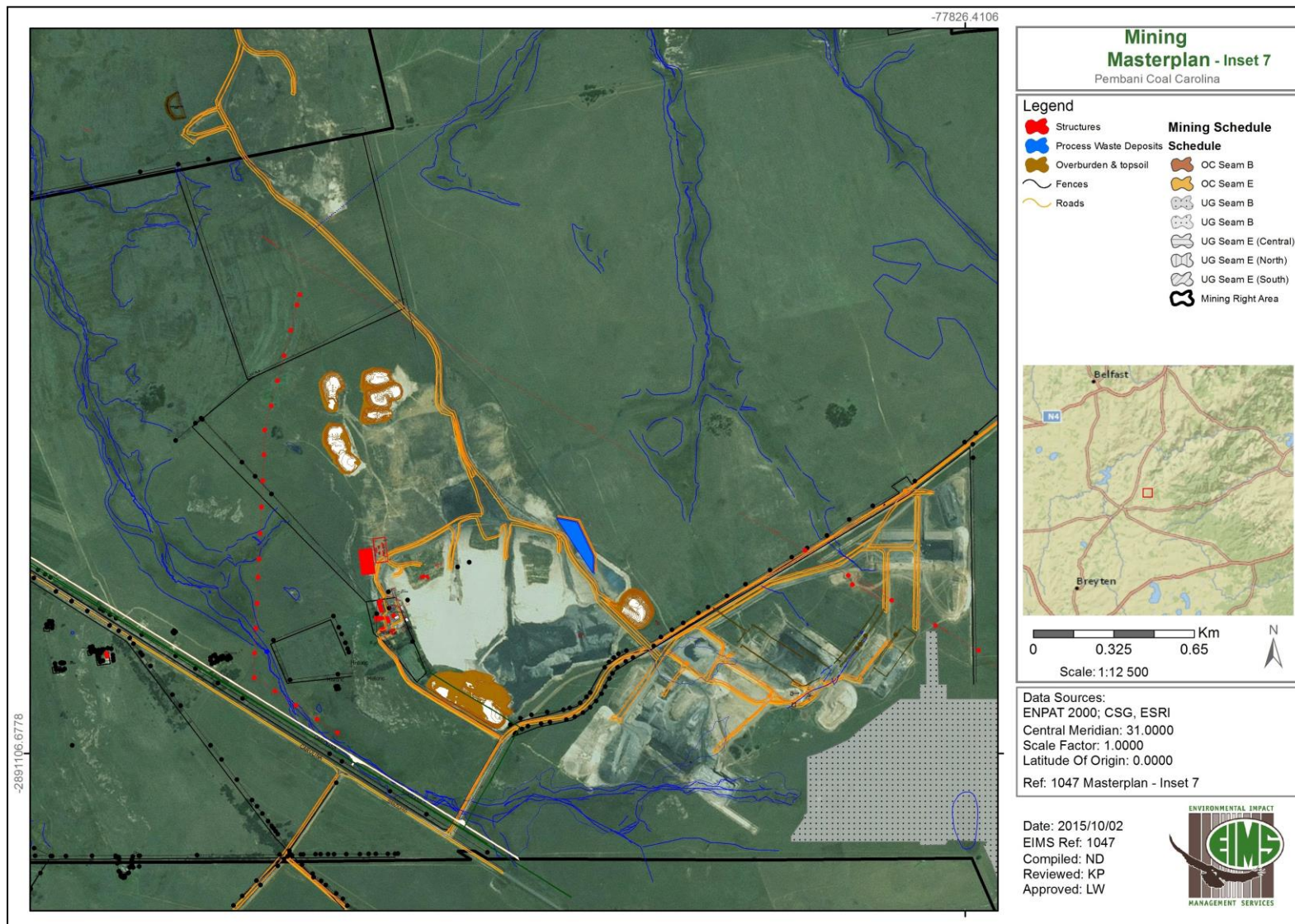


Figure 9: Master plan map showing mine infrastructure - Inset 7

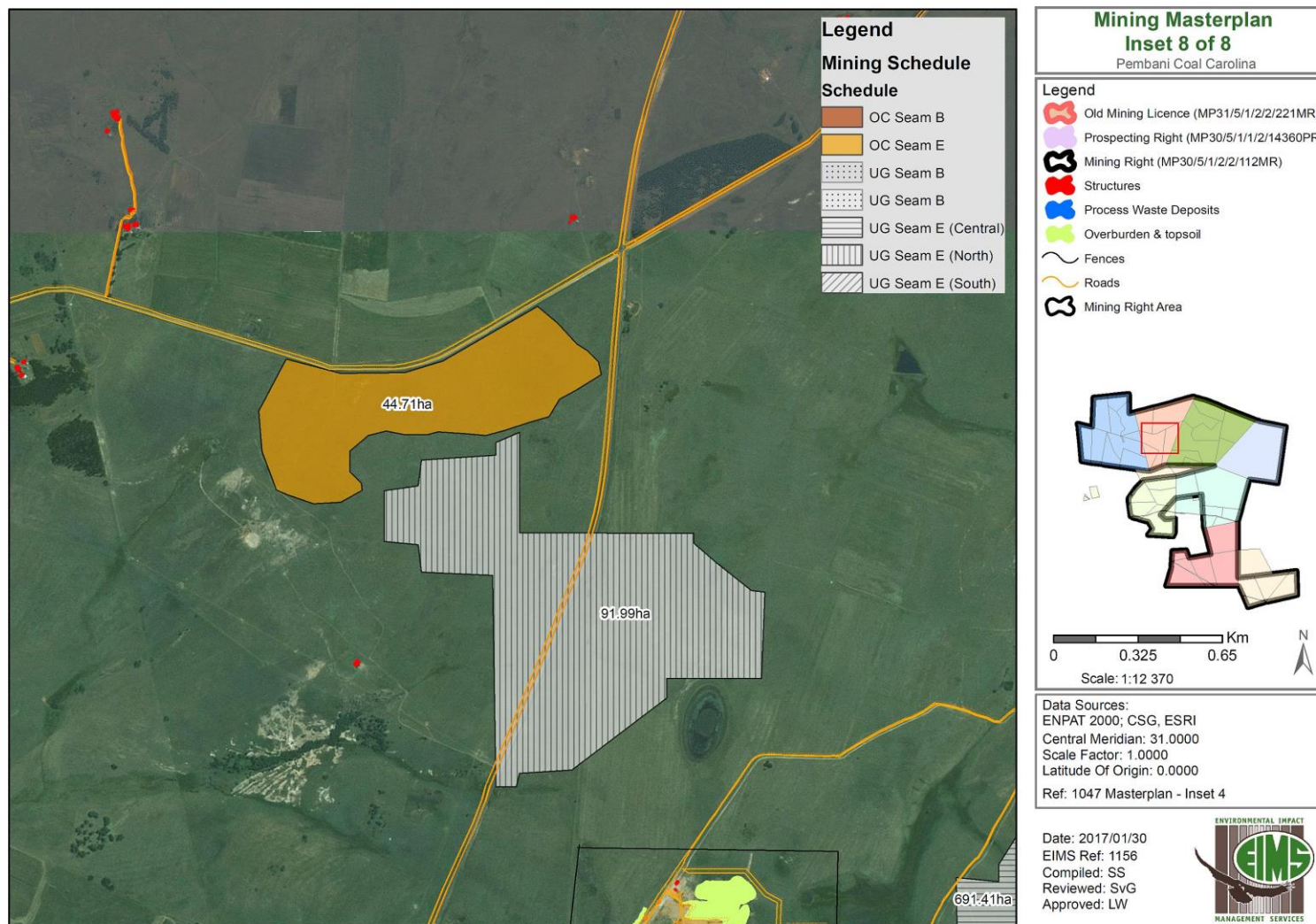


Figure 10: Master plan map showing mine infrastructure - Inset 8.

3.1. LISTED AND SPECIFIED ACTIVITIES

The EA in terms of the NEMA for the Pembani Colliery was originally issued on 6 August 2012 and amended on 31 July 2013 by the Mpumalanga Department of Economic Development, Environment and Tourism (MDEDET), now the Mpumalanga Department of Agriculture, Rural Development, Land, and Environmental Affairs (MDARDLEA). The listed activities in terms of Chapter 3 of the National Environmental Management Act (NEMA), 1998 approved as part of the EA includes:

- Activity 9, 11, 12, 18, 22, 23, 28, 47, 56 of Government Notice (GN) R544;
- Activity 5, 15, 20 of GN R545; and
- Activity 4 (a), 10 (a) and 12 of GN R546.

These approved activities are described further in Table 6 below.

Table 6: Description of the land on which the Pembani Colliery is located

Name of Activity	Aerial Extent of Activity (Ha or m ²)	Listed Activity	Applicable Listing Notice
<p>The construction of facilities or infrastructure exceeding 1000 metres in length for the bulk transportation of water, sewage or storm water -</p> <p>(i) with an internal diameter of 0,36 metres or more; or</p> <p>(ii) with a peak throughput of 120 litres per second or more,</p> <p>excluding where:</p> <p>a. such facilities or infrastructure are for bulk transportation of water, sewage or storm water or storm water drainage inside a road reserve; or</p> <p>b. where such construction will occur within urban areas but further than 32 metres from a watercourse, measured from the edge of the watercourse.</p>	This will occur within the 1417.618 ha mining footprint.	X	GNR 544 Activity 9
<p>The construction of:</p> <p>(i) canals;</p> <p>(ii) channels;</p> <p>(iii) bridges;</p> <p>(iv) dams;</p> <p>(v) weirs;</p> <p>(vi) bulk storm water outlet structures;</p> <p>(vii) marinas;</p> <p>(viii) jetties exceeding 50 square metres in size;</p> <p>(ix) slipways exceeding 50 square metres in size;</p> <p>(x) buildings exceeding 50 square metres in size; or</p> <p>(xi) infrastructure or structures covering 50 square metres or more.</p>	This will occur within the 1417.618 ha mining footprint.	X	GNR 544 Activity 11

Name of Activity	Aerial Extent of Activity (Ha or m ²)	Listed Activity	Applicable Listing Notice
where such construction occurs within a watercourse or within 32 metres of a watercourse, measured from the edge of a watercourse, excluding where such construction will occur behind the development setback line.			
The construction of facilities or infrastructure for the off-stream storage of water, including dams and reservoirs, with a combined capacity of 50000 cubic metres or more, unless such storage falls within the ambit of activity 19 of Notice 545 of 2010;	92.199 ha	X	GNR 544 Activity 12
<p>The infilling or depositing of any material of more than 5 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock or more than 5 cubic metres from:</p> <p>(i) a watercourse;</p> <p>(ii) the sea;</p> <p>(iii) the seashore;</p> <p>(iv) the littoral active zone, an estuary or a distance of 100 metres inland of the high-water mark of the sea or an estuary, whichever distance is the greater-</p> <p>but excluding where such infilling, depositing, dredging, excavation, removal or moving;</p> <p>(a) is for maintenance purposes undertaken in accordance with a management plan agreed to by the relevant environmental authority; or</p> <p>(b) occurs behind the development setback line.</p>	This will occur within the 1417.618 ha mining footprint.	X	GNR 544 Activity 18
<p>The construction of a road, outside urban areas,</p> <p>(i) with a reserve wider than 13,5 meters or,</p> <p>(ii) where no reserve exists where the road is wider than 8 metres, or</p> <p>for which an environmental authorisation was obtained for the route determination in terms of activity 5 in Government Notice 387 of 2006 or activity 18 in Notice 545 of 2010.</p>	1180.55 ha	X	GNR 544 Activity 22

Name of Activity	Aerial Extent of Activity (Ha or m ²)	Listed Activity	Applicable Listing Notice
<p>The transformation of undeveloped, vacant or derelict land to –</p> <ul style="list-style-type: none"> (i) residential, retail, commercial, recreational, industrial or institutional use, inside an urban area, and where the total area to be transformed is 5 hectares or more, but less than 20 hectares, or (ii) residential, retail, commercial, recreational, industrial or institutional use, outside an urban area and where the total area to be transformed is bigger than 1 hectare but less than 20 hectares; - <p>[except where such transformation takes place for linear activities]</p> <p>except where such transformation takes place –</p> <ul style="list-style-type: none"> (i) for linear activities; or (ii) for purposes of agriculture or afforestation, in which case Activity 16 of Notice No. R. 545 applies. 	This will occur within the 1417.618 ha mining footprint.	X	GNR 544 Activity 23
<p>The expansion of <u>or changes to</u> existing facilities for any process or activity where such expansion <u>or changes to</u> will result in the need for a [new, or amendment of, an existing] permit or license in terms of national or provincial legislation governing the release of emissions or pollution, excluding where the facility, process or activity is included in the list of waste management activities published in terms of section 19 of the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) in which case that Act will apply.</p>	This will occur within the 1417.618 ha mining footprint.	X	GNR 544 Activity 28
<p>The widening of a road by more than 6 metres, or the lengthening of a road by more than 1 kilometre -</p> <ul style="list-style-type: none"> (i) where the existing reserve is wider than 13,5 meters; or (ii) where no reserve exists, where the existing road is wider than 8 metres – <p>excluding widening or lengthening occurring inside urban areas.</p>	1180.55 ha	X	GNR 544 Activity 47
<p>Phased activities for all activities listed in this Schedule, which commenced on or after the effective date of this Schedule, where any one phase of the activity may be below a threshold</p>	This will occur within the 1417.618 ha mining footprint.	X	GNR 544

Name of Activity	Aerial Extent of Activity (Ha or m ²)	Listed Activity	Applicable Listing Notice
<p>but where a combination of the phases, including expansions or extensions, will exceed a specified threshold; -</p> <p>excluding the following activities listed in this Schedule:</p> <p>2; 11(i)-(vii); 16(i)-(iv); 17; 19; 20; 22(i) and 22(iii); 25; 26; 27(iii) and (iv); 28; 39; 45(i)-(iv) and (vii)-(xv); 50; 51; 53; and 54.</p>			Activity 56
<p>The construction of facilities or infrastructure for any process or activity which requires a permit or license in terms of national or provincial legislation governing the generation or release of emissions, pollution or effluent and which is not identified in Notice No. 544 of 2010 or included in the list of waste management activities published in terms of section 19 of the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) in which case that Act will apply.</p>	This will occur within the 1417.618 ha mining footprint.	X	GNR 545 Activity 5
<p>Physical alteration of undeveloped, vacant or derelict land for residential, retail, commercial, recreational, industrial or institutional use where the total area to be transformed is 20 hectares or more;</p> <p>except where such physical alteration takes place for:</p> <p>(i) linear development activities; or</p> <p>agriculture or afforestation where activity 16 in this Schedule will apply.</p>	This will occur within the 1417.618 ha mining footprint.	X	GNR 545 Activity 15
<p>Any activity which requires a mining right or renewal thereof as contemplated in sections 22 and 24 respectively of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002).</p>	17 302 ha	X	GNR 545 Activity 20
<p>The construction of a road wider than 4 metres with a reserve less than 13,5 metres.</p> <p>(a) In Eastern Cape, Free State, KwaZulu-Natal, Limpopo, Mpumalanga and Northern Cape provinces:</p> <p>i. In an estuary;</p> <p>ii. Outside urban areas, in:</p>	1180.55 ha	X	GNR 546 Activity 4(a)

Name of Activity	Aerial Extent of Activity (Ha or m ²)	Listed Activity	Applicable Listing Notice
<p>(aa) A protected area identified in terms of NEMPAA, excluding conservancies;</p> <p>(bb) National Protected Area Expansion Strategy Focus areas;</p> <p>(cc) Sensitive areas as identified in an environmental management framework as contemplated in chapter 5 of the Act and as adopted by the competent authority;</p> <p>(dd) Sites or areas identified in terms of an International Convention;</p> <p>(ee) Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans;</p> <p>(ff) Core areas in biosphere reserves;</p> <p>(gg) Areas within 10 kilometres from national parks or world heritage sites or 5 kilometres from any other protected area identified in terms of NEMPAA or from the core areas of a biosphere reserve;</p> <p>(hh) Areas seawards of the development setback line or within 1 kilometre from the high-water mark of the sea if no such development setback line is determined.</p> <p>iii. In urban areas:</p> <p>(aa) Areas zoned for use as public open space;</p> <p>(bb) Areas designated for conservation use in Spatial Development Frameworks adopted by the competent authority or zoned for a conservation purpose;</p> <p>(cc) seawards of the development setback line or within urban protected areas.</p>			
<p>The construction of facilities or infrastructure for the storage, or storage and handling of a dangerous good, where such storage occurs in containers with a combined capacity of 30 but not exceeding 80 cubic metres.</p> <p>(a) In Eastern Cape, Free State, KwaZulu-Natal, Limpopo, Mpumalanga and Northern Cape provinces:</p> <p>i. In an estuary;</p> <p>ii. Outside urban areas, in:</p>	1.9 ha	X	GNR 546 Activity 10 (a)

Name of Activity	Aerial Extent of Activity (Ha or m ²)	Listed Activity	Applicable Listing Notice
<ul style="list-style-type: none"> (aa) A protected area identified in terms of NEMPAA, excluding conservancies; (bb) National Protected Area Expansion Strategy Focus areas; (cc) Sensitive areas as identified in an environmental management framework as contemplated in chapter 5 of the Act and as adopted by the competent authority; (dd) Sites or areas identified in terms of an International Convention; (ee) Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans; (ff) Core areas in biosphere reserves; (gg) Areas within 10 kilometres from national parks or world heritage sites or 5 kilometres from any other protected area identified in terms of NEMPAA or from the core areas of a biosphere reserve; (hh) Areas seawards of the development setback line or within 1 kilometre from the high-water mark of the sea if no such development setback line is determined; (ii) Areas on the watercourse side of the development setback line or within 100 metres from the edge of a watercourse where no such setback line has been determined; (jj) Within 500 metres of an estuary. iii. In urban areas: <ul style="list-style-type: none"> (aa) Areas zoned for use as public open space; (bb) Areas designated for conservation use in Spatial Development Frameworks adopted by the competent authority or zoned for a conservation purpose; (cc) Within 500 metres of an estuary. 			
The clearance of an area of 300 square metres or more of vegetation where 75% or more of the vegetative cover constitutes indigenous vegetation.	This will occur within the 1417.618 ha mining footprint.	X	GNR 546 Activity 12

Name of Activity	Aerial Extent of Activity (Ha or m ²)	Listed Activity	Applicable Listing Notice
<p>(a) 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 area that has been identified as critically endangered in the National Spatial Biodiversity Assessment 2004;</p> <p>(b) Within critical biodiversity areas identified in bioregional plans;</p> <p>(c) Within the littoral active zone or 100 metres inland from high water mark of the sea or an estuary, whichever distance is the greater, excluding where such removal will occur behind the development setback line on erven in urban areas.</p>			

It is therefore understood that insofar as the proposed additional mining areas, within the existing Mining Right are concrete-, that all the relevant NEMA listed activities have been authorised. Consequently these additional mining areas and changes to the Mine Works Programme (MWP) are subject to an Amendment Application process. This EIA process will serve to support the amendment application.

With respect to the addition of Zandvoort into the Mining Right, it is understood that all the relevant NEMA listed activities are captured and approved in the current NEMA EA, except Activity 17 of GNR 984. Activity 17, GNR 984 specifies that any activity which requires a mining right as contemplated in Section 22 of the MPRDA triggers the requirement for an Environmental Authorisation. In order for Pembani to include Zandvoort into the existing Mining Right area, Pembani therefore, needs to apply for the activity indicated below in Table 7 below.

Table 7: Listed Activities

Name of Activity	Aerial Extent of Activity (Ha or m ²)	Listed Activity	Applicable Listing Notice
Underground mining (Portion 1 and RE of the farm Zandvoort 10IT)	471.3849 ha	X	R.984 (2014) LA 17

The proposed project entails only the additional underground mining within the above mentioned areas. No additional infrastructure / surface structures will be constructed on the farm Zandvoort.

Below is a plan Figure 11 indicating the location of the aforesaid main and listed activity and the location of the proposed additional mining areas.

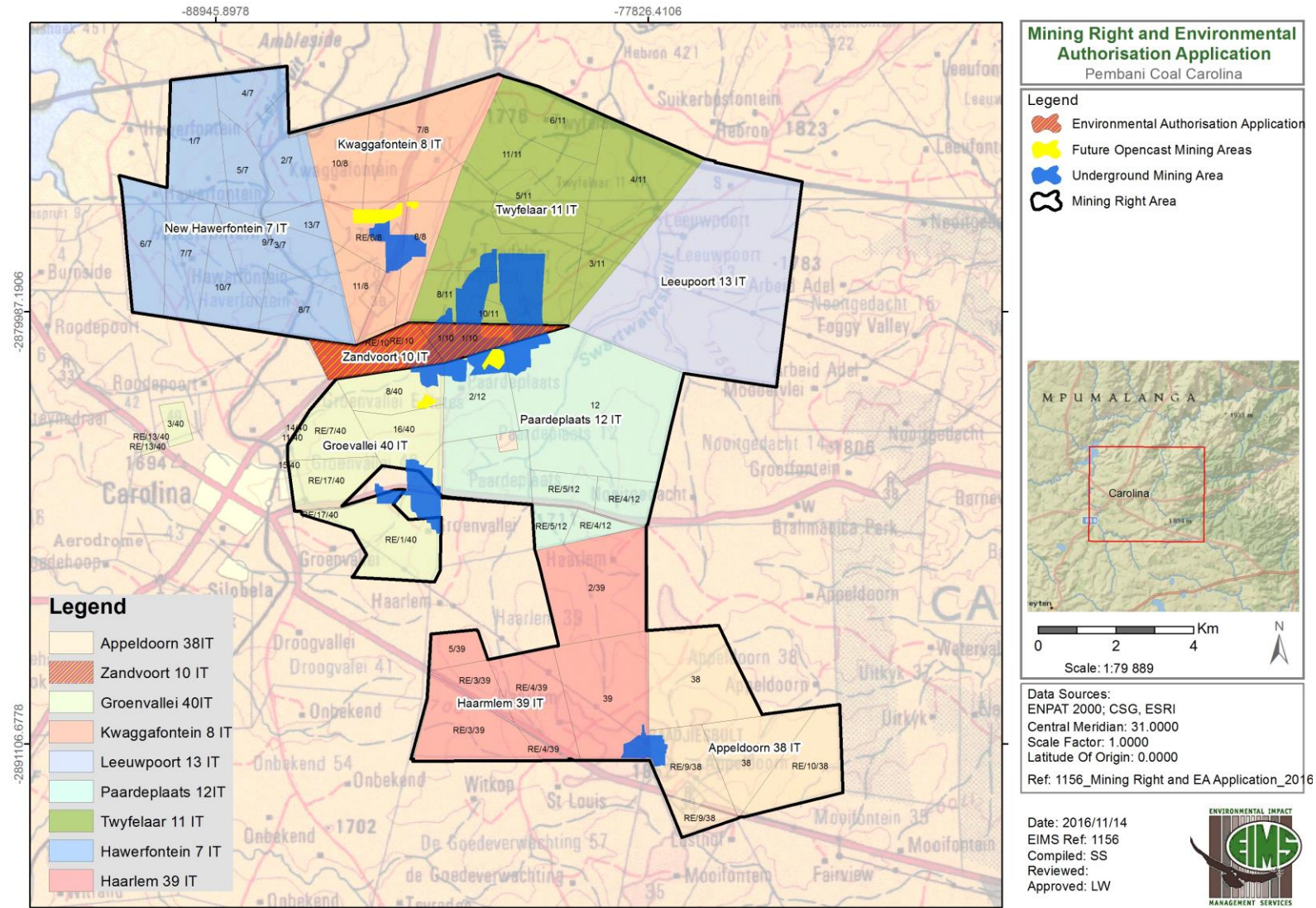


Figure 11: Plan of Listed Activity and location of the proposed additional mining areas.

3.2. DESCRIPTION OF ACTIVITIES TO BE UNDERTAKEN

It is the intention of this Scoping Report to provide the necessary information regarding the proposed inclusion of additional areas within the existing Pembani Colliery Mining Right, as well as to provide information on the proposed changes with regards to amendment of the existing MWP to include additional underground and opencast mining of coal resources at Pembani Colliery. The additional areas to be included are described in detail above, and include Portions 1 and Re of the farm Zandvoort 10IT. The proposed amendment to the mine works programme (within the existing mining right) includes:

- New underground mining operations: Portions RE of 6, 7, 8 and 10 of the farm Kwaggafontein 8 IT; Portions of the farm Haarlem 39 IT; Portion RE/9 of the farm Appeldoorn 38 IT; Portions Re of 1, 5, 8, 16 and 20 of the farm Groenvallei 40 IT; Portions 2, 7, 8, 9 and 10 of the farm Twyfelaar 11 IT; and Portions 2 and 12 of the farm Paardeplaats 12 IT.
- New opencast mining operations: Portions RE of 6, 7, 8 and 10 of the farm Kwaggafontein 8 IT; Portion 8 of the farm Groenvallei 40 IT and Portion 2 of the farm Paardeplaats 12 IT.

3.2.1. MINING OPERATIONS

3.2.1.1. THE MINERAL RESOURCES

The Pembani Colliery is situated within the northern part of the Ermelo Coalfield, which forms part of the coal-bearing Vryheid Formation of the Ecca Group. The Ecca Group forms part of the larger Karoo Super group. The coal seams present, within the Ermelo Coalfield, are named from the base to the top, E to A. In the northern parts of the coal field the E Seam attains a thickness of over 3m and consists of mainly bright coal and ranges from the surface to about 100 m. The less prominent D Seam (< 0.6 m) is usually too thin to be of economic value although being predominantly bright coal and ranges from surface to about 70 m. The C Seam is usually sub-divided into the C Upper and the C Lower due to several plies that vary in thickness. The C Lower Seam is usually thin and seldom thicker than 0.6 m, however, thickens towards the Dirkiesdorp District reaching thicknesses of up to 3 m. In contrast to the other seams the C Upper Seam is well developed in the entire coal field, but is of poor quality and tends to be torbanitic over large areas. Thicknesses usually vary from 0.4 m – 4 m depending on the area. The B Seam is usually split into the B, B1, and BX, however, in the Ermelo district only the B (Lower) and the BX (Upper) Seams are considered feasible for mining. The B Seam may reach thicknesses of up to 3 m and consists of mainly dull coal (high sulphur content), capped by a glauconitic sandstone. The A Seam is of moderate to low quality across the coal field and occurs as outliers in the central and northern parts of the coal field (Greenshields, 1986).

The B Seam and the E Seam are the main economic coal seams present within the mining area and these are exploited by means of opencast and underground mining operations. The average depth of the E seam is 53 m, and 27.6 m for the B seam.

3.2.1.2. MINING METHOD TO BE EMPLOYED

The Pembani Colliery has access to extensive coal reserves, which are to be exploited by both above ground (opencast mining) and below ground mining methods (bord and pillar underground mining). Extensive opencast mining has also taken place, although the mine has only recently commenced with underground mining. The mining methods that are currently being employed and which are yet to be employed in the future are discussed in the sections that follow.

3.2.1.3. OPENCAST MINING

Historically extensive opencast mining has taken place at Pembani Colliery, during which time a number of opencast pits were mined without progressive rehabilitation being undertaken. As such in addition to the current opencast mining which follows the strip mining approach with progressive rehabilitation, there are historical opencast pits in various stages of rehabilitation.

Currently, limited opencast mining is undertaken in the form of strip mining where the strips are laid out to follow the surface contours. As the strips progress, the previous pit is rehabilitated, thus resulting in minimal surface disturbance. A contractor (Professional Opencast Mining Services (POMS)) is currently conducting the opencast operations. Certain temporary infrastructure associated with the opencast mining activities (such as storm water management infrastructure) will move as the opencast mining progresses along the coal seams to the new pit areas. The coal is transported by truck to the existing Imbani Wash Plant where wet processing of the coal takes place.

3.2.1.4. UNDERGROUND MINING

Further to the opencast, mining the remainder of the deeper coal reserves are mined using the bord and pillar underground mining method. Underground mining has been initiated recently (in 2015) and is undertaken by Pembani themselves (and not a contractor). At present, the underground reserves are accessed via the existing TZP4 pit (highwall entrance). The typical layout and design of the Mine Infrastructure Dedicated to each Underground Operation is illustrated in Figure 12 below.

It is anticipated that similar infrastructure will be constructed for any future adits/shafts. The entire infrastructure will be situated around the entrance to the underground workings (either box-cut or highwall). The entire area at each underground operation within the security fence will cover less than 20 ha. The underground infrastructure shall typically include the following:

- Ventilation fans
- Short Conveyors (bringing coal to surface)
- ROM stockpiles;
- Sub Station;
- Parking Area;
- Lamp Room;
- Stores;
- Cable Shop;
- Workshop;

- Washbay;
- Refueling Bay;
- Stone Dust Shed;
- 10m x 10m sump;
- Service Water Dams;
- Potable Water Dam.

Coal will be transported to the surface via conveyor for temporary storage at the RoM stockpile. All coal will either be directly transported by means of coal trucks to the processing plant or will be crushed by means of a mobile crusher and directly sold to Eskom and/or other clients from pre-qualified stockpiles situated near the underground access.

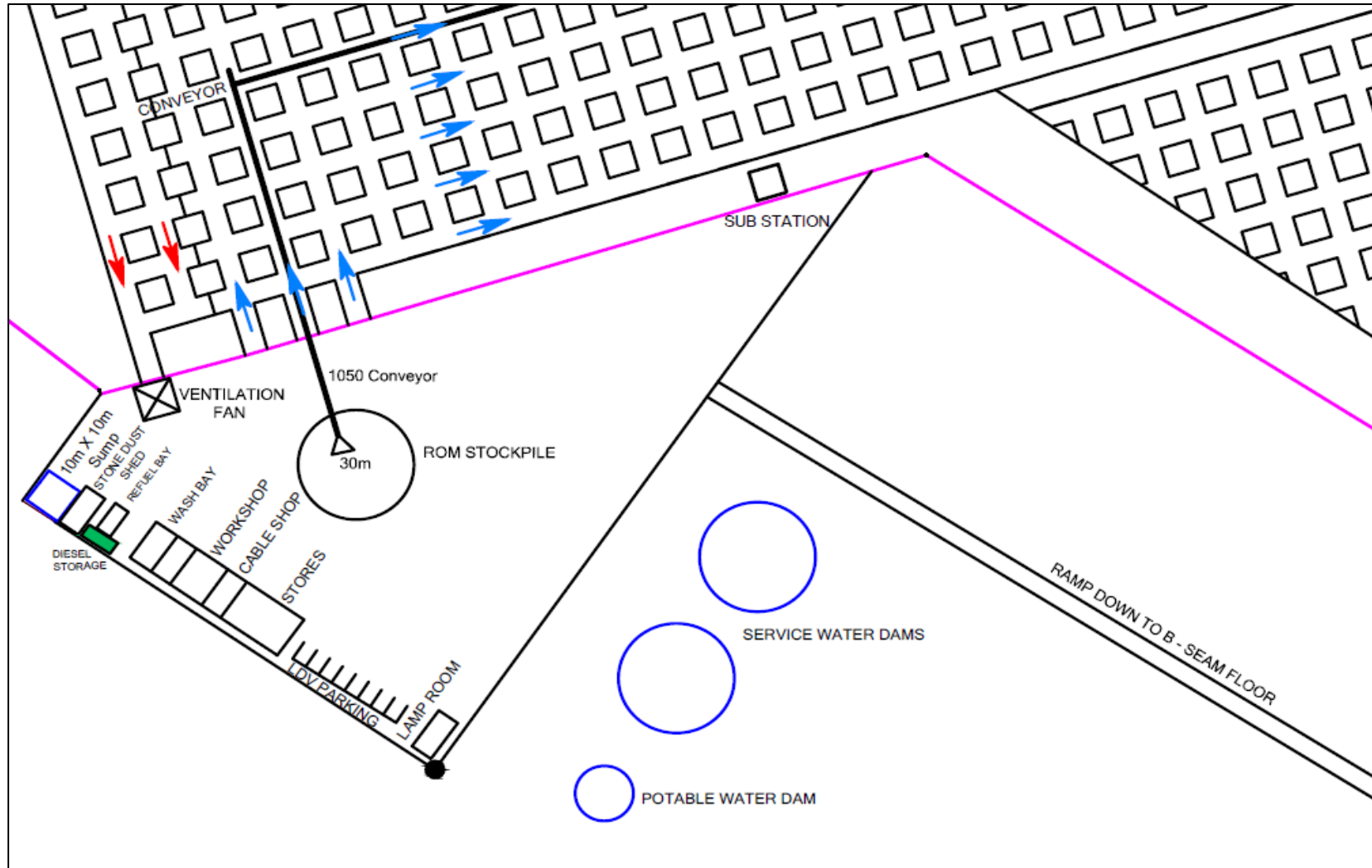


Figure 12: Mine infrastructure dedicated to each Underground Operation (Typical drawing)

3.2.1.5. MINE AREAS

The mining plan layout as indicated in Figure 13 illustrates the various underground and opencast mine areas. The mining areas are grouped into sections according to their farm name. below.

Table 8 below summarises these sections, indicating whether these are current, future and past mining areas. These mine areas are referred to by different names in different studies; however, for the purposes of this report the mine areas will be referred to as named in below.

Table 8 below.

Table 8: Mine Areas

Mining Area	Description /Status:
Mined Out	
TZP 1	Twyfelaar-Zandvoort-Paardeplaats Section. Area mined out and rehabilitated.
GV 1	Groenvallei Section. Mined via opencast methods, this area is currently being rehabilitated.
GV 5	Groenvallei Section. Area mined out and rehabilitated. Water use activities in this area are largely related to infrastructure.
HA 1	Haarlem Section. Area mined out and rehabilitated.
HA 2	Haarlem Section. Area mined out and rehabilitated.
HA 3	Haarlem Section. Mined via opencast methods, this area is currently being rehabilitated.
HA 4	Haarlem Section. Mined via opencast methods, this area is currently being rehabilitated.
HA 5	Haarlem Section. Mined via opencast methods, the Northern extent of this area has been rehabilitated. The Southern extent will be used to access the Haarlem underground section.
Current Operational Areas	
TZP 3 (consists of a east and west pit)	Twyfelaar-Zandvoort-Paardeplaats Section. Opencast mining has commenced however, activities have been halted and the area put on care and maintenance due to market conditions.
TZP 4	Twyfelaar-Zandvoort-Paardeplaats Section. This pit is currently active. Mining is via opencast rollover methods. This section may be utilised to access the TZP underground.
TZP 5	Twyfelaar-Zandvoort-Paardeplaats Section. This pit is currently active. Mining is via opencast rollover methods.

GV 7	Groenvallei Section. Opencast mining has commenced however, activities have been halted and the area put on care and maintenance due to market conditions. This pit may be used to access the underground sections at Groenvallei.
Future Mine Areas	
KW 1	Kwaggafontein Section. Future opencast area.
KW 2	Kwaggafontein Section. Future opencast area.
KW Underground	Kwaggafontein Section. Future underground area.
TZP Underground	<p>Twyfelaar-(proposed) Zandvoort-Paardeplaats Section. Future underground area.</p> <p>This will consist of underground mining areas that will target the B and E coal seams</p>
TZP 2	Twyfelaar-(proposed) Zandvoort-Paardeplaats Section. Future opencast area.
GV Underground	Groenvallei Section. Future underground area.
HA Underground	Haarlem Section. Future underground area.

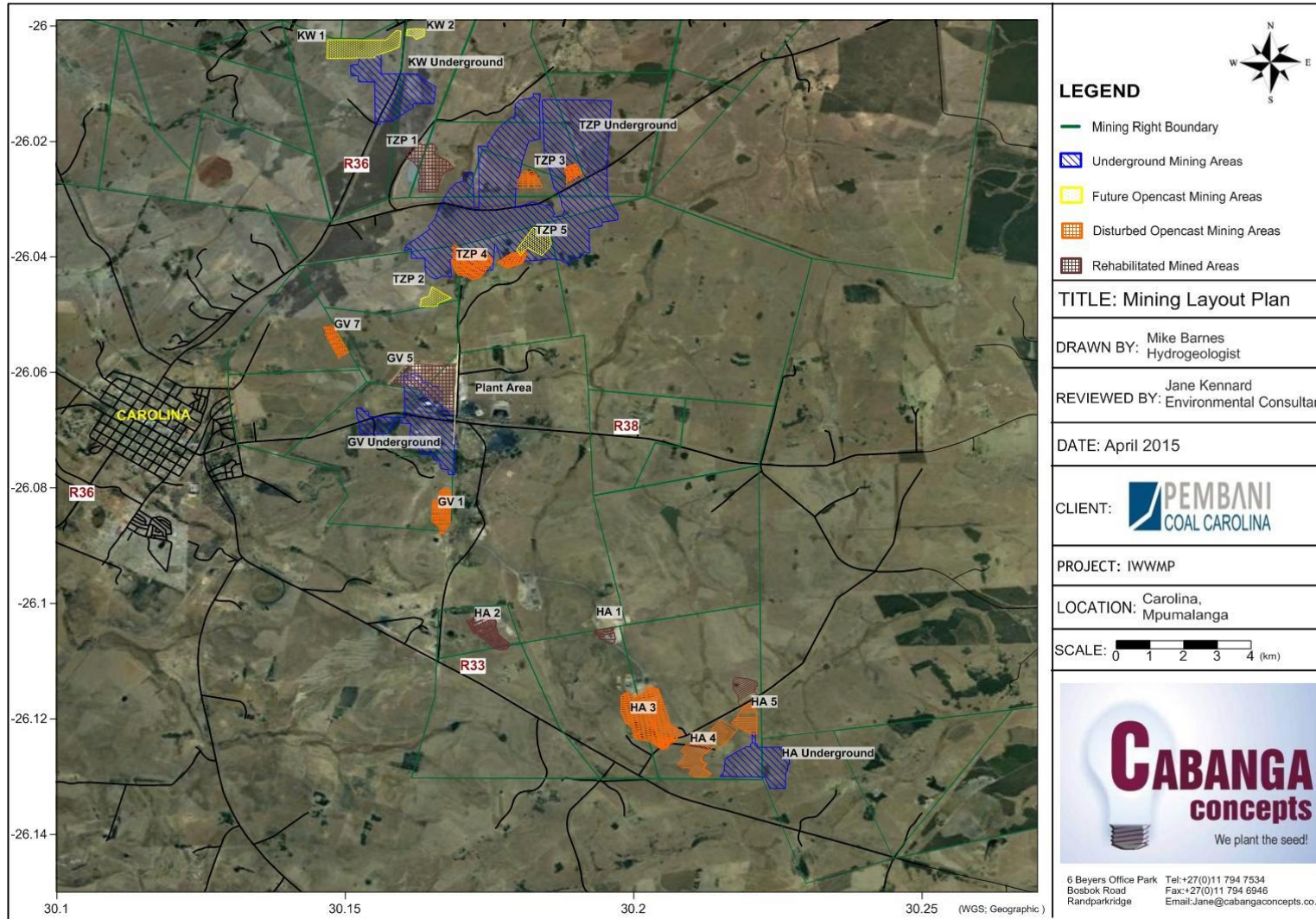


Figure 13: Mine layout plan

3.2.1.6. MINE PRODUCTION RATE

Estimates of the predicted production rates for each operational area are provided in the tables that follow.

Table 9: TZP5 Opencast Production.

PEMBANI TZP5 OP					
OC Model: January 2015					
CAPE LO31					
List of Assumptions:					
Type of mining operation	Openpit Truck and Loader				
Mineable coal seams	BU and BL seperately				
Maximum depth of coal	0	m			
Minimum mining height	0.5	m	<i>BU and BL combined.</i>		
Maximum strip ratio	6:1	bcm / t			
Coal quality cut-offs					
Minimum RAW CV	20	Mj/kg			
Minimum RAW DAFVM	27	%			
Geological Loss	10.0	%	<i>As per Kobus Resource Report</i>		
Mining Loss	3.0	%	<i>Equivalent to 10cm</i>		
Contamination	0	%	<i>No contamination applied</i>		
Mine design criteria					
Strip width	35	m			
Blast block length	100	m			
Mining right boundary	9	m			
Boundary from Graves	100	m			
Wetland buffer zone	100	m			
Production target REV01					
SBL plant feed	70,000	romt per month			
SBU as result of SBL operation					
Total waste production as result of Coal production					

Table 10: SBT Underground Production

PEMBANI SBT UNDERGROUND				
UG Model: January 2015				
CAPE LO31				
List of Assumptions:				
Type of mining operation	Board and Pillar underground operation			
Mineable coal seams	SBT		<i>Combined SBU and SBL coal seams</i>	
Extraction of Pillars	No			
Minimum depth of coal	20	m	<i>Depth from Topo to SBT seam roof</i>	
Minimum mining height	1.5	m	<i>BU and BL combined.</i>	
Coal quality cut-offs				
Minimum RAW CV	20	Mj/kg		
Minimum RAW DAFVM	27	%		
Geological Loss	20	%	<i>As per Kobus Resource Report</i>	
Mining Loss	5	%		
Contamination	10	%		
Mine design criteria				
Board (Road) width	6.5	m		
Number of Roads	9			
Factor of Safety	2			
Factor of Safety formula	Salamon & Munro			
Mining section type	CM (CM factor applied to SF formula)			
Resulting Pillar center	13	m		
Mining right boundary	9	m		
Boundary from Major dyke / Fault	20	m	<i>either side of structure</i>	
Pillar from OC operation	25	m		
Production targets REV01				
TZP4-S				
Number of production section:	1			
Production per section	40,000	romt per month		
TZP4-N				
Number of production section:	2			
Production per section	24,000	romt per month		
HAARLEM				
Number of production section:	1			
Production per section	45,000	romt per month		

Table 11: E-Seam Openpit Production

PEMBANI E-SEAM OPENPIT			
CONCEPTUAL STUDY			
ASSUMPTIONS			
<u>Model and Geological data</u>			
Geological model: Jan2015			
Mining model update: Feb2015			
<i>Schedule Rev01: 25-02-2015. Life-of-Mine schedule. Target SE tonnage 25,000romt p mth</i>			
<i>Only Openpit R1-West was scheduled. R1-East and R4 are total Reserve quantities</i>			
<u>Losses</u>			
Geological Loss	10	%	<i>Ave as per KD resource</i>
Mining Loss	5	%	<i>Ave to 10cm on total sbt</i>
No contamination applied			
<u>Design</u>			
Strip width	35	m	
Blast block width	100	m	
Mineable Coal seams	SE		
<u>Cut-offs applied</u>			
Minimum mining ST	0.50	m	
Maximum RAW CV	20.0	%	
Minimum RAW DAFVM	27.0	%	
Maximum Strip Ratio	9:1	waste bcm : coal t	
Barrier either side of Road	50	m (applied from CL of road)	

Table 12: SE Underground Production

PEMBANI SE UNDERGROUND					
UG Model: January 2015					
CAPE LO31					
<u>List of Assumptions:</u>					
Type of mining operation	Board and Pillar underground operation				
Mineable coal seams	SE				
Extraction of Pillars	No				
Minimum depth of coal	20	m	<i>Depth from Topo to SE seam roof</i>		
Minimum mining height	0.8	m			
Coal quality cut-offs					
Minimum RAW CV	27.2	Mj/kg			
Minimum RAW DAFVM	27	%			
Geological Loss	20	%	<i>As per Kobus Resource Report</i>		
Mining Loss	5	%			
Contamination	10	cm			
Mine design criteria					
Board (Road) width	6.5	m			
Number of Roads	9				
Factor of Safety	2				
Factor of Safety formula	Salamon & Munro				
Mining section type	Drill and Blast				
Resulting Pillar center	13	m			
Mining right boundary	9	m			
Boundary from Major dyke / Faults	20	m	<i>either side of structure</i>		
Pillar from OC operation	25	m			
Production targets					
Number of production sections	Vary				
Production per section	7,500	romt per month - average with Contamination			

3.2.1.7. MINE SCHEDULE

The LoM production schedules for the different production areas are presented in Figure 14 to Figure 18. Some areas may be mined simultaneously and some will be mined subsequently to other areas to maintain favourable production levels.

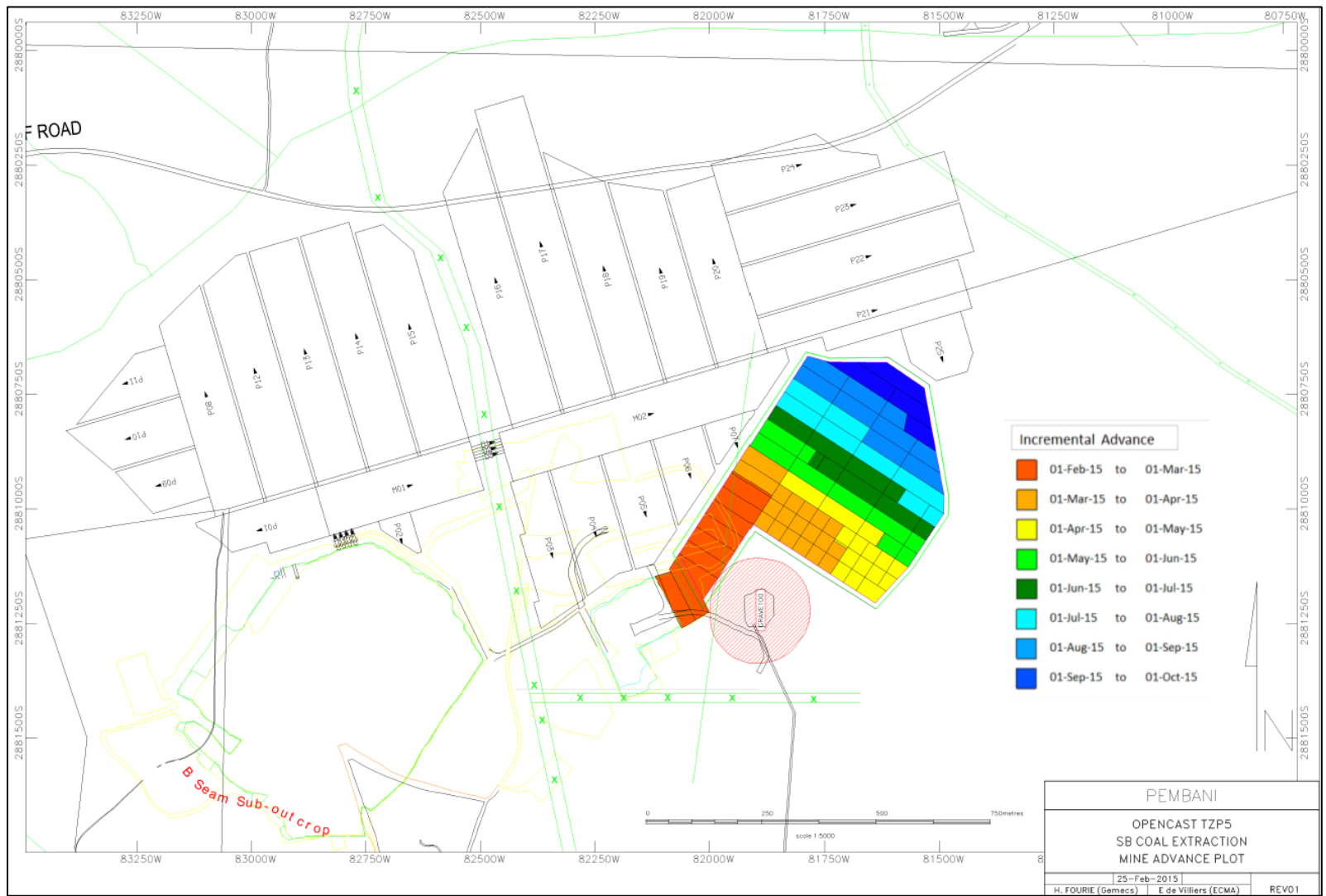


Figure 14: LoM Progressive Plot - TZP 50C B Seam

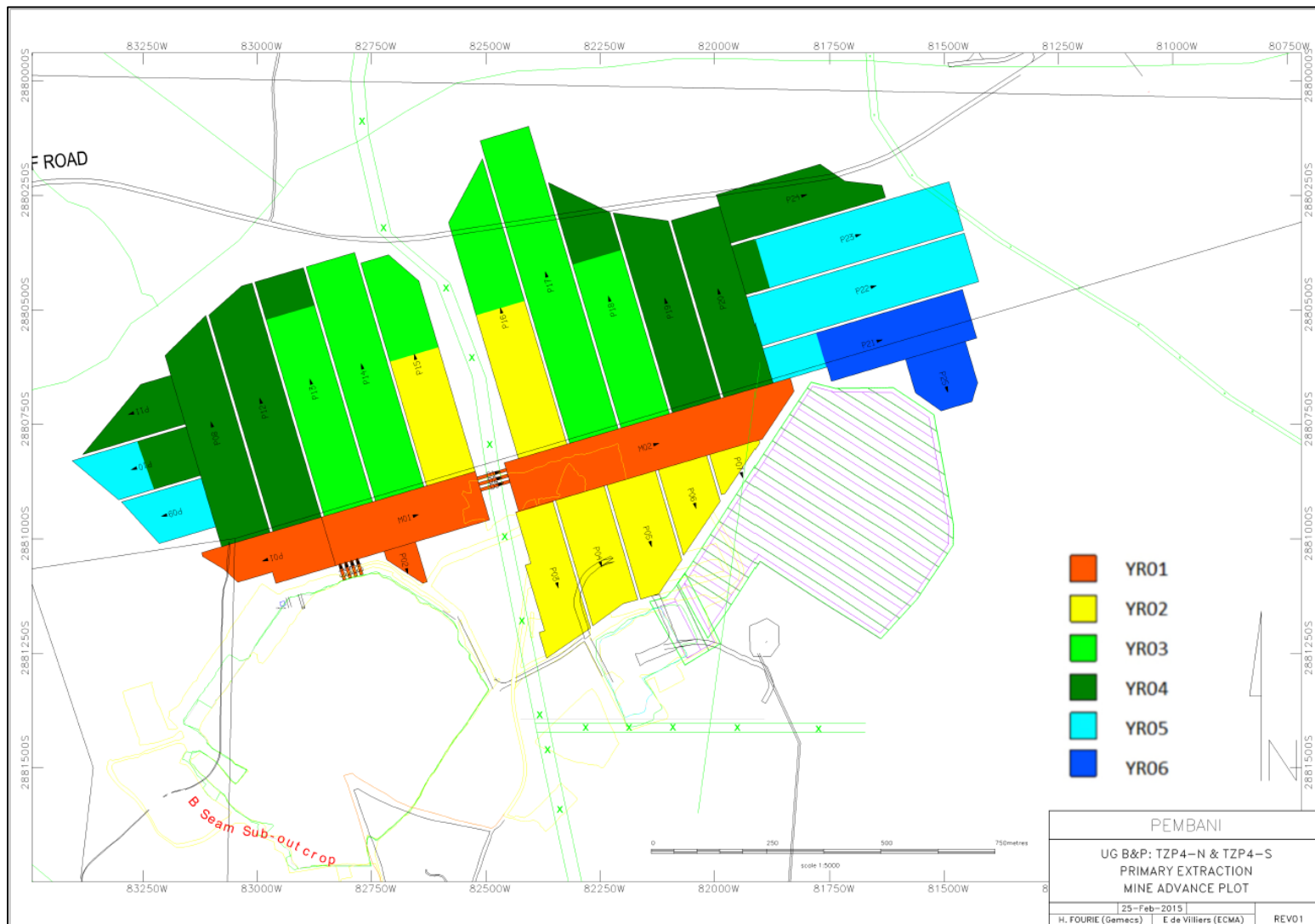


Figure 15: LoM Progressive Plot - TZP 4 UG B Seam

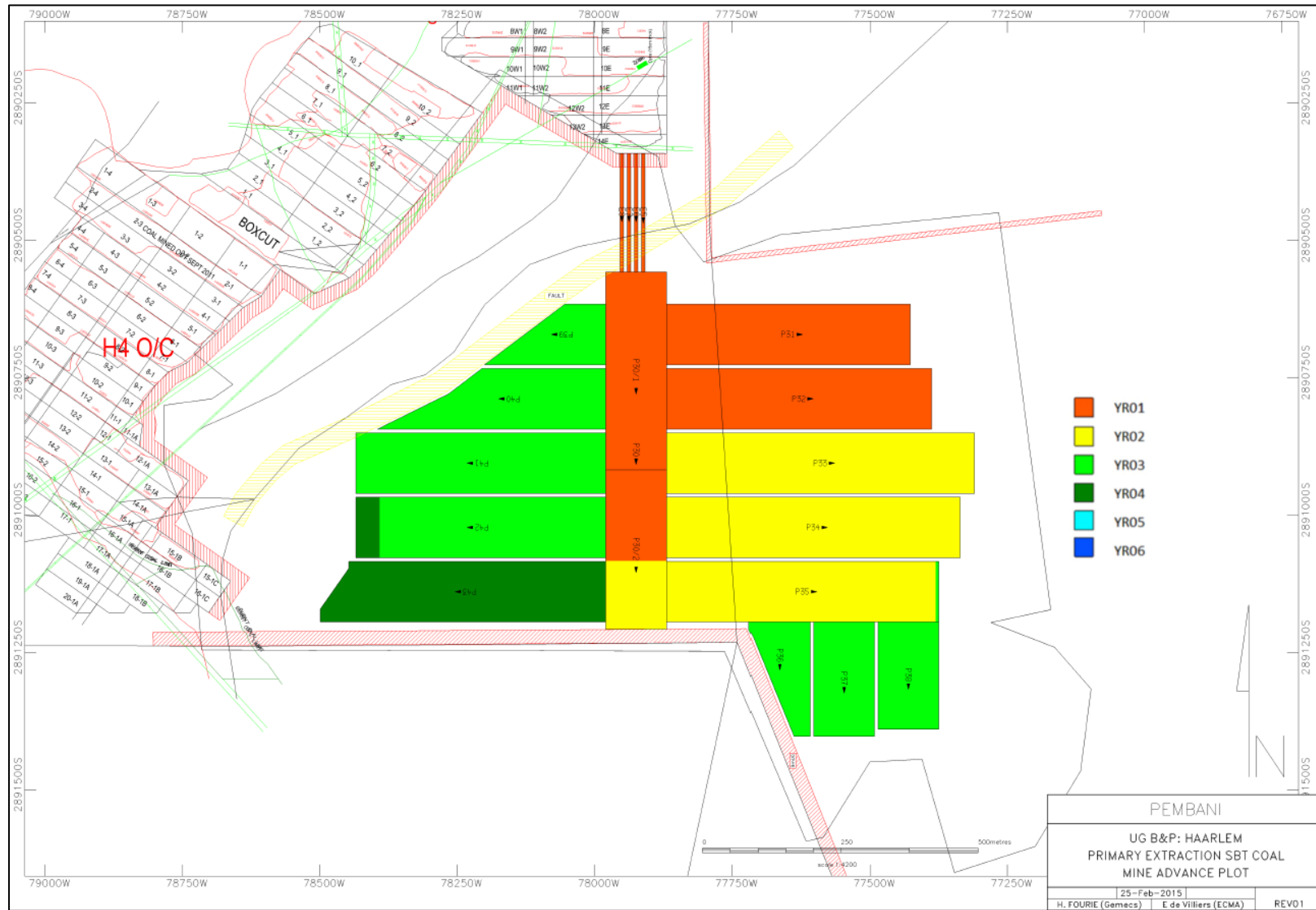


Figure 16: LoM Progressive Plot - Haarlem B Seam UG

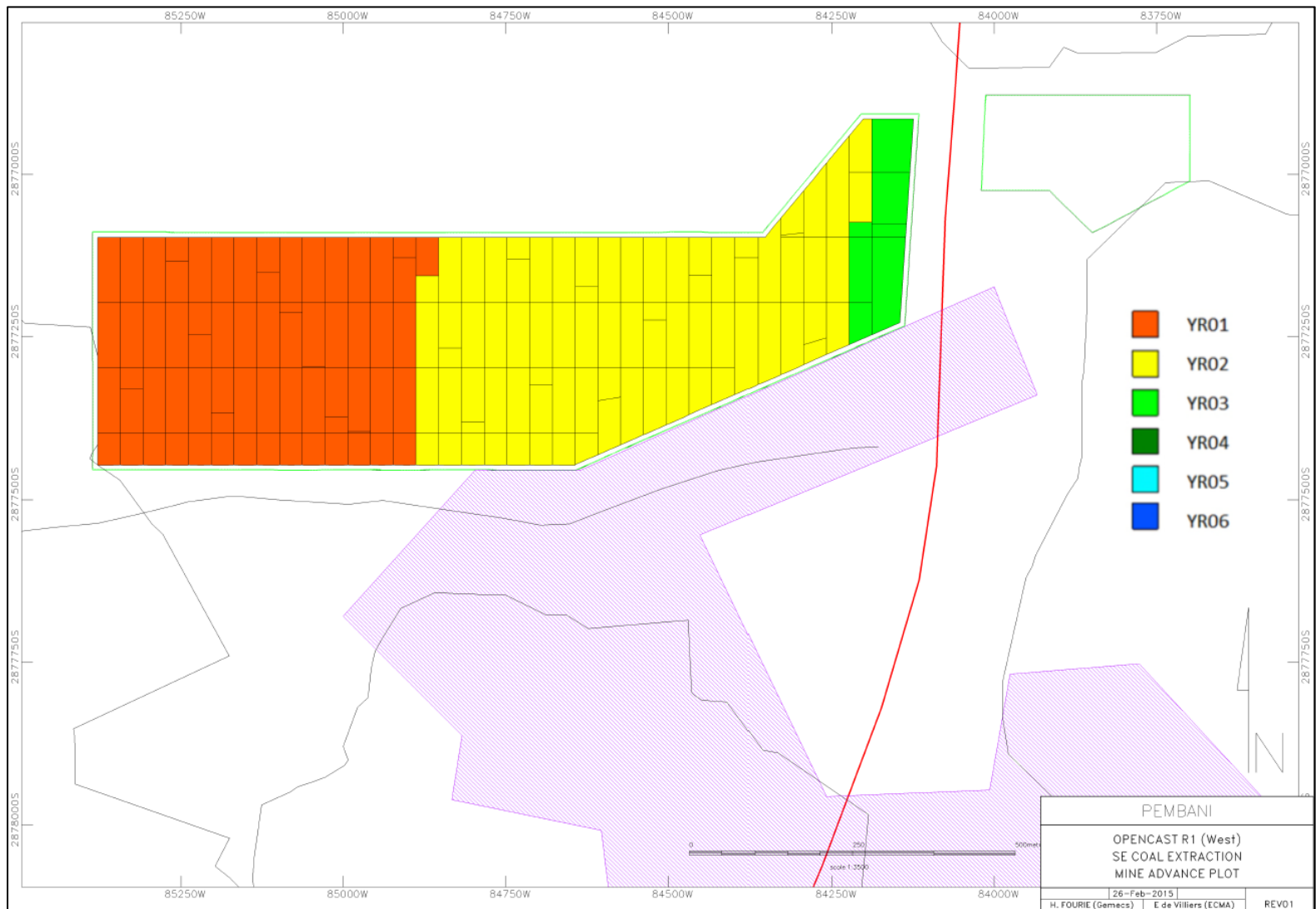


Figure 17: LoM Progressive Plot - R1W Area E Seam Opencast

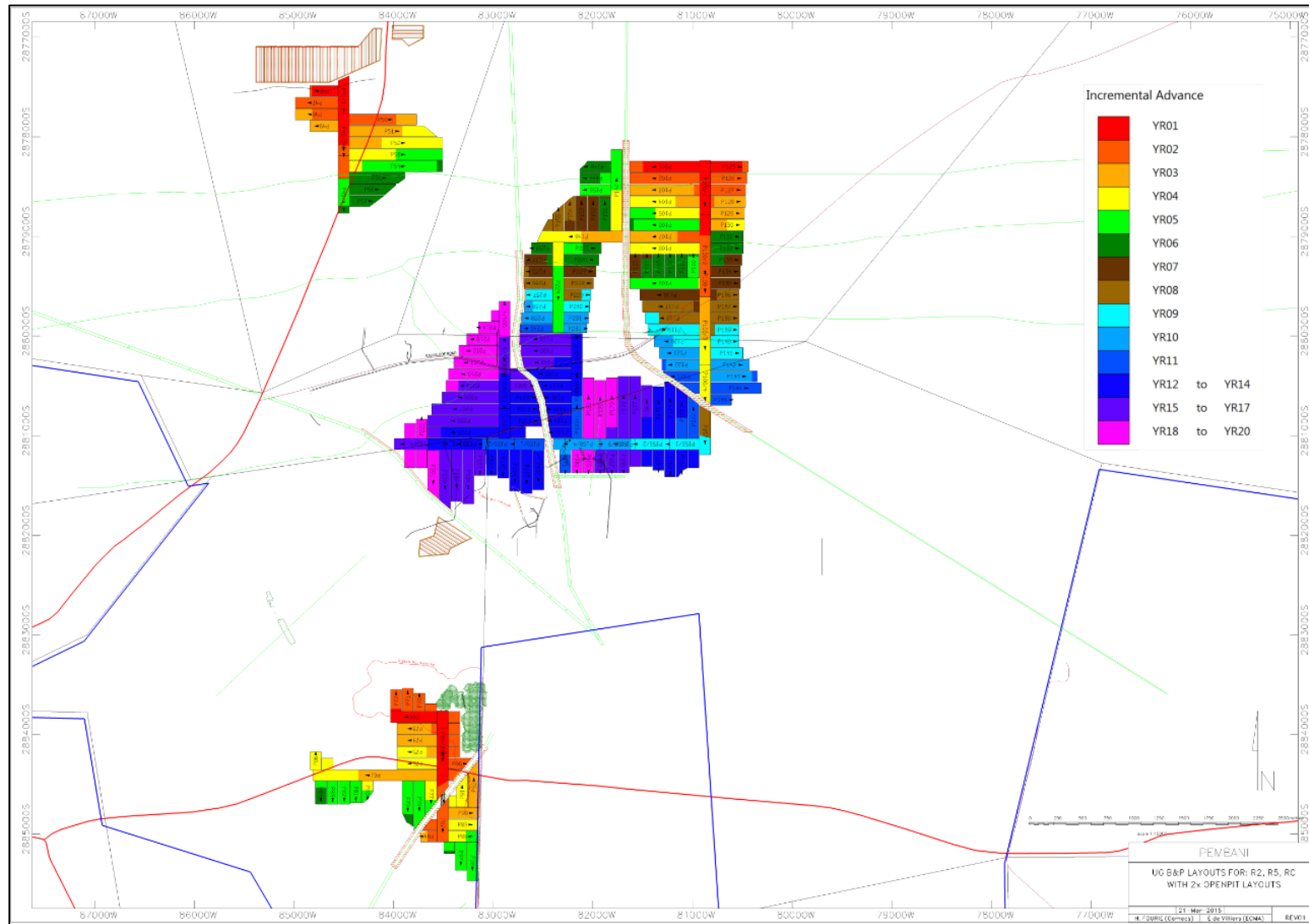


Figure 18:LoM Progressive Plot - All E-Seam Underground areas as if mined simultaneously LoM Progressive Plot

3.2.1.8. MINERALS PROCESSING

The processing of raw coal is undertaken at the Imbani Wash Plant (refer to Figure 19 below). The Imbani Wash Plant is located on the farm Paardeplaats (Portion 7 of Portion 3). This plant was previously owned and operated by Siphete Coal (previously called Carolina Coal), however; this plant was purchased by Pembani in 2003. The plant consists of a crusher, screener and wash plant.

Raw coal is fed from a RoM stockpile into a crusher, and crushed to market related sizing. The <3mm particles are screened out and the >3mm are washed in a dense medium separation plant (DMS) at the Imbani Wash Plant. The underflow from the DMS is discarded to the discard bin, whereas the overflow forms part of the product line. The <3mm coal is put through a cyclone and the >1 mm is added to the product line as duff. Duff is fine dry coal (usually anthracite) obtained through coal processing operations. The size range for duff is 4.8 mm to 0 mm.

During the beneficiation process, the slurry produced contains approximately 80% water and 20% solids. Slurry is routed to a filter press, where the slurry is dried to a filter cake before being added to the saleable product. During emergencies and maintenance, the slurry is disposed of onto the existing co-disposal facility. Here the supernatant water is piped off for reuse at the wash plant.

Discard that is not sold immediately is placed onto the co-disposal facility located on Portion 7 of Portion 3 of the farm Paardeplaats 12 IT. Once the slurry on the co-disposal facility has dried it is reclaimed for sale. The water requirements of the plant are approximately 0.25m³ per run of mine feed ton. Currently the plant feed is approximately 2, 640 tons per day. The water requirements for the wash plant are met from dewatering of the various opencast pits. Water from the pits is pumped to the reservoirs before being fed to the raw water dam which in turn feeds the plant. Water is also obtained from the plant PCDs. Water is recycled as far as possible. Run of mine coal and washed product is stockpiled within the dirty footprint area of the plant.



Figure 19: Imbani Wash Plant

In addition, discard has previously been trucked to opencast pits on site and placed at the base of the pits. Discard that is not sold immediately is now placed onto the co-disposal facility located on Portion 7 of Portion 3 of the farm Paardeplaats 12 IT. Once the slurry on the co-disposal facility has dried it is reclaimed for sale. The processing plant operates 24 hours a day. From the plant, the coal is transported to local markets or the Droogvallei siding for rail transportation to distribution centres or end users.

Pembani intends to install a coal to energy power plant on site. Waste coal or discard that is not suitable for market will be sent to the power plant where it will be converted to gas which in turn will be utilised by a gas turbine to generate electricity for Pembani's operations. This facility, should it proceed, will trigger listed activities and, prior to commencement, will be subject to an additional environmental impact assessment.

3.2.2. WASTE

Waste generated from the mining areas includes minimal construction and domestic waste, some hydrocarbon and explosive waste and sewage. These are all collected and disposed of as part of the mines waste management plan and or managed by contractors. Waste is recycled as far as possible. Portable toilets are used at the mining areas.

3.2.2.1. DOMESTIC/GENERAL WASTE

General waste includes domestic refuse, office waste, soiled paper, non-hazardous plastic containers, detergent containers (washing-up liquid etc.) and cardboard. This waste will be collected in clearly demarcated bins situated around the site. The waste will be trucked to the Carolina municipal dump/landfill site on a weekly basis. No littering or dumping will be tolerated on site. Portable chemical toilets are utilised at the mining area. The chemical toilets are emptied regularly by the chemical toilet supply company and the waste is disposed of in the correct manner at the respective registered sewage treatment works. Pembani ensures a cradle-to-grave policy with regards to following up on correct disposal by contractors managing their portable toilets and general waste disposal.

3.2.2.2. INDUSTRIAL WASTE

Scrap metal includes any ferrous metals and non-ferrous metals not contaminated with hazardous material which should be placed in an appropriately labelled bin at the mine and transferred to central collection and recycling point and sold as scrap metal or removed and transported to an appropriate landfill site.

3.2.2.3. HAZARDOUS INDUSTRIAL WASTE

Hydrocarbon waste includes used oil and grease, filters, contaminated containers, rags, equipment and soil, engine oil, transmission oil, hydraulic oil, transformer oil, or oil of any kind. All used oil generated at the Service Bays and Workshops is stored in designated storage tanks and periodically transferred to collection and storage points for collection and disposal by an authorised contractor.

3.2.3. MINE RESIDUE

Mine residue (slurry and discard) are generated at the Imbani Wash Plant area. Slurry is routed to a filter press, where the slurry is dried to a filter cake before being added to the saleable product. During emergencies and maintenance, the slurry is disposed of onto the existing, licensed co-disposal facility. Here the supernatant water is piped off for reuse at the wash plant.

Discard that is not sold immediately is placed onto the co-disposal facility located on Portion 7 of Portion 3 of the farm Paardeplaats 12 IT. Once the slurry on the co-disposal facility has dried it is reclaimed for sale. Pembani also intends to install a coal to energy power plant. This power plant will receive discard that would otherwise be placed onto the co-disposal, and generate electricity to power the wash plant and administration area.

3.2.4. SOIL STOCKPILES

Various stockpiles are required on site. Long-term stockpiles include topsoil, subsoil, soft overburden and hard overburden stockpiles, all of which will be erected as close as possible to the final void to aid in infilling and rehabilitation of final voids. In addition, the mine will have duff, product and RoM coal stockpiles which will be temporary in nature. Coal within these stockpiles is moved on a “first-in-first-out” basis to reduce the risk of spontaneous combustion.

The extraction of coal requires temporary coal stockpiles at the each of the mine sections, these stockpiles are estimated to be between 22,500 and 31,500 tons. The coal stockpile areas are currently compacted and made as impermeable as possible to limit seepage through the stockpiles into the strata below. As per the conditions of the IWUL (Licence No. 05/X11B/ACGIJ/4704), all storage facilities must be lined using approved requirement of the Department of Water and Sanitation (DWS) for the lining of dirty containment facilities. The stockpile areas are lightly sloped to drain water away from the pits and towards the PCDs. Dirty water trenches are placed downslope of these stockpiles to collect and divert dirty water runoff. Where necessary (in areas where upslope areas are clean areas), upslope berms of soil are placed around these stockpiles to divert clean water.

3.2.5. ADMINISTRATION BUILDINGS, WORKSHOPS AND OTHER BUILDINGS

The main offices, ablution facilities and change house are located at the Imbani Wash Plant. A number of administrative buildings are also located at the POMS contractors camp. Temporary containers are utilised as administration blocks at the various pit areas.

Workshops are utilised for the servicing of diesel driven equipment on site within the POMS contractors camp. Workshops will also be constructed at the underground mining contractors camp at the underground access points. Workshops are constructed with with impervious concrete slabs fitted with oil and silt traps. In addition, all wash bays will be required to have the necessary oil management facilities such as oil and silt traps.

Portable chemical toilets are utilised at the mining areas. The chemical toilets are emptied regularly by the chemical toilet supply company and the waste is disposed of in the correct manner at a registered sewage treatment works. One septic tank/french drain exists at the Imbani Wash Plant area, and services the change house, security house and administration block.

3.2.6. DANGEROUS GOODS STORAGE

3.2.6.1. DIESEL

Mining equipment, including drills, trucks and shovels, front-end loaders and 30 ton trucks for coal haulage are diesel operated. At the Imbani Wash Plant the hydrocarbons (and used hydrocarbon drums and rags) and diesel bowsers are stored within bunded areas designed to applicable standards, with a bunding volume of 110% of total storage volume. The bunded area is fitted with a tap which is only opened under controlled circumstances to release any water that has accumulated within the bunding. The hydrocarbons from these oil traps are cleared out at regular intervals and incorporated into hydrocarbon waste drums which are stored within the same bunded area until removal from site by a registered contractor for hydrocarbon waste. All water from the bunded areas is considered hazardous waste and must be disposed of accordingly. Spillage kits and handling and emergency procedures are available on site.

3.2.6.2. EXPLOSIVES

The biggest consumable during the mining operation is the explosives required to break the hard overburden. Drill rods and drill bits will be used to drill the hard overburden above the coal seam. Explosives are kept in an explosive magazine on site.

3.2.7. WATER SUPPLY

3.2.7.1. POTABLE WATER SUPPLY

For the main offices potable water is purchased off site and trucked to the premises. A borehole is used to supply potable water for the mine contractors. Filtered water from the raw water dam supplies the change house and admin block. A borehole is utilised at TZP 4 to supply the mine contractors with potable water. A potable water tank is located at the entrance to the underground workings at TZP4.

3.2.7.2. PROCESS WATER

Water will be recycled onsite as far as possible. Process water needs, such as dust suppression and water for the wash plant and/or for drilling will be supplied from the PCDs or in-pit sumps. Figure 20 shows the Mine Water Reticulation Diagram.

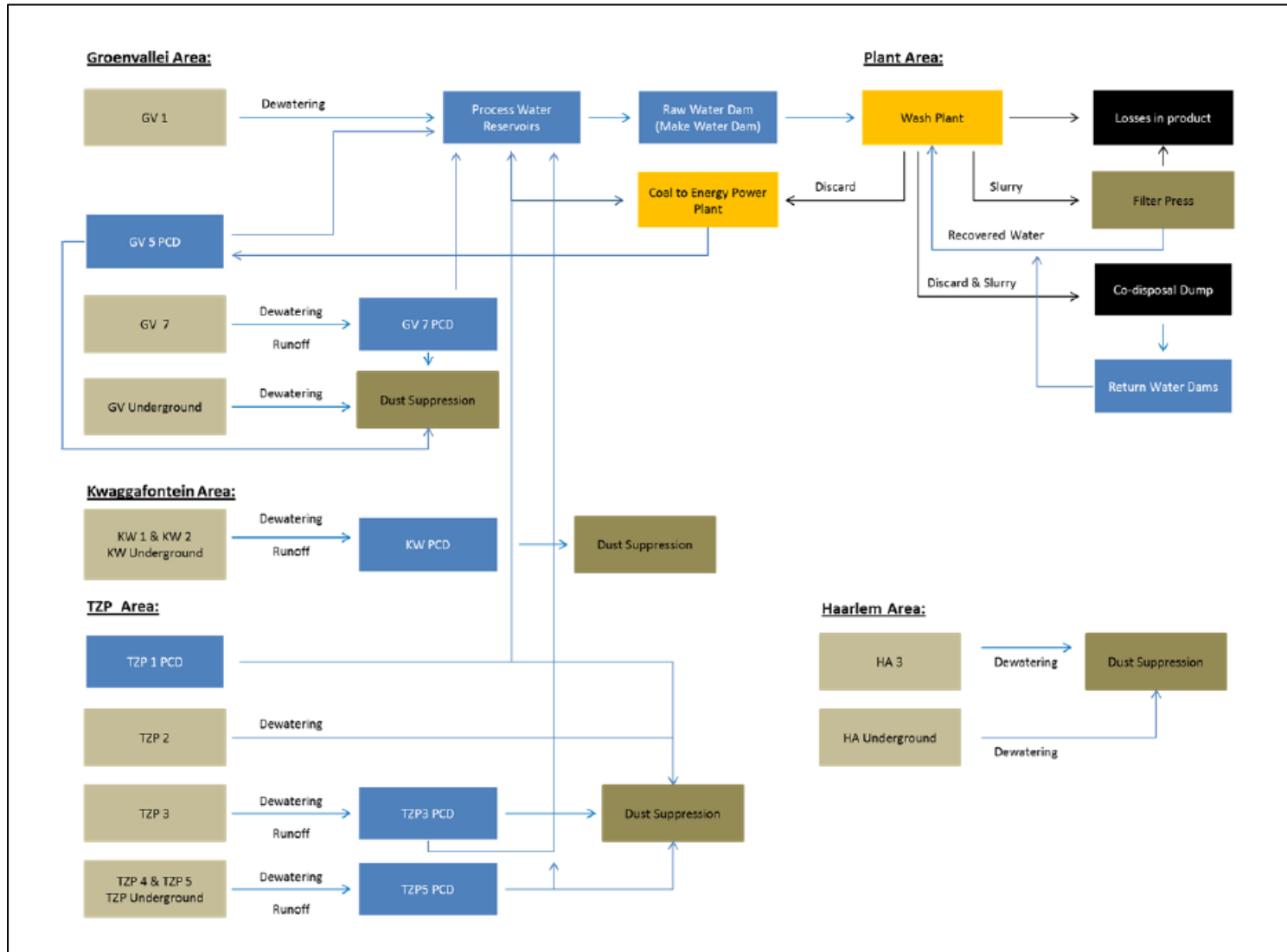


Figure 20: Mine Water reticulation diagram.

3.2.8. CLEAN AND DIRTY WATER PROCESSING

In general storm water management and drainage infrastructure on site accommodates a 1:50 year storm event as required by legislation. Clean and dirty water is separated and all dirty water is channelled into dirty water containment facilities at the Imbani Wash Plant area. Dirty water runoff at the opencast areas drains into in-pit sumps and from these is pumped to the PCDs. Clean water is diverted around various dirty footprints by means of channels and berms to the natural environment.

3.2.8.1. CLEAN WATER PROCESS

All storm water falling within the Imbani Wash Plant's 15 ha dirty footprint area is stored within the dirty water system for use within the plant. Clean water is diverted around the property. Clean water diversion berms are situated up slope and interception trenches and drains are cut down slope of the dirty footprint area. Active mining areas have berms and trenches constructed around their facilities to keep clean water runoff from entering mine workings and to divert clean water around the site.

3.2.8.2. SUMPS AND PUMPS

Dewatering activities are carried out on site to allow for the safe continuation of mining. Diesel pumps are utilised to dewater the opencast pits and underground workings and dispose of mine affected water into the relevant PCD and/or pumped to the process water reservoirs for use at the Imbani Wash Plant.

3.2.8.3. POLLUTION CONTROL DAM AND ASSOCIATED DIRTY WATER MANAGEMENT

Currently there are seven (7) dirty water dams on site (the two reservoirs, the raw water dam, the plant dam, the 2 return water dams at the base of the co-disposal facility and the PCD at TZP 5). Further details of these dams include:

- The two reservoirs receive water from the dewatered current and future opencast area and future underground workings, this water is then pumped to the raw water dam (also known as the make water dam) which feeds the wash plant;
- The plant dam collects contaminated storm water runoff from the plant and stockpiling area. This water is allowed to evaporate and/or reused within the wash plant;
- Water from the co-disposal facility reports to the dual return water dams for evaporation; and
- A small PCD has been constructed at TZP 5 to receive contaminated storm water runoff from the stockpile area, as well as to manage water dewatered from the opencast pits at TZP 4 and 5.

Lined PCDs will also be constructed at the various opencast areas to manage dirty water runoff and ingress into the pits/workings. These PCDs will be approximately 50 000 m³ and will be constructed in accordance with the designs included in the 2015 Integrated Water and Waste Management Plan (IWWMP). The position of these PCDs have been determined based on the results of the groundwater study and the potential decant points as identified, this way the position of the dams will be suitable for operational and closure management objectives.

4. POLICY AND LEGISLATIVE CONTEXT

A summary of the applicable legislation is provided in Table 13 below. More detail on the legislative framework is presented in Section 4.1 below.

Table 13: Applicable Legislation and guidelines

Applicable Legislation and Guidelines	Reference Where Applied
<p>(a description of the policy and legislative context within which the development is proposed including an identification of all legislation, policies, plans, guidelines, spatial tools, municipal development planning frameworks and instruments that are applicable to this activity and are to be considered in the assessment process);</p>	
<p>APPLICABLE LEGISLATION</p>	
<p><u>Constitution of the Republic of South Africa, Act 108 of 1996</u></p> <p>The constitution of any country is the supreme law of that country. The Bill of Rights in chapter 2 section 24 of the Constitution of South Africa Act (Act 108 of 1996) makes provisions for environmental issues and declares that: "Everyone has the right -</p> <p>(a) to an environment that is not harmful to their health or well-being; and</p> <p>(b) to have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that:</p> <p>(i) prevent pollution and ecological degradation;</p> <p>(ii) promote conservation; and</p> <p>(iii) secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development"</p> <p>Therefore, the EIA is conducted to fulfill the requirement of the Bill of Rights.</p>	<p>Throughout the SandEIR process</p>
<p>National Environmental Management Act (NEMA), 1998 (Act 107 of 1998) and the EIA Regulations (2014) thereunder:</p> <p>The NEMA (1998) requires that a project of this nature (inclusive of a Mining Right) must undergo a Scoping and Environmental Impact Assessment; an Environmental Management Programme must also be compiled. Regulations applicable to this project include the following:</p> <ul style="list-style-type: none"> • EIA Regulations R.982 (2014) in terms of NEMA. • Listing Notice 2: R.984 (2014) in terms of NEMA. 	<p>Throughout the SandEIR process</p>
<p>Minerals and Petroleum Resources Development Act (MPRDA) (Act no 28 of 2002), as amended and Mineral and Petroleum Resource Development Regulations, 2004, (MPRDR) as amended:</p>	<p>Throughout the SandEIR process</p>

Applicable Legislation and Guidelines	Reference Where Applied
<p>The MPRDA (2002) requires an applicant who wishes to proceed with a mining project to obtain a Mining Right, part of which requires the applicant to obtain Environmental Authorisation in terms of the NEMA (1998).</p>	
<p>National Water Act (NWA) (Act 36 of 1998):</p> <p>The NWA recognises that water is a scarce and unevenly distributed national resource which must managed encompassing all aspects of water resources.</p> <p>In terms of Chapter 4 of the NWA, activities and processes associated with the proposed Braeside Aggregate Quarry and associated infrastructure, are required to be licensed by the Department of Water and Sanitation (DWS). An Integrated Water Use Licence Application (IWULA) will be lodged with the DWS in terms of Section 21 of the NWA, which lists several water uses requiring authorisation. Furthermore, an Integrated Water and Waste Management Plan (IWWMP) has been compiled and submitted in support of the IWULA.</p> <p>A Water Use Licence was issued on the 07 July 2016.</p>	<p>Throughout the process – all water related aspects</p>
<p>National Heritage Resources Act, 1999 (Act no 25 of 1999):</p> <p>The National Heritage Resources Act aims to promote good management of cultural heritage resources and encourages the nurturing and conservation of cultural legacy so that it may be bestowed to future generations. Due to the extent of the project, it is likely that some heritage resources are likely to occur within the project boundary area.</p>	<p>Heritage specialist study, EIA, EMP.</p>
<p>Specific Environmental Management Acts (SEMAs):</p> <p>The SEMAs refer to specific portions of the environment where additional legislation over and above the NEMA (1998) is applicable. SEMAs relevant to this application include the following:</p> <ul style="list-style-type: none"> • National Environmental Management: Protected Areas Act, 2003 (Act no 57 of 2003). • National Environmental Management: Biodiversity Act, 2004 (Act no 10 of 2004). • National Environmental Management: Air Quality Act, 2004 (Act no 39 of 2004). • National Environmental Management: Waste Act, 2008 (Act no 59 of 2008). 	<p>Specialist studies, Baseline description and EMP</p>

Applicable Legislation and Guidelines	Reference Where Applied
APPLICABLE GUIDELINES	
<p>Integrated Environmental Management Information Guidelines series:</p> <p>This series of guidelines was published by the Department of Environmental Affairs (DEA), and refers to various environmental aspects. Applicable guidelines in the series include:</p> <ul style="list-style-type: none"> • Guideline 4: Strategic Environmental Assessment (SEA). • Guideline 7: Public Participation. • Guideline 9: Need and desirability. 	<p>The guidelines will be used throughout the Scoping and Environmental Impact Report process.</p>
<p>Best Practise Guideline (BPG) series:</p> <p>The BPG series is a series of publications by the then Department of Water Affair and Forestry (now DWS – Department of Water and Sanitation) providing best practice principles and guidelines relevant to certain aspects of water management. Best practice guidelines relevant to this project include the following:</p> <ul style="list-style-type: none"> • BPG A4: Pollution Control Dams. • BPG H1: Integrated Mine Water Management. • BPG H2: Pollution Prevention and Minimisation of Impacts. • BPG H3: Water Reuse and Reclamation. • BPG H4: Water treatment. • BPG G1: Storm Water Management. • BPG G2: Water and Salt balances. • BPG G3: Water Monitoring Systems. • BPG G4: Impact Prediction 	<p>Surface water and groundwater specialist studies, EIA and EMP.</p>

4.1. APPLICABLE NATIONAL LEGISLATION

The legal framework within which the Pembani Colliery is governed by many Acts, Regulations, Standards, Guidelines and Treaties on an international, national, provincial and local level. Legislation applicable to the project includes (but is not limited to):

4.1.1. THE MINERAL AND PETROLEUM RESOURCES DEVELOPMENT ACT

In support of the amendment to the mining right submitted by Pembani Coal Carolina (Pty) Ltd., the applicant is required as to conduct a Scoping Report, EIA /EMP and I&AP consultations that need to be submitted to the DMR for adjudication. This report has been compiled in accordance with Regulation 49 of the MPRDA in order to satisfy the criteria for a Scoping Report. Pending presentation of the results of the study and inclusion of comment from I&AP's, the Final Scoping Report will be submitted to the DMR for review.

4.1.2. THE NATIONAL ENVIRONMENTAL MANAGEMENT ACT

The main aim of the National Environmental Management Act, 1998 (Act 107 of 1998) (NEMA) is to provide for co-operative governance by establishing decision-making principles on matters affecting the environment. In terms of the NEMA Environmental Impact Assessment (EIA) regulations, the proponent is required to appoint an environmental assessment practitioner (EAP) to undertake the EIA, as well as the public participation

process. In South Africa, EIA became a legal requirement in 1997 with the promulgation of regulations under the Environment Conservation Act (ECA). Subsequently, NEMA was passed in 1998. Section 24(2) of NEMA empowers the Minister and any MEC, with the concurrence of the Minister, to identify activities which must be considered, investigated, assessed and reported on to the competent authority responsible for granting the relevant environmental authorisation. On 21 April 2006 the Minister of Environmental Affairs and Tourism promulgated regulations in terms of Chapter 5 of the NEMA. These regulations, in terms of the NEMA, were amended in June 2010 and again in December 2014. The December 2014 Nema regulations are applicable to this project.

The objective of the Regulations is to establish the procedures that must be followed in the consideration, investigation, assessment and reporting of the activities that have been identified. The purpose of these procedures is to provide the competent authority with adequate information to make decisions which ensure that activities which may impact negatively on the environment to an unacceptable degree are not authorized, and that activities which are authorized are undertaken in such a manner that the environmental impacts are managed to acceptable levels.

A Scoping and EIA process is reserved for activities which have the potential to result in significant impacts which are complex to assess. Scoping and EIA accordingly provides a mechanism for the comprehensive assessment of activities that are likely to have more significant environmental impacts.

WWC was granted EA, Authorisation Number 17/2/3 GS – 44 on 6 August 2012, in terms of:

- Items 9, 12, 22, 47 and 56 of Government Notice R544;
- Items 5, 15, 20 and 4(a) of Government Notice R545; and
- Items 10(a) and 12 of Government Notice R546 of 18 June 2010, in terms of Chapter 5 of the NEMA, respectively.

The EA was to undertake the following activities:

- Construction of pollution control dams and dirty water storage reservoirs with a combined capacity of 50 000m³ or more. The dam wall height falls below 5m;
- Construction of access roads and haul roads where the road is wider than 8m;
- Extending of existing farm roads/ haul roads by more than 1km;
- Physical alteration of vacant agricultural land for mining. The total area to be transformed exceeds 20 hectares;
- Construction of a fuel storage facility; and
- Construction of clean and dirty water canals in and around the mining areas with a width of more than 36 cm.

An amendment to the EA, Authorisation Number 17/2/3 GS – 44 was granted on 15 March 2013, due to the exclusion of activities and farm portions, by the then Department of Economic Development, Environment and Tourism (DEDET) (now MARDLEA), with the original EA. The amended activities include:

Items 11, 18 and 28 of Government Notice R544.

It is therefore understood that insofar as the proposed additional mining areas, within the existing Mining Right are concrete-, that all the relevant NEMA listed activities have been authorised.

As part of this Environmental Authorisation, a review of the mines activities was undertaken and in terms of the NEMA, the following listed activity is herewith applied for to amend the current Mining Right to include Zandvoort into the current Mining Right:

Listed Activity 17 of GNR 984 (2014).

4.1.3. THE NATIONAL WATER ACT

The National Water Act, 1998 (Act 36 of 1998) (NWA) makes provision for two types of applications for water use licences, namely individual applications and compulsory applications. The NWA also provides that the responsible authority may require an assessment by the applicant of the likely effect of the proposed licence on the resource quality, and that such assessment be subject to the EIA regulations. A person may use water, if the use is-

- Permissible as a continuation of an existing lawful water use (ELWU);
- Permissible in terms of a general authorisation (GA);
- Permissible under Schedule 1; or
- Authorised by a licence.

The NWA defines 11 water uses. A water use may only be undertaken if authorised by the Department of Water and Sanitation (DWS). Water users are required to register certain water uses that actually took place on the date of registration, irrespective of whether the use was lawful or not. The water uses for which an authorisation issued can be issued includes:

- taking water from a water resource;
- storing water;
- impeding or diverting the flow of water in a watercourse;
- engaging in a stream flow reduction activity contemplated in section 36;
- engaging in a controlled activity identified as such in section 37(1) or declared under section 38(1);
- discharging waste or water containing waste into a water resource through a pipe, canal, sewer, sea outfall or other conduits;
- disposing of waste in a manner which may detrimentally impact on a water resource;
- disposing in any manner of water which contains waste from, or which has been heated in, any industrial or power generation process;
- altering the bed, banks, course or characteristics of a watercourse;
- removing, discharging or disposing of water found underground if it is necessary for the efficient continuation of an activity or for the safety of people; and
- using water for recreational purposes.

WWC was granted an Integrated Water Use Licence (IWUL) in terms of Chapter 4 of the NWA, Licence No: 05/X11D/AGJ/466 and File No: 16/2/7/X100/C180, dated 1 April 2011, for the following water uses:

- Section 21(a): Taking of water from a water resource;
- Section 21(g): Disposing of waste in a manner which may detrimentally impact on a water resource; and
- Section 21(j): Removing, discharging or disposing of water found underground.

Further to the issued IWUL, additional water uses were identified and an Integrated Water Use License Application (IWULA) was compiled and submitted to the DWS (previously the Department of Water Affairs (DWA)). The IWUL was granted on 07 July 2016 (Licence No. 05/X11B/ACGIJ/4704) The following water uses are included additionally in the new IWULA:

- Section 21(c): Impeding or diverting the flow of water in a watercourse;
- Section 21(i): Altering the bed, banks, course or characteristics of a watercourse; and
- Section 21(g): Disposing of waste in a manner which may detrimentally impact on a water resource.

The IWUL granted on 07 July 2017, (Licence No. 05/X11B/ACGIJ/4704), incorporates both Zandvoort, and the proposed changes to the MWP.

4.1.4. THE NATIONAL ENVIRONMENTAL MANAGEMENT WASTE ACT

The applicable waste act is no. 59 of 2008: National Environmental Management: Waste Act, 2008 (NEM:WA). The NEM:WA aims to regulate waste management in order to protect health and the environment by providing reasonable measures for the prevention of pollution and ecological degradation and for securing ecologically sustainable development. Furthermore, the NEM:WA provides for specific waste management measures to be implemented; as well as providing for the licensing and control of waste management activities. No waste management licenses in terms of NEM:WA have been applied for or granted to date by Pembani Colliery. Waste management activities may be applicable to the proposed expansion of the co-disposal dump; the proposed return water dam (RWD); stockpiles and pollution control dams (PCDs). However, as these overlap with identified uses in terms of the NWA it may be possible to apply for exemption from the provisions of the NEM:WA.

4.1.5. THE NATIONAL ENVIRONMENTAL MANAGEMENT AIR QUALITY ACT

The applicable air quality act is no. 39 of 2004: National Environment Management: Air Quality Act, 2004 (NEM:AQA). The environmental regulations and guidelines governing the emissions and impact of the mining operations on air quality need to be considered prior to potential impacts and sensitive receptors being identified.

Air quality guidelines and standards are fundamental to effective air quality management, providing the link between the source of atmospheric emissions and the user of that air at the downstream receptor site. The ambient air quality limits are intended to indicate safe daily exposure levels for the majority of the population, including the very young and the elderly, throughout an individual's lifetime. Air quality guidelines and standards are normally given for specific averaging periods. These averaging periods refer to the time-span over which the air concentration of the pollutant was monitored at a location. Generally, five averaging periods are applicable, namely an instantaneous peak, 1-hour average, 24-hour average, 1-month average, and annual average. The application of these standards varies, with some countries allowing a certain number of exceedances of each of the standards per year.

4.1.6. THE NATIONAL HERITAGE RESOURCES ACT

The National Heritage Resources Act (NHRA) (Act 25 of 1999) stipulates that cultural heritage resources may not be disturbed without authorization from the relevant heritage authority. Section 34(1) of the NHRA states that, “no person may alter or demolish any structure or part of a structure which is older than 60 years without a permit issued by the relevant provincial heritage resources authority...” The NHRA is utilized as the basis for the identification, evaluation and management of heritage resources and in the case of CRM those resources specifically impacted on by development as stipulated in Section 38 of NHRA, and those developments administered through NEMA, MPRDA and the DFA legislation. In the latter cases the feedback from the relevant heritage resources authority is required by the State and Provincial Departments managing these Acts before any authorizations are granted for development. The last few years have seen a significant change towards the inclusion of heritage assessments as a major component of Environmental Impacts Processes required by NEMA and MPRDA. This change requires us to evaluate the Section of these Acts relevant to heritage (Fourie, 2008b):

The NEMA 23(2)(b) states that an integrated environmental management plan should, “...identify, predict and evaluate the actual and potential impact on the environment, socio-economic conditions and cultural heritage”.

A study of subsections (23)(2)(d), (29)(1)(d), (32)(2)(d) and (34)(b) and their requirements reveals the compulsory inclusion of the identification of cultural resources, the evaluation of the impacts of the proposed activity on these resources, the identification of alternatives and the management procedures for such cultural resources for each of the documents noted in the Environmental Regulations. A further important aspect to be taken account of in the Regulations under NEMA is the Specialist Report requirements laid down in Section 33 (Fourie, 2008b).

The MPRDA defines ‘environment’ as it is in the NEMA and, therefore, acknowledges cultural resources as part of the environment. Section 39(3)(b) of this Act specifically refers to the evaluation, assessment and identification of impacts on all heritage resources as identified in Section 3(2) of the National Heritage Resources Act that are to be impacted on by activities governed by the MPRDA. Section 40 of the same Act requires the consultation with any State Department administering any law that has relevance on such an application through Section 39 of the MPRDA. This implies the evaluation of Heritage Assessment Reports in Environmental Management Plans or Programmes by the relevant heritage authorities (Fourie, 2008b).

In accordance with the legislative requirements and EIA rating criteria, the regulations of the South African Heritage Resources Agency (SAHRA) and Association of Southern African Professional Archaeologists (ASAPA) have also been incorporated to ensure that a comprehensive and legally compatible Heritage Scoping Report (HSR) is compiled.

4.2. APPLICABLE INTERNATIONAL CONSIDERATIONS

4.2.1. EQUATOR PRINCIPALS

The Equator Principles is a credit risk management framework for determining, assessing and managing environmental and social risk in project finance transactions. The signatories of the Equator Principles believe that adoption of, and adherence to, these principles offers significant benefits to the financiers, their customers and other stakeholders. These principles will foster the ability of financiers to document and manage their risk

exposures to environmental and social matters associated with the projects they finance, thereby allowing them to engage proactively with their stakeholders on environmental and social policy issues.

Adherence to these principles will allow the financiers to work with their customers in their management of environmental and social policy issues. The adopting institutions view these principles as a framework for developing individual, internal practices and policies, and are doing so voluntarily and independently.

The latest set of principles (Equator Principles III or EPIII) came into effect on 4th June 2013. The new EPIII should be applied to all new transactions from 01 January 2014. This review utilised the EPIII and will thus allow the project to align themselves with the latest set of standards. The principles are listed below with a very brief summary:

Principle 1: Review and Categorisation: including legal review and due diligence;

Principle 2: Social and Environmental Assessment: includes a requirement to carry out a comprehensive environmental and social assessment to identify and address (including mitigation) environmental and social issues;

Principle 3: Applicable Environmental and Social Standards: including alignment with the IFC Performance standards and applicable industry specific EHS Guidelines and compliance with relevant host country laws, regulations and permits that pertain to social and environmental matters;

Principle 4: Environmental and Social Management System and Equator Principles Action Plan: Typically requires development of a Social and Environmental Management System that addresses the management of the impacts, risks, and corrective actions required. An action plan must be developed to address gaps identified in the Independent review.

Principle 5: Stakeholder Engagement: includes the requirement to ensure that the public is provided with free, prior and informed consultation and facilitate their informed participation as a means to establish whether a project has adequately incorporated affected communities' concerns.

Principle 6: Grievance Mechanism: requires assurance that consultation, disclosure and community engagement continues throughout construction and operation of the project.

Principle 7: Independent Review: Requires that an independent social or environmental expert not directly associated with the borrower will review the assessment and consultation process documentation in order to ensure compliance with these principles.

Principle 8: Covenants: This typically refers to obligations on the person lending or applying for finance. This review will assist in determining the applicable covenants for this project.

Principle 9: Independent Monitoring and Reporting: Requires that monitoring is carried out by an independent environmental and/or social expert. Allocation should be made for such an independent person in the EMP's for construction and operation.

Principle 10: Reporting and Transparency: The client will ensure that the ESIA is accessible and available online. The client will also report on GHG emissions for project emitting over 100 000 tonnes of CO₂ equivalent annually. Each EPFI adopting the Equator Principles commits to report publicly at least annually about its Equator Principles implementation processes and experience.

4.2.2. IFC STANDARDS

The International Finance Corporation (IFC) Performance Standards are directed at providing guidance on how to identify risks and impacts and are designed to help avoid, mitigate, and manage risks and impacts as a way of doing business in a sustainable way, including stakeholder engagement and disclosure obligations of the client in relation to project-level activities. IFC uses the Sustainability Framework along with other strategies, policies, and initiatives to direct the business activities of the Corporation in order to achieve its overall development objectives. The Environmental Health Standard Guidelines (EHS) provide performance levels and measures for compliance with the Performance Standards.

In addition to meeting the IFC Performance Standards, clients must comply with applicable national law, including those laws implementing host country obligations under International law. When host country regulations differ from the levels and measures presented in the EHS, projects are expected to achieve whichever is more stringent. This review is based on the 2012 IFC Performance Standards. The IFC Performance Standards are listed below with very brief summaries:

Performance Standard 1: Assessment and Management of Environmental and Social Risks and Impacts: Requires the development of an Environmental and Social Management System (ESMS) to address the management and mitigation of risks and impacts identified, and corrective actions required. The ESMS entails a methodological approach to managing environmental and social risks and impacts in a structured way on an ongoing basis. An effective ESMS appropriate to the nature and scale of the project promotes sound and sustainable environmental and social performance.

Performance Standard 2: Labour and Working Conditions: Requires the implementation of human resources policies and procedures relevant to the size and workforce of the client, and is consistent with the requirements of the Performance Standards. The pursuit of economic growth through employment creation and income generation should be accompanied by protection of the fundamental rights of workers.

Performance Standard 3: Resource Efficiency and Pollution Prevention: Generally requires the application of technically and financially feasible resource efficiency and pollution prevention principles and techniques to avoid or minimise adverse impacts on human health and the environment. Reference should be made to the EHS guidelines or other internationally recognised sources during the evaluation and selection process.

Performance Standard 4: Community Health, Safety, and Security: Requires the identification of risks and impacts to the health and safety of Affected Communities and the proposal of mitigation measures commensurate with magnitude and nature.

Performance Standard 5: Land Acquisition and Involuntary Resettlement: Requires the consideration of alternative project designs to minimise or avoid physical or economic displacement and to balance environmental, social, and financial costs and benefits. Compensation for the loss of assets will be provided in the event that displacement cannot be avoided.

Performance Standard 6: Biodiversity Conservation and Sustainable Management of Living Natural Resources: Consideration of direct and indirect impacts on biodiversity and ecosystem services and identification of any significant residual impacts is required. A practice of adaptive management should be adopted to ensure that mitigation and management measures are implemented in response to changing conditions and monitoring during the project life-cycle.

Performance Standard 7: Indigenous Peoples: Identification of Indigenous Peoples that could be affected by the project is required. Adverse impacts are to be avoided where possible, with minimisation, restoration, and / or compensation being provided when avoidance is not possible. An engagement process with Affected Communities is required as per Performance Standard 1.

Performance Standard 8: Cultural Heritage: The client is required to comply with applicable legislation regarding the protection of cultural heritage, including the implementation of the host country's obligations under the Convention Concerning the Protection of the World Cultural and Natural Heritage. Internationally recognised methods for the protection, field study, and documentation of cultural heritage are to be implemented.

5. NEED AND DESIRABILITY OF THE PROPOSED ACTIVITY

As an existing operational mine, the need and desirability of the current mining operations has been described in several previous environmental authorisation processes. The extension of the proposed underground mining operations to Zandvoort, as well as the proposed changes to the Mining Works Programme to include additional underground and opencast mining within the existing Mining Right, will allow the continued contribution of the mine to favourable economic impacts on both the local and regional economies.

The extension of proposed underground mining to Zandvoort is preferred as the current Pembani operations (opencast and underground) are located adjacent to this property. The close proximity of the current operations allows for an extension of the underground mining without the need to undertake opencast operations or establish additional surface infrastructure.

This extension of the proposed underground workings will lead to improved positive economic impacts in the form of capital injections into the local and regional economy resulting in increased commercial activity. The increased coal produced will ensure consistent product for both the local market (such as Eskom) and export market.

In addition, the current and proposed extension of mining operations at Pembani will provide for additional employment opportunities for a workforce recruited from the surrounding area which houses many historically disadvantaged South Africans requiring employment. As per Pembani's current policy, priority will be given to recruiting additional local people for employment opportunities associated with mining activities. The extension of underground mining will therefore allow for the direct employment of approximately 203 employees, an increase from 171 currently employed and extend employment opportunities for those currently employed by Pembani.

In summary, the extension of the proposed underground mining to Portions RE and 1 of Zandvoort 10 IT and the amendment to the Mining Works Programme will allow for the following:

- Extension of LoM and associated extension of existing employment opportunities;
- Provision of additional employment opportunities;
- Continued and improved contributions to the local and export market;
- Continued contribution of rates and taxes to the Regional Services Council of Carolina; and
- Continued and improved investment in social capital through the undertaking of Pembani's approved Social and Labour Plan (SLP) promoting local economic development in the surrounding area.

6. PERIOD FOR WHICH AUTHORISATION IS REQUIRED

The remaining LoM is 30 years and as such the EA will be required for a period of 30 years.

7. PROJECT ALTERNATIVES

As an existing operational mine, Pembani has been subject to several previous environmental processes. These processes have, where relevant, considered alternatives in the form of both development and land use alternatives prior to approval.

7.1. DETAILS OF DEVELOPMENT FOOTPRINT ALTERNATIVES

The section below provides information on the development footprint alternatives, the properties considered, as well as the type of activity, activity layout, technological and operational aspects of the activity. As indicated above, Pembani is an existing operational mine, and has been subject to several previous environmental processes., which considered alternatives in the form of both development and land use alternatives prior to approval.

7.1.1. DETAILS OF DEVELOPMENT FOOTPRINT ALTERNATIVES

Given that both opencast and underground mining operations are currently underway and that the land use of the application area is now considered to be predominantly one of mining and related activities, there is no practical development alternative for the current Pembani Colliery mining area. The proposed inclusion of Zandvoort into the Pembani Colliery mining area has been explored, taking into consideration economic viability, practicality, and environmental characteristics.

The proposed amendment of the existing MWP to include the mining of additional coal resources including new underground mining operations on Portions RE of 6, 7, 8 and 10 of the farm Kwaggafontein 8 IT; Portions of the farm Haarlem 39 IT; Portion RE/9 of the farm Appeldoorn 38 IT; Portions Re of 1, 5, 8, 16 and 20 of the farm Groenvallei 40 IT; Portions 2, 7, 8, 9 and 10 of the farm Twyfelaar 11 IT; and Portions 2 and 12 of the farm Paardeplaats 12 IT, and new opencast mining operations on Portions RE of 6, 7, 8 and 10 of the farm Kwaggafontein 8 IT; Portion 8 of the farm Groenvallei 40 IT and Portion 2 of the farm Paardeplaats 12 IT all fall within the approved mining right boundary of Pembani.

Based on the below considerations, no further development alternatives can be considered or assessed as no other development alternative can be considered feasible. In areas where mining operations have ceased, rehabilitation should be undertaken to return the land to usable and viable land uses, as defined in the closure planning.

7.1.2. CONSIDERATION OF PROPERTY

The proposed inclusion of Zandvoort has been selected based on the results of prospecting activities undertaken on the property which indicate a viable coal deposit that can be economically exploited. It is also important to note that the properties are adjacent to those already included in the approved mining right and from a mining perspective are ideal for extension purposes.

The proposed amendment of the existing MWP includes areas that are already included in the existing Mining Right of Pembani.

7.1.3. TYPE OF ACTIVITY

The appropriateness of undertaking opencast mining methods for Zandvoort and Portions RE of 6, 7, 8 and 10 of the farm Kwaggafontein 8 IT; Portions of the farm Haarlem 39 IT; Portion RE/9 of the farm Appeldoorn 38 IT; Portions Re of 1, 5, 8, 16 and 20 of the farm Groenvallei 40 IT; Portions 2, 7, 8, 9 and 10 of the farm Twyfelaar 11 IT; and Portions 2 and 12 of the farm Paardeplaats 12 IT has also been evaluated but determined to be uneconomical due to the fact that the reserves can be reached through the extension of the existing underground mine working on adjacent properties.

The option of the proposed underground mining only on Zandvoort and Portions RE of 6, 7, 8 and 10 of the farm Kwaggafontein 8 IT; Portions of the farm Haarlem 39 IT; Portion RE/9 of the farm Appeldoorn 38 IT; Portions Re of 1, 5, 8, 16 and 20 of the farm Groenvallei 40 IT; Portions 2, 7, 8, 9 and 10 of the farm Twyfelaar 11 IT; and Portions 2 and 12 of the farm Paardeplaats 12 IT allows for the continuation of the existing land use, which in turn allows for the concurrent existence of both land uses, namely agriculture and mining, which will result in fewer socio-economic disruptions to the livelihoods of people living and working in the area.

In addition, the proposed underground extension of mining operations allows for a reduction in the temporal and spatial scales of mining related impacts as the mining operations will not result in any surface disturbance or require additional infrastructure to be placed on site. The reduction in these impact scales is significant in terms of cumulative impacts and improves the Applicants' capacity to manage the environmental impacts, as well as remediate environmental pollution and contamination.

Opencast mining operations on Portions RE of 6, 7, 8 and 10 of the farm Kwaggafontein 8 IT; Portion 8 of the farm Groenvallei 40 IT and Portion 2 of the farm Paardeplaats 12 IT will allow for mining in smaller areas where certain underground mining techniques would not be appropriate.

7.1.4. DESIGN OR LAYOUT OF THE ACTIVITY

The proposed extension of underground mining activities to Zandvoort and Portions RE of 6, 7, 8 and 10 of the farm Kwaggafontein 8 IT; Portions of the farm Haarlem 39 IT; Portion RE/9 of the farm Appeldoorn 38 IT; Portions Re of 1, 5, 8, 16 and 20 of the farm Groenvallei 40 IT; Portions 2, 7, 8, 9 and 10 of the farm Twyfelaar 11 IT; and Portions 2 and 12 of the farm Paardeplaats 12 IT correlates to the location of a viable mineral resource that can be accessed from existing mine workings. Opencast mining operations on Portions RE of 6, 7, 8 and 10 of the farm Kwaggafontein 8 IT; Portion 8 of the farm Groenvallei 40 IT and Portion 2 of the farm Paardeplaats 12 IT will allow for mining in smaller areas where certain underground mining techniques would not be appropriate. As such there are no design or layout alternatives to consider.

7.1.5. TECHNOLOGY TO BE USED IN THE ACTIVITY

As an existing operational mine, the Pembani Colliery has been subject to several previous environmental processes. These processes have, where relevant, considered technology alternatives prior to approval and are currently in use at the Pembani Colliery. As such no further technology alternatives are considered.

7.1.6. OPERATIONAL ASPECTS OF THE ACTIVITY

As an existing operational mine, the Pembani Colliery has been subject to several previous environmental processes. These processes have, where relevant, considered operational aspect alternatives prior to approval. Given that both opencast and underground mining operations are currently underway, and that the land use of the application area is now considered to be predominantly one of mining and related activities, there is no practical operational aspect alternative for the mining area.

7.1.7. NO-GO

The implication of not implementing the proposed extension of mining to Zandvoort, and of amending the existing mining works programme (within the approved mining right boundary) to include the mining of additional coal resources, both underground and opencast on the areas, as indicated in the MWP, includes a reduction in the existing mining operations overall LoM, as well as compromising the ability of Pembani to ensure consistent coal supply to Eskom for electricity generation and extended local and regional economic benefits.

The area is currently viewed as a mining area and if the No go option is used then most likely the mine will cease to operate and the existing mining areas will be rehabilitated. An opportunity will still remain for a future mine applicant to apply for rights to access the coal reserves remaining and thereby re-activate mining and the associated environmental impacts.

8. STAKEHOLDER ENGAGEMENT

8.1. HISTORICAL PUBLIC PARTICIPATION

A full Public Participation Process (PPP) was undertaken in 2004 by Digby Wells for the mining operation and all its associated activities during the compilation of the EIA/EMP as per the MPRDA. Whereby the following steps were undertaken:

- A number of Interested and Affected Parties (I&APs) were identified and an Interested and Affected Party (landAP) register was opened and maintained. These included farmers, farm labourers, communities, individuals and organisations;
- A Background Information Document (BID) was compiled containing information on the proposed project, and this was circulated to all landAPs along with registration forms;
- Notices were erected by means of advertisements as well as posters informing people of the project, and requesting the public to register as landAPs;
- An authorities meeting was held; and
- A PPP meeting was held.

Further to the initial PPP, numerous additional authorisation processes have been undertaken and have included additional PPP for consideration by authorities in the decision making process for these applications.

The Public Participation Processes followed thus far for Pembani Colliery includes the following:

- Public Participation for the original MPRDA Mining Right Application EIA in 2006;
- Public Participation for the EIA/EMP amendment for the Groenvallei 5 Underground Mining and the adjacent Imbani Washplant undertaken in July 2009;
- Public Participation for the NEMA S24G EIA in 2011.
- Partial Public Participation Process conducted for the EIA/EMP for Mining Related Activities at the Worldwide Coal Carolina Colliery: Appeldoorn 38 IT, Groenvallei 40 IT, Haarlem 39 IT, Kwaggafontein 8 IT, Paardeplaats 12 IT and Twyfelaar 11 IT in 2012.
- Public Participation for the WUL in 2016.
- Public Participation for the Section 102 Application and EMPR in 2016.
- Public Participation for the Basic Assessment in 2016.

Pembani has maintained an open and transparent relationship with the Interested and Affected Parties (landAPs). A summary of the results of previously conducted public consultation is provided below, however the reader is directed to the original reports for the details of previous public participation:

- Depletion of indigenous vegetation due to mining activities;
- Destruction of red data species, and species which are of medicinal value;
- Damage of wetlands systems;
- The degradation of local roads associated with transporting the coal via road trucks;
- The presence of alien plant species, which should be removed by the mine;
- Negative impacts on water quality and quantity in the local area;
- Dust and noise pollution;

- Disruption of the aesthetic beauty of the area;
- Degradation of grazing land;
- Damage to buildings due to blasting;
- Negative impact on fish farming (particularly trout) due to pollution;
- Influx of job-seekers into the area;
- Increase in social ills (such as crime, abuse etc);
- The loss of Carolina as a possible tourist destination; and
- Potential negative impact on the natural gas pipeline from Mozambique.
- The impact of blasting on property;
- Lack of rehabilitation being conducted by the mine;
- Impacts on the water resources and the decanting of water.
- The validity of the prospecting right for Zandvoort 10IT has been queried; and
- The perceived / real lack of compliance shown by the mine in the past.

These issues and concerns have all been noted, and will be addressed in the EIR and EMPR.

8.2. PUBLIC PARTICIPATION METHODOLOGY

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&APs) 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 proposed project needs to be managed sensitively and according to best practises in order to ensure and promote:

- Compliance with international best practise options;
- 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:

- Provide an opportunity for I&APs to obtain clear, accurate and comprehensible information about the proposed activity, its alternatives or the decision and the environmental impacts thereof.
- Provide I&APs with an opportunity to indicate their viewpoints, issues and concerns regarding the activity, alternatives and / or the decision.
- Provide I&APs with the opportunity to suggest ways of avoiding, reducing or mitigating negative impacts of an activity and enhancing positive impacts.
- Enable the Applicant to incorporate the needs, preferences and values of I&APs into the activity.

- Provide opportunities to avoid and resolve disputes and reconcile conflicting interests.
- Enhance transparency and accountability in decision-making.
- Identify all significant issues for the project; and
- Identify possible mitigation measures or environmental management plans to minimise and/or prevent environmental impacts associated with the project.

The PPP for this project has been undertaken in accordance with the requirements of the MPRDA and NEMA, in line with the principles of Integrated Environmental Management (IEM). IEM implies an open and transparent participatory process, whereby stakeholders and other I&APs are afforded an opportunity to comment on the project.

8.2.1. IDENTIFICATION OF INTERESTED AND AFFECTED PARTIES

The I&AP databases compiled from various past environmental authorisation processes have been updated to compile a new register of key landAP's identified for notification of the Environmental Authorisation Application. The I&AP database includes amongst others landowners, communities, regulatory authorities and other specialist interest groups.

8.2.1.1. LIST OF AUTHORITIES IDENTIFIED AND NOTIFIED

The following Regulatory Authorities have been identified over the life of project, and are included in the updated landAP register:

- The Albert Luthuli Local Municipality;
- The Gert Sibande District Municipality;
- The Department of Mineral Resources (DMR);
- Mpumalanga Department of Agriculture, Rural development, Land and Environmental Affairs (DARDLEA);
- The Department of Water and Sanitation (DWS);
- The Mpumalanga Parks Board (MPB);
- The South African Heritage Resources Agency (SAHRA); and
- The Department of Public Works, Roads and Transport.
- Department of Rural Development and Land Reform.

Please see the I&AP database attached in Appendix B.

8.2.1.2. LIST OF KEY STAKEHOLDERS IDENTIFIED AND NOTIFIED

A number I&APs were identified and an updated I&AP register was opened and maintained. These included farmers, communities, individuals and organisations.

- Endangered Wildlife Trust;
- Wildlife and Environment Society of South Africa (WESSA);
- Mpumalanga Wetland Forums;
- Federation for Sustainable Development;
- NAFU Mpumalanga;
- Agricultural Research Council;

- SANBI Working for Wetlands;
- Ekangala Grassland Trust; and
- South African Crane Working Group.

Please see the updated I&AP database attached in **Appendix B** for the full list of stakeholders identified and notified of the proposed Environmental Authorisation application process.

8.2.1.3. LIST OF SURFACE RIGHTS HOLDERS/LAND OWNERS IDENTIFIED AND NOTIFIED

Please see the updated I&AP database attached in **Appendix B** for the full list of surface rights/land owners identified and notified, as well as Table 6 of this report.

8.2.2. NOTIFICATION OF I&AP'S

As part of this Environmental Authorisation application, an additional public participation process has been undertaken whereupon I&AP's will have an opportunity to comment on the Scoping report. All registered I&AP's, including regulatory authorities and existing engagement structures have been notified of the availability of this Scoping Report for review and comment by means of registered post, facsimile, and e-mail. I&AP's have been afforded a 30 day review period, the results of which will be included in the final submission to DMR.

8.2.2.1. REGISTERED LETTERS, FAXES, AND EMAILS

Letters, emails and facsimiles were composed and sent to the identified authorities, adjacent landowners, ward councillors and registered I&APs of the proposed Pembani Project. Examples of the letters, emails and facsimiles that were sent out during the Scoping Phase notification are attached. The letters, emails and facsimiles introduced the addressee to the proposed amendment to the existing Mining Right and the proposed amendment to the MWP. The letters were sent by registered mail.

8.2.2.2. NEWSPAPER ADVERTISEMENTS

Two advertisements, one in English and one in Afrikaans, describing the Mining Right amendment and EA Application process have been placed in newspapers with adequate circulation in the area. The advertisements have been placed in "The Highvelder" on 17 November 2016. The newspaper adverts included the following information:

- Project name;
- Applicant name;
- Project location;
- Description of the Environmental Authorisation Application process;
- Legislative requirements; and
- Relevant EIMS contact person for the project.

I&AP's were provided a period of 30 days, from the 17 November 2016 to the 09 January 2017, to register as I&AP's for the proposed project. All registered I&AP's were further notified of the availability of the Scoping Report for review and comment. The Scoping Report will be made available for 30 days from the 1st February 2017 to the 3rd March 2017, for review and comment. Comments obtained during the Scoping phase process and the responses of the EAP to date have been included in the summary table below (Table 14) in the Scoping

Report to be submitted to the DMR. The Scoping Report will be resubmitted to the DMR including all comments received from the I&APs.

8.2.2.3. SITE NOTICES

Twenty (20) site notices (English and Afrikaans) were placed along and within the perimeter of the proposed project area on 17 November 2016. The on-site notices included the following information:

- Project name;
- Applicant name;
- Project location;
- Description of the Environmental Authorisation Application process;
- Legislative requirements; and
- Relevant EIMS contact person for the project.

Please refer Appendix B for proof of site notice placement.

8.2.3. CONSULTATION MEETINGS

This section briefly outlines the consultation meetings that will be scheduled to be held for the project.

8.2.3.1. AUTHORITY MEETINGS

An Authority meeting was scheduled on 22 October 2016 before the start of the process in order to determine the way forward with the proposed Pembani Project. Should any Authority require a meeting further during the process, one will be arranged. The purpose of the Authority meeting was to explain the project in detail to authorities and clarify the process going forward.

8.2.3.2. PUBLIC OPEN DAYS

As part of the Section 102 amendment Application, that was submitted to the DMR in October 2016, together with the supporting EMPR, a PPP was undertaken and, therefore, a public open day is currently not proposed to be held for the this project.

8.3. SUMMARY OF ISSUES RAISED BY I&AP'S

The Integrated PPP was initiated on 17 November 2016. I&AP's were given until 09 January 2017 (a period of 30 days plus to include the exclusion period of 16 December to 2 January) to register and will be provided a 30 day review period to comment on the draft scoping report. All comments or issues received from I&AP's thus far have been included in the Issues and Response Report (IRR) provided below. All comment received during the 30 day review period of the scoping report will be included in the final scoping report to be submitted to the DMR. Any issues received after the scoping report is submitted to the DMR, will still be responded to and included in the final EIA report for submission to the authority. Furthermore, the comments received for the Section 102 Application and that were provided in the EMPR that was submitted to the DMR in October 2016, have also been included in Table 14 below, as the comments and issues that were raised by the I&APs for the Section 102 amendment Application process are considered to be relevant to the current project.

Table 14: Issues and Responses Received from I&APs

Interested and Affected Parties	Consulted	Date	Issues Raised	Response to Issue	Reference in this Report
Key Stakeholders					
Landowner/s					
Mr. Anthon Benadie	X	2015-07-08	Mr. Benadie thanked EIMS for the heritage scoping level report and the soil, land use, and capability report. To his understanding this reports are not the finalised reports and that Pempani/Environmental Impact Management Services (Pty) Ltd will provide me with the finalised reports when they apply for the section 102 amendment. He would appreciate it, if EIMS could inform him the same day Pempani Carolina coal applies for the 102	EIMS advised that Mr. Benadie will be provided with the finalised specialist reports once they have been completed and he will also be informed of the submission of the Section 102 Application on the day that it is handed in to the DMR. Please note that EIMS was not involved in the Water Use Licence Application, we will however request the information regarding the landowner consent letter from Pempani for Mr. Pretorius. EIMS	Appendix B

Interested and Affected Parties	Consulted	Date	Issues Raised	Response to Issue	Reference in this Report
			<p>amendment in terms of the Mineral and Petroleum Resources Development Act (Act No. 28 of 2002, MPRDA).</p> <p>He noticed in the water use licence document that was supplied to him on Monday (06/07/2015) that there is a water use licence on Zandvoort. Can EIMS please advise him to why he never knew about this? He wants the copy of the owners consent document that Pembani used for this water use license on Zandvoort.</p> <p>Can EIMS also provide me with the following documents?</p> <p>Copy of the mining rights on Paardeplaats and Twyfelaar.</p> <p>Copy of the authorisation documents for the use of the Kalkkloof road on Zanvoort. The road is a registered servitude on Zandvoort. Can you also provide me with the documents for the authorisation to use the private farm/dirt road from the Kalkkloof road to Twyfelaar. There is no</p>	<p>will also request the mining rights and the authorisation for use of the Kalkkloof Road and EIMS will revert back to you with information regarding these as soon as possible.</p>	

Interested and Affected Parties	Consulted	Date	Issues Raised	Response to Issue	Reference in this Report
			servitude for this road on Zandvoort.		
Mr. Anthon Benadie	X	2015-09-16	Mr. Benadie communicated the concern to EIMS that there is undermining at Zandvoort.	Pembani Colliery confirmed on a formal letter that the mining occurs within the approved Mining Right area and that there is no undermining taking place at Zandvoort 10IT Portions 1 and Re.	Appendix B
Mr. Anthon Benadie	x	2015-11-06	<p>May you please explain in detail the process involved with the application of the section 102.</p> <p>At what stage are the proceedings now. We understood that the application was already filed, but you mentioned that you are still waiting on a reply from the correct authority before you can file. Will you please explain this in full.</p> <p>We also request 2 hardcopies of all documents. You mentioned that you have to request this from your client first. Will you please update us as soon as possible on both requests.</p>	<p>As requested previously through correspondence with Dr Pretorius and yourself, documentation regarding Pembani's Section 102 application is available for your perusal. Due to the number of documents and their size it is not feasible to email them directly to you. Please can you therefore indicate whether you would prefer these documents to be uploaded to a Dropbox folder or sent to you using a large file transfer site?</p> <p>Please note that this information is provided only for use in evaluating Pembani's Section 102 application and for no other purposes.</p>	Appendix B

Interested and Affected Parties	Consulted	Date	Issues Raised	Response to Issue	Reference in this Report
Mr Anthon Benadie	X	2016-06-30	<p>Mr Benadie requested a copy of the acknowledgement letter received from DMR for the submission of the Section 102 application.</p> <p>Mr Benadie also said the some of the appendices would not download.</p>	<p>EIMS thanked Mr. Benadie for his call and emailed the acknowledgement letter that Pembani Colliery received from the Department of Mineral Resources (DMR) on 22 March 2016. The letter was signed by Mr. Sam Mathavhela, the Regional Manager, of the DMR.</p> <p>The links on the website (www.eims.co.za) for Appendices I, K and Q of the amended EMPR have been sorted and should now download as well. EIMS advised that a CD, with the EMPR and the appendices, had been posted to Mr. Benadie with the notification letter to via registered post on 17 June 2016. EIMS also said that a CD could be couriered to him and that Mr. Benadie should then send EIMS the physical address.</p>	Appendix B
Mr Anthon Benadie	X	2016/07/28	<p>Mr Benadie sent a letter (attached in Annexure F of the IRR attached as Appendix D of this report) with the below matters:</p> <p>A letter dated 15 June 2016 written by Environmental Impact Management Services (EIMS)</p>	<p>EIMS responded as per the below (refer to letter Attached as Annexure F in the IRR attached as Appendix D of this report).</p> <p>EIMS sent notifications (registered letters, emails and faxes) to all Interested and Affected Parties (I&APs), as well as all stakeholders and organs of</p>	Appendix B

Interested and Affected Parties	Consulted	Date	Issues Raised	Response to Issue	Reference in this Report
			<p>was addressed to me as an interested and affected party in respect of the proposed amendment to the Environmental Management Programme Report (EMPR) in support of a Section 102 Application in terms of the Mineral and Petroleum, Resources Development Act, Act 28 of 2002 (MPRDA) by Pembani Coal Carolina Proprietary Limited (Pembani Coal). I attach hereto a copy of the aforesaid letter marked as annexure "A". Accordingly, the above-mentioned application for the proposed amendment to the EMPR by Pembani Coal in terms of the requirements of the MPRDA has relevance.</p>	<p>state as per the requirements of the Mineral and Petroleum, Resources Development Act, 2002 (Act 28 of 2002) (MPRDA) and the National Environmental Management Act, 1998 (Act 107 of 1998) (NEMA) Environmental Impact Assessment (EIA) Regulations, as well as the regulations and guidelines under these acts, need to be notified of the project.</p>	
Mr Anthon Benadie	X	2016/07/28	The Johannes Stephanus Trust with registration number MT8191/1995 and registered	EIMS notes this comment. Furthermore, all correspondence with Interested and Affected Parties (I&APs) and or stakeholders / landowners, such	Appendix B

Interested and Affected Parties	Consulted	Date	Issues Raised	Response to Issue	Reference in this Report
			owner of the property known as Portion 1 and RE of the farm Zandvoort 10 IT is in principle opposed to and strongly objects to the amendment to the EMPR and granting of Mining Rights to Pembani Coal for mining coal on and or under Portion 1 and RE of the farm Zandvoort 10 IT (Zandvoort 10 IT) for the following reasons as set out herein under.	as yourself, will be included in Section 5.3 under "Summary of issues raised by I&APs" of the Final EMPR. All issues and concerns that have been sent through to EIMS will also be included in the Issues and Response Report (IRR) that will be included as part of an Appendix of the Final EMPR that will be submitted to the DMR.	
Mr Anthon Benadie	X	2016/07/28	The application for the amendment to the EMPR presupposes that Pembani Coal holds a valid and existing prospecting right over the farm Zandvoort 10IT as per the letter dated 15 June 2016 by EIMS.	EIMS is of the understanding that the Prospecting Right for Zandvoort has lapsed, and that following consultation with the DMR, Pembani Colliery has submitted a new application to the DMR. You will be notified of further development and opportunity to participate in consequent environmental approval application processes, with regards to this.	Appendix B
Mr Anthon Benadie	X	2016/07/28	On 29 March 2007 a prospecting right (MP/30/5/1/1/2/415PR) was granted over the Farm Zandvoort	Please refer to the previous response provided with regards to the Prospecting Right.	Appendix B

Interested and Affected Parties	Consulted	Date	Issues Raised	Response to Issue	Reference in this Report
			10 IT to Ingwe Collieries Limited (Registration number:1963/000537/06), which would commence on 8 March 2007 and continue for a period of three (3) years. A copy of the prospecting right is attached hereto as Annexure "B".		
Mr Anthon Benadie	X	2016/07/28	Section 18(4) of the MPRDA clearly states that a "prospecting right may be renewed once in a period not exceeding three years"	Please refer to the previous response provided with regards to the Prospecting Right.	Appendix B
Mr Anthon Benadie	X	2016/07/28	On 22 March 2013 the prospecting right was renewed for a period of three (3) years commencing on 15 February 2013 and ending on 14 February 2016. This is prima facie proof that the prospecting right has lapsed.	Please refer to the previous response provided with regards to the Prospecting Right.	Appendix B

Interested and Affected Parties	Consulted	Date	Issues Raised	Response to Issue	Reference in this Report
Mr Anthon Benadie	X	2016/07/28	On 23 August 2013 the aforesaid prospecting right was ceded to Pembani Coal.	Please refer to the previous response provided with regards to the Prospecting Right.	Appendix B
Mr Anthon Benadie	X	2016/07/28	In light of what is set out above Pembani Coal does not hold a prospecting right over the farm Zandvoort 10 IT as stated in the proposed amendment to the EMPR as the prospecting right lapsed on 15 February 2016.	Please refer to the previous response provided with regards to the Prospecting Right. The amended EMPR to be submitted to the DMR will reflect that the Prospecting Right for Zandvoort has lapsed, and that following consultation with the DMR, Pembani Colliery has submitted a new application to the DMR.	Appendix B
Mr Anthon Benadie	X	2016/07/28	The EMPR can only be extended to property over which Pembani Coal holds a mineral right. As such seeing as no form of mineral right is held by Pembani Coal over Zandvoort 10 IT and accordingly the application for amendment of the EMPR should not be considered or approved.	The amended EMPR will still be submitted to DMR as the updated EMPR aims to consolidate the numerous authorisation processes that been undertaken to date to produce a single overarching EMPR for holistic management of the Pembani Colliery going forward.	Appendix B
Mr Anthon Benadie	X	2016/07/28	In addition to the above the applicant has not complied with NEMA and the MPRDA with	Regulation 34(1) GNR 982 (2014) requires that a holder of an Environmental Authorisation (EA) must ensure compliance with the	Appendix B

Interested and Affected Parties	Consulted	Date	Issues Raised	Response to Issue	Reference in this Report
			reference to the manner in which it must exercise its existing EIA and EMPR pertaining to its existing mining right. In support of the aforesaid I attached hereto, marked as annexure “C”, a field assessment prepared by Mr Johan Mare of M2 Environmental Connections on 4 June 2016 titled: “Zandvoort Field Assessment in Response to Claim of Water Resource Pollution.”	conditions of an EA and associated EMPR and submit an independent environmental audit report to the competent authority at the intervals indicated in the EA. Enforcement of the requirements of the various permits and authorisations lies with the relevant Competent Authorities.	
Mr Anthon Benadie	X	2016/07/28	Regulation 51 of the Regulations to the MPRDA provides detail regarding the contents of an EMPR. The Regulation provides that the EMPR must contain an outline of the implementation programme, which includes detailed descriptions of the technical options chosen for each identified impact action plans	As per Section 26.9 of the amended EMPR, conditions of the IWUL must be implemented by Pembani Colliery. Pembani Colliery has received an updated Integrated Water Use Licence (IWUL), dated 07/07/2016. Condition 5.2 of Appendix V of the IWUL requires that Pembani Colliery “shall make full financial provision for all investigations, designs, construction, operation and maintenance for a water treatment plant should it become	Appendix B

Interested and Affected Parties	Consulted	Date	Issues Raised	Response to Issue	Reference in this Report
			linked to time schedules to achieve the set goals. The Regulation requires that the EMPR must contain sufficient detail to enable readers to ascertain the specific actions that Pembani Coal commits itself to undertake in order to address every identified impact. Pembani Coal fails to commit itself to address long-term residual impact stemming from Acid Mine Drainage as water treatment is to be considered as "if required".	a requirement as a long-term water management strategy."	
Mr Anthon Benadie	X	2016/07/28	<p>Mr Benadie sent a letter (attached in Annexure F of the IRR attached as Appendix D of this report) with the below matters:</p> <p>A letter dated 15 June 2016 written by Environmental Impact Management Services (EIMS) was addressed to me as an interested and affected party in respect of the proposed</p>	<p>EIMS responded as per the below (refer to letter Attached as Annexure F in the IRR attached as Appendix D of this report).</p> <p>EIMS sent notifications (registered letters, emails and faxes) to all Interested and Affected Parties (I&APs), as well as all stakeholders and organs of state as per the requirements of the Mineral and Petroleum, Resources Development Act, 2002 (Act 28 of 2002) (MPRDA)</p>	Appendix B

Interested and Affected Parties	Consulted	Date	Issues Raised	Response to Issue	Reference in this Report
			<p>amendment to the Environmental Management Programme Report (EMPR) in support of a Section 102 Application in terms of the Mineral and Petroleum, Resources Development Act, Act 28 of 2002 (MPRDA) by Pembani Coal Carolina Proprietary Limited (Pembani Coal). I attach hereto a copy of the aforesaid letter marked as annexure "A". Accordingly, the above-mentioned application for the proposed amendment to the EMPR by Pembani Coal in terms of the requirements of the MPRDA has relevance.</p>	<p>and the National Environmental Management Act, 1998 (Act 107 of 1998) (NEMA) Environmental Impact Assessment (EIA) Regulations, as well as the regulations and guidelines under these acts, need to be notified of the project.</p>	
Mr Anthon Benadie	X	2016/07/28	<p>The requirements of section 23 and 24 of NEMA read together with sections 38 and 39 of the MPRDA that environmental issues be subject to a decision process that involves integrated</p>	<p>It is understood that the relevant requirements of both the NEMA and MPRDA have been addressed in the amended EMPR.</p>	Appendix B

Interested and Affected Parties	Consulted	Date	Issues Raised	Response to Issue	Reference in this Report
			environmental management was evidently not respected in the compilation of the amended EMPR. This is apparent from the numerous deficiencies in the document as set out below.		
Mr Anthon Benadie	X	2016/07/28	The purpose of the proposed amendment to the EMPR is to seek approval to extend the Mining Right Area of Pembani Coal's footprint to include the farm Zandvoort 10 IT. The mine erroneously assumes that it holds the prospecting right for the property, which is not correct	Please refer to the previous response provided with regards to the Prospecting Right.	Appendix B
Mr Anthon Benadie	X	2016/07/28	Although the mine has been operational for many years it did not succeed in obtaining an Integrated Water Use Licence for all its water uses on all relevant properties where these water uses are executed. The mine has therefore operated illegally in	It is our understanding that Pembani Coal is responsible for ensuring compliance with all relevant legislation and any permits, licences and/or authorisations it may hold. The relevant regulating authorities are responsible for enforcing these legal requirements. Pembani Colliery has received an updated Integrated Water Use	Appendix B

Interested and Affected Parties	Consulted	Date	Issues Raised	Response to Issue	Reference in this Report
			terms of the requirements of the National Water Act. 1998 (Act 36 of 1998).	Licence (IWUL), dated 07/07/2016.	
Mr Anthon Benadie	X	2016/07/28	Pembani Coal states in the proposed amendment to the EMPR that it follows a progressive rehabilitation approach but acknowledges that it has historic open pits that still need to be rehabilitated.	Please note that the amended Environmental Management Programme Report (EMPR) does provide for rehabilitation. Please refer to Section 27.3 and Figure 70 of the amended EMPR, which refers to the rehabilitation plan that Pembani Colliery should be implementing. The DMR is responsible for enforcing the mines environmental obligations and your concerns will be included in the submission that EIMS will make to the DMR.	Appendix B
Mr Anthon Benadie	X	2016/07/28	Surface water quality degradation is correctly identified as a key impact but the supporting document is a specialist study conducted during 2005. This study is outdated and should be redone to provide more accurate and up to date information having regard to an onsite inspection.	The impact on surface water features was assessed in the 2005 report and considering that the Zandvoort will be underground mining only it is not anticipated that there will be significant changes to the findings of this previous assessment. Please note that the amended EMPR includes the whole of Pembani Colliery and aims to consolidate the numerous authorisation processes that have	Appendix B

Interested and Affected Parties	Consulted	Date	Issues Raised	Response to Issue	Reference in this Report
				been undertaken to date to produce a single overarching EMPR for holistic management of the Pembani Colliery	
Mr Anthon Benadie	X	2016/07/28	Wetland findings as contained in the specialist studies of 2011 were ignored by the mine as it failed to apply timeously for section 21 (c) and 21(i) of the National Water Act, Act 36 of 1998 water uses to undermine wetlands or to mine in close proximity to wetlands.	As mentioned previously, Pembani Colliery applied for and was granted an updated IWUL on 07 July 2016. The IWUL, (Licence No. 05/X11B/ACGIJ/4704) has authorised Water Uses in terms of Section 21(c) and 21(i).	Appendix B
Mr Anthon Benadie	X	2016/07/28	The mine has a long history of non-compliance with environmental legislation and only acted to implement mitigatory measures upon instruction by the regulatory authorities as per issued Notices of Intend to Direct, Directives and Section 24(G) of NEMA rectifications.	It is understood that the decision making authority (DMR) is aware of the historical performance of the mine and will consider such in their consideration of this application. Your concerns regarding past performance will be included in the submission made to the DMR.	Appendix B

Interested and Affected Parties	Consulted	Date	Issues Raised	Response to Issue	Reference in this Report
Mr Anthon Benadie	X	2016/07/28	It is stated in the report that Pembani Coal has commenced with underground mining on the known as Portion 2 of the farm Paardeplaats. Undermining of this property during 2015 implies undermining of wetlands without authorisation.	As mentioned previously, Pembani Colliery applied for and was granted an updated IWUL on 07 July 2016. The IWUL, (Licence No. 05/X11B/ACGIJ/4704) has authorised Water Uses in terms of Section 21(c) and 21(i).	Appendix B
Mr Anthon Benadie	X	2016/07/28	It is stated in the report that the management of clean and dirty water processed adheres to GN 704 regulations. This statement is questioned based on the numerous spills and discharges experienced at the mine and reported by adjacent landowners.	Thank you for the comment. EIMS compiled the amended EMPR based on information provided by the mine and the specialist studies at the time of compiling the document. Your comment will be included in Section 5.3 under "Summary of issues raised by I&APs" of the Final EMPR. All issues and concerns that have been sent through to EIMS will also be included in the Issues and Response Report (IRR) that will be included as part of an Appendix of the Final EMPR that will be submitted to the DMR. Section 2.2.13 of the EMPR provides an overview of the current Clean and Dirty Water Processes on the mine. Section	Appendix B

Interested and Affected Parties	Consulted	Date	Issues Raised	Response to Issue	Reference in this Report
				<p>26.9 of the EMPR- Impact Management Objectives (surface water) requires the following: “The mine shall ensure that a detailed storm water management is approved and implemented for the mining area. Clean and dirty water system infrastructure must be installed as per the detailed storm water management plan which must take into consideration the design capacities and locations restrictions stipulated in GN 704 of the NWA”.</p> <p>Furthermore, Conditions 2.4 and 2.5 of Appendix III of the IWUL, dated 07 July 2016, require that “as-built” plans must be submitted to the Chief Executive Officer and that a stormwater management plan must be designed. All the conditions under 3.1 of Appendix III of the IWUL refer to stormwater measures that need to be implemented by Pembani Colliery. As mentioned previously, Section 26.9 of the amended EMPR states that the conditions of the IWUL must be met. Pembani Colliery needs to submit an independent annual</p>	

Interested and Affected Parties	Consulted	Date	Issues Raised	Response to Issue	Reference in this Report
				audit on compliance with the conditions of the IWUL as per Condition 12 of Appendix 1 of the IWUL, dated 07 July 2016.	
Mr Anthon Benadie	X	2016/07/28	The requirements of section 23 and 24 of NEMA read together with sections 38 and 39 of the MPRDA that environmental issues be subject to a decision process that involves integrated environmental management was evidently not respected in the compilation of the amended EMPR. This is apparent from the numerous deficiencies in the document as set out below.	It is understood that the relevant requirements of both the NEMA and MPRDA have been addressed in the amended EMPR.	Appendix B
Mr Anthon Benadie	X	2016/07/28	The water balance of the mine needs to be refined in accordance with the requirements as contained in BPG: G2 (Water and Salt Balances).	Condition 3.1 of Appendix IV of the IWUL dated 07 July 2016, states that the "licensee shall update the water balance annually." Section 26.9 of the amended EMPR states that the conditions of the IWUL must be met. The EMPR will be amended to reflect the need to consider	Appendix B

Interested and Affected Parties	Consulted	Date	Issues Raised	Response to Issue	Reference in this Report
				BPG: G2 in this annual updating of the water balance process	
Mr Anthon Benadie	X	2016/07/28	There is no correlation between the soil studies conducted by Digby Wells and Associates and the study conducted by the Agricultural Research Council.	The soil study conducted by Digby Wells and Associates was used for information purposes only. The study conducted by the Agricultural Research Council was specific to Zandvoort.	Appendix B
Mr Anthon Benadie	X	2016/07/28	The report does not make provision for a sound rehabilitation plan for the predicted post-mining acid mine drainage decant.	Section 26.3.1 to 26.6 of the amended EMPR addresses Acid Mine Drainage (AMD), while in Section 26.9 there is the commitment that "The mine shall appoint specialist to develop detailed, site specific AMD management plan". Rehabilitation in terms of AMD is also discussed in Section 26.9.	Appendix B
Mr Anthon Benadie	X	2016/07/28	The site layout for the various discard dumpsites and dirty water containment facilities are inappropriate as it is situated close to proximity to a network of wetlands, seepage wetlands and clusters as well as pans, rivers and water courses.	Section 4 of Appendix 3 of the IWUL dated 07 July 2016 refers to rehabilitation of water courses. As indicated in Section 26.9 of the amended EMPR conditions of the IWUL must be implemented by Pembani Colliery.	Appendix B

Interested and Affected Parties	Consulted	Date	Issues Raised	Response to Issue	Reference in this Report
Mr Anthon Benadie	X	2016/07/28	<p>Moreover, section 3(1) of the Promotion of Administrative Justice Act, Act 3 of 2000 (PAJA) – which gives effect to section 33(1) of the Constitution of the Republic of South Africa, provides that “everyone has the right to administrative action that is lawful, reasonable and procedurally fair”- states that “administrative action which materially and adversely affected the rights or legitimate expectations of any person must be procedurally fair”. Section 3(2)(b) of PAJA sets out the minimum standards for procedural fairness, requiring an administrator to give a person adversely affected by administrative action:</p> <p>Adequate notice of the nature and purpose of the proposed action;</p> <p>A reasonable opportunity to make representations;</p> <p>Clear statement of administrative actions;</p> <p>Adequate notice of any right of review or internal appeal;</p>	<p>This comment is noted and will be included in Section 5.3 under “Summary of issues raised by I&APs” of the Final EMPR. All issues and concerns that have been sent through to EIMS will also be included in the Issues and Response Report (IRR) that will be included as part of an Appendix of the Final EMPR that will be submitted to the DMR.</p> <p>Please also be advised that as per Section 68 of the Mineral and Petroleum Resources Development Amendment Act (Act 49 of 2008) that Section 96 of the principal Act (MPRDA, 2002) is amended and that you have the right to appeal the decision made by the DMR with regards to the Section 102 and the amended EMPR:</p> <p>“(1) Any person whose rights or legitimate expectations have been materially and adversely affected or who is aggrieved by any administrative decision in terms of this Act may appeal within 30 days becoming aware of such</p>	Appendix B

Interested and Affected Parties	Consulted	Date	Issues Raised	Response to Issue	Reference in this Report
			Adequate notice of the right to request reasons.	<p>administrative decision in the prescribed manner to—</p> <p>(a) the Director-General, if it is an administrative decision by a Regional Manager or [an officer] any officer to whom the power has been delegated or a duty has been assigned by or under this Act;</p> <p>(b) the Minister, if it is an administrative decision that was taken by the Director-General or the designated agency.”</p>	
Mr Anthon Benadie	X	2016/07/28	No consideration is given by Pembani Coal to section 48(1)(c) of the MPRDA insofar it relates to land reserved in terms of the National Environmental Management: Protected Areas Act, Act 57 of 2003 and classified in the Mpumalanga Biodiversity Conservation Plan as terrestrial biodiversity areas where mining should be prohibited or restricted.	Pembani Colliery is an existing mine with the required environmental authorisations. The amended EMPR aims to consolidate the numerous authorisation processes that been undertaken to date to produce a single overarching EMPR for holistic management of the Pembani Colliery going forward. The proposed inclusion of Zandvoort is for underground mining only and as indicated in the Ecological Study, conducted in 2015, will have a minimal impact on the terrestrial biodiversity. The Ecology study	Appendix B

Interested and Affected Parties	Consulted	Date	Issues Raised	Response to Issue	Reference in this Report
				(refer to Appendix J2 of the amended EMPR) does take the Mpumalanga Biodiversity Conservation Plan into account. It is our understanding that the application area does not fall within and of the areas referred to in Section 48(1)(c) of the MPRDA. Please advise if you are aware of any specific restriction applicable to this application area?	
Mr Anthon Benadie	X	2016/07/28	The Mpumalanga Biodiversity Conservation Plan (2006) (MBCP) was developed by the Mpumalanga Department of Agricultural and Land Administration in association with Mpumalanga Tourist and Parks Agency to guide conservation and land use decisions in support of sustainable development in the Province.	Both the Mpumalanga Department of Agriculture, Rural Development and Land Administration, as well as the Mpumalanga Tourist and Park Agency have been notified of the proposed project and were invited to comment on the amended EMPR. Please also refer to responses above.	Appendix B
Mr Anthon Benadie	X	2016/07/28	The Carolina area is classified in the MBCP's terrestrial biodiversity	Please refer to responses above. Figure 6 of the Ecology Report attached in Appendix J2 indicates the MBCP of the study area.	Appendix B

Interested and Affected Parties	Consulted	Date	Issues Raised	Response to Issue	Reference in this Report
			assessment as of “irreplaceable” value.		
Mr Anthon Benadie	X	2016/07/28	The MBCP Aquatic Assessment also rate the Carolina area of irreplaceable biodiversity value.	Please refer to response above.	Appendix B
Mr Anthon Benadie	X	2016/07/28	NFEPA’s and wetland clusters must therefore be maintained if they are in a good ecological donation and rehabilitated to the best attainable ecological condition if they are in a sub-standard condition.	Please refer to Section 5.7.9 of the amended EMPR which discusses the wetlands, as well as Section 7 which includes the impacts on the wetlands and mitigation measures, as well as refer to the rehabilitation of wetlands.	Appendix B
Mr Anthon Benadie	X	2016/07/28	A great concern is the matter of Acid Mine Drainage (AMD) and the associated residual impacts that it will have on the wetlands in the area and the pollution of water resources in this sensitive water scarce area. I cannot support nor endorse the destruction of wetlands as well as the water resources that has been classified	Please refer to the response above. Please also note that Condition 4 of the IWUL dated 07 July 2016, requires that the Licencee embark on a long-term rehabilitation and management programme with regards to water courses. As per Section 26.9 of the amended EMPR, conditions of the IWUL must be implemented	Appendix B

Interested and Affected Parties	Consulted	Date	Issues Raised	Response to Issue	Reference in this Report
			in terms of the National Freshwater Ecosystem Priority Areas (NFEPA). Undermining of the farm Zandvoort 10IT is highly likely to have a long-term negative impact on the wetlands, pan and water resources in the area.		
Mr Anthon Benadie	X	2016/07/28	The water balance of the mine needs to be refined in accordance with the requirements as contained in BPG: G2 (Water and Salt Balances).	Condition 3.1 of Appendix IV of the IWUL dated 07July 2016, states that the “licensee shall update the water balance annually.” Section 26.9 of the amended EMPR states that the conditions of the IWUL must be met. The EMPR will be amended to reflect the need to consider BPG: G2 in this annual updating of the water balance process	Appendix B
Mr Anthon Benadie	X	2016/07/28	Due to the sensitivity of the aquatic ecosystems, the hydrological importance of the area and the potential significant impact of the extension of the mine to include underground mining on these ecosystem, mainly through the dewatering of	Comment noted. As per Condition 6,.1 of Appendix V of the IWUL dated 07 July 2016, “The Licensee must prevent adverse effect on other water users. All complaints must be investigated by a suitable qualified person and if investigations prove that the Licensee has impaired the rights of other water users, the Licensee	Appendix B

Interested and Affected Parties	Consulted	Date	Issues Raised	Response to Issue	Reference in this Report
			<p>the wetlands and pan in the area, the proposed amendment to the EMPR cannot be considered without consultation with downstream water users dependent on the water, and a quantification of the dewatering effect on economic (agricultural) activities downstream of the impact area.</p>	<p>must initiate suitable compensative measures.”</p> <p>All other conditions of the IWUL, dated 07 July 2016 will also be applicable. As per Section 26.9 of the amended EMPR, conditions of the IWUL need to be implemented.</p>	
Mr Anthon Benadie	X	2016/07/28	<p>As the relevant decision making authority in terms of the constitutional legal responsibility to ensure that administrative actions do not significantly affect the environment as set out in section 2(1) of NEMA, there is in fact no choice but to apply the risk-adverse and cautious approach and for the DMR to reject the proposed amendment to the EMPR.</p>	Please refer to response in above.	Appendix B

Interested and Affected Parties	Consulted	Date	Issues Raised	Response to Issue	Reference in this Report
Mr Anthon Benadie	X	2016/07/28	Due to the sensitivity of the aquatic ecosystems, the hydrological importance of the area and the potential significant impact of the extension of the mine to include underground mining on these ecosystem, mainly through the dewatering of the wetlands and pan in the area, the proposed amendment to the EMPR cannot be considered without consultation with downstream water users dependent on the water, and a quantification of the dewatering effect on economic (agricultural) activities downstream of the impact area.	<p>Comment noted. As per Condition 6,.1 of Appendix V of the IWUL dated 07 July 2016, "The Licensee must prevent adverse effect on other water users. All complaints must be investigated by a suitable qualified person and if investigations prove that the Licensee has impaired the rights of other water users, the Licensee must initiate suitable compensative measures."</p> <p>All other conditions of the IWUL, dated 07 July 2016 will also be applicable. As per Section 26.9 of the amended EMPR, conditions of the IWUL need to be implemented.</p>	Appendix B
Mr Anthon Benadie	X	2016/07/28	The Johannes Stephanus Trust and I hereby request a response to the aforementioned concerns within five (5) working days in order to have sufficient time to	Please note that the comment period for the proposed amendment to the Environmental Management Programme (EMPR) and submission of the Section 102 for the inclusion of Zandvoort into the Pembani Colliery's existing Mining Right	Appendix B

Interested and Affected Parties	Consulted	Date	Issues Raised	Response to Issue	Reference in this Report
			consider the response and if required, to lodge further objections should the need arise.	closed on 01 August 2016. However, in an effort to accommodate you, EIMS will extend the comment period for you, until close of business on Wednesday 10th August 2016.	
Mr Anthon Benadie	X	2016/07/28	I wish to specifically record that I reserve my right to elaborate on the nature and scope of my objection receipt of any response and or further documentation in respect of the proposed amendment to the EMPR.	As indicated above, EIMS will extend the comment period for you, for a further week, until close of business on Friday 12th August 2016.	Appendix B
Mr Anthon Benadie	X	2016/08/10	<p>With regards to our telephone conversation earlier today, I would like to confirm that EIMS will extend the comment period (amendment of EMPR) till Friday 19th August 2016.</p> <p>Could EIMS provide me with the following documents / proof.</p> <ol style="list-style-type: none"> 1. The new authorised (updated) Water Use Licence. 2. Proof of consent for the WUL from the landowner (Zandvoort 10IT Portion 1 and Zandvoort 10IT Remaining Extent) 	Please be advised that EIMS will extend the comment period for the amended EMPR to Wednesday, 17 August 2016, as EIMS had originally provided a comment period of 45 days, from 15 June 2016 until 01 August 2016, which has already been extended once to 12 August 2016. Please note that all your comments pertaining to the S102 application and amended EMPR must be received no later than close of business on the 17th August 2016.	Appendix B

Interested and Affected Parties	Consulted	Date	Issues Raised	Response to Issue	Reference in this Report
			<p>according to the National Water Act 36 of 1998 clause 24.</p> <p>3. Proof of the new Prospecting Right Application (Invoice number, file reference, time and date).</p>	<p>Please also receive attached to this email the following requested information i.e.:</p> <p>The Updated Water Use Licence (WUL), dated 07 July 2016 (Licence No. 05/X11B/ACGIJ/4704).</p> <p>Proof of the application for the prospecting right submitted to the Department of Mineral Resources.</p> <p>Regarding the proof of landowner consent, and any other supporting documentation that was submitted to the DWS in support of the water use licence, we would request that you direct this enquiry directly to Pembani. EIMS was not involved in the compilation and submission of the Water Use licence and does not have copies of this information. We will also submit your request for such directly to the mine for consideration.</p>	
Mr Anthon Benadie	X	2016/08/10	Mr. Benadie would like to enquire whether a public participation process will follow for the proposed Basic Assessment process for the Prospecting Right	EIMS thanked Mr. Benadie for the email and advised that he must note that with regards to the Section 102 Application and the EMPR amendment, EIMS will	Appendix B

Interested and Affected Parties	Consulted	Date	Issues Raised	Response to Issue	Reference in this Report
			<p>and Environmental Authorisation Application.</p> <p>Please provide me with the Public meeting schedules and register me as an affected party for input and objections.</p>	<p>include all correspondence with Interested and Affected Parties (I&APs) in Section 5.3 under “Summary of issues raised by I&APs” of the Final EMPR. All issues and concerns that have been sent through to EIMS will also be included in the Issues and Response Report, which will be included as part of an Appendix of the Final EMPR that will be submitted to the DMR.</p> <p>Regarding the pending Basic Assessment process for the Prospecting Right and Environmental Authorisation Application, EIMS will register you as an I&AP and notify you of the consultation process in due course.</p>	
Mr Anthon Benadie	X	2016-11-18	Mr Benadie requested the updated MWP, as well as the mining works programme previously submitted with the Mining Right Application.	<p>EIMS sent Mr Benadie the following:</p> <p>As requested, please find herewith attached the current proposed future and underground mining plan, which forms part of the Section 102 application (titled “Mine Plan for Section 102</p>	Sections 2 and 3.

Interested and Affected Parties	Consulted	Date	Issues Raised	Response to Issue	Reference in this Report
				<p>application”) submitted to the Department of Mineral Resources (DMR).</p> <p>The Pembani Coal Water Management Plan that was included in the 2015 Integrated Water and Waste Management Plan (IWWMP) and approved as part of the Integrated Water Use Licence (IWUL) in July 2016, is also included.</p>	
Lawful Occupier/s					
Mr. Johan Bensch	x	2016-07-30	<p>Mr. Bensch sent an email in Afrikaans advising that he is renting land on Zandvoort from the Fanie Davel Trust. He would like to know what happens if there is a shortage of water due to underground mining. Will Pembani supply him with water as they are dependent on water from the fountain. He would also like to ensure that the fences on the</p>	<p>EIMS thank Mr Bensch for the email that he sent to EIMS and his concerns regarding a possible shortage of water, maintenance of fences and firebreaks on Zandvoort.</p> <p>EIMS advised Mr. bensch that he should please note that the amended Environmental Management Programme Report (EMPR), which will be submitted to the Department of Mineral Resources (DMR) for adjudication, does include a</p>	Appendix B

Interested and Affected Parties	Consulted	Date	Issues Raised	Response to Issue	Reference in this Report
			<p>mine boundary are maintained and that firebreaks are made in order to prevent fires. He is prepared to work with the mine and has a rental contract for five years with the option of extending this for another five years.</p>	<p>discussion of fire and firebreaks, including proposed fire prevention measures to be implemented in consultation with adjacent landowners, under Section 31.2.1.1. Furthermore, all correspondence with Interested and Affected Parties (I&APs), such as yourself, will be included in Section 5.3 under “Summary of issues raised by I&APs” of the Final EMPR. All issues and concerns that have been sent through to EIMS will also be included in the Issues and Response Report (IRR) that will be included as part of an Appendix of the Final EMPR that will be submitted to the DMR.</p> <p>Pembani Colliery has also been issued with an updated Integrated Water Use Licence (IWUL), dated 07 July 2016. According to Appendix 2 Point 1.3 and Appendix 5 Point 1.3 of the IWUL, the licensee shall provide any water user with potable water whose water supply is impacted. Section 26.9 of the amended EMPR refers that the conditions of the IWUL need to be implemented.</p>	

Interested and Affected Parties	Consulted	Date	Issues Raised	Response to Issue	Reference in this Report
				<p>With regards to your concern regarding the fences, EIMS will bring this to the attention of the mine and if possible provide you with a contact person at Pembani Colliery. Again please note that all of this correspondence is included in the amended EMPR, as well as the IRR.</p>	
Mr. HP Visagie	x	2016/08/01	<p>Mr. Visagie rents the croplands on the farm Zandvoort 10IT. He does not have objections to the proposed coal mining at Zandvoort, but would like to bring it to the attention that fly rock during blasting may make it difficult to harvest the soya as any stones can damage the harvester and no can also result in loss due to small stones occurring in the soya, which can then not be sold. He trusts that the mine will work with him regarding this matter.</p>	<p>Thank you for sending through the email raising your concerns with regards to the possibility of rocks falling into the croplands during blasting activities, which may result in damage to the harvester, as well as stones coming in the soya harvest. Please note that the amended Environmental Management Programme Report (EMPR) addresses fly rocks and mitigation types in Section 7 of the report, while Section 26 of the amended EMPR includes the Environmental Management System that needs to be implemented with regards to blasting and fly rocks. EIMS included these extractions from the amended EMPR.</p>	Appendix B

Interested and Affected Parties	Consulted	Date	Issues Raised	Response to Issue	Reference in this Report
				Furthermore, all correspondence with Interested and Affected Parties (I&APs), such as yourself, will be included in Section 5.3 under “Summary of issues raised by I&APs” of the Final EMPR. All issues and concerns that have been sent through to EIMS will also be included in the Issues and Response Report (IRR) that will be included as part of an Appendix of the Final EMPR that will be submitted to the DMR.	
Mr Garry van Rensburg	X	2016-11-21	Mr van Rensburg requested the following information: 1. An approved Mine Work Programme (The plan) showing the exact mining operations with clean and dirty water systems, mine dump placements on Groenvlei 7 and 8. 2. The New Mine Work Programme (The Plan) containing all the above information for which	EIMS thanked Mr. van Rensburg for his email and attached the previous mine plan (titled “Plan 2 Land Tenure”) indicating the mining operations for Pembani Colliery, as well as the current proposed future and underground mining plan, which will form part of the Section 102 application (titled “Mine Plan for Section 102 application”) to still be submitted	Sections 2 and 3.

Interested and Affected Parties	Consulted	Date	Issues Raised	Response to Issue	Reference in this Report
			you are doing application for the 102 for Groenvlei 7and8.	to the Department of Mineral Resources (DMR). The Pembani Coal Water Management Plan that was included in the 2015 Integrated Water and Waste Management Plan (IWWMP) and approved as part of the Integrated Water Use Licence (IWUL) in July 2016, is also included.	
Adjacent Landowners					
Ms. Marietha Prinsloo	x	2016-07-30	Ms. Prinsloo from MJ Pieterse Trust Farms on Portion 5 of Twyfelaar 11IT. Her property is close to Zandvoort. She is worried that if Pembani Colliery mines on Zandvoort that she will have more damage to the buildings on her property. The house and outer buildings have already been damaged due to mining activities on Twyfelaar and Paardeplaats. She is also worried about the water. At Twyfelaar there is a big hole filled with acid water to which nothing is done. Pembani has	Thank you for the email that was sent to EIMS regarding your concerns of the proposed mining at Zandvoort and the impact of the blasting on your property located on Portion 5 of the farm Twyfelaar 11IT. Please provide EIMS with the details of the inspection, names of the people and date, that was conducted on your house previously, as well as any other relevant information at your earliest convenience, so that EIMS can correspond with the mine regarding this matter.	Appendix B

Interested and Affected Parties	Consulted	Date	Issues Raised	Response to Issue	Reference in this Report
			<p>ceased work at the mine. What will happen now. The rainy season is on its way. The Tyfelaar mine has been open for years now and where Pembani has finished mining no thing has been rehabilitated. Now they want to open another mine without completing the previous one.</p> <p>Pembani, when it was still known as Worldwide Coal, hired professional people to conduct a survey and inspection of Ms. Pieterse's house. Pembani Colliery should still have the photos and the report. This should be suitable to use as evidence for the damage done to the property by the mining operations. Walls have big cracks and the windowframes are cracks.</p> <p>Ms. Pieterse would just like to protect her property. When Pembani has finished mining one day she may sit without good drinking water and a broken house.</p>	<p>The amended Environmental Management Programme Report (EMPR), which will be submitted to the Department of Mineral Resources (DMR) for adjudication, does include mitigation measures for blasting. Please refer to Section 5.8.19 of the amended EMPR for the mitigation measures included. Furthermore, all correspondence with Interested and Affected Parties (I&APs), such as yourself, will be included in Section 5.3 under "Summary of issues raised by I&APs" of the Final EMPR. All issues and concerns that have been sent through to EIMS will also be included in the Issues and Response Report that will be included as part of an Appendix of the Final EMPR that will be submitted to the DMR.</p> <p>Please note that the amended EMPR does provide for rehabilitation. Please refer to Section 27.3 and Figure 70 of the amended EMPR, which refers to the rehabilitation plan that</p>	

Interested and Affected Parties	Consulted	Date	Issues Raised	Response to Issue	Reference in this Report
				Pembani Colliery should be implementing. The DMR is responsible for enforcing the mines environmental obligations and your concerns will be included in the submission that EIMS will make to the DMR. The amended EMPR also deals with Acid Mine Drainage under Section 26.3 to Section 26.6, as well as in the table under Section 26.9.	
Mr. Basson	X	2016-06-27	Mr. Basson referred to the letter he received in the post and wanted to confirm that it was not his property that was affected by the proposed Zanvoort project and wanted to know if EIMS is independent.	EIMS thanked Mr. Basson for the telephone call and advised that the project was for the proposed inclusion of Portions 1 and RE of the farm Zandvoort 10 IT into the existing Mining Right of Pembani Colliery. EIMS confirmed that EIMS was working as an independent EAP.	Appendix B
Mr. Pieter Hanekom	x	2016-07-08	Mr. Hanekom referred to the Site Notice placed outside his farm. Mr. Hanekom wanted to confirm where the development was taking place.	EIMS thanked Mr. Hanekom for the telephone call and advised that the site notice was for inclusion of Portions 1 and RE of	Appendix B

Interested and Affected Parties	Consulted	Date	Issues Raised	Response to Issue	Reference in this Report
				the farm Zandvoort 10 IT into the existing Mining Right of Pembani Colliery.	
Mrs Marianne Greyling	x	2016-07-14	Mrs Greyling wanted confirmation of the email address.	EIMS thanked Mrs. Greyling for the telephone call and confirmed the email address for the project to be pembani@eims.co.za and provided an alternative email.	Appendix B
Mrs Marianne / Mr. Lourens Greyling	x	2016-07-18	<p>Mr and Mrs Greyling sent an email regarding the damage done to some of the buildings on their farm during the mining activities of Pembani Colliery on the farms Zandvoort and Paardeplaats, lately.</p> <p>Stone buildings were erected to provide accommodation for hikers as early as 1991 together with existing dairy buildings, erected in 1954. Some of the buildings date from the previous century and are of historical importance.</p> <p>None of these buildings have ever shown signs of structural deterioration up to the stage when Pembani started mining in</p>	<p>EIMS thanked Mr and Mrs Greyling for their emails that they have sent with regards to the blasting at Pembani Colliery for the underground mining of coal and the impact of this on the camping site on your property, Twyfelaar 11 IT, part of Portion 5 and Portion 6. EIMS requested that they provide the name of the person that they previously contacted at Pembani Colliery and the date, as well as any other relevant information at their earliest convenience, so that EIMS can correspond with the mine regarding this matter.</p> <p>EIMS advised Mr and Mrs Greyling that the amended EMPR, which will be submitted to</p>	Appendix B

Interested and Affected Parties	Consulted	Date	Issues Raised	Response to Issue	Reference in this Report
			<p>the area at a distance of about 2km as the crow flies.</p> <p>The buildings are constructed on a diabase outcrop, which Mr Greyling believes, carry the shockwaves of blasting over a distance. The farmhouse which is a distance away from the outcrop is probably cushioned by weathered rock material consisting of mainly weathered diabase and shale and has up to now only shown a very small crack in one of the walls.</p> <p>The other buildings have large cracks running from top to bottom and after some of the blasts pieces of plaster can be found on the floors and enlargement of the cracks can be seen.</p> <p>Photos were also attached to the email.</p> <p>Mr Greyling thus objects to the proposed continuation of mining activities as it is causing harm to the environment.</p>	<p>the Department of Mineral Resources (DMR) for adjudication, does include mitigation measures for blasting, and referred them to Section 5.8.19 of the amended EMPR for the mitigation measures included. Furthermore, EIMS advised them that all correspondence with Interested and Affected Parties (I&APs), will be included in Section 5.3 under “Summary of issues raised by I&APs” of the Final EMPR. All issues and concerns that have been sent through to EIMS will also be included in the Issues and Response Report that will be included as part of an Appendix of the Final EMPR that will be submitted to the DMR.</p> <p>The amended EMPR does provide for rehabilitation. Please refer to Section 27.3 and Figure 70 of the amended EMPR, which refers to the rehabilitation plan that Pembani Colliery should be implementing.</p> <p>Pembani Colliery falls under the DMR situated in eMalahleni. The</p>	

Interested and Affected Parties	Consulted	Date	Issues Raised	Response to Issue	Reference in this Report
				Regional Manager is Mr. Sam Mathavhela, who can be contacted on 013- 653 0500.	
Ms. Marietha Prinsloo	x	2016-07-30	<p>Ms. Prinsloo from MJ Pieterse Trust Farms on Portion 5 of Twyfelaar 11IT. Her property is close to Zandvoort. She is worried that if Pembani Colliery mines on Zandvoort that she will have more damage to the buildings on her property. The house and outer buildings have already been damaged due to mining activities on Twyfelaar and Paardeplaats. She is also worried about the water. At Twyfelaar there us a big hole filled with acid water to which nothing is done. Pembani has ceased work at the mine. What will happen now. The rainy season is on its way. The Tyfelaar mine has been open for years now and where Pembani has finished mining no thing has been rehabilitated. Now they want to open another mine without completing the previous one.</p> <p>Pembani, when it was still known as Worldwide Coal, hired</p>	<p>Thank you for the email that was sent to EIMS regarding your concerns of the proposed mining at Zandvoort and the impact of the blasting on your property located on Portion 5 of the farm Twyfelaar 11IT. Please provide EIMS with the details of the inspection, names of the people and date, that was conducted on your house previously, as well as any other relevant information at your earliest convenience, so that EIMS can correspond with the mine regarding this matter.</p> <p>The amended Environmental Management Programme Report (EMPR), which will be submitted to the Department of Mineral Resources (DMR) for adjudication, does include mitigation measures for blasting. Please refer to Section 5.8.19 of the amended EMPR for the mitigation measures included. Furthermore, all correspondence with Interested and Affected Parties (I&APs),</p>	Appendix B

Interested and Affected Parties	Consulted	Date	Issues Raised	Response to Issue	Reference in this Report
			<p>professional people to conduct a survey and inspection of Ms. Pieterse's house. Pembani Colliery should still have the photos and the report. This should be suitable to use as evidence for the damage done to the property by the mining operations. Walls have big cracks and the windowframes are cracks.</p> <p>Ms. Pieterse would just like to protect her property. When Pembani has finished mining one day she may sit without good drinking water and a broken house.</p>	<p>such as yourself, will be included in Section 5.3 under "Summary of issues raised by I&APs" of the Final EMPR. All issues and concerns that have been sent through to EIMS will also be included in the Issues and Response Report that will be included as part of an Appendix of the Final EMPR that will be submitted to the DMR.</p> <p>Please note that the amended EMPR does provide for rehabilitation. Please refer to Section 27.3 and Figure 70 of the amended EMPR, which refers to the rehabilitation plan that Pembani Colliery should be implementing. The DMR is responsible for enforcing the mines environmental obligations and your concerns will be included in the submission that EIMS will make to the DMR. The amended EMPR also deals with Acid Mine Drainage under Section</p>	

Interested and Affected Parties	Consulted	Date	Issues Raised	Response to Issue	Reference in this Report
				26. 3 to Section 26.6, as well as in the table under Section 26.9.	
Mr. JF Goss	x	2016-07-27	<p>Mr Goss is the owner of Portion 12 and 14 and part of Portion 11 of the farm Groenvallei 40 IR. He sent a letter in Afrikaans objecting against any further development from Pembani Coal Carolina until the rehabilitation programme has been completed in totality especially on Groenvallei 40.</p> <p>Mr. Goss would also like to know what the impact of blasting at Zandvoort will be on his house and the outside buildings, as the mining activities have already damaged his house and the outside activities. At the time of his house being damaged he was unfortunately in Mozambique and by the time he had come back his wife had already started with repair work. Mr. Goss submitted a complaint to the manager at that time, Jabo, who sent a consultant to his property to investigate. The wall had not yet been painted and it was clear where the cracks were and the extent of these cracks. The consultant said that as repair work had already been done and</p>	<p>EIMS thanked Mr. Goss for sending through the email regarding the objection of further development by Pembani Coal, Carolina.</p> <p>EIMS advised that the amended Environmental Management Programme Report (EMPR) does provide for rehabilitation. Please refer to Section 27.3 and Figure 70 of the amended EMPR, which refers to the rehabilitation plan that Pembani Colliery should be implementing. The DMR is responsible for enforcing the mines environmental obligations and your concerns will be included in the submission that EIMS will make to the DMR.</p> <p>EIMS requested that Mr Goss provide the date that the consultant was sent to his property to investigate the impact of the blasting on the buildings of your property, as well as any other relevant information that was gathered during the investigation at his earliest convenience, so that EIMS can correspond with</p>	Appendix B

Interested and Affected Parties	Consulted	Date	Issues Raised	Response to Issue	Reference in this Report
			<p>as there are no previous photos of the house, nothing can be done with regards to the complaint. He took various photos in and around the house and recommended that records should be taken of extraordinary vibrations and tremors, and to report this to Jabo, which they did.</p> <p>However, no further investigations have been undertaken with regards to the damage on the house and outside buildings.</p> <p>All the damage is for his own account and he refuses to repeat this.</p>	<p>the mine regarding this matter. The amended EMPR, which will be submitted to the Department of Mineral Resources (DMR) for adjudication, does include mitigation measures for blasting. Please refer to Section 5.8.19 of the amended EMPR for the mitigation measures included. Furthermore, all correspondence with Interested and Affected Parties (I&APs), such as yourself, will be included in Section 5.3 under “Summary of issues raised by I&APs” of the Final EMPR. All issues and concerns that have been sent through to EIMS will also be included in the Issues and Response Report that will be included as part of an Appendix of the Final EMPR that will be submitted to the DMR.</p> <p>EIMS advised that should Mr. Goss require the email to be translated into Afrikaans, to please contact EIMS.</p> <p>Any further queries, comments or concerns could be sent through to EIMS.</p>	

Interested and Affected Parties	Consulted	Date	Issues Raised	Response to Issue	Reference in this Report
Mr. Garry van Rensburg	x	2016/08/01	<p>Mr Garry van Rensburg sent an email in Afrikaans objecting to the Section 102 Application that Pembani has submitted as:</p> <p>Pembani does not follow through with agreements made with the landowners,</p> <p>Do not respect the National Water Act.</p> <p>Pembani is currently polluting a wetland.</p> <p>Rehabilitaton is not high on their agenda.</p> <p>Incompetent management digs holes for which there is no money to close up.</p>	<p>Thank you for sending through your objections with regards to the proposed inclusion of Zandvoort into the Mining Right of Pembani Colliery to EIMS.</p> <p>Please note that the amended Environmental Management Programme Report (EMPR) recommends that a grievance mechanism shall be developed by Pembani Colliery and be implemented (Refer to Section 30.1.2) and that the mine needs to address these grievances and adjust the management programme accordingly (Refer to Section 29.9) of the amended EMPR.</p> <p>Pembani Colliery has also been issued with an updated Integrated Water Use Licence (IWUL), dated 07 July 2016. Appendix 1 Point 2 of the IWUL indicates that “the responsibility of complying with the provision of the licence is vested in the Licensee and not any other person or body.” Furthermore, Appendix 1 Point 14 of the IWUL states that “any incident that caused or may cause water pollution must be reported to the Chief Executive</p>	Appendix B

Interested and Affected Parties	Consulted	Date	Issues Raised	Response to Issue	Reference in this Report
				Officer or his/her designated representative within 24 hours.” According to Section 26.9 of the amended EMPR refers that the conditions of the IWUL need to be implemented. Pambeni Colliery must, therefore, comply to the conditions set out	
Mr. Jan Goss	x	2016/08/11	Mr. van Goss advised that they have gone through all of their correspondence regarding the blasting, and have to accept that everything was discussed verbally with the former manager, Jabo Radebe and the consultant. They did attach notes (attached in Annexure F to this IRR report) on which severe vibrations have been noted. Mr Goss did not receive any written comments from the consultant. In the meantime, Mr Goss has decided not to go ahead with renovations, expecting further damage and the cracks in the house which were repaired are clearly visible. The one wall of the workshop was cracked vertically from top to bottom, which Mr Goss has not attempted to repair. One wall of the garaged cracked at the joint at the one corner and eventually	EIMS thanked Mr Goss for sending through the notes regarding the mine blasting that were noted in 2014. EIMS will correspond with the mine regarding the blasting. Furthermore, EIMS will include all comments and issues in Section 5.3 under “Summary of issues raised by I&APs” of the Final EMPR. All issues and concerns that have been sent through to EIMS will also be included in the Issues and Response Report that will be included as part of an Appendix of the Final EMPR that will be submitted to the DMR.	Appendix B

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			collapsed, which had to be rebuild. The debris is still lying next to the building. It was obvious that immediately after submitting his complaints to Jabo, the severity of the blastings decreased considerably.		
Municipal Councillor					
Municipal Councillors have been consulted. No comments received to date.					
Municipality					
Municipality has been consulted. No comments received to date.					
Organs of State (i.e. roads department, Eskom, Telkom)					
Organs of state have been consulted. No comments received to date.					
Communities					
No comments received to date.					
Department of Land Affairs					
Department has been consulted. No comments received to date.					
Traditional Leaders					

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No traditional leaders have been identified within the proposed project area.					
Department of Environmental Affairs					
Department has been consulted. No comments received to date.					
Other Competent Authorities					
Competent Authorities have been consulted. No comments received to date.					
Other Affected Parties					
Mrs Liefie Grobler	2016-12-01	X	Mrs Grobler said that she lived in one of the railway houses in the industrial area of Carolina, on the corner of Asbes and Fabriek streets. Two years ago, the house was painted and cracks were filled. Since, Pembani Colliery started blasting, cracks have appeared in the walls of the house and she can feel the vibrations of the blasting, which you have marked on a calendar. Two shafts in the vicinity have fallen in, which have	EIMS followed up with an email, summarising what Mrs Grobler had discussed telephonically. EIMS sent the email to the mine, who called Mrs Grobler and advised that Pembani Colliery would pay R80 000 for damages.	Section 10.2.17 and Appendix B

Interested and Affected Parties	Consulted	Date	Issues Raised	Response to Issue	Reference in this Report
			<p>been marked off by red tape and recently a sinkhole has also appeared across the road from where you live.</p> <p>She and her husband have spoken to the previous mine manager and to the current mine manager, who advised that Pembani Colliery is not at fault.</p>		
Interested Parties					
Mr. Koos Pretorius	X	2015-08-06	<p>Mr Pretorius sent an email to EIMS on behalf of the Mr. Anthon Benadie and the Federation for a Sustainable Environment. Information was required such as the mining right, mining works programme, a copy of all adverts and notices, specialist reports (see letter attached in Annexure F of the IRR for full details), details regarding the consultation process.</p>	<p>EIMS thanked Mr. Pretorius for the correspondence and advised that the information request would be sent to Pembani. EIMS advised that the public participation process for the Pembani Section 102 Application has not yet formally commenced. The FSE has been registered for the project as an I&AP and EIMS will notify at such time as the Public Participation Process officially commences.</p>	Appendix B

Interested and Affected Parties	Consulted	Date	Issues Raised	Response to Issue	Reference in this Report
Mr. Koos Pretorius	X	2015-11-06	Mr. Pretorius said that he would like some clarity on the process. There is a s102 application pending. The docs EIMS sent are however of the approved EMPR and other documents. There is no new draft application that was made available. Do I have these facts correct?	EIMS advised that Pembani has submitted a Section 102 application to the DMR. Pembani and EIMS are currently awaiting a decision from the authority which will have an impact on the process to be followed and the content of any reports. As such, no further information is currently available. Once a decision is made by the DMR outlining what is required, all relevant information will be provided to you.	Appendix B
Mr. Koos Pretorius	X	2015-12-28	Mr. Pretorius thanked EIMS for the call to clarify matters. My understanding is now as follows: 1. An application, in the form of motivational letter as required by the DMR was lodged on the 1st of October together with the 2006 empr and other docs. 2. No response has been forthcoming from the DMR.	EIMS advised that Mr. Pretorius understanding of the current status of the Section 102 process is correct. His concerns regarding the location of the opencast mining area has been passed on to the mine for comment. EIMS has uploaded the 2015 Zandvoort environmental specialist studies and the latest wetland delineation and geohydrological study for the Pembani Colliery to Google Drive and have shared the link with him.	Appendix B

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			<p>3. 3 new studies have been completed – soil, heritage and ecology.</p> <p>4. Nothing further is going to happen until such time as the DMR Witbank comes back to you with instructions</p> <p>5. The underground mining operations are not yet underneath Zandvoort and operation will discontinue when the boundary is reached.</p> <p>Please look at EMPR plans 2/4 and 5A. The area where the shaft has been sunk is approved for opencast mining and not underground mining.</p> <p>The monitoring data and audits as per the NEMA, Mining right, Approved EMPR and WUL is available and you will send that to me.</p> <p>The other docs will be sent to me via a google drive link for me to download.</p>	<p>The request for access to the monitoring data has been passed on to the mine and the mine requested that Mr. Pretorius contact them directly regarding this matter.</p>	

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Klagsbrun, Edelstein, Bosman, De Vries INC	x	2016-01-19	<p>A letter was received from D. Jacobs from Klagsbrun Edelstein Bosman De Vries Inc sent on behalf of Mr Anthon Benadie, the beneficiary of the Johannes Stephanus Trust. The letter advise that a Section 102 Application has been lodged with the DMR and the EIMS is the EAP appointed by PCC to deal with the application. The letter referred to the requested documentation and information of the letter sent to EIMS by the FSE and listed the information. Furthermore, the letter refers to the email sent on 2015/11/06 to explain the process of the Section 102 Application and the emails and subsequent responses in November 2015 from Mr Koos Pretorius. The letter stated the requiriements of an EAP as per NEMA and requested the IWUL, monitoring</p>	<p>EIMS thanked D. Jacobs for the letter and advied that PCC has submitted a Section 102 application in terms of the MPRDA (2002) to the Mpumalanga DMR. It is our understanding that this does not constitute an application for amendment of an environmental authorisation in terms of Reguation 31 of the NEMA (1998) 2014 EIA Regulations. As such no formal NEMA Public Participation Process has commenced.</p> <p>To date EIMS has provided all available and reasonable relevant information to both Mr. Benadie and Dr. Pretorius as requested and as such no further information is currently available. At such time as the official public participaton process for the Section 102 and Regulation 31 amendment commences Mr. Benadie and Dr. Pretorius will be officially notified of the proposed project and afforded the</p>	Appendix B

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			information, engineering information, dam designs, quantum of financial provision (for a full request of information, refer to letter attached in Annexure F).	opportunity to participate in the formal Public Participation Process.	
Ms Aldine Armstrong	x	2016-06-24	Ms Armstrong advised that RCL Foods Consumer (Pty) Ltd., was previously known as Rainbow Farms (Pty) Ltd. Ms Armstrong asked that they be registered as an I&AP for the proposed extension of Pembani Coal. Ms Armstrong asked that EIMS sent the co-ordinates of the properties proposed for the extension, preferably on a google earth image as well as the original mining right and environmental authorisation.	EIMS thanked her for the email and advised that the name of the company would be changed accordingly. EIMS sent through the requested information.	Appendix B
Sasol (Mrs Sandra Reyneke)	x	2016-06-27	Mrs Reyneke sent an email advising that one of the Sasol pipelines would be affected by the proposed project and that a	EIMS thanked Sasol for the letter and requested that Sasol send through the co-ordinates of the pipeline. On receiving these, the	Appendix B

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			meeting should be arranged with Sasol prior to the work starting on Zandvoort.	pipeline was plotted on the shapefiles of Pembani Colliery and the plotted map was sent to Sasol	
Mr Koos Pretorius (Federation for a Sustainable Environment)	x	2016-07-04	Mr. Pretorius requested a copy of the Prospecting Right for Zandvoort	EIMS sent through the copy of the Prospecting Right.	Appendix B
Mr Koos Pretorius (Federation for a Sustainable Environment)	x	2016-07-05	The NEMA Regulations require that all specialists include a reasoned opinion as to whether the proposed activity or portions thereof should be authorised. If the opinion is that the proposed activity or portions thereof should be authorised, any avoidance, management and mitigation measures that should be included in the EMPr, and where applicable, the closure plan;	A comprehensive baseline assessment was undertaken during the EIA in support of the Mining Right Application from 2004 – 2006. The specialist studies undertaken for the existing mineral rights pre-date the current NEMA EIA Regulations. It is our understanding that the requirement for all specialists to provide a reasoned opinion was not a requirement at the time that these studies were compiled. Four additional specialist studies were however undertaken in 2015 on the farm Zandvoort in support of the S102 application, namely: Heritage and Palaeontology Assessment; Fauna and Flora Assessment;	Appendix B

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				<p>Soils, Land Use and Land Capability Assessment; and Groundwater Study.</p> <p>As per the Regulations a reasoned opinion, from each of the specialist studies that were compiled and/or updated in support of the Section 102 Application to include Zandvoort, will be obtained and incorporated into the submission to be made to the DMR. The Final EMPR will be made available to you on completion of the document.</p> <p>With reference to the specialist studies listed above, each specialist has, where relevant, provided management and mitigation measures which have consequently been suggested and incorporated into the EMPR.</p>	
Mr Koos Pretorius (Federation for a Sustainable Environment)	x	2016-07-05	The EAP then has to give a reasoned opinion, based on the above, as to whether the proposed activity should or should not be authorised, and if the opinion is that it should be	A reasoned opinion has been provided by the EAP under Section 14 of the EMPR amendment. This opinion is based on all of the information provided by the specialists and	Appendix B

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			authorised, any conditions that should be made in respect of that authorisation based upon the avoidance, management and mitigation measures.	the mine at the time of writing the report. Section 14.2 of the EMPR includes specific conditions that the EAP has recommended to the Competent Authority to include into the Authorisation Letter to make it legally binding to the Applicant.	
Mr Koos Pretorius (Federation for a Sustainable Environment)	x	2016-07-05	Below is a table of the reports attached to the draft EMPr. As can be seen we cannot find compliance with the above requirement. If it is in the documents, please advise as to the page and paragraph numbers where they can be found. (Please refer to letter attached in Annexure F of Appendix D for the table).	Please refer to the response provided with regards to specialist reports above.	Appendix B
Mr Koos Pretorius (Federation for a Sustainable Environment)	x	2016-07-05	In view of the above we submit that there is clear non-compliance with the regulations, yet EIMS as the EAP, is still prepared to reason that the project should go ahead.	Please refer to the response provided above.	Appendix B

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Mr Koos Pretorius (Federation for a Sustainable Environment)	x	2016-07-05	The EAP must have knowledge of the Act as well as the regulations. Both the Act as well as the Regulations require such compliance and the EAP must ensure compliance with the Regulations and the Act. Despite the obvious lack of avoidance and management and mitigation measures, EIMS have expressed an opinion in favour of the project.	EIMS has included management and mitigation measures in the EMPR (refer to Sections 28 and Sections 5.8, 7, 8 and 26).	Appendix B
Mr Koos Pretorius (Federation for a Sustainable Environment)	x	2016-07-05	There is also an obligation on the EAP to ensure that all relevant information is put before the decision maker and that there the EAP has sufficient knowledge to integrate the specialist reports into the EMPr. We refer, as example, to the obvious non compliances at the mine, especially relating to rehabilitation not being done. We had requested access to the audit reports, something we are entitled to in terms of the NEMA regulations. It has not been received. These reports would	It is EIMS's understanding that the relevant information for this S102 Application has been submitted to the relevant competent authority. Pembani Colliery is required to undertake periodic compliance audits of the operations. Such audits must be undertaken and submitted to the relevant Competent Authorities. Enforcement of the requirements of the various permits and authorisations lies with the relevant Competent Authorities. Regulation 34(1) GNR982 requires that a holder of an	Appendix B

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			contain all the relevant and necessary information.	Environmental Authorisation (EA) must ensure compliance with the conditions of an EA and associated EMPR and submit an independent environmental audit report to the competent authority at the intervals indicated in the EA. Further, in accordance with Regulation 34(6) GNR982 the holder of an environmental authorisation must make these audit reports available to anyone on request. It is therefore EIMS's understanding that any Independent Audit Reports compiled in compliance with the requirements of an EA should be made available to the public in accordance with these provisions. This request has been submitted to Pembani Colliery for consideration.	

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Mr Koos Pretorius (Federation for a Sustainable Environment)	x	2016-07-05	We fail to see how the fact that Pembani is not supplying the audit reports should stop the EAP from commenting on the fact that relevant information is not being supplied by Pembani. An opinion should also be expressed as to the impact of this on the process. This was specifically requested and we can find no mention or reference to this in the EMPr.	Please refer to response provided for Item 6 herein. This correspondence will be included in Section 5.3 under “Summary of issues raised by I&APs” for the Final EMPR.	Appendix B
Mr Koos Pretorius (Federation for a Sustainable Environment)	x	2016-07-05	The above puts the independence of EIMS is serious doubt. The fact that Pembani has a proven track record over many years of non-compliance with its previous EMPr overshadows the undertakings in the new EMPr, especially since there are no significant enforceable conditions proposed. Monitoring is not a condition, mitigation measure, avoidance measure or	Section 14.2 of the EMPR includes specific conditions that EIMS has recommended to the Competent Authority to include into any subsequent authorisation to make such legally binding on the Applicant. Furthermore, Table 48 under Section 28 of the amended EMPR includes recommended monitoring procedures that Pembani Colliery should include and the	Appendix B

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			management measure to prevent something from happening that is predicted to happen without any doubt.	timeframes associated with monitoring and auditing reports, as well as the recommended mitigation measures included in the report (Sections 5.8, 7, 8 and 26).	
Mr Koos Pretorius (Federation for a Sustainable Environment)	x	2016-07-05	The fact that there are as many as 6 current decant points, and this was not monitored and measured during the wet season, should raise significant apprehensions and red lights should be flickering. It is merely passed over and not dealt with at all. How is the risk averse and cautious approach implemented in this case?	It is understood that water monitoring is carried out on a quarterly basis (wet and dry seasons) and that this monitoring will include some of the relevant decant positions. Furthermore, the decant positions have also been indicated to the IUCMA at the CMA meeting. The S102 EMPR does make reference to the fact that certain workings are currently decanting. It is further EIMS's understanding that the IWWMP was updated in 2015 for Pembani Colliery, and that the decant points were included in this 2015 IWWMP. The 2015 IWWMP indicated that Pembani Colliery needs to include measures to monitor and to mitigate these. Pembani Colliery is investigating measures to address the decanting points. EIMS is of the understanding that	Appendix B

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				<p>Pembani Colliery has submitted an amended IWULA application to the DWS, which is currently under review by the DWS. It is further understood from the 2015 IWWMP, that Pembani Colliery intends to apply the principles of containing and/or treating the decant.</p> <p>Where relevant the findings and recommendations in the 2015 IWWMP have been incorporated into the S102 EMPR.</p>	
Mr Koos Pretorius (Federation for a Sustainable Environment)	x	2016-07-05	The above speaks specifically to the closure plan which is not compliant with the 2015 Financial provision requirements. The decant, current and predicted, should be quantified and full Financial provision should be made for the mitigation measure. This is not done and no specific measure is even suggested in the report.	In accordance with the Regulation 17(4) of the 2015 Financial Provisions Regulations Pembani Colliery must review and align their current approved financial provision with the provisions of the 2015 Regulations, after the coming into operation of these Regulations, as set out in sub-regulations (5) to (10), and annually thereafter as set out in regulations 9 and 11, read with the necessary changes. Regulation 5 permits a period of 15 months from the date of the Financial Provision Regulations coming into effect (i.e. 20 February 2017) by which the	Appendix B

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				<p>Financial Provisioning and associated documentation must be submitted to the Competent Authority. It is understood that Pembani Colliery must comply with this requirement and timeframe and that the decant (current and future) will be considered in this process.</p> <p>Further the S102 EMPR includes a condition that 'an Integrated Rehabilitation and Closure Plan must be developed by a specialist for implementation within one year of the approval of the EMPR. The Plan shall be viewed as a dynamic document and shall be subjected to independent review on an annual basis along with the quantum for financial provision'.</p>	
Mr Koos Pretorius (Federation for a Sustainable Environment)	x	2016-07-05	It must be admitted that this is difficult to quantify if no mitigations measures are proposed by either the specialist or the EAP and the impact on the sensitive environment is swatted	The amended EMPR does include management and mitigation measures (Refer to Sections 5.8, 7, 8 and 26 of the amended EMPR). The introduction of the amended EMPR, which is referred to in the	Appendix B

Interested and Affected Parties	Consulted	Date	Issues Raised	Response to Issue	Reference in this Report
			<p>away by stating that since this an underground operation no impact on the sensitive environment will occur. The decant already happening and predicted to happen will have a significant impact on the sensitive environment and will require a water treatment plant as per decision of the IUCMA that all mines in this catchment will need a treatment plant. However, the EAP sees no reason to require such a plan or financial provision thereof.</p>	<p>letter, will be amended accordingly in the final EMPR. It is understood that water treatment costs have been included in the latest closure cost assessment done for Pembani Colliery.</p> <p>Please also refer to responses provided above.</p>	
Mr Koos Pretorius (Federation for a Sustainable Environment)	x	2016-07-05	<p>In view of the above we request that EIMS have another good look at the issues we had raised in the process, the documents requested, the quality and content of the documents contained and attached to the EMPr and asses that with the requirements of the</p>	<p>All issues and comments received by the interested and affected parties will be included and addressed in the Final EMPR. This is in line with the requirements of the EAP as per the 2014 NEMA regulations.</p>	Appendix B

Interested and Affected Parties	Consulted	Date	Issues Raised	Response to Issue	Reference in this Report
			EAP as per the NEMA regulations of 2014.		
Mr Koos Pretorius (Federation for a Sustainable Environment)	x	2016-07-05	We ask that we be advised of any such process and the timeframes for the project further on.	Please note that the comment period for the review of the S102 EMPR ends on the 01 August 2016. We will advise all registered I&AP's of any further opportunities for public consultation if applicable.	Appendix B
Mr Koos Pretorius (Federation for a Sustainable Environment)	x	2016-07-05	We will comment in more detail should the EMPR be submitted as is.	Please note that the comment period for the review of the S102 EMPR ends on the 01 August 2016. We will advise all registered I&AP's of any further opportunities for public consultation if applicable.	Appendix B
Mr Koos Pretorius (Federation for a Sustainable Environment)	x	2016-07-06	Mr. Pretorius asked for clarification with regards to the S102: S102 merely states that no amendment may happen without the consent of the Minister. In the Regs (both MPRDA and NEMA) I can find no procedure laid down for how one should go about a	EIMS thanked Mr. Pretorius for advising that the Prospecting Right for Zandvoort 10 IT has lapsed. However, PCC has confirmed that they have submitted the Section 102	Appendix B

Interested and Affected Parties	Consulted	Date	Issues Raised	Response to Issue	Reference in this Report
			<p>“s102” application or what are the requirements to be met in order to grant it. There is procedure on EMPR amendments, S24G, EIA, etc.</p> <p>My question is thus: Is it possible to bring such an application to s102 since the mining right as such will not be evaluated on the new area, but merely the environmental management.</p>	<p>application (before the expiry of the Prospecting Right) in terms of the MPRDA over the same property to consolidate the “right” with the existing PCC Mining Right. PCC has further advised that this Section 102 is already at an advanced stage of processing at the DMR. Furthermore, it is EIMS’ understanding that a new prospecting right application has been submitted over the same property and an Environmental Authorisation Application for the Prospecting Right for Zandvoort 10 IT, which if authorised by the DMR will be subject to a Basic Assessment. As a registered Interested and Affected Party (I&AP) of the current S102 Application, you will be notified of any further developments with regards to this process.</p>	

Interested and Affected Parties	Consulted	Date	Issues Raised	Response to Issue	Reference in this Report
Mr Koos Pretorius (Federation for a Sustainable Environment)	x	2016-08-10	Mr. Pretorius advised that he was waiting for a response with regards to the decision on the updated reports as far as reasoned opinion is concerned for the specialists.	EIMS advised that as indicated in the letter sent to Mr. Pretorius on 29 July 2016, EIMS has requested the specialist studies (i.e. Heritage and Palaeontology Assessment; Fauna and Flora Assessment; Soils, Land Use and Land Capability Assessment; and Groundwater Study) that were compiled and/or updated in support of the Section 102 Application to include Zandvoort to include a reasoned opinion. These will then be incorporated into the amended EMPR to be submitted to the DMR. The Final EMPR will be made available to Mr. Pretorius on completion of the document.	Appendix B

9. ENVIRONMENTAL ATTRIBUTES AND BASELINE ENVIRONMENT

9.1. CULTURAL AND HERITAGE RESOURCES

A heritage study was conducted by professional archaeological consultants in 2004 to identify all heritage sites that occur in the proposed mining areas and document and assess their importance within local, provincial and national context. In 2013, a follow-up archaeological study was undertaken and an additional heritage study was undertaken in 2015 for Zandvoort. As Kwaggafontein was not included in the previous heritage studies, a heritage study will be conducted and the results thereof will be included in the EIR.

Cultural and heritage resources include graves, cemeteries, palaeolithic features and structures that are more than 60 years old. It is of great importance to identify these features prior to the proposed mining activities to ensure that they are correctly protected thereby attempting to prevent disturbance or damage to the features.

The province of Mpumalanga is known to be rich in archaeological sites that tell the story of humans and their predecessors in the region going back some 1.7 million years (Delius and Hay, 2009). The archaeological history of the area can broadly be divided into a Stone Age, Iron Age and Historic Period. Both the Stone and Iron Ages form part of what is referred to as the Pre-Colonial Period (Prehistoric Period) whereas the Historic Period is referred to as the Colonial Period. The archaeological and historical overview of the study area and surrounding landscape is summarised in a chronological order in Table 15 below.

Table 15: Archaeological and Historical Overview of the Study Area and Surrounding Landscape

DATE	DESCRIPTION
2.5 million to 250 000 years ago	<p>The Earlier Stone Age is the first and oldest phase identified in South Africa's archaeological history and comprises two technological phases. The earliest of these is known as Oldowan and is associated with crude flakes and hammer stones. It dates to approximately 2 million years ago. The second technological phase is the Acheulian and comprises more refined and better made stone artefacts such as the cleaver and bifacial hand axe. The Acheulian dates back to approximately 1.5 million years ago.</p> <p>No Early Stone Age sites are known from the study area or direct vicinity. This is more than likely rather due to lack of research focus in this area than an absence of such sites.</p>
250 000 to 40 000 years ago	<p>The Middle Stone Age is the second oldest phase identified in South Africa's archaeological history. This phase is associated with flakes, points and blades manufactured by means of the so-called 'prepared core' technique.</p>

DATE	DESCRIPTION
	No Middle Stone Age sites are known from the study area or direct vicinity. This is more than likely rather due to lack of research focus in this area than an absence of such sites.
40 000 years ago to the historic past	<p>The Later Stone Age is the third archaeological phase identified and is associated with an abundance of very small artefacts known as microliths.</p> <p>Later Stone Age sites, including rock paintings, are known from the farm Groenvlei in localities roughly 5 km east of Carolina (Van Niekerk, 1984) (Bergh, 1999). The farm Groenvlei (or Groenvallei) is located adjacent to and directly south of Zandvoort and within the Pembani Colliery area.</p>
AD 280 – AD 450	The earliest phase in the Iron Age history of Southern African is known as the Early Iron Age. According to the distribution maps published by Huffman (2007) the only possible presence of Early Iron Age sites in the study area and surrounding landscape would be in the form of the so-called Silver Leaves facies of the Kwale Branch of the Urewe Tradition. This facies is dated to between AD 280 and AD 450. The key features on the decorated ceramics of the Silver Leaves facies comprise multiple facets in the first position (Huffman, 2007).
AD 1650 – AD 1840	The second phase in the Iron Age history of the study area and surrounding landscape is in the form of the Marateng facies of the Moloko Branch of the Urewe Tradition. The key features in the decorated ceramics of the Marateng facies are incised arcades on upper shoulder separating black and red (Huffman, 2007).
c. 1800	At the time a group of people known as the Phuthing were living in the wider surroundings of the present study area (Bergh, 1999). According to this author the Phuthing were at the time living in the watershed between the upper reaches of the Vaal and Olifants Rivers.
c. 1821	<p>Across the Highveld this period was characterised by warfare and unrest. Known as the Mfecane, these years of upheaval originated primarily in the migration of three Nguni groups from present day Kwazulu-Natal into the present day Free State, North West, Gauteng and Mpumalanga as a result of the conquests of the Zulu under King Shaka. The three Nguni groups were the Hlubi of Mpangazitha, the Ngwane of Matiwane and the Khumalo Ndebele (Matabele) of Mzilikazi. Only the latter group is of relevance to the present study area and surroundings.</p> <p>The Khumalo Ndebele left present day Kwazulu Natal and moved through the general vicinity of the present study area. In this general area they attacked the Phuthing who fled southward across the Vaal River (Bergh, 1999).</p>
1836 – 1850	Although the first Voortrekker parties started crossing over the Vaal River in 1836, the years 1839 to 1840 saw the first widespread settlement of Voortrekkers north of the Vaal River in

DATE	DESCRIPTION
	<p>an area which encompasses the south-eastern end of the North West Province and the western end of Gauteng. Early towns such as Klerksdorp, Potchefstroom, Rustenburg and Pretoria were all included in this first settlement area. Between 1841 and 1850 an expansion of settlement took place which included present day towns of Bronkhorstspuit in the east, Thabazimbi in the north and Rooigrond in the west (Bergh, 1999).</p>
1845 – 1864	<p>The district of Lydenburg was established in 1845 and the study area fell within this district (Bergh, 1999). It can be expected that the general surroundings of the study area would have increasingly being settled by Voortrekkers after the establishment of this district.</p> <p>The permanent settlement of white farmers in the general vicinity of the study area would have resulted in the proclamation of individual farms and the establishment of permanent farmsteads. Features that can typically be associated with early farming history of the area include farm dwellings, sheds, rectangular stone kraals, canals, farm labourer accommodation and cemeteries.</p> <p>While very few heritage sites associated with the very first establishment of white farmers in the study area would likely still be found, a number of farmsteads dating from the 1880s and 1890s are likely still in existence in the general vicinity of the study area.</p> <p>The other sites often associated with these early farms are graves and cemeteries for both white farmers and black farm labourers. A large number of such cemeteries are located in the general vicinity of the study area.</p>
16 November 1864	<p>The farm Zandvoort was inspected by J. J. H. Steyn (National Archives, RAK, 3082). It is possible that this person was Jacobus Johannes Hercules Steyn (11 June 1837 – 27 August 1893) who appears to have been a resident of the Lydenburg district (see for example www.geni.com) and may have been responsible for the inspection of the farm at a time when it still fell within the Lydenburg district. If this assumption is correct, then Jacobus Johannes Hercules Steyn would in all likelihood have been a veldkornet or commandant.</p> <p>At the time the farm was proclaimed as Zandvoort number 306 of the Lydenburg District (National Archives, RAK, 3082).</p>
3 August 1869	<p>The farm Zandvoort was transferred to its first owner, Gerhardus Theodorus Becking (National Archives, RAK, 3082). While no information is presently known about Mr. Becking, his surname suggests a strong Dutch association or origin. It is therefore quite likely for the farm name Zandvoort to have originated with the property's very first owner.</p>
1872 - 1894	<p>During the early 1870s the general vicinity of Witbank was visited by a geologist from Eastern Europe Woolf Harris. During his visit</p>

DATE	DESCRIPTION
	<p>Harris identified coal in the Van Dyksdrift area. He is also believed to have started the Maggie's Mine the following year. Following on these discoveries and events, a number of small coal mining operations were started in the general vicinity of Witbank as well. By 1889 there were four coal mines in the Witbank area, namely Brugspruit Adit, Maggie's Mine, Steenkoolspruit and Douglas (Falconer, 1990).</p> <p>No coal mines are known from the Carolina area at this early point in time.</p>
10 January 1876	<p>The farm Zandvoort was transferred to James Martin Williams (National Archives, RAK, 3082) roughly six years after the death of its first owner Gerhardus Theodorus Becking in 1870 (National Archives, MHG, 0/19328).</p>
7 February 1876	<p>Less than a month after obtaining the farm, James Martin Williams divided Zandvoort into two portions. One portion was transferred to Frans Coenraad Dekker with another going to Richard Thomas Nicolaas James (National Archives, RAK, 3082). No information could be found on these two individuals.</p>
2 December 1879	<p>The portion of the farm Zandvoort belonging to Frans Coenraad Dekker was transferred to the Lydenburg Branch of the Cape Commercial Bank (National Archives, RAK, 3082).</p>
9 March 1880	<p>The portion of the farm Zandvoort belonging to Richard Thomas Nicolaas James was transferred to William Palfaram (National Archives, RAK, 3082). It would appear that the person referred to here was William Palfaram who had been born in Binkin, North Yorkshire, Great Britain in c. 1924 and died on 4 August 1905 in Pietermaritzburg, Kwazulu Natal (www.geni.com).</p>
7 December 1880	<p>The share of the farm Zandvoort belonging to the Cape Commercial Bank was transferred to Hermann Ludwig Eckstein (3 August 1847 – 16 January 1893) (National Archives, RAK, 3082). Eckstein immigrated to South Africa from Germany in 1882 and became manager of the Phoenix Diamond Mining Company at Du Toit's pan in Kimberly. In 1884 he joined the partnership of Jules Porges and Co which later became known as Wernher, Beit and Co. The company was intensively involved in the Barberton and De Kaap goldfields. In 1888 Eckstein started his own firm namely Hermann Eckstein and Co.</p> <p>It was during this early phase in the existence of Hermann Eckstein and Co. that he acquired the portion of the farm Zandvoort. While it is certain that Eckstein would not have bought the farm with the intention of living there (his business interests were more orientated towards Johannesburg), it may have been acquired for farming purposes or alternatively for coal.</p> <p>Amongst many accomplishments, Eckstein is known to have established the Chamber of Mines in Johannesburg and acted as its president until 1892. He was also one of the leading role</p>

DATE	DESCRIPTION
	<p>players in the mining development of the Witwatersrand and the Transvaal Republic.</p> <p>In 1903, a decade after his death, Eckstein's former partners made a gift to the City of Johannesburg of a portion of land known as the Sachsenwald. This land presently includes Saxonwold, Forest Town, Zoo Lake and the Johannesburg Zoo. At the time, the area which today encompasses the Johannesburg Zoo and Zoo Lake was known as the Hermann Eckstein Park in honour of this historic figure.</p>
26 October 1882	The district of Ermelo was proclaimed (Bergh, 1999). The study area would now fall within this district for the next 11 years.
16 June 1886	The town of Carolina was officially proclaimed on this day (Myburgh, 1956) and was proclaimed on the farms Groenvlei and Goedehoop owned by Cornelius Johannes Coetzee. The name of the town is in honour of Coetzee's wife namely Magdalena Carolina Smit.
4 February 1890	<p>The portion of the farm Zandvoort belonging to W. Palframan was transferred to another well known late nineteenth century Transvaal businessman named Alois Hugo Nellmapius (5 May 1847 – 27 July 1893) (National Archives, RAK, 3082).</p> <p>Nellmapius was born in Budapest, Hungary and after the discovery of gold in the eastern Transvaal Republic gave up a promising career as a civil engineer to follow a path of business and fortune in Africa. He arrived in Pilgrims Rest in 1873 and within a short space of time became successful. At first he ran a successful mule caravan service between the Highveld and Delagoa Bay and also had a successful business of merchant of contraband Portuguese liquor in Pilgrims Rest. However, Nellmapius also had much success in farming and became the owner of large tracks of land, including a farm just south of Pretoria that he named Irene after his daughter (Webster 2002).</p> <p>With time Nellmapius became a friend and confidant of President Paul Kruger and also suggested to Kruger to start implementing concessions. On 3 October 1881 the Republican Volksraad granted Nellmapius the concession for the “...sole right to manufacture from grain, potatoes and other products growable in the Transvaal, with the exception of tree fruits and grapes, and the right to sell in bulk and bottle free of licence such spirits.” (Webster 2002). This concession was granted for a period of fifteen years which made Nellmapius the only legal licensed producer of spirits in the Transvaal. On 17 June 1882 Nellmapius ceded this concession to a partnership consisting of himself, cousins Isaac and Barnard Lewis and Barnard's brother in law, Samuel Marks (Webster 2002). This laid the foundation for the first liquor distillery in the Transvaal Republican known as De Eerste Fabrieken and in June 1883 President Paul Kruger opened the new distillery and christened it 'Volkshoop' (the Nation's Hope) (Webster 2002).</p>

DATE	DESCRIPTION
11 June 1892	Hermann Ludwig Eckstein transferred his portion of Zandvoort to the Transvaal Consolidated Land and Exploration Company Limited (National Archives, RAK, 3082). Incorporated in the 1870s, this company became one of the significant players in the Transvaal Republic as a land company. By the end of the nineteenth century the company owned as many as 656 farms in the Transvaal Republic (Bonner, 2002).
21 December 1893	The district of Carolina was established on this day (Bergh, 1999). The study area now fell within this district. It would remain in this district for at least the next 100 years.
4 November 1895	Alois Hugo Nellmapius transferred his portion of Zandvoort to the Landed Proprietary Company Limited (National Archives, RAK, 3082). Very little information could be found about this company.
31 December 1902	The Landed Proprietary Company Limited transferred their portion of Zandvoort to the Transvaal Consolidated Land and Exploration Company Limited (National Archives, RAK, 3082). According to a file found in the National Archives (LD, 184, AG6377/02) all the farms owned by the Landed Proprietary Company Limited were transferred to the Transvaal Consolidated Land and Exploration Company during the period between 1902 and 1904. When this transfer was completed it meant that for the first time since 7 February 1876 the farm was again owned by a single entity.
1899 - 1902	The South African War wreaked havoc across Southern Africa during this time. Although no record for any battles or skirmishes for the study area and its immediate surroundings could be located, a number of skirmishes and battles did take place in the surrounding landscape. On 14 August 1900 members of the Canadian force known as Stratchcona's Horse were about to occupy Carolina when they were fired upon by 14 Boers under the command of General Tobias Smuts. The skirmish took place in Dorp Street (Van der Westhuizen and Van der Westhuizen 2000) and the scene of the skirmish is located roughly 4 km south west of Zandvoort. Furthermore, on 7 November 1900, a battle took place at Leliefontein (the battle is also referred to as Witkloof). The farm Leliefontein is located roughly 10 km west by northwest of the present study area. Two senior Boer commanders at the battle, namely General Joachim Fourie and Commandant Hendrik Prinsloo were killed in a fatal frontal attack on a strong British position. Twenty-seven years after the battle, on 7 November 1927, General Smith-Dorrien, the British commander at the battle, erected a memorial on the battlefield in honour of Fourie and Prinsloo. The memorial was designed and built with funds raised from the public in Great Britain (Van der Westhuizen and Van der Westhuizen 2000).

A study was conducted by professional archaeological consultants in 2004 to identify all heritage sites which occur in the proposed mining areas and document and assess their importance within local, provincial and national context. During the survey, twenty-four sites of importance were found along the

proposed opencast mining area (Refer to Heritage Study attached in Appendix E). In 2013, a follow-up archaeological study was undertaken and identified six archaeological features, two of which were previously identified in 2004. An additional heritage study was undertaken in 2015 for Zandvoort. Each of the identified archaeological sites is described in detail below.

9.1.1. PALEONTOLOGY

A palaeontology study was undertaken for Zandvoort in 2015. The site is underlain by Carboniferous to Permian aged tillite of the Dwyka Group, Permian aged sandstone and shale, with coal beds of the Vryheid Formation, Ecca Group and Jurassic aged Dolerite of the Karoo Supergroup.

Due to the igneous nature of the rock, dolerite will contain no fossils; however, the Vryheid Formation is well known for the occurrence of coal beds that resulted from the accumulation of plant material over long periods of time. According to Bamford (2011), little data has been published on these potentially fossiliferous deposits.

The potential to find well preserved plant fossil material can differ from place to place. These are however more likely to be found around the coal bearing strata than elsewhere. When they do occur fossil plants are usually abundant and it would not be feasible to preserve and maintain all the sites. With regards to animal fossils, the late Carboniferous to early Jurassic Karoo Supergroup sediments of South Africa are almost entirely lacking in complete fossils. Trace fossils (ichnofossils) are however abundant in the area surrounding the site.

9.1.2. RESULTS

9.1.2.1. HERITAGE ASSESSMENTS

Twenty-four (24) heritage features were identified during the 2004 heritage assessment. These comprise twelve (12) potential cemeteries and grave sites, five (5) historical farmsteads, and seven (7) historical structures. Several of these heritage features were noted to fall within the proposed development footprints. A verification of the previously undertaken mining activities and the locations of these heritage features must be conducted in order to verify whether any of the identified heritage features have been disturbed by mining activities. An additional six (6) cemeteries and grave sites were assessed during the 2013 heritage assessment, two of which had been previously identified during the 2004 assessment.

A heritage assessment was undertaken for Zandvoort in 2015. A total of seven heritage sites were identified during the study, four of which form part of a single farmstead, namely a farm dwelling, rondavel, garage and shed. The three other sites include one cemetery, one possible informal grave and an old farm dipping structure.

All seven identified heritage sites are surface occurrences and as a result the proposed underground mining activities at Zandvoort 10 IT are not expected to have any direct negative impact on any of these seven heritage sites. Such surface impacts are unlikely if mining is undertaken correctly and safely because of the safety factors required.

A full description of the identified heritage features is included in the specialist studies attached in Appendix E, while Figure 21 below indicates the location of the heritage features.

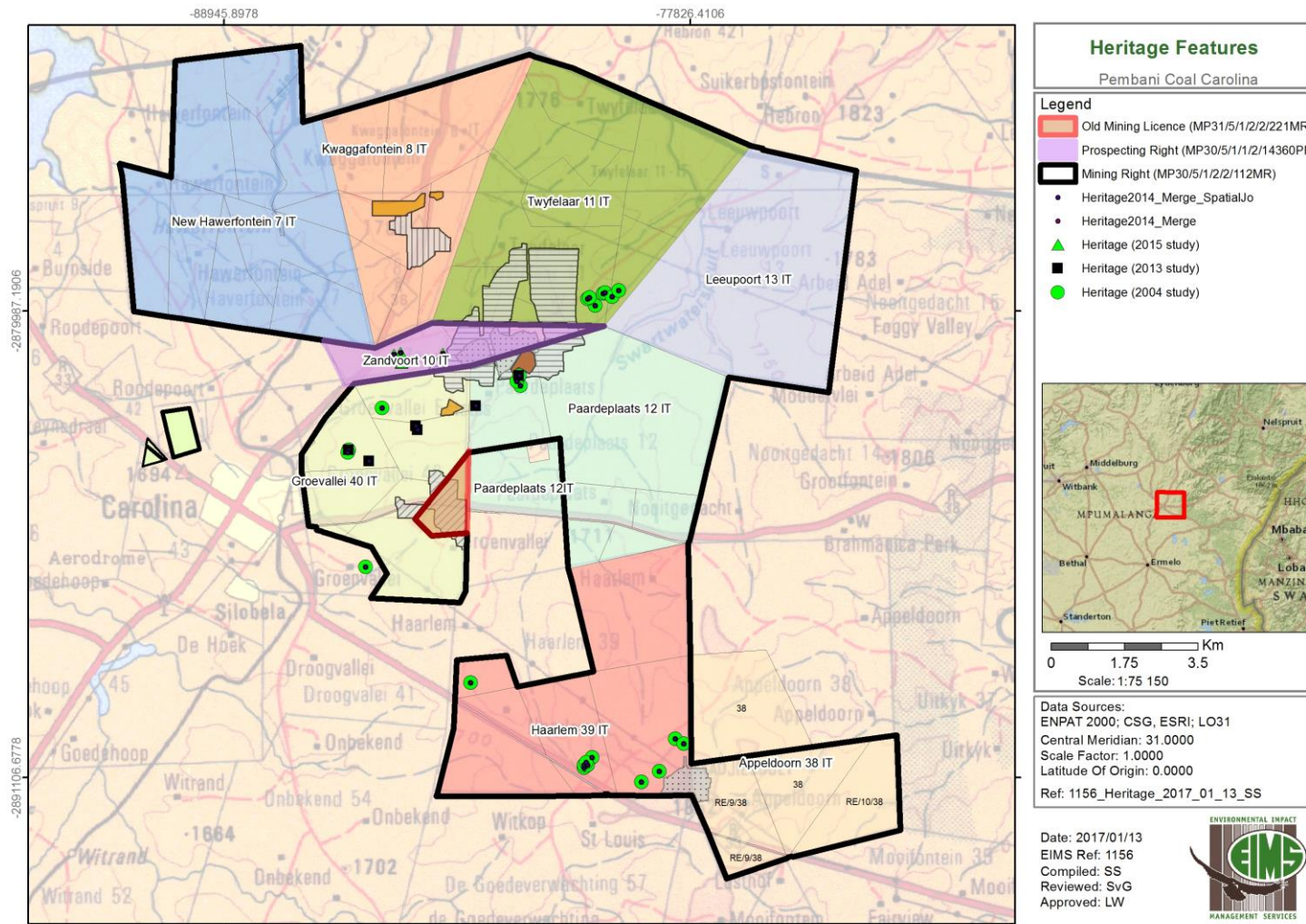


Figure 21: Heritage features

9.2. SOCIO-ECONOMIC

Mpumalanga Province, with Nelspruit as its Capital, occupies 6.5% of South Africa and 3 million (6.9%) of the population resides in this province. Manufacturing industries, mining, power generation industries, tourism, agriculture and forestry are some of the main economical activities in the Mpumalanga area. The GGP in 1993 was around R 28 billion and comprised of 8% of the GGP of South Africa.

The mining area falls specifically within the Albert Luthuli Local Municipality which covers an area of around 5 556.29 km², and is one of seven (7) local municipalities of the Gert Sibande District Municipality in Mpumalanga. The Municipality offices are in Carolina and the main industries include agriculture and mining.

The major economic activities and sources of employment are in the mining and quarrying sector (23.9%), the services sector (23.7%), the manufacturing sector (14.3%) and the agricultural sector (13.9%). In Carolina, the main source of employment is the agricultural sector; however increased mining activities are increasing employment opportunities in this sector. Agriculture/forestry and fishing make up the largest percentage of industries in the municipality (27.05%), followed by community, social and government service industries (22.8%). Mining and quarrying only makes up 3.4%.

About 34.3% of the population falls within the elementary occupation category. Around 11.1% are technicians and 10.2% are occupations related to agriculture and fishery. Plant or machine operators make up 9% of occupations. Within the Albert Luthuli Local Municipality 20% of the population is employed, 22% are unemployed and around 58% are not economically active. About 78% of the population within the Albert Luthuli Local Municipality receive no monthly income, 7% receive between R1 – R400 and 9.3% between R401 – R800. Of the households in the area, around 30% receive no income, 15.4% receive between R1 000 – R4 800 annually, 24.6% receive between R4 801 – 9 600 annually.

The Albert Luthuli Local Municipality provides essential services such as water, sanitation and housing to the local communities, although bulk water supply is still administered largely by DWS. Communities obtain water from community standpipes (29.2%), from flowing waters (8.6%) and dam or pool water (1.7%). No municipal water supply is available within the mine boundary and the immediate surrounding areas.

Many school buildings in the Albert Luthuli Local Municipality area are reported to be in unacceptable condition and there is a shortage of classrooms. The schools also lack essential services such as water and electricity. Access to schools is poor and long distances need to be covered for pupils to get to schools. Of the population over 20 years of age, around 37% have no schooling, 23% have secondary schooling and only 5% have tertiary education.

The Pembani Colliery falls within the Albert Luthuli Local Municipality. The Municipality covers an area of about 5 556.29 km², and together with six other local Municipalities, contributes to the Carolina District Municipality in the Mpumalanga Province. Towns within the Municipality include Badplaas, Carolina, Eerstehoek and Lochiel. The Municipality offices are based in Carolina, the surroundings of which are

predominantly rural. The Municipality is dominated by agricultural (i.e. maize, vegetables, stock farming and timber) and mining industries (coal, lime, granite, iron).

9.2.1. TRANSPORTATION, INFRASTRUCTURE AND TRAFFIC

Current traffic in the area consists of local farmers, motorists and trucks transporting coal from the mines, mostly for Eskom consumption. Private properties are fenced off to the public but secondary roads are accessible to the public. The main access roads to the area are the R33, R36 and R38. These all lead to Carolina and then to neighbouring towns. The roads in Carolina are currently being upgraded in order to handle the large trucks.

9.3. GEOLOGY

The information presented in this section was summarised from the heritage specialist study, which is attached in Appendix E, and the MWP. The stratigraphy and depositional environment in the area is similar to that of the whole of the Eastern Transvaal coal field. The coalfield is underlain by pre-Karoo rocks which were subjected to glaciation that resulted in the deposition of tillite of the Dwyka formation over most of the area.

The Ecca group, which contains the coal-bearing Vryheid formation, rests on the Dwyka formation. The Vryheid formation contains five bituminous coal seams, named E, D, C, B and A (with E being at the bottom and A at the top) which are separated by mainly arenaceous sediments. The Vryheid formation reaches a maximum thickness of 120m. After being deposited, the Ecca sediments were subject to faulting and intrusion by dolerite sills and dykes.

The coal seams are numbered from E seam at the base to A seam at the top of the sequence. The E seam varies in thickness from 0.3 meters to 2.02 meters. This seam is a high quality low ash, low phosphorus highly volatile bituminous coal. Its deposition and lateral extent appears to be determined by palaeotopography. The E seam is overlain by a persistent shale member, followed by sandstones.

The D seam is thin and uneconomic and is made up of four members locally, but usually has two leaves separated by a thin shale parting. The seam, although laterally continuous, seldom exceeds 0,5 m in thickness in total. The D seam is overlain by a sandstone layer followed by a persistent shale layer, followed by further sandstone and another persistent shale layer.

The C seam contains the highest quality of coal but is not well developed in the Carolina area and can be narrow in places. The C seam, which averages 1,8 m in thickness, is usually composed of a C Upper (CU) and C Lower (CL) seam, separated by a parting of variable lithological composition. Locally the CU seam may split into two recognisable zones. It is overlain by a sandstone layer of variable thickness.

The B upper seam is low quality high ash coal. The B seam group is generally represented by two seams, termed the B and the BL1, separated by a sandstone parting. Locally the B seam may include the thin BX seam lying above the B seam. The B seam is overlain by sandstone which in turn is overlain by a persistent shale member. Thereafter there is an alternating sequence of sandstone and shale developments.

The A seam is seldom preserved as it has been removed by recent erosion. It is usually overlain by a glauconitic sandstone layer. The Beaufort group sediments do not occur in this area as they have been removed by erosion.

The Pembani Colliery is situated within the northern part of the Ermelo Coalfield, which forms part of the coal-bearing Vryheid Formation of the Ecca Group. The B Seam and the E Seam are the main economic coal seams present within the mining area and are exploited by means of opencast and underground mining operations. The average depth of the E seam is 53 metres (m) and 27.6 m for the B seam.

9.4. TOPOGRAPHY

The gently undulating highland topography is typical of the central Mpumalanga Province, with fairly broad to narrowly incised valleys of the headwater drainages, with average height of 1600 in the north west and 1 080 metres above sea level in the south. There are a number of marshy areas or vleis in the upper parts of the valleys and numerous pans, which vary from insignificant vegetated depressions to large deeply etched features with bare clayey floors.

The study area stretches over a wide region and comprises of various topographical features. Several watersheds, pans, hills and valleys are incorporated within the mining area. These topographical features also play a role in how the coal is mined in the region.

9.5. CLIMATE

Climate can be defined as weather conditions that have occurred over a long period of time in an area. Dominant climatic features that climate is centred around are temperature, rainfall, wind and evaporation. These climatic features can affect the mining environment in a number of ways:

- Influence erosion;
- Influence vegetation growth, which affects rehabilitation planning;
- System monitoring of ground water balance/availability;
- Evaporation rates influence vegetation growth;
- Air temperature can influence air dispersion through atmospheric stability and mixing layers; and,
- Wind speed and direction can influence erosion and the dispersion of potential atmospheric pollutants.

The area wherein Pembani lies, falls within the central Mpumalanga climatic zone, or the “Highveld” climatic region, which is characterized by warm summers with rainfall and warm (during the day) to cold (at night), dry winters with sharp frosts. A well-formed overland anticyclone high-pressure system in winter maintains dry air over the region and sharp frosts occur.

Table 16 below shows the mean minimum and maximum temperatures for the area. The hottest months are December/January and the coldest June/July.

Table 16: Mean monthly maximum and minimum temperatures and relative humidity

Month	Mean Max (°C)	Mean Min. (°C)	Daily Mean (°C)
January	24.3	13.4	18.9
February	23.7	13.1	18.5
March	23.0	12.0	17.5
April	20.7	8.7	14.7
May	18.9	5.3	12.3
June	16.5	1.8	9.1
July	16.9	2.6	9.8
August	19.1	4.4	11.8
September	22.1	7.3	14.5
October	23.2	9.5	16.6
November	23.2	11.5	17.3
December	23.6	12.2	17.9
ANNUAL AVERAGE	21.3	8.5	14.9

Pembani lies within an area of 700-800 mm mean annual precipitation. Table 17 was the mean monthly and annual rainfall for the area. Rainfall occurs mainly in the form of showers and thunderstorms from October to March with maximum events occurring December to January. The winter months are typically dry with the combined rainfall for June, July and August making up only 3.9% of the annual average total of 744 mm. Rainstorms are often violent with up to 80 mm falling in one day, lightning, and strong winds and at times hail.

Table 17: Mean Monthly and Annual Rainfall for the Site

Month	Mean (mm)	Annual Rainfall %
January	128.51	17.25
February	98.41	13.21
March	80.83	10.85
April	44.33	5.95
May	17.14	2.30
June	8.49	1.14
July	7.3	0.98
August	8.34	1.12
September	30.25	4.06
October	74.95	10.06
November	124.19	16.67
December	121.66	16.33
ANNUAL MEAN	744	100

Table 18 below shows the maximum rainfall intensities per month. The highest rainfall intensities occur in the summer months.

Table 18: Rainfall intensities (in mm)

Month	60 Min (mm)	24 Hours(mm)	24 Hours – 50 Year
January	63.6	74.4	60.2
February	49.8	80.0	57.0
March	26.0	42.0	56.6
April	25.0	48.2	56.9

Month	60 Min (mm)	24 Hours(mm)	24 Hours – 50 Year
May	18.5	22.0	26.6
June	6.4	37.5	14.6
July	7.8	23.4	22.6
August	11.5	17.4	27.2
September	22.0	54.0	61.2
October	22.0	51.5	89.4
November	50.1	53.0	64.6
December	44.0	48.0	68.6

The area is somewhat windier than is typical for the Eastern Mpumalanga Highveld because of its position near the escarpment. Wind speed averages around 3.1 m/s. September to December are the windiest months and average wind gust speed ranges between 12 and 14 m/s. Average wind gust speeds for the remainder of the year range between 10 and 12 m/s. Strong winds come predominantly from the northwest and northeast, however topography does affect wind direction in a specific location. Surface inversions occur during 80% of nights in winter and about 40% of nights in summer to a depth of 100-150 m above the surface. Nocturnal stability regularly occurs close to the ground causing stagnation and slow catabolic drift, particularly in winter.

Table 19 below shows the mean monthly evaporation for the area. The trends follow expectation for the Highveld climatic zone with higher evaporation in the summer and lower evaporation in winter. Evaporation is fairly high compared with the other Highveld areas due to windier conditions.

Table 19: Mean average evaporation (in mm)

Mean			
Month	S Pan (%)	S Pan (mm)	Lake Evaporation (mm)
January	11.28	164	138
February	9.67	140	123
March	9.49	138	121
April	7.2	104	92

May	6.28	91	79
June	5.16	75	64
July	5.57	81	67
August	7.05	102	83
September	8.5	123	100
October	9.5	138	112
November	9.48	137	112
December	10.77	156	129
Annual Total	100	1449	1220

9.6. SOILS, LAND USE AND LAND CAPABILITY

The original soil assessment for areas affected by the original mining footprint of the Pembani Colliery was undertaken by Rehab Green Monitoring Consultants cc in 2004. ARC undertook an additional assessment for Zandvoort in 2015 (Appendix G). Seventeen (17) soil units were identified in the 2005 assessment and are summarized in terms of the dominant and sub-dominant soil form and families, average depth, topsoil and sub-soil texture and a description of the dominant soil form horizons in Table 20 below. Six (6) soil units were identified in the 2015 Zandvoort assessment and are assessed in terms of the dominant and sub-dominant soil form and families, average depth, characteristics, and agricultural potential in Table 21 below.

The soils of the mining area were classified according to the Taxonomic System for South Africa (Soil Classification Group, 1991). The soils were investigated using a hand auger on a 150 x 150 m predefined grid. At each observation point, soil physical characteristics such as depth, colour, texture and structure were noted. The study area for the soils was divided into nine areas:

- Portions 6, 7, 8, and 17 of Groenvallei 40 IT;
- Portion RE of Portion 1 of Groenvallei 40 IT;
- Portions 1 and 4 of Haarlem 39 IT;
- Portion 5 of Haarlem 39 IT;
- Portions RE and 4 of Haarlem 39 IT and Portions 3 and 9 of Appeldoorn 38 IT;
- Portions RE and 2 of Paardeplaats 12 IT;
- Portion 8 of Twyfelaar 11 IT;
- Portions 9, and 10 of Twyfelaar 11 IT; and
- Portions RE and 1 of Zandvoort 10 IT.

Although a site specific study has not been completed on Kwaggafontein, it is assumed from the regional soil map (Figure 27) that the soils on Kwaggafontein are not anticipated to be significantly different from other studies and, therefore, the basis and recommendations of the soil studies will also apply on Kwaggafontein.

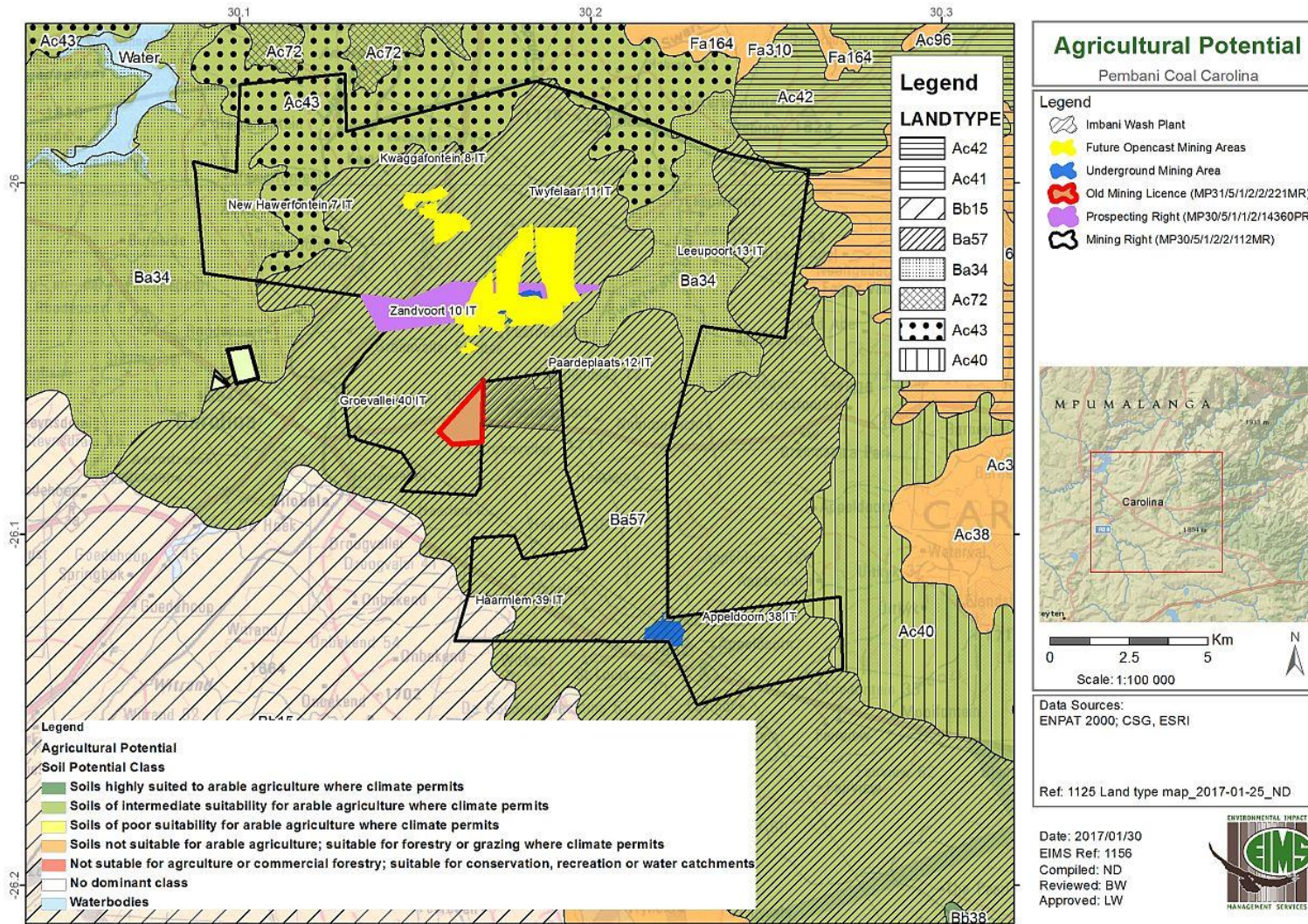


Figure 22: Regional soils and agricultural potential for Pembani

The figures below (Figure 23 to Figure 31) indicate the farms assessed, as well as the main soil types found on these properties).

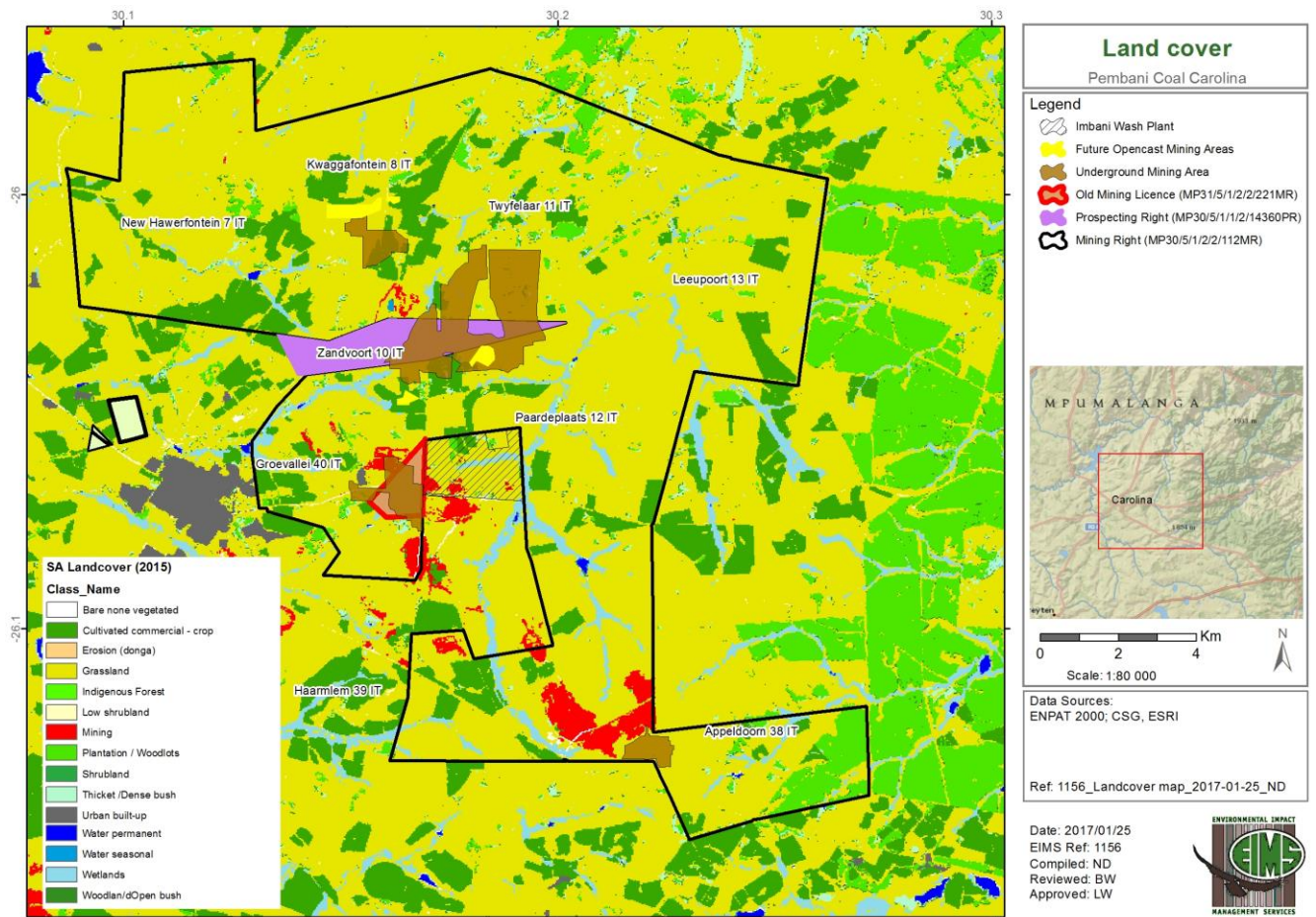


Figure 32 indicates the land cover of the of the areas, including the proposed additional mining areas on portions of the farms Kwaggafontein, Paardeplaats, Twyfelaar, Haarlem, Groenvlei and Appeldoorn, which lie within the existing mining right of Pembani Colliery, as well as the land cover for Zandvoort, which is to be included into the existing mining right.

Table 20: Soil units (2005)

Unit	Dominant Soil Form and Family	Other Forms and Families	Average Depth (mm)	Topsoil Texture	Sub-soil Texture	Summarized Description of Dominant Soil Form
Av	Avalon 1100	Clovelly 1100 Glencoe 1100 Dresden 1000	400-600	Sandy loam	Sandy loam – Sandy clay loam	Shallow; Greyish brown topsoil; Yellowish brown sub-soil on mottled soft plinthite; Structureless; Non-calcareous; Moderate arable potential.
Cv	Clovelly 1100	Avalon 1100 Glencoe 1100	800-1200	Sandy loam	Sandy loam – Sandy clay loam	Moderately deep to deep; Greyish brown topsoil; Yellowish brown sub-soil on weathered rock; Structureless; Non-calcareous; Moderate to high arable potential.
Cv1	Clovelly 1100	Avalon 1100 Glencoe 1100 Dresden 1000	600-900	Sandy loam	Sandy loam – Sandy clay loam	Moderately deep; Greyish brown topsoil; Yellowish brown sub-soil on weathered rock; Structureless; Non-calcareous; Moderate arable potential.
Cv2	Clovelly 1100	Avalon 1100 Glencoe 1100 Dresden 1000	400-600	Sandy loam	Sandy loam – Sandy clay loam	Shallow; Greyish brown topsoil; Yellowish brown sub-soil on weathered rock; Structureless; Noncalcareous; Moderate arable potential.
Dr	Dresden 1000	Wasbank 1000 Dresden 2000 Glencoe 1100	100-300	Sandy loam	-	Very Shallow; Yellowish brown topsoil underlain by hard plinthite; Structureless; Non-calcareous; Low arable potential.

Unit	Dominant Soil Form and Family	Other Forms and Families	Average Depth (mm)	Topsoil Texture	Sub-soil Texture	Summarized Description of Dominant Soil Form
Exc/Dist	Hutton 1100	Glencoe 1100 Dresden 1000 Wasbank 1000	0-800	Sandy loam	Sandy loam – Sandy clay loam	Old mine area, partly excavated and disturbed, partly covered with topsoil stockpiles and mine residue deposits. Usable topsoil at some areas.
Gc	Glencoe 1100	Clovelly 1100 Avalon 1100 Dresden 1000	400-600	Sandy loam	Sandy loam – Sandy clay loam	Shallow; Greyish brown topsoil; Yellowish brown sub-soil on hard plinthite; Structureless; Noncalcareous; Low arable potential.
Gc1	Glencoe 1100	Clovelly 1100 Avalon 1100 Dresden 1000	500-900	Sandy loam	Sandy loam – Sandy clay loam	Moderately deep; Greyish brown topsoil; Yellowish brown sub-soil on hard plinthite; Structureless; Non-calcareous; Moderate arable potential.
Gc2	Glencoe 1100	Clovelly 1100 Avalon 1100 Dresden 1000	300-500	Sandy loam	Sandy loam – Sandy clay loam	Shallow; Greyish brown topsoil; Yellowish brown sub-soil on hard plinthite; Structureless; Non-calcareous; Low arable potential.
Hu	Hutton 2100	Hutton 2200 Dresden 1000	600-900	Sandy loam	Sandy loam – Sandy clay loam	Moderately deep; Reddish brown topsoil; Yellowish red to red sub-soil; Structureless; Noncalcareous; Moderate arable potential.
Hu1	Hutton 1200	Hutton 2200 Dresden 1000	1000-1500	Sandy loam	Sandy loam – Sandy clay loam	Deep; Reddish brown topsoil; Yellowish red to red sub-soil; Structureless; Non-calcareous; High arable potential.

Unit	Dominant Soil Form and Family	Other Forms and Families	Average Depth (mm)	Topsoil Texture	Sub-soil Texture	Summarized Description of Dominant Soil Form
Hu2	Hutton 1200	Hutton 2200 Dresden 1000	300-500	Sandy loam	Sandy loam – Sandy clay loam	Shallow; Reddish brown topsoil; Yellowish red to red sub-soil; Structureless; Non-calcareous; Low arable potential.
Ka	Katspruit 1000	Longlands 1000 Kroonstad 1000 Wasbank 2000	200-400	Sandy clay	Clay	Shallow; Dark greyish brown topsoil underlain by a grayish non-structured to structured clay horizon. No arable potential.
Kd	Kroonstad 1000	Longlands 1000 Katspruit 1000 Wasbank 2000	400-600	Loamy sand	Loamy sand	Shallow; Dark greyish brown topsoil; Bleached greyish brown to light gray sub-soil which overlies a grayish structured clay horizon. Low arable potential.
Lo	Longlands 1000	Wasbank 1000 Dresden 2000 Kroonstad 1000	400-600	Loamy sand	Loamy sand	Shallow; Dark greyish brown topsoil; Bleached greyish sub-soil on mottled soft plinthite; Structureless; Non-calcareous; Low arable potential.
Ms/R	Mispah 1100	Dresden 1000 Clovelly 1100	0-250	Sandy loam	-	Very Shallow; Yellowish brown topsoil underlain by hard rock; Structureless; Non-calcareous; Low arable potential. Rock outcrops also occurs.
Wa	Wasbank 1000	Longlands 1000	500-900	Loamy sand	Loamy sand	Shallow to moderately deep; Greyish brown topsoil, Bleached light grey sub-soil on hard

Unit	Dominant Soil Form and Family	Other Forms and Families	Average Depth (mm)	Topsoil Texture	Sub-soil Texture	Summarized Description of Dominant Soil Form
		Dresden 2000				plinthite; Structureless; Non-calcareous; Low arable potential.

Table 21: 2015 Zandvoort soils

Map unit	Dominant soils	Sub-dominant soils	Depth (mm)	Characteristics	Agric. Potential	Area (ha)
Hu	Hutton	Lichtenburg, Clovelly	600-1200+	Reddish-brown, structureless, sandy loam topsoil on red, structureless to weakly structured, sandy clay loam to clay loam subsoil, on weathering rock, cemented ferricrete greyish (or occasionally on mottled soft plinthite).	Moderate to high	143.7
Av	Avalon	Clovelly, Glencoe, Hutton	600-900	Brown, structureless, loamy sand to sandy loam topsoil on yellow to yellow-brown (occasionally reddish-brown), structureless to weakly structured, loamy sand to sandy loam subsoil, on greyish, mottled soft plinthite (occasionally on cemented ferricrete or weathering rock)	Moderate to high	46.1
Gc	Glencoe	Avalon, Dresden	450-800	Brown, structureless, loamy sand to sandy loam topsoil on yellow to yellow-brown (occasionally greyish-brown), structureless to weakly structured, loamy sand to sandy clay loam subsoil, on cemented ferricrete or greyish, mottled soft plinthite	Low to moderate	150.1
Ms	Mispah	Dresden, Glencoe	50-350	Brown (occasionally reddish-brown), structureless, loamy sand to sandy loam topsoil on cemented ferricrete or weathered rock. Cemented ferricrete and rock outcrops occur in places.	Low	131.1
Lo/W	Longlands	Westleigh, Kroonstad, Katspruit	250-900	Dark greyish-brown to black, structureless to weakly structured, sandy loam to sandy clay loam topsoil on grey, weakly structured, sandy clay loam to sandy clay, mottled subsoil, often wet. Occurs in lower-lying parts and close to stream channels.	Very low	105.5

Pan/W	Katspruit	-	0-50	Surface water in closed pan; dark-brown to black, clay soils with mottled, gleyed subsoil around the pan.	None	13.8
					Total	590.3

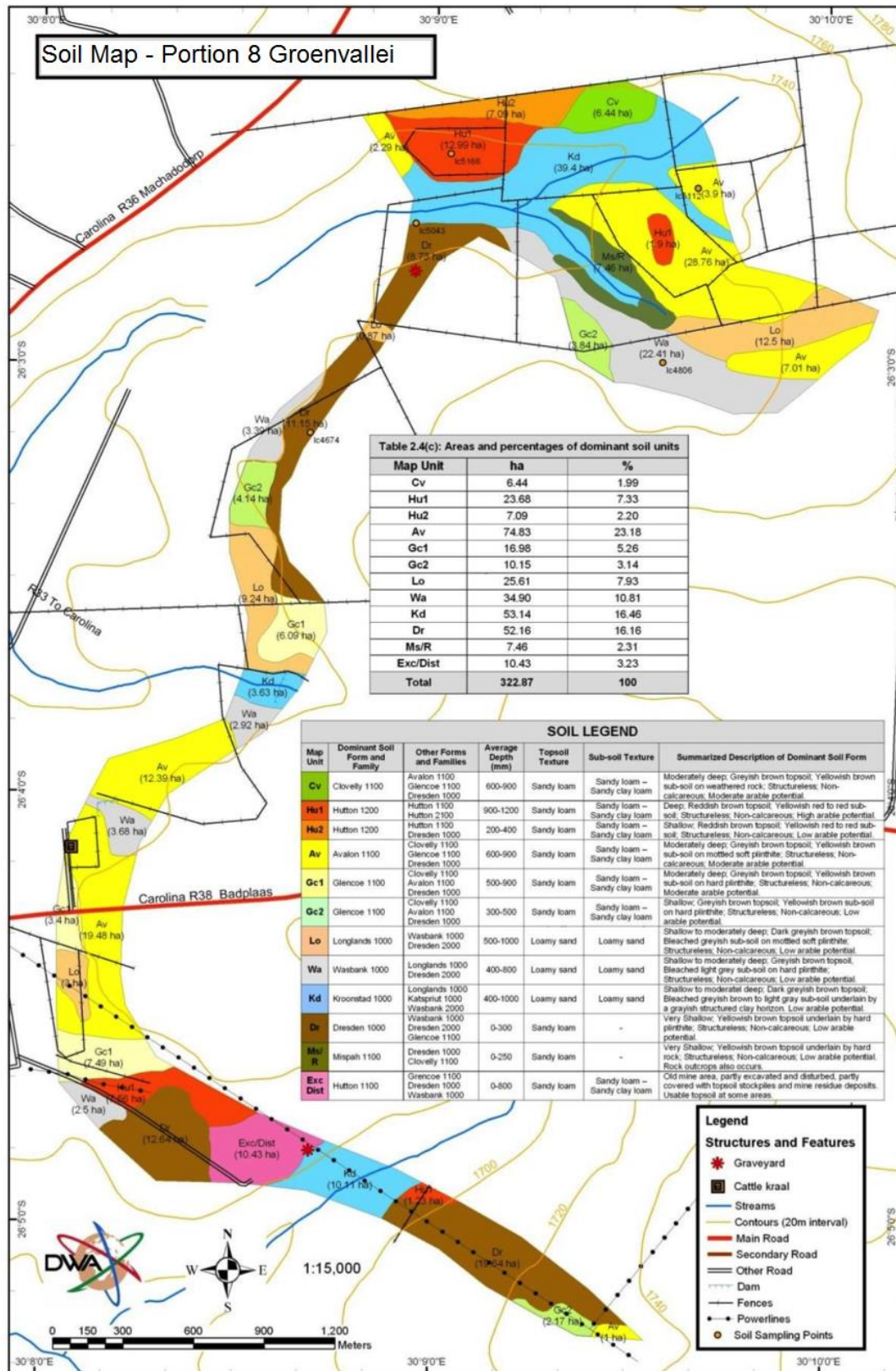


Figure 23: Affected soils located on Portions 6, 7, 8 and 17 of the farm Groenvallei 40 IT

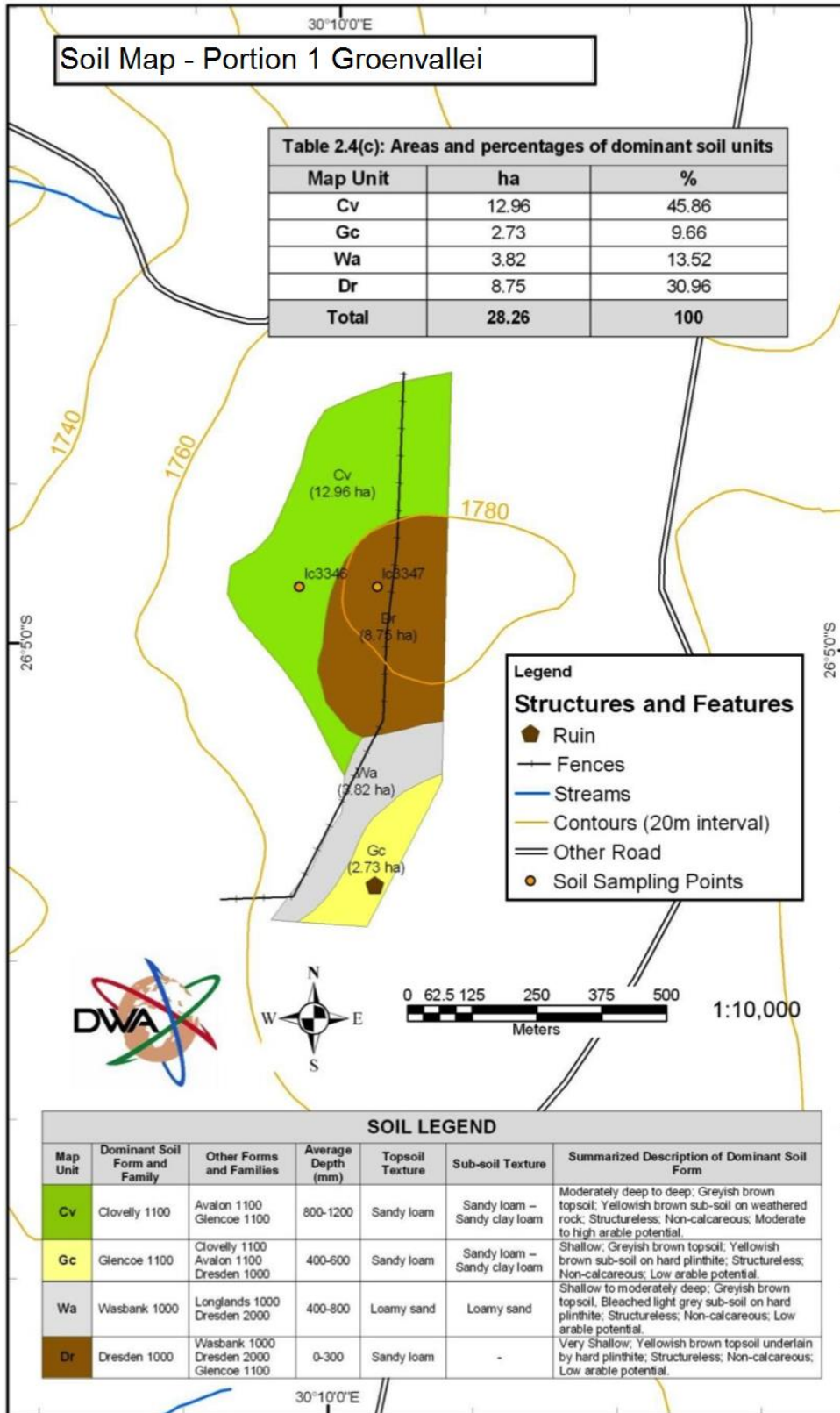


Figure 24: Affected soils located on Portion Re of Portion 1 of the farm Groenvallei 40IT

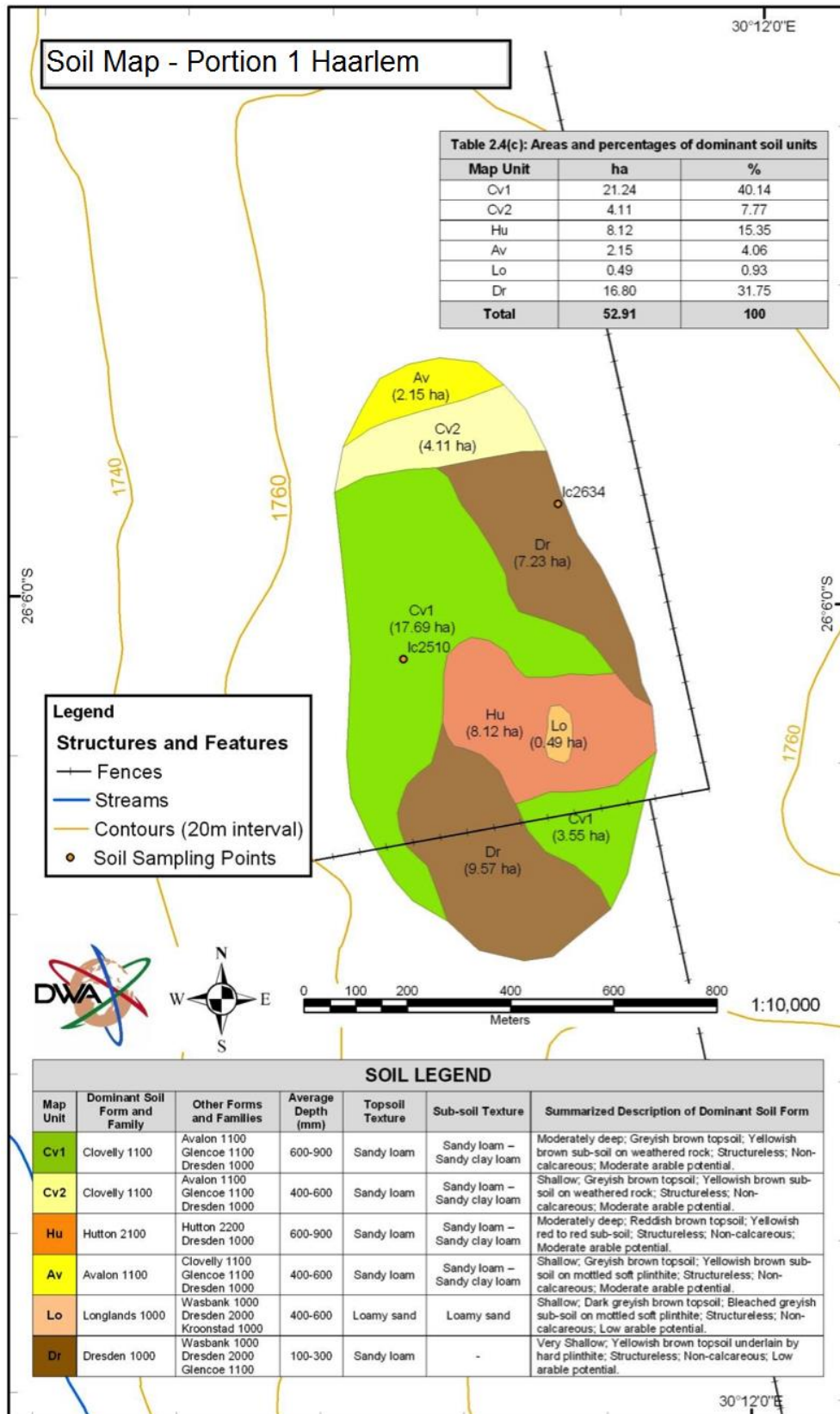


Figure 25: Affected soils located on Portions 1 and 4 of the farm Haarlem 39 IT

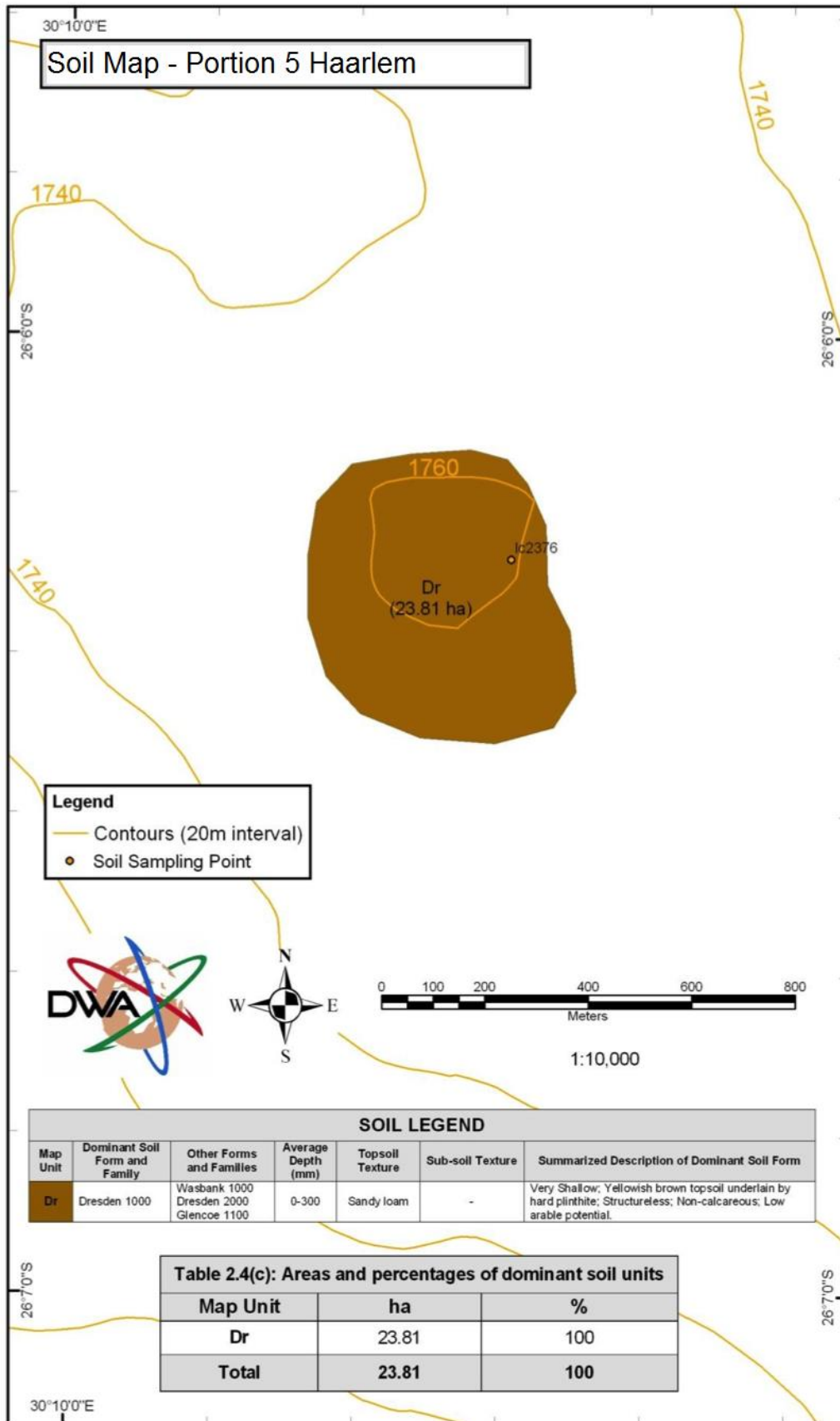


Figure 26: Affected soils located on Portion 5 of the farm Haarlem 39 IT

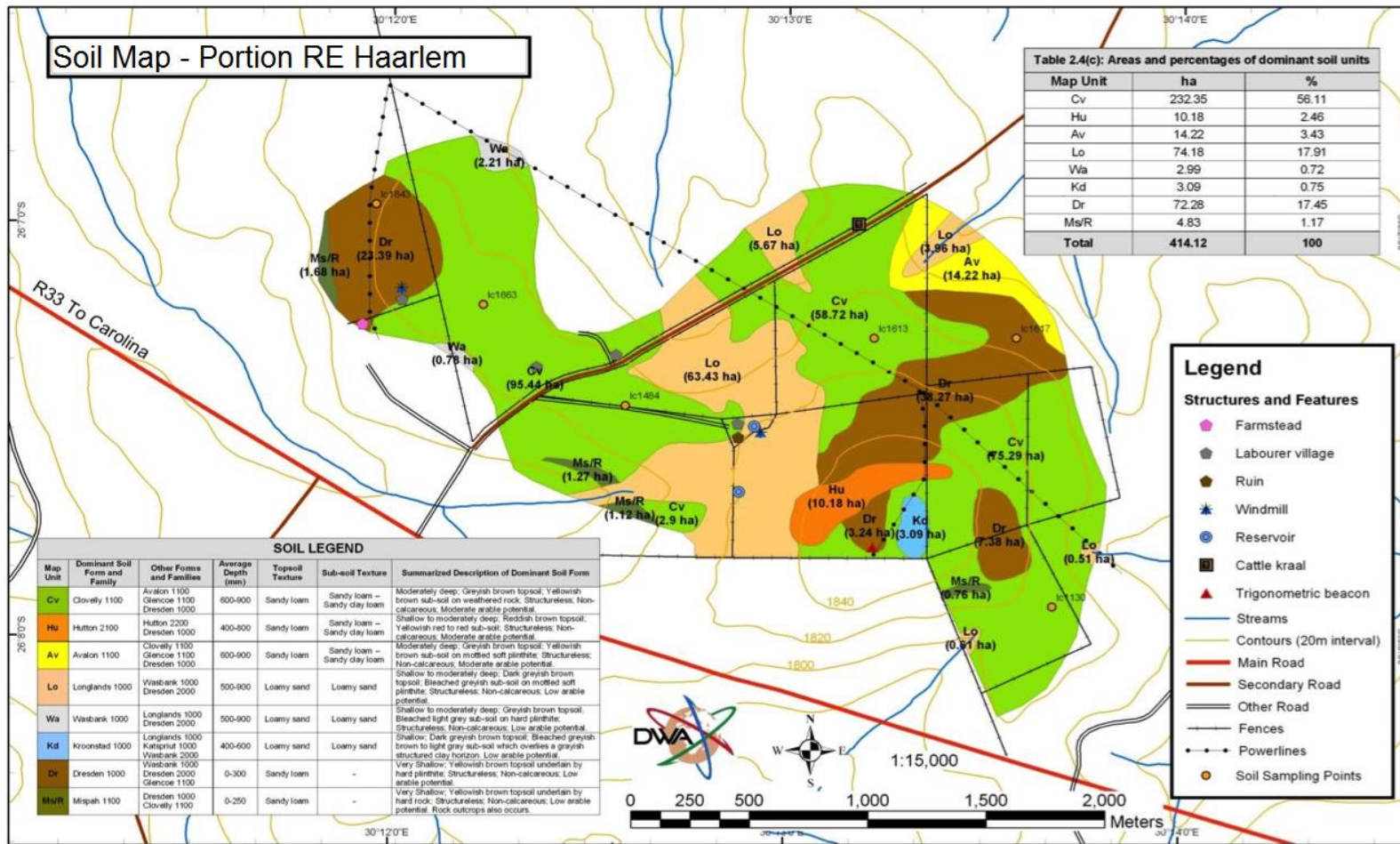


Figure 27: Affected soils located on Portions RE and 4 of the farm Haarlem 39 IT and Portions 3 and 9 of the farm Appeldoorn 38 IT

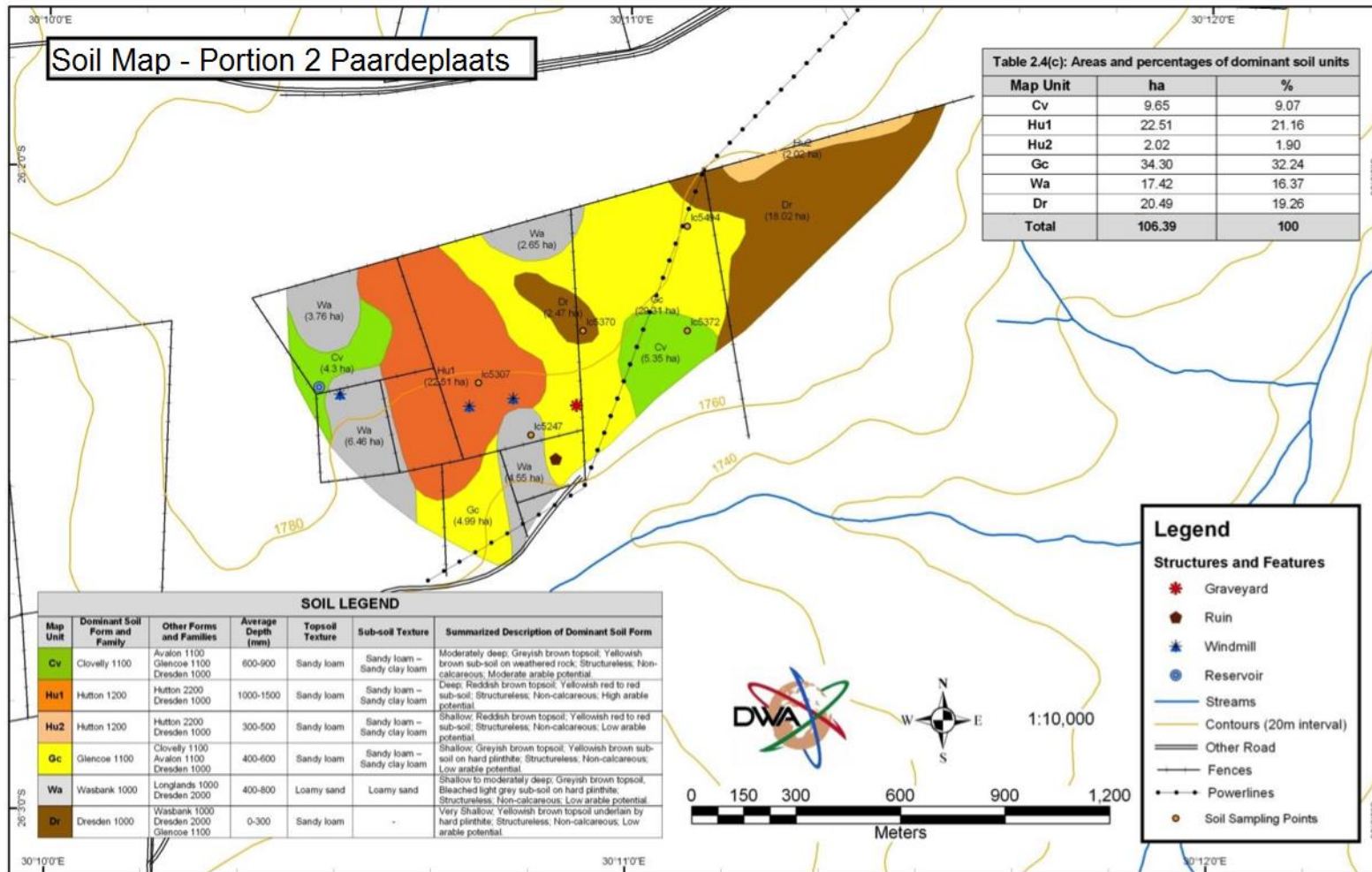


Figure 28: Affected soils located on Portions RE and 2 of the farm Paardeplaats 12 IT

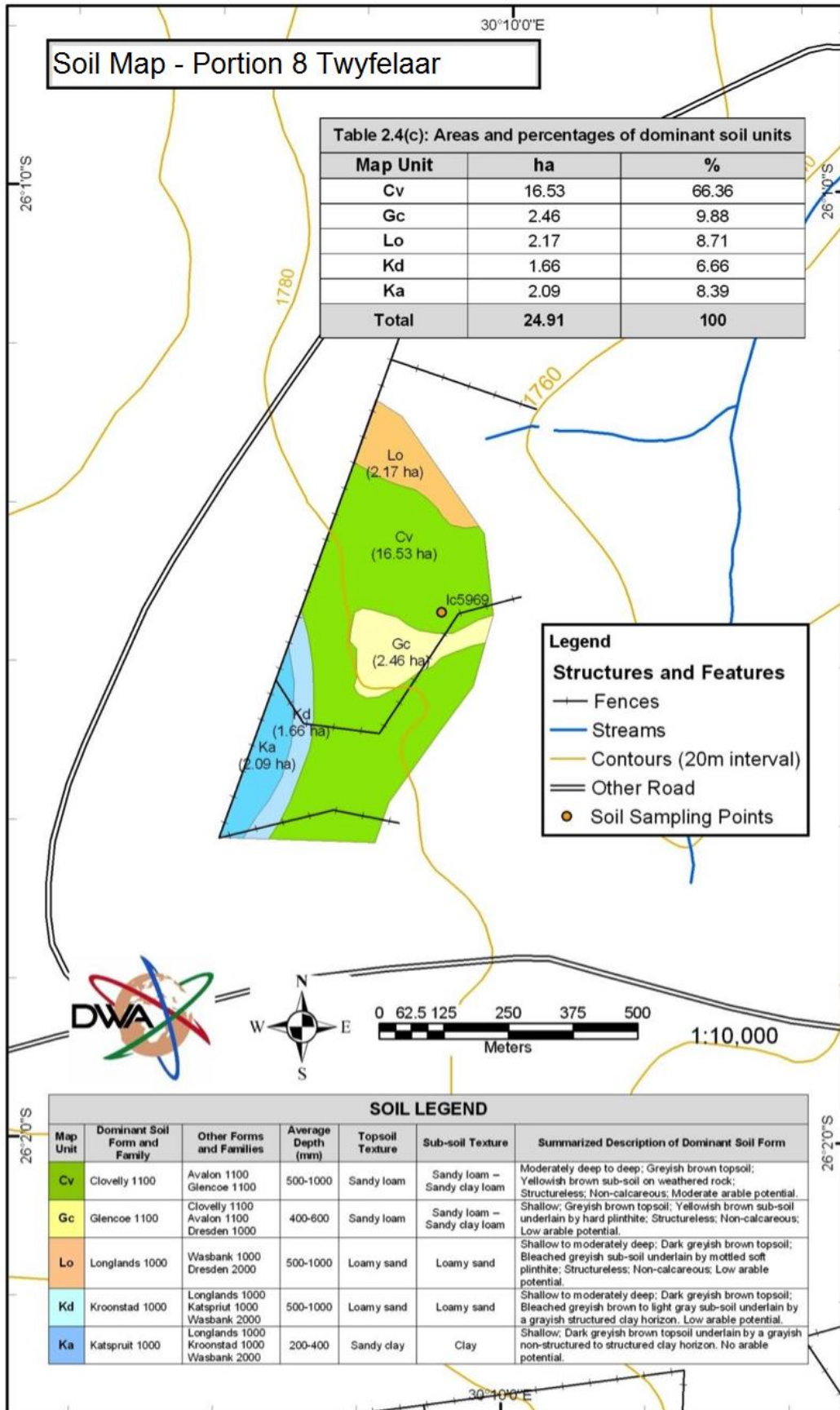


Figure 29: Affected soils located on Portion 8 of the farm Twyfelaar 11 IT

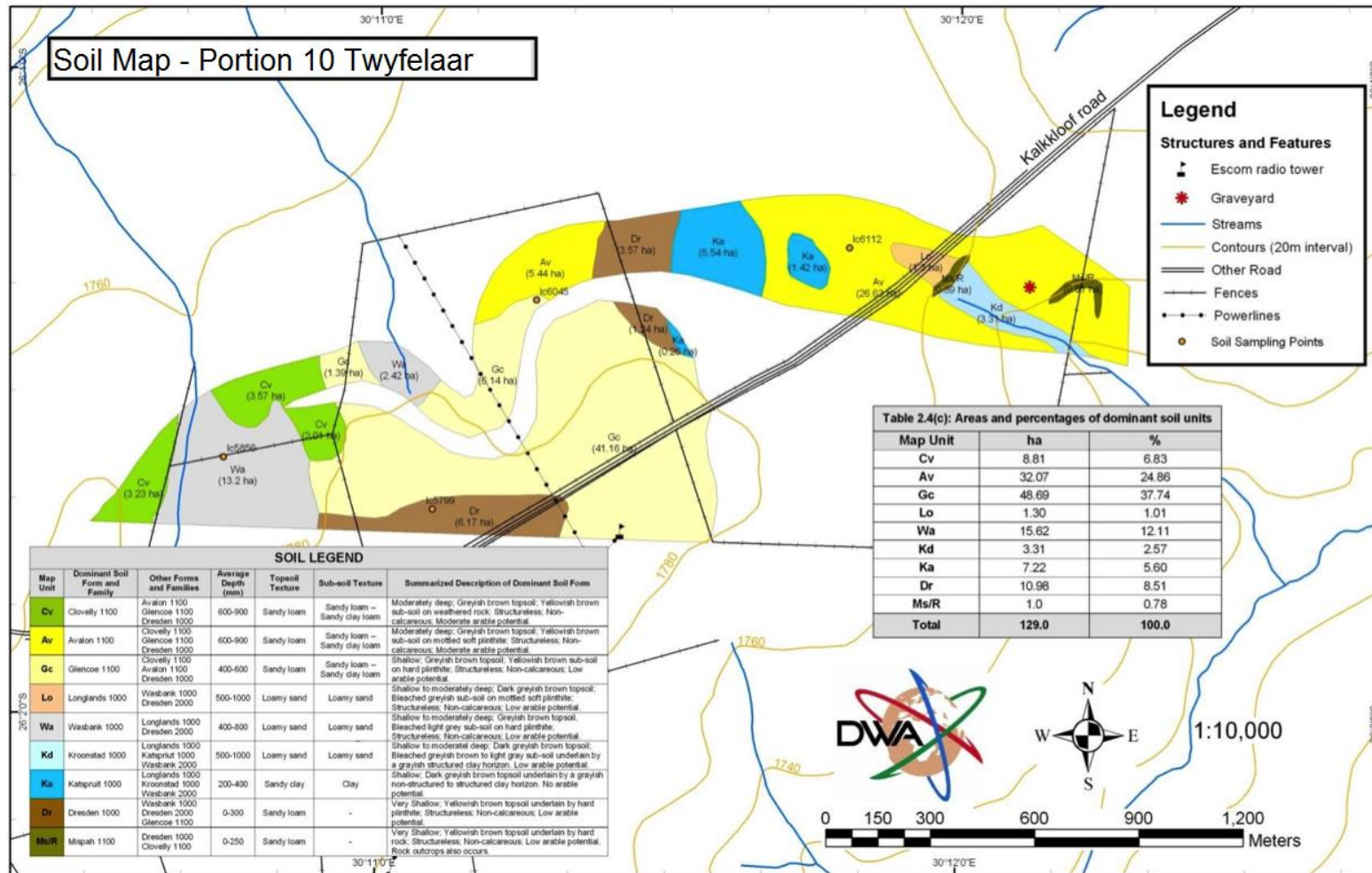


Figure 30: Affected soils located on Portions 9 and 10 of the farm Twyfelaar 11 IT

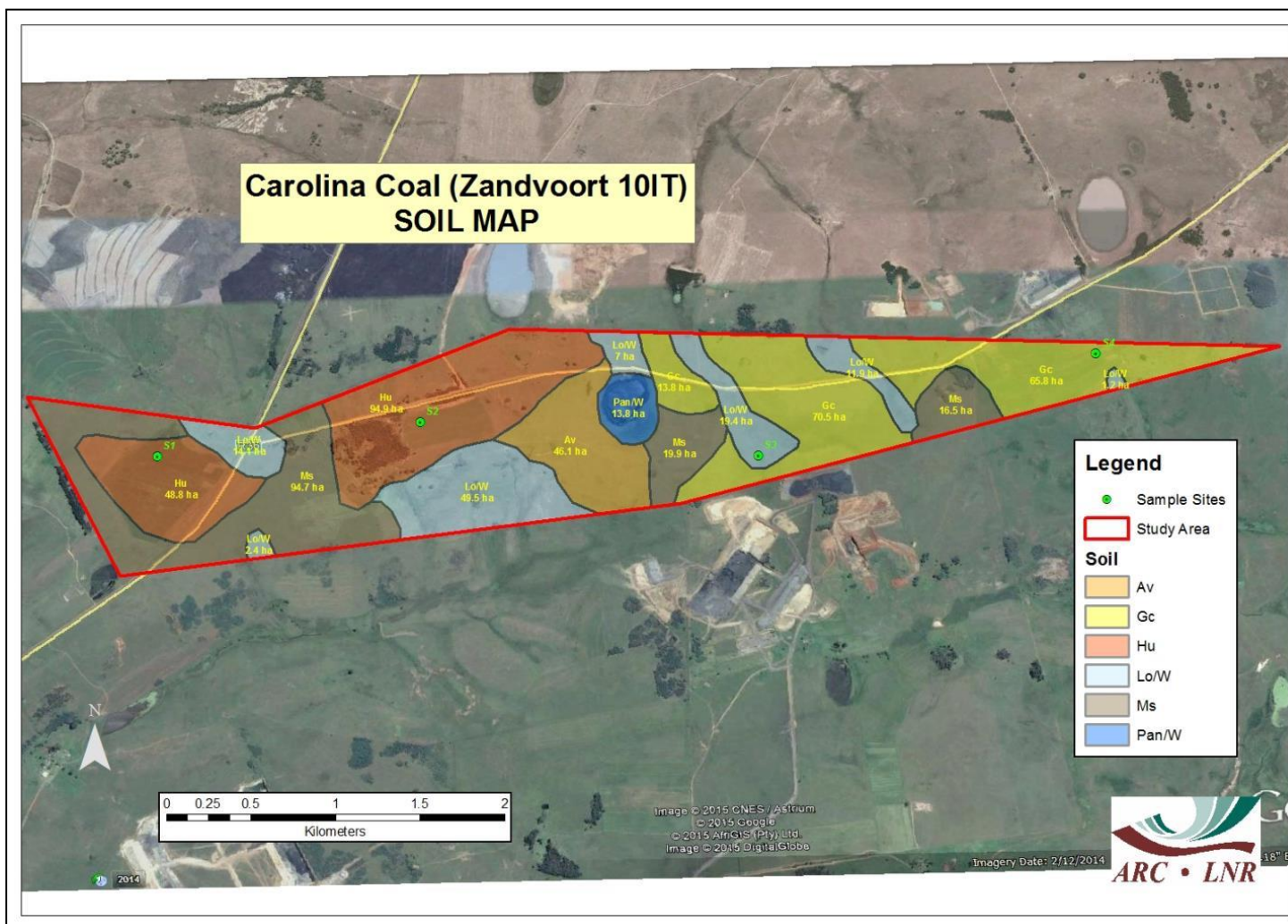


Figure 31: Soils located on Portions RE and 1 of the farm Zandvoort 10 IT

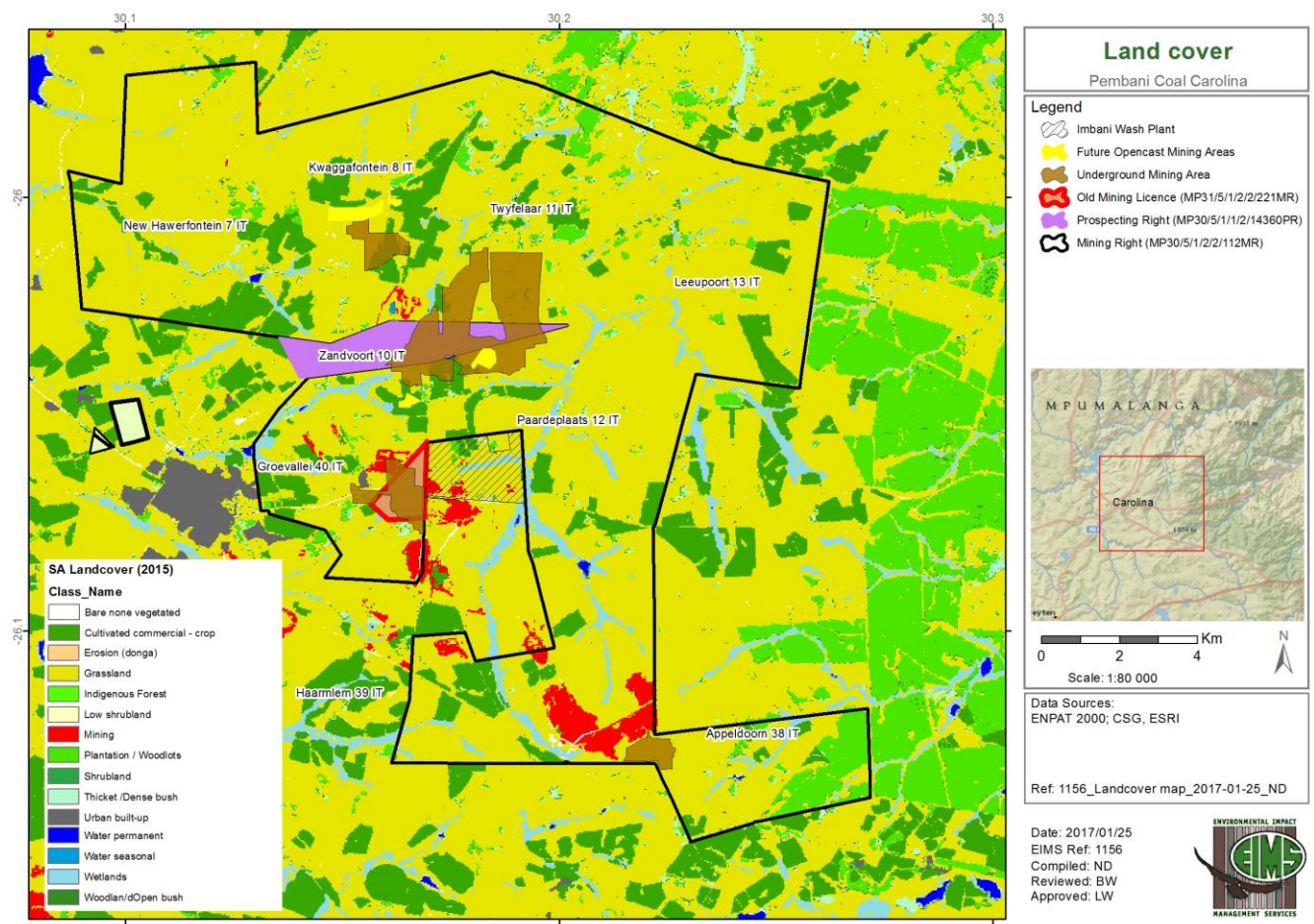


Figure 32: Land cover of Pembani Colliery and surrounding area

9.6.1.1. LAND CAPABILITY

The Land capability was investigated as part of the soil studies in 2005. Land capability was assessed according to the definitions of the Chamber of Mines of South Africa, 1981. (Guidelines for the rehabilitation of disturbed land by surface coal mining in South Africa. Johannesburg). The soil units were classified in terms of four land capability classes: arable land, grazing land, wetlands and wilderness land. The area and percentage of each land capability class was assessed and individually discussed for each soil area evaluated. Additionally, Zandvoort was assessed during 2015 for the S102 application.

During the 2004 study, the land capability within the proposed mining area was determined to consist predominantly of areas with arable and grazing potential. Several areas of the land capability class wetland were identified. Due to the widespread cultivated land within the study area, the wilderness land capability class was considered to be limited (refer to Figure 33 to Figure 36 below).

The baseline land capability of Zandvoort, as defined by the relevant guidelines (Coaltech, 2007), identifies most of the soils as falling into the arable class, due to their favourable depth, texture and natural drainage (see Figure 37). The Hu map unit, being somewhat deeper, will have a slightly higher arable capability than either the Gc or Av map unit. The Ms map unit, due to its severely restricted depth to a hard layer, is unsuited for cultivation, so that the land capability class is grazing. The Lo/W unit consists of soils in the land capability class of wetland, due to the position in the landscape, which causes gleyed subsoil material with signs of wetness to occur. The Pan/W unit has surface standing water due to almost continuous wetness.

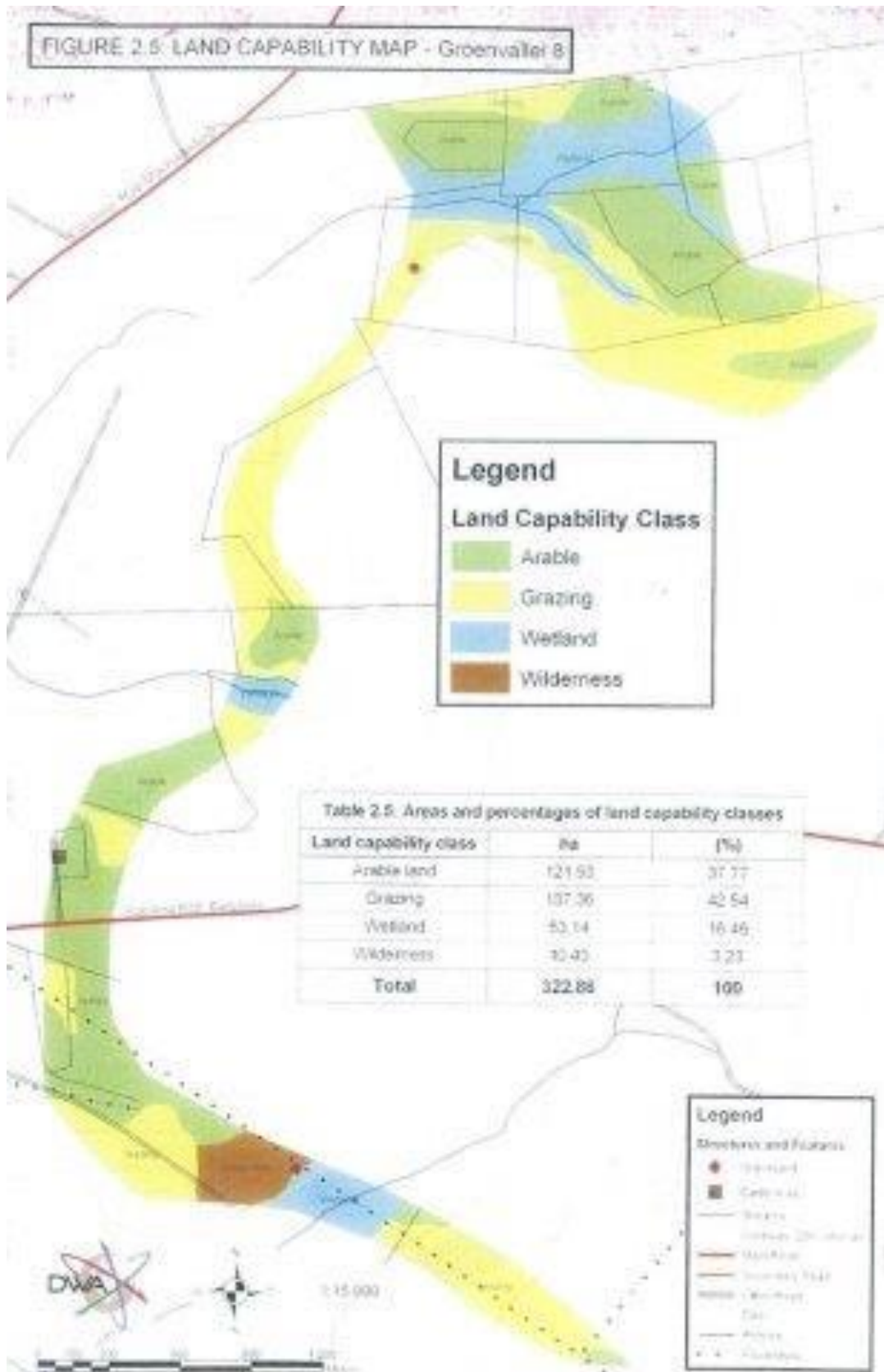


Figure 33: Land capability on Groenvallei Portion 8

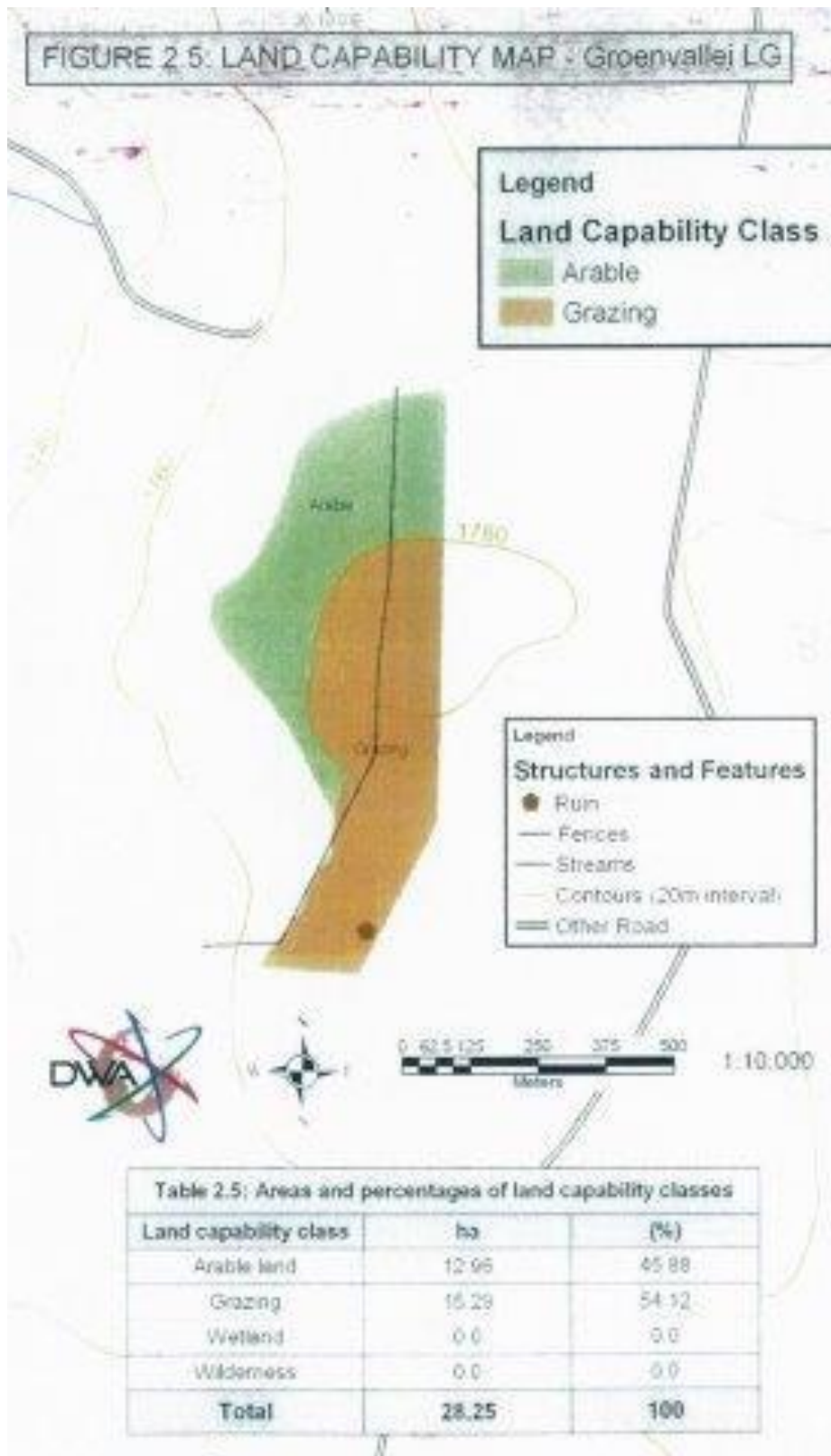


Figure 34: Land capability indicated on Groenvallei

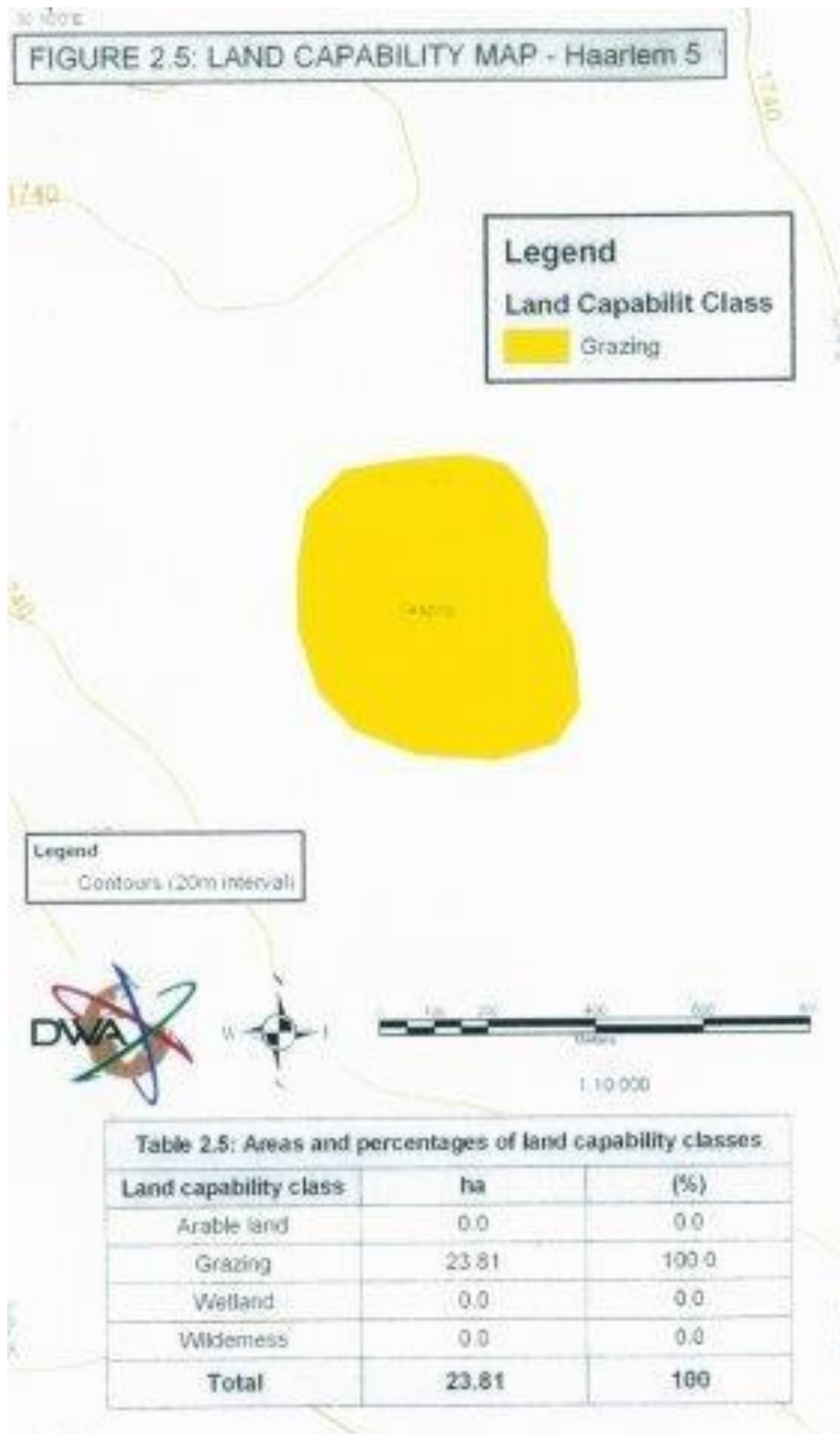


Figure 35: Land capability indicated on Haarlem

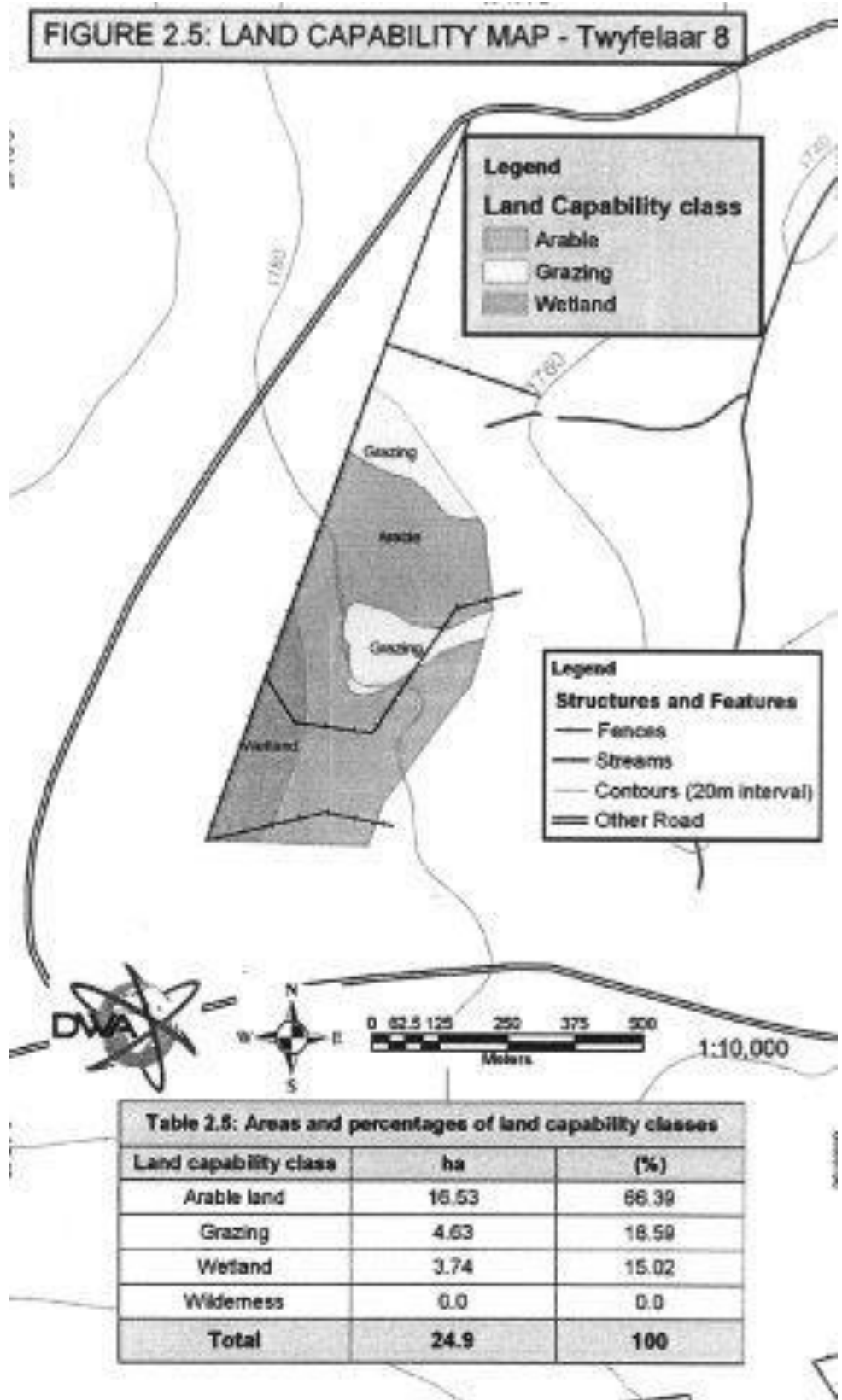


Figure 36: Land capability indicated on Twyfelaar

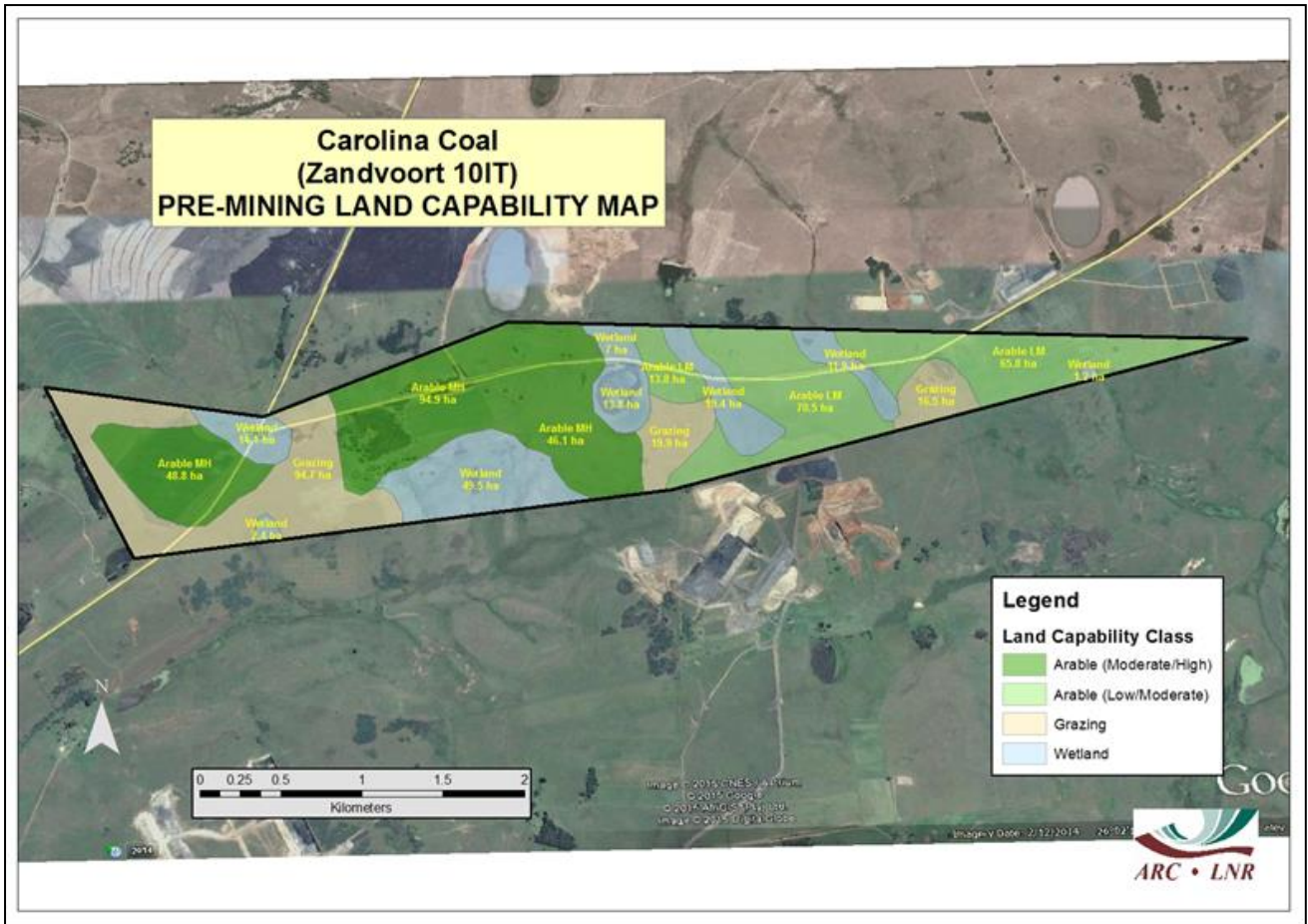
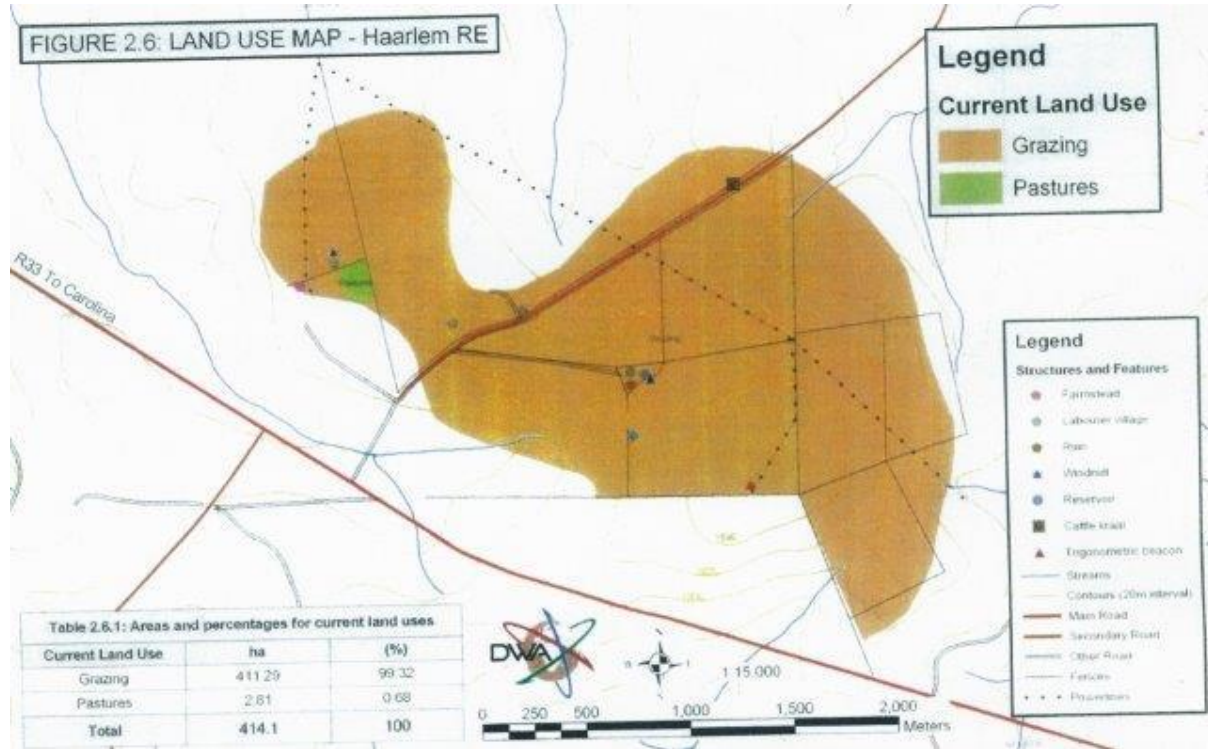


Figure 37: Zandvoort pre-mining land capability

9.6.1.2. LAND USE

The current land use of the Pembani Colliery is mining, however, a land use evaluation was undertaken in 2005, for the mining right EMPR. Additionally, a land use assessment was undertaken in 2015 for Zandvoort. The observations from both of these are summarised in Table 22 below, and is indicated in



to Figure 40 below.

Table 22: Mining Right Land use per area

Area	Current Land Use	ha	(%)
Portions 6, 7, 8, and 17 of Groenvallei 40 IT	Maize	14.5	4.49
	Dry beans	11.52	3.57
	Pastures	24.85	7.7
	Grazing	260.29	80.62
	Fallow land	7.55	2.34
	Informal settlement	4.14	1.28
Portion RE of Portion 1 of Groenvallei 40 IT	Grazing	28.25	100
Portions 1 and 4 of Haarlem 39 IT	Grazing	43.24	81.72

	Pastures	9.67	18.28
Portions RE and 4 of Haarlem 39 IT and Portions 3 and 9 of Appeldoorn 38 IT	Grazing	411.29	99.32
	Pastures	2.81	0.68
Portion 5 of Haarlem 39 IT	Grazing	23.81	100
Portions RE and 2 of Paardeplaats 12 IT	Maize	16.65	15.65
	Pastures	4.75	4.46
	Grazing	82.3	77.36
	Fallow land	2.69	2.53
Portion 8 of Twyfelaar 11 IT	Grazing	11.95	47.99
	Pastures	12.95	52.01
Portions 9 and 10 of Twyfelaar 11 IT	Grazing	129	100
Portions RE and 1 of Zandvoort 10 IT	Arable	339.9	57.64
	Grazing	131.1	22.23
	Wetland	118.7	20.13
	Total	1 639	(%)

The predominant pre-mining land use of the above areas consisted of unimproved grassland for grazing with some small areas of cultivation. According to the 2015 study, the prevailing agricultural potential of most of the Zandvoort area is moderate to high, defined mainly by the available soil depth. The majority of the soils in the area have an average effective soil depth of less than 900 mm, which is generally adequate for most crops. Where subsurface restrictions, such as rock or hard plinthite, gleyed waterlogged clay or a water table, are present at shallow depth (generally less than 500 mm from the surface), then the arable agricultural potential will be significantly restricted.

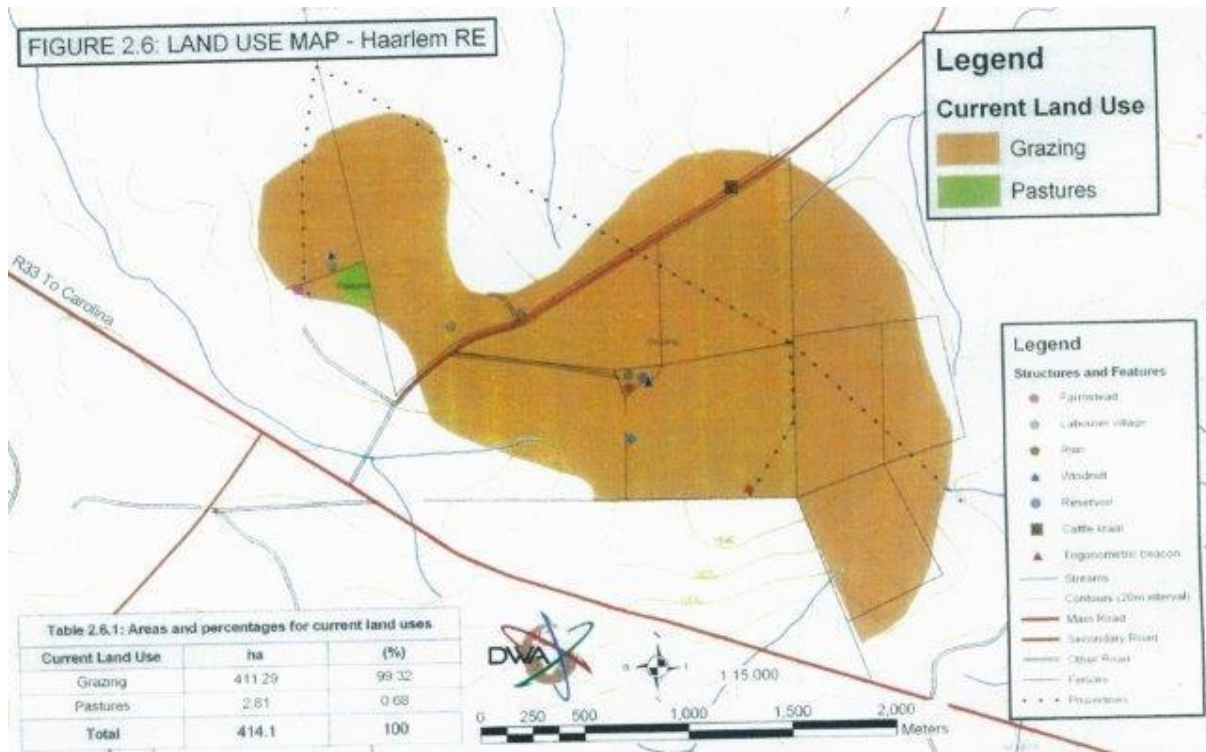


Figure 38: Land use on Haarlem Re

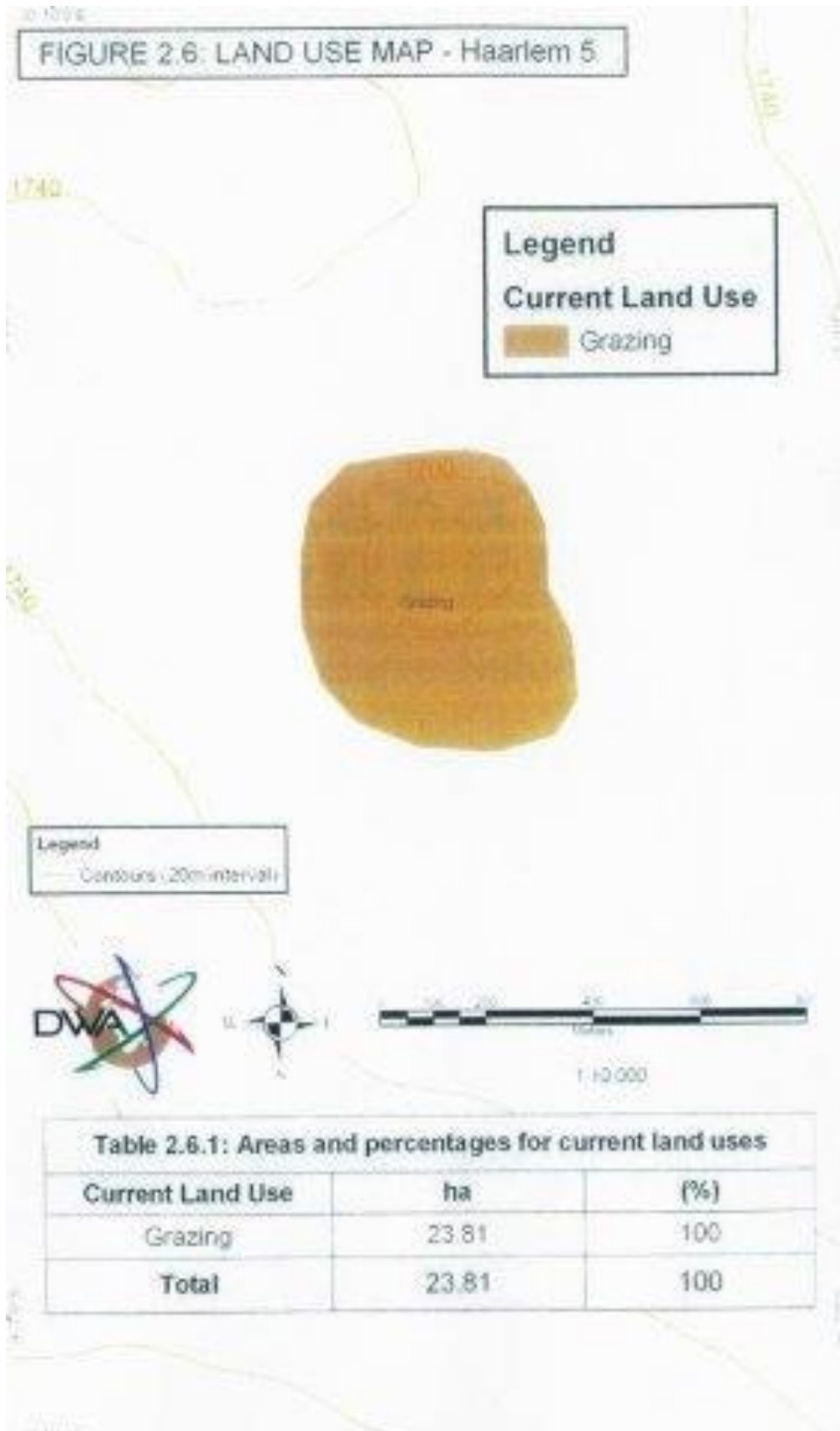


Figure 39: Land use on Haarlem

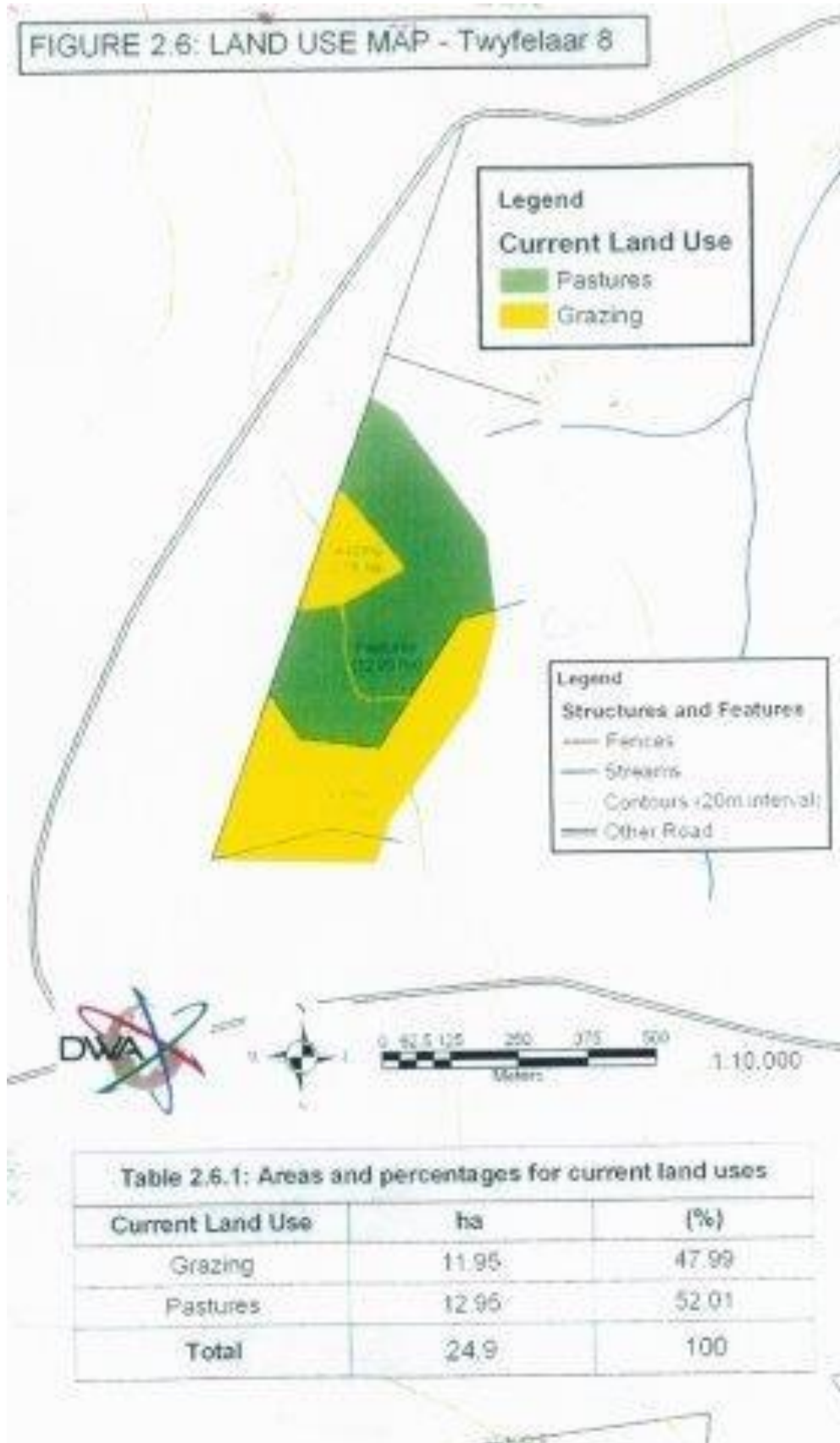


Figure 40: Land use on Twyfelaar

9.7. FLORA

According to the ecology study (Appendix H) undertaken in 2004 the mining right area is classified as a Grassland Biome and can be divided into three vegetation units namely (Figure 41):

- The Eastern Highveld Grassland vegetation unit;
- Eastern Temperate Freshwater wetlands (not visible on map); and
- KaNgwane Montane Grassland.

According to the National list of threatened ecosystems all three of the vegetation units are listed as vulnerable (Government Notice 34809, 9 December 2011). Eastern Highveld Grassland occurs in the Gauteng and Mpumalanga Provinces and is by far the most dominant vegetation unit within the mining right. The species composition of this grassland unit comprises highveld grasses such as *Themeda triandra* (Red Grass), *Aristida congesta*, *Digitaria* species as well as *Tristachya leucothrix* and *T. rehmanni* (Mucina and Rutherford, 2006). The landscape usually includes undulating plains that support short, dense grassland, scattered rocky outcrops with sour grasses and tree species such as *Acacia caffra* (Sweet Thorn), *Celtis africana* (White Stinkwood) and *Diospyros lycioides subsp. lycioides* (Blue Bush). Only a small portion of Eastern Highveld Grassland is conserved in statutory reserves like the Nooitgedacht Dam or in private reserves. Almost half of this vegetation type has been transformed by cultivation, plantation, mining and the building of dams and it is therefore classified as an Endangered vegetation type (Mucina and Rutherford, 2006). Eastern Temperate Freshwater wetlands also form an important component within the mining right and are found around various types of waterbodies and sources embedded within the grassland biome. The waterbodies support zoned systems of aquatic and hygrophilous vegetation of temporarily flooded grasslands and ephemeral herblands. Important species within this unit include: *Cyperus congestus*, *Agrostis lachnantha*, *Carex acutiformis*, *Eleocharis palustris*, *Eragrostis plana*, *Fuirena pubescens*, *Helictotrichon turgidulum*, *Hamarthria altissima*, *Imperata cylindrical*, *Leersia hexandra*, *Paspalum dilatatum*, *P. urvillei*, *Pennisetum thunbergii*, *Schoenoplectus sphacelata*, *Centella asiatica*, *Ranunculus multifidus*, *Phragmites australis*, *Schoenoplectus corymbosus*, *Typha capensis*, *Rorippa fluviatilis*, *Disa zuluensis*, *Nerine platypetala* and *Crassula tuberella*. KaNgwane Montane Grassland situated in the northern section of the mining right area contains several biogeographically important and endemic taxa (Mucina and Rutherford, 2006).

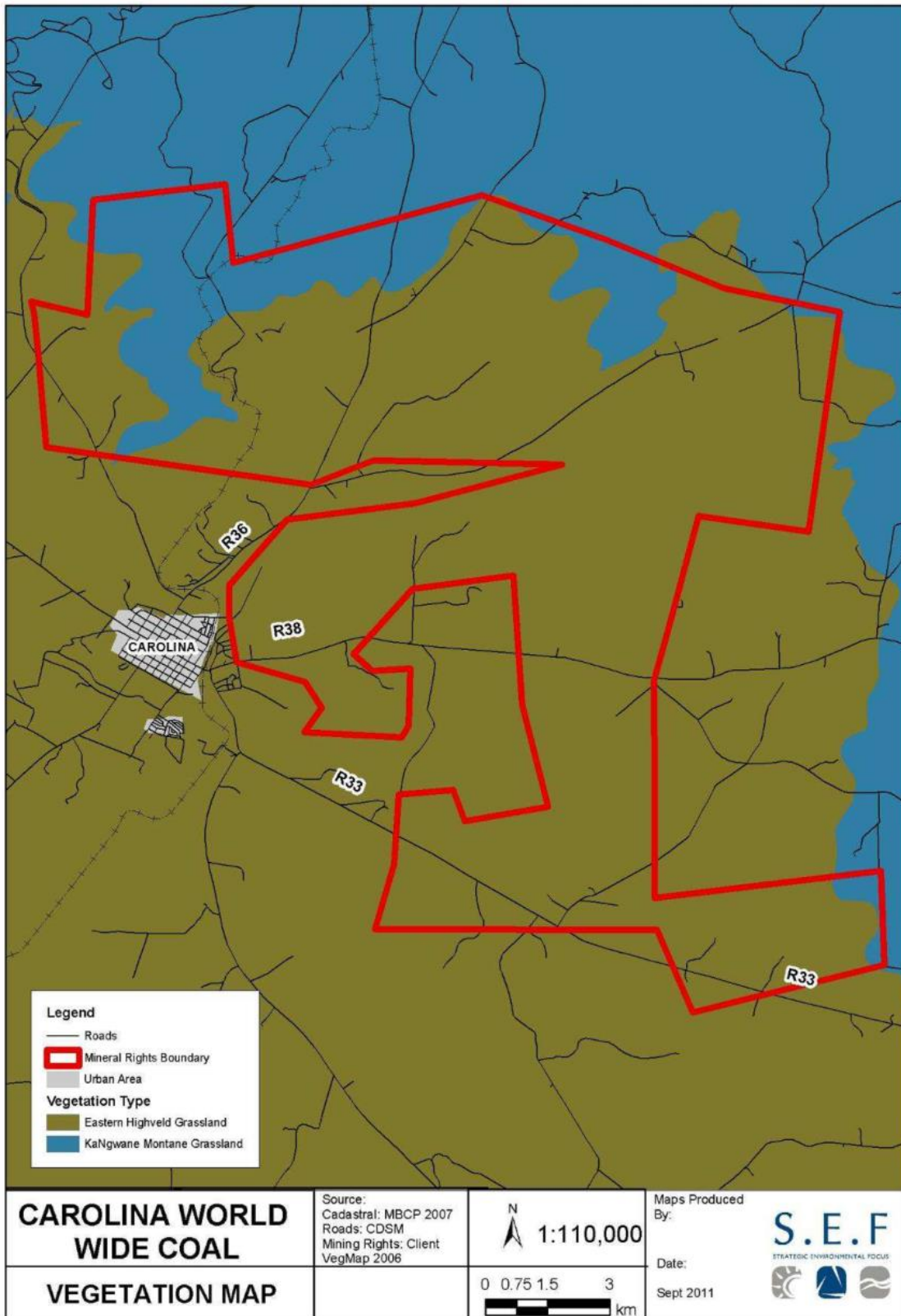


Figure 41: Vegetation units within the Pembani Colliery

The area that was surveyed in 2004 consists of a mosaic of cultivated fields, old fields, pastures and areas of natural vegetation. The majority of the surface is dedicated to agricultural practices. Due to the presence of pans wetland vegetation was also found at certain sites. The natural vegetation consists

mainly of short, open grassland dominated by various grass species and some herbs. There are some sites where wattle trees have developed into small bushclumps. Separate dense stands of *Eucalyptus camaldulensis* / *Eucalyptus grandis* and *Populus sp.* are also present at certain sites. During the survey 294 plant species were recorded. This included 45 tree, shrub and shrublet species, 71 grass species and 177 herb species. Thirty-two exotic and / or invader species, four Red data plants and 104 plants that have medicinal, cultural or magical uses were recorded. Four species recorded have Red Data Status: *Nemesia fruticans*, *Eucomis autumnalis* (subsp.) *clavata*, *Lobelia erinus* and *Urginea modesta*. Many different plant communities were identified at the site of the proposed mining activities.

The 2015 ecology study for Zandvoort (Appendix G) identified one broad vegetation unit occurring within the study area, namely Eastern Highveld Grassland (Figure 42). This vegetation type is classified in the scientific literature as Endangered and is listed in the National List of Ecosystems that are Threatened and in need of Protection as Vulnerable.

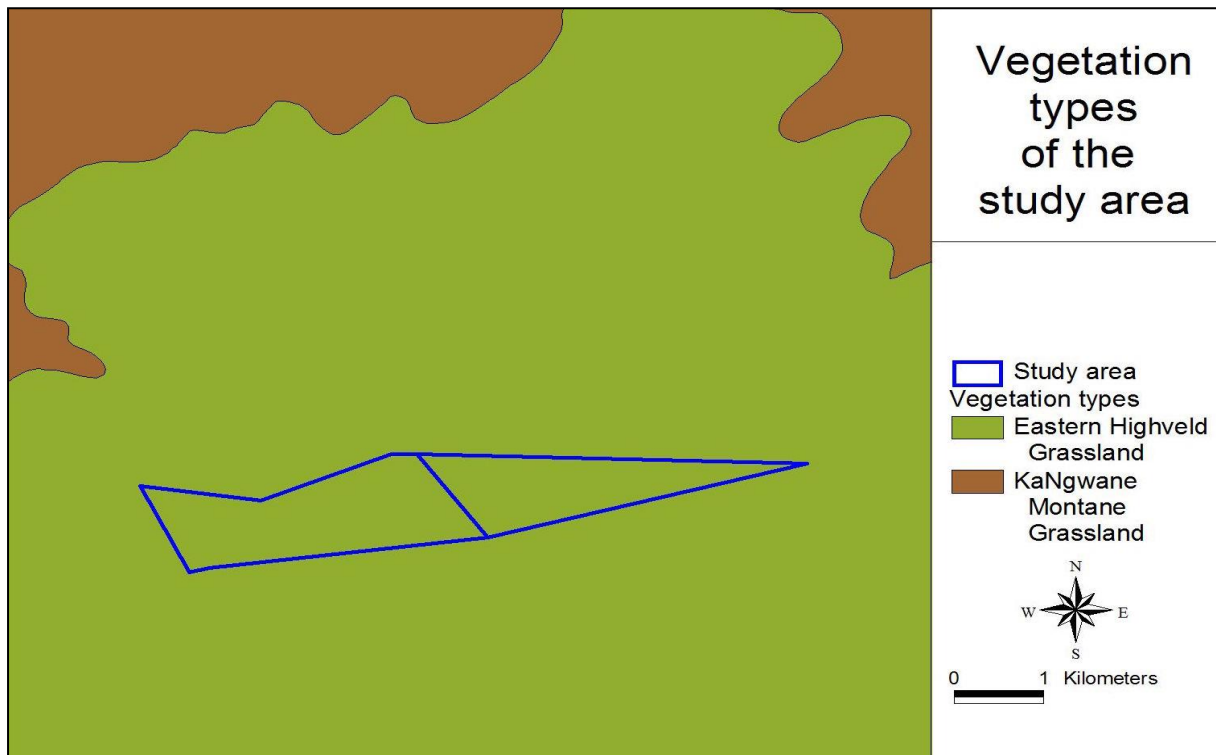


Figure 42: Zandvoort vegetation unit

Plant species of conservation concern that have a probability of occurring on site and are therefore of concern for development of this site are as follows: *Alepidea longeciliata* (EN), *Boophone disticha* (Declining), *Callilepis leptophylla* (Declining), *Crinum bulbispermum* (Declining) and *Crinum macowanii* (Declining). There is suitable habitat for these species on site within untransformed terrestrial vegetation. There is, therefore, a moderate to high probability that they will be directly affected by the proposed project. There are no protected tree species that occur in the study area and which could occur in the types of habitats that are available on site.

A detailed habitat map of the site was compiled. This shows that the site has more natural than disturbed habitat and that the natural habitat consists primarily of grasslands and various wetlands. There is also

a rocky ridge that runs through the site. The floristic survey was undertaken at the incorrect time of the year to properly characterise species composition, but initial indications are that there is a diversity of floristic communities on site and that these potentially harbour high species richness (Figure 43).

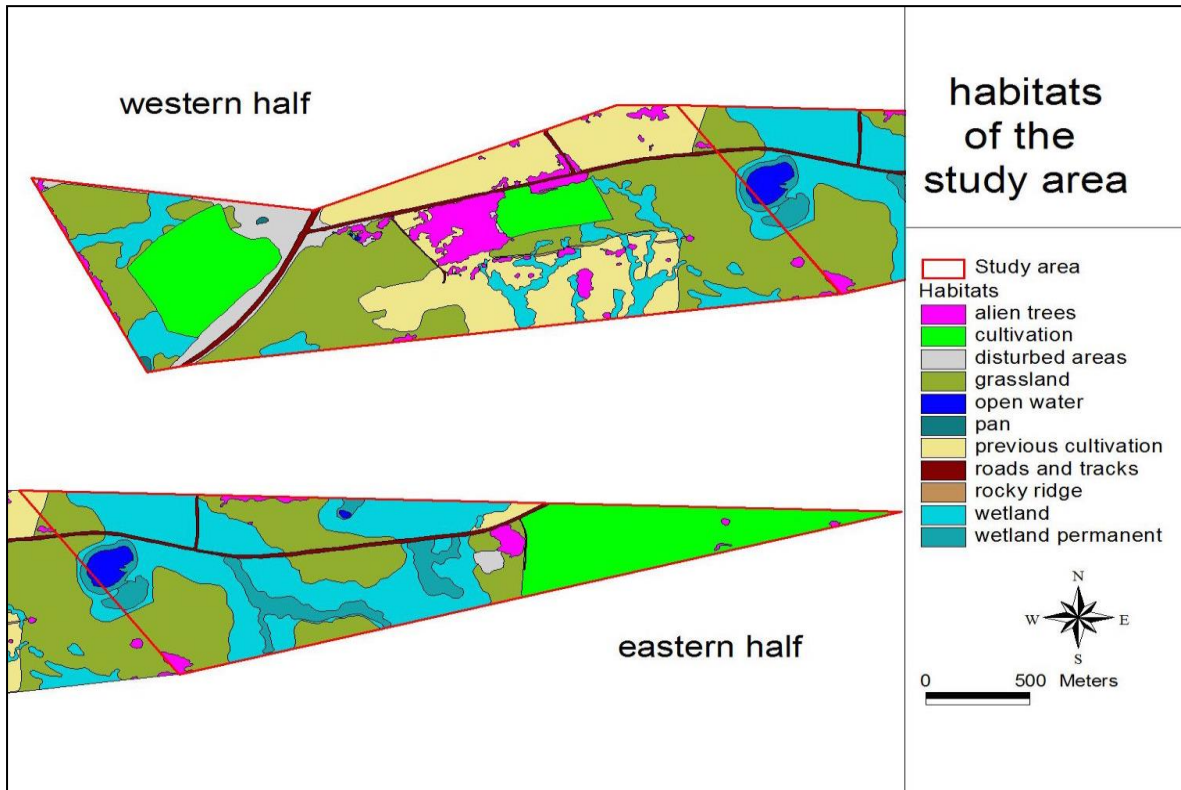


Figure 43: Zandvoort habitats

According to the Mpumalanga Biodiversity Conservation Plan (MBCP) (Figure 44), remaining areas of natural vegetation on site are classified as Highly Significant or No natural habitat remaining. This is the third highest biodiversity value attributed to any areas, according to this conservation plan. Protected areas are afforded the highest conservation status, followed by Irreplaceable areas, which are considered to be the highest priority for conservation. Areas classified as Highly Significant either have high intrinsic biodiversity value or are the next priority for conservation. This indicates that remaining areas of natural vegetation on site are considered to be of moderately high to high conservation value.

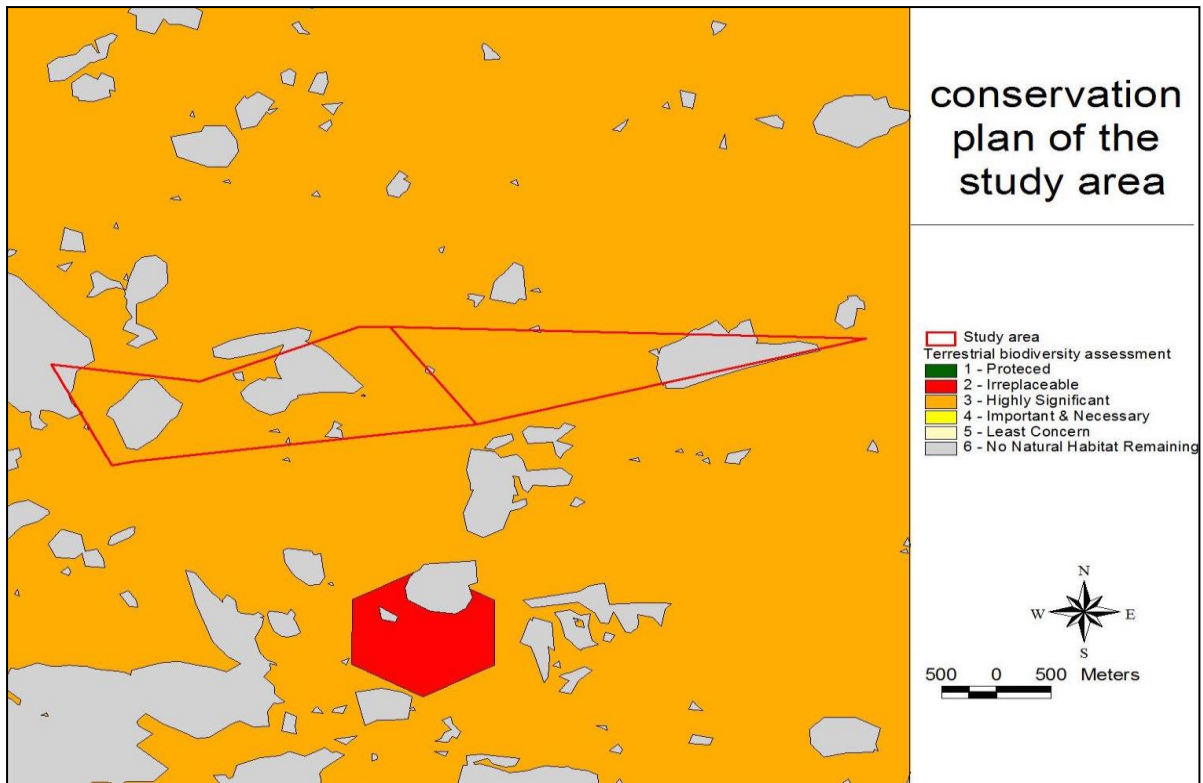


Figure 44: MBCP of Zandvoort

According to the recently compiled Mpumalanga Biodiversity Sector Plan the site contains areas within two main categories, namely Modified Areas and Critical Biodiversity Areas. The Critical Biodiversity Areas are all remaining natural areas on site, except for the central pan and a small part of the surrounding area that are mapped as Other natural areas and Ecological Support Areas respectively. This classification in the Mpumalanga Biodiversity Sector Plan indicates that all remaining areas of natural habitat on site are considered to have high biodiversity value and are critical for meeting conservation targets within the Province (Figure 46). The Mpumalanga Biodiversity Sector Plan for the entire Pembani Colliery mining right are is indicated in Figure 45 below.

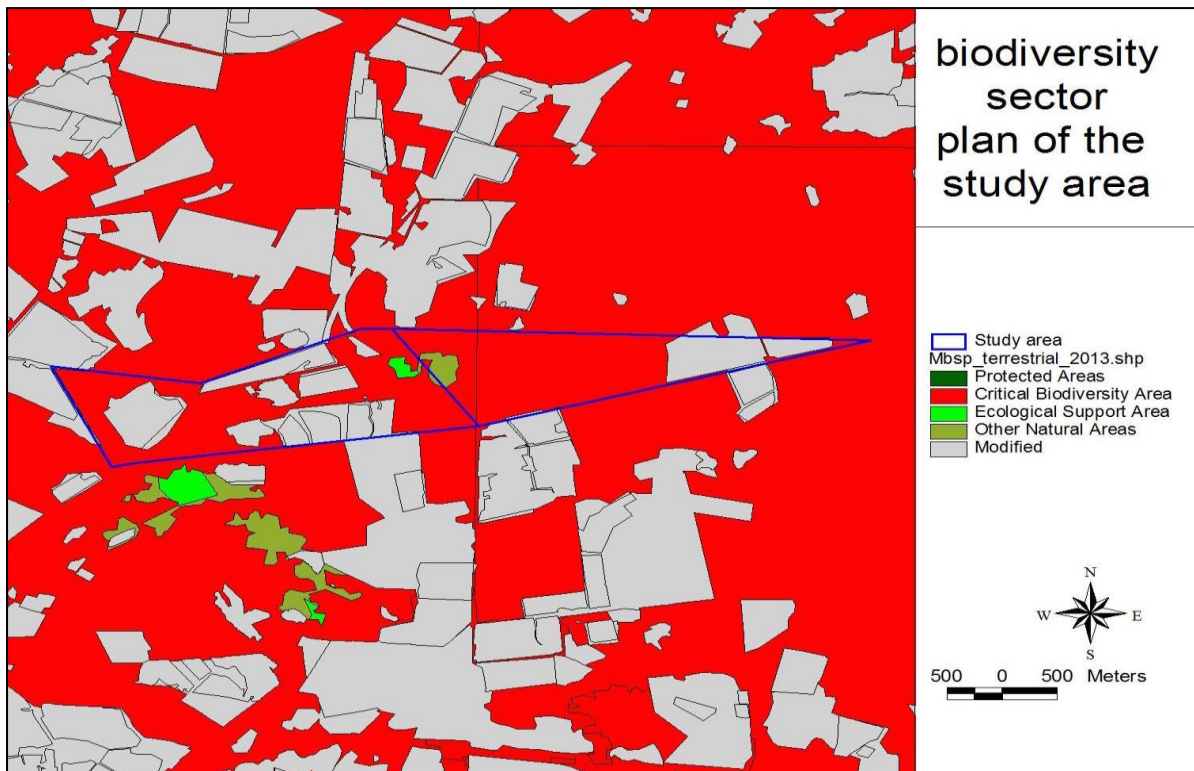


Figure 46: Mpumalanga Biodiversity Sector Plan of Zandvoort

There are sensitive biodiversity receptors within the study area, however none of these will be negatively impacted by the proposed project. This is due to the fact that there will be no surface disturbance of the site (only underground mining to be undertaken). No further studies are recommended. The clearing of vegetation on the proposed new mining areas has been included in the existing NEMA authorisation.

9.8. FAUNA

A desktop study and on site animal surveys were undertaken in 2004 to ascertain what species of animals (mammals, birds, reptiles and amphibians) could potentially occur at the proposed Pembani Colliery and in the surrounding area. In this study the potential for each species to occur at the site and in the surrounding areas was based primarily on distribution maps. Habitat preferences were taken into account to a degree, but certain animals may use this site primarily as a thoroughfare, in which case the habitat does not have to be ideal.

The desktop study for mammals revealed that a total 125 different mammal species can possibly be present in the proposed areas of development. These 125 species of mammals represent 25 species from the Order Artiodactyla, 25 species from the Carnivora, 18 species of bats (Chiroptera), 15 species from Insectivora, five species of primates (Primata), four species of the order Lagomorpha and 29 rodents (Rodentia) could potentially occur in the region of the proposed mining development. Four other species, representing four separate orders, could also occur in this region.

Of these mammals 24 are rare and endangered (Friedmann and Daly, 2004; Hoare, 2015). The Rough-haired Golden Mole is critically endangered and the Oribi, Tsessebe, Samango Monkey and Whitetailed Rat are endangered. It is, however, unlikely that the Samango Monkey will occur at this site as it does not support any suitable habitat. Fifteen Red Data species are near threatened and include many bat species such as Geoffrey's Horseshoe Bat, Darling's Horseshoe Bat, Lesser Long-fingered Bat, Schreiber's Long-fingered Bat, Temminck's Hairy Bat, Welwitsch's Hairy Bat and Lander's Horseshoe Bat. The potential for these bat species to occur at this site will depend largely on the availability of roosting sites. The other near threatened species are the Brown Hyaena, Serval, Side-striped Jackal, Honey Badger, Spotted-necked Otter, South African Hedgehog, Highveld Golden Mole and the Water Rat. The vulnerable species include the Black Rhinoceros, Maquassie Musk Shrew and the Pangolin. The Black Rhinoceros is a browser which predominantly consumes the leaves of members of the *Acacia* genus and is generally found where dense stand of these occur. It is, therefore, assumed that this species will not occur at the site.

A species list of bird species that can possibly be present within the entire area (Grid 2630AA) was drawn up from the Roberts' Multimedia of Birds of Southern Africa (2003). Potentially 361 species of birds could occur in the region of the proposed area of development within Grid 2630AA (Roberts, 2003).

There are 42 species of snakes, 22 species of lizards, a single species of tortoise and single species of terrapin that could potentially occur in the proposed area of development.

A desktop study of frogs that can possibly be present within the proposed area was done in order to list all frogs that can possibly be present within the area. A total of 21 species of frog could possibly be present in the proposed area of development and its surroundings (Carruthers, 2001).

A total of 6 different mammal species, 69 different bird species, three different reptile species, which represents one snake and two skinks, nine frog species and 35 different species of insects, of which 6 are different butterfly species, were recorded during the survey. No red data animal species, except for one bird species namely the blue Korhaan, were recorded during the animal survey.

In order to compile a list of bird species that could potentially occur at the site and in the surrounding areas Robert's Multimedia of Birds (2003) was consulted. A list of all birds officially recorded for grid 2630AA (in which the site is situated) was extracted. This list shows that 361 species of birds could occur in this grid. The actual occurrence of many of these species will depend on the availability of suitable habitat. Thirty-eight of these 361 birds have Red Data status. Four are critically endangered: the Eurasian Bittern, Wattled Crane, Rudd's Lark and the White-winged Flufftail. There is both open water and water covered by wetland vegetation so the occurrence of these species is not unlikely, based on habitat availability and distribution maps. The Botha's Lark is endangered and the other 33 species are near threatened or vulnerable, including the blue Korhaan, which was one of the 69 different bird species sighted during the animal survey.

There are 42 species of snakes, 22 species of lizards, one species of tortoise and one species of terrapin that could potentially occur in the area. During the desktop study it was found that of the reptiles that could potentially occur here two snake species have Red Data status: the Southern African Python

(vulnerable) and the Aurora House Snake (rare). A desktop study revealed that 21 species of frog could potentially be present in the area. Of these the Giant Bull Frog is listed as threatened in the Red Data Book. No Red Data species were observed during the animal survey.

The field survey was conducted in March and April 2004. Environmental conditions were not ideal for insects and butterfly sampling due to the rainy conditions. All mammals seen by the specialists from Digby Wells during the field survey were recorded. Interviews were also held with some of the farmers and all species seen by these farmers were also recorded.

Eight mammal species were recorded during the field survey. None of these have Red Data status. Burrows and holes of small mammals, which could belong to mice, rats, or suricates, to name a few, were abundant in the old fields and in the areas of natural vegetation. Individual suricates, mongoose, duikers (abundant) and steenbok were observed. Evidence of porcupine was also observed during the survey.

Sixty-nine bird species were observed and identified. Most of these birds were observed in close proximity to the pans and streams, natural vegetation, pastures and old fields. Not many were seen in the areas supporting crops. The Blue Korhaan (*Eupodotis caerulescens*), which has Red Data status, was seen during the survey.

One snake was encountered during the field survey. This was probably a Green Water Snake (*Philothamnus sp.*) but this could not be confirmed due to the quick disappearance of this snake into the grass near a small pan. Two skink species, the Spotted Skink (*Trachylepis punctatissima*) and the Variable Skink (*Trachylepis varia*) were also observed during the survey. No other reptiles were observed or recorded during the survey. No Red Data status reptiles were found during the animal surveys.

The terrestrial macroinvertebrate sampling yielded quite good results. A total number of 258 individuals of 7 different orders, 15 different families and 35 different species were recorded. Six of the 258 individuals were different butterfly species. A total of 8 individual spiders belonging to the same genus and species were recorded and only one tick was recorded during the animal survey.

An additional faunal assessment was undertaken for Zandvoort during 2015. The findings of this study were based on a desktop assessment, mapping from aerial imagery, and a field survey. The key habitats identified for faunal species on Zandvoort are grassland and wetland.

A total of 100 mammal species have a geographical distribution that includes the general study area in which the site is found. Of the species currently listed as threatened or protected, the following are considered to have a medium to high probability of occurring on site, based on habitat suitability: Honey Badger, Highveld Golden Mole, South African Hedgehog and Temminck's Ground Pangolin. The site is not considered to be important for the protection of any of these species. No mammal species are likely to be significantly negatively impacted by development on site.

A total of 19 frog species have a geographical distribution that includes the general study area in which the site is found. Of the frog species that could potentially occur in the study area, none have been

listed in a threat category. There are therefore no frog species of conservation concern that could be negatively impacted by development on site.

A total of 64 reptile species have a geographical distribution that includes the general study area in which the site is found. Of the reptile species that have a geographical distribution that includes the study area, the Striped Harlequin Snake, Yellow-bellied House Snake, African Rock Python and Breyer's Long-tailed Seps have been listed in a threat category. The African Rock Python is considered unlikely to occur on site due to the absence of suitable habitat. The other three species could potentially occur in the grassland of the study area, but the chances of finding any of these species is slim, even if they occur there. There are, therefore, three reptile species of conservation concern that could potentially occur in the study area.

A total of 352 bird species have a geographical distribution that includes the general study area in which the site is found. A number of the bird species with a geographical distribution that includes the site have been listed in the Eskom Red Data Book of the Birds of South Africa, Lesotho and Swaziland. These are the African Marsh Harrier, Barrow's Korhaan, Blackbellied Bustard, Blackwinged Lapwing, Blackwinged Pratincole, Blue Crane, Blue Korhaan, Corn Crake, African Grass Owl, Grey-crowned Crane, Lanner Falcon, Lesser Kestrel, Pallid Harrier, Secretarybird, Southern Bald Ibis, Denham's (Stanley's) Bustard and the Yellowbreasted Pipit. It is concluded that the site contains habitat that is suitable for various bird species, many of which are of conservation concern. It is possible that some of these species are likely to be significantly negatively impacted by development of mining on site. Two species of concern were seen on site, namely the Southern Bald Ibis and the Secretarybird.

The site is not within an Important Bird Area (IBA), but there are three IBAs within relatively close proximity to the site, namely the Steenkampsberg IBA, 20 km to the north of the site, the Chrissie Pans IBA, 20 km to the south of the site, and the Amersfoort-Bethal-Carolina District IBA, 8 km to the south-east of the site. The general region is therefore probably important with respect to bird biodiversity.

The Amersfoort-Bethal-Carolina District IBA is the one that most closely matches the study area in terms of physical attributes and consists of a combination of grasslands, streams, pans, rocky slopes, gulleys and ravines. This site holds a large proportion of the global population of Botha's Lark (*Spizocorys fringillaris*). The grassland areas also hold Denham's Bustard (*Neotis denhami*), White-bellied Bustard (*Eupodotis senegalensis*), Buff-streaked Chat (*Saxicola bifasciata*), Sentinel Rock Thrush (*Monticola explorator*) and Southern Bald Ibis (*Geronticus calvus*). The Lesser Kestrel (*Falco naumanni*), Black-winged Pratincole (*Glareola nordmanni*) and (less frequently) Pallid Harrier (*Circus macrourus*) can be seen quartering the grasslands. Occasionally, all of South Africa's crane species can be found in the grasslands or cropfields within the site (BirdLife International 2015).

The main threats to birds and their habitats in this IBA have been identified and include agriculture, alien species invasions, habitat transformation, pollution, residential and commercial development and utilities.

There are sensitive biodiversity receptors within the study area, however none of these will be negatively impacted by the proposed project. This is due to the fact that there will be no surface

disturbance of the site (only underground mining to be undertaken). No further studies are recommended.

9.9. SURFACE WATER

Surface water resources includes rivers, streams, drainage lines, flow paths of storm water runoff, as well as water collection and channelling through the use of irrigation furrows, canal, channels, and dams. Mining activities have the potential to alter surface water drainage patterns through actual mining methods employed as well as the placement of infrastructure. In addition, these activities also have the potential to result in the pollution and/or contamination of surface water resources through geological exposure, seepage, spillages and waste streams both mineralised and non-mineralised. A baseline surface water report was completed by Digby Wells in 2005 prior to the commencement of mining. The information below has largely been extracted from this report. For further information, please refer to the full surface water scoping report which is included in Appendix 1.

9.9.1. WATER MANAGEMENT AREA

Pembani falls within the X11 and X12 sub-catchments of the Eastern Escarpment primary drainage region. Affected water courses include tributaries to the Boesmanspruit, the Swartwaterspruit and the Buffelspruit as well as the stream that drains to the Transnet dam adjacent to Carolina. Drainage is predominantly to the north and east towards the Komati River. Figure 47 below indicates the relevant catchment areas and the location of the mining areas, while Figure indicates all the surface water bodies in relation to the mining areas. Figures indicate the surface water catchment boundaries and floodlines.

9.9.1.1. MEAN ANNUAL RUNOFF

The surface water report indicates the streams that could be affected by the opencast mining and their relevant catchment areas. The annual runoff for these eight (8) affected streams was determined using the quaternary catchment information for the WRC Report No 298/6.1/94 volume VI. These are summarised in Table 23 below.

Table 23: Mean annual run-off

Area	Stream No.	Catchment (km ²)	MAR (Million m ³)	Tributary to Major Stream	Quaternary Catchment
Appeldoorn 38 IT and Haarlem 39 IT	Stream 1	0.788	0.41	Buffelspruit	X12A
Haarlem 39 IT	Stream 2	1.069	0.105	Swartwaterspruit	X11E
Groenvallei 40 IT	Stream 3	5.238	0.23	Boesmanspruit	X11B
Groenvallei 40 IT, Zandvoort 10 IT	Stream 8	1.263	0.055	Boesmanspruit	X11B
Groenvallei 40 IT and Paardeplaats 12 IT	Stream 4	5.8	0.255	Boesmanspruit	X11B
Twyfelaar 11 IT, Zandvoort 10 IT	Stream 5	0.663	0.065	Swartwaterspruit	X11E
Twyfelaar 11 IT	Stream 6	0.133	0.013	Swartwaterspruit	X11E
Twyfelaar 11 IT	Stream 7	0.969	0.095	Swartwaterspruit	X11E

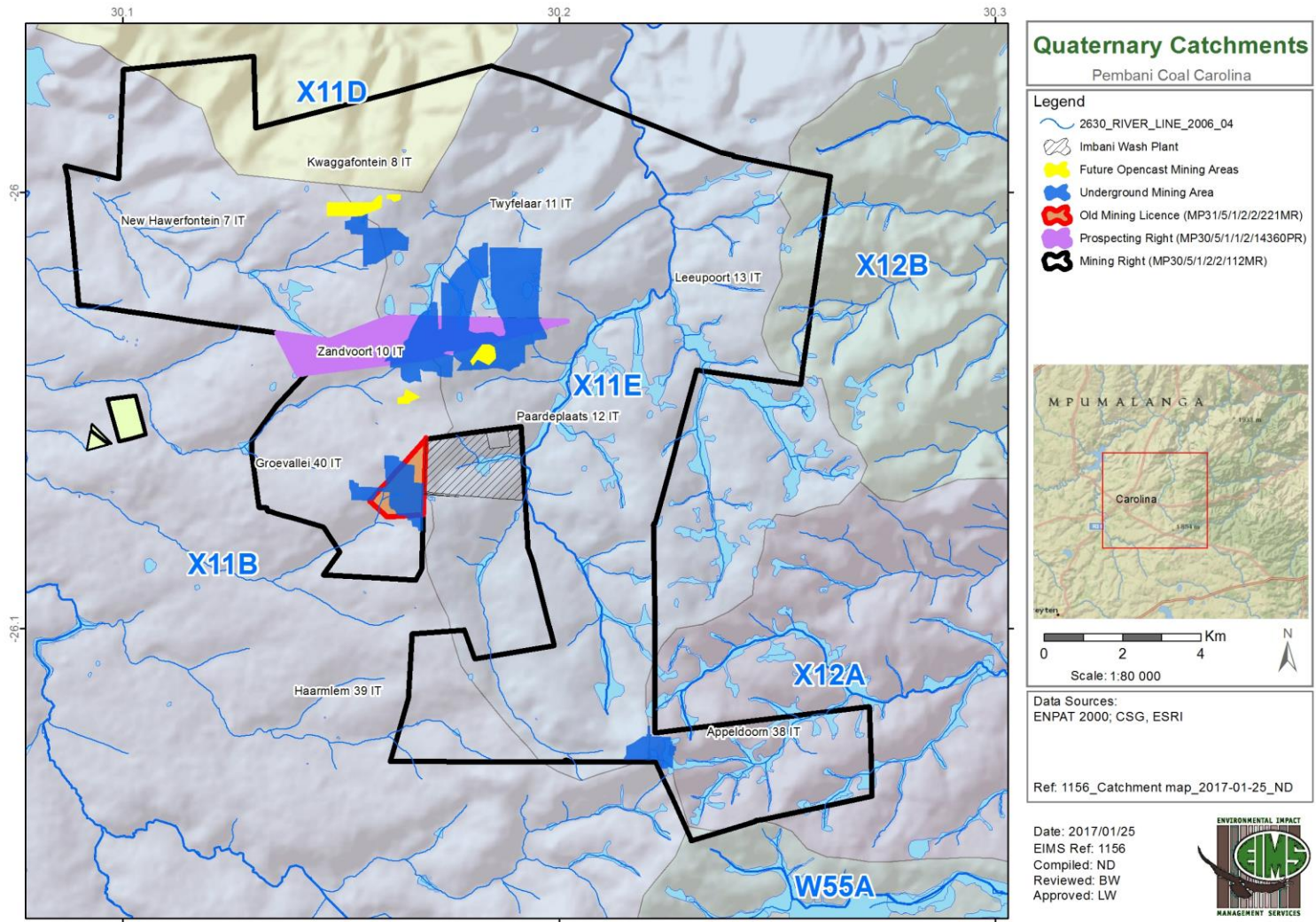
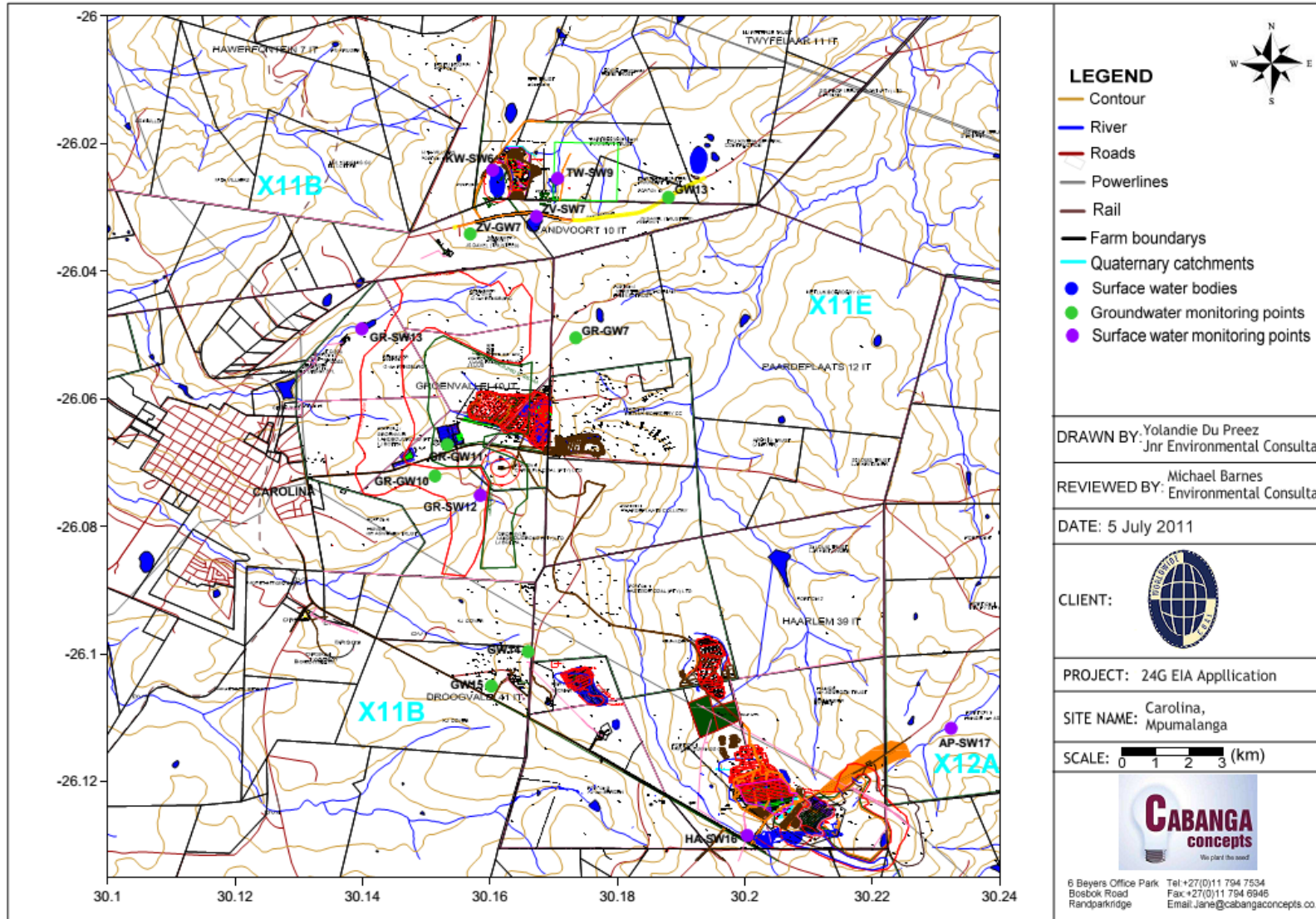
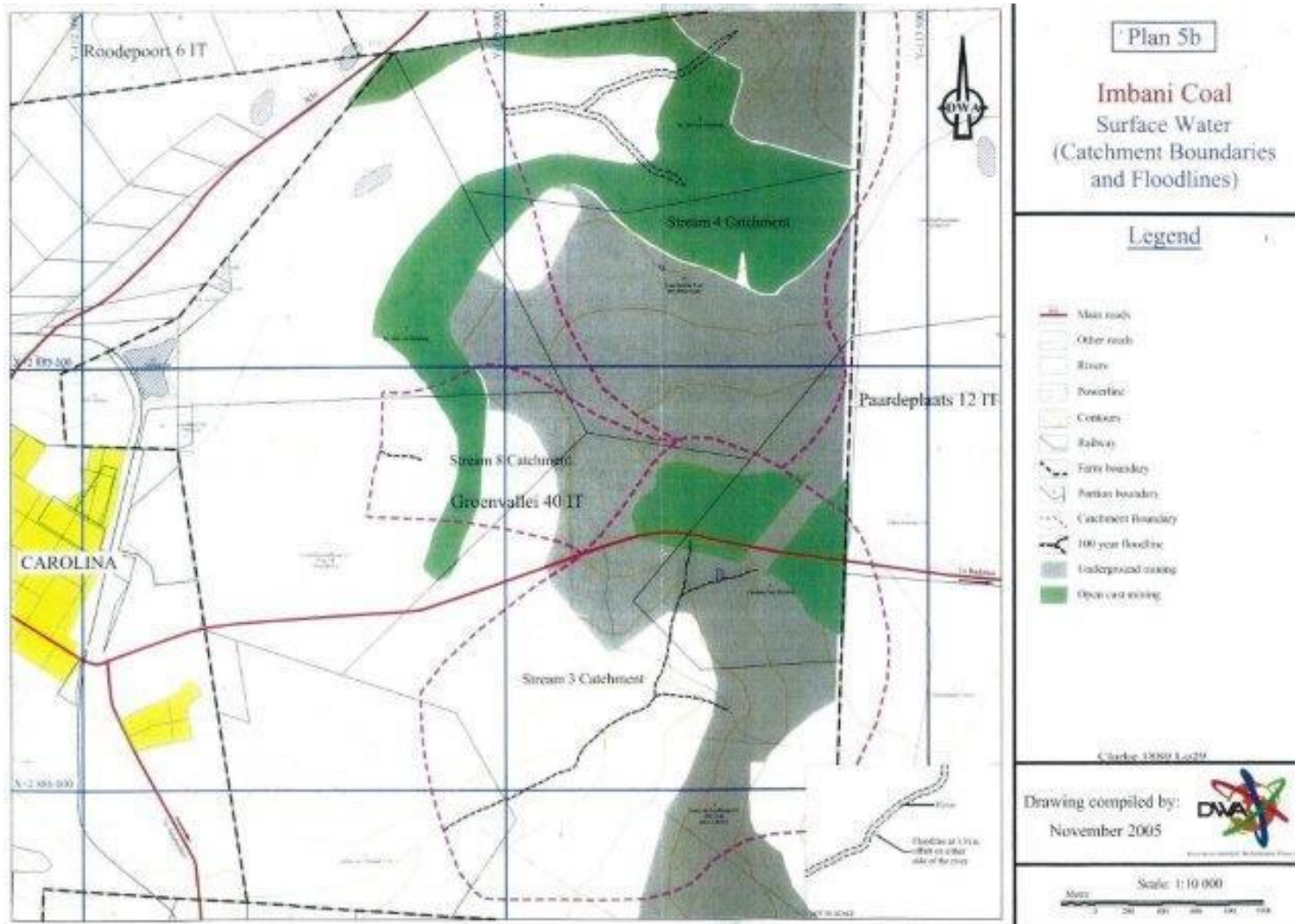
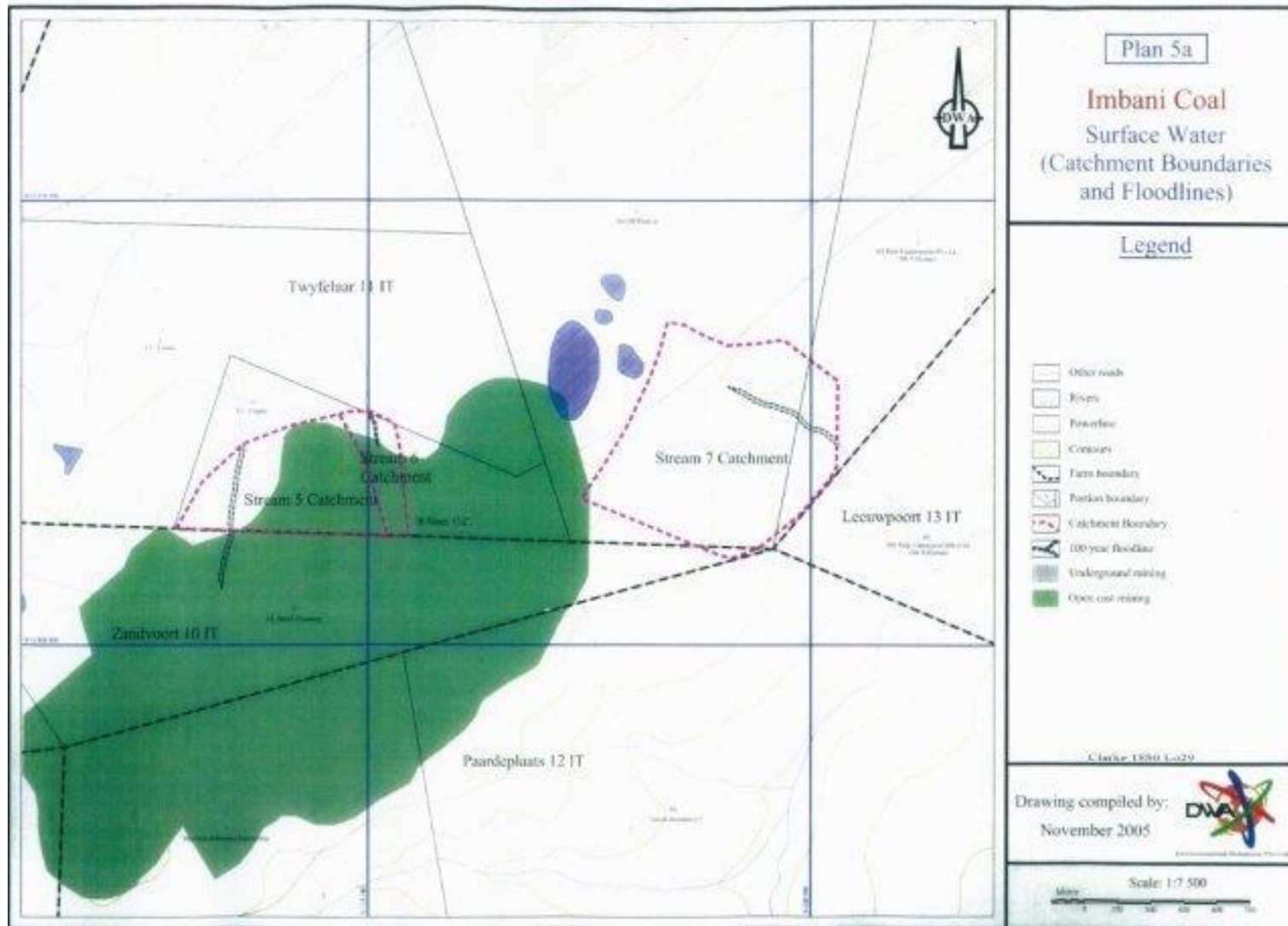


Figure 47: Catchment Areas







9.9.1.2. NORMAL DRY FLOW

Due to the fact that most of the streams are situated very close to the watersheds of their relevant catchments, no flow is expected during the dry season.

9.9.1.2.1. FLOOD PEAKS

Flood peaks were determined for affected streams using the Rational Method. These are summarised in Table 24 below.

Table 24: Flood peak flows at recurrence intervals based on years

Floods in (m ³ /s)	1:50	1:100
Stream 1	18.29	23.67
Stream 2	25.24	32.66
Stream 3	41.65	51.44
Stream 4	51.58	63.68
Stream 5	9.72	11.83
Stream 6	3.137	4.078
Stream 7	22.023	28.14
Stream 8	24.62	30.775

9.9.1.3. SURFACE WATER QUALITY

Pembani has an established surface water monitoring programme in place since March 2010, although sporadic sampling was also conducted prior to this.

Previously five up gradient sample sites' (PA-SW10, GR-SW13, HA-SW16, AP-SW17, and SS-SW20) water quality data over a year's period was averaged in order to obtain the Background Water Quality Limits. It must be noted that the Background Water Quality Limits are far more stringent than the SANS 241-1:2011 Drinking Water Standards, but are meant to represent up gradient surface water qualities in the area.

The water monitoring programme now consists of 30 surface water monitoring sites. Surface water monitoring sites include surrounding rivers, dams and pans. The surface water points are sampled on a monthly basis. The monitoring points can be seen in Figure 48 below.

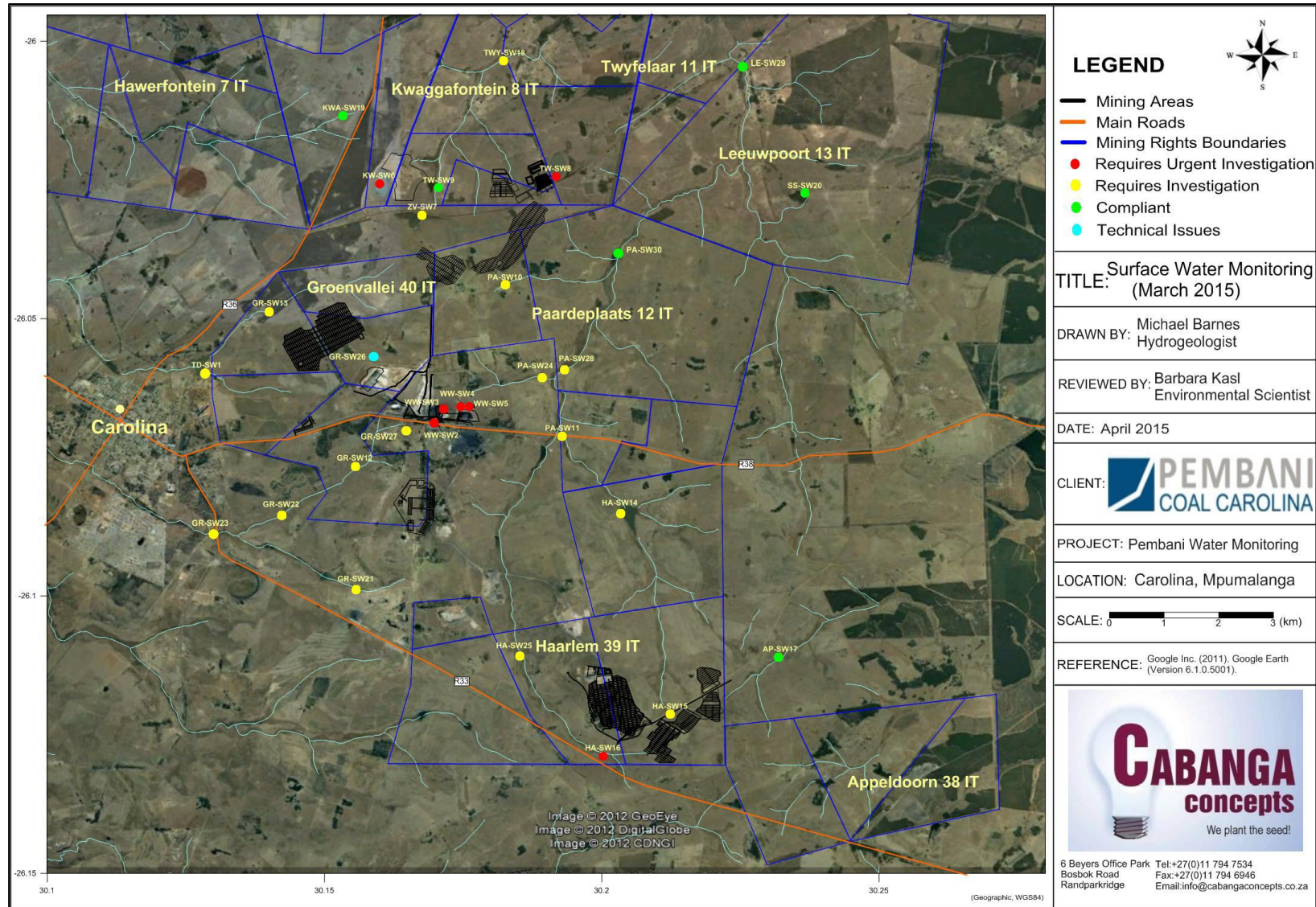


Figure 48: Surface water monitoring points.

Water samples were compared to the SANS 241-1:2011 Drinking Water Standards and Background Water Quality Limits (upgradient water sampling points). In several of the surface water samples (both up and down gradient) there were elevated concentrations of metals, namely iron and aluminium. The elevated concentration of iron and aluminium in the water is a result of water-rock interactions. This is a natural process and in many instances not related to mining. Sulphate concentrations in several of the samples exceed the SANS Drinking Water Standards. Several samples indicate water quality deterioration from mining operations in the area other than the Pembani Colliery.

9.9.1.4. RECEIVING WATER QUALITY OBJECTIVES AND RESERVES

A study to determine the Water Resource Classes and Associated Resource Quality Objectives in the Inkomati Water Management Area has been conducted by the IUCMA.

The Swartspruit and Buffelspruit carry a Mpumalanga Highlands 1 river signature, which has a conservation status of Endangered, while the Boesmanspruit carries a Highveld 2 river signature with a Critically Endangered status (Nel *et al.*, 2004). According to National Freshwater Ecosystem Priority Areas (NFEPA - Nel *et al.*, 2011) both the Buffelspruit and the Boesmanspruit systems have a PES in a C-category, which translates to a Moderately Modified system. With regards to the associated quaternary catchments and sub-quaternary catchments the desktop PES in 2011 (DWA, 2011) was in a C-category, which implies a Moderately Modified ecosystem state (DWAF, 2000). The sub-quaternary reaches in the study area all showed High and Very High Ecological Importance (EI) and Ecological Sensitivity (ES). The high scores for EI and ES are attributed to the general sensitivity aquatic and riparian communities in the reaches (flow and water quality).

Sites on the Swartspruit (SS1 and SS3) and the associated tributaries (TS1 and TS2) are located in the Freshwater Ecosystem Priority Area (FEPA). These systems were identified as being in a Good condition (NFEPA – Nel *et al.*, 2011) and therefore need to be maintained in order to contribute to the biodiversity of the area. Concurrently, site BS1 (Buffelspruit catchment) is located in an Upstream Management Area. Anthropogenic activities taking place in these areas need to be monitored in order to prevent the degradation of FEPA's and Fish Support Areas located downstream. Sites TB1 and TB2, tributaries of the Boesmanspruit, are located in a Fish Support Area (Nel *et al.*, 2011). According to Nel *et al.* (2011), fish sanctuaries for rivers in a good condition (A or B ecological category) were identified as FEPAs, whereas the remaining fish sanctuaries associated with rivers with an ecological condition lower than an A or B were identified as Fish Support Areas.

9.9.2. SURFACE WATER USE

Surface water use in the area includes livestock watering, irrigation for crops and forestry and water supply for mining activities and domestic consumption. There are several registered users of water in the area.

9.10. WETLANDS

Wetlands are considered to be sensitive landscapes. A wetland delineation study was conducted by S.E.F. in September 2011 (Appendix J). The sections below have been extracted from this report and detail the findings of the study.

Certain portions of the farm Appeldoorn 38 IT, which border the mining right area, have recently been declared as protected (Notice 19 of 2014, Mpumalanga Tourism and Parks Agency, Declaration of the Chrissiesmeer Protected Environment in terms of the National Environmental Management: Protected Areas Act, 2003 (Act No. 57 of 2003) as amended).

The Mining Right area wetlands are classified as National Freshwater Ecosystem Priority Areas (NFEPA), which are wetlands containing special features such as species of conservation concern or extensive peat wetlands. The wetlands identified on site have the following key sensitivities:

- Boesmanspruit catchment is identified as a Fish Support Area for threatened fish species (i.e. fish sanctuary, translocation, and/or relocation zone not in Present Ecological State Class A or B), in this case a specific genetic lineage of *Barbus anoplus* (Chubbyhead Barb);
- Swartspruit catchment is identified as a Freshwater Ecosystem Priority Area and accordingly needs to stay in a good condition (i.e. Present Ecological State Class A or B) in order to achieve national biodiversity goals and protect water resources for human use; and
- Buffelspruit catchment is identified as an upstream management catchment required to prevent the downstream degradation of Freshwater Ecosystem Priority Areas and Fish Support Areas.

The largest portion of the Mining Right is considered to be highly significant in terms of the Mpumalanga Biodiversity Conservation Plan with one area considered to be irreplaceable (Figure 49).

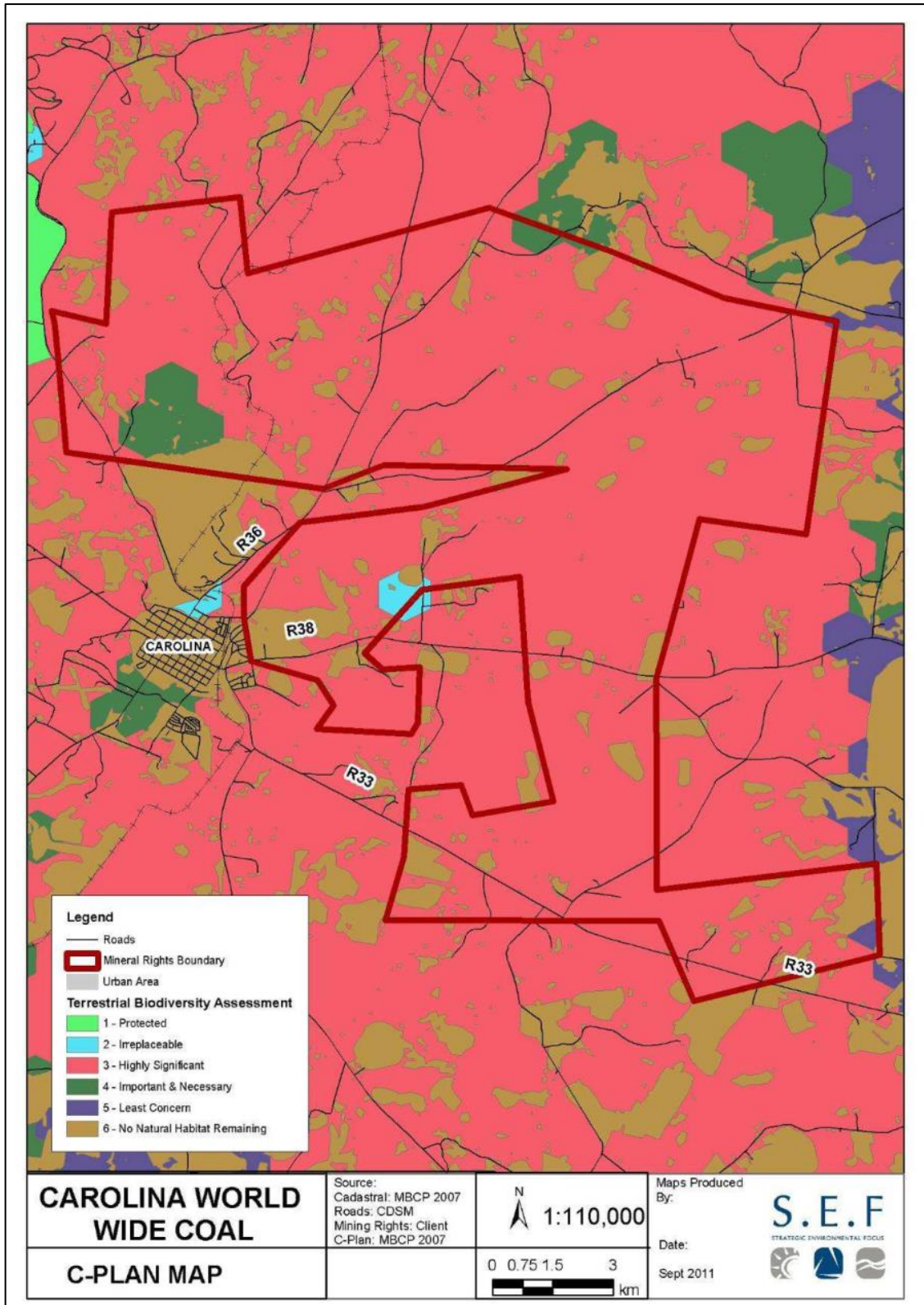


Figure 49: Mpumalanga Conservation Plan for the Mining Right

Wetlands typically occur on the interface between aquatic and terrestrial habitats and, therefore, display a gradient of wetness – from permanent, to seasonal, to temporary zones of wetness - which is represented in their plant species composition, as well as their soil characteristics. It is important to take

cognisance of the fact that not all wetlands have visible surface water. An area which has a high water table just below the surface of the soil is also a wetland, as well as a pan that only contains water for a few weeks during the year. Hydrophytes and hydric soils are subsequently used as the two main wetland indicators.

Hydro-geomorphic (HGM) units encompass three key elements (Kotze *et al.*, 2005 in SEF, 2011):

- Geomorphic setting. This refers to the landform, its position in the landscape and how it evolved (e.g. through the deposition of river borne sediment);
- Water source. There are usually several sources, although their relative contributions will vary amongst wetlands, including precipitation, groundwater flow, stream flow, etc.; and
- Hydrodynamics, which refers to how water moves through the wetland.

Five different types of wetland areas were classified within the study area and were categorised HGM units. A total of a 147 separate HGM units were identified and classified within the study area, and are presented graphically in Figure 50. These included 11 valley bottom wetlands with a channel, 2 valley bottom wetlands without a channel, 45 hillslope seepage wetlands not feeding a watercourse, 80 hillslope seepage wetlands feeding a watercourse (including 25 valley head seepages) and 9 depression wetlands. Altogether, delineated wetlands occupy approximately 4,781 ha within the study area.

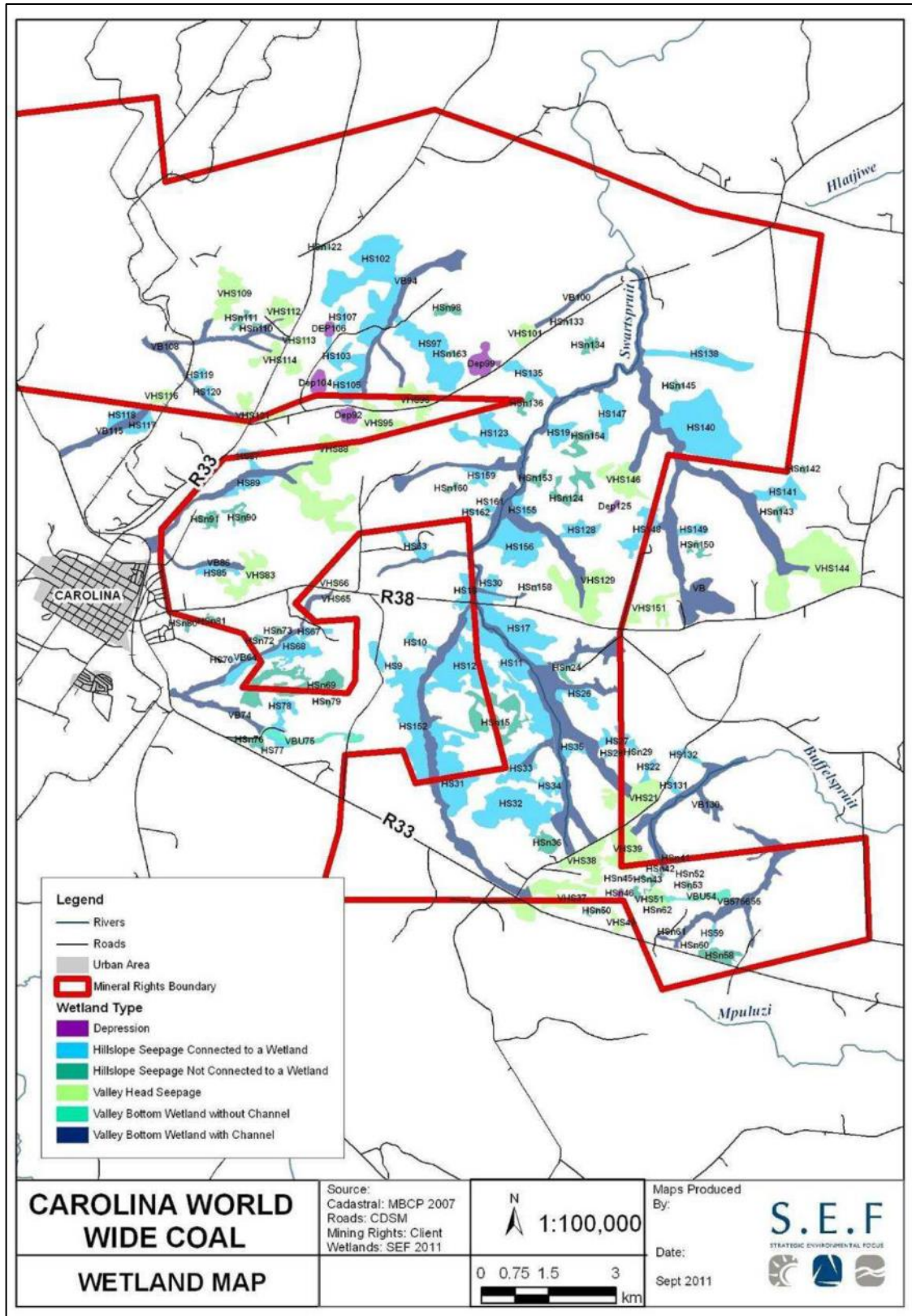


Figure 50: Identified Wetland types within the Mining Right

The wetland delineation study included a high level assessment on the Present Ecological State (PES) of the area. This study indicated that the PES for the various wetlands varied and included examples

of all the possible PES categories. Figure 51 below indicates the PES score for selected wetlands within the mining right area, whilst Table 25 interprets the ratings thereof.

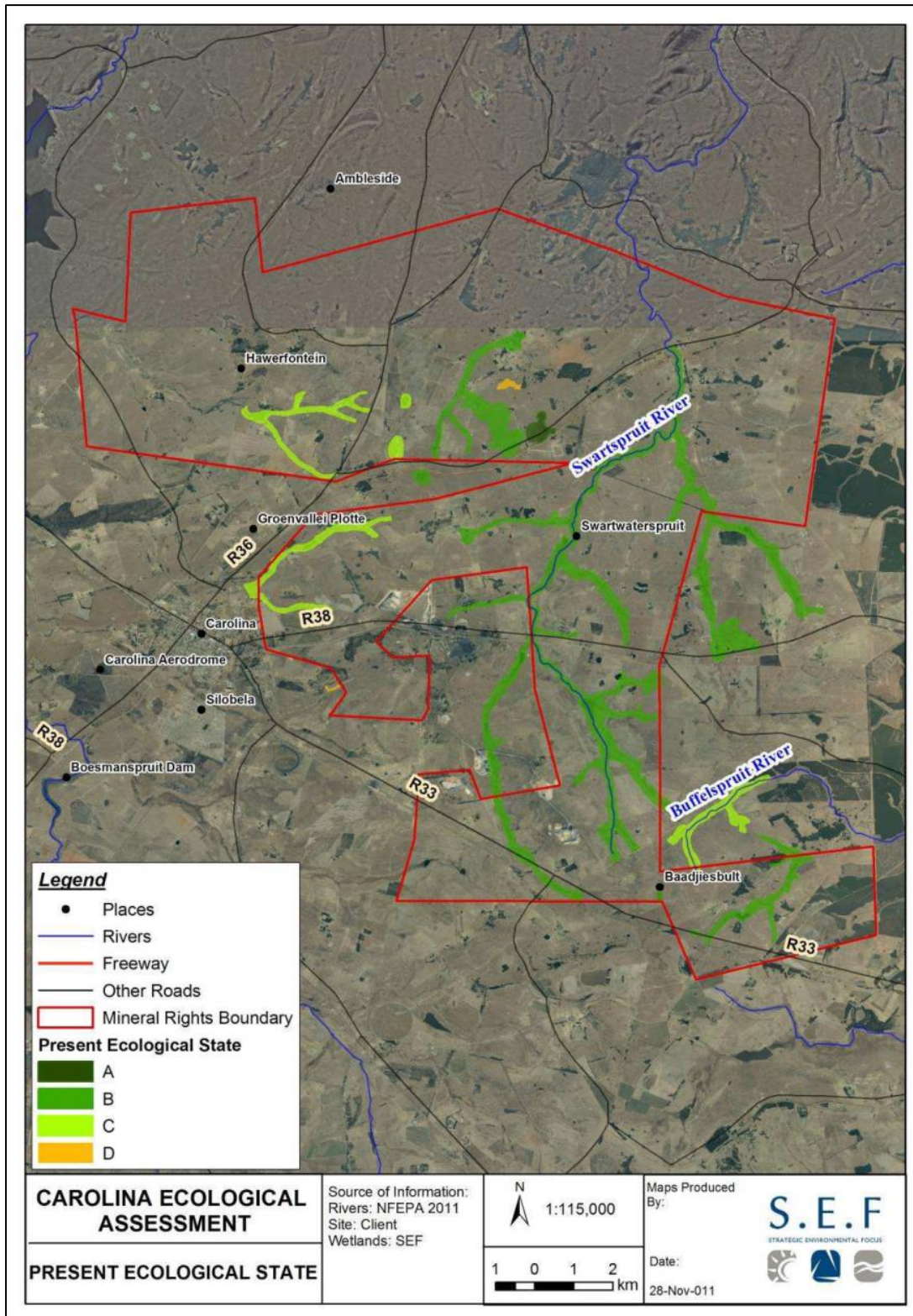


Figure 51: Present Ecological State of wetland within the Mining Right

Table 25: Interpretation of PES status category

Class	Ecological category	Description
A	Natural	Unmodified state - Un-impacted state, conditions natural
B	Good	Largely natural - Few modifications, mostly natural
C	Fair	Moderately modified - Community modifications, some impairment of river health
D	Poor	Largely modified - Distinct impairment of river health, impacted state
E	Seriously modified	Seriously modified - Most community characteristics modified, seriously impacted state
F	Critically modified	Critically modified - Extremely low species diversity and abundance, unaccepted modified state

From a preliminary perspective, PES for wetlands within the Mining Right varied greatly (Figure 51), with examples of all possible PES categories observed within the Mining Right. The PES of most of the valley bottom wetlands are classified as PES category C, moderately modified, with isolated hillslope seepages showing more variance, a likely result of exposure to divergent management regimes on different properties. Heavy grazing regimes and cultivation practices within wetland catchments was perceived to be the biggest modifiers of hydrology and water quality. From a geomorphic perspective the largest impacts within wetlands was as a result of placement of impoundments (dams) throughout valley bottom systems as well as within hillslope seepages. The concentrated outlets / overflows from impoundments often cause unchanneled valley bottoms to become incised, changing them to channelled valley bottom systems with accompanied changes in wetland functionality. From a preliminary perspective, most of the valley bottom systems seems to have reached some form of equilibrium again with erosion processes stabilised to some extent, probably as a result of deposition of sediments mobilised from sheet erosion within heavily grazed or cultivated areas

9.10.1. RESOURCE CLASS AND RIVER HEALTH

Pembani has an established bi-annual biomonitoring program in place. At the time of the study, the latest survey was conducted in October 2014, at eight (8) sampling locations (Figure 52).

Site BS1 is located on the Buffelspruit, approximately 9 km from its origin, with sites SS1 and SS3 associated with the Swartspruit catchment. Five additional sites were strategically selected and included in 2013: two sites on tributaries of the Boesmanspruit (TB1 and TB2), two on tributaries of the Swartspruit (TS1 and TS2) and an additional site in the upper reaches of the Swartspruit (SS0).

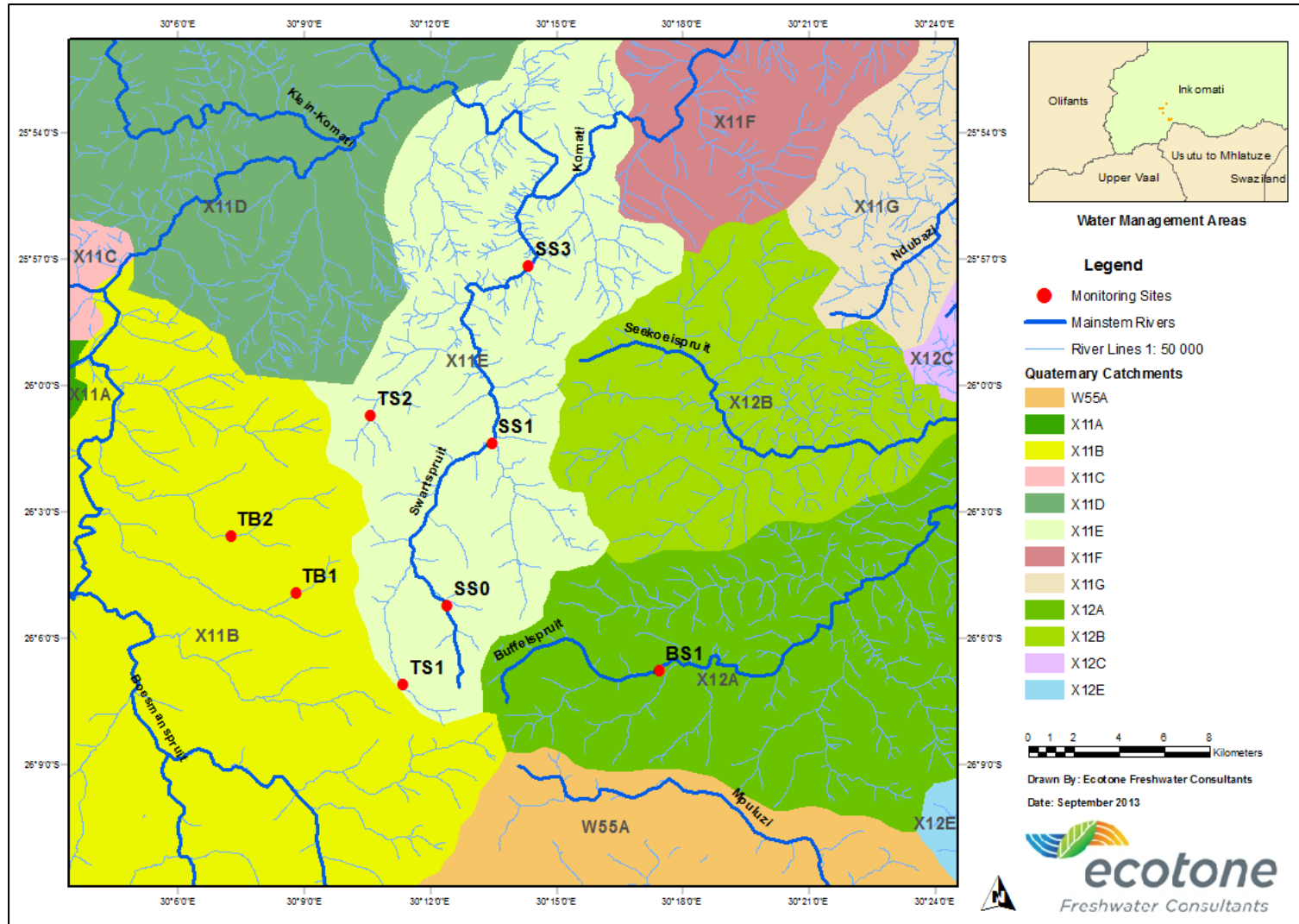


Figure 52: Biomonitoring sample locations in comparison to the catchment and water management areas (Ecotone, 2014)

9.11. GROUNDWATER

Groundwater is defined as water located beneath the ground surface in lithological formations. Mining activities have the potential to impact on ground water resources through potential pollution and/or contamination as a result of activities such as the actual mining method employed and resultant geological exposure of oxidising materials, seepage, spillages and both mineralised and non-mineralised waste streams. Additional impacts related to mining activities also include dewatering cones of depression and loss of water supply to surrounding land users.

9.11.1. AQUIFER CHARACTERISATION

Two aquifers occur in the area. These two aquifers are associated with a) the upper weathered material, and b) the underlying competent and fractured rock material.

Upper weathered material aquifer

The upper aquifer forms due to the vertical infiltration of recharging rainfall through the weathered material being retarded by the lower permeability of the underlying competent rock material. Groundwater collecting above the weathered / unweathered material contact migrates down gradient along the contact to lower lying areas. In places where the contact is near surface the groundwater can daylight on surface as springs or seepage into the various perennial and non-perennial pans that exist in the study area. Shallow seepage also contributes baseflow to the rivers and streams that occur in the area.

Exploration drilling logs from 607 boreholes show that the upper aquifer has an average depth of approximately 6.95 m, and can range between 1.5 and 26 m in thickness. These minimum and maximum values are not absolute values for the entire study area. Lesser thicknesses can occur at the numerous springs that occur in the area where daylighting of groundwater is evident and near the Swartwaterspruit and its many tributaries that drain the study area. Deeper weathering can also occur in higher lying areas, and in zones associated with fracturing. However, the mentioned values are considered to provide a good general indication of the site conditions.

It is considered that effectively 3 % of the mean annual rainfall eventually reaches the groundwater table in the form of recharge to the aquifers. No aquifer tests were done that specifically targeted this aquifer, however, previous experience in similar environments in the Witbank Coal Fields show that typical transmissivity values for this aquifer range between 0.5 and 2 m²/day.

Lower fractured rock aquifer

Although the lower permeability unweathered rock material will retard vertical infiltration of groundwater a percentage of the water in the upper aquifer will recharge the lower aquifer. Direct recharge from rainfall can occur along the banks of the Swartwaterspruit and Boesmanspruit and their various tributaries where the fractured, competent rock outcrops. In areas where the stream base is located directly on top of the competent rock the aquifer can be directly recharged from the surface water bodies.

The competent rock is subjected to fracturing associated with tectonic movements that took place during intrusion of the dolerite dykes into the older Karoo aged sandstone and shale. Groundwater flows in the lower aquifer are associated with the secondary fracturing in the competent rock and as such will be along discrete pathways associated with the fractures. Faults and fractures in the sandstone and shale can be a significant source of groundwater depending on whether the fractures have been filled with secondary mineralisation.

The transmissivities of the aquifer was characterised through aquifer testing. In summary it can be said that the general transmissivity of this aquifer ranges between 0.1 and 5 m²/day. Fracture zones can have transmissivities of up to 10 to 15 m²/day as can be seen from the GCS study that was done in 2008. These values are typical of the area and general geology.

Aquifer Classification

The general regional aquifer is classified as a minor aquifer, but of high importance to the local landowners as it is their only source of water.

Groundwater zone

The proposed mining area is situated on Karoo aquifers. Aquifer yields are typically low but groundwater is often considered to be vital as a water resource for domestic and stock watering. The perched aquifer is poorly developed in the Mining Right and may be regarded as the only possible primary type aquifer. This aquifer will only manifest during the wetter summer months when significant seepage in the shallow weathered zone occurs.

A number of dykes, sills and fracture zones exist within the mining areas. All significant groundwater strikes, indicating the presence of aquifers, occurred in fractures or fracture zones caused by faulting, bedding plane fractures or small discontinuity fractures developed on hard rock/soft rock interfaces or in unweathered bedrock. The aquifer yields are low, indicating poor fracture development, even in the dolerite sills. Information indicates that these fractures and the shallow parts of the dykes are water-bearing and that, with increasing depths, the dykes tend to be less permeable. The thicker dykes may also act as barriers to groundwater through-flow, resulting in the compartmentalization of the local groundwater systems. Based on the previous findings of the borehole drilled and tested, the following conclusion can be made:

- The borehole yields are generally low (< 0.1m³/h);
- The aquifer permeability decreases with depth.

9.11.2. GROUNDWATER USE

Groundwater forms the sole source of water supply to the local landowners. Groundwater is abstracted through boreholes, windmill, and hand pumps for domestic and stock watering. Abstraction values could only be obtained from 26 boreholes, however a total of 42 boreholes are being actively used. Abstraction volumes from the 26 boreholes, identified during the hydrocensus, are calculated around 50 m³ of water used daily. The average abstraction rate is 2 m³ of water each day. If this average

volume is applied to the 16 unknown abstraction volumes then the total abstraction rate for the area is 82 m³ of water daily.

The sub-catchments within which the study area falls measure approximately 1,083 km². Applying an average rainfall of 744 mm/annum, as obtained from the Pembani Colliery IWWMP (Cabanga Concepts, 2015), and an average recharge from rainfall of 3 %, it is calculated that the average annual recharge to the sub-catchments from rainfall is 24.17Mm³ per annum (67 146 m³/day). It can thus be calculated that less than 1 % of the recharged water is abstracted for private and stock watering use.

9.11.3. GROUNDWATER QUALITY

Pembani has an established groundwater monitoring programme in place. In total 44 groundwater points are monitored on a quarterly basis, of these 26 points are boreholes whilst 18 points are springs. Figure 53 illustrates the location of the various groundwater monitoring points.

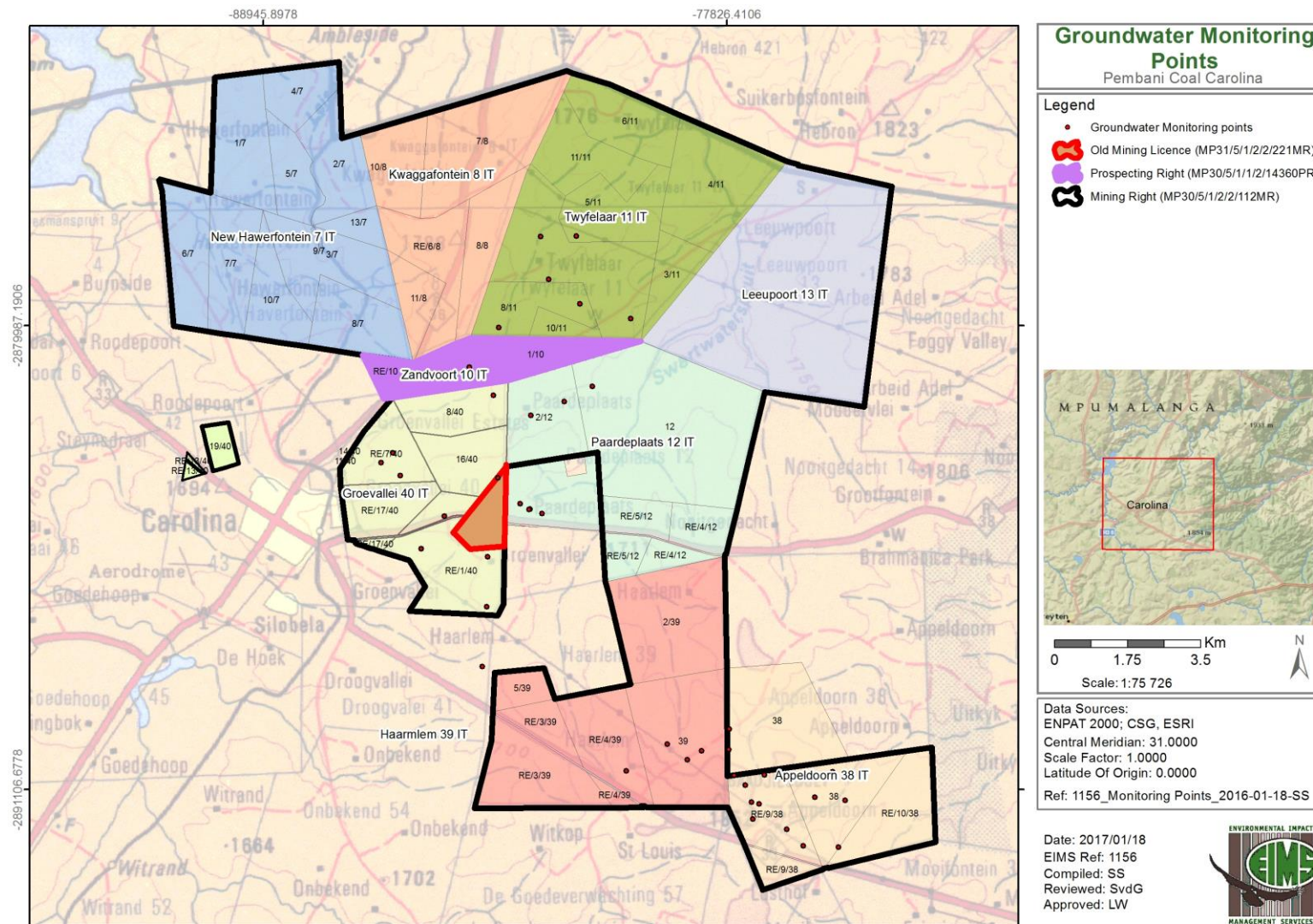


Figure 53: Groundwater monitoring points

In several of the groundwater samples (both up and down gradient) there were elevated concentrations of metals, namely iron and aluminium. The elevated concentration of iron and aluminium in the water is a result of water-rock interactions. This is a natural process and in many instances not related to mining. Sulphate concentrations in several of the samples exceed the SANS Drinking Water Standards. Several samples indicate water quality deterioration from mining operations in the area other than the Pembani Colliery.

9.11.4. HYDROCENSUS

The depth to groundwater level in the area was measured during the hydrocensus. A total of 113 boreholes were visited and a further 34 springs were recorded where the groundwater level can be accepted to be at surface. From the 113 visited boreholes the depth to groundwater level was measured in 73 boreholes with the other boreholes being closed by various means which prevented the depth to groundwater level to be measured. The boreholes are usually closed due to the equipment installed in the boreholes.

The average depth to groundwater level is calculated to be 6.3 m. A 98 % correlation is achieved when plotting topographical versus groundwater level elevations. From The regional groundwater level in the area vary from approximately 5 meters below surface in the topographically lower lying areas to a maximum of approximately 22 meters below natural ground level. Deeper groundwater levels, in the form of large troughs, prevail in close proximity and below the plantations (JCI, 1997). These levels extend to 30m below the natural ground level.

The depth to groundwater level in the area was measured during the hydrocensus. A total of 81 boreholes were visited and a further 15 springs were recorded where the groundwater level can be accepted to be at surface. From the 81 visited boreholes the depth to groundwater level was measured in 58 boreholes with the other boreholes being closed by various means which prevented the depth to groundwater level to be measured. The boreholes are usually closed due to the equipment installed in the boreholes.

The depth to groundwater level in general ranges between artesian (at or above surface) and 34 m below surface. The majority of groundwater depths are recorded at less than 7 mbgl. Plotting the groundwater level elevation against topography normally indicates areas where external influences such as large scale mine dewatering influences the groundwater levels. A 96 % correlation is achieved for the aquifer. From this it is concluded that the groundwater levels mimic topography and is largely un-influenced by mining activities in the area.

Groundwater flow directions are directed towards the low lying surface water channels (Figure 55). Calculations show that based on the available data the groundwater gradient range between 1:300 in the high lying plateau areas to 1:50 along the slopes around the streams.

A hydrocensus was conducted and completed during July 2004 and 2012. Several groundwater users were identified. The hydrocensus found thirty boreholes and twenty three springs on the proposed affected properties. The information from this survey is presented in Table 26. The yields of boreholes were reported by farmers and are in the range of 1 000 l/d to 20 000 l/d,

hence possible future irrigation (small scale) in the area. According to Hogdson and Krants 1998, the weathered aquifer yields are generally between 100 and 2 000 l/hr (0.0002 and 0.55 l/s) and the fractured aquifer has a mean yield of 0.35 l/s. The information obtained from the farmers, therefore, implies an overestimation of yields from the relevant boreholes.

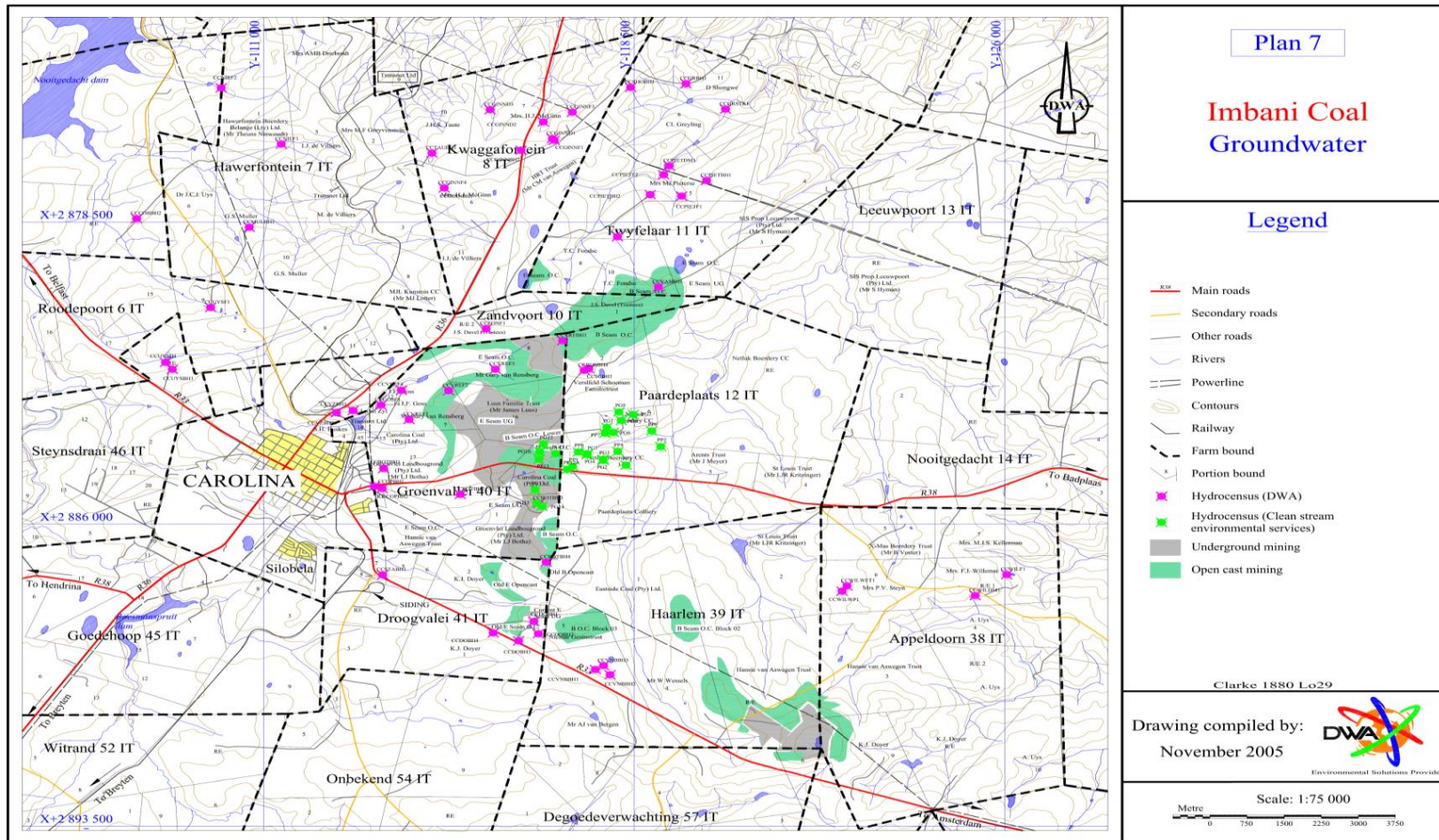


Figure 54: Groundwater hydrocensus borehole locations

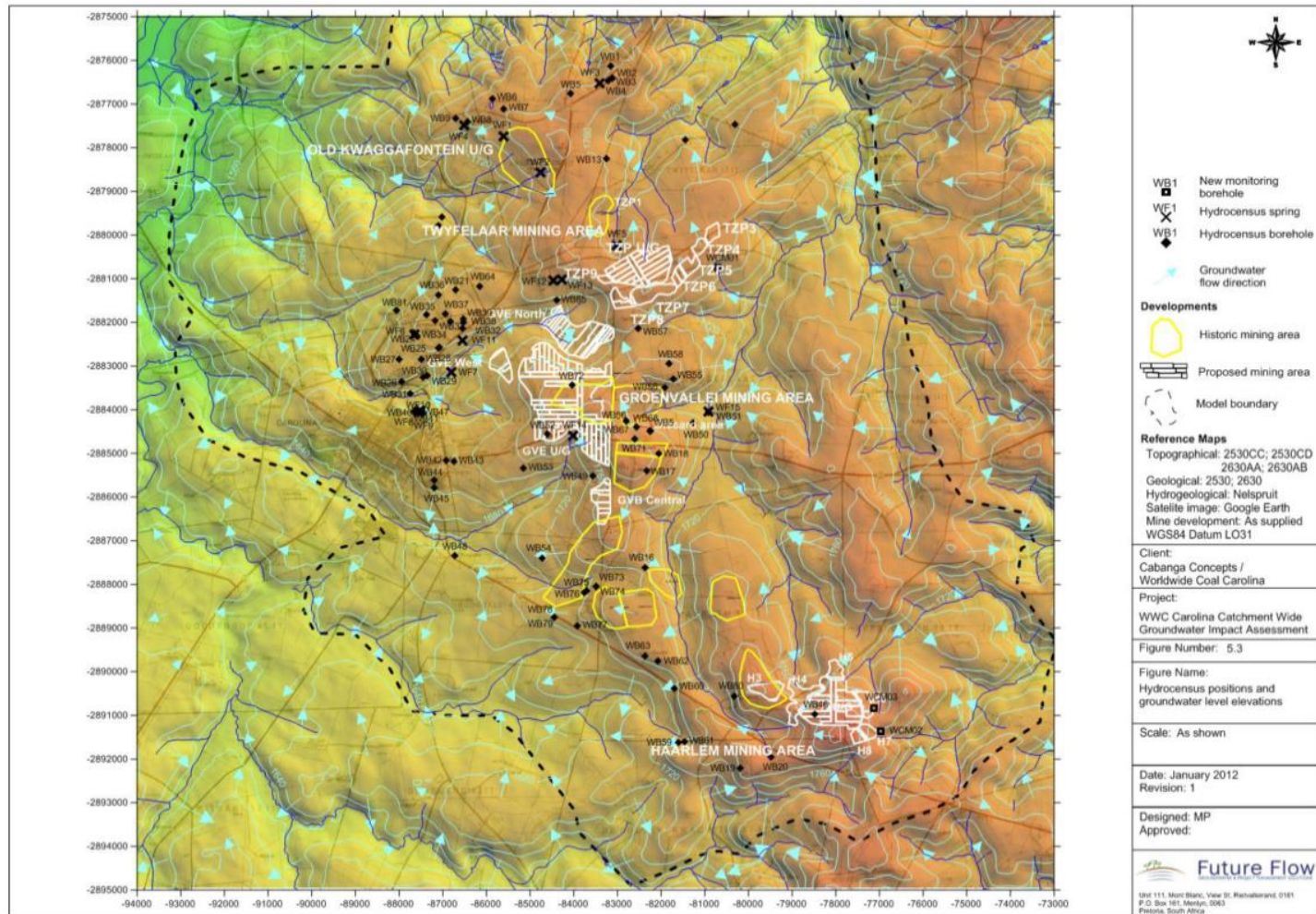


Figure 55: Ground water flow direction

Table 26: Hydrocensus Results

X	Y	Z	Name	Water level	PH	Use	Volume	Sample ID	Casing Stickup	BH Depth	Registered Water User	Abstraction Rate
-86703.504	-2884416.978	1632 m	CCBOTBH1			Domestic	1000/d	CCGV026GW	0.2m			
-85142.318	-2885034.901	1659 m	CCBOTBH2			Domestic	500/d	CCGV027GW	0.1m			
-83547.960	-2885231.776	1680 m	CCBOTBH3			Domestic	1000/d	CCGV028GW	0.35m			
-83380.521	-2886690.973	1721 m	CCBOTBH4	12.9 m		Domestic		CCGV029GW	0.85m		Yes	
-82684.368	-2881916.862	1637 m	CCBUSBH4			Domestic		CCGV023GW	0.42m		No	
-90203.538	-2870270.018	1402 m	CCCOBBH1		7	Domestic	1000/d	CCNG008GW	0m			500/h
-91792.345	-2878289.309	1464 m	CCCOBBH2		7.3	Domestic + Chickens		CCBN009GW	0.27m		No	2000/h
-83605.181	-2888167.088	1665 m	CCDOBH1		7	Domestic	700/d	CCDG003GW	0.22m			
-83511.190	-2888471.171	1657 m	CCDOBH2		7.1	Domestic	700/d	CCDG003GW	0.5m			
-83908.193	-2888652.102	1641 m	CCDOBH3	6.5m		Test Pit			0.27m	20m	Yes	
-84424.625	-2888463.764	1640 m	CCDOBH4	1.8m	7.2	Test Pit		CCDG004GW	0.26m	20m		
-84683.715	-2880913.693	1700 m	CCFONF1		6.3	Domestic	500/d	CCZV016GW			No	
-85584.375	-2877433.984	1759 m	CCGINNBH1		6.6	Domestic			0.15m			
-84044.587	-2876472.288	1765 m	CCGINNBH2			Domestic	50/d		0.2m	20m		

X	Y	Z	Name	Water level	PH	Use	Volume	Sample ID	Casing Stickup	BH Depth	Registered Water User	Abstraction Rate
-83414.630	-2876175.764	1759 m	CCGINND1	0m	6.9	Live stock watering						
-83603.508	-2875764.819	1720 m	CCGINND2	0m	7.1	Live stock watering						
-84684.877	-2875477.060	1712 m	CCGINND3	0m	5.1	Bass Dam						
-83376.311	-2876217.621	1764 m	CCGINNF1	0m	7.2	Domestic						
-83019.282	-2875514.033	1744 m	CCGINNF3	0m	7	Live stock watering						
-85584.375	-2877433.984	1752 m	CCGINNF4	0m	7	Live stock watering						
-86779.018	-2882843.083	1637 m	CCGOSF1	0m	6.9	Domestic	800l/d	CCGV006G W			No	
-80732.631	-2874771.830	1605 m	CCGRBH1		7	Domestic	1000l/d	CCTF014G W	0.27m	25m	Yes	
-79923.678	-2875390.626	1604 m	CCGRSTR1	0m	7	Irrigation	500l/d	CCTF019SF				
-89511.321	-2878469.605	1518 m	CCMULBH1		Borehole collapsed							
-88898.656	-2876395.781	1571 m	CCNIEF1	0m	7.5	Domestic	700l/d	CCHF021G W			Yes	
-90133.798	-2875020.402	1536 m	CCNIEF2	0m	7.2	Domestic		CCHF022G W				
-86883.673	-2884862.465	1682 m	CCOPBH1			Domestic		CCGV020G W	0.5m		No	
-86722.220	-2884913.464	1682 m	CCOPBH2			Domestic		CCGV020G W	0.1m		No	
-80279.295	-2877167.690	1742 m	CCPIETBH1		8	Live stock watering	1000l/d					

X	Y	Z	Name	Water level	PH	Use	Volume	Sample ID	Casing Stickup	BH Depth	Registered Water User	Abstraction Rate
-81414.452	-2877536.996	1730 m	CCPIETBH2		6.5	Domestic	700l/d	CCTF001GW	0.2m	9.2m		
-81038.444	-2876815.619	1691 m	CCPIETDM1	0m	7.7	Live stock watering						
-80777.502	-2877561.854	1714 m	CCPIETF1	0m	7.6	Live stock watering						
-81149.219	-2877036.782	1694 m	CCPIETF2	0m	7.5	Live stock watering						
-82591.559	-2881873.065	1715 m	CCSCBH1			Domestic			0.25m			
-81852.604	-2874878.495	1662 m	CCSHOBH1		6.8	Domestic		CCTF015GW	0.3m		No	
-86681.963	-2887054.869	1596 m	CCSTABH1		7.6	Domestic	1000l/d	CCDG002GW				
-85844.364	-2876570.388	1676 m	CCTAUBH1		6.7	Domestic	1000l/d	CCKF013GW	0.27m	33m		
-91013.436	-2882019.897	1609 m	CCUYSBH1		7.3	Domestic	1000l/d		0.15m	50m		
-91153.752	-2881850.250	1612 m	CCUYS1	0m	8	Domestic + Live stock						
-90263.415	-2880472.416	1638 m	CCUYSF1	0m	7.3	Live stock watering						
-81214.015	-2879823.619	1720 m	CCVASBH1	4.8m		Domestic	500l/d	CCTF017GW	0.37m	30m		
-82060.662	-2878590.242	1693 m	CCVASF1	0m		Domestic		CCTF018GW				
-82342.213	-2889339.004	1708 m	CCVNBH1		Dried up after mining							

X	Y	Z	Name	Water level	PH	Use	Volume	Sample ID	Casing Stickup	BH Depth	Registered Water User	Abstraction Rate
-82043.310	-2889465.639	1709 m	CCVNBBH2			Dried up after mining						
-82177.777	-2889240.466	1715 m	CCVNBBH3			Dried up after mining						
-83131.419	-2881187.354	1688 m	CCVREBH1	3.4m	6.9	Domestic	10 000l/d	CCGV011GW	0.6m	45m	Yes	
-86205.223	-2883191.609	1625 m	CCVREF1	0m	5.6	Domestic		CCGV010GW				
-85418.331	-2882462.948	1632 m	CCVREF2	0m	6	Domestic		CCGV024GW				
-84480.033	-2881916.168	1628 m	CCVREF3	0m	7	Domestic		CCGV025GW				
-86374.140	-2882469.236	1621 m	CCVREF4	0m	6.9	Domestic	20 000l/d	CCGV012GW				
-87343.540	-2882987.558	1662 m	CCVZBH1		6.5	Domestic + Chickens		CCGV005GW	0.25m		No	
-87678.447	-2883044.093	1638 m	CCVZBH2		6.6	Domestic	10 000l/d		0.15m			
-74687.790	-2887387.218	1671 m	CCWILDM1	0m		Live stock watering						
-74058.504	-2886856.257	1613 m	CCWILF1	0m	6.6	Domestic		CCAD007GW			No	
-77286.244	-2887185.218	1690 m	CCWILWET1	0m	7	Live stock watering						
-77383.500	-2887318.746	1695 m	CCWILWP1			Not working			0.2m			

9.12. AIR QUALITY

The project is situated on the Mpumalanga Highveld, an area which has been formally declared as an air quality priority area in terms of Section 18(1) of the National Environmental Management: Air Quality Act, 2004 (Act 39 of 2004) (NEMAQA), to be known as the “the Highveld Priority Area” (Notice No. 1123 of 23 November 2007 contained in Government Gazette No. 30518).

This declaration is in recognition of the extremely stressed nature of the airshed in this region, home as it is, to much of South Africa’s coal mining activity and to many coal fired power stations. While the declaration of this hotspot does not have a direct impact on the project, it will mean that in the long term this mine will operate in a legislative environment where proper air quality management will be considered a priority and appropriate management and mitigation measures against excessive emissions will be required in keeping with the broader air quality management plan for the area.

Dust monitoring takes place on site on a monthly basis. The network comprises of thirty-seven (37) single buckets, located over nine (9) mining areas (see Figure 56). The selection of sampling sites was in accordance with the latest SANS 1137:2012 guidelines, which stipulates:

- The number of samplers that shall be sufficient to monitor dust fallout at representative locations; and
- Criteria for site selection around the dust source.

This includes monitors located at human residences and sensitive business, non-residential or agricultural locations within a maximum distance of two kilometres (km) from the source boundary. A site might sometimes be located farther to establish background away from the influence of source emissions.

Typical sources of the fugitive dust emissions are from farming activities such as ploughing, mining and transportation of coal on the dirt roads in the area. Table 27 below indicates the annual dust fallout averages for all Pembani areas.

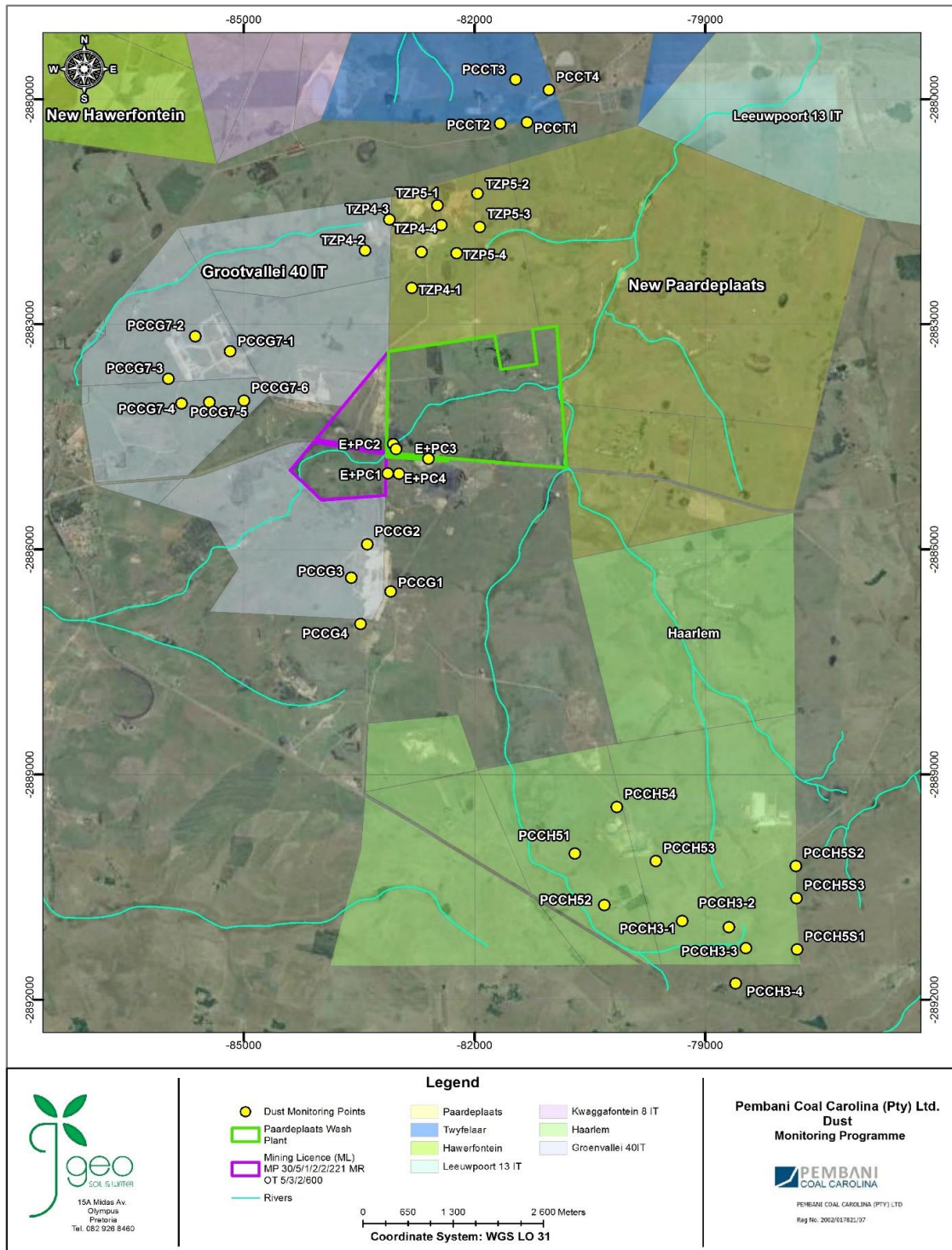


Figure 56: Pembani dust fallout monitoring programme

Table 27: Combined annual dust fallout averages for all Pembani areas

Pembani Dust Fallout Monitoring 2014	
Monthly Average – All Pembani Areas	
Monitoring Area	Dust Fallout in mg/m ² /day
	All Areas
Groenvallei	342.001
Twyfelaar	255.750
E+PC	798.029
TZP4	513.978
TZP5	350.680
Groenvallei 7	464.274
Haarlem 3	489.538
Haarlem 5	419.369
Haarlem 5 South	344.623
* NDCR, 2013 - National Environmental Management: Air Quality Act, 2004 (Act 39 of 2004). National Dust Control Regulations 2013.	
** Values highlighted in yellow exceeded the NEMA: AQA Residential Standards	
*** Values highlighted in red exceeded the NEMA: AQA Non-residential Standards	
NR = No Results - Either because of theft or the dust sample was compromised	

From the results it is evident that dust fallout recorded at the monitoring sites fluctuated according to the time of season and the intensity of activities. The Imbani Wash Plant, with the highest activity, recorded the highest individual and average dust fallout during the monitoring period. Dust fallout was the highest during the September seasonal winds.

9.13. CURRENT LAND USE

The current land use of the Pembani Colliery is mining, however, a land use evaluation was undertaken in 2005, for the mining right EMPR. Additionally, for the S102 and EA application, a land use assessment was undertaken in 2015 for Zandvoort (Appendix G) . The observations from both of these are summarised Table 28 below.

Table 28: Mining Right Land use per area

Area	Current Land Use	ha	(%)
Portions 6, 7, 8, and 17 of Groenvallei 40 IT	Maize	14.5	4.49
	Dry beans	11.52	3.57
	Pastures	24.85	7.7

	Grazing	260.29	80.62
	Fallow land	7.55	2.34
	Informal settlement	4.14	1.28
Portion RE of Portion 1 of Groenvallei 40 IT	Grazing	28.25	100
Portions 1 and 4 of Haarlem 39 IT	Grazing	43.24	81.72
	Pastures	9.67	18.28
Portions RE and 4 of Haarlem 39 IT and Portions 3 and 9 of Appeldoorn 38 IT	Grazing	411.29	99.32
	Pastures	2.81	0.68
Portion 5 of Haarlem 39 IT	Grazing	23.81	100
Portions RE and 2 of Paardeplaats 12 IT	Maize	16.65	15.65
	Pastures	4.75	4.46
	Grazing	82.3	77.36
	Fallow land	2.69	2.53
Portion 8 of Twyfelaar 11 IT	Grazing	11.95	47.99
	Pastures	12.95	52.01
Portions 9 and 10 of Twyfelaar 11 IT	Grazing	129	100
Portions RE and 1 of Zandvoort 10 IT	Arable	339.9	57.64
	Grazing	131.1	22.23
	Wetland	118.7	20.13
	Total	1 639	(%)

The predominant pre-mining land use of Zandvoort application area consisted of unimproved grassland for grazing with some small areas of cultivation. According to the 2015 study, the prevailing agricultural potential of most of the Zandvoort area is moderate to high, defined mainly by the available soil depth. The majority of the soils in the area have an average effective soil depth of less than 900 mm, which is generally adequate for most crops. Where subsurface restrictions, such as rock or hard plinthite, gleyed waterlogged clay or a water table, are present at shallow depth (generally less than 500 mm from the surface), then the arable agricultural potential will be significantly restricted.

As indicated in the landcover map (Figure 32) above, the farm Kwaggafontein consists of grassland, which would be used for grazing with some small areas of cultivation, while the landcover for the farm Appeldoorn consists of mainly grasslands with some cultivated land and indigenous forests

9.14. NOISE

Noise monitoring points are indicated in Figure 57 and monitoring took place over two eight hour shifts for day and night. The results of the noise monitoring are indicated in Table 29 below.

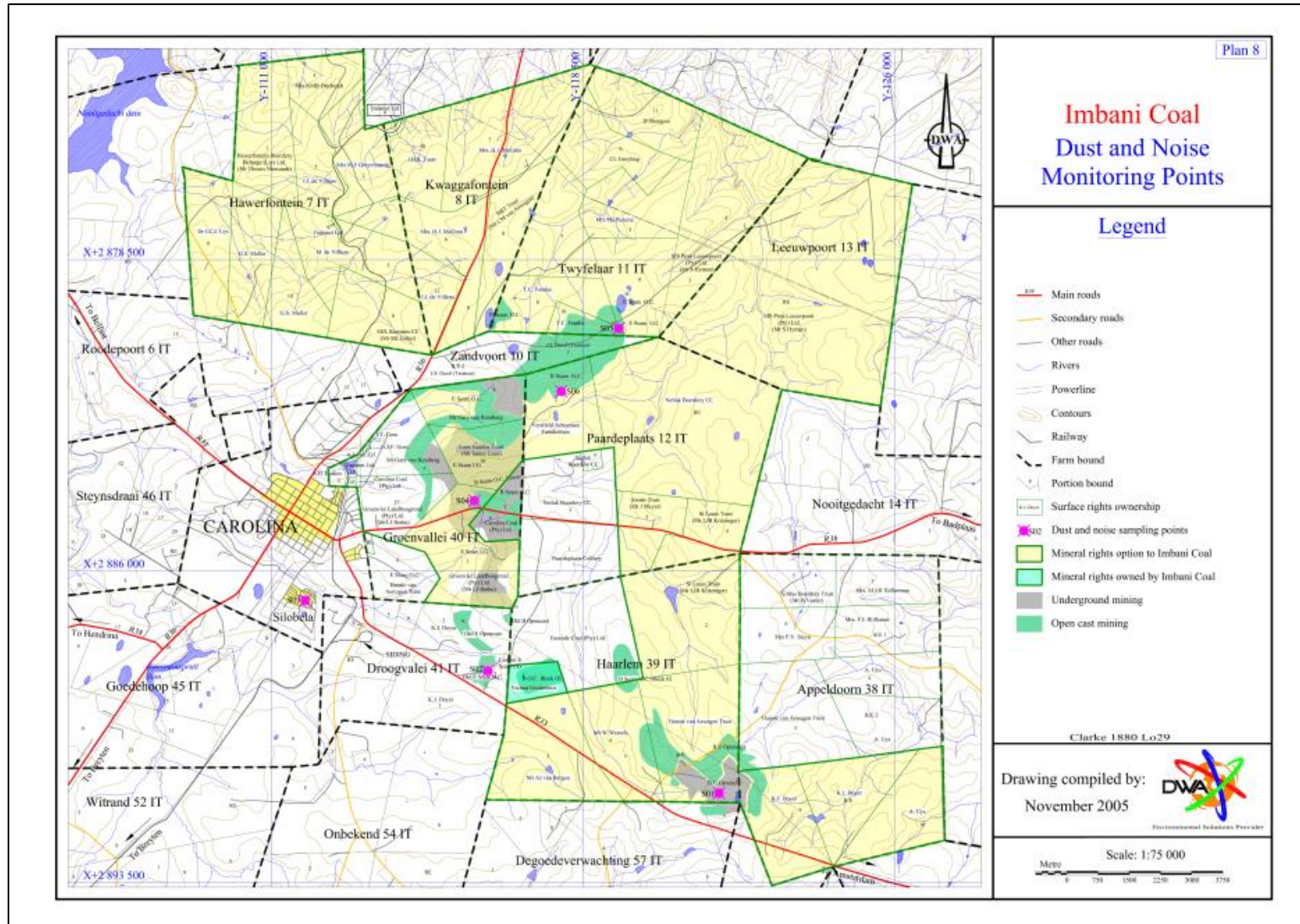


Figure 57: Noise monitoring points (Pink)

Table 29: Noise monitoring in the Mining Right

Monitoring Position	Noise Readings (dBa)	
	Day	Night
1	48,1	43,0
2	64,7	54,8
3	68,4	61,7
4	32,5	54,9
5	50,8	42,7
6	53,3	45,3

Noise levels exceeding 85dBa can cause damage to hearing. From the results above it is evident that all noise levels are within acceptable levels. Noise in the Carolina area is generated from road traffic, farm machinery, animals, urban living and, in some parts, mining activities.

9.15. BLASTING AND VIBRATION

The opencast blasting operations will be the main source contributing to the influences with regards to ground vibration levels, air blast levels and fly rock. These aspects contribute to damage to structures and causing nuisance to humans and animals if levels are too high and not controlled. Apart from levels that causes damage the possible influence with regards to the human perceptions of ground vibration and air blast will also be considered. Humans are sensitive to even very low level effects of ground vibration and air blast. In order to take this into consideration an area of 3500m is identified as the area that could observe influence. This is in view that people will experience ground vibration at levels as low as 0.75mm/s³.

9.16. SPECIFIC ENVIRONMENTAL FEATURES AND INFRASTRUCTURE ON SITE

The sensitive environmental features on site have been mapped together with the mine infrastructure layout and are presented in Figure 58 to Figure 61. Sections within the mining right area are identified as Critical Biodiversity Areas (CBA) and Ecologically Sensitive Areas (ESA) according the Mpumalanga Conservation Plan (CPLAN). The CPLAN is a compilation of sensitive ecological elements considered to be a high priority in terms of protection and conservation.

Further to the above, specific environmental features identified on site which may require protection, remediation, management or avoidance includes the following identified sensitive features:

- Farmhouses and associated farm buildings;
- Rural settlements;
- Infrastructure such as Eskom Transmission/Distribution lines and servitudes;
- Several heritage features, including grave sites;

- Remaining areas of natural vegetation;
- High Biodiversity areas; and
- Watercourses, wetlands and dams.

The existing surface infrastructure located within the application area is considered sensitive in terms of physical damage. Mitigation measures will stipulate total avoidance of surface infrastructure with a 100 m buffer or unless other with stipulated by the landowner or Chief Mining officer, whichever is relevant.

9.17. ENVIRONMENTAL AND CURRENT LAND USE MAP

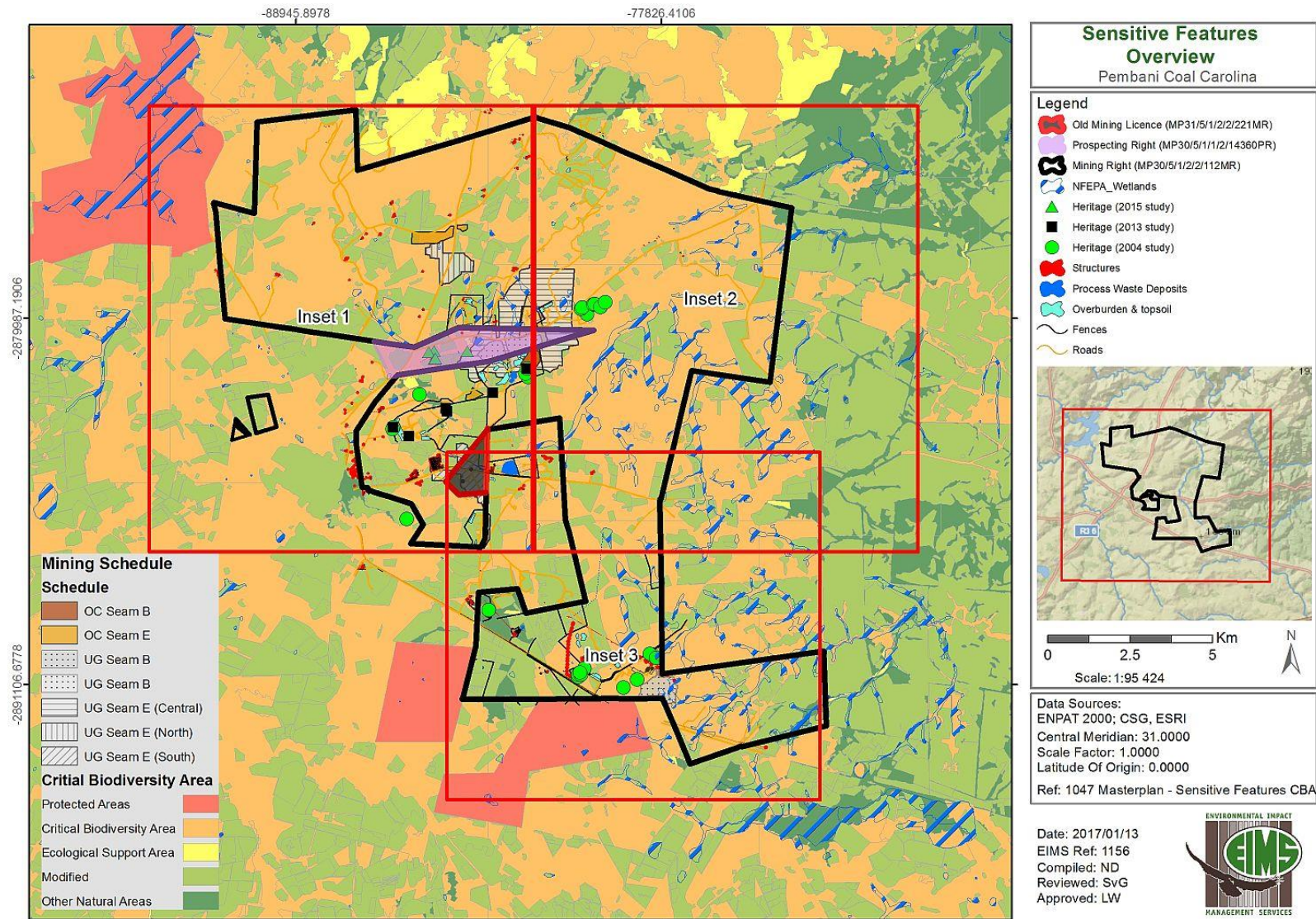


Figure 58: Sensitive Environmental Features - Overview

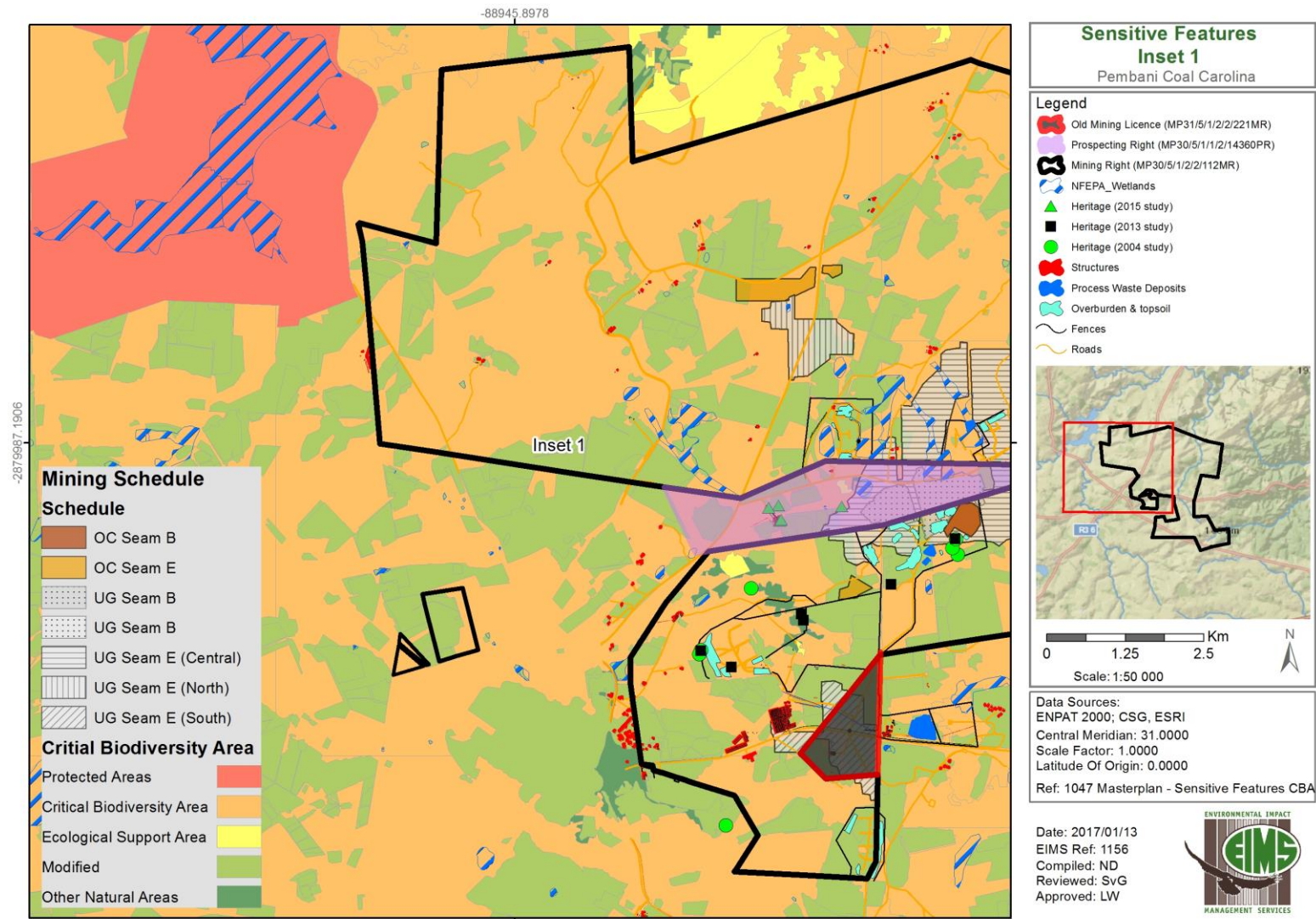


Figure 59: Sensitive Environmental Features – Inset 1

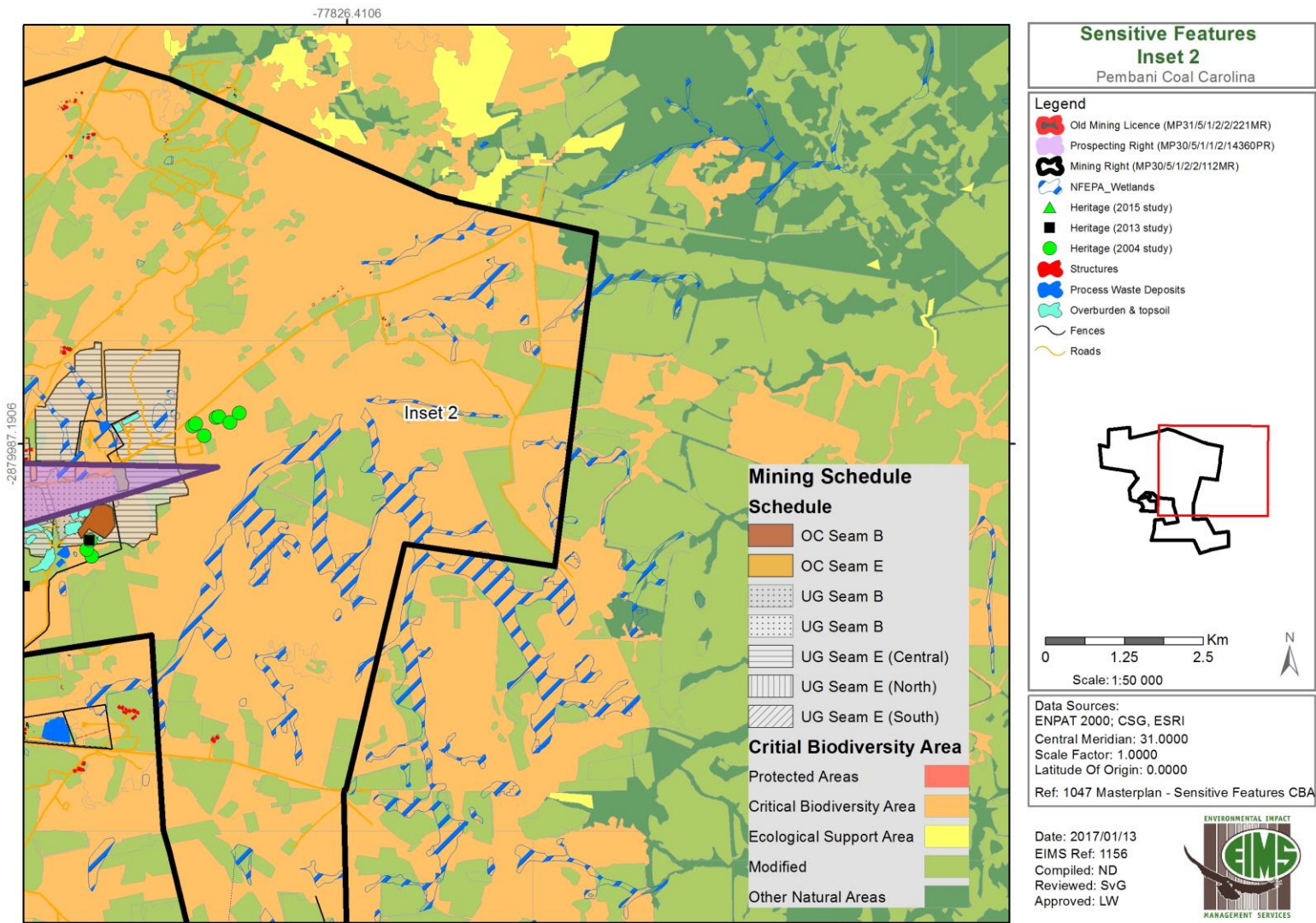


Figure 60: Sensitive Environmental Features – Inset 2

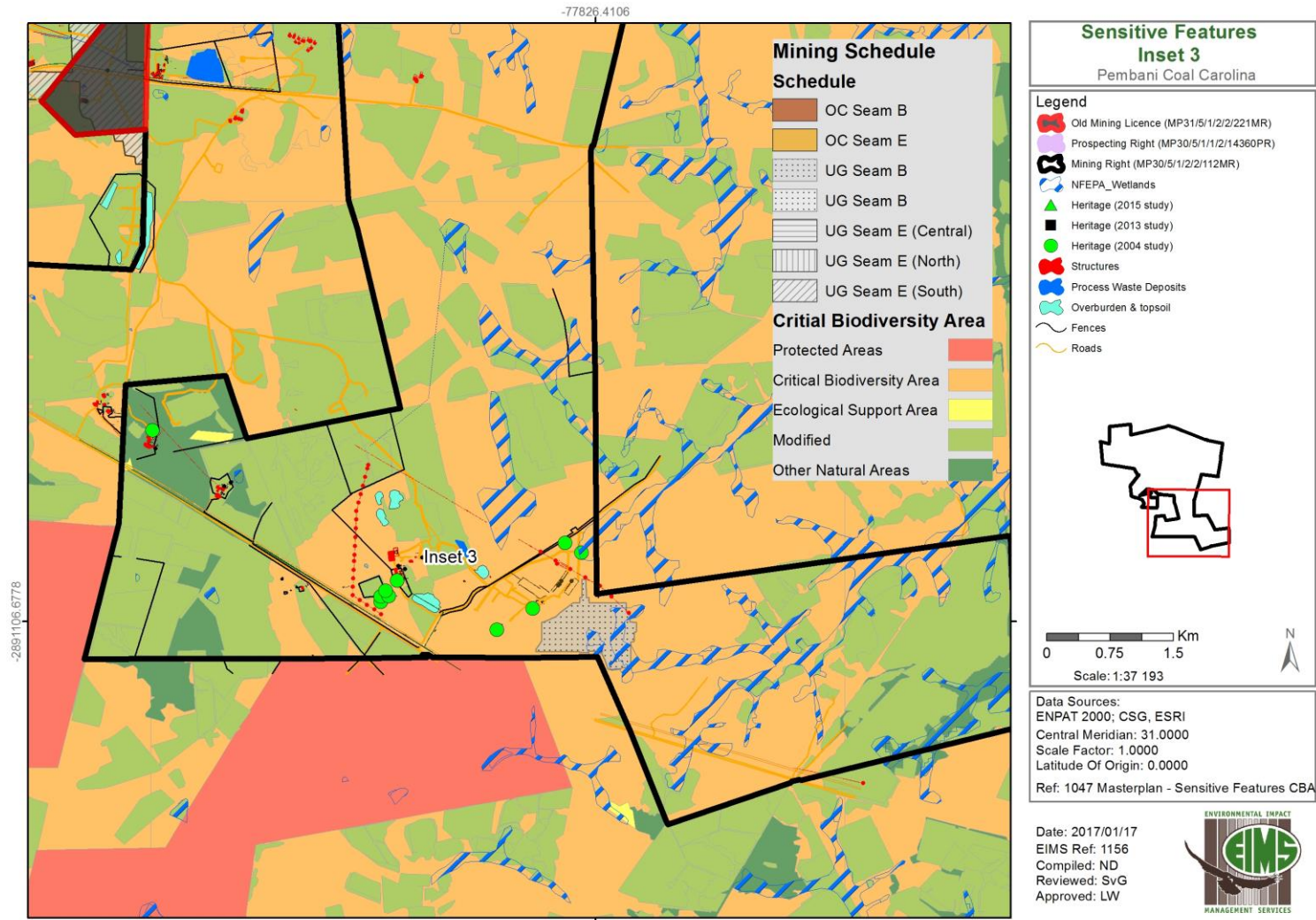


Figure 61: Sensitive Environmental Features – Inset 3

10. IMPACT ASSESSMENT

10.1. THE IMPACT ASSESSMENT METHODOLOGY

The impact significance rating methodology, as provided by EIMS, is guided by the requirements of the NEMA EIA Regulations. 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:

$$C = (E+D+M+R) \times N$$

4

Each individual aspect in the determination of the consequence is represented by a rating scale as defined in Table 30.

Table 30: 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)
Duration	1	Immediate (<1 year)
	2	Short term (1-5 years),
	3	Medium term (6-15 years),
	4	Long term (the impact will cease after the operational life span of the project),
	5	Permanent (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),
	4	High (where natural, cultural or social functions or processes are altered to the extent that it will temporarily cease), or
	5	Very high / don't know (where natural, cultural or social functions or processes are altered to the extent that it will permanently cease).
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 31.

Table 31: 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 32: Determination of environmental risk

Con sequ ence	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	5
	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 Table 33.

Table 33: Significance classes

Environmental Risk Score	
Value	Description
< 10	Low (i.e. where this impact is unlikely to be a significant environmental risk),
≥ 10; < 20	Medium (i.e. where the impact could have a significant environmental risk),
≥ 20	High (i.e. where the impact will have a significant environmental risk).

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 Regulation 31 (2)(l) of the EIA Regulations (GNR 543), 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.

In addition, it is important that the public opinion and sentiment regarding a prospective development and consequent potential impacts is considered in the decision making process.

In an effort 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 34: Criteria for the determination of prioritisation

Public response (PR)	Low (1)	Issue not raised in public response.
	Medium (2)	Issue has received a meaningful and justifiable public response.
	High (3)	Issue has received an intense meaningful and justifiable public response.
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 Table 34. The impact priority is therefore determined as follows:

$$\text{Priority} = \text{PR} + \text{CI} + \text{LR}$$

The result is a priority score which ranges from 3 to 9 and a consequent PF ranging from 1 to 2 (refer to Table 35).

Table 35: Determination of prioritisation factor

Priority	Ranking	Prioritisation Factor
3	Low	1
4	Medium	1.17
5	Medium	1.33
6	Medium	1.5
7	Medium	1.67
8	Medium	1.83
9	High	2

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 to be able to increase the post mitigation environmental risk rating by a full ranking class, if all the priority attributes are high (i.e. if an impact comes out with a medium environmental risk after the conventional impact rating, but there is significant cumulative impact potential, significant public response, and significant potential for irreplaceable loss of resources, then the net result would be to upscale the impact to a high significance).

Table 36: Environmental Significance Rating

Environmental Significance Rating	
Value	Description
< -10	Low negative (i.e. where this impact would not have a direct influence on the decision to develop in the area).
$\geq -10 < -20$	Medium negative (i.e. where the impact could influence the decision to develop in the area).
≥ -20	High negative (i.e. where the impact must have an influence on the decision process to develop in the area).
0	No impact
< 10	Low positive (i.e. where this impact would not have a direct influence on the decision to develop in the area).
$\geq 10 < 20$	Medium positive (i.e. where the impact could influence the decision to develop in the area).
≥ 20	High positive (i.e. where the impact must have an influence on the decision process to develop in the area).

The significance ratings and additional considerations applied to each impact will be used to provide a quantitative comparative assessment of the alternatives being considered. In addition, professional expertise and opinion of the specialists and the environmental consultants will be applied to provide a qualitative comparison of the alternatives under consideration. This process will identify the best alternative for the proposed project.

10.2. IMPACTS IDENTIFIED

The following potential impacts were identified during the scoping phase assessment and are for the initial mining layout only. As a result of the scoping phase assessment and the sensitivity mapping exercise, a preferred layout alternative will be identified and will be assessed further in the EIA phase assessment.

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 submitted to the DMR for adjudication. The results of the public consultation will be used to update the identified potential impacts.

Please note that these preliminary impacts will be subject to amendment based on the EIA phase assessment and the results of public consultation undertaken during the EIA phase.

10.2.1. TOPOGRAPHY AND LANDFORM

Topography refers to the surface shape and features of an area. Opencast operations will remove surface material to access and mine an orebody and this can alter the natural topography of the site. Resultant changes to the topography can in turn impact on ground water, surface water drainage, visual character and the safety of both people and animals if not properly mitigated. If underground mining extraction techniques are not carried out correctly, lack of support from underlying layers could cause the surface soil profile to vertically subside to a greater or lesser degree. This could result in limitations to the viability of potential post mining land uses.

The following activities have been associated with potential impacts on topography and landform:

- Construction
 - Site establishment – Contractors Camp;
 - Construction of mineral processing facilities;
 - Mine area site preparation;
 - Site establishment – Permanent site office Infrastructure; and
 - Water management Infrastructure construction.
- Operation
 - Maintenance and operation of site infrastructure and facilities;
 - Opencast mining;
 - Underground mining; and
 - Mineral Processing.
- Decommissioning
 - Infrastructure removal;
 - Filling Opencast Voids; and
 - Decommissioning of Underground Mine Infrastructure.
- Rehabilitation and Closure
 - General Surface Rehabilitation;
 - Storm water management; and

- Post Closure Monitoring and Maintenance.

Impacts on the topography and landform within the application area are expected to occur as follows:

- Alteration of topography;
- Altered drainage patterns; and
- Soil surface subsidence.

10.2.2. GEOLOGY

Geology refers to the underlying mineral structure of an area. Alterations to the natural geology could have impacts on other aspects such as groundwater and topography. Mining operations will remove the entire ore body layer which will alter the geology of the site. Resultant changes to the geology can in turn impact on ground water, soil forms, and palaeontological resources. Mining will have a permanent impact on the geology of the application area.

The following activities have been associated with potential impacts on geology:

- Operation
 - Underground mining; and
 - Opencast mining.

Impacts on the local geology are expected to occur as follows:

- Impacts on Geology

10.2.3. SOILS, LAND USE AND LAND CAPABILITY

Mining operations have the potential to damage soil resources through physical loss of soil and/or the contamination of soils, thereby impacting on the soils ability to sustain natural vegetation and altering land capability. Due to the increased activity of trucks and heavy machinery the possibility of soil contamination by leaking oils and fuels is increased. The contamination of soils may contribute to the contamination of surface and groundwater resources. Increased soil erosion can be caused by a loss in vegetative cover resulting in increased water runoff. This is especially likely to occur on sloping terrain. Impacts on soil structure can result in changes to soil drainage, increasing runoff and erosion, and may also result in further potential knock on effects impacting on surface and underground water resources. Loss of the topsoil resource reduces chances of successful rehabilitation and restoration. The underground operations, if confined to bord and pillar mining will have limited impact, with the possibility of subsidence and collapse of the surface at or close to the adit entrances to the underground operations and/or around the ventilation shafts.

The following activities have been associated with potential impacts on soil:

- Planning and Design
 - Drilling monitoring boreholes; and
 - Drilling for continued resource evaluation.
- Construction

- Drilling monitoring boreholes;
- Drilling for continued resource evaluation;
- Site establishment – Contractors Camp;
- Construction of mineral processing facilities;
- Mine area site preparation;
- Site establishment – Permanent site office Infrastructure; and
- Water management Infrastructure construction.
- Operation
 - Drilling monitoring boreholes;
 - Drilling for continued resource evaluation;
 - Maintenance and operation of site infrastructure and facilities;
 - Opencast mining.
 - Underground mining; and
 - Mineral Processing.
- Decommissioning
 - Drilling monitoring boreholes;
 - General decommissioning activities;
 - Decommissioning of Co-Disposal Dump;
 - Infrastructure removal;
 - Filling Opencast Voids; and
 - Decommissioning of Underground Mine Infrastructure.
- Rehabilitation and Closure
 - Drilling monitoring boreholes;
 - General Surface Rehabilitation;
 - Storm water management;
 - Re-vegetation;
 - Post Closure Monitoring and Maintenance; and
 - Water Treatment (when required).

Impacts on soil resources are expected to occur as follows:

- Erosion and sedimentation;
- Soil compaction; and
- Soil Pollution/Contamination.

Land capability is closely linked to the soil. Mining operations have the potential to significantly transform the land capability, often irreparably. The types of impacts related to land capability involve post mining compaction, loss of fertility, impeded soil drainage and insufficient depth of the replaced soil. In many cases, mining may result in the land capability class changing from arable to grazing post closure. The loss of potentially productive agricultural land, along with a reduction in land capability may occur as a result of site sterilisation due to mining activities. A reduction of natural soil fertility can be caused by the removal, storage, and replacement of the soil profile. Underground mining does not affect the

surface to the same extent as opencast mining. In this respect the impact on the land capability will be less severe and will impact only in areas which will be cleared for infrastructure. Some impacts such as acidification and loss of original soil depth and volume can be permanent and will reduce the capability post closure.

The following activities have been associated with potential impacts on land capability:

- Construction
 - Site establishment – Contractors Camp;
 - Construction of mineral processing facilities;
 - Mine area site preparation;
 - Site establishment – Permanent site office Infrastructure; and
 - Water management Infrastructure construction.
- Operation
 - Maintenance and operation of site infrastructure and facilities; and
 - Opencast mining.
- Decommissioning
 - Filling Opencast Voids.
- Rehabilitation and Closure
 - General Surface Rehabilitation;
 - Storm water management; and
 - Water Treatment (when required).

Impacts on land capability are expected to occur as follows:

- Loss of soil fertility (denitrification, loss of soil nutrient store and organic carbon stores) and loss of land capability; and
- Loss of soil resource and its utilisation potential.

The predominant land use in the surrounding area is agriculture. Mining activities have the potential to affect land uses both within the application area and in the surrounding areas. This can be caused by physical transformation of land through direct or indirect impacts. Impacts may be related to factors such as loss of soil, loss of biodiversity, pollution of water, dewatering, air pollution, noise pollution, and damage/destruction from blasting. The nature of opencast mining is such that it is unlikely that mining and other land uses can coexist. This means that any area utilised for opencast mining will be unavailable for other land uses. The extent of surface interference from underground mining is limited to areas of surface infrastructure and the underground entrance only.

The following activities have been associated with potential impacts on land use:

- Planning and Design
 - Drilling monitoring boreholes; and
 - Drilling for continued resource evaluation.
- Construction

- Drilling monitoring boreholes;
- Drilling for continued resource evaluation;
- Site establishment – Contractors Camp;
- Construction of mineral processing facilities;
- Mine area site preparation;
- Site establishment – Permanent site office Infrastructure; and
- Water management Infrastructure construction.
- Operation
 - Drilling monitoring boreholes;
 - Drilling for continued resource evaluation;
 - Opencast mining; and
 - Underground mining.
- Decommissioning
 - Drilling monitoring boreholes;
 - Infrastructure removal; and
 - Filling Opencast Voids.
- Rehabilitation and Closure
 - Drilling monitoring boreholes;
 - General Surface Rehabilitation;
 - Storm water management; and
 - Water Treatment (when required).

Impacts on land use are expected to occur as follows:

- Damage/Disruption of services (such as water and power supply, etc.); and
- Interference with existing land uses.

10.2.4. FAUNA AND FLORA

The mining activities and the establishment of the supporting infrastructure have the potential to result in loss of vegetation, habitat disruption, loss of ecosystem functionality, habitat transformation, spread of alien invasive species, a reduction in overall biodiversity, increased hunting of animals, the introduction of new species to the site, and disruption of migration routes.

Mining and associated activities may result in the removal and destruction of primary vegetation communities. These communities may be in threat categories according to NEMBA or important according to the Mpumalanga C-Plan. According to the ecology specialists several species listed as threatened under NEMBA, the South African Red Data list, and the Mpumalanga C-Plan are expected to be present on site. Should these species be present on site mining activities may result in losses to the on site populations of these species.

Disturbances to the site may result in an increase of invasive species on site and on downstream and adjacent properties. Increased erosion may alter the drivers that affect wetland vegetation. Several pollutants associated with mining activities including oil, concrete, coal dust, and AMD have the potential

to inhibit plant growth and germination and could potentially result in plant mortality. Mining alters the movement of water through the landscape, potentially affecting the hydrological flow regime which is the main driver of natural vegetation.

Threatened animal species are affected primarily by the overall loss of habitat, as direct mining impacts on individuals can often be avoided due to movement of individuals from the area of disturbance. Direct impacts during mining activities are unlikely to have an impact on individual animals of concern, as most are highly mobile and will move out of the area. During operation, birds could potentially suffer mortality due to collisions with vertical infrastructure, especially infrastructure with low visibility, such as power lines.

The following activities have been associated with potential impacts on fauna and flora:

- Planning and Design
 - Drilling monitoring boreholes;
 - Drilling for continued resource evaluation; and
 - Site visits.
- Construction
 - Drilling monitoring boreholes;
 - Drilling for continued resource evaluation;
 - Site establishment – Contractors Camp;
 - Construction of mineral processing facilities;
 - Mine area site preparation;
 - Site establishment – Permanent site office Infrastructure; and
 - Water management Infrastructure construction.
- Operation
 - Drilling monitoring boreholes;
 - Drilling for continued resource evaluation;
 - Maintenance and operation of site infrastructure and facilities;
 - Opencast mining;
 - Underground mining; and
 - Mineral Processing.
- Decommissioning
 - Drilling monitoring boreholes;
 - Decommissioning of Co-Disposal Dump;
 - Infrastructure removal; and
 - Filling Opencast Voids.
- Rehabilitation and Closure
 - Drilling monitoring boreholes;
 - General Surface Rehabilitation;
 - Storm water management;
 - Post Closure Monitoring and Maintenance; and

- Water Treatment (when required).

Impacts on fauna and flora are expected to occur as follows:

- Direct and indirect mortality of flora and fauna;
- Habitat fragmentation and blockage of seasonal and dispersal movements; and
- Introduction/invasion by alien (non-native) species.

10.2.5. SURFACE WATER

Mining activities have the potential to alter surface water features through actual mining methods employed as well as the placement of infrastructure. Hydrocarbon spills from diesel machinery also pose threats to local water resources. Surface infrastructure can result in the diversion of surface runoff to storm water dams and PCD's resulting in a decrease in the quantity of water entering local resources. Should surface water become contaminated it could have impacts on downstream users, resulting in affected livelihoods and supply problems. Underground mining methods are in general, less impactful on surface water than opencast mining methods.

The following activities have been associated with potential impacts on surface water:

- Construction
 - Site establishment – Contractors Camp;
 - Construction of mineral processing facilities;
 - Mine area site preparation;
 - Site establishment – Permanent site office Infrastructure; and
 - Water management Infrastructure construction.
- Operation
 - Maintenance and operation of site infrastructure and facilities;
 - Opencast mining;
 - Underground mining; and
 - Mineral Processing.
- Decommissioning
 - Decommissioning of Co-Disposal Dump; and
 - Filling Opencast Voids.
- Rehabilitation and Closure
 - Re-vegetation; and
 - Post Closure Monitoring and Maintenance.

Impacts on surface water are expected to occur as follows:

- Pollution of surface water resources/decreased water quality; and
- Decrease in Surface Water Availability.

10.2.6. WETLANDS

Mining activities have the potential to damage and/or disturb wetland habitat, and result in deterioration of water quality, increased surface run-off, erosion, increased transport and sedimentation in wetlands, and increased alien vegetation. Erosion of wetlands and watercourses may occur at storm water discharge points due to point source discharges of high velocity flows. The erosion of channels through wetlands results in the local lowering of the water table with resultant partial desiccation and changes in vegetation structure and composition. Erosion of topsoil which could result in silt deposition in wetlands and this could have severe impacts on wetland flow systems and therefore inhibit their functioning. Silt also changes the water quality which will adversely affect the habitat and biodiversity associated with wetlands. Increased sediment movement off the site may occur during mining operations. Increased sediment deposition within wetlands and watercourses can result in alteration to benthic habitats and the establishment of reed beds in areas of sediment deposition. With increased activity of heavy machinery and vehicles, there exists the increased potential of spillages. If hydrocarbons get into the wetland areas, then impacts on the habitat and biodiversity will be severe.

The following activities have been associated with potential impacts on wetlands:

- Construction
 - Site establishment – Contractors Camp;
 - Construction of mineral processing facilities;
 - Site establishment – Permanent site office Infrastructure; and
 - Water management Infrastructure construction.
- Operation
 - Maintenance and operation of site infrastructure and facilities;
 - Opencast mining; and
 - Underground mining.
- Decommissioning
 - Decommissioning of Underground Mine Infrastructure.
- Rehabilitation and Closure
 - Water Treatment (when required).

Impacts on wetlands are expected to occur as follows:

- Decreased watermake to adjacent wetlands;
- Loss and disturbance of wetland habitat; and
- Undermining of wetlands - surface subsidence.

10.2.7. GROUND WATER

Mining activities have the potential to impact on ground water resources through potential pollution and/or contamination as a result of activities such as the actual mining method employed and resultant geological exposure of oxidising materials, seepage, spillages and both mineralised and non-mineralised waste streams. Additional impacts related to mining activities also include dewatering cones of depression and loss of water supply to surrounding land users. The dewatering of the weathered and fractured aquifer will occur due to the removal of the material below the phreatic surface

to reach the coal seam. This cone of depression will extend a short distance from the mine workings (Figure 62 and Figure 63). The cone of depression dewatering will remain in place until the completion of mining when the pits and void will be allowed to fill with water and flood.

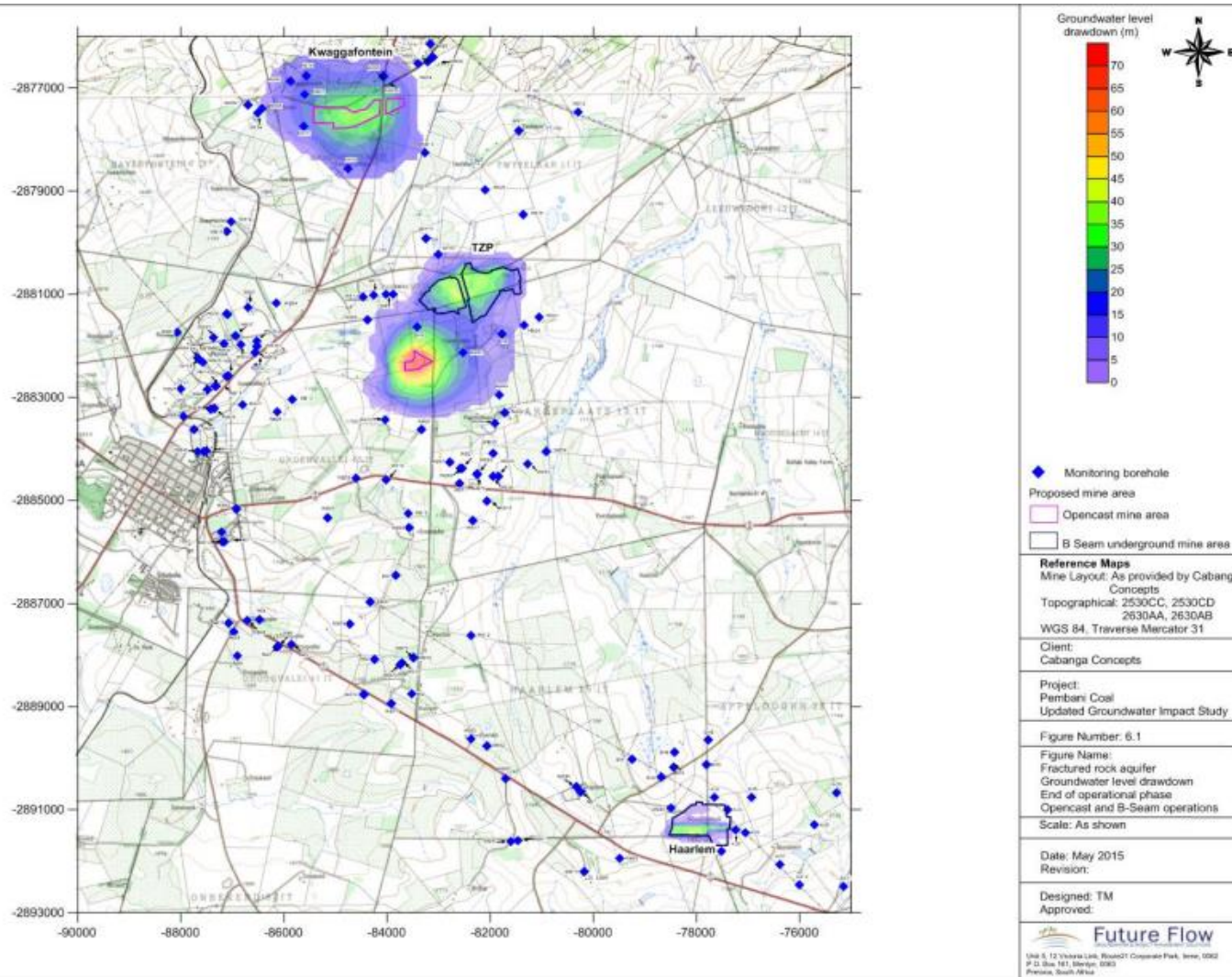


Figure 62: Fractured rock aquifer groundwater level drawdown - end of life operational phase Opencast and B seam operations

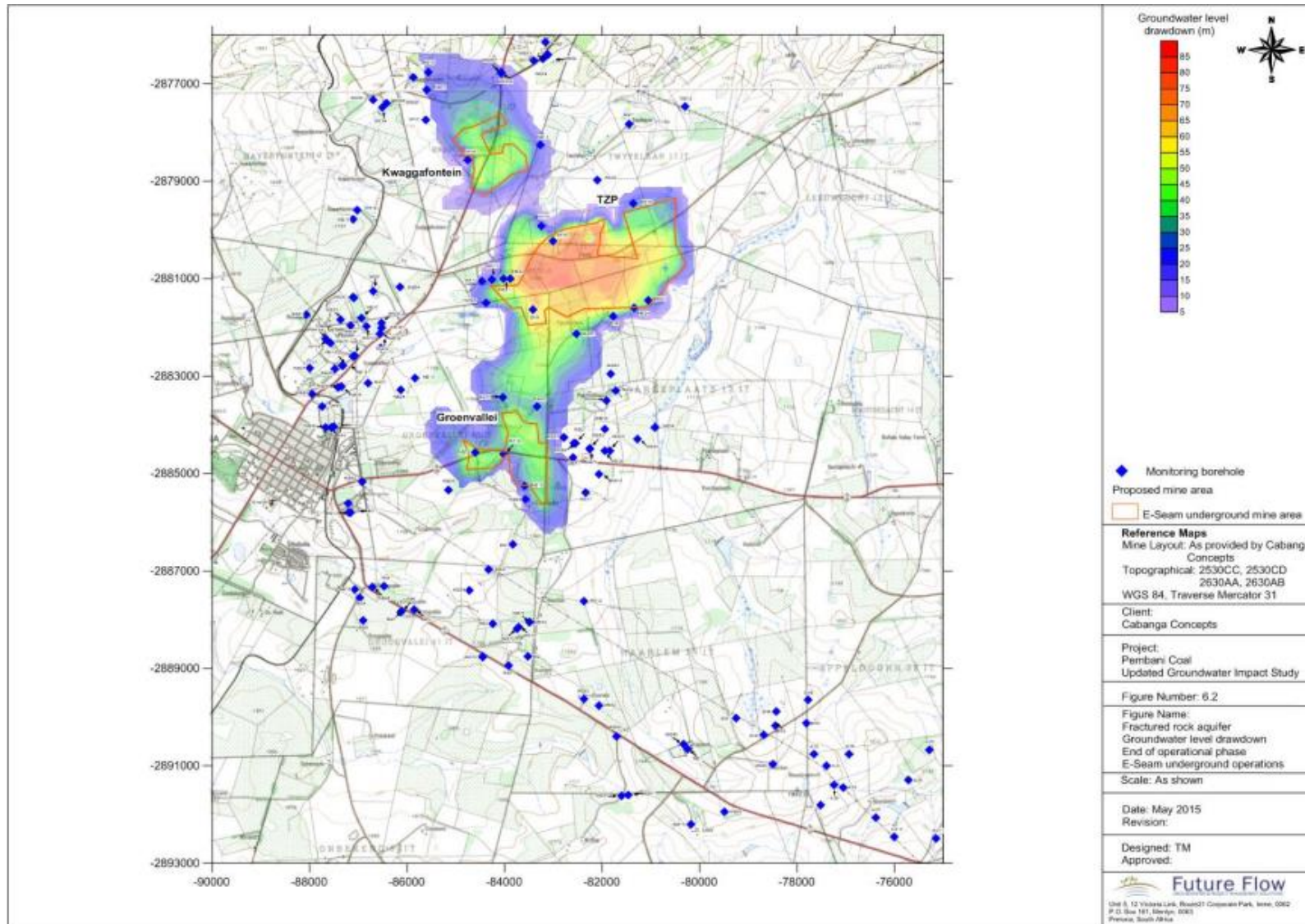


Figure 63: Fractured rock aquifer groundwater level drawdown - end of operational phase E seam operations

The access to the underground mining will be via the highwall of the opencast pits, therefore overlapping with the operational phase of the opencast mining. The driving of the accesses for the underground mining will result in the removal of the coal seam as the exposure of the coal seam roof and floor, the latter material could have a potential for the generation of acid mine drainage. Once the mining has ceased, AMD is still likely to form in the facility. Therefore, a groundwater contaminant plume is likely to migrate from the mining area once the water level in the workings have reached long term steady state conditions (i.e. each underground mine water level has reached the decant level). The migration of pollution in the groundwater could lead to the plume crossing the property boundary, albeit unlikely. Groundwater contamination plumes after mine closure are indicated in Figure 64 to Figure 66. The current decant points are indicated in Figure 68.

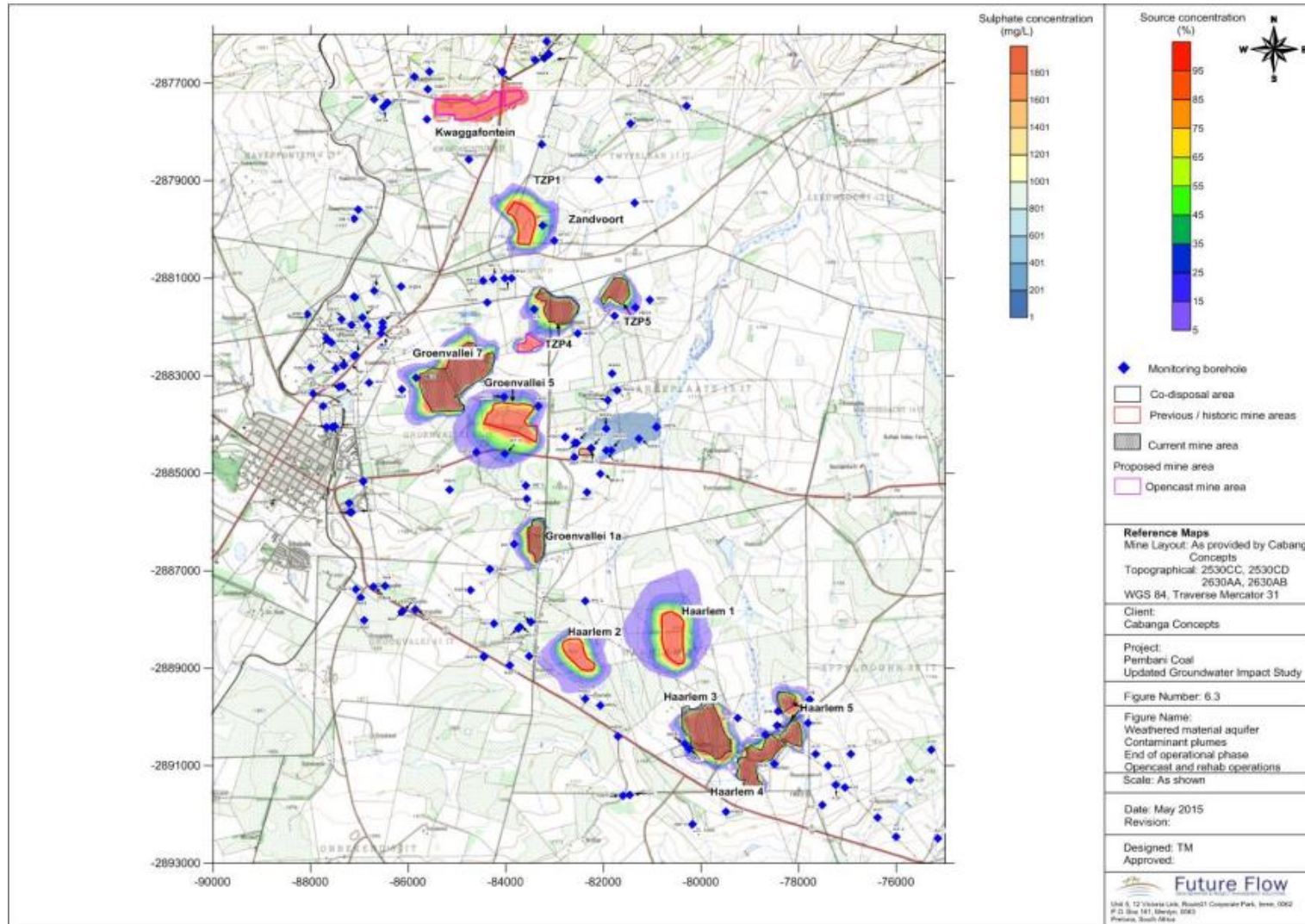


Figure 64: Sulphate plumes at end of life of mine

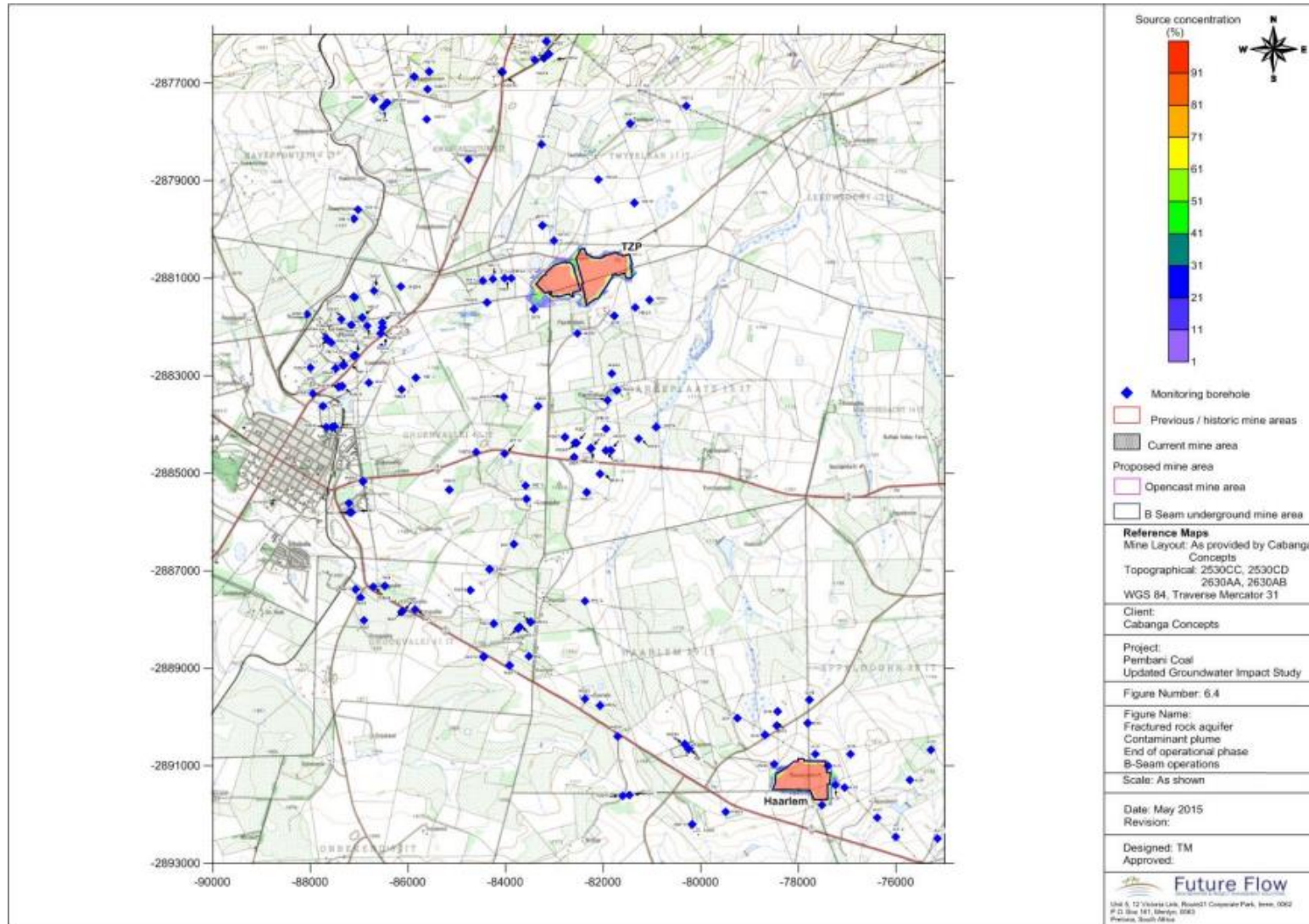


Figure 65: Sulphate plumes for the B Seam operations

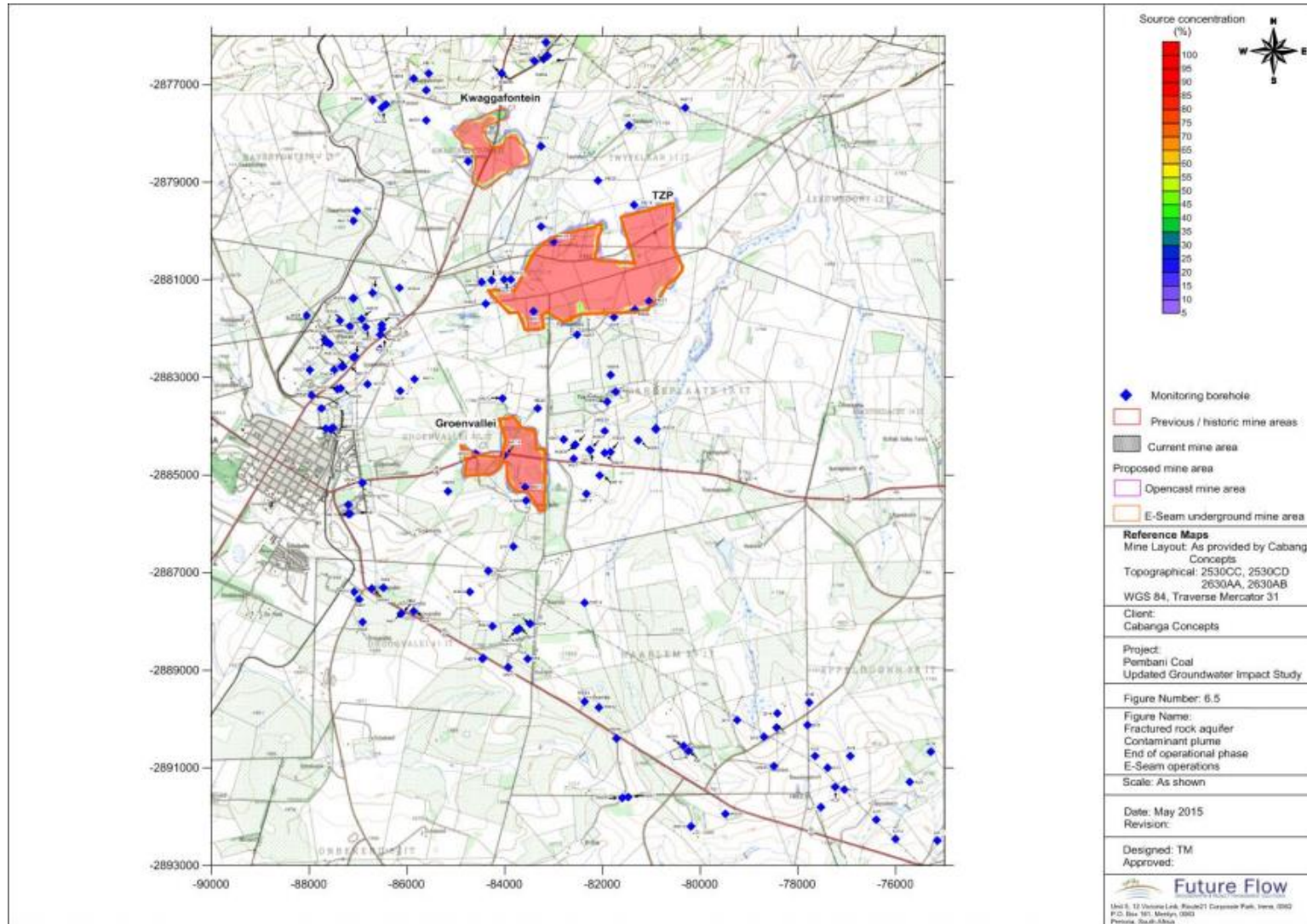


Figure 66: Sulphate plumes for E Seam operations

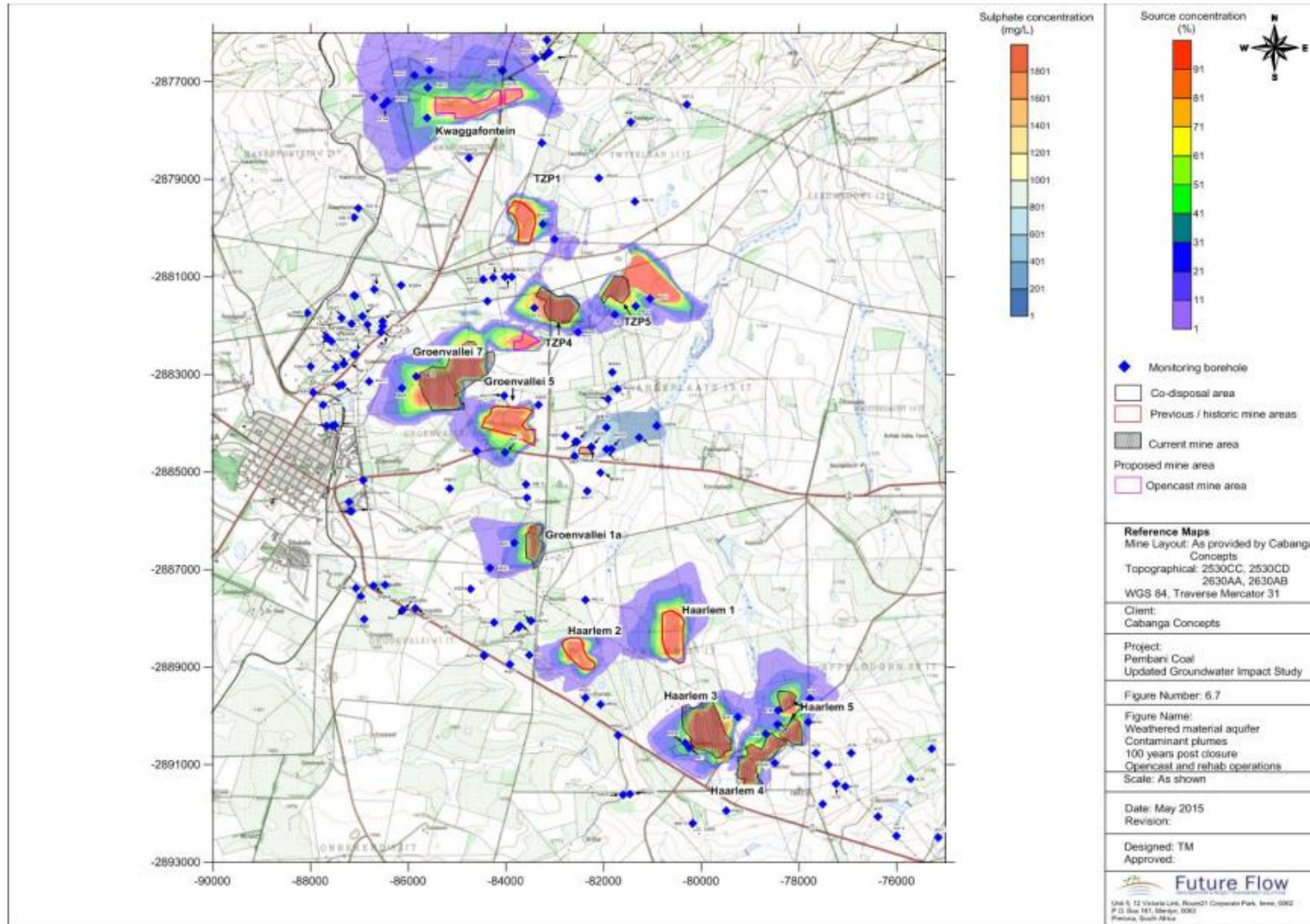


Figure 67: Contamination plumes 100 years after closure

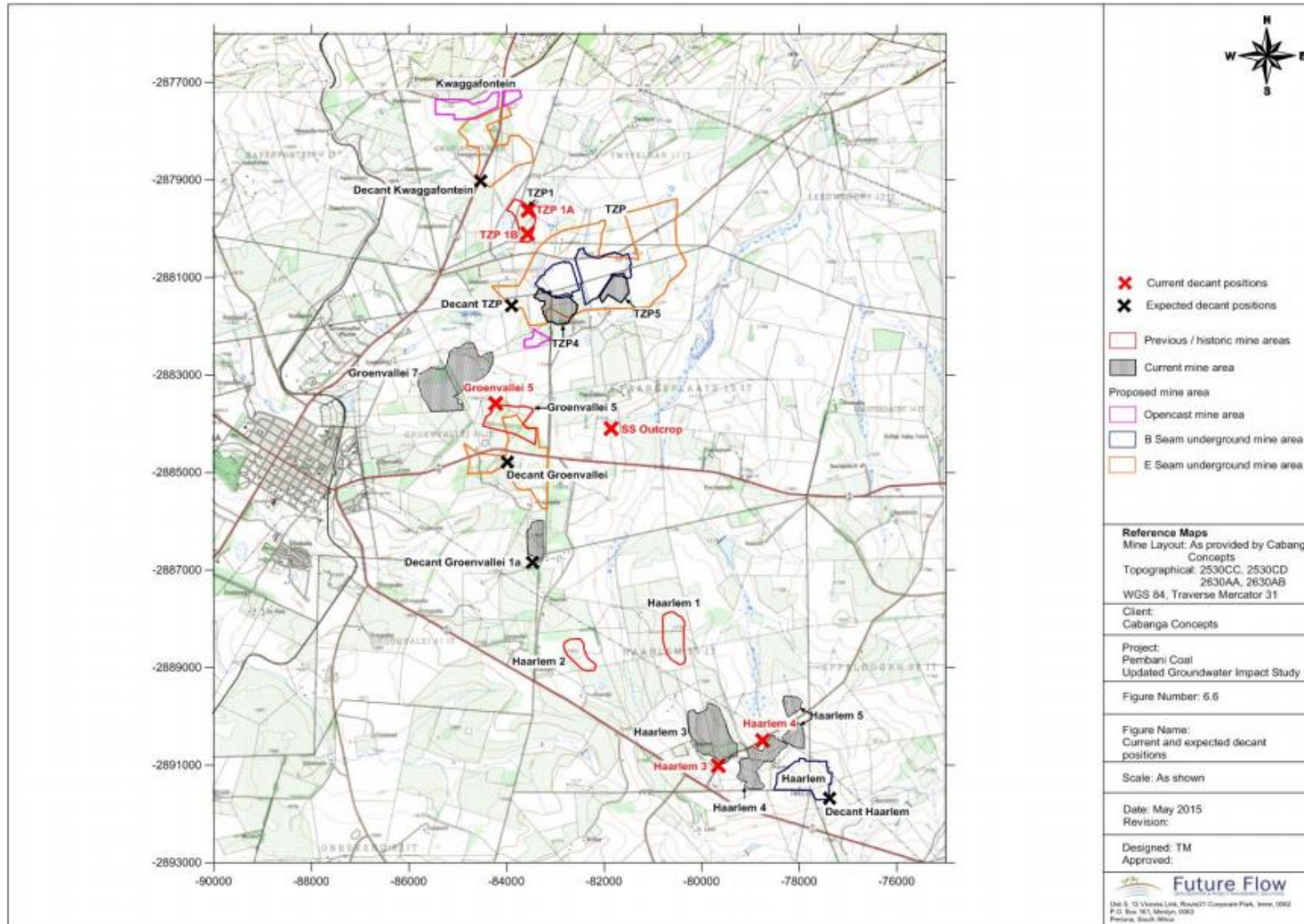


Figure 68: Current decant points

The bord and pillar mining technique prevents the dewatering of the overlying aquifers due to the low vertical permeability of the Karoo strata. Small areas may be dewatered where the vertical conductivity is higher e.g. dyke contacts of geological faults.

The following activities have been associated with potential impacts on groundwater:

- Construction
 - Site establishment – Contractors Camp;
 - Construction of mineral processing facilities;
 - Mine area site preparation;
 - Site establishment – Permanent site office Infrastructure; and
 - Water management Infrastructure construction.
- Operation
 - Maintenance and operation of site infrastructure and facilities;
 - Opencast mining;
 - Underground mining; and
 - Mineral Processing.
- Decommissioning
 - General decommissioning activities;
 - Filling Opencast Voids; and
 - Decommissioning of Underground Mine Infrastructure.
- Rehabilitation and Closure
 - General Surface Rehabilitation;
 - Storm water management;
 - Re-vegetation; and
 - Post Closure Monitoring and Maintenance.

Impacts on groundwater are expected to occur as follows:

- Acid Mine Drainage;
- Decrease in water quantity/availability;
- Dewatering of groundwater aquifers; and
- Pollution of groundwater/decreased water quality.

10.2.8. ENVIRONMENTAL POLLUTION

Environmental pollution refers to any contamination of the environment resulting from mining activities. The types of impacts related to environmental pollution include hydrocarbon spills, sewage spills, and decant from underground workings. Environmental pollution can affect surface water, groundwater, wetlands, soil resources, and air quality. Poorly designed wash bays, accidental spillages, related water facilities on site, hydrocarbon spills from heavy machinery and vehicles onsite, the removal or capping of waste products from the site, the intentional washing and rinsing of equipment, storage and use of hydrocarbons and other hazardous materials including cement, and improper waste handling, storage and disposal can all be sources of environmental pollution. Activities that involve the removal of infrastructure within the dirty water areas or associated with dirty water management systems such as PCD's could potentially result in the mobilisation of pollutants potentially

trapped in the soils underlying these areas. Negative air quality effects can occur from processing plants, crushers and chemical/hydrocarbon by-product release in to the air. Due to the recovery of ground water levels in the post-mining environment, contaminated groundwater will be able to migrate away from the mining area. This can lead to the contamination of surrounding aquifers and streams.

The following activities have been associated with potential impacts of environmental pollution:

- Planning and Design
 - Drilling monitoring boreholes; and
 - Drilling for continued resource evaluation.
- Construction
 - Drilling monitoring boreholes;
 - Drilling for continued resource evaluation;
 - Site establishment – Contractors Camp;
 - Construction of mineral processing facilities;
 - Mine area site preparation;
 - Site establishment – Permanent site office Infrastructure; and
 - Water management Infrastructure construction.
- Operation
 - Drilling monitoring boreholes;
 - Drilling for continued resource evaluation;
 - Maintenance and operation of site infrastructure and facilities;
 - Opencast mining;
 - Underground mining; and
 - Mineral Processing.
- Decommissioning
 - Drilling monitoring boreholes;
 - General decommissioning activities;
 - Decommissioning of Co-Disposal Dump;
 - Infrastructure removal;
 - Filling Opencast Voids; and
 - Decommissioning of Underground Mine Infrastructure.
- Rehabilitation and Closure
 - Drilling monitoring boreholes;
 - General Surface Rehabilitation;
 - Storm water management;
 - Re-vegetation;
 - Post Closure Monitoring and Maintenance; and
 - Water Treatment (when required).

Impacts of environmental pollution are expected to occur as follows:

- Decant from underground workings;
- General Environmental Pollution;
- Hydrocarbon spills/contamination; and

- Sewage spills/contamination.

10.2.9. CULTURAL AND HERITAGE RESOURCES

An evaluation of the study area and the surroundings has shown that various heritage resources occur within the mining area, including historical structures as well as graves and cemeteries. Mining activities such as blasting may result in damage to heritage features present on the site. The disturbance, destruction or damage of such sites requires a permit from the responsible heritage authority. If graves are to be relocated, the community will need to be engaged in a consultation process. The relocation of graves and the associated consultation process will need to be conducted by a reputable organisation. Unexpected discovery of any unidentified graves and cemeteries during the operations may also delay mining activities due to the legal processes involved.

The following activities have been associated with potential impacts on heritage resources:

- Construction
 - Site establishment – Contractors Camp;
 - Construction of mineral processing facilities;
 - Mine area site preparation;
 - Site establishment – Permanent site office Infrastructure; and
 - Water management Infrastructure construction.
- Operation
 - Opencast mining; and
 - Underground mining.
- Rehab and Closure
 - General Surface Rehabilitation;
 - Storm water management; and
 - Water Treatment (when required).

Impacts on heritage resources are expected to occur as follows:

- Discovery and preservation of fossils;
- Destruction/damage of palaeontological resources; and
- Destruction/damage of heritage resources.

10.2.10. SOCIAL IMPACTS

It is important to understand the difference between a social change process and a social impact. Social change processes are set in motion by project activities or policies. Social change processes can be measured objectively, independent of the local context. Examples of a social change process are increase in the population, relocation or presence of temporary workers. Under certain circumstances these processes may result in social impacts, but if managed properly these changes may not create impacts. Whether impacts are caused will depend on the characteristics and history of the host community, and the extent of mitigation measures that are put in place (Vanclay, 2003). A social impact is something that is experienced or felt by humans. It can be positive or negative. Social impacts can be experienced in a physical or perceptual sense. Social impacts can be either objective or subjective. Objective social impacts can be quantified and verified by independent observers in the local context, such as changes in employment patterns, in standard of living or in health and safety. Subjective social impacts occur “in the heads” or emotions of people, such as negative public attitudes, psychological stress or reduced quality of life. It is very likely that a number of social changes processes will be set in motion by the project. Whether these processes result in social impacts will depend on the successful implementation of the suggested mitigation measures.

The following activities have been associated with potential impacts on the social environment:

- Planning and Design
 - General Mine Management.
- Construction
 - General Mine Management;
 - General Construction Management;
 - Site establishment – Permanent site office Infrastructure; and
 - Mine area site preparation.
- Operation
 - General Mine Management;
 - Maintenance and operation of site infrastructure and facilities;
 - Opencast mining;
 - Underground mining; and
 - Mineral Processing.
- Decommissioning
 - General Mine Management.
- Rehabilitation and Closure
 - General Mine Management; and
 - Water Treatment (when required).

Impacts on the social environment are expected to occur as follows:

- Crime and violence;
- Influx of migrant workers;
- Loss of sense of place;
- Relocation; and

- Social vices.

10.2.11. SOCIO-ECONOMIC ENVIRONMENT

The study of economic development, which is generally broad in its scope, refers to the standard of living of citizens; most often measured by GDP per capita, literacy rate, and life expectancy. Economic development incorporates many elements of pure macro-economics, such as price stability, high employment, and sustainable growth. However, this is underpinned by the study of infrastructure and social development programs, such as education, housing, and road networks. Mine operations have the potential to positively or negatively influence/affect the economic environment of the area. Mines contribute directly towards employment, procurement, skills development and taxes on a local, regional and national scale. In addition, mines indirectly contribute to economic growth in the local and regional economies because the increase in the number of income earning people has a multiplying effect on the trade of other goods and services in other sectors. However, the introduction of a mine into an area can have undesirable implications in the surrounding environment. This is because changes occur not only to the pre-existing land uses but also to the existing associated social structures and general way of life. The closure phase of the mine can have highly negative impacts because the surrounding environment loses the economic support that it receives during the operation of the mine. To ensure the economic safety of the communities which are affected by the mining operations, mitigation measures post closure of the mine will need to consider the economic environment of the communities and address these impacts effectively.

Impacts on the socio-economic environment are expected to occur as follows:

- Coal supply for energy security;
- Economic growth;
- Education, Skills Development and Training;
- Employment Opportunities;
- Impacts on local farm labour;
- Loss of jobs and economic opportunities;
- Perceptions and Expectations; and
- Re-instatement of livelihoods.

10.2.12. HEALTH AND SAFETY

It is important to recognize that mining activities, equipment, and infrastructure can increase community exposure to risks and impacts. The mining activities can result in a possible increase in crime due to increased number of strangers in the community. Hazardous structures and excavations may pose a threat to community safety if not correctly located, properly designed and correctly managed. By way of example, excavations may pose a risk to animals and people if not properly managed to prevent unauthorised access. The use of hazardous materials on the mine may result in a community health and safety risk if these materials are not stored, handled and disposed of in an appropriate manner. For example, the storage and use of explosives may represent a safety risk if appropriate controls and procedures are not followed. Fly rock in particular may pose

a risk to people, animals and infrastructure within close proximity to the mine. The use of public roads for hauling coal will result in increased safety risks for members of the community and public utilising these roads. Mining activities have the potential to increase the risk of accidental fires. Impacts on ecosystem services can impact on communities, particularly where these communities rely on these ecosystem services (e.g. water from watercourses) for their livelihoods. The contamination or degradation of natural resources, such as adverse impacts on the quality, quantity, and availability of freshwater, may result in health-related risks and impacts. Land use changes may result in the loss of natural buffer areas such as wetlands, and impacts to natural vegetation areas that mitigate the effects of natural hazards such as flooding, landslides, and fire, may result in increased vulnerability and community safety-related risks and impacts. An influx of people to the mining area seeking employment may increase the risk for community exposure to waterborne, water based, water-related, and vectorborne and communicable diseases.

The following activities have been associated with potential impacts on health and safety:

- Planning and Design
 - General Mine Management.
- Construction
 - General Mine Management;
 - General Construction Management;
 - Site establishment – Contractors Camp;
 - Construction of mineral processing facilities;
 - Mine area site preparation;
 - Site establishment – Permanent site office Infrastructure; and
 - Water management Infrastructure construction.
- Operation
 - General Mine Management;
 - Maintenance and operation of site infrastructure and facilities;
 - Opencast mining;
 - Underground mining; and
 - Mineral Processing.
- Decommissioning
 - General Mine Management;
 - General decommissioning activities;
 - Decommissioning of Co-Disposal Dump;
 - Filling Opencast Voids; and
 - Decommissioning of Underground Mine Infrastructure.
- Rehabilitation and Closure
 - General Mine Management; and
 - Re-vegetation.

Impacts on health and safety are expected to occur as follows:

- Community health and safety;
- Fire and explosion hazard;

- Fly Rock; and
- Health impacts.

10.2.13. TRANSPORTATION, INFRASTRUCTURE, AND TRAFFIC

In terms of potential impacts, the mine will result in increased use of the local road network which may result in the deterioration of road surfacing, damage to bridges and culverts in the area, and safety risks to surrounding communities. The R33, R36 and R38 are expected to experience increased traffic usage due to mining activities. This will be predominantly due to the increase in transport of heavy machinery, and vehicles carrying coal and labour for mining activities. Some of the roads are already in a state of disrepair and further traffic is expected to have negative impacts on road quality. Increased traffic will have repercussions on safety for other road users, predominantly by increasing the potential for road accidents. There are no large communities along the R38 and therefore increased traffic along this route should not create major safety concerns for residents, such as concern for children playing near the road. The R33, however, is close to the Silobela settlement which could pose a safety hazard to residents walking home and to town. The R36 is in close proximity to Carolina and increased traffic on this road will also be a safety issue with residents in this town.

The following activities have been associated with potential impacts on transportation, infrastructure, and traffic:

- Construction
 - Site establishment – Contractors Camp;
 - Construction of mineral processing facilities;
 - Mine area site preparation;
 - Site establishment – Permanent site office Infrastructure; and
 - Water management Infrastructure construction.
- Operation
 - Opencast mining; and
 - Underground mining.
- Decommissioning
 - Decommissioning of Co-Disposal Dump.

Impacts on transportation, infrastructure, and traffic are expected to occur as follows:

- Damage to road infrastructure; and
- Increased traffic.

10.2.14. AIR QUALITY

Existing sources of emissions in the region and the characterisation of existing ambient pollution concentrations is fundamental to the assessment of cumulative air impacts. A change in the ambient air quality can result in a variety of impacts which in turn may cause a disturbance to and/or health impacts on nearby receptors. Sensitive receptor sites include residential areas, communities, and natural environments. Mining activities have the potential to result in increased levels of atmospheric dust, increased concentrations of PM₁₀ (Particulate Matter with an aerodynamic diameter of less than 10µm) and increased concentrations of PM_{2.5} (Particulate Matter with an aerodynamic diameter of less than 2.5µm). Historical evidence indicates that the pollutant of concern

associated with open-cast mining operations is particulate matter creating a nuisance dust source and resulting in human health concerns and nuisance.

The following activities have been associated with potential impacts on air quality:

- Planning and Design
 - Drilling monitoring boreholes; and
 - Drilling for continued resource evaluation.
- Construction
 - Drilling monitoring boreholes;
 - Drilling for continued resource evaluation;
 - Site establishment – Contractors Camp;
 - Construction of mineral processing facilities;
 - Mine area site preparation;
 - Site establishment – Permanent site office Infrastructure; and
 - Water management Infrastructure construction.
- Operation
 - Drilling monitoring boreholes;
 - Drilling for continued resource evaluation;
 - Maintenance and operation of site infrastructure and facilities;
 - Opencast mining;
 - Underground mining; and
 - Mineral Processing.
- Decommissioning
 - Drilling monitoring boreholes;
 - General decommissioning activities;
 - Decommissioning of Co-Disposal Dump;
 - Infrastructure removal;
 - Filling Opencast Voids; and
 - Decommissioning of Underground Mine Infrastructure.
- Rehabilitation and Closure
 - Drilling monitoring boreholes;
 - General Surface Rehabilitation;
 - Storm water management;
 - Re-vegetation;
 - Post Closure Monitoring and Maintenance; and
 - Water Treatment (when required).

Impacts on air quality are expected to occur as follows:

- Greenhouse gas emissions; and
- Fugitive emissions (Dust).

10.2.15. VISUAL IMPACTS

Considering the rural setting of the application area and the mountain backdrop, it is anticipated that the introduction of mining structures and related activities would create strong contrast with the existing landscape characteristics. During mining, it is expected that there will be coal trucks and other mine vehicles on both the roads and farmlands. This, along with the removal of vegetation, dust generation and preparation of opencast mining areas will result in a negative impact on the visual aspect. Operational areas may require lighting at night for safety reasons.

The following activities have been associated with potential visual impacts:

- Construction
 - Site establishment – Contractors Camp;
 - Construction of mineral processing facilities;
 - Mine area site preparation;
 - Site establishment – Permanent site office Infrastructure; and
 - Water management Infrastructure construction.
- Operation
 - Opencast mining;
 - Underground mining; and
 - Mineral Processing.
- Decommissioning
 - Decommissioning of Co-Disposal Dump.
- Rehab and Closure
 - General Surface Rehabilitation;
 - Storm water management; and
 - Water Treatment (when required).

Visual impacts are expected to occur as follows:

- Visual impact of light at night; and
- Visual impact of mine infrastructure, stockpiles and dust.

10.2.16. BLASTING AND VIBRATION

The application of explosives for breaking rock will always have an effect on the surrounding environment. These effects can manifest in the form of ground vibration, air blast, fumes, fly rock and noxious fumes. These short duration events may be noticeable by communities and individuals living in the immediate environment. These events tend to cause nuisance and elicit an emotive response because of resonance because they are easily recognized as being related to blasting.

The following activities have been associated with potential impacts of blasting and vibration:

- Operation
 - Opencast mining; and
 - Underground mining.

Impacts of blasting and vibration are expected to occur as follows:

- Air Blast;
- Ground Vibration and human perception;
- Ground Vibration Impacts on productivity of farm animals (cattle, chickens, pigs, etc.);
- Impacts on Infrastructure (roads, communications infrastructure, services, houses, boreholes); and
- Noxious fumes.

10.2.17. LIST OF POTENTIAL CUMULATIVE IMPACTS

Without proper mitigation measures and continual environmental management, most of the identified impacts in Section 10 may potentially become cumulative, affecting areas outside of their originally identified zone of impact. The potential cumulative impacts will be identified, evaluated, and mitigation measures suggested during the detailed EIA level investigation. The impact identification and calculation methodology employed by all specialists' incorporates cumulative impacts in a quantitative manner to determine the final impact score and corresponding rating.

When considering cumulative impacts it is vitally important to bear in mind the scale at which different impacts occur. There is potential for a cumulative effect at a broad scale, such as regional deterioration of air quality, as well as finer scale effects occurring in the area surrounding the development. The main impacts which have a cumulative effect on a regional scale are related to the transportation vectors that they act upon. For example air movement patterns result in localised air quality impacts having a cumulative effect on air quality in the region. Similarly water acts as a vector for distribution of impacts such as contamination across a much wider area than the localised extent of the impacts source. At a finer scale, there are also impacts that have the potential to result in a cumulative effect, although due to the smaller scale at which these operate, the significance of the cumulative impact is lower in the broader context.

The following is a list of some of the potential cumulative impacts that may occur as a result of the project. It must be stated that the list is not exhaustive and will be investigated further during the EIA Phase and in consultation with stakeholders. The potential cumulative impacts identified at this stage that may occur as a result of the project are:

- Reduction in groundwater availability;
- Sense of Place;
- Disturbance/destruction of palaeontological material;
- Habitat Loss/Destruction;
- Downstream Sedimentation;
- Displacement of Faunal Species;
- Flora Direct and Indirect Mortality;
- Fauna Direct and Indirect Mortality;
- Pollution of Habitats; and

- Spillage of Oils, Fuels and Chemicals.

10.3. ASSESSMENT AND EVALUATION OF POTENTIAL PROJECT IMPACTS

Project alternatives have been previously assessed in the previous environmental applications. The reader is directed to the original assessments for a full description of the alternative assessments previously undertaken. This Scoping Report is based on the final approved alternatives and project description and provides the proposed mitigation measures to ensure the advantages associated with the chosen alternatives, layout and design are optimised.

10.4. POTENTIAL MITIGATION MEASURES AND RESIDUAL RISK

The following potential mitigation measures and residual risks have been provided for each environmental aspect assessed. It should be noted that this report has been made available to landAP's for review and comment and their comments and concerns will be addressed in the final report to be submitted to the DMR for adjudication. Furthermore, it should be noted that the results of the public consultation will be used to update the proposed potential mitigation measures prior to the submission of the finalised scoping report to the DMR for adjudication.

The impact scores below are reflective of the impacts post 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, the cumulative nature of the impact, as well as the degree of public concern regarding 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 EIR to be submitted to the DMR for adjudication

10.4.1. TOPOGRAPHY AND LANDFORM

The following mitigation types have been associated with potential impacts on topography and landform:

- Control through site planning and design;
- Control through proper soil management procedures; and
- Avoidance through mine design and planning (depth of mining, safety factors, overburden and rock qualities).

10.4.1.1. SIGNIFICANCE OF IMPACT MITIGATION

With mitigation, the impact can be controlled but not prevented and will remain low to moderate in significance.

Impact	Activity	Post-Mitigation Score	Final Significance
Operational Phase			
Alteration of Topography	Opencast Mining	-15	-15,00

Impact	Activity	Post-Mitigation Score	Final Significance
	Underground Mining	-15	-15,00
Altered Drainage Patterns	Maintenance and operation of site infrastructure and facilities	-8,25	-11,00
	Mineral Processing	-8,25	-11,00
	Opencast mining	-8,25	-11,00
	Underground mining	-8,25	-11,00
Soil surface subsidence	Opencast mining	-4,5	-4,5
	Underground mining	-9	-9
Decommissioning Phase			
Alteration of Topography	Filling Opencast Voids	-8	-8,00
Altered Drainage Patterns	Infrastructure removal	-6	-8,00
	Filling Opencast Voids	-6	-8,00
Soil surface subsidence	Filling Opencast Voids	-6	-6
	Decommissioning Underground Mine Infrastructure	-6,75	-6,75
Rehabilitation and Closure Phase			
Alteration of Topography	General Surface Rehabilitation	-6	-6,00
Altered Drainage Patterns	General Surface Rehabilitation	-3	-4,00
	Storm water management	-3	-4,00
Soil surface subsidence	Post Closure Monitoring and Maintenance	-3,5	-3,5

10.4.2. GEOLOGY

Mining operations will remove the entire ore body layer which will alter the geology of the site. Mining will have a permanent impact on the geology of the application area. The following mitigation types have been associated with potential impacts on geology:

- Modify through mine planning, design and rehabilitation.

10.4.2.1. SIGNIFICANCE OF IMPACT MITIGATION

There are no mitigation measures to reduce the impact on geology as the removal of a geological unit is the goal of the activity. The impact will remain high.

Impact	Activity	Post-Mitigation Score	Final Significance
Operational Phase			
Impacts on geology	Opencast mining	-17,5	-23,33
	Underground mining	-17,5	-23,33

10.4.3. SOILS

The following mitigation types have been associated with potential impacts on soil:

- Avoid and control through preventative measures (Soil placement, storm water infrastructure, erosion control structures);
- Avoid through implementation of EMP mitigation measures;
- Remedy through application of treatment measures (e.g. ripping);
- Avoid through preventative measures (e.g. bunding, spill kits);
- Remedy through cleanup and waste disposal; and
- Modify through soil treatment if required.

10.4.3.1. SIGNIFICANCE OF IMPACT MITIGATION

With mitigation, the impact can be controlled but not prevented and will remain low to moderate in significance.

Impacts	Activity	Post-Mitigation Score	Final Significance
Operational Phase			
Soil compaction	Drilling for continued resource evaluation	-5	-6,67
	Drilling monitoring boreholes	-5	-6,67
	Mineral Processing	-8,25	-11,00
	Opencast mining	-9	-12,00
	Underground mining	-8,25	-11,00
Soil pollution/contamination	Maintenance and operation of site infrastructure and facilities	-9	-12,00
	Mineral Processing	-9	-12,00
	Opencast mining	-9	-12,00
	Underground mining	-6,75	-9,00
Erosion and sedimentation	Maintenance and operation of site infrastructure and facilities	-8,25	-9,63
	Mineral Processing	-8,25	-9,63
	Opencast mining	-8,25	-9,63
	Underground mining	-8,25	-9,63
Decommissioning Phase			

Impacts	Activity	Post-Mitigation Score	Final Significance
Soil compaction	Decommissioning of Co-Disposal Dump	-6,75	-9,00
	Drilling monitoring boreholes	-4	-5,33
	Infrastructure removal	-7,5	-10,00
Soil pollution/contamination	Decommissioning of Co-Disposal Dump	-5,25	-7,00
	General decommissioning activities	-7,5	-10,00
	Infrastructure removal	-7,5	-10,00
	Filling Opencast Voids	-5,25	-7,00
	Decommissioning Underground Mine Infrastructure	-5,25	-7,00
Erosion and sedimentation	Decommissioning of Co-Disposal Dump	-6,75	-7,88
	Infrastructure removal	-6,75	-7,88
Rehabilitation and Closure Phase			
Soil compaction	Drilling monitoring boreholes	-4	-5,33
	Post Closure Monitoring and Maintenance	-7,5	-10,00
	Storm water management	-4	-5,33
	Water Treatment (when required)	-4	-5,33
Soil pollution/contamination	General Surface Rehabilitation	-7,5	-10,00
	Post Closure Monitoring and Maintenance	-7,5	-10,00
	Re-vegetation	-7,5	-10,00
	Storm water management	-5,25	-7,00
	Water Treatment (when required)	-5,25	-7,00
Erosion and sedimentation	General Surface Rehabilitation	-6	-7,00
	Post Closure Monitoring and Maintenance	-6	-7,00
	Storm water management	-6	-7,00
	Water Treatment (when required)	-6	-7,00

10.4.4. IMPACTS ON LAND CAPABILITY

The following mitigation types have been associated with potential impacts on land capability:

- Avoid through preventative measures (e.g. limit area of disturbance); and
- Remedy through soil remediation if required (e.g. fertilizer and Organic Matter applications).

10.4.4.1. SIGNIFICANCE OF IMPACT MITIGATION

With mitigation, the impact can be controlled but not prevented and some impacts will be permanent.

Impacts	Activity	Post-Mitigation Score	Final Significance
Operational Phase			
Loss of soil fertility (denitrification, Loss of soil nutrient store and organic carbon stores) and loss of land capability	Maintenance and operation of site infrastructure and facilities	-9	-12,00
	Opencast mining	-12	-16,00
Loss of soil resource and its utilisation potential	Maintenance and operation of site infrastructure and facilities	-9	-13,50
	Opencast mining	-9	-13,50
Decommissioning Phase			
Loss of soil fertility (denitrification, Loss of soil nutrient store and organic carbon stores) and loss of land capability	Filling Opencast Voids	-6,75	-9,00
Loss of soil resource and its utilisation potential	Filling Opencast Voids	-4,5	-6,75
Rehabilitation and Closure Phase			
Loss of soil fertility (denitrification, Loss of soil nutrient store and organic carbon stores) and loss of land capability	General Surface Rehabilitation	-7,5	-10,00
	Storm water management	-7,5	-10,00
	Water Treatment (when required)	-5,25	-7,00
Loss of soil resource and its utilisation potential	General Surface Rehabilitation	-4,5	-6,75
	Storm water management	-4,5	-6,75
	Water Treatment (if required)	-4	-6,00

10.4.5. IMPACTS ON LAND USE

The following mitigation types have been associated with potential impacts on land use:

- Avoid through implementation of EMP mitigation measures (e.g. service detection and communication with landowners);

- Remedy through repair or reinstatement of services if required; and
- Control through implementation of ESMS.

10.4.5.1. SIGNIFICANCE OF IMPACT MITIGATION

With mitigation, the impact can be controlled but not prevented and will remain low in significance.

Impacts	Activity	Post-Mitigation Score	Final Significance
Operational Phase			
Impacts on services	Opencast Mining	-12	-12,00
	Underground Mining	-8,25	-8,25
Interference with existing land uses	Drilling for continued resource evaluation	-6	-8,00
	Drilling monitoring boreholes	-6	-8,00
	Opencast Mining	-12	-16,00
	Underground Mining	-7,5	-10,00
Decommissioning Phase			
Impacts on services	Infrastructure removal	-6,75	-6,75
Interference with existing land uses	Drilling monitoring boreholes	-4,5	-6,00
	Infrastructure removal	-4,5	-6,00
	Filling Opencast Voids	-5,25	-7,00
Rehabilitation and Closure Phase			
Impacts on services	Water treatment (when required)	-3,5	-3,50
Interference with existing land uses	Drilling monitoring boreholes	-4,5	-6,00
	General Surface Rehabilitation	-5,25	-7,00
	Storm water management	-5,25	-7,00

10.4.6. FLORA AND FAUNA

The following mitigation types have been associated with potential impacts on flora:

- Control through implementation of EMP mitigation measures (e.g. limit area of disturbance, training);
- Avoid/Stop through relocation of threatened or protected species;
- Control through implementation of ESMS;
- Avoid and control through implementation of EMP mitigation measures (e.g. shape of disturbed areas, maintaining corridors);
- Control through implementation of EMP mitigation measures (e.g. alien vegetation management plan); and
- Avoid/Stop through preventative measures (e.g. limit extent of disturbance).

10.4.6.1. SIGNIFICANCE OF IMPACT MITIGATION

With mitigation, the impact can be controlled but not prevented and will remain low to moderate in significance.

Impacts	Activity	Post-Mitigation Score	Final Significance
Operational Phase			
Direct and indirect mortality of flora and fauna	Drilling for continued resource evaluation	-8,25	-9,63
	Drilling monitoring boreholes	-8,25	-9,63
	Maintenance and operation of site infrastructure and facilities	-9	-10,50
	Mineral Processing	-9	-10,50
	Opencast mining	-9	-10,50
Habitat fragmentation and blockage of seasonal and dispersal movements	Opencast mining	-9,75	-11,38
	Maintenance and operation of site infrastructure and facilities	-9,75	-11,38
Introduction/invasion by alien (non-native) species	Drilling for continued resource evaluation	-4,5	-6,00
	Maintenance and operation of site infrastructure and facilities	-8,25	-11,00
	Mineral Processing	-5	-6,67
	Opencast mining	-5	-6,67
	Underground mining	-5	-6,67
Decommissioning Phase			
Direct and indirect mortality of flora and fauna	Drilling monitoring boreholes	-6	-7,00
Habitat fragmentation and blockage of seasonal and dispersal movements	General decommissioning activities	-8,25	-9,63
Introduction/invasion by alien (non-native) species	Decommissioning of Co-Disposal Dump	-3,5	-4,67
	Infrastructure removal	-7,5	-10,00
	Filling Opencast Voids	-6,75	-9,00
Rehabilitation and Closure Phase			

Impacts	Activity	Post-Mitigation Score	Final Significance
Direct and indirect mortality of flora and fauna	Drilling monitoring boreholes	-4	-4,67
	General Surface Rehabilitation	-4,5	-5,25
	Post Closure Monitoring and Maintenance	-4,5	-5,25
	Storm water management	-4,5	-5,25
	Water Treatment (when required)	-4,5	-5,25
Habitat fragmentation and blockage of seasonal and dispersal movements	Storm water management	-6,75	-7,88
	Water Treatment (when required)	-6,75	-7,88
Introduction/invasion by alien (non-native) species	General Surface Rehabilitation	-7,5	-10,00
	Post Closure Monitoring and Maintenance	-7,5	-10,00
	Storm water management	-6	-8,00
	Water Treatment (when required)	-3,5	-4,67

10.4.7. SURFACE WATER

The following mitigation types have been associated with potential impacts on surface water resources:

- Avoid through implementation of preventative measures (e.g. Bunding, Hazardous materials management, Pollution prevention measures, storm water management);
- Extending the monitoring programme for the surface water;
- Control through implementation of mitigation measures (water treatment if required); and
- Avoid and control through implementation of preventative measures (e.g. limitation of water usage, water conservation strategies, optimization of water usage and recycling).

10.4.7.1. SIGNIFICANCE OF IMPACT MITIGATION

With mitigation, the impact can be controlled but not prevented.

Impacts	Activity	Post-Mitigation Score	Final Significance
Operational Phase			
Decrease in surface water quantity/availability	Maintenance and operation of site infrastructure and facilities	-9,75	-16,25
Pollution of surface water	Maintenance and operation of site infrastructure and facilities	-9,75	-16,25

Impacts	Activity	Post-Mitigation Score	Final Significance
resources/decreased water quality	Mineral Processing	-13	-21,67
	Opencast mining	-13	-21,67
	Underground mining	-6,5	-10,83
Decommissioning Phase			
Pollution of surface water resources/decreased water quality	Decommissioning of Co-Disposal Dump	-7,5	-12,50
	Filling Opencast Voids	-7,5	-12,50
Rehabilitation and Closure Phase			
Pollution of surface water resources/decreased water quality	Post Closure Monitoring and Maintenance	-5	-8,33
	Re-vegetation	-5	-8,33

10.4.8. WETLANDS

The following mitigation types have been associated with potential impacts on wetlands:

- Avoid and control through implementation of preventative measures (e.g. wetland delineation and mine planning, limitation area of wetland disturbance);
- Remedy/modify through wetland rehabilitation; and
- Avoid through implementation of preventative measures (e.g. adequate safety factors).

10.4.8.1. SIGNIFICANCE OF IMPACT MITIGATION

With mitigation, the impact can be controlled but not prevented and will remain moderate to high in significance.

Impacts	Activity	Post-Mitigation Score	Final Significance
Operational Phase			
Decreased water make to adjacent wetlands	Maintenance and operation of site infrastructure and facilities	-9	-13,50
	Opencast mining	-9	-13,50
	Underground mining	-9	-13,50
Loss and disturbance of wetland habitat	Maintenance and operation of site infrastructure and facilities	-11,25	-20,63
	Opencast mining	-15	-27,50
	Underground mining	-11,25	-20,63
Undermining of wetlands - surface subsidence	Underground mining	-9,75	-17,88
Decommissioning Phase			

Impacts	Activity	Post-Mitigation Score	Final Significance
Decreased watermake to adjacent wetlands	Decommissioning Underground Mine Infrastructure	-6,75	-9,00
Rehabilitation and Closure Phase			
Loss and disturbance of wetland habitat	Water Treatment (when required)	-11,25	-20,63

10.4.9. GROUND WATER

The following mitigation types have been associated with potential impacts on groundwater:

- Expand groundwater monitoring programme to include all new and additional mining areas;
- Avoid and control through implementation of preventative measures (e.g. limitation of water usage, water conservation strategies, optimization of water usage and recycling);
- Avoid and control through implementation of preventative measures (e.g. AMD mitigation strategy, mine design and progressive rehabilitation);
- Remedy through water treatment when required;
- Avoid and control through implementation of preventative measures (e.g. Bunding, Hazardous materials management, Pollution prevention measures); and
- Control through implementation of mitigation measures (AMD mitigation strategy, progressive rehabilitation).

10.4.9.1. SIGNIFICANCE OF IMPACT MITIGATION

Mitigation is possible and is effective if implemented correctly.

Impacts	Activity	Post-Mitigation Score	Final Significance
Operational Phase			
Decrease in water quantity/availability	Mineral Processing	-9,75	-14,63
	Mineral Processing	-9,75	-14,63
	Opencast mining	-9,75	-14,63
	Underground mining	-9,75	-14,63
Dewatering of groundwater aquifers	Opencast mining	-14	-23,33
	Underground mining	-14	-23,33
Pollution of groundwater/decreased water quality	Maintenance and operation of site infrastructure and facilities	-10,5	-17,50
	Opencast mining	-15	-25,00
	Underground mining	-16	-26,67
Decommissioning Phase			

Impacts	Activity	Post-Mitigation Score	Final Significance
Decrease in water quantity/availability	General decommissioning activities	-7,5	-11,25
Dewatering of groundwater aquifers	Decommissioning Underground Mine Infrastructure	-6	-10,00
Pollution of groundwater/decreased water quality	Filling Opencast Voids	-7,5	-12,50
	Decommissioning Underground Mine Infrastructure	-11	-18,33
Rehabilitation and Closure Phase			
Acid Mine Drainage	Post Closure Monitoring and Maintenance	-15	-27,50
Decrease in water quantity/availability	Re-vegetation	-4,5	-6,75
Dewatering of groundwater aquifers	General Surface Rehabilitation	-6	-10,00
	Storm water management	-6	-10,00
Pollution of groundwater/decreased water quality	Post Closure Monitoring and Maintenance	-8,25	-13,75
	Re-vegetation	-5	-8,33

10.4.10. ENVIRONMENTAL POLLUTION

The following mitigation types have been associated with potential impacts on environmental pollution:

- Avoid through implementation of suitable progressive rehabilitation and soil management;
- Control/Remedy through interception of decant and treatment of polluted water where required;
- Avoid and control through implementation of EMP mitigation measures (e.g. Spill prevention, Hydrocarbon Storage);
- Avoid through preventative measures (e.g. bunding, spill kits);
- Remedy through cleanup and waste disposal;
- Modify through soil treatment if required; and
- Avoid and control through implementation of preventative measures (e.g. location of toilets, spill prevention, waste management).

10.4.10.1. SIGNIFICANCE OF IMPACT MITIGATION

Mitigation is possible and is effective in most cases.

Impacts	Activity	Post-Mitigation Score	Final Significance
Operational Phase			
General Environmental Pollution	Mineral Processing	-9	-13,50
	Opencast mining	-9	-13,50
	Underground mining	-9	-13,50
Hydrocarbon spills/contamination	Drilling for continued resource evaluation	-8,25	-11,00
	Drilling monitoring boreholes	-8,25	-11,00
	Maintenance and operation of site infrastructure and facilities	-9	-12,00
	Mineral Processing	-9	-12,00
	Opencast mining	-9	-12,00
	Underground mining	-9	-12,00
Sewage spills/contamination	Maintenance and operation of site infrastructure and facilities	-5	-5,00
	Opencast mining	-4,5	-4,50
	Underground mining	-4,5	-4,50
Decommissioning Phase			
General Environmental Pollution	General decommissioning activities	-7,5	-11,25
	Infrastructure removal	-7,5	-11,25
Hydrocarbon spills/contamination	Decommissioning of Co-Disposal Dump	-6,75	-9,00
	Drilling monitoring boreholes	-6	-8,00
	General decommissioning activities	-6,75	-9,00
	Infrastructure removal	-6,75	-9,00
	Filling Opencast Voids	-6,75	-9,00
	Decommissioning Underground Mine Infrastructure	-6,75	-9,00
Sewage spills/contamination	General decommissioning activities	-3,5	-3,50

Impacts	Activity	Post-Mitigation Score	Final Significance
Rehabilitation and Closure Phase			
Decant from underground workings	Post Closure Monitoring and Maintenance	-15	-25,00
General Environmental Pollution	Water Treatment (when required)	-6,75	-10,13
Hydrocarbon spills/contamination	Drilling monitoring boreholes	-5,25	-7,00
	General Surface Rehabilitation	-6	-8,00
	Post Closure Monitoring and Maintenance	-6	-8,00
	Re-vegetation	-6	-8,00
	Storm water management	-6	-8,00
	Water Treatment (when required)	-6	-8,00
Sewage spills/contamination	Water Treatment (when required)	-3,5	-3,50

10.4.11. CULTURAL AND HERITAGE RESOURCES

The following mitigation types have been associated with potential impacts on heritage resources:

- Avoid and control through implementation of preventative measures (e.g. Palaeontological site visit and training, watching brief);
- Modify through removal and curation of fossils;
- Avoid and control through implementation of preventative measures (e.g. fencing of graveyards, watching brief, chance finds procedure); and
- Stop through relocation of graves if required.

10.4.11.1. SIGNIFICANCE OF IMPACT MITIGATION

If the provided mitigation measures are implemented any disturbance to heritage features can be minimised. Any destruction of heritage features is considered permanent. This impact will remain permanent despite mitigating efforts as it is not possible to mitigate the destruction of heritage resources.

Impacts	Activity	Post-Mitigation Score	Final Significance
Operational Phase			
Destruction/damage of heritage resources	Opencast mining	-12,75	-23,38
	Underground mining	-12,75	-23,38
	Opencast Mining	-12	-14,00

Impacts	Activity	Post-Mitigation Score		Final Significance
Destruction/damage of palaeontological resources	Underground Mining	-12		-14,00
Discovery and preservation of fossils	Opencast Mining	9		12,00
	Underground Mining	9		12,00
Decommissioning Phase				
Destruction/damage of heritage resources	General decommissioning activities	-8		-14,67
Rehabilitation and Closure Phase				
Destruction/damage of heritage resources	General Surface Rehabilitation	-8		-14,67
	Storm water management	-8		-14,67
	Water Treatment (when required)	-8		-14,67
Destruction/damage of palaeontological resources	Water Treatment (when required)	-8		-14,67

10.4.12. SOCIAL IMPACTS

The following mitigation types have been associated with potential social impacts:

- Avoidance and control through preventative measures (e.g. site security, code of conduct);
- Avoidance and control through mitigation measures (e.g. recruitment procedure, grievance mechanism, code of conduct);
- Control through implementation of ESMS and stakeholder engagement plan;
- Modify through reduction of visual impact; and
- Modify and control through mitigation measures (e.g. grievance mechanism, Relocation plan).

10.4.12.1. SIGNIFICANCE OF IMPACT MITIGATION

With mitigation, the impacts can be controlled but not prevented.

Impacts	Activity	Post-Mitigation Score	Final Significance
Operational Phase			
Crime and violence	General mine management	-5,5	-5,50
Influx of migrant workers	General mine management	-13	-13,00
	Opencast mining	-13	-13,00

Loss of sense of place	General mine management	-6	-6,00
	Mineral processing	-9	-9,00
	Opencast mining	-12	-12,00
	Underground mining	-6	-6,00
Relocation	General mine management	-11,25	-13,13
Social vices	General mine management	-9	-9,00
	Maintenance and operation of site infrastructure and facilities	-9	-9,00
	Opencast mining	-9	-9,00
	Underground mining	-9	-9,00
Decommissioning Phase			
Crime and violence	General mine management	-4,5	-4,50
Influx of migrant workers	General mine management	-7,5	-7,50
Loss of sense of place	General mine management	-4	-4,00
Relocation	General mine management	-11,25	-13,13
Social vices	General mine management	-7,5	-7,50
Rehabilitation and Closure Phase			
Crime and violence	General mine management	-4,5	-4,50
Influx of migrant workers	General mine management	-5	-5,00
Loss of sense of place	General mine management	-4	-4,00
	Water treatment (when required)	-4	-4,00
Relocation	General mine management	-11,25	-13,13
Social vices	General mine management	-7,5	-7,50

10.4.13. SOCIO-ECONOMIC ENVIRONMENT

The following mitigation types have been associated with potential socio-economic:

- Maximise through optimisation of economic growth opportunities;
- Maximise skills development and training through implementation of SLP;
- Maximise employment opportunities through implementation of SLP;
- Minimise impacts on local farm labour through compensation, skills development and livelihood restoration;
- Minimise impacts of job loss through skills development and livelihood restoration;
- Avoid through implementation of preventative measures (e.g. consultation and communication);
- Control through ESMS procedures such as recruitment procedure;
- Minimise impacts of job loss through skills development and livelihood restoration; and
- Maximise security of coal supply through sound and responsible mine management.

10.4.13.1. SIGNIFICANCE OF IMPACT MITIGATION

Implementation of mitigation measures will help maximise the positive impact of the mining operation.

Impacts	Activity	Post-Mitigation Score	Final Significance
Operational Phase			
Coal supply for energy security	Opencast mining	20	23,33
	Underground Mining	20	23,33
Economic growth	General Mine Management	13	13,00
	Opencast mining	13	13,00
	Underground mining	13	13,00
Education, Skills Development and Training	Drilling for continued resource evaluation	9	9,00
	General Mine Management	9	9,00
	Opencast mining	9	9,00
	Underground mining	9	9,00
Employment Opportunities	Drilling for continued resource evaluation	13	13,00
	General Mine Management	13	13,00
	Maintenance and operation of site infrastructure and facilities	13	13,00
	Opencast mining	13	13,00
	Underground mining	13	13,00
Impacts on local farm labour	General Mine Management	-8,25	-8,25
	Underground mining	-8,25	-8,25
Perceptions and Expectations	Drilling for continued resource evaluation	-8,25	-8,25
Impact on livelihoods	General Mine Management	-9	-9,00
Decommissioning Phase			
Economic growth	General Mine Management	8	8
Education, Skills Development and Training	General Mine Management	6	6
Employment Opportunities	General decommissioning activities	7,5	7,50
	General Mine Management	7,5	7,50

Impacts	Activity	Post-Mitigation Score	Final Significance
Impacts on local farm labour	General Mine Management	-4	-4,00
Loss of jobs and economic opportunities	General Mine Management	-16,25	-16,25
Impact on livelihoods	General Mine Management	-5	-5,00
Rehabilitation and Closure Phase			
Economic Growth	General Mine Management	5,25	5,25
Education, Skills Development and Training	General Mine Management	5,25	5,25
Employment Opportunities	General Mine Management	7,5	7,50
Impacts on local farm labour	General Mine Management	-3,5	-3,50
Loss of jobs and economic opportunities	General Mine Management	-16,25	-16,25
Impact on livelihoods	General Mine Management	-5	-5,00

10.4.14. HEALTH AND SAFETY

The following mitigation types have been associated with potential impacts on health and safety:

- Avoidance and control through preventative measures (e.g. HIV/AIDS awareness);
- Remedy through application of mitigation measures in EMP;
- Avoid and control through implementation of preventative measures (e.g. Fire breaks, Blasting procedures, hazardous substances management, adequate ventilation underground); and
- Avoid and control through implementation of preventative measures (e.g. blast procedures, monitoring, communication with landowners, emergency response procedures).

10.4.14.1. SIGNIFICANCE OF IMPACT MITIGATION

With mitigation, the impact can be controlled but not prevented.

Impacts	Activity	Post-Mitigation Score	Final Significance
Operational Phase			
Community health and safety	General Mine Management	-9,75	-11,38
	Maintenance and operation of site infrastructure and facilities	-9,75	-11,38
	Opencast mining	-9,75	-11,38
Fire and explosion hazard	Maintenance and operation of site infrastructure and facilities	-5	-5,00

Impacts	Activity	Post-Mitigation Score	Final Significance
	Mineral Processing	-5	-5,00
	Opencast mining	-5	-5,00
	Underground mining	-5	-5,00
Fly Rock	Opencast mining	-4,5	-4,50
	Underground mining	-4,5	-4,50
Health impacts	General Mine Management	-9	-10,50
	Maintenance and operation of site infrastructure and facilities	-9	-10,50
	Mineral Processing	-9	-10,50
	Opencast mining	-9	-10,50
	Underground mining	-9	-10,50
Decommissioning Phase			
Community health and safety	Decommissioning of Co-Disposal Dump	-4	-4,00
	General decommissioning activities	-4	-4,00
	General Mine Management	-4	-4,00
	Filling Opencast Voids	-4	-4,00
	Decommissioning Underground Mine Infrastructure	-4	-4,00
Health Impacts	General decommissioning activities	-7,5	-8,75
	General Mine Management	-7,5	-8,75
Rehabilitation and Closure Phase			
Community health and safety	General Mine Management	-3	-3,00
	Re-vegetation	-3	-3,00
Health Impacts	General Mine Management	-6,75	-7,88
	Re-vegetation	-6,75	-7,88

10.4.15. TRANSPORTATION, INFRASTRUCTURE AND TRAFFIC

The following mitigation types have been associated with potential impacts on transportation, infrastructure and traffic:

- Avoid and control through implementation of EMP mitigation measures (e.g. speed limit enforcement, vehicle maintenance).

10.4.15.1. SIGNIFICANCE OF IMPACT MITIGATION

With mitigation, the impact can be controlled but not prevented and will remain low to moderate in significance.

Impacts	Activity	Post-Mitigation Score	Final Significance
Operational Phase			
Increased traffic	Opencast mining	-13	-13,00
	Underground mining	-13	-13,00
Damage to road infrastructure	Opencast mining	-9	-9,00
	Underground mining	-9	-9,00
Decommissioning Phase			
Damage to road infrastructure	Decommissioning of Co-Disposal Dump	-7,5	-7,50

10.4.16. AIR QUALITY

The following mitigation types have been associated with potential impacts on air quality:

- Avoid and control through implementation of EMP mitigation measures (e.g. vehicle maintenance, progressive rehabilitation);
- Extend the dust monitoring programme to include all new and additional mining areas;
- Avoid through preventative measures (e.g. speed limit enforcement); and
- Control through implementation of EMP mitigation measures (e.g. dust suppression).

10.4.16.1. SIGNIFICANCE OF IMPACTS

With mitigation, the impact can be controlled but not prevented and will remain low in significance.

Impacts	Activity	Post-Mitigation Score	Final Significance
Operational Phase			
Fugitive emissions (Dust)	Drilling for continued resource evaluation	-4	-4,67
	Drilling monitoring boreholes	-4	-4,67
	Mineral Processing	-12	-14
	Opencast mining	-8,25	-9,63
	Underground mining	-8,25	-9,63
Greenhouse gas emissions	Maintenance and operation of site infrastructure and infrastructure and facilities	-6,75	-10,13
	Mineral Processing	-6,75	-10,13
	Opencast mining	-6,75	-10,13
	Underground mining	-6,75	-10,13
Decommissioning Phase			

Impacts	Activity	Post-Mitigation Score	Final Significance
Fugitive emissions (Dust)	Decommissioning of Co-Disposal Dump	-6,75	-7,88
	Drilling monitoring boreholes	-3	-3,50
	General decommissioning activities	-6,75	-7,88
	Infrastructure removal	-6,75	-7,88
	Filling Opencast Voids	-6,75	-7,88
Greenhouse gas emissions	Decommissioning of Co-Disposal Dump	-5,25	-7,88
	General decommissioning activities	-5,25	-7,88
	Infrastructure removal	-5,25	-7,88
	Filling Opencast Voids	-5,25	-7,88
	Decommissioning Underground Mine Infrastructure	-5,25	-7,88
Rehabilitation and Closure Phase			
Fugitive emissions (Dust)	Drilling monitoring boreholes	-5,25	-6,13
	General Surface Rehabilitation	-5,25	-6,13
	Post Closure Monitoring and Maintenance	-5,25	-6,13
	Re-vegetation	-5,25	-6,13
	Storm water management	-5,25	-6,13
	Water Treatment (when required)	-5,25	-6,13
Greenhouse gas emissions	Re-vegetation	-5,25	-7,88
	General Surface Rehabilitation	-5,25	-7,88
	Storm water management	-5,25	-7,88
	Water Treatment (when required)	-5,25	-7,88

10.4.17. VISUAL IMPACTS

The following mitigation types have been associated with potential visual impacts:

- Avoid and control through implementation of EMP mitigation measures (e.g. directional down lighting, dust suppression, mine planning and progressive rehabilitation).

10.4.17.1. SIGNIFICANCE OF IMPACT MITIGATION

Mitigation is possible and is effective if implemented correctly.

Impacts	Activity	Post-Mitigation Score	Final Significance
Operational Phase			
Visual impact of light at night	Mineral Processing	-8,25	-9,63
	Opencast mining	-8,25	-9,63
	Underground mining	-6	-7,00
Visual impact of mine infrastructure, stockpiles and dust	Mineral Processing	-9	-10,50
	Opencast mining	-9	-10,50
	Underground mining	-6,75	-7,88
Decommissioning Phase			
Visual impact of mine infrastructure, stockpiles and dust	Decommissioning of Co-Disposal Dump	-7,5	-8,75
Rehabilitation and Closure Phase			
Visual impact of mine infrastructure, stockpiles and dust	General Surface Rehabilitation	-6	-7,00
	Storm water management	-6	-7,00
	Water Treatment (when required)	-6,75	-7,88

10.4.18. NOISE IMPACTS

The following mitigation types have been associated with potential noise impacts:

- Avoid through preventative measures (e.g. communication with landowners, timing of activities);
- Amend the noise monitoring programme to include additional and new mining areas; and
- Control through implementation of EMP mitigation measures (e.g. Noise abatement measures).

10.4.18.1. SIGNIFICANCE OF IMPACT MITIGATION

With mitigation, the impact can be controlled but not prevented and will remain low in significance.

Impacts	Activity	Post-Mitigation Score	Final Significance
Operational Phase			
Disburbing and/or nuisance noise	Drilling for continued resource evaluation	-6,75	-7,88
	Drilling monitoring boreholes	-6,75	-7,88

Impacts	Activity	Post-Mitigation Score	Final Significance
	Maintenance and operation of site infrastructure and facilities	-9	-10,50
	Mineral Processing	-9	-10,50
	Opencast mining	-9	-10,50
	Underground mining	-7,5	-8,75
Decommissioning Phase			
Disburbing and/or nuisance noise	Decommissioning of Co-Disposal Dump	-6,75	-7,88
	Drilling monitoring boreholes	-6,75	-7,88
	General decommissioning activities	-9	-10,50
	Infrastructure removal	-9	-10,50
	Filling Opencast Voids	-9	-10,50
	Decommissioning Underground Mine Infrastructure	-7,5	-8,75
Rehabilitation and Closure Phase			
Disburbing and/or nuisance noise	Drilling monitoring boreholes	-5,25	-6,13
	General Surface Rehabilitation	-6	-7,00
	Re-vegetation	-5,25	-6,13
	Storm water management	-6	-7,00
	Water Treatment (when required)	-5,25	-6,13

10.4.19. BLASTING AND VIBRATION

The following mitigation types have been associated with potential blasting and vibration impacts:

- Avoid and control through implementation of preventative measures (e.g. blast procedures, monitoring, communication with landowners, emergency response procedures).

10.4.19.1. SIGNIFICANCE OF IMPACT MITIGATION

Mitigation is possible and is effective in most cases.

Impacts	Activity	Pre-Mitigation Score	Post-Mitigation Score	Final Significance
Operational Phase				
Air Blast	Opencast mining	-11	-6,75	-7,88
	Underground mining	-11	-6,75	-7,88
Ground Vibration and human perception	Opencast mining	-13	-7,5	-7,50
	Underground mining	-13	-7,5	-7,50
Ground Vibration Impacts on productivity of farm animals (cattle, chickens, pigs, etc.)	Opencast mining	-13	-8,25	-9,63
Impacts on Infrastructure (roads, communications infrastructure, services, houses, boreholes)	Opencast mining	-13	-8,25	-9,63
	Underground mining	-13	-9	-9,00
Noxious fumes	Opencast mining	-12	-9	-9,00
	Underground mining	-12	-9	-9,00

11. OUTCOME OF THE SITE SELECTION PROCESS

A final site layout plan as informed by the process of consultation with I&AP's will be included in the final report to be submitted to the DMR for adjudication.

11.1. MOTIVATION WHERE NO ALTERNATIVE SITES WERE CONSIDERED

The Applicant has an existing Mining Right over the sites assessed in this report, and a Prospecting Right for Zandvoort 10 IT. It is noted that alternative locations for the project have not been considered for the following reasons:

- The proposed project of including Zandvoort 10IT, is an expansion of an existing mine.
- The proposed amendments to the Mining Works Programme, includes properties for which Pembani Colliery already has an existing Mining Right. The changes to the MWP were subject to a separate NEMA EIA for which approval has been granted.
- The location of the proposed project is determined by the availability of coal.

The proposed project cannot go ahead in the form as proposed (i.e. without any additional infrastructure) unless it is undertaken at the location as proposed due to the proximity of the existing infrastructure, mining operations and coal reserves.

Furthermore, as Pembani is an existing, operational mine no comparative land use and/or development alternatives have been considered or assessed in this report. Pembani has undertaken previous assessments where various land use and/or development alternatives have been previously considered as part of prior applications for approval or authorisation. However, the land use at present is mining and given that the mine is already in operation there are no practical alternative land use and/or development alternatives to the land on which the mine and related infrastructure/activities are located.

Due to the nature of the coal reserve (high quality reserve) and the identified sensitivities identified on the surface area of Zandvoort, as well as concerns raised by landAP's it was concluded that underground mining is the only viable alternative for the proposed mining activities on Zandvoort.

11.2. STATEMENT MOTIVATING THE PREFERRED SITE

As Pembani is an existing, operational mine no comparative land use and/or development alternatives have been considered or assessed in this report. The land use at present is mining and given that the mine is already in operation there are no practical alternative land use and/or development alternatives to the land on which the mine and related infrastructure/activities are located.

12. PLAN OF STUDY FOR THE IMPACT ASSESSMENT

The section below outlines the proposed plan of study which will be conducted for the various environmental aspects during the EIA Phase. It is also important to note that the plan of study will also be guided by comment obtained from landAP's and other stakeholders during the PPP.

12.1. DESCRIPTION OF ALTERNATIVES TO BE CONSIDERED INCLUDING THE OPTION OF NOT GOING AHEAD WITH THE ACTIVITY

The alternatives considered and discussed in the above sections, including land use, location, and mining alternatives have culminated into the identification of three feasible development alternatives. These three feasible development alternatives are discussed below.

12.1.1. ALTERNATIVE 1: NO GO ALTERNATIVE

The implication of not implementing the proposed extension of mining to Zandvoort, and of amending the existing mining works programme (within the approved mining right boundary) to include the mining of additional coal resources including new underground mining operations on Portions RE of 6, 7, 8 and 10 of the farm Kwaggafontein 8 IT; Portions of the farm Haarlem 39 IT; Portion RE/9 of the farm Appeldoorn 38 IT; Portions Re of 1, 5, 8, 16 and 20 of the farm Groenvallei 40 IT; Portions 2, 7, 8, 9 and 10 of the farm Twyfelaar 11 IT; and Portions 2 and 12 of the farm Paardeplaats 12 IT, and new opencast mining operations on Portions RE of 6, 7, 8 and 10 of the farm Kwaggafontein 8 IT; Portion 8 of the farm Groenvallei 40 IT and Portion 2 of the farm Paardeplaats 12 IT, includes a reduction in the existing mining operations overall LoM, as well as compromising the ability of Pembani to ensure consistent coal supply to Eskom for electricity generation and extended local and regional economic benefits.

12.1.2. ALTERNATIVE 2: MINING METHOD

The proposed extension of underground mining activities to Zandvoort and Portions RE of 6, 7, 8 and 10 of the farm Kwaggafontein 8 IT; Portions of the farm Haarlem 39 IT; Portion RE/9 of the farm Appeldoorn 38 IT; Portions Re of 1, 5, 8, 16 and 20 of the farm Groenvallei 40 IT; Portions 2, 7, 8, 9 and 10 of the farm Twyfelaar 11 IT; and Portions 2 and 12 of the farm Paardeplaats 12 IT correlates to the location of a viable mineral resource that can be accessed from existing mine workings. Opencast mining operations on Portions RE of 6, 7, 8 and 10 of the farm Kwaggafontein 8 IT; Portion 8 of the farm Groenvallei 40 IT and Portion 2 of the farm Paardeplaats 12 IT will allow for mining in smaller areas where certain underground mining techniques would not be appropriate. As such there are no design or layout alternatives to consider.

12.2. DESCRIPTION OF THE ASPECTS TO BE ASSESSED AS PART OF THE ENVIRONMENTAL IMPACT ASSESSMENT PROCESS

The following aspects will be assessed further during the EIA phase investigation to be undertaken:

- Topography and landform;

- Geology;
- Soils, Land Use and Land Capability;
- Biodiversity (including Flora, Fauna, and Wetlands);
- Surface Water
- Wetlands;
- Geohydrology
- Cultural and Heritage Resources;
- Social Impacts;
- Socio-economic;
- Health and Safety;
- Transportation, Infrastructure and Traffic;
- Air Quality;
- Visual Impacts;
- Noise and
- Blasting and Vibration.

12.3. ASPECTS TO BE ASSESSED BY SPECIALISTS

A comprehensive baseline assessment was undertaken during the EIA in support of the Mining Right Applications from 2004 – 2006.

Four additional specialist studies were undertaken in 2015 on the farm Zandvoort namely:

- Heritage and Palaeontology Assessment;
- Fauna and Flora Assessment;
- Soils, Land Use and Land Capability Assessment; and
- Groundwater Study.

A follow up heritage and an ecological study will be undertaken for the farm Kwaggafontein to inform the EIA phase. The following specialist studies have been undertaken in the past, and the results of these studies will be used, where applicable in the EIA:

Table 37: Lists of specialists appointed to the project

Aspect	Component	Company Responsible	Consultant	Date	Authorisation
Surface Water	Surface Water Report	Digby Wells	Digby Wells	2005	(MR) MP 30/5/1/2/2/112 MR
Soil	Pre-mining Soil Assessment of the Proposed Opencast Area on Portions 1 and 4 of the Farm Haarlem 39 IT	Rehab Green Monitoring Consultants cc	P I Steenekamp	2005	(MR) MP 30/5/1/2/2/112 MR
Soil	Pre-mining Soil Assessment of the Proposed Opencast Area on Portions 5 of the Farm Haarlem 39 IT	Rehab Green Monitoring Consultants cc	P I Steenekamp	2004	(MR) MP 30/5/1/2/2/112 MR
Soil	Pre-mining Soil Assessment of the Proposed Opencast Area on Portions 4 and R/E of the Farm Haarlem 39 IT and Portion 3 and 9 of The Farm Appeldoorn 38 IT	Rehab Green Monitoring Consultants cc	P I Steenekamp	2004	(MR) MP 30/5/1/2/2/112 MR
Soil	Pre-mining Soil Assessment of the Proposed Opencast Area on Portions 2 and RE of the Farm Paardeplaats 12 IT	Rehab Green Monitoring Consultants cc	P I Steenekamp	2004	(MR) MP 30/5/1/2/2/112 MR
Soil	Pre-mining Soil Assessment of the Proposed Opencast Area on Portions 8 of the Farm Twyfelaar 11 IT	Rehab Green Monitoring Consultants cc	P I Steenekamp	2004	(MR) MP 30/5/1/2/2/112 MR
Soil	Pre-mining Soil Assessment of the Proposed Opencast Area on Portions 9 and 10 of the Farm Twyfelaar 11 IT	Rehab Green Monitoring Consultants cc	P I Steenekamp	2004	(MR) MP 30/5/1/2/2/112 MR
Soil	Pre-mining Soil Assessment of the Proposed Opencast Area on Portions 6, 7, 8 and 17 of the Farm Groenvallei 40 IT	Rehab Green Monitoring Consultants cc	P I Steenekamp	2004	(MR) MP 30/5/1/2/2/112 MR

Aspect	Component	Company Responsible	Consultant	Date	Authorisation
Soil	Pre-mining Soil Assessment of the Proposed Opencast Area on Portion LG of the Farm Groenvallei 40 IT	Rehab Green Monitoring Consultants cc	P I Steenekamp	2004	(MR) MP 30/5/1/2/2/112 MR
Heritage	Heritage Assessment	Matakoma Consultants	Matakoma Consultants	2004	(MR) MP 30/5/1/2/2/112 MR
Heritage	Heritage Assessment	Cabanga Concepts	Dr. A.C. Vollenhoven	2013	N/A
Social	Social Report	Digby Wells	Digby Wells	2005	(MR) MP 30/5/1/2/2/112 MR
Ecology	Fauna and Flora Report	Digby Wells	Digby Wells	2005	(MR) MP 30/5/1/2/2/112 MR
Ecology	Ecology (Flora and Fauna) study for Zandvoort underground mining expansion	David Hoare Consulting cc	David Hoare	2015	Completed for the S102 Application
Heritage	Heritage Study for proposed underground mining on Zandvoort 10 IT	PGS Heritage	Polke Birkholtz	2015	Completed for the S102 Application
Wetlands	Wetland Assessment	Strategic Environmental Focus (Pty) Ltd	Strategic Environmental Focus (Pty) Ltd	2011	N/A
Geohydrology	Groundwater study (2012)	Future Flow GPMS cc	Martiens Prinsloo	2012	N/A
Geohydrology	Groundwater study (2015)	Future Flow GPMS cc	Martiens Prinsloo	2015	Completed for the S102 Application

12.4. PROPOSED METHOD OF ASSESSING ENVIRONMENTAL ASPECTS

The same method of assessing impact significance as was used during the Scoping phase will be applied during the EIA phase. This methodology is described in detail in Section 10.1.

12.5. PROPOSED METHOD FOR ASSESSING DURATION SIGNIFICANCE

The significance of environmental impacts will be rated before and after the implementation of mitigation measures. These mitigation measures may be existing measures or additional measures that may arise from the impact assessment and specialist input. The impact rating system considers the confidence level that can be placed on the successful implementation of the mitigation. The proposed method for the assessment of environmental issues is set out in the Section 8.1. This assessment methodology enables the assessment of environmental issues including: the severity of impacts (including the nature of impacts and the degree to which impacts may cause irreplaceable loss of resources), the extent of the impacts, the duration and reversibility of impacts, the probability of the impact occurring, and the degree to which the impacts can be mitigated.

The specialist studies will recommend practicable mitigation measures or management actions that effectively minimise or eliminate negative impacts, enhance beneficial impacts, and assist project design. If appropriate, the studies will differentiate between essential mitigation measures, which must be implemented and optional mitigation measures, which are recommended (“nice-to-haves”).

12.6. STAGES AT WHICH COMPETENT AUTHORITIES WILL BE CONSULTED

Competent authorities will be consulted during the initial notification period, the scoping phase, and during the EIA/EMP phase. No Authority meetings are scheduled during the scoping phase. However, if and/or when an Authority requires a meeting one will be arranged. The date, time, and venue of the meeting will be scheduled post dissemination of the project notification documents should one be required. The purpose of the Authority meeting would be to explain the project in detail to authorities and clarify the process going forward.

12.7. PROPOSED METHOD OF PUBLIC PARTICIPATION

An overview of the proposed public participation process to be followed for the EIA phase is provided below. Forecast dates provided below may change as the project progresses but authority submission deadlines will be strictly adhered to.

The commenting periods that will be provided to an landAP’s will be thirty (30) days long. Two commenting periods will be provided for the:

- Scoping Report; and
- EIA/EMPR

The public participation process was initiated on the 17th of November 2016 with an initial notification and call to register. The 30 day commenting and review period of the Scoping report will take place from the 1st February

2017 and 3rd March 2017. All comments received during the initial call to register and Scoping report comment periods will be included in the Final Scoping Report for submission to the authorities.

The dates of the review and commenting period for the draft EIA/EMPR will be determined at a later date and communicated to all registered I&AP's.

12.7.1. STEPS TO BE TAKEN TO NOTIFY INTERESTED AND AFFECTED PARTIES

Interested and Affected Parties (I&APs) will be notified of the proposed Mining Right application and amendmend to the Mining Works Programme for properties within the existing Mining Right via registered letters, emails and facsimiles. The Public Participation Process will be undertaken in accordance with the NEMA process and the 2014 Regulations. A minimum of 30 days will be provided to the public to register as I&AP's and to provide comments and a further 30 days to comment on the draft Scoping Report. The information submitted by I&AP's will be utilised during the Impact Assessment and compilation of the Environmental Impact Assessment Report (EIAR). Upon acceptance of the Scoping Report an EIA process will be undertaken. An EIAR will be drafted, this report will be put out for public review with a further 30 day commenting period given to I&AP's.

Feedback from I&AP's has been and will be solicited through the following means:

- Advertisements;
- Site Notices and Posters;
- Registered Letters;
- Faxes and e-mails; and
- Any other communication with EIMS.

12.7.2. DETAILS OF ENGAGEMENT PROCESS TO BE FOLLOWED

I&APs will be afforded the following opportunities to participate in the project.

- I&APs have been requested via written notifications distributed to provide their comments on the project.
- The EIA/EMP Report will be available for comment for a period of 30 days at the same public places in the project area that the Draft Scoping report was made available, sent to stakeholders who request a copy, and placed on the EIMS website: www.eims.co.za.

All comments and issues raised during the 30 day public comment period will be incorporated into the EIA/EMP Report to be submitted to the competent and commenting authorities.

12.7.3. DESCRIPTION OF INFORMATION TO BE PROVIDED

The following information will be provided during the PPP:

- The site plan;
- List of activities to be authorised;

- Scale and extent of activities to be authorised;
- Typical impacts of activities to be authorised (e.g. surface disturbance, dust, noise, drainage, fly rock etc.);
- The duration of the activity;
- 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;
- The Mining methods to be used;
- Details of the affected properties (including parent farm and portion);
- Details of the MPRDA and NEMA Regulations that must be adhered to;
- The minerals being mined;
- Date by which comment, concerns and objections must be forwarded through to both EIMS the DMR respectively; and
- Contact details of the Environmental Assessment Practitioner (EAP).

12.8. DESCRIPTION OF TASKS THAT WILL BE UNDERTAKEN DURING EIA PROCES

The plan of study in terms of certain aspects is detailed in the above sections, and is summarised below. The following tasks will be undertaken as part of the EIA phase of the project:

- Updating specialist studies if relevant such as the heritage and ecology studies on Kwaggafontein.
- Public consultation:
 - Advertising of the availability of the EIAR for review and comment to all registered I&AP's;
 - Informing registered landAPs of the project progress.
 - Public and focus group meetings if required
- Authority consultation:
 - Consultation with DMR and the commenting authorities; and
 - Authorities consultation (including meetings where necessary) to provide authorities with project related information and obtain their feedback.
- Document compilation:
 - The EIA and EMPR will be compiled in line with the requirements of Appendix 3 and 4 of the NEMA Regulations.
 - The EIA and EMPR will be made available for public comment for a period of 30 days.
 - The EIA and EMPR will be finalised and submitted to the DMR.

12.9. MEASURES TO AVOID, REVERSE, MITIGATE, OR MANAGE IMPACTS

All comments received by I&APs will be taken into consideration and inform the high level mitigation measures. Detailed mitigation measures will be further developed as part of the impact assessment phase. The potential impacts will further be assessed in terms of the mitigation potential, taking into consideration the following:

- Reversibility of impact:
 - Reversible.
 - Partially reversible.
 - Irreversible.
- Irreplaceable loss of resources:
 - Replaceable.
 - Partially replaceable.
 - Irreplaceable.
- Potential of impacts to be mitigated:
 - High.
 - Medium.
 - Low.

This information for each identified impact will be provided in the EIA and EMP.

13. OTHER INFORMATION REQUIRED BY THE COMPETENT AUTHORITY

No additional information has been requested from the competent authority.

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

The potential impacts on the socio-economic conditions that may occur include:

- Coal supply for energy security;
- Economic growth;
- Education, Skills Development and Training;
- Employment Opportunities;
- Impacts on local farm labour;
- Loss of jobs and economic opportunities;
- Perceptions and Expectations; and

- Re-instatement of livelihoods.

These impacts have undergone a preliminary assessment in this report. The EIA/EMPR will further assess these impacts and will provide detailed mitigation and management measures to minimise the negative socio-economic impacts of the proposed exploration activities on any directly affected person.

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

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

The findings of the study that was conducted by professional archaeological consultants in 2004, identified twenty-four sites of importance along the proposed opencast mining area. In 2013, a follow-up archaeological study was undertaken and identified six archaeological features, two of which were previously identified in 2004, while the 2015 study undertaken for Zandvoort, identified seven heritage sites, comprising of a farm dwelling, rondavel, garage and shed all forming part of a single farmstead, as well as a cemetery, one possible informal grave and an old farm dipping structure.

Further recommendations for mitigation (destruction, recording and/or avoidance) of the confirmed heritage resources will be made for incorporation into the EMP for the project. Any heritage features that are identified on Kwaggafontein, will be included in the EIR and EMPR and mitigation measure will be recommended for these as well.

The potential impacts on heritage features and the anticipated applicable mitigation measures include:

- Disturbance, damage or destruction of archaeological sites
 - During design and before construction no-go areas need to be demarcated. Alternatively, mitigation measures such as the archaeological excavation of sites must be planned and scheduled to fit within the timing of the project phases.
- Disturbance, damage or destruction of historical structures
 - During design and before construction,
 - Baseline assessment of structures
 - Permitting and controlled destruction of sites
 - Operational
 - Evaluation of structures during mining against baseline data
- Disturbance, damage or destruction of graves and cemeteries sites
 - During design and before construction no-go areas need to be demarcated. Alternatively, mitigation measures such as the physical relocation of the graves in question (including aspects such as detailed social consultation) need to be planned and scheduled to fit within the timing of

the project phases. It must be understood that such a process impacts on the spiritual and social fabric of the next of kin and associated communities.

- Disturbance, damage or destruction of palaeontological resources
 - Whenever the mining will impact on palaeontological resources mitigation measures include to avoid and control through implementation of preventative measures (e.g. Palaeontological site visit and training, watching brief); and
 - Modify through removal and curation of fossils.

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

This scoping report forms proof that an investigation as required by Section 24(4)(b)(i) of the Act (NEMA) is being undertaken for the proposed Pembani Project. The EIA/EMPR will further assess the preferred alternative as identified in this report.

14. ASSUMPTIONS, LIMITATIONS, AND UNCERTAINTIES

It is assumed that for any changes to or deviations of existing public roads, Pembani Colliery will obtain the required environmental authorisations and permissions before proceeding with such changes/deviations.

It is assumed that the environmental impacts associated with the NEMA triggers have been assessed and approved in accordance with the NEMA authorisation, in all previous applications submitted to the competent authority at that time. These assumptions and limitations apply to the relevant specialist studies that have informed this report.

The following assumptions, limitations, gaps in knowledge and uncertainties are applicable to this assessment:

14.1. HERITAGE AND CULTURAL RESOURCES

- The scope of work made provision for the investigation of areas identified by Digby Wells and the survey of the whole development area by vehicle in the scope of four days.
- Due to the nature of cultural remains that occur, in most cases, below surface, the possibility remains that some cultural remains may not have been discovered during the survey. It is incumbent upon the applicant to inform the relevant heritage agency should further as yet unknown cultural remains be unearthed or laid open during the process of development.
- Notwithstanding the comprehensiveness of the fieldwork undertaken in the various heritage assessments, it is necessary to realise that the heritage resources located during the fieldwork do not necessarily represent all the possible heritage resources present within the area. Various factors account for this, including the subterranean nature of some archaeological sites and vegetation cover. As such, should any heritage features and/or objects not included in the present inventory be located or observed, a heritage specialist must be contacted immediately. 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.

- Previous heritage studies have not included Kwaggafontein in specific detail. Therefore, a heritage study will be undertaken to inform the EIR phase of this project.

14.2. SOCIAL

- The social environment constantly changes and adapts to change, and external factors outside the scope of the project can offset social changes, for example changes in local political leadership. It is therefore difficult to predict all impacts to a high level of accuracy, although care has been taken to identify and address the most likely impacts in the most appropriate way for the current local context within the limitations.
- Social impacts can be felt on an actual or perceptual level, and therefore it is not always straightforward to measure the impacts in a quantitative manner.
- There are different groups with different interests in the community, and what one group may experience as a positive social impact, another group may experience as a negative impact.

14.3. FAUNA AND FLORA

- Red List species are, by their nature, usually very rare and difficult to locate. Compiling the list of species that could potentially occur in an area is limited by the paucity of collection records that make it difficult to predict whether a species may occur in an area or not. The methodology used in this assessment is designed to reduce the risks of omitting any species, but it is always possible that a species that does not occur on a list may be located in an area where it was not previously known to exist.
- Animal species are mostly highly mobile and often migrate seasonally. Any field assessment of relatively short duration is therefore unlikely to record anything more than the most common species that happen to be on site at the time of the survey. This is a poor reflection of the overall diversity of species that could potentially occur on site.
- The previous ecological studies did not include Kwaggafontein in specific detail, therefore, an ecology study will be conducted during the EIR phase of the project.

14.4. WATER BALANCE

For the water balance the following assumptions have been made:

- It is assumed that rainfall will only enter the active mining areas. Opencast (300m x 100m). Underground Adit (50m x 50m).
- It is assumed that rainfall and groundwater seepage in the workings will migrate to the lowest point in the workings and be temporary stored in a sump (25m x 25m).
- It is assumed that dust suppression will be at a rate of 0.0025m³/m²/day.
- It is assumed that each ROM stockpiling area will be 3m high and cover an area of 10000m².
- It is assumed that each person consumes 25l per day.

14.5. SURFACE WATER

- It is recommended that the stormwater management plan and monitoring points are updated for the new and additional mining areas. This recommendation will be included in the EIR and EMPR reports.

14.6. GROUND WATER

- Where reliable data was absent, conservative/worse case assumptions were made when undertaking risk and impact assessments.
- The groundwater monitoring programme will be expanded, if necessary, to include the new and additional mining areas.

14.7. SOIL

- Although a site specific soil study has not been conducted for the farm Kwaggafontein, it is assumed that with reference to the regional soil map, the soil on the farm are not anticipated to be significantly different from the other soil studies previously conducted and, therefore, it is assumed that the same impacts and mitigation measures will be applicable.

14.8. AIR QUALITY

- Modelling is inherently an imperfect science, relying as it must on assumptions and approximations for emissions rates, weather conditions and dispersion.
- When assessing the modelling results, it is important to bear the following in mind: The absolute values of modelled dust emissions may not be a reliable indicator of the values expected in the real world. However, the exercise is valuable in terms of assessing relative values. For example, if an area to one side of a source appears more heavily impacted from dust dispersion, it is reasonable to assume that that will be the case in the real world. For this reason, it is important to consider the results of the air quality modelling as being an indicator of areas of potential concern and impact, rather than a definitive prediction of the amount of dust expected to be released into the receiving environment.
- The dust monitoring programme will be extended to include all new and additional mining areas.

14.9. VISUAL

- All mining structures will be removed during decommissioning phase. The land will be rehabilitated back to the original land use as far as possible after rehabilitation and closure.
- It is assumed that the old prospecting areas will be rehabilitated.

14.10. NOISE

- Noise experienced at a certain location is the cumulative result of innumerable sounds emitted and generated both near and far, each in a different time domain, each having a different spectral character at a different sound level. Each of these sounds are also impacted differently by surrounding vegetation, structures and meteorological conditions that result in a total cumulative noise level represented by a few numbers on a sound level meter. It is not the purpose of noise modelling to

accurately determine a likely noise level at a certain receptor, but to calculate a noise rating level that is used to identify potential issues of concern.

- The noise monitoring programme will be amended to include additional and new mining areas.

15. UNDERTAKING REGARDING CORRECTNESS OF INFORMATION

I _____ herewith undertake that the information provided in the foregoing report is correct, and that the comments and inputs from stakeholders and Interested and Affected Parties has been correctly recorded in the report.

Signature of the EAP

Date: _____

16. UNDERTAKING REGARDING LEVEL OF AGREEMENT

I _____ herewith undertake that the information provided in the foregoing report is correct, and that the level of agreement with Interested and Affected Parties and stakeholders has been correctly recorded and reported herein.

Signature of the EAP

Date: _____

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