mineral resources

Department:
Mineral Resources
REPUBLIC OF SOUTH AFRICA

ELDERS COLLIERY

ENVIRONMENTAL IMPACT ASSESSMENT REPORT

AND

ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT

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

NAME OF APPLICANT: Anglo Operations (Pty) Ltd

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DMR REFERENCE NUMBER: MP 30/5/1/2/3/2/1 10117 EA

AngloAmerican

srk consulting

1. 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 or instructions or guidance provided by the competent authority to the submission of applications.

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

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

2. OBJECTIVE OF THE ENVIRONMENTAL IMPACT ASSESSMENT PROCESS

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

(a) determine the policy and legislative context within which the activity is located and document how the proposed activity complies with and responds to the policy and legislative context;

(b) describe 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 the location of the development footprint within the preferred site based on an impact and risk assessment process inclusive of cumulative impacts and a ranking process of all the identified development footprint alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects of the environment;

(d) determine the—-

(i) nature, significance, consequence, extent, duration and probability of the impacts occurring to inform identified preferred alternatives; and

(ii) degree to which these impacts—

(aa) can be reversed;

(bb) may cause irreplaceable loss of resources, and

(cc) can be avoided, managed or mitigated;

(e) identify the most ideal location for the activity within the preferred site based on the lowest level of environmental sensitivity identified during the assessment;

(f) identify, assess, and rank the impacts the activity will impose on the preferred location through the life of the activity;

(g) identify suitable measures to manage, avoid or mitigate identified impacts; and

(h) identify residual risks that need to be managed and monitored.

ANGLO OPERATIONS (PTY) LTD

ELDERS COLLIERY

Environmental Impact Assessment and Environmental Management Programme JANUARY 2016

SIGNATURE SHEET

SIGNED OFF BY:

Mr Jacob du Plessis

Anglo Operations (Pty) Ltd: Project Manager: – Goedehoop Projects Complex

Ms Daphney Tshehla

Anglo Operations (Pty) Ltd: Environmental Specialist: – Goedehoop Projects Complex

COMPILED BY:

Ms Suzanne Van Rooy

SRK Consulting – Senior Environmental Scientist

Ms Beth Candy

SRK Consulting – Principal Environmental Scientist

REVIEWED BY:

Ms Briony Liber

SRK Consulting – Partner, Principal Consultant

Executive Summary

Anglo Operations' (Pty) Ltd (AOL) Elders Colliery is a proposed underground coal mine, located approximately 25 km north of Bethal on the R35 provincial road towards Middelburg in the Mpumalanga Province. The project falls mainly within the Gert Sibande District Municipality and Govan Mbeki Local Municipality. AOL proposes to develop a boxcut to gain access to the coal resources and will mine the No. 2 and No. 4 coals seams by means of bord and pillar underground mining methods, making use of continuous miners and shuttle cars. Coal will be transported via a newly constructed conveyor belt 10 km in length to Block 20 (a mined out shaft currently on care and maintenance, owned by AOL's Goedehoop Colliery). Coal will be transported from Block 20 to the Goedehoop Colliery on an existing conveyor belt of 7 km that will be re-installed. This will include a small new section of conveyor belt. Coal will be processed at the existing Goedehoop Colliery Processing Plant

AOL appointed SRK Consulting (South Africa) (Pty) Ltd (SRK) as the independent Environmental Assessment Practitioner (EAP) to facilitate the environmental authorisation process for its proposed Elders Colliery, an underground coal mining project.

The proposed Elders Colliery requires environmental authorisation in terms of the National Environmental Management Act (Act No. 107 of 1998) (NEMA) and will follow a Scoping and Environmental Impact Report (S&EIR) process in terms of NEMA Regulation 982. The newly promulgated regulations enforce a strict timeframe and require a decision by the competent authority within 300 days from submission of the environmental authorisation application. The competent authority is the Department of Mineral Resources (DMR)

In addition, an Integrated Water Use Licence (IWULA) and associated Integrated Water and Waste Management Plan (IWWMP) will be required in terms of the National Water Act (Act No. 36 of 1998) (NWA). The competent authority for the IWULA is the Department of Water and Sanitation (DWS).

The first phase of an S&EIR process is the scoping phase, which was completed in August 2015. During this phase, various stakeholder groups were identified and stakeholders were encouraged to participate in the project so that significant issues requiring further investigation and assessment by specialists could be identified. Stakeholders had the opportunity to comment on the Scoping Report from 3 August – 2 September 2015. The Scoping Report was submitted to the lead authority, the DMR on 28 August 2015. The Scoping Report was also submitted to other commenting authorities in August 2015. The Scoping Report was approved by the DMR on 20 October 2015.

The second phase of the S&EIR process is the impact assessment phase and has been completed in November 2015. The impact assessment phase included specialist investigations, the assessment of impacts, and the preparation of an environmental management programme. Stakeholders were invited to participate in the public review period of the impact assessment phase of the project to ensure that the assessment of impacts and proposed management of impacts have addressed their concerns. The EIA/EMP was made available for public comment from 9 November to 8 December 2015 at various public places.

After the public review period, the EIA/EMP report was updated with comments received from stakeholders during the impact assessment phase for the EIA/EMP for authorities review. The EIA/EMP for authorities review (this report) will be submitted to the DMR who will consider the findings in consultation with various other authorities. After reviewing the document, the DMR will make a decision whether environmental authorisation should be granted for the proposed Elders Colliery Project.

This EIA and EMP has been compiled in terms of the provisions of Appendix 3 and 4 of December 2014 Regulation R. 982 of the National Environmental Management Act (NEMA). These requirements are cross-referenced to the various sections in this report where these requirements are addressed in the tables below.

Table 1: Structure of the EIA

EIA Regulation requirement	Section addressed	Page number
(a) Details of – (i) The EAP who prepared the report and; (ii) The expertise of the EAP, including a curriculum vitae	PART A -Section 3 (a)	15
(b) The location of the activity, including – (i) The 21 digit Surveyor General code of e\ach cadastral land parcel; (ii) Where available, the physical address and farm name; (iii) Where the required information in terms of (i) and (ii) is not available, the coordinates of the boundary of the property or properties;	PART A -Section 3 (b)	16
(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 land where the property has not been define, the coordinates within which the activity is to be undertaken;	Appendix 4	N/A
(d) A description of the scope of the proposed activity, including – (i) All listed and specified activities triggered and being applied for; and (ii) A description of the associated structures and infrastructure related to the development;	PART A -Section 3 (d)	19, 20
(e) A description of the policy and legislative context within which the development is located and an explanation of how the proposed development complies with and responds to the legislation and policy context	PART A -Section 3 (e)	31
(f) A motivation for the need and desirability for the proposed development, including the need an desirability of the activity in the context of the preferred location;	PART A -Section 3 (f)	34
(g) A motivation for the preferred development footprint within the approved site	PART A -Section 3 (g)	35
(i) details of the development footprint alternatives considered;	PART A -Section 3 (g)(i)	35

EIA Regulation requirement		Section addressed	Page number
(ii)	details of the public participation process undertaken in terms of regulation 41 of the Regulations, including copies of the supporting documents and inputs;	PART A -Section 3 (g)(ii)	38
(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;	PART A -Section 3 (g)(iii)	43
(iv)	the environmental attributes associated with the development footprint alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects;	PART A -Section 3 (g)(iv)	72
(v)	the impacts and risks identified including the nature, significance, consequence, extent, duration and probability of the impacts, including the degree to which these impacts – (aa) can be reversed; (bb) may cause irreplaceable loss of resources; and (cc) can be avoided, managed or mitigated;	PART A -Section 3 (g)(v)	87
(vi)	the methodology used in determining and ranking the nature, significance, consequences, extent, duration and probability of potential environmental impacts and risks;	PART A -Section 3 (g)(vi)	88
(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	PART A -Section 3 (g)(vii)	90
(viii)	the possible mitigation measures that could be applied and level of residual risk	PART A -Section 3 (g)(viii)	91
(ix)	if no alternative development locations for the activity were investigated, the motivation for not considering such; and	PART A -Section 3 (g)(ix)	99
(x)	a concluding statement indicating the preferred alternative development location within the approved site;	PART A -Section 3 (g)(x)	99
(h)	**a full description of the process undertaken to identify, assess and rank the impacts the activity and associated structures and infrastructure will impose on the preferred location through the life of the activity, including-**	PART A -Section 3 (h)	99
(i)	a description of all environmental issues and risks that were identified during the environmental impact assessment process; and		
(ii)	an assessment of the significance of each issue and risk and an indication of the extent to which the issue and risk could be avoided or addressed by the adoption of mitigation measures;		
(i)	**an assessment of each identified potentially significant impact and risk, including-**	PART A -Section 3 (i)	102
(i)	Cumulative impacts;		
(ii)	The nature, significance and consequences of the impact and risk;		

EIA Regulation requirement	Section addressed	Page number
(iii) The extent and duration of the impact and risk;		
(iv) The probability of the impact and risk occurring;		
(v) the degree to which the impact and risk can be reversed;		
(vi) the degree to which the impact and risk may cause irreplaceable loss of resources; and		
(vii) the degree to which the impact and risk can be mitigated;		
(j) where applicable, a summary of the findings and recommendations of any specialist report complying with Appendix 6 to these Regulations and an indication as to how these findings and recommendations have been included in the final assessment report;	PART A -Section 3 (j)	146
(k) an environmental impact statement which contains-	PART A -Section 3 (k)	171
(i) a summary of the key findings of the environmental impact assessment:	PART A -Section 3 (k)(i)	171
(ii) map at an appropriate scale which superimposes the proposed activity and its associated structures and infrastructure on the environmental sensitivities of the preferred site indicating any areas that should be avoided, including buffers; and	Appendix 8	N/A
(iii) a summary of the positive and negative impacts and risks of the proposed activity and identified alternatives;	PART A -Section 3 (k)(iii)	173
(l) based on the assessment, and where applicable, recommendations from specialist reports, the recording of proposed impact management objectives, and the impact management outcomes for the development for inclusion in the EMPr as well as for inclusion as conditions of authorisation;	PART A -Section 3 (l)	173
(m) the final proposed alternatives which respond to the impact management measures, avoidance, and mitigation measures identified through the assessment;	PART A -Section 3 (m)	173
(n) any aspects which were conditional to the findings of the assessment either by the EAP or specialist which are to be included as conditions of authorisation	PART A -Section 3 (n)	173
(o) a description of any assumptions, uncertainties and gaps in knowledge which relate to the assessment and mitigation measures proposed;	PART A -Section 3 (o)	174
(p) a reasoned opinion as to whether the proposed activity should or should not be authorised, and if the opinion is that it should be authorised, any conditions that should be made in respect of that authorisation;	PART A -Section 3 (p)	179

EIA Regulation requirement	Section addressed	Page number
(q) where the proposed activity does not include operational aspects, the period for which the environmental authorisation is required and the date on which the activity will be concluded and the post construction monitoring requirements finalised;	PART A -Section 3 (q)	180
(r) an undertaking under oath or affirmation by the EAP in relation to:	PART A -Section 3 (r) and PART B – Section 2	180
(i) the correctness of the information provided in the reports;		
(ii) the inclusion of comments and inputs from stakeholders and I&APs;		
(iii) the inclusion of inputs and recommendations from the specialist reports where relevant; and		
(iv) any information provided by the EAP to interested and affected parties and any responses by the EAP to comments or inputs made by interested or affected parties;		
(s) where applicable, details of any financial provisions for the rehabilitation, closure, and ongoing post decommissioning management of negative environmental impacts;	PART A -Section 3 (s)	180
(t) an indication of any deviation from the approved seeping report, including the plan of study, including-	PART A -Section 3 (t)	181
(i) any deviation from the methodology used in determining the significance of potential environmental impacts and risks; and	PART A -Section 3 (t)(i)	181
(ii) a motivation for the deviation;	PART A -Section 3 (t)(ii)	182
(u) any specific information that may be required by the competent authority; and	PART A -Section 3 (u)	182
(v) any other matters required in terms of section 24(4)(a) and (b) of the Act.	PART A -Section 3 (v)	183

Table 2: Structure of the EMP

EMP Regulation requirement	Section addressed	Page number
(a) Details of – (i) The EAP who prepared the EMPr; and (ii) The expertise of the EAP to prepare an EMPr, including a curriculum vitae	PART B -Section 1 (a)	14
(b) a detailed description of the aspects of the activity that are covered by the EMPr as identified by the project description;	PART B -Section 1 (b)	19
(c) a map at an appropriate scale which superimposes the proposed activity, its associated structures, and infrastructure on the environmental sensitivities of the preferred site, indicating any areas that any areas that should be avoided, including buffers;	Appendix 8	N/A
(d) a description of the impact management objectives, including management statements, identifying the impacts and risks that need to be avoided, managed and mitigated as identified through the environmental impact assessment process for all phases of the development including-	PART B -Section 1 (d)	175
(i) planning and design;		
(ii) pre-construction activities; (iii) construction activities;		
(iv) rehabilitation of the environment after construction and where applicable post closure; and		
(v) where relevant, operation activities;		
(e) a description and identification of impact management outcomes required for the aspects contemplated in paragraph (d);	PART B -Section 1 (e)	198
(f) a description of proposed impact management actions, identifying the manner in which the impact management objectives and outcomes contemplated in paragraphs (d) and (e) will be achieved, and must, where applicable, include actions to-	PART B -Section 1 (f)	198
(i) avoid, modify, remedy, control or stop any action, activity or process which causes pollution or environmental degradation;		
(ii) comply with any prescribed environmental management standards or practices;		
(iii) comply with any applicable provisions of the Act regarding closure, where applicable; and		
(iv) comply with any provisions of the Act regarding financial provisions for rehabilitation, where applicable;		
(g) the method of monitoring the implementation of the impact management actions contemplated in paragraph (n;	PART B- Section 1 (g)	204

EMP Regulation requirement	Section addressed	Page number
(h) the frequency of monitoring the implementation of the impact management actions contemplated in paragraph (n;	PART B- Section 1 (h)	204
(i) an indication of the persons who will be responsible for the implementation of the impact management actions;	PART B- Section 1 (i)	211
(j) the time periods within which the impact management actions contemplated in paragraph (n must be implemented;	PART B- Section 1 (j)	211
(k) the mechanism for monitoring compliance with the impact management actions contemplated in paragraph (n;	PART B- Section 1 (k)	211
(l) a program for reporting on compliance, taking into account the requirements as prescribed by the Regulations;	PART B- Section 1 (l)	214
(m) an environmental awareness plan describing the manner in which-	PART B- Section 1 (m)	214
(i) the applicant intends to inform his or her employees of any environmental risk which may result from their work; and		
(ii) risks must be dealt with in order to avoid pollution or the degradation of the environment; and		
(n) any specific information that may be required by the competent authority.	PART B – Section 1 (n)	216

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List of Abbreviations

AEL	Air Emissions Licence
AOL	Anglo Operations (Pty) Ltd
BID	Background Information Document
CBO	Community Based Organisations
CM	Continuous miners
CRR	Comment and Response Report
CSI	Corporate Social Investment
CSR	Corporate Social Responsibility
DEA	Department of Environmental Affairs
DMR	Department of Mineral Resources
EAP	Environmental Assessment Practitioner
EIA	Environment Impact Assessments
EITI	Extractive Industries Transparency Initiative
EMP	Environmental Management Programmes
FOE	Frequency of Exceedance
GLC	Ground Level Concentrations
HDPE	High-density polyethylene
HPA	Highveld Priority Area
I&APs	Identification of Interested and Affected Parties
IDP	Integrated Development Plan
IRWQO	Interim Resource Water Quality Objectives
IWULA	Integrated Water Use Licence Application
IWWMP	Integrated Water and Waste Management Plan
LHRP	Labour and Human Resources Plan
LOM	Life of Mine
MAE	Mean annual evaporation
MAP	Mean annual precipitation
NEM:BA	National Environmental Management: Biodiversity Act
NEM:WA	National Environmental Management: Waste Act
NEMA	National Environmental Management Act
NGO	Non-Governmental Organisations
NWA	National Water Act
PCD	Pollution Control Dam

RO	Reverse osmosis
PCMP	Preliminary Mine Closure Plan
SACNASP	South African Council for Natural Scientific Professions
SA NAAQS	South African National Air Quality Standards
SEP	Stakeholder Engagement Plan
SLP	Social and Labour Plan
SMME	Small Medium and Micro Enterprises
SPLUMA	Spatial Planning and Land Use Management Act
WULA	Water Use Licence Application
ZOI	Zone of influence

PART A

SCOPE OF ASSSSMENT AND ENVIRONMENTAL IMPACT ASSESSMENT REPORT

3. Contact Person and correspondence address

a) Details of

i) Details of the EAP

Name of the Practitioner: Beth Candy

Tel No: +27 11 441 1111

Fax No: +27 11 880 8086

e-mail address: bcandy@srk.co.za

ii) Expertise of the EAP.

(1) The qualifications of the EAP

(with evidence).

SRK Consulting (South Africa) Pty Ltd (SRK) assigned Beth Candy, a principal environmental scientist as the lead environmental assessment practitioner and associated project team to undertake the necessary environmental authorisation process.

Beth Candy's qualifications include the following:

- Bachelor of Science in Geology;
- Bachelor of Science with Honours in Environmental Geology; and
- Master of Science in Environmental Science.

Beth is registered as a Professional Scientist of Nature (*Pr. Sci. Nat*) in Environmental Science with the South African Council for Natural Scientific Professions (SACNASP), SACNASP registration number 400299/06.

Refer to **Appendix 1** for the qualifications of the Environmental Assessment Practitioner (EAP).

(2) Summary of the EAP's past experience.

(In carrying out the Environmental Impact Assessment Procedure)

Beth Candy (*MSc (Environmental Science), Pr. Sci. Nat*. is an environmental scientist with more than 13 years' experience in environmental impact assessments and environmental management. With a strong background in Geology (BSc Hons Geology) her core experience and expertise is in the mining industry sector, focusing on Risk Assessments, Environment Impact Assessments (EIA), Environmental Management Programmes (EMP), Water Use Licence Applications (WULA), due diligence and integrated regulatory processes. Her involvement in such projects varies from project management and co-ordination, to the compilation and review of technical and environmental documentations and reports. In the mining sector she has been involved in the authorisation of EIAs, EMPs and WULAs for both underground and opencast mining operations, as well as the associated activities such as ash facilities, waste disposal facilities, conveyors routes, access roads, dragline walkways, pollution control and other dams, stream diversions, undermining of wetlands, pipelines and oil and fuel storage facilities amongst others. Other experience includes industrial sector projects and construction projects.

Beth Candy has extensive experience with coal projects, particularly in the Mpumalanga area.

Curriculum Vitae with past experience is attached as **Appendix 2**.

b) Description of the property.

Farm Name:	Within mining right area: Portion 3 and 10 of the farm Elandsfontein 75 IS Portion 1 and 2 of the farm Geluk 226 IS Portion 2, 3, 4, 12 and 13 of the farm Halfgewonnen 190 IS Portion 5, 6, 7, 16 and 7 of the farm Legdaar 78 IS Portion 0, 3, 5 and 6 of the farm Middelkraal 50 IS Portion 7, 12, 13, 14, 22, 26, 27 and 28 of the farm Schurvekop 227 IS Portion 0 of the farm Vlakkuilen 76 IS Conveyor belt servitude: Portion 3 of the farm Middelkraal 50 IS Portion 0, 2 and 3 of the farm Schoonvlei 52 IS Portion 1, 4 and 8 of the farm Kleinfontein 49 IS New conveyor belt servitude: Schoonvlei 52 IS portion 0, 2 and 3 Kleinfontein 49 IS portion 1, 4 and 8 Reinstating of existing conveyor belt and new section: Kleinfontein 49 IS portion 1 Goedehoop 46 IS portion 4 and 9 Koornfontein 27 IS portion 12
Application area (Ha)	Total hectares for mining right area: 5 772 ha New conveyor route: 10 km Upgrade of existing conveyor route: 8 km
Magisterial district:	Mining area: Gert Sibande District Municipality Govan Mbeki Local Municipality Conveyor route (including new and upgrade of existing conveyor route: Gert Sibande District Municipality Govan Mbeki Local Municipality and Nkangala District Municipality Steve Tshwete Local Municipality
Distance and direction from nearest town	The nearest town is Kriel which is 12 km west in distance in a straight line from the mining right area.

21 digit Surveyor General Code for each farm portion	**Mining right area:[1]**	**Mining right area:**
	Elandsfontein 75 IS portion 3	T0IS00000000007500003
	Elandsfontein 75 IS portion 10	T0IS00000000007500010
	Geluk 226 IS portion 1	T0IS00000000022600001
	Geluk 226 IS portion 2	T0IS00000000022600002
	Halfgewonnen 190 IS portion 2	T0IS00000000019000002
	Halfgewonnen 190 IS portion 3	T0IS00000000019000003
	Halfgewonnen 190 IS portion 4	T0IS00000000019000004
	Halfgewonnen 190 IS portion 12	T0IS00000000019000012
	Halfgewonnen 190 IS portion 13	T0IS00000000019000013
	Legdaar 78 IS portion 5	T0IS00000000007800005
	Legdaar 78 IS portion 6	T0IS00000000007800006
	Legdaar 78 IS portion 7	T0IS00000000007800007
	Legdaar 78 IS portion 16	T0IS00000000007800016
	Legdaar 78 IS portion 17	T0IS00000000007800017
	Middelkraal 50 IS portion 0	T0IS00000000005000000
	Middelkraal 50 IS portion 3	T0IS00000000005000003
	Middelkraal 50 IS portion 5	T0IS00000000005000005
	Middelkraal 50 IS portion 6	T0IS00000000005000006
	Schurvekop 227 IS portion 7	T0IS00000000022700007
	Schurvekop 227 IS portion 12	T0IS00000000022700012
	Schurvekop 227 IS portion 13	T0IS00000000022700013
	Schurvekop 227 IS portion 14	T0IS00000000022700014
	Schurvekop 227 IS portion 22	T0IS00000000022700022
	Schurvekop 227 IS portion 26	T0IS00000000022700026
	Schurvekop 227 IS portion 27	T0IS00000000022700027
	Schurvekop 227 IS portion 28	T0IS00000000022700028
	Vlakkuilen 76 IS portion 0	T0IS00000000007600000
	New conveyor belt servitude:	**New conveyor belt servitude:**
	Schoonvlei 52 IS portion 0	T0IS00000000005200000
	Schoonvlei 52 IS portion 2	T0IS00000000005200002
	Schoonvlei 52 IS portion 3	T0IS00000000005200003
	Kleinfontein 49 IS portion 1	T0IS00000000004900001
	Kleinfontein 49 IS portion 4	T0IS00000000004900004
	Kleinfontein 49 IS portion 8	T0IS00000000004900008
	Reinstating of existing conveyor belt and new section:	**Reinstating of existing conveyor belt and new section:**
	Kleinfontein 49 IS portion 1	T0IS00000000004900001
	Goedehoop 46 IS portion 4	T0IS00000000004600004
	Goedehoop 46 IS portion 9	T0IS00000000004600009
	Koornfontein 27 IS portion 12	T0IS00000000002700012

Landowners of the various farms and portions are shown in Figure 1.

[1] Not all farm portions included in the mining right area will be undermined. The farm portions that will be undermined are underlined.

Figure 1: Properties within the Elders Colliery Project

c) Locality map

(show nearest town, scale not smaller than 1:250000).

Refer to **Appendix 3** for the Elders Colliery locality map.

d) Description of the scope of the proposed overall activity.

Provide a plan drawn to a scale acceptable to the competent authority but not less than 1: 10 000 that shows the location, and area (hectares) of all the aforesaid main and listed activities, and infrastructure to be placed on site

(i) Listed and specified activities

NAME OF ACTIVITY	Aerial extent of the Activity Ha or m²	LISTED ACTIVITY	APPLICABLE LISTING NOTICE (*GNR 983, GNR 984 or GNR 985)/ NOT LISTED*	WASTE MANAGEMENT AUTHORISATION
Boxcut and associated infrastructure				
Boxcut	65 ha (total area to be disturbed by boxcut and associated infrastructure)	X	GNR 984 – 15, 17	
Access road				
Internal roads				
Service roads				
Power lines		X	GNR 983 – 11	
Pipelines		X	GNR 983 – 9	
Bulk storage for fuel		X	GNR 983 – 14 GNR 985 – 10	
Ventilation shafts				
Surface silo				
Fencing				
Topsoil stockpiles		X		
Overburden stockpile		X		X (Category B)
Pollution control dams			GNR 983 – 13	
Sewage treatment plant		X	GNR 983 – 10 GNR 984 - 6	
Water treatment plant		X	GNR 983 – 10 GNR 984 - 6	
Waste and scrap yard				
Substation				
Cable yard and repair workshop				
Washbay				
Storage of explosives		X	GNR 983 – 14 GNR 985 – 10	
Primary crusher		X	GNR 984 – 21	
Conveyor route and servitude (new and upgrade of existing)				
Service road		X	GNR 983 - 12, 27, 19, 48	

Conveyor belt	New conveyor belt: 10 km; Upgraded conveyor belt: 8 km	X	GNR 983 - 12, 27, 19, 48 GNR 984 - 7	
Powerline		X	GNR 983 – 10,12, 19	
Pipeline		X	GNR 983 – 9, 10, 12, 19	
Fencing		X	GNR 983 – 12, 19	
Water management infrastructure		X	GNR 983 – 12	

(ii) Description of the activities to be undertaken

(Describe Methodology or technology to be employed, including the type of commodity to be mined and for a linear activity, a description of the route of the activity)

The proposed Elders Colliery project is located in the Mpumalanga Province and falls mainly within the Gert Sibande District Municipality and Govan Mbeki Local Municipality. Certain infrastructure (the conveyor belt servitude) falls within the Nkangala District Municipality and the Steve Tshwete Local Municipality. Elders Colliery is located approximately 25km north of the town of Bethal, on the R35 provincial road. Anglo Operations (Pty) Ltd (AOL) submitted a mining right application for the Elders Colliery to the Department of Mineral Resources (DMR) on 16 July 2015. The mining right application has subsequently been accepted (mining right number: MP 30/5/1/2/2 (10117) MR).

AOL proposes to develop a new box cut access at the Elders Colliery. It is proposed to mine the No. 2 and No. 4 coal seams by means of bord and pillar underground mining methods, making use of continuous miners and shuttle cars. The planned Life of Mine (LOM) is approximately 14 years. During the construction phase of the boxcut, coal from the No. 2 and No.4 seams will be transported to AOL's Goedehoop Colliery by trucks along the R35 and R542 to the Goedehoop Colliery processing plant.

During operations, coal will be transported from Elders' underground operations via a new conveyor route (10 km in length) from Elders Colliery to Block 20 (a mined out shaft currently on care and maintenance, owned by AOL's Goedehoop Colliery). Coal will be transported from Block 20 to the Hope 4 Shaft (owned and managed by Goedehoop Colliery) on a 4 km existing conveyor belt that will be upgraded. An additional new conveyor belt of 3 km will be constructed from Hope 4 Shaft to the Goedehoop Colliery processing plant, where the coal will be washed and processed. A general layout of the proposed project is shown in **Appendix 4**. The proposed surface infrastructure at the Elders Colliery is listed in Table 3. A detailed site layout plan is shown in **Appendix 5**.

The project will take place in three phases. The proposed schedule for the phases are:

- Construction = 2 years
- Operation = 14 years
- Decommissioning and Closure = 2 years.

Table 3: Proposed surface infrastructure for the Elders Colliery

Proposed infrastructure	Description	
	Underground Mine Shaft complex	**Conveyor route servitude**
Surface Infrastructure		
Roads	Access road: Access from the R35 to the mining area will be via a new intersection incorporating the existing Sudor Mine road. This road and intersection be upgraded to provincial standards. The same intersection will link the Silo facility and the underground shaft complexes.	Access road: Access from the R35 to the silo and conveyor service road will be via a new intersection that incorporates the existing Sudor Mine road.
	Internal roads: Roads within the shaft complex will be 6m wide asphalt surfaced roads.	N/A
	Service roads: The service roads include roads from the shaft area to the substation, water treatment plant and water tanks. These roads will be 4m wide gravel roads, on which dust suppression will take place.	Service roads: The service road for the conveyor and overhead powerline will run adjacent to the conveyor belt for its entire route. The service road will fall within the conveyor route servitude and is a 7 m wide gravel road on which dust suppression will take place.
Power	During the construction phase, power will be supplied via a two 22kV powerlines which will follow the conveyor route servitude. Please refer to the description under conveyor route servitude. The powerlines will also be used for power supply during the construction and operational phase of the Elders underground mine.	Two 22kV overhead powerlines will be constructed within the conveyer route servitude from Block 20 to Elders Colliery. The lines will be constructed with single wooden poles. The powerlines will avoid footings within wetlands as far as possible.
Pipelines	Potable, dirty and sewage water pipe reticulation will be provided to various water supply and containment or treatment facilities. A polluted water pipeline will be installed from the underground mine to surface for transfer of polluted water to the pollution control dam (PCD).	A pipeline transporting raw water from the Block 8 abstraction point to Elders Colliery will be constructed along the conveyor route. Water will be pumped into the pollution control dam. The supply of this pipeline will be variable up to between 0 and 2Ml/day. The HDPE pipeline will be buried in areas outside delineated wetlands and channelled watercourses. A steel pipe will be used above ground at the delineated wetlands and channelled watercourses. The internal diameter of this pipeline will be a maximum of 0.2 m.
Bulk storage for fuel	Four fuel tanks, each with a capacity of 63m^3, will be installed at the Elders Colliery shaft area (combined capacity of 252m^3). Oil tanks will have a combined capacity of 18m^3 (2 x 6m^3 and 2 x 3m^3).	N/A
Ventilation shafts	No ventilation shafts are planned on surface. All foundations, ducting, motors and fans will be located within the box-cut	N/A

Proposed infrastructure	Description	
	Underground Mine Shaft complex	**Conveyor route servitude**
Conveyor belt	Coal will be transported from the underground workings to a surface storage silo (9,000 tonnes capacity) using an underground conveyor network comprising section and trunk conveyors.	A conveyor belt with a length of approximately 10km will be constructed within the conveyor route servitude from Elders Colliery to Block 20. A crushing station will be installed after the storage silo before depositing coal on the 10 km conveyor. The conveyor belt has a design capacity of 1 750 tonnes per hour and is a 1 350 mm wide steel cord reinforced conveyor belt. The belt operates at a maximum speed of 4,5 m/s. Coal will be transported from Block 20 to the Goedehoop Colliery on an existing conveyor route of 7 km that will be re-installed. This will include a small new section of conveyor belt.
Fencing	The perimeter of the shaft complex and silo / crushing facility will be fenced off with a high security fence with flat wrap razor wire top and bottom.	The perimeter of the conveyor route servitude will be a 1.8m fence with adequate warning signage.
Stockpiles		
Topsoil stockpiles	All topsoil stripped from the shaft complex area will be used to construct a berm diverting water around the complex.	N/A
Overburden Stockpile	The overburden softs will be utilised to construct the berm around the shaft complex area. The box cut will be excavated selectively; overburden material contaminated with acidifying carbonaceous material will be excavated and transported to Goedehoop South Mineral Residue disposal facility at the Goedehoop Mine Complex. The excavated hard material not contaminated (clean) will be stockpiled and later used to backfill the mine shaft at mine closure. Approximately 1.6 Mm^3 will be excavated from the box cut.	N/A
Run of Mine (RoM)	No run-of-mine stockpile will be allowed for at Elders Colliery. All coal will be conveyed to an existing RoM stockpile at Goedehoop Colliery.	N/A
Waste Rock	No other waste rock dumps other than the overburden stockpiles are anticipated.	N/A
Discard	No discard dumps will be necessary as all coal will be processed at Goedehoop Colliery.	N/A
Solid Waste Management Facilities		
General waste	General waste (including domestic waste, paper and scrap steel) will be temporarily stored in skips which will be placed in designated areas within the shaft complex and will be disposed of at a licensed municipal facility	N/A

Proposed infrastructure	Description	
	Underground Mine Shaft complex	**Conveyor route servitude**
Hazardous waste	Hazardous waste will be temporarily stored in skips or other specialised containers which will be placed in designated, concreted areas within the shaft complex and will be disposed of at a licensed hazardous waste facility	N/A
Water Pollution Management Facilitates		
Pollution control dams (PCDs)	Two PCDs (combined capacity: 45Mℓ) will be constructed to contain polluted water generated at the shaft area. The PCDs have been sized to contain the 1:50 year rain event. The volume of water in the PCD shall be kept to a minimum in order to have the maximum storage capacity available in the event of a large flood. A maximum of 5Ml (24 hour operational storage) will be kept in the PCD. There will be a PCD at the 9T silo with a capacity of 1.25Mℓ. Excess water will be treated in the Water Treatment Plant (below) before being released to the environment. Excess water in the PCD during flood events that is not treated and released will be pumped underground to an underground facility earmarked for storage of excess water. During extreme flood events the PCD will spill. The PCD will be designed with an adequately sized spillway. Water spilled during rainfall in excess of the 1:50 year event would be diluted and therefore spilling to the natural environment during these events will result in a water quality which is below the Resource Water Quality Objectives (RWQO).	N/A
Sewage Treatment Plant (STP)	A 100m^3/day sewage treatment plant will be constructed to cater for 611 people at the underground mine. Sewer water reticulation piping shall be provided leading from the waste water generating points to the treatment plant. Effluent from the treatment plant will be treated to quality suitable for release to the environment. Sludge drying beds shall be provided for the drying of sludge produced by the sewage treatment plant.	N/A
Water Treatment Plant (WTP)	In the initial stages of the project, water for industrial and potable use will be obtained from Block 8 and pumped into the PCD dam. From the PCD dam, water will be pumped to an initial 0.5Ml/day Reverse Osmosis (RO) plant for potable usage. Industrial water will only be treated if necessary to lower the pH and remove solids. Once the Elders mining operations become water positive, further RO plant modules will be added.(Modular capacities still to be finalised but	N/A

Proposed infrastructure	Description	
	Underground Mine Shaft complex	**Conveyor route servitude**
	can be 1.0 M/day modules) The total capacity required during the life of mine of the RO plant facility is 5Mℓ/day in the worst case scenario Brine from the treatment plant will be accommodated in brine dams that are appropriately lined to prevent underground seepage. The gypsum pad will decant to the Brine ponds via a sloping pad and channel that is concrete lined.	

Construction Phase

The construction phase of the Elders project is expected to take a maximum of two years.

Conveyor route servitude

The conveyor route servitude will be approximately 55m wide and will be fenced with a fence. Two 22kV single pole powerlines will be constructed first in order to provide power to the Elders Colliery. The conveyor belt and the associated service road will be constructed for the transportation of coal from Elders Colliery to Block 20, from where the coal will be loaded onto a re-established conveyor belt to Goedehoop Colliery for processing.

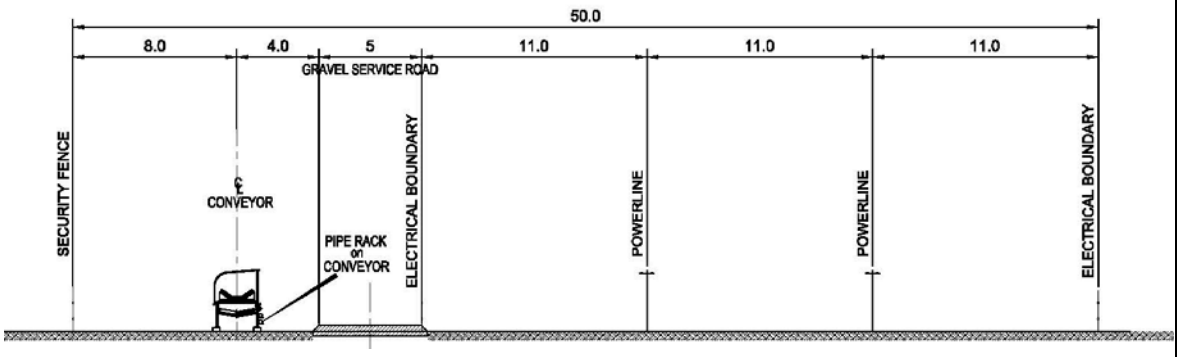


Figure 2: Typical section through the conveyor and powerline servitude

Shaft complex

During the construction phase of the shaft complex, surface preparation of the construction and site area will be done by excavation, backfill and compaction. Each contractor will be provided with a laydown area, water and an electrical point of supply.

The provision of utilities, offices and warehousing will be temporary and supplied by each individual contractor. An area within the laydown area will be prepared to be used as a temporary wash bay for the cleaning of on-site construction vehicles. Once the final washbay has been constructed the use of this temporary area will be discontinued. The following buildings and amenities will be constructed at the shaft complex of Elders Colliery:

- Administration building
- Control Room/ medical facility/ proto building
- Green Room/Covered Assembly
- Medical Facility
- Change House/lamp and crush room building
- Assembly Point open area
- Engineering/Mining/general store
- Bulk Fuel Store
- Paint/Oil/Gas Store Yard
- Cable Repair Workshop
- LDV Wash Bay
- Security & Access Control
- Bus Shelter

- Carports
- Banksman Cabin
- Covered shaft waiting area
- Shaft complex roads and parking;
- Fencing;
- Washbay and oil separator;
- Break test ramp;
- Crusher (peak operating throughput of 1 500 tons per hour and product size of -150mm);
- Silo (approximately 9,000 ton)
- Stone dust silo (100 ton);
- Outdoor yard Substation;
- Pollution control dams;
- Sewage treatment plant;
- Water treatment plant;
- Gypsum pad
- Brine pond
- Salvage yard
- Fire tanks

The boxcut will be located to the east of the R35 provincial road accessing the No. 2 Seam initially. The No. 4 Seam will be accessed from the boxcut at a later stage of development. The portal will have an arched structure to support access to the underground workings. Ventilation fans and associated infrastructure will be located within the boxcut excavation.

Construction Water & Sewage treatment

Potable water for the construction phase will be obtained from boreholes identified outside a 200 m radius from the box cut location. The borehole water will be pumped to a central temporary reservoir at ground level. Pre-treatment of the borehole water is allowed for to add chlorine and any other treatment that may be necessary – pending water test results - in order to make it safe for human consumption. A pump set will provide the necessary pressure to fill a temporary elevated tank that will supply potable water to the construction offices.

Construction service water will be trucked in Bowsers from Block 8 until the permanent raw water line from Block 8 has been constructed and commissioned.

Sewage from the offices and other sanitary facilities will be piped under gravity to a series of conservancy tanks. These tanks will be emptied on a bi-weekly basis and transported to an approved sewage treatment facility.

Operational Phase

Underground mining

The Elders Colliery underground mine will use the bord and pillar mining method for coal extraction. Bord and pillar entails the cutting of a network of rooms into the coal seam. Pillars of coal are left behind to primarily support the roof. The underground mine will have an average production rate of 6 Mt per year from six continuous miner (CM) sections. Two seams will be mined, namely the No.

2 Seam and at later stage the No. 4 seam. The average depth at Elders Colliery is 51 m for No. 4 seam and 60m for No. 2 seam. A typical bord and pillar mining layout is illustrated in Figure 3.

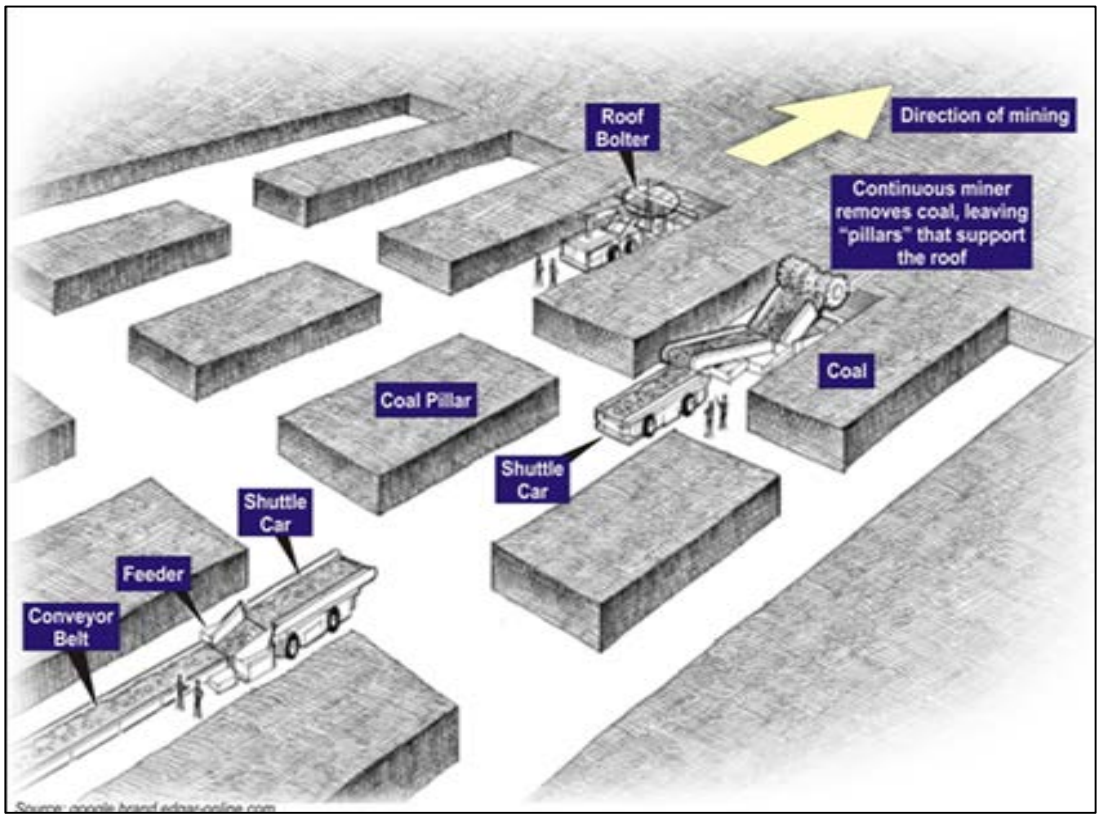


Figure 3: Typical bord and pillar layout

The mine plan for the No.2 seam and No. 4 seam is shown in Figure 4 and Figure 5.

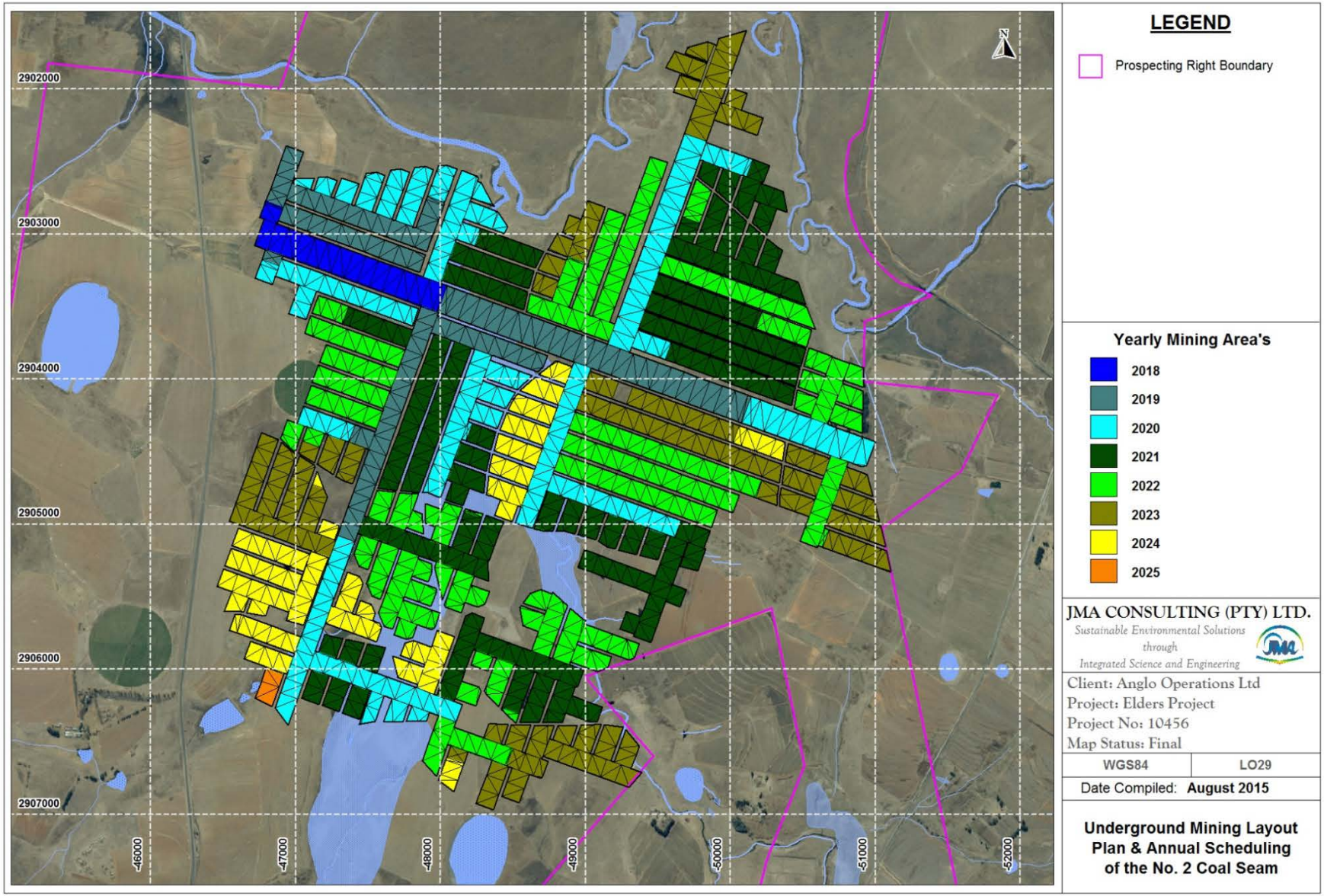


Figure 4: Elders Colliery underground mine plan for the No. 2 Coal Seam (JMA, 2015)

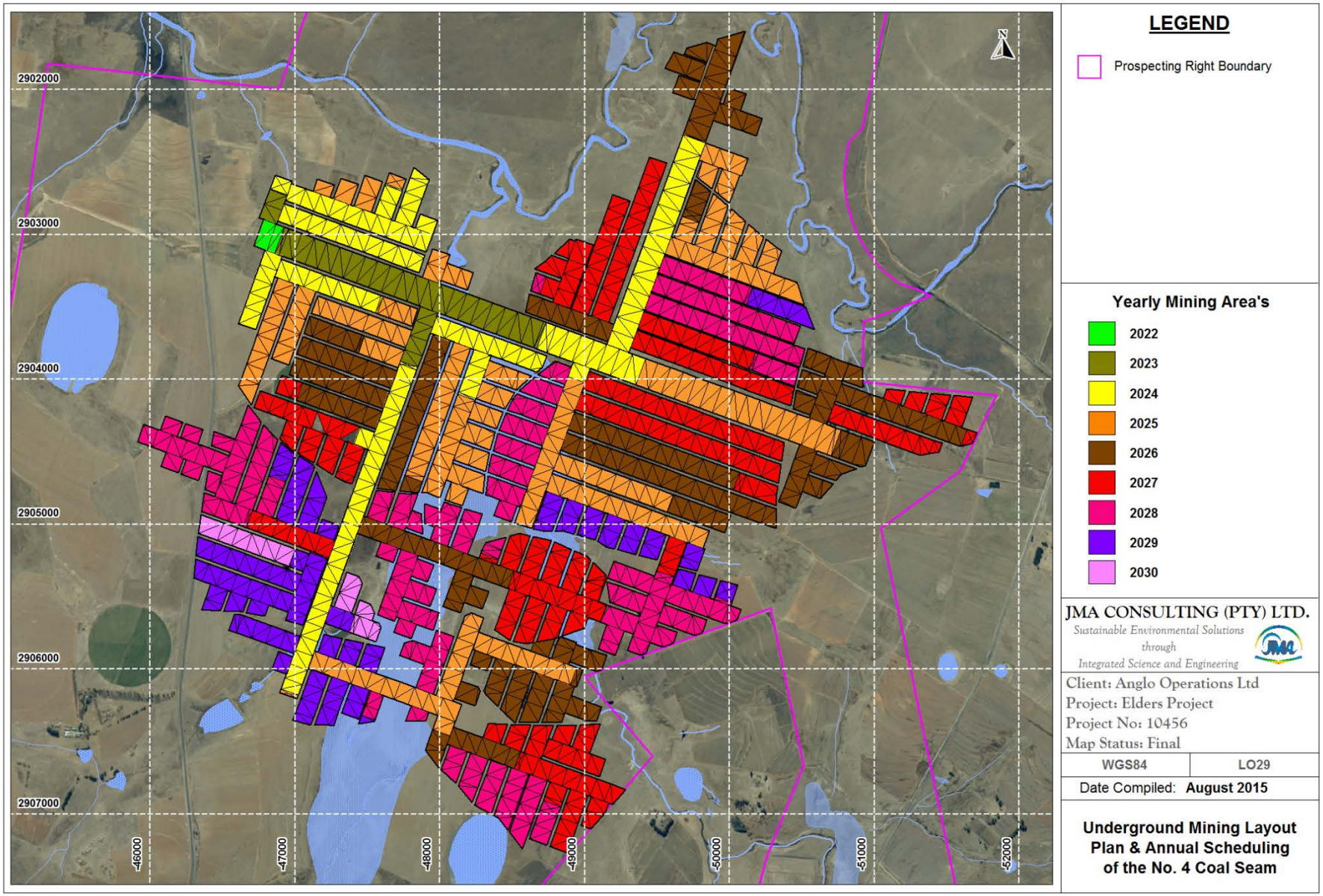


Figure 5: Elders Colliery underground mine plan for the No. 4 Coal Seam (JMA, 2015)

Continuous Miner Section

Continuous miner (CM) mechanised mining is used to develop the board and pillar primary, secondary and tertiary developments. The primary development is the main development on the mine. It offers primary access to the coal seam. The number of roadways is determined by the ventilation requirements as well as productivity of the CM.

The main development is in an easterly direction using nine roadways with secondary development towards the south and north, also using nine roadways. The section panels will also have nine roadways.

Cutting and Loading

A CM is used to cut/shear coal from the mining face. The machine continuously extracts coal since it is loading with a cutting steel drum and conveyor system. The machine is operated remotely which ensures that no person is on the mining face whilst the coal is being cut.

Hauling/Transport

Shuttle cars are used to transport/haul the broken coal from the back of the CM to the feeder breaker that feeds the main/secondary belt system inspection. The section conveyor belt then feeds unto a trunk conveyor that transports the coal to a surface silo and from there via an overland conveyor to the Block 20, from where it will be placed on a conveyor to Goedehoop Colliery.

Support

Trackless mechanical roofbolters are used to drill holes into the roof of the mining end. Steel roofbolts with resin are then installed to act as secondary support. These roofbolts keep the immediate strata together and assists in the prevention of rock/roof falls.

Water requirements during operations

A water treatment plant is planned that will treat dirty water generated on the mine to supply all of the mine's potable and process water requirements. In the early years when the water make is expected to be too low to meet the mine's water demand, the make-up will be supplied from Goedehoop Colliery's dirty water system. In this way the reuse of dirty water will be maximised.

In the initial stages of the project, water for industrial and potable use will be obtained from Goedehoop Colliery Block 8 and pumped to the Main PCD. From the Main PCD, water will be pumped to an initial 0.5 Mℓ/day reverse osmosis (RO) plant for potable usage. Industrial water will only be treated if necessary to lower the pH and remove solids.

Once the Elders mining operations become water positive, further RO plant modules will be added. The total maximum capacity of the RO plant facility required during the life of mine is 5 Mℓ/day.

Closure Phase

During the closure phase, the mine surface area structures will be demolished, with the steel sold and re-enforced concrete broken up and removed from the mine site. Foundations will be broken up below the soil surface and removed from site.

Non-hazardous mine waste could be placed into the boxcut, provided authorisation is granted and the appropriate permits have been obtained. Waste areas will be shaped, clad and re-vegetated.

Off-site surface infrastructure as constructed for mining purposes will be decommissioned if no post-closure third party use is identified. This infrastructure will be demolished, roads will be ripped and culverts will be removed.

Constructed waste storage/disposal infrastructure could be used post-closure. This will require further investigation and discussions during the LOM.

The sewage treatment plant may be removed as its capacity may prove to be inadequate for future land uses. The shaft will be sealed at closure via standard plug design. Current planning does not

include pillar removal Equipment, wiring and other underground services will be removed to the extent required to limit the potential that unauthorised access is obtained by people scavenging.

The post closure water make is expected to amount to approximately 2 600 m^3/day. Note that post closure, recharge from the wetland area is expected to be approximately 990 m^3/day, or some 38% of the total post closure water make.

Once mining ceases, it is expected that approximately 48.7 million m^3 of storage will be available in the No. 2 and No. 4 seam workings.

The estimated time to decant, if the workings are left to fill post closure, has been estimated by JMA as 35 to 42 years.

The water treatment plant will be decommissioned within 3 years of mine closure. Thereafter the water make from underground workings will be managed such that it will be allowed to fill up through natural recharge to a pre-determined environmental safe level below decant level.

The rise of water will be closely monitored to ensure that the environmental safe level is not exceeded and that appropriate extraction works and treatment facilities are constructed in time to treat the surplus water once the environmental safe level is reached. The water will then be actively maintained at or below the environmental safe level.

A detailed decant management plan will be developed at mine closure. Ultimately water treatment solutions, either passive or active, will be implemented.

Monitoring of the water table rebound will continue post-closure and the modelling updated to quantify the long-term impacts. If necessary, the management measures should be revised based on the modelling results.

e) Policy and Legislative Context

APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT	REFERENCE WHERE APPLIED	HOW DOES THIS DEVELOPMENT COMPLY WITH AND RESPOND TO THE POLICY AND LEGISLATIVE CONTEXT
<u>The National Environmental Management Act (Act No. 107 of 1998) (NEMA) as amended; and</u> <u>The National Environmental Management: Waste Act (Act No. 59 of 2008) (NEM:WA)</u> The National Environmental Management Act (Act 107 of 1998 as amended on the 8th of December 2014) (NEMA) and the Regulations and associated listed activities identified under Regulations 982, 983, 984 and 985, is the key national legislation underpinning environmental authorisations in South Africa. The Department of Mineral Resources (DMR) is the competent authority for mining-related applications in terms of NEMA. The DMR, along with the Department of Environmental Affairs (DEA), will take into account the National Environmental Management Waste Act (NEM:WA).	NEMA and associated regulations as well as NEM:WA and associated regulations are directly relevant to this authorisation application. This report was compiled as per the NEMA Regulation 982 requirements. This project required a waste licence. The	This EIA/EMP was compiled in accordance with NEMA Regulation R982 and NEM:WA GNR 921.

APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT	REFERENCE WHERE APPLIED	HOW DOES THIS DEVELOPMENT COMPLY WITH AND RESPOND TO THE POLICY AND LEGISLATIVE CONTEXT
The NEM:WA was promulgated on 10 March 2009 to reform the law regulating waste management in South African in order to protect health and environment by providing reasonable measures for the prevention of pollution and ecological degradation. On the 3rd of July 2009, under section 19(1) of the NEM:WA, a list of waste management activities which have, or are likely to have a detrimental effect on the environment were published [Government Notice (GN) 718]. Subsequently, the NEM:WA Amendment Act published in June 2014 added a Schedule 3 waste categorisation which classifies mine residue stockpiles as hazardous waste. The environmental authorisation application was submitted prior the promulgation of the Planning and Management of Residue Stockpiles and Deposits were published on 24 July 2015. Therefore, this application is exempted from these regulations.	waste licence application forms part of the environmental authorisation application.	
<u>The National Water Act (Act No. 36 of 1998) (NWA)</u> The NWA recognises that water is a scarce and unevenly distributed national resource which must managed encompassing all aspects of water resources. In terms of Chapter 4 of the NWA, activities and processes associated with the proposed Elders Colliery 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) will be compiled and submitted in support of the IWULA. This application will be undertaken under the current legislation as the new draft legislation has not yet been promulgated.	An IWULA and IWWMP will be required for the proposed Elders Colliery.	The IWULA and IWWMP will be compiled in accordance with the requirements of the NWA and will be submitted to DWS as a separate application. Refer to Table 15 for a list of the water uses being applied for.
<u>The National Environmental Management: Biodiversity Act (Act No.10 of 2004) (NEM:BA)</u> The National Environmental Management: Biodiversity Act (Act No. 10 of 2004) (NEM:BA) provides for the management and conservation of South Africa's biodiversity within the framework of NEMA, as well as the protection of species and ecosystems that warrant national protection and the sustainable use of indigenous biological resources. The proposed Elders Colliery falls within the Mpumalanga Province, which has a provincial	NEM:BA was used to inform the activities triggered by Listing Notice 3 (R. 985) in the 2014 NEMA Regulations. The Mpumalanga Biodiversity Sector Plan provides land use	The Elders Colliery project team has taken into consideration the CBA during the alternatives analysis and layout design of the project.

APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT	REFERENCE WHERE APPLIED	HOW DOES THIS DEVELOPMENT COMPLY WITH AND RESPOND TO THE POLICY AND LEGISLATIVE CONTEXT
Biodiversity Sector Plan. This provides the conservation planning approach in the Mpumalanga Region.	recommendations which are considered in this application. Refer to Figure 6 which indicates the Mpumalanga Biodiversity Conservation Areas in and around the proposed Elders Colliery project area.	
<u>The National Environmental Management: Air Quality Act (Act No. 39 of 2004) (NEM:AQA)</u> The National Environmental Management Air Quality Act (NEM:AQA) came into effect in April 2010 and is applied in accordance with the principals stipulated in NEMA. The Act outlines norms and standards with regards to air quality management planning, monitoring, compliance and management measures in order to protect and enhance the quality of air and reduce risks to human health. NEM:AQA also promotes sustainable development. **No Air Emissions Licence (AEL) is required for this project.**	This legislation has been considered and this project will be incorporated into the mine wide air quality management plan. No Air Emissions Licence (AEL) is required for this project.	The Elders Colliery project team has taken into consideration air quality measures during the design of the project.
<u>The National Heritage Resources Act (Act No. 25 of 1999)</u> 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. The Act requires all developers (including mines) to undertake cultural heritage studies for any development exceeding 0.5 ha. It also provides guidelines for impact assessment studies to be undertaken where cultural resources may be disturbed by development activities. The South African Heritage Resources Agency (SAHRA) will need to approve the heritage assessment undertaken as part of the impact assessment process. It is important to note that so far no areas of cultural heritage significance were found within the Elders Colliery project area.	As part of the impact assessment process, an updated heritage assessment of the project area will be undertaken. This assessment will be uploaded on the SAHRA site along with the EIA/EMP and will require approval should any sites of cultural heritage significance be identified within the project footprint.	The placement of infrastructure has been informed by identified historical features within the project area. No historical features with cultural significance were identified where surface infrastructure is planned.
<u>Spatial Planning and Land Use Management Act (Act No. 16 of 2013) (SPLUMA)</u>	AOL will apply for rezoning. This is a separate	The site is currently zones as agricultural and therefore a

APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT	REFERENCE WHERE APPLIED	HOW DOES THIS DEVELOPMENT COMPLY WITH AND RESPOND TO THE POLICY AND LEGISLATIVE CONTEXT
The Spatial Planning and Land Use Management Act, 2013 (SPLUMA) was promulgated in May 2015. SPLUMA is a framework act for all spatial planning and land use management legislation in South Africa. It seeks to promote consistency and uniformity in procedures and decision-making in this field. SPLUMA will also assist municipalities to address historical spatial imbalances and the integration of the principles of sustainable development into land use and planning regulatory tools and legislative instruments.	application that will be submitted to the local municipalities.	rezoning process has been initiated.

f) Need and desirability of the proposed activities.

(Motivate the need and desirability of the proposed development including the need and desirability of the activity in the context of the preferred location).

AOL studies have shown a strong potential for the development of the deposit as satisfactory yields of export thermal coal provides a good fit with the AOL strategy of expansion into this market. AOL has identified that the domestic market can also be served with a secondary product and there are synergies with the existing Goedehoop Colliery in that the proposed Elders Colliery could make use of the currently available Goedehoop South Processing Plant.

Goedehoop Colliery's Block 20 infrastructure is situated approximately 10 km to the northwest and the Richards Bay coal line passes along the eastern boundary of the project area. There are also several provincial roads in the vicinity.

AOL has identified a number of benefits of the Elders Colliery Project which include:

- Creation and retention of employment opportunities on local and regional scale. Employment opportunities will be outlined in the Elders Colliery Social and Labour Plan (SLP) that has been submitted with the mining right application to the DMR.
- It will ensure continued coal supply to export market as per Goedehoop's contractual agreements.
- Secondary coal could potentially be supplied to Eskom. This of strategic importance for energy security in South Africa.

The export of coal will contribute to economic development, both locally and regionally.

g) Motivation for the preferred development footprint within the approved site including a full description of the process followed to reach the proposed development footprint within the approved site.

NB!! – This section is about the determination of the specific site layout and the location of infrastructure and activities on site, having taken into consideration the issues raised by interested and affected parties, and the consideration of alternatives to the initially proposed site layout.

i) Details of the development footprint alternatives considered.

With reference to the site plan provided as **Appendix 4** and **Appendix 5** and the location of the individual activities on site, provide details of the alternatives considered with respect to:

(a) the property on which or location where it is proposed to undertake the activity;

The identification and selection of alternative locations for the placement of the boxcut complex and conveyor servitude was undertaken based on a process that considered access to the reserves, location of sensitive environments, servitudes and proximity to the existing Goedehoop/Block 20 conveyor route and the Goedehoop South Processing Plant.

The current boxcut location was selected due to the following reasons:

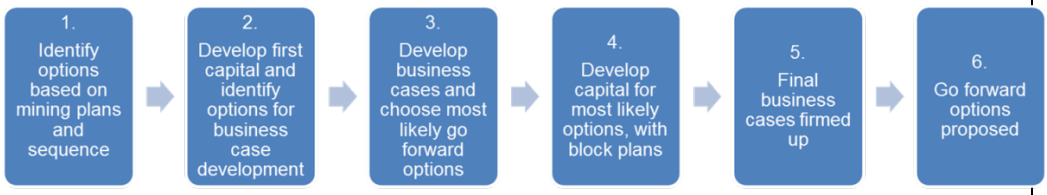
- Access to shaft from major road networks;
- Land owned by Anglo American;
- Geohydrological conditions – the boxcut is placed on the highest point as possible to increase the distance to the water table resulting in reduced impact on groundwater and delay in potential decant;
- Topographical high point in order to improve management of stormwater;
- Environmentally sensitive areas were avoided as far as possible such as the Olifants River and Vlakkuilen and Viskuile wetlands;
- Depth to reserve - access to the coal reserve as rapidly as possible to limit the production gap at the existing Goedehoop Colliery; and
- Proximity of communities to boxcut area in order to minimise the social impact.

(b) the type of activity to be undertaken;

<u>Study and decision flow process:</u>

The study process follows a systematic method of analysis and enables the project team to derive the best solution and value.

The study approach is highlighted in the figure below.



<u>Project and coal supply alternatives:</u>

2002: Resource offered to Eskom as part of the Kriel Power station supply, project includes open cast mining of entire area not overlain by wetlands;

2005: Opencast and underground mining methods considered, supplying to Majuba Power station. It was planned to mine entire resource area not overlain by wetlands by means of open cast mining methods.

2007 and 2009: Opencast and underground mining methods where considered by mining the entire area not overlain by wetland via open cast mining methods.

2011: Use underground mining methods to access entire resource with an optional mini-pit on the western side - Primary and Secondary product.

2015: The current preferred option includes using only underground mining methods to access the majority of the resource, mining the No. 2 and No. 4 seams. This option was chosen for the following reasons:

- Most financially viable;
- Less impact on the delineated wetlands in the area;
- Less impact on surrounding water courses;
- No requirement for relocating communities; and
- Less impact on current land use activities (mainly agriculture).

Transport alternatives during operation:

Three main options, namely rail, road and conveyor, were identified for the transportation of coal from Elders Colliery to the Goedehoop Colliery.

Short term (5 years) and long term (life of mine) coal transportation options were investigated. The short term options include road transportation. Alternative road transportation options investigated were as follow:

- Conveyor belt service road to be widened from 3.7m to 7.4m to haul coal from Elders Colliery to Goedehoop; and
- Use of the existing provincial road network.

The use of the conveyor belt in the long term from Elders Colliery to Goedehoop was chosen for the following reasons:

- Most direct route from Elders Colliery to Goedehoop;
- Low maintenance costs (compared to hauling);
- Minimal impact of dust fallout expected, as the conveyor will be partially enclosed;
- A lower impact in terms of noise and dust compared to trucking due to less heavy duty vehicles on existing road network to haul coal; and
- Conveyor route does not cross the Olifants River, only non-perennial tributaries.

No major options were identified for the transport of coal from the underground workings to the 9 000t surface silo. Conventional underground and incline shaft conveyors have been considered for this study with only a few sub-options investigated for underground coal storage and transfer.

(c) the design or layout of the activity;

The following aspects were taken into consideration for the design of the layout of the boxcut:

- The existing R35 provincial road;
- Regulation GN 704 which indicates that mining activities should take place outside the 1:100 year floodline or 100 m from a watercourse, whichever is the greatest;
- Minimising the overall footprint;

- Separation of clean and dirty water by having berms around the boxcut to divert clean water around the site, as well as directing all dirty water runoff from surface infrastructure areas to a pollution control dam;
- Placing the boxcut outside of delineated wetlands and minimising any other associated surface infrastructure areas in the wetlands areas.

The layout of the new conveyor route was chosen for the following reasons:

- Most direct route from Elders Colliery to Goedehoop;
- Low maintenance costs (compared to hauling);
- Minimal impact of dust fallout expected, as the conveyor will be partially enclosed;
- A lower impact in terms of noise and dust compared to trucking due to less heavy duty vehicles on existing road network to haul coal; and

Conveyor route does not cross the Olifants River, only non-perennial tributaries.

(d) the technology to be used in the activity;

Mining methods:

The various mining methods that were chosen for investigation are proven mining methods within the industry and are currently being exploited at various collieries within AAIC and AAC around the country. These methods can be summarised as follow:

- Bord and Pillar mining, mechanised mining with continuous miners and shuttle cars;
- Bord and Pillar mining with additional pillar extraction;
- Longwall mining;
- Bord and Pillar mining with the Flexible Train Conveyor; and
- Open cast mining method.

A trade-off study between various mining methods (e.g. bord and pillar, bord and pillar stooping, long wall, and open cast) was conducted for the coal resources at the proposed Elders Colliery. It was concluded that the bord and pillar option was the most viable option in terms of economics as well as minimising the risk for subsidence and dewatering of the wetland due to underground mining operations. Underground mining minimises the impact on surface including impacts on wetlands, communities, biodiversity, air quality noise, visual and heritage.

Water treatment options:

Numerous treatment options were considered when developing the water management strategy to ensure that contaminated water would not be released to the environment more than once in 50 years (a 2% or lower risk of spill, as required by GN704). These included consideration of various treatment plant sizes, coupled with provision of storage both on surface and in the underground workings. Treatment plant sizes from 2.5 Mℓ/day to 5 Mℓ/day were considered, with emergency storage facilities up to 250 Mℓ in capacity. The selected option of a 2.5 Mℓ/day treatment capacity at the boxcut, with discharge of treated water to the environment, coupled with storage in the underground workings for extreme rainfall events, was considered the most practicable and cost effective solution.

(e) the operational aspects of the activity; and

Processing of coal on site or off site

It was considered to process coal at the Elders Colliery and it was not financially viable, however the preferred option is to process the coal at the existing Goedehoop Colliery processing plant. Goedehoop has an existing coal washing facility and associated mineral residue facility, therefor these will not be required at the Elders Colliery.

The preferred option is to undertake crushing after the material exited the silo from where it will be transported via overland conveyors to the Goedehoop Colliery.

(f) the option of not implementing the activity.

The last remaining reserves at Goedehoop South based on the current mine plan will be depleted by 2017. Should the Elders Colliery not be an option, the Goedehoop Colliery will need to investigate alternative coal supply in order to maintain the operation of the plant. If an alternative resource cannot be identified, the Goedehoop Colliery will have to be decommissioned and closed down and will cease to export coal. This will result in imminent mine closure, potential re-deployment and the retrenchment of Goedehoop employees. Mine rehabilitation at Goedehoop will follow and capital expenditure would need to be allocated as per the following costs as referenced:

Closure costs allowed for according to Golder Associates Report 2012 and Venn & Milford Estimates (escalated values used) – R434 Million.

Redundancy costs allowance – R488 Million

ii) Details of the Public Participation Process Followed

Describe the process undertaken to consult interested and affected parties including public meetings and one on one consultation. NB the affected parties must be specifically consulted regardless of whether or not they attended public meetings. (Information to be provided to affected parties must include 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.

This section provides details of the public participation process followed to date and focuses on:

- Introduction to the approach followed;
- Identification of Interested and Affected Parties (I&APs);
- Background to the public participation process;
- Public participation process undertaken during 2012 - 2014; and
- Public participation process undertaken for the current environmental authorisation process - 2015.

Approach

The public participation followed for this environmental authorisation is an integrated and comprehensive process with the purpose to provide I&APs with sufficient and accessible information in an objective manner to assist them to:

During the pre-application and scoping phase:

- Raise issues of concerns and make recommendations to be considered during the impact assessment phase;
- Provide comment on project alternatives and the proposed process of assessment;
- Verify that I&AP issues were recorded and understood; and

- Contribute local knowledge to the process.

During the impact assessment phase

- Verify that I&AP issues have been considered in the EIA and EMP; and
- Comment on the findings of the specialist studies and the EIA.

During the decision-making phase

- Advise I&APs of the outcome of the environmental authorisation (i.e. DMR decision), and the appeals process and procedure.

Identification of Interested and Affected Parties

The NEMA Regulations require identification of and consultation with I&APs. The term I&AP generically refers to persons or groups who are directly or indirectly affected by a project, as well as those who may have interests in a project and/or the ability to influence its outcome, either positively or negatively. SRK Consulting commenced with the I&AP identification process in 2012 by utilising existing databases from previous environmental authorisation processes. Existing details were verified and incorporated into the stakeholder database developed for the proposed Elders Colliery Project.

SRK's approach recognises that I&APs are diverse in character and in their project interest and the following criteria were used to identify the I&APs:

- ***Zone of influence***: physical location relative to the project site and potential impacts. Generally the closer stakeholders live to a project site the higher their interest and the potential impacts of the project;
- ***Stakeholder values***: the value stakeholders attach to the area that might be affected by the project. This includes aspects such as livelihoods, land use, ownership, heritage and sense of place; and
- ***Jurisdiction***: the mandate/influence of institutions over regulatory process and public opinion.

Additional to the above criteria, the following aspects refined the I&AP identification process:

- The demarcation area for stakeholder engagement of the Elders Colliery Project falls within the boundaries of two District Municipalities and two Local Municipalities, namely the Nkangala District Municipality and the Steve Tshwete Local Municipality; and the Gert Sibande District Municipality and Govan Mbeki Local Municipality, as the proposed boxcut with associated infrastructure and part of the new conveyor route falls within the Gert Sibande District Municipality, and the remaining part of the new conveyor belt and upgrade of the existing conveyor belt falls with Nkangala District Municipality.
- The focus in the Steve Tshwete Local Municipality was Ward 4 and in the Govan Mbeki Local Municipality, Ward 15
- Directly affected landowners or occupants living adjacent to the project area influenced by the mining right area of Elders Colliery.

A Register of I&APs exist in terms of the NEMA Regulations (GN R543) Section 24. This register of I&APs covers the period 2012 - 2013. This register was updated in compliance to Section 42 of the EIA Regulations (GN R 982 of 2014) that requires that a register with full contact details of registered I&APs be submitted to the competent authority.

A list of identified I&APs and the Register of I&APs are included in **Appendix 6-1.**

Public participation process undertaken during 2012 - 2013

Project announcement

The proposed Elders Colliery was announced from 11 February to 11 March 2013 as follows:

- Distribution of a letter of invitation (English, Afrikaans and Zulu), accompanied by a Background Information Document (BID);

- Posting all documentation on the SRK website;
- Placing the invitation letter, BID, registration and comment sheet, together with an A3 poster to indicate the availability of the announcement documents, at public places in the project area;
- Eight site notices were erected at various locations in the project area;
- Advertisements in English and Afrikaans were published in the main body of 3 newspapers on 8 February 2013 namely the Ridge Times, Middelburg Observer and the Highvelder.

Availability of the Draft Scoping Report (DSR) for public comment

The DSR was made available at various public places in Secunda, Middelburg, Bethal and Kriel for public review for a period of 40 days from Wednesday 29 May to Tuesday 9 July 2013.

Commenting on the DSR

Stakeholders could contribute comments either in writing by completing and returning comment sheets, verbally by phone, or by attending focus group meetings.

Focus group meetings took place between the 23 and 25 June 2013 to discuss the content of the DSR. Key stakeholders such as landowners, neighbouring industries, environmental and conservation NGOs and Parastatals were invited to attend these meetings.

Two open house meetings were held to present and discuss the content of the DSR. An open invitation was extended to the Vlakkuilen Community and the general public to attend the open houses.

All stakeholder comments were recorded in a Comment and Response Report (CRR).

Availability of the Final Scoping Report (FSR)

The FSR was made available for public comment for a period of 21 days, from 8 August to 28 August 2013. The CRR attached to the FSR was updated with stakeholder comment obtained during the comment period.

Additional communication with stakeholders

A feedback letter was distributed to stakeholders on 27 January 2014 to inform them that the FSR has been accepted by authorities and that permission was granted to proceed with the impact assessment phase. The CRR was updated with stakeholder comments in February 2014

Public participation for the current environmental authorisation process - 2015

This process acknowledges and builds on the previous stakeholder engagement undertaken for this project. The fundamentals of this project have not changed since the previous engagement process except for the exclusion of the mini-pit. Therefore many of the comments and issues raised during the previous process are still valid for this authorisation process and have been included into the pre-announcement consultation.

SRK's approach to the identification of I&APs remains the same as during the previous process ensuring the involvement of directly affected I&APs, such as the adjacent landowners.

Pre-announcement consultation

The purpose of the pre-announcement consultation is to

- Inform all I&APs of the revised scope of the project;
- Provide sufficient information and opportunity to stakeholders to comment on the revised scope; and
- Provide information on the new EIA authorisation process going forward.

The following activities formed part of the pre-announcement consultation:

- A background information letter, I&AP registration and comment form (in English, Afrikaans and Zulu) dated 22 July 2015, providing information on the revised scope, the new EIA authorisation process and how stakeholders can become involved were distributed to all I&APs on the current Elders Colliery Project database via email or post (See **Appendix 6-2** for copies of the letters);
- The above documentation was personally delivered to the directly affected communities, namely the Vlakkuilen and Middelkraal Communities (See **Appendix 6-3** for details of personal delivery);
- Community meetings were held on 26 July 2015 with the Vlakkuilen and Middelkraal communities and on 27 July 2015 with the farmers and landowners in the project area. A meeting was also held with the Mahlathini Community on 17 August 2015 (See **Appendix 6-4** for presentations (English and Zulu) and attendance registers); and
- Comments received from I&APs during the pre-announcement consultation and scoping phase are included in the Scoping Report.

Announcement of project and availability of the Scoping Report for public comment

- The Scoping Report was made available for public comment for a period of 30 days (3 August to 2 September 2015). This was announced to stakeholders in a letter dated 31 July 2015 (in English, Afrikaans and Zulu) and distributed to I&APs on the stakeholder database via email, fax or post. (See **Appendix 6-5** for copies of the letters);
- Two site notices each in English, Afrikaans and Zulu were placed at various locations in the project area (**Appendix 6-6**);
- The Scoping Report, letter and comment sheet were made available for public viewing and comment at the following places:
  - Bethal Public Library;
  - Kriel Public Library; and
  - Middelburg Public Library.
- Additional copies of the Scoping Report and comment sheets were hand delivered to the Vlakkuilen and Middelkraal communities;
- Advertisements (refer to **Appendix 6-7**) were published in the following newspapers:
  - Ridge Times, Wednesday, 29 July 2015 (English and Afrikaans);
  - Highvelder, Thursday, 30 July 2015 (Afrikaans); and
  - Middelburg Observer, Friday 31 July 2015 (English and Afrikaans).
- Adjacent landowners and I&APs without email or postal addresses received SMS notification of the availability of the Scoping Report for public comment;
- The Scoping Report, letter and comment sheet was posted on the SRK website www.srk.co.za;
- Telephonic consultation took place during the 30 day comment period with adjacent landowners, district and local municipalities, government departments and non-governmental organisations, to obtain comments on the Scoping Report.

Submission of the Scoping Report to the competent authority

- The Scoping Report was submitted to the DMR and other commenting authorities on 28 August 2015.
- The Scoping Report was approved by the DMR on 20 October 2015.

Availability of the EIA/EMP for public comment

- The EIA/EMP is made available for public comment for a period of 30 days (9 November to 8 December 2015). This was announced to stakeholders in a letter that was made available from 21 October 2015 (in English, Afrikaans and Zulu) and distributed to I&APs on the stakeholder database via email, fax or post. Letters to the Vlakkuilen, Middelkraal and Mahlathini communities were hand delivered (See **Appendix 6-8** for copies of the letters);
- The EIA/EMP, a letter and comment sheets were made available for public comment at the following venues:
  - Bethal Public Library;
  - Kriel Public Library;
  - Middelburg Public Library;
  - Vlakkuilen Community;
  - Middelkraal community; and
  - Goedehoop Colliery.
- Additional copies of the EIA/EMP and comment sheets were hand delivered to the Vlakkuilen, Middelkraal and Mahlathini communities;
- Advertisements (refer to **Appendix 6-9**) announcing the availability of the EIA/EMP for public comment were published in the following newspapers:
  - Ridge Times, Wednesday, 28 October 2015 (English and Afrikaans);
  - Highvelder, Thursday, 22 October 2015 (Afrikaans); and
  - Middelburg Observer, Friday 23 October 2015 (English and Afrikaans).
- Adjacent landowners and I&APs without email or postal addresses received SMS notification of the availability of the EIA/EMP for public comment;
- The EIA/EMP, a letter and comment sheets were posted on the SRK website www.srk.co.za;

Impact assessment feedback meetings

Feedback meetings to discuss the findings of the specialist studies and the impact assessment were held on the following:

- 20 November 2015: Mahlathini Community
- 22 November 2015: Vlakkuilen and Middelkraal Communities; and
- 23 November 2015: Landowners and Farmers.

During these meetings, stakeholders had an opportunity to comment on the findings of the EIA/EMP. Attendance registers and presentations from the meetings are attached as **Appendix 6-10**.

Submission of the EIA/EMP to the competent authority

All comments obtained from stakeholders during the Pre-assessment, Announcement/ Scoping and Impact Assessment Phases are captured in this EIA/EMP Report for authorities review. This report will be submitted to the competent authority (DMR) and other commenting authorities in January 2016.

iii) Summary of issues raised by I&APs

(Complete the table summarising comments and issues raised, and reaction to those responses)

Table 4: Comments raised by I&APs during the stakeholder engagement process from 2012 - 2015

Interested and Affected Parties	Date Comments Received	Issues raised	EAPs response to issues as mandated by the applicant	Reference in EIA/EMP
AFFECTED PARTIES				
Landowner/s	25 June 2013 Lourens De Koning	There are rumours that there is a tender out to re-build a portion of the R35 close to the Goedehoop Colliery turn-off. Is this true and what are the implications of this to the proposed project?	Comment noted. This will not impact on the Elders Colliery Project as coal will not be transported by road during the operational phase.	Not applicable
Landowner/s	25 June 2013 Johan Potgieter	Landowners are tired of being walked over by the mine. We are of the opinion that nothing we say is taken into account, or will make a difference to decisions taken by government whether projects are approved or not.	As part of the current Elders Colliery environmental authorisation process, all comments received from the public are documented in the Comment and Response table. Each comment is considered and responded to by the EAP/applicant. This table is included into the EIA/EMP which is submitted to authorities for review and consideration, prior to a decision being made on the proposed project. Stakeholders are notified of the decision and are provided an opportunity to appeal.	Table 4
Landowner/s	25 June 2013 Johan Potgieter	No compensation for losses has been made to farmers, their families and their workers. Compensation is only given to communities.	All surface infrastructure for the Elders Colliery is located on property owned by Anglo American. Underground mining methods have been chosen to limit surface disturbance. Land owned by Anglo American is managed by Anglo Estates and all negotiations and compensation regarding land managed is facilitated by this department.	Not applicable
Landowner/s	11 March 2013 Nic Britz NC Boerdery	The quantity of water used by the mine and the quality of drinking water must be monitored on a regular basis. Stakeholders must be kept informed of this monitoring information.	A water balance was calculated as part of the Surface Water Study. A surface and groundwater monitoring programme for the Elders Colliery has been included in the EIA/EMP which was made available for public review and comment.	Figure 23 Part B Section 1 (k)
Landowner/s	25 June 2013 Nic Britz NC Boerdery	How far apart are the coal seams that will be mined in the underground mining operation?	The distance between 4 Seam and 2 Seams varies between 4m to 20m.	Not applicable
Landowner/s	27 July 2015 Nic Britz	Is the Middelkraal community part of the Bethal municipality or are they on their own?	The Middelkraal Community falls within the Govan Mbeki Local Municipality (which includes Bethal), and	Not applicable

Interested and Affected Parties	Date Comments Received	Issues raised	EAPs response to issues as mandated by the applicant	Reference in EIA/EMP
	NC Boerdery		the Gert Sibande District Municipality as per the demarcation board.	
Landowner/s	27 July 2015 Nic Britz NC Boerdery	The communities do not adhere to the carrying capacity of the land in terms of cattle grazing. They allow more cattle onto the land than the land can carry. The mines have moved the communities to the land, and should therefore ensure that the carrying capacities are adhered to.	The Middelkraal community was relocated by Glencore Umcebo onto property not owned by Anglo American. Therefore Anglo has no jurisdiction on that property and associated community. The Vlakkuilen community is located on land owned by Anglo. A census of the Vlakkuilen community was undertaken by SRK in September 2015 and shows an increase in cattle on the land. The Department of Agriculture was present at the last Vlakkuilen Working Group meeting (held on 14 October 2015) and agreed to request ownership certificates for all the cattle on the property. This issue is being addressed by Anglo through the working group.	Not applicable
Landowner/s	27 July 2015 Nic Britz NC Boerdery	There are 50 whippet dogs at the Middelkraal community with which the community hunts on the farm Middelkraal on Sundays.	The Middelkraal community was relocated by Glencore Umcebo onto property not owned by Anglo American. Therefore Anglo has no jurisdiction on that property and associated community.	Not applicable
Landowner/s	31 July 2015, Pieter Honeyborne, Landowner	Thank you for the opportunity to comment on the Elders project. I have a few concerns, namely water supply, safety fences and the servitude area at Block 8 & Block 20. Goedehoop Colliery is aware of my concerns, as I have discussed it with the Engineering Manager, Mr Rowan Youell. He has informed me that negotiations will take place within the next three weeks. I fully support this project that will have a positive effect on creating sustainable jobs in our community.	The concern is addressed by Goedehoop Colliery.	Not applicable Action for AOL.
Landowner/s	25 June 2013 Nic Britz NC Boerdery	Boreholes used by famers surrounding the proposed Elders Colliery must be assessed and monitored.	A groundwater study was undertaken as part of the impact assessment phase. The study included a hydro census which includes boreholes in the project area, as well as in a 100m buffer zone around the project area. The hydro census will be updated one year prior to the operational phase of the project, to confirm boreholes users in the underground mining area. The groundwater study has identified that the overlying aquifers retain their saturation status during	Appendix 7-4 Table 9
Lawful occupier/s of the land	25 June 2013 Johan Engelbrecht	How will mining affect boreholes and the availability of water from boreholes close to the proposed mine?		

Interested and Affected Parties	Date Comments Received	Issues raised	EAPs response to issues as mandated by the applicant	Reference in EIA/EMP
			underground operations and that a cone of depression does not form over and around the underground workings. The groundwater study is included in the EIA.	
Lawful occupier/s of the land	25 June 2013 Johan Engelbrecht	I have taken responsibility for providing transport and electricity to members of the Vlakkuilen community since 2006, and have not been compensated for these expenses.	Compensation with regards to expenses as a result of the community has been discussed with Anglo Estates and Anglo American Government and Social Affairs (GSA) department as part of the lease agreement. Compensation has been paid to the farmer and has been addressed in full. The matter is being addressed by Anglo independently of this environmental authorisation process.	Action for AOL
Lawful occupier/s of the land	25 June 2013 Johan Engelbrecht	Please note that the current landowners are the registered users of the Weirs and the Dams in the Elders Colliery project area.	The Elders Colliery project will not abstract water from the Olifants River and other tributaries. Water during the construction and operational phases will be obtained from boreholes at Elders Colliery until a water positive balance is eminent from the Elders underground workings.	Not applicable
Lawful occupier/s of the land	27 July 2015 Johan Engelbrecht	What was promised to the Vlakkuilen community in the meetings held with them on 26 July 2015? We have concerns regarding the number of cattle allowed on the land that exceeds its carrying capacity. The community brings in foreign cattle onto the land which could carry diseases that will have serious impacts on the farmer's cattle. The communities rent out their informal homes to other people who bring in the foreign cattle.	A meeting was held with the Vlakkuilen community by Anglo on 22 July 2015 to disclose to the community the new mine plan and the implications for them, i.e. Anglo will no longer need to relocate them. No promises were made during this meeting, yet a number of issues and concerns were raised by the community. A working group has been set up with the community and meets every 2nd Wednesday of the month. The Vlakkuilen community is located on land owned by Anglo. A census of the Vlakkuilen community was undertaken by SRK in September 2015 and shows an increase in cattle on the land. The Department of Agriculture was present at the last Vlakkuilen Working Group meeting (held on 14 October 2015) and agreed to request ownership certificates for all the cattle on the property. This issue is being addressed by Anglo through the working group.	Not applicable
Lawful occupier/s of the land	27 July 2015 Johan Engelbrecht	What is the planned life of mine?	The planned life of mine is 14 years. The Middelkraal community was relocated by Glencore Umcebo onto property not owned by Anglo American.	Appendix 7-9 Table 8 and Table 9

Interested and Affected Parties	Date Comments Received	Issues raised	EAPs response to issues as mandated by the applicant	Reference in EIA/EMP
		How will issues with surrounding communities, such as Middelkraal and Vlakkuilen that are negatively affecting landowners be managed?	Therefore Anglo has no jurisdiction on that property and associated community. The Vlakkuilen community is located on land owned by Anglo and therefore Anglo Estates is involved in the management of those farms. Influx of people into the area was assessed as part of the Social Impact Assessment and is included in the EIA/EMP. Anglo can only implement policies that manage expectations around opportunities at the mine. The responsibility for management of influx and growth of population in the area is the jurisdiction of the local government and not the mine.	
Lawful occupier/s of the land	27 July 2015 Johan Engelbrecht	There should be meetings with the communities to address the issue of the carrying capacity of the land, the number of cattle and the foreign cattle on the land.	The Middelkraal community was relocated by Glencore Umcebo onto property not owned by Anglo American. Therefore Anglo has no jurisdiction on that property and associated community. A census of the Vlakkuilen community was undertaken by SRK in September 2015 and shows an increase in cattle on the land. The Department of Agriculture was present at the last Vlakkuilen Working Group meeting (held on 14 October 2015) and agreed to request ownership certificates for all the cattle on the property. This issue is being addressed by Anglo through the Working group. The Vlakkuilen Working Group meets on the 2nd Wednesday of every month where these issues are discussed and addressed.	Not applicable
Lawful occupier/s of the land	23 November 2015 Niekie Jonker	Why is the noise impact bigger at night?	Due to lower ambient noise conditions at night, the noise impact is bigger. This is not due to more noise being generated at night.	Appendix 7-6
Lawful occupier/s of the land		There is one decant point close to the Viskuile wetland. How will this be managed?	The potential for surface decant will be manged by: • Optimising storage of mine water in mined out underground sections; • Monitoring of water levels • Water levels in the workings will be actively managed to ensure it remains below the decant elevation	Appendix 7-4

Interested and Affected Parties	Date Comments Received	Issues raised	EAPs response to issues as mandated by the applicant	Reference in EIA/EMP
			A detailed decant management plan will be developed at mine closure. Ultimately water treatment solutions, either passive or active, will be implemented.	
Lawful occupier/s of the land	27 July 2015 William Seabi Total Coal	The Forzando West project will come on line within the next couple of years. We require full understanding of the environmental issues for Elders Colliery that is foreseen such as decanting. Exxaro (previously owned by Total) will provide comment on the Scoping Report that will be made available for public comment.	A groundwater study was undertaken as part of the impact assessment phase. This study has identified potential decant points after closure. Impacts from decanting have been assessed in the impact assessment tables.	Appendix 7-4 Figure 22 Table 10
Landowners or lawful occupiers on adjacent properties	27 July 2015 Pieter Honeyborne Landowner	On 21 October 1991 Anglo sent a letter to my parents restricting us to construct any buildings on our farm without the consent of the mine. We received permission from the mine to build a second home on the property. However, the last four years the conveyor from Block 8 to Goedehoop Colliery has been vandalised and the communities use this material to build informal houses on the property – they apparently do not require permission from the mine to do so. The Block 8 servitude is registered in Anglo's name. According to the servitude agreement, Anglo is required to maintain the servitude. However, this has not taken place during the last four years and nothing has been maintained. This has resulted in the vandalising the conveyor belt and the influx of people onto our property. We as landowners have to protect ourselves against criminals. Therefor in legal terms, Anglo has not honoured the servitude agreement. On 15 June 1994 we received letters from Amcoal regarding its Landau Colliery for an assessment on our farms regarding the water problem. Two of our boreholes were destroyed by the mining activities. For the past four years there were three occasions where we have not had water on our farm. People from the communities come to our house to collect water in buckets and wheelbarrows from our private taps. Because of Block 8, my cattle do not have drinking water. Because of the influx of people, there is an increase in crime in the area. Everything gets stolen including machines and gearboxes.	The concern was communicated to the Goedehoop Colliery management. As a result, further meetings with the farmers in the Goedehoop Colliery area have been set up to address the concerns related to Goedehoop Colliery.	Not applicable Action for AOL.

Interested and Affected Parties	Date Comments Received	Issues raised	EAPs response to issues as mandated by the applicant	Reference in EIA/EMP
		Our grievances have been raised in the past, but we have not been consulted and provided with feedback. With the mine's current history, I cannot see how the future will be any better. I don't know what to say about this. This is actually a joke. The consultants do not know what is really going on and is not aware of the tension that exists between the farmers and the communities. The farmers are now seen as the culprits because we are protecting what is ours. Strange people are coming onto our land and we cannot do anything about it. We have had no response from the mines regarding the security issues.		
Landowners or lawful occupiers on adjacent properties	23 June 2013 Johannes Motau Vlakkuilen Community	The Vlakkuilen Community will be affected by the impacts of mining activities such as dust and other impacts.	An Air Quality study was undertaken as part of the impact assessment phase. Dust fallout for the proposed project was modelled. Dust fallout exceedances do not impact on any sensitive receptors. Socio-economic impacts were assessed as part of the Social Impact Assessment and results of these are included in the EIA/EMP	Appendix 7-5 Appendix 7-9 Figure 14 and Figure 19 Table 8 and Table 9
Landowners or lawful occupiers on adjacent properties	23 June 2013 Jacob Chauke Vlakkuilen Community	I request to communicate directly with Mrs Zareena Ebrahim of AOL regarding the SMME opportunities for Elders Colliery.	The message was passed on to Mrs Ebrahim of Anglo American. All queries regarding the environmental authorisation process should be addressed to SRK.	Not applicable, comment addressed.
Landowners or lawful occupiers on adjacent properties	23 June 2013 Joseph Vlakkuilen Community	Elders Colliery must employ local contractors and communities in preference to external labour.	AOL has a preferential procurement policy aimed at empowering local SMMEs and such policy will be applicable to the project's procurement strategy. In terms of Labour, employment opportunities will also depend on the skills available. Skills are important and a specific level of training is required in order to work for Anglo Operations (Pty) Ltd (AOL). Anglo Operations are unable to guarantee jobs to the community, however, they will look into opportunities for the community.	Appendix 7-9 Table 8 and Table 9
Landowners or lawful occupiers	23 June 2013 Joseph	Commitments made in Social Labour Plans (SLPs) of other mines in the area have not been complied with. For example, communities have not been informed when blasting will take	A Social Impact Assessment was undertaken as part of the impact assessment phase. The results of this are included in the EIA/EMP. Mitigations measures with	Appendix 7-8 Appendix 7-9

Interested and Affected Parties	Date Comments Received	Issues raised	EAPs response to issues as mandated by the applicant	Reference in EIA/EMP
on adjacent properties	Vlakkuilen Community	place at adjacent mines. Elders Colliery must therefore comply with the commitments made in their SLP and EMP.	specific reference to compliance to the SLP have been included in the EMP. A blasting study was also undertaken during the impact assessment phase. The results have been included in the EIA/EMP with specific reference to informing surrounding communities of the planned blasting.	Table 8 and Table 9
Landowners or lawful occupiers on adjacent properties	23 June 2013 Joseph Vlakkuilen Community	How many communities or households will be affected in this project?	A socio-economic impact assessment was under during the impact assessment phase and has identified two communities within the vicinity of the boxcut (Middelkraal and Vlakkuilen communities) and two communities within the vicinity of the proposed conveyor belt (Mahlathini and Hope Village). In addition, a number of specialist studies (air quality and noise, heritage, blasting etc.) were undertaken to assess potential impacts of the project on these communities.	Appendix 7-5 Appendix 7-6 Appendix 7-7 Appendix 7-8 Appendix 7-9 Table 8 and Table 9
Landowners or lawful occupiers on adjacent properties	23 June 2013 Joseph Vlakkuilen Community	AOL must ensure that the local communities benefit from the proposed development.	AOL has a preferential procurement policy aimed at empowering local SMMEs and such policy will be applicable to the project's procurement strategy. In terms of Labour, employment opportunities will also depend on the skills available. Skills are important and a specific level of training is required in order to work for Anglo Operations (Pty) Ltd (AOL). Anglo Operations are unable to guarantee jobs to the community, however, they will communicate potential opportunities to the community.	Table 8 and Table 9
Landowners or lawful occupiers on adjacent properties	23 June 2013 Leonard Mahlangu / Simpiwe Ngobesa Vlakkuilen Community	Please ensure that the youth from local communities are provided with employment opportunities at Elders Colliery, and that this is set out in the Social Labour Plan for the project.		
Landowners or lawful occupiers on adjacent properties	23 June 2013 Ronni Nkosi Vlakkuilen Community	AOL must provide the community with various opportunities for employment, for example as employees and as contractors.		
Landowners or lawful occupiers on adjacent properties	23 June 2013 Sarafina Mndebele Vlakkuilen Community	AOL must develop small business opportunities in the community so that the wealth is shared equally. The mine needs to consider employing women and the youth, not only the men.		

Interested and Affected Parties	Date Comments Received	Issues raised	EAPs response to issues as mandated by the applicant	Reference in EIA/EMP
Landowners or lawful occupiers on adjacent properties	23 June 2013 Jacob Chauke Vlakkuilen Community	Why has the schedule for the proposed construction of the project changed from 2014 to end 2015, as was mentioned at the last meeting with the Vlakkuilen Community in June 2012?	Due to the change in project scope (by excluding the mini-pit) the proposed start date of the project has moved out. The new life mine plan is illustrated in the EIA/EMP.	Figure 4 and Figure 5
Landowners or lawful occupiers on adjacent properties	23 June 2013 John Hlophe Vlakkuilen Community	Electricity provision is the main concern for Vlakkuilen community. Please provide the community with electricity until relocation takes place.	Electricity is provided to some of the Vlakkuilen Community members by Eskom in the form of prepaid electricity. Eskom has approved the re-installation of electricity in all household at Vlakkuilen and are awaiting consultation with the community by the councillor. It is the responsibility of the municipality to provide electricity to houses without electricity in the interim. Anglo is working with Eskom to resolve this matter. Visits by Eskom to the site have been scheduled through the ward councillor.	Not applicable
Landowners or lawful occupiers on adjacent properties	23 June 2013 Emma Mahlangu Vlakkuilen Community	Other mines that are operational in the area have caused damage to houses in the Vlakkuilen Community, especially the windows. They have also provided community members with groceries, why is this not taking place anymore?	AOL is not responsible for the actions of other mining houses in the area. Grievances should be addressed directly with the mining companies concerned. In terms of impacts of the Elders Colliery, this EIA/EMP addressed all identified impacts of the proposed project and has provided mitigation measures in order to manage these impacts.	Table 8 and Table 9
Landowners or lawful occupiers on adjacent properties	23 June 2013 Thandi Vlakkuilen Community	There are community members who stay in mud houses. These houses are damaged and destroyed due to the blasting activities by other mines in the area. Please replace these mud houses with corrugated iron houses before resettlement takes place.	A blasting study was undertaken as part of the impact assessment phase. It was identified that there will be limited low impact on surrounding communities during the construction phase. There will be no Secondary blasting at Elders, only at the Boxcut construction. Main Developments underground will be done by stoneworks whereby limited and minimum blasting activities will take place. The blasting will not have any impact on the mine buildings. AOL is not responsible for the actions of other mining houses in the area. Grievance should be addressed directly with the mining companies concerned.	Appendix 7-8 Table 8
Landowners or lawful occupiers	23 June 2013	Houses in the Vlakkuilen community are falling apart. It is requested that AOL build new houses for the community.	An updated census of the Vlakkuilen community was undertaken by SRK during September 2015.	Action for AOL.

Interested and Affected Parties	Date Comments Received	Issues raised	EAPs response to issues as mandated by the applicant	Reference in EIA/EMP
on adjacent properties	Florence Mudzanani, Essie Mnguni & Linah Nkosi Vlakkuilen Community		The Vlakkuilen Working Group has been set up to address the concerns of the community. The working group meets every 2nd Wednesday of the month where these concerns are raised and addressed.	
Landowners or lawful occupiers **on adjacent properties**	23 June 2013 Jacob Chawuka Vlakkuilen Community	Is SRK independent from Anglo American Inyosi Coal (AAIC*)? *Project is now owned by AOL.	Yes, SRK is an independent consultant who has been appointed by AOL to assist with the environmental authorisations for the Elders Colliery Project. SRK has no vested interested in the outcome of this project and are legally required to maintain and independent perspective.	Executive summary
Landowners or lawful occupiers **on adjacent properties**	26 July 2015 Sophie Mahlangu Vlakkuilen Community	If underground mining takes place, will subsidence not take place, and will we not fall into those areas?	The bord and pillar mining method does not remove all the coal resource available, pillars are left behind in order to support to surface area. The mining engineers calculate what the sizes and the ratio must be in order for no subsidence to take place. A report was compiled by a rock engineer to assess the potential for surface subsidence and found that there are zero possibilities of surface subsidence due to the safety factors applied in the resource. No underground mining will occur near the Vlakkuilen Community, therefore there is no risk for subsidence at the Vlakkuilen community.	Table 9
Landowners or lawful occupiers **on adjacent properties**	26 July 2015 Sarah Nkosi Vlakkuilen Community	Please look behind you to see the shack that I live in. That is my house and my home. Will you (Anglo American) build us brick houses?	Anglo has established a working group with the Vlakkuilen Community, which includes members from Anglo, the Vlakkuilen community and the ward councillors. The housing concern will be addressed as part of this working group. An updated census of the Vlakkuilen community was undertaken by SRK during September 2015.	Not applicable
Landowners or lawful occupiers **on adjacent properties**	26 July 2015 Sakhi Sam Mahlangu Vlakkuilen Community	Sophie's question regarding the subsidence should not be taken lightly. There have been underground mines in the area where subsidence has taken place and the people who lived there are no longer around.	The current mine plan shows that no underground mining will take place underneath any existing communities. The bord and pillar mining method does not remove all the coal resource available, pillars are left behind in order to support to surface area. The mining engineers	Table 9

Interested and Affected Parties	Date Comments Received	Issues raised	EAPs response to issues as mandated by the applicant	Reference in EIA/EMP
		We have also seen a lot of smoke coming from these mining areas which has a negative impact on the environment and the communities living in this area.	calculate what the sizes and the ratio must be in order to minimise the potential risk for subsidence to take place. The potential for surface subsidence was assessed in the EIA/EMP. Subsidence has been observed at other historical mining operations where total extraction mining methods have been implemented. There is no risk for spontaneous combustion on surface as no RoM stockpiles will be constructed. The boxcut face will be covered to avoid oxidation of the coal and associated spontaneous combustion.	
Landowners or lawful occupiers on adjacent properties	26 July 2015 Wonder Ndlovu Vlakkuilen Community	There are two different departments within Anglo that deals with environmental issues: one looking after the environment and the associated permitting processes, and the other looking after the social affairs (CED – Community Engagement and Development department). Despite this, Anglo must still listen and respond to community issues during all meetings.	Anglo has established a working group with the Vlakkuilen Community, which includes members from Anglo, the Vlakkuilen community and the ward councillors. This working group will meet on a regular basis to provide feedback from all departments to the Vlakkuilen community.	Not applicable
Landowners or lawful occupiers on adjacent properties	26 July 2015 Sakhi Sam Mahlangu Vlakkuilen Community	Please inform us of potential jobs that will be available during the life of the mine. Please inform us timeously of these employment opportunities in order for the Vlakkuilen community to apply for these positions before anyone else. Vlakkuilen could form companies that are contracted to Anglo American.	AOL has a preferential procurement policy aimed at empowering local SMMEs and such policy will be applicable to the project's procurement strategy. In terms of Labour, employment opportunities will also depend on the skills available. Skills are important and a specific level of training is required in order to work for Anglo Operations (Pty) Ltd (AOL). Anglo Operations are unable to guarantee jobs to the community, however, they will look into opportunities for the community.	Table 8 and Table 9
Landowners or lawful occupiers on adjacent properties	26 July 2015 Jerry Tao Vlakkuilen Community	When is the mine starting?	The mine plans to start with construction during the third quarter of 2016. The construction phase will last for approximately two years. The first coal is expected towards the end of 2018.	Not applicable
Landowners or lawful occupiers on adjacent properties	26 July 2015 Jerry Tao Vlakkuilen Community	Please let the mine start at the times you have described. The mine has been planned for many years but has not commenced. Our graves have been relocated but the mine has not started. Please stick to the timeframes.	The project was delayed for various reasons (technical and financial). Furthermore, the implementation of the project depends on its approval by Anglo executives. However, Goedehoop is now dependent on the supply	Not applicable

Interested and Affected Parties	Date Comments Received	Issues raised	EAPs response to issues as mandated by the applicant	Reference in EIA/EMP
		People from the mine run away and don't provide feedback to the communities.	of coal from Elders, and if Elders does not start then the Goedehoop plant will need to be closed. Anglo has established a working group with the Vlakkuilen Community, which includes members from Anglo, the Vlakkuilen community and the ward councillors. This working group meets once a month to provide feedback from all departments to the Vlakkuilen community. There is a process in place supported by the working group of which the town councillor is part of, together with the Govan Mbeki local municipality town planners to establish a long term solution for the community. Until this matter has been resolved the Vlakkuilen community has agreed to use the current licenced grave site in Bethal for burials of their loved ones.	
Landowners or lawful occupiers on adjacent properties	26 July 2015 Johannes Motau Vlakkuilen Community	The Elders project goes back 10 years. This is the first time we have seen Marcia Mabuza from the CED department. We have been struggling to have our issues addressed by Anglo. You say the project will only start making money in 2018. But we are hungry now, not in 2018. We will not all benefit from a project that is only in the future. What will Anglo do about our situation now? Please give me money now, so that I can farm. How can we benefit from the land besides from mining? The land is currently under grazed and no development has taken place for the past 10 years.	Anglo has established a working group with the Vlakkuilen Community, which includes members from Anglo, the Vlakkuilen community and the ward councillors. This working group meets on a monthly basis to provide feedback from all departments to the Vlakkuilen community. All concerns raised by the community are addressed as part of the Vlakkuilen Working Group.	Not applicable
Landowners or lawful occupiers on adjacent properties	26 July 2015 Sakhi Sam Mahlangu Vlakkuilen Community	Anglo gives us timeframes within which they plan to start the mine, which means they are reliable and can be trusted. We appreciate that you give us the opportunity to raise our concerns. Anglo went from open cast mining to underground mining methods indicating that they have thought about the project.	Noted.	Not applicable
Landowners or lawful occupiers on adjacent properties	26 July 2015 Petunia Muozanani Vlakkuilen Community	Will you bring in your own employees during construction, or will you use people from the Vlakkuilen community? If I am skilled in a certain area, but I don't have matric, will you still consider hiring me?	AOL has a preferential procurement policy aimed at empowering local SMMEs and such policy will be applicable to the project's procurement strategy. In terms of Labour, employment opportunities will also depend on the skills available. Skills are important and	Not applicable

Interested and Affected Parties	Date Comments Received	Issues raised	EAPs response to issues as mandated by the applicant	Reference in EIA/EMP
			a specific level of training is required in order to work for Anglo Operations (Pty) Ltd (AOL). Anglo Operations are unable to guarantee jobs to the community, however, they will look into opportunities for the community. The project will adhere to the Mining Charter requirements and all CSI and SLP opportunities do not discriminate on the levels of education but are meant to cater for the broader community in development initiatives.	
Landowners or lawful occupiers on adjacent properties	26 July 2015 Jerry Tao Vlakkuilen Community	You have relocated our graves. What will happen if someone in our community dies? Where will we have to bury them?	Anglo established a working group with the Vlakkuilen Community, which includes members from Anglo, the Vlakkuilen community as well as the ward councillors. There is a process in place supported by the working group of which the town councillor is part of, together with the Govan Mbeki local municipality town planners to establish a long term solution for the community. Until this matter has been resolved the Vlakkuilen community has agreed to use the current licenced grave site in Bethal for burials of their loved ones.	Not applicable
Landowners or lawful occupiers on adjacent properties	26 July 2015 Johannes Motau Vlakkuilen Community	How will you resolve the lack of water we are currently experiencing?	Anglo established a working group with the Vlakkuilen Community, which includes members from Anglo, the Vlakkuilen community as well as the ward councillors. Anglo is in a process of drilling a new borehole for the community for drinking water needs. This item is also a priority item for the working group.	Not applicable
Landowners or lawful occupiers on adjacent properties	26 July 2015 Lendani Mbata Vlakkuilen Community	At the next meeting, please ensure that you have the answers to our questions, especially for the important issues such as water.	Comments raised during the scoping phase of the project have been listed in the comments and response table included in the EIA/EMP. All comments have been responded to.	Table 4
Landowners or lawful occupiers on adjacent properties	26 July 2015 Johannes Motau Vlakkuilen Community	Who will assist me from the Anglo team regarding my financial request?	Anglo is not a financial institution and is therefore not authorised to issue financial bonds.	Not applicable

Interested and Affected Parties	Date Comments Received	Issues raised	EAPs response to issues as mandated by the applicant	Reference in EIA/EMP
Landowners or lawful occupiers on adjacent properties	26 July 2015 Moses Mahlangu, Sakhi Sam Mahlangu Vlakkuilen Community	We have too many meetings, but no answers to our questions. At the next meeting, please have responses to our queries from the experts, otherwise it creates confusion.	Comments raised during the scoping phase of the project have been listed in the comments and response table included in the EIA/EMP. All comments have been responded to. In addition, Anglo established a working group with the Vlakkuilen Community, which includes members from Anglo, the Vlakkuilen community as well as the ward councillors. Meetings are held on a monthly basis to provide feedback to the community.	Table 4
Landowners or lawful occupiers on adjacent properties	22 November 2015 Mr Chauke Vlakkuilen Community	I am 48 years old. Discussions regarding this proposed mine has been taking place since I was 18 years old. Why has this process taken so long and when will the mine start?	Previous studies for the Elders mine initially focussed on open cast mining methods. The impact of open cast mining on the environment and surrounding communities and the cost to mitigate those are far greater than the impact of underground mining. Due to capital constraints, Anglo decided to investigate the underground mining option, as an underground mine has less impact on the environment and surrounding community. Currently, the Elders project is still in study phase, and once the environmental authorisation and mining right has been granted, the project will be presented to Anglo's board where it will be evaluated in terms of its potential and capital (money) required. Only after the board has approved the project, construction will start. The environmental authorisation is expected in May 2016, and another meeting will be held with the Vlakkuilen community to inform them of Anglo's planned way forward.	Not applicable
Landowners or lawful occupiers on adjacent properties	22 November 2015 Chad Mokoena Vlakkuilen Community	Will Anglo pay if the blasting from the boxcut damage our houses and cause cracks?	The blasting study has shown that structures beyond 500 m of the boxcut will not be affected by the blasting activities. The Vlakkuilen community is located approximately 5 km south west therefore it is unlikely that there will be an impact on the houses from blasting activities. Furthermore, blasting will only take place during the construction of the boxcut, no blasting will take place for the underground mining operation, continuous miners will be used.	Appendix 7-8

Interested and Affected Parties	Date Comments Received	Issues raised	EAPs response to issues as mandated by the applicant	Reference in EIA/EMP
Landowners or lawful occupiers on adjacent properties		If people are not educated, will there still be employment opportunities.	The proposed Elders mine will require skills of various levels. During the construction phase, there will be more opportunities for unskilled workers than during the operational phase.	Not applicable
Landowners or lawful occupiers on adjacent properties		We need to know if qualification are important for job opportunities.		Not applicable
Landowners or lawful occupiers on adjacent properties	22 November 2015 Mr Vilakazi Vlakkuilen Community	Education is not a requirement to mine. One does not need an education to take coal out of the ground.	Thank you for your comment.	Not applicable
Landowners or lawful occupiers on adjacent properties	22 November 2015 Joseph Motsoedi Vlakkuilen Community	This community uses boreholes for water supply. Will the underground mining affect the water supply of the boreholes?	No underground mining will take place underneath the Vlakkuilen community, therefore it is unlikely that the underground mining will impact on the boreholes used by the Vlakkuilen community. In addition, underground mining will take place 60 m below surface, below the weathered zone. Most of the groundwater is found in shallower boreholes within the weathered zone.	Appendix 7-4
Landowners or lawful occupiers on adjacent properties		What km radius around the mine will be used by AOL's social team to determine where local labour will be used? Sometimes the zone of influence is not big enough and people who are affected by the mining activities do not benefit from it.	AOL considers a radius of 50 km around the proposed mine should for the recruitment of local labour. AOL further investigates the primary and secondary zones of influence of the project for the recruitment of labour. AOL also develops a zone of influence which will consider those communities that are influenced most by the proposed mine. Furthermore, a register of skills and qualifications within communities should be compiled by the communities which will assist AOL in the recruitment process.	Not applicable
Landowners or lawful occupiers on adjacent properties		Will the R35 be closed during blasting? Please inform the community of proposed blasting.	The R35 will be closed during blasting, and the communities will most definitely be informed of blast dates and times.	Table 8 Appendix 7-8

Interested and Affected Parties	Date Comments Received	Issues raised	EAPs response to issues as mandated by the applicant	Reference in EIA/EMP
			In addition, AOL will erect notice boards next to the R35 informing road users and communities of proposed blasting and road closures.	
Landowners or lawful occupiers on adjacent properties	22 November 2015 Moses Mahlangu Vlakkuilen Community	This is all very confusing. Studies were done to examine underground mining – but it was found to be too expensive. Now AOL decides to utilise underground mining methods. The graves were removed and relocated, but now there will be no more open cast activities. We require clarity. Why are we talking about graves if they have already been moved?	The Vlakkuilen Working Group has been set up to address the concerns of the community. The working group meets every 2nd Wednesday of the month where these concerns are raised and addressed. The concern regarding the graves are currently addressed by this working group. There are no other heritage sites identified in the proposed project area that will be affected by the Elders mine.	Appendix 7-7
Landowners or lawful occupiers on adjacent properties	22 November 2015 Sifiso Nguna Vlakkuilen Community	We are confused. Please finish one issue at a time. Some of the graves that were relocated had headstones, but after the relocation there are no more headstones. We spent a lot of money for those headstones that are now no longer there.	The Vlakkuilen Working Group that meets every 2nd Wednesday of the month addresses the concerns regarding the graves and associated headstones.	Not applicable
Landowners or lawful occupiers on adjacent properties	22 November 2015 Julian Mduhli Vlakkuilen Community	No feedback is given. The community is divided and we do not trust the Working Group. There is a breakdown between the community members.	This concern will be raised at the next Working Group meeting. The Working Group has been designed to include representative from the community. They have been designated by the community. AOL does not intervene in the election process. This should be taken up at your next community meeting. However, AOL has decided to hold a quarterly meeting with the Vlakkuilen residents to brief them on all the discussion that are held.	Not applicable
Landowners or lawful occupiers on adjacent properties	Petunia Mudzanani 22 November 2015 Vlakkuilen Community	What working group meetings are you talking about? The leadership does not extend the meeting invites to the rest of the community. The information discussed at these meetings are not shared with the rest of the community.		Not applicable
Landowners or lawful occupiers on adjacent properties	26 July 2015 Abraham Mokoena Middelkraal Community	We are in a crisis – there are no jobs. Will there be employment and training opportunities for skills during the Elders project? Some of us have companies. Will there be opportunities for contracting?	AOL has a preferential procurement policy aimed at empowering local SMMEs and such policy will be applicable to the project's procurement strategy. In terms of Labour, employment opportunities will also depend on the skills available. Skills are important and a specific level of training is required in order to work for AOL. AOL are unable to guarantee jobs to the community, however, they will look into opportunities for the community.	Not applicable

Interested and Affected Parties	Date Comments Received	Issues raised	EAPs response to issues as mandated by the applicant	Reference in EIA/EMP
Landowners or lawful occupiers on adjacent properties	26 July 2015 MH Mahlangu Middelkraal Community	How big is the area that the Elders Project will be developed on and has the land been bought?	The surface infrastructure will cover an area of 65 ha, located on the farm Middelkraal. The underground mining area covers an area of 1 355 ha. The conveyor belt including the new sections and upgraded section will be approximately 17 km long. All the land on which surface infrastructure will be developed is owned by AOL. The majority of the land where underground mining will take place is owned by AOL.	Figure 1
Landowners or lawful occupiers on adjacent properties	26 July 2015 Solomon Nzimande Middelkraal Community	Will the mining project affect our surface water, and groundwater?	Surface and groundwater studies have been undertaken as part of the impact assessment phase. These studies have identified that it will be unlikely that the Middelkraal community will be impacted by the project in terms of surface and groundwater.	Appendix 7-3 Appendix 7-4
Landowners or lawful occupiers on adjacent properties	26 July 2015 Linnah Mahlangu, Leta Mtetwa Middelkraal Community	Will we be relocated? Are you a hundred percent sure that there will be no reason to relocate this community and that we will only be neighbours?	The current Elders Colliery mine plan does not necessitate the relocation of the Middelkraal community.	Not applicable
Landowners or lawful occupiers on adjacent properties	22 November 2015 David Ntuli Middelkraal Community	What are we going to get from AOL because they are mining coal next to us? What is our benefit from this project?	AOL is required, by law, to develop a Social and Labour Plan (SLP) for the Elders Colliery. This SLP is compiled in conjunction with the ward councillor and takes into account the needs of the communities located around the proposed mine, as well as the municipality.	Not applicable
Landowners or lawful occupiers on adjacent properties		The conveyor belt will definitely generate dust. We are concerned about dust impact in our area, especially when coal is spilled.	The conveyor belt will be partially enclosed (top and one side). At transfer stations there will be dust suppression.	Table 8, 9 Appendix 7-5
Landowners or lawful occupiers on adjacent properties	22 November 2015 Nelly Mhlangu Middelkraal Community	There is no municipality at Middelkraal.	Your comment is noted.	Not applicable
Landowners or lawful occupiers	22 November 2015 Abram	Give skills to those who are unskilled. This is our request, to provide skills to especially the young people.	The communities should compile a list of available skills. Communities should prepare themselves for	Not applicable

Interested and Affected Parties	Date Comments Received	Issues raised	EAPs response to issues as mandated by the applicant	Reference in EIA/EMP
on adjacent properties	Middelkraal Community		employment opportunities which may arise and services to provide to the project.	
Landowners or lawful occupiers on adjacent properties	22 November 2015 Wanda Nthuli Middelkraal Community	Is the mining company only going to hire contractors or will they employ people themselves?	The Elders Colliery will redeploy employees from Goedehoop Colliery, therefore most of the employees will be from Goedehoop Colliery.	Not applicable.
Landowners or lawful occupiers on adjacent properties	22 November 2015 David Mahlangu Middelkraal Community	We request that you skill our young people and give them training.	The communities should compile a list of available skills. Communities should prepare themselves for employment opportunities and services to provide to the project.	Not applicable
		We need guarantees that our people with skills and training will have jobs. If someone has trained himself, it needs to be guaranteed that he will be employed.		
Landowners or lawful occupiers on adjacent properties	22 November 2015 Letta Mtetwa Middelkraal Community	We have no municipality and therefore no councillor. How will we know of opportunities? Will that count against us?	No, this will not count against you. Jobs will be advertised and do not go through the ward councillor. The communities should compile a list of available skills. Communities should prepare themselves for employment opportunities and services to provide to the project.	Not applicable
Landowners or lawful occupiers on adjacent properties	22 November 2015 Simon Mokoena Middelkraal Community	I worked for AOL from 1981. It is a good company. I must warn you though, they require that all employees have at least matric. Therefore I urge you all to obtain at least a gr. 12 education.	Comment noted, thank you.	Not applicable
		Will there be dust suppression?	There will be dust suppression at transfer stations, crusher house on the conveyor belt and on gravel roads around the shaft complex.	Table 8, 9 Appendix 7-5
Landowners or lawful occupiers on adjacent properties	22 November 2015 Nomvula Skosana Middelkraal Community	There should be signage boards indicating the entrance to the Middelkraal Community.	The Middelkraal community was relocated by Glencore mine to whom such requests should be made.	Not applicable
Municipal councillor	17 August 2015 Mahlathini Community Meeting Steve Tshwete Local Municipality	With regards to IDs, the ward councillor acknowledges that this is a Home Affairs issue which he should facilitate - Community members are to consolidate a list of all members with/ without documents and the ward councillor will assist with this.	Not related to the Elders project but referred to Ward Councillor Nyambi to address the issue with the community.	Not applicable
		The Ward Councillor encourages communities to work together. As the conveyor belt will be directed between two municipal boundaries, the councillor believes in shared	Noted	Not applicable

Interested and Affected Parties	Date Comments Received	Issues raised	EAPs response to issues as mandated by the applicant	Reference in EIA/EMP
	Ward 4 Councillor Edward Nyambi	opportunities with other communities and will communicate with neighbouring farms accordingly.		
		With regards to employment/ unemployment, the councillor and his ward committee will gather information from community members to assess the skills available within the community.	Noted	Not applicable
		Mahlathini proposed that the community, together with the municipality and mine, can consider the option of identifying land and develop settlement options for a Mahlathini community settlement. The settlement land that the Municipality can develop and install basic services	Noted and Councillor. advised to refer the proposal to mine community engagement forum and relevant departments within the Municipality	Not applicable
		Mahlathini will work together with the municipality and mine to identify land and develop settlement options for a Mahlathini community settlement. The settlement land can also be used to develop basic services through the municipality.	To be addressed in the mine forum as it is not related to the Elders Colliery project.	Not applicable
Municipality	20 June 2012 Wisdom Mpofu Gert Sibande District Municipality	A letter of consent from the landowner must accompany the application for the water use licence and surface rights.	The Department of Water and Sanitation requires that completed and signed DW902 forms (details of property owners) be submitted as part of the water use licence. Land owners are shown in Figure 1.	To be included in the WULA
Municipality	25 June 2013 Ignatius Matebula Gert Sibande District Municipality	Past experience has shown that many mines do not comply with rehabilitation regulations. AOL has to indicate clearly how rehabilitation measure will comply with regulations.	A rehabilitation and closure plan was compiled as part to the impact assessment phase. This report is included in the EIA/EMP.	Appendix 7-10
Municipality	25 June 2013 Ignatius Matebula Gert Sibande District Municipality	It is important that a study of the cumulative impacts of all the mines in the area be undertaken?	Current baseline conditions have been assessed by all specialists, which include current impact of adjacent mines to the Elders Colliery. The impact assessment has taken the baseline conditions into consideration when modelling potential impacts.	Table 8 and Table 9
Municipality	20 June 2012 Wisdom Mpofu Gert Sibande District Municipality	We are deeply concerned about the impact of the proposed mining activities on the Gert Sibande District Municipality. How will these impacts be managed?	As part of the impact assessment phase, an impact assessment was undertaken, and an environmental management programme was developed which includes mitigation measures to avoid and minimise impacts and enhance positive impacts.	Table 8, Table 9 and Table 10
Municipality	25 June 2013 Ignatius Matebula	Are there studies undertaken in the area where the conveyor belt will be located and have any applications been submitted to the local municipality? Please contact the Land use	The conveyor route has been included in all the specialist studies undertaken for the EIA/EMP.	Appendix 7

Interested and Affected Parties	Date Comments Received	Issues raised	EAPs response to issues as mandated by the applicant	Reference in EIA/EMP
	Gert Sibande District Municipality	Department (Mr Nic Van der Merwe) regarding the application.	In addition, rezoning applications will be submitted for all surface infrastructures, which includes the conveyor route and boxcut.	
Municipality	20 June 2012 Wisdom Mpofu Gert Sibande District Municipality	The SDF aspects of the area need to be considered in the project. The municipal boundaries that the project falls in need to be confirmed to ensure that the correct authority authorises the project in terms of land use and zoning applications. The SDF of the Gert Sibande District Municipality and Govan Mbeki Local Municipality is up to date, and is reviewed annually.	The municipal areas within which the project and the associated conveyor belt fall have been identified. The project will include rezoning which will take the SDF into consideration.	Part A Section 3 (b)
Municipality	20 June 2012 Wisdom Mpofu Gert Sibande District Municipality	The applicant should apply for rezoning because of the change in land use, depending on the current land zoning for the project area. This application should take current land use into consideration.	Rezoning applications will be submitted for all surface infrastructures, which includes the conveyor route and boxcut.	Part A Section 3 (e)
Organs of state (Responsible for Infrastructure that may be affected Roads Department, Eskom, Telkom, DWA	3 April 2013 Pinky Monyela DWS	A comprehensive wetland specialist study is requested in which all wetlands are delineated and the Present Ecological State (PES) and Recommended Ecological Class (REC) for each wetland is indicated.	A wetland delineation study was undertaken as part of the impact assessment phase and is included in the EIA/EMP.	Appendix 7-11 Figure 7
DWS	3 April 2013 Pinky Monyela DWS	A geochemical impact prediction should be included in the water use licence application.	A geochemical analysis was undertaken as part of the Groundwater study. This is included in the EIA/EMP and will be included with the WULA.	Appendix 7-4 Part B Section 1 (d)
		Please provide clarity on the uses of discharged water.	Dirty water (discharge water) will be treated in a water treatment plant to suitable standards. Excess water will then be discharged back into the water resource. The sewage treatment plant will be designed to ensure that water discharged into the system will be according to accepted standards. Water uses associated with discharge is included in the WULA	Table 9 Table 15
		It must be reflected in the water balance that storage of water will take place in the underground workings and therefore minimises the need for surface water.	A water balance was undertaken, which took into consideration the storage of water underground. This was undertaken as part of the surface water study and is included in the EIA/EMP.	Appendix 7-3 Figure 23

Interested and Affected Parties	Date Comments Received	Issues raised	EAPs response to issues as mandated by the applicant	Reference in EIA/EMP
		The interaction between groundwater and surface water needs to be understood.	The wetland reserve determination has taken into consideration the groundwater and surface water interaction. These potential impacts have been assessed and are included in the EIA/EMP. The study indicated that there is an interaction between the wetland and groundwater table within the weathered zone. It is expected that the underground mining activities will take place below this weathered zone, and it is therefore unlikely that the mining activities will influence this interaction.	Appendix 7-11 Table 9
		What is the current land use at Elders Colliery?	The current land use is mainly agriculture.	Figure 11
		Who owns the land on which Elders Colliery is located on?	All land on which is surface infrastructure will be developed is owned by AOL. Some areas where underground mining will take place are owned by private landowners.	Figure 1
		The water use licence application must contain details of the water management measures for the post closure phase of the project.	The closure plan for the mine will contain a water management plan for during post closure as part of technical information for IWULA. Impacts and management measures for the closure phase is included in the EIA/EMP.	Table 10
Communities	17 August 2015 Mahlathini Community Meeting Michael Thuhloane	The Mahlathini community would like to thank Goedehoop Colliery for the supply of water to the community.	Thank you for your comment.	Not applicable
Communities		The perception from the community is that people from other communities and other towns are getting jobs and Mahlathini feels left behind as they are not receiving opportunities. The Mahlathini community hope and believe that they will be considered for opportunities provided by Goedehoop Colliery.	In order to be employed by a mine, skills are important and legislation stipulates that a specific level of training is required in order to work for a mine. AOL are unable to guarantee jobs to the Mahlathini community, however will liaise with the Ward Councillor and his ward committee to understand the skills set of community members for when there are potential job opportunities in the future.	Not applicable to Elders Colliery
Communities		When will -the projects start?	The Elders Colliery plans to start with construction during the third quarter of 2016. The construction phase will last for approximately two years. The first coal is expected towards the end of 2018.	Not applicable
Communities	17 August 2015 Mahlathini	Is the training for the underground mine machinery taught at home or would you need to train at the mine? Because when	Training depends on the skills set required to use the machinery. AOL will take Mahlathini, and other	Not applicable

Interested and Affected Parties	Date Comments Received	Issues raised	EAPs response to issues as mandated by the applicant	Reference in EIA/EMP
	Community Meeting Xolani Pikwa	there are job opportunities at Goedehoop Colliery, the minimum requirements is that one need to have a relative working for the mine,	communities into consideration as and when job opportunities arise and if training is needed for that specific opportunity then it will be provided as employee skills and capacity building is also important to AOL. Goedehoop Colliery engages continuously with all stakeholders on challenges around unemployment and skills/capacity building possible opportunities.	
Communities	17 August 2015 Mahlathini Community Meeting Johanna Ndlovu	Mahlathini community is extremely concerned that the Goedehoop Colliery conveyor belt will be passing through a few households.	The conveyor for the Elders Colliery has been re-routed to not pass the Mahlathini community directly. The conveyor route is approximately 500 m from the community.	Appendix 4 Table 8,
Communities		Children in the Mahlathini community make use of the gravel roads, as there is a school bus route that travels on this road. In the rainy season, when the road is not useable, there is an alternative bus stop near the Goedehoop Colliery Kom Saam Saal mine property, outside the gate on the main access road. How will the new conveyor route impact the alternative bus stop near the road?	AOL conducted an investigation to determine the route of the conveyor belt in relation to roads in order determine if the alternative bus stop will be affected Based on the route of the proposed Elders conveyor belt, it was confirmed that the new conveyor route from Elders will not impact the bus route.	Not applicable
Communities	17 August 2015 Mahlathini Community Meeting Nicholas Morokong	There are a large number of community members without South African Identity Documents (IDs).	Not related to the Elders project but referred to Ward Councillor Nyambi to address the issue with the community.	Not applicable
Communities	17 August 2015 Mahlathini Community Meeting Novageli Mayifele	Some Mahlathini community members were not given the opportunity to go to school. How will the project benefit these people?	The project will adhere to the Mining Charter requirements and all CSI and SLP opportunities do not discriminate on the levels of education but are meant to cater for the broader community in development initiatives. Possible employment opportunities are on the basis of the requirements. Engagement channels will remain open in discussing unemployment challenges that exist within our zones of influence	Not applicable
Communities	17 August 2015 Mahlathini Community Meeting Simphiwe Vilikazi	The meeting was focused on Mahlathini community members only. Please will AOL consider surrounding farms for opportunities as well, as there is a need for skills and capacity building initiatives. We require skills and capacity building opportunities that will enable us to be employable with other mine houses or industries	AOL has a preferential procurement policy aimed at empowering local (SMMEs and such policy will be applicable to the project's procurement strategy In terms of Labour, employment opportunities will also depend on the skills available. Skills are important and a specific level of training is required in order to work for	Not applicable

Interested and Affected Parties	Date Comments Received	Issues raised	EAPs response to issues as mandated by the applicant	Reference in EIA/EMP
			AOL. AOL are unable to guarantee jobs to the community; however, they will look into opportunities for the community.	
Communities	20 November 2015 Mahlathini Community Vuyani Somi	There are people that are not educated and don't know what a CV is. How does AOL help people to register on Zimele Hub?	AOL encourages people to still apply for opportunities. You need to register on Zimele Hub, the hub will assist those who are in need with the compilation of the CVs. Lack of employment or education should not deter people from applying.	Not applicable
Communities	20 November 2015 Mahlathini Community Kenneth Mgwane	Why are the contractors in the mines not compliant with the gender equality requirements?	AOL have noted that contractors are not complying with Anglo Social Way requirements and have started the process of negotiating and influencing the contractors to bring in more youth, women and disabled. AOL is communicating with the existing contractors to influence them to employ more youth, woman and disabled people. All new contractors will comply with the Anglo Social BEE Contractor Management Plan.	Not applicable
		How does the mine accept or consider learnership applications? People are applying for learnerships and are not getting contacted back. There are concerns that the Mahlathini community is not being provided equal opportunities.	People from Mahlathini have been given equal opportunities for learnerships. Nine people have been shortlisted for learnership opportunities at Goedehoop Colliery.	Not applicable
Communities	20 November 2015 Mahlathini Community Thabile Magoqoza	Can Hub only help one person or group of people?	The Zimele Hub assists individuals as well as groups of people.	Not applicable
Communities	20 November 2015 Mahlathini Community Maureen Moglang	She knows the Zimele Hub Manager, not only for educated people. All sorts of opportunities available to everyone	Thank you for your comment.	Not applicable
Dept. Land Affairs	25 June 2013 Jan Venter DARDLA – Mpumalanga7	Even though mitigation measures for dust pollution are in place at many mining operations, many of these measures are not effective. What other dust prevention measures will be in place?	Impacts on air quality were assessed by the Air Quality study. Mitigations measures were suggested and included in the EIA/EMP. This includes dust suppression on roads and partial enclosure of the conveyor belt, reduced vehicle speed and dust control at transfer points.	Appendix 7-5 Table 8 and Table 9

Interested and Affected Parties	Date Comments Received	Issues raised	EAPs response to issues as mandated by the applicant	Reference in EIA/EMP
			A dust monitoring programme will be implemented thought-out all phases of the project to monitoring dust impacts.	
Dept. Land Affairs	25 June 2013 Jan Venter DARDLA - Mpumalanga	What rehabilitation measures will be used in the rehabilitation plan for the Elders Colliery? Will these measures be included in the Final EIA/EMP Report?	A closure and rehabilitation plan has been compiled as part of the impact assessment phase. The following activities will be undertaken as part of the closure phase: • Decommissioning all surface infrastructure that has no beneficial post-closure use; • Identify potential post-closure uses of the land occupied by mine infrastructure in consultation with the surrounding land owners and land users. Should a suitable use for mine infrastructure not be found, it will be removed; • Rehabilitate disturbed land to a state that is suitable for its post-closure uses; • Rehabilitate disturbed land to a state that facilitates compliance with applicable environmental quality objectives (air quality objectives and water quality guidelines); • Reduce the visual impact of the site through rehabilitation of all disturbed land and residue deposits; • Rehabilitation that results in landforms that emulate the surroundings and would facilitate drainage; • Rehabilitate all disturbed land to a state where post-closure management is minimised;	Part B Section 1 (f)
Dept. Land Affairs	25 June 2013 Jan Venter DARDLA - Mpumalanga	What are the Pillar sizes that will be used in the underground mining operation and what are the safety factors associated with the underground operation?	A geotechnical assessment has been undertaken to determine the pillar sizes for the underground bord and pillar operations. The details of the safety factors will also be included in the water use licence application for the undermining of delineated wetlands, to be submitted to the Department of Water Affairs for approval.)	Addressed in WULA
Dept. Land Affairs	25 June 2013 Jan Venter	How will increased traffic impact on the road surface of the R35 be assessed?	A traffic impact assessment was undertaken in 2012/2013 which identified that the additional of construction vehicles to the existing road network will not have significant impact on current traffic volumes.	Part A Section 3 (g) (iv)

Interested and Affected Parties	Date Comments Received	Issues raised	EAPs response to issues as mandated by the applicant	Reference in EIA/EMP
	DARDLA - Mpumalanga		During the operational phase, coal will be transported via a conveyor belt, therefore there will no impact on the current traffic volumes	
Traditional Leaders				
Dept. Environmental Affairs	21 August 2012 Musa Mandlane MDEDET	Which specialist studies will be conducted during the EIA for the proposed Elders Colliery?	A list of specialist studies undertaken as part of the impact assessment phase is included in the EIA/EMP.	Table 11
Dept. Environmental Affairs	21 August 2012 Musa Mandlane MDEDET	In which District Municipality is the majority of the proposed project activities located?	The majority of listed activities for the proposed project are located in the Gert Sibande District Municipality.	Part A Section 3 (b)
Other Competent Authorities affected	24 August 2012 F Murunga DMR	Will the existing EMP for Goedehoop Colliery be amended to include Elders Colliery, or will there be a stand-alone EMP for the proposed Elders Colliery?	A stand-alone EIA/EMP has been prepared for Elders Colliery according requirements of NEMA.	This report
		Is it the intention to submit a prospecting or mining rights application to the Department of Mineral Resources (DMR)?	The mining right application was submitted on 16 July 2015. The DMR reference number is MP 30/5/1/2/2 (10117) MR.	Not applicable
	20 October 2015 MC Mutengwe DMR	Proof of correspondence with the various stakeholders must be included in the EIAR.	A stakeholder engagement process is being followed for the Elders Colliery environmental authorisation process. Proof of correspondence with stakeholders is included in this report.	Appendix 6
		Should a Water Use Licence be required, proof of application for a license needs to be submitted.	A water use license application was made available for public review (28 October – 26 November 2015). The water use licence application was submitted to the DWS on 4 December 2015.	Not applicable
		Provide a detailed explanation on the management of traffic during the contraction phase of the road.	Three temporary construction access roads to the Elders site off the R35 will be required. Heavy and light motor vehicles will be separated. The intention is to install traffic calming infrastructure (temporary traffic bumps) during the duration of construction. All construction works will be fenced off to prevent interaction with public as the intention is for limited crossing of the R35 during construction operations. If any heavy machinery is required to cross the R35, proper safety measures which include flag men will be	Table 4

Interested and Affected Parties	Date Comments Received	Issues raised	EAPs response to issues as mandated by the applicant	Reference in EIA/EMP
			in place. Blasting activities to occur only during daylight hours. There will also be a new intersection constructed off the R35 opposite the Sudor access road for the operational phase. A detailed traffic management plan for the construction phase will be compiled and implemented by the contractor.	
		Please ensure that the EIAR includes the A3 size locality maps of the area and illustrates the exact location of the proposed development.	A3 maps have been included as part of this EIA/EMP.	Appendix 3
		Should an application for Environmental Authorisation be subjected for any permits or authorisation in terms of the provisions of any Specific Environmental Managements Acts (SEMAs), proof of such application will be required.	A waste licence is required, but the application was included with the environmental authorisation application. No other requirements have been identified.	Not applicable
Mpumalanga Tourism and Parks Agency (MTPA)	7 October 2015 Dr MC Lotter MTPA	The Freshwater assessment as determined in the Mpumalanga Biodiversity Sector Plan (MBSP) indicates that the proposed mine will undermine large portions of an Ecological Support Area: Wetland area that supports and feeds cleaner water into the upper Olifants River. The effect of the dewatering on this wetland during the underground mining process and the costs to provide a constant supply of clean water into this wetland system, needs to be considered and addressed in the studies that will be conducted.	A wetland study was undertaken as part of the impact assessment phase. Impacts identified have been included in this EIA/EMP and mitigation and management measures to avoid and reduce these impacts have been included in the EIA/EMP. The majority of wetlands on site, specifically the hillslope seepage wetlands, are however predominantly maintained by shallow perched water tables and the shallow weathered aquifer that are generally separate from deeper groundwater and are thus considered unlikely to be affected by the dewatering. As the bord and pillar underground mining will take place below the weathered zone, it is unlikely that the underground mining will impact on groundwater flow into the wetland.	Appendix 7-11 Table 8, Table 9 and Table 10 Part A Section 3 (g) (iv) Figure 7
MTPA	7 October 2015 Dr MC Lotter MTPA	The accumulative impacts of AMD from the proposed underground mine and the nearby existing mines should be quantified. Liability for water purification and rehabilitation must be determined.	Current baseline conditions have taken into consideration existing mining facilities in the immediate vicinity of the proposed Elders Colliery and are reflected in the quality and quantity of surface and groundwater monitoring results.	Appendix 7-4 Part B Section 1 (d) (iii) Table 10 Appendix 9

Interested and Affected Parties	Date Comments Received	Issues raised	EAPs response to issues as mandated by the applicant	Reference in EIA/EMP
			The groundwater study indicated that the current groundwater is of good quality. AMD potential for the Elders Colliery was assessed as part of the groundwater study and is included in the EIA/EMP. The potential for AMD formation in the underground workings is highly probable. However, the potential for this AMD to decant onto surface, or to migrate laterally from the mine workings as groundwater seepage and to eventually contaminate water resources in the catchment, was assessed to be manageable to a medium consequence with a low significance. This will be managed by: • Optimising storage of mine water in mined out underground sections; • Monitoring of water levels • Water levels in the workings will be actively managed to ensure it remains below the decant elevation • A detailed decant management plan will be developed at mine closure. Ultimately water treatment solutions, either passive or active, will be implemented. The liability for water purification was quantified and is available in Appendix 9.	
MTPA	7 October 2015 Dr MC Lotter MTPA	The current or present ecological status of the wetland system needs to be determined.	This was undertaken as part of the wetland study.	Appendix 7-11 Figure 8
MTPA	7 October 2015 Dr MC Lotter MTPA	The Olifants River's health status with regards to 4 different SASS 5 monitoring readings together with the current chemical analyses with focus on the pH and heavy metals present should be provided.	Results of chemical analysis are provided in the surface water study. The results of the SASS5 monitoring is included in the EIA/EMP.	Appendix 7-3 Part 1 Section 3 (g) (iv)
MTPA	7 October 2015 Dr MC Lotter MTPA	The decanting points must be determined and also the mitigating actions to prevent dirty water and AMD to reach the river.	The decanting points were identified as part of the groundwater study. All mitigation measures are included in the EIA/EMP.	Figure 22 Table 10

Interested and Affected Parties	Date Comments Received	Issues raised	EAPs response to issues as mandated by the applicant	Reference in EIA/EMP
MTPA	7 October 2015 Dr MC Lotter MTPA	A cost benefit analysis is needed, taking into account the costs to purify the water for the next 100 years.	A closure cost for the water liability at Elders Colliery was undertaken by AOL.	Appendix 9
MTPA	7 October 2015 Dr MC Lotter MTPA	The mine management plan with regards to discard dumps, coal stockpiles, washing plants, incline shafts and roads must be planned outside the 100 meter buffer of any wetland on site.	The Elders Colliery will not have any discard dumps, coal run of mine stockpiles or washing plants. Use will be made of Goedehoop Colliery's existing facilities. The overburden stockpile has been placed outside of any delineated wetlands and floodlines. The No. 2 and No. 4 coal seems will be removed during the construction of the boxcut and taken to the Goedehoop Colliery. Due to the location of the No. 2 and No. 4 and required access to these seams, the boxcut and other associated infrastructure is partially located within a hillslope seepage wetland. The PES of this wetland has been rated as C – moderately modified due to agricultural activities. This impact is unavoidable, however, management measures have been included in the EIA/EMP to minimise these impacts. The mining method is underground mining and therefore limited surface infrastructure is required.	Appendix 8 Table 8 and Table 9 Figure 8
<u>OTHER AFFECTED PARTIES</u>	24 June 2013 Alexander Adams Sudor Coal	Will mining activities at Elders Colliery affect the Olifants River?	A surface water study was undertaken as part of the impact assessment phase. This included potential impact of the Elders Colliery on the Olifants River. These impacts and management measures have been included in the EIA/EMP. Potential impact on the Olifants River is expected to be low if all mitigations measures are implemented.	Appendix 7-3 Table 8 and Table 9
	24 June 2013 Alexander Adams Sudor Coal	Is the AOL coal resource in the north of the Elders Prospecting Right Area included in the project boundary?	The extent of the proposed underground mining area of the Elders Resources is included in the EIA/EMP. The mining right area applied for on the 16th of July2015 is included in the EIA/EMP	Appendix 4
	1 March 2013 Tshilikzi Masalela Transnet	The development must not have a direct or indirect impact on the existing rail line and its foundation.	Due to the distance of the railway line to Elders Colliery boxcut and associated conveyor belt, it is highly unlikely that the project will impact on any railway lines.	Part A Section 3 (c)

Interested and Affected Parties	Date Comments Received	Issues raised	EAPs response to issues as mandated by the applicant	Reference in EIA/EMP
	11 August 2015, Tshifhiwa Ludere, Eskom	The environmental authorisation process for the proposed Elders Colliery affects existing Eskom Distribution lines, Komati Rural Tee-Komati 3 11kV, Export-Doornsfontein 22kV and Kudu-Doornsfontein 88 kV. Eskom distribution has no objection to the proposed development in portion 4&9 of the farm Goedehoop 46 IS, provided Eskom's rights and services are acknowledged and respected at all times. Please see attached the full letter from Eskom with conditions that they request must be adhered to and accepted in writing before any development and or construction. (Full letter and annexures included as **Appendix 6-11**).	Noted. AOL have been communicating with Eskom regarding the proposed Elders Colliery project and will adhere to conditions as per correspondence with Eskom.	Appendix 6-11
INTERESTED PARTIES	24 June 2013 Mainah Medupi	Will the conveyor cross over the R35, and will this road be used during construction?	The conveyor route will cross over the R35. The R35 will be utilised during the construction phase to deliver material to the proposed boxcut area. During blasting activities, the R35 will be temporarily closed.	Table 8
	24 June 2013 Mainah Medupi	Has construction activities commenced in the project area and when will procurement for the construction start?	No construction will commence prior to the approval of all the relevant environmental authorisation processes. It is currently proposed that construction will commence in 2016. It has not been confirmed when procurement will take place. Procurement procedures will be communicated to tender contractors well before construction commences.	Not applicable
	24 June 2013 Anton	Will blasting activities take place close to the R35, and if so, will the R35 be closed during this time?	The impacts of blasting on the R35 were assessed during the impact assessment phase as part of the blasting study. This study is included in the EIA/EMP. Management measures for blasting are included in the EIA/EMP. During blasting activities, the R35 will be temporarily closed.	Appendix 7-8 Table 8
	20 November 2015 Kwaba Trading and Projects- representative from businesses in area	When the project starts, AOL must consider small businesses during construction. Often they observe people from Witbank getting contracts and they want to be considered	Special considerations will be given to businesses in the vicinity around the Project Area and the Anglo American Procurement Process will be followed. Businesses with the necessary qualifications, skills and documentation will be considered. Zimele Hub assists local SMMEs in Middleburg, Witbank, Standerton etc.	Not applicable

Interested and Affected Parties	Date Comments Received	Issues raised	EAPs response to issues as mandated by the applicant	Reference in EIA/EMP
			Closest Hubs are approximately 50 km from AOL. The Zimele Hub assists community members and businesses with obtaining vendor numbers and certificates.	

iv) The Environmental attributes associated with the development footprint alternatives.(The environmental attributed described must include socio-economic, social, heritage, cultural, geographical, physical and biological aspects)

(1) Baseline Environment

(a) Type of environment affected by the proposed activity.

(its current geographical, physical, biological, socio- economic, and cultural character).

Topography

The general topography is characterised by gently rolling terrain with no steep inclines. The altitudes vary between 1520 metres above mean sea level (mamsl) and ~1660 mamsl over the proposed mining area.

Climate

The proposed Elders Colliery Project is located where the climate is warm to hot in the summer with an average daily high of approximately 27˚C. Winters are mild to cold with an average daily maximum of approximately 15˚C. Frost and mist are frequently experienced during the winter months on the Mpumalanga Highveld.

The majority of precipitation is experienced in summer months, mostly in the form of afternoon thundershowers. Mean annual precipitation (MAP) is 707 mm, with 85% of the annual rainfall occurring between October and March. Mean annual evaporation (MAE) in the region is approximately 1600 mm.

The wind field is predominantly characterised by winds from the eastern and north-western quadrants. The wind speed is generally moderate; 68% less than 8 m/s although peak wind speeds greater than 10n m/s have been recorded (~3.4%) (Airshed, 2015).

Geology

The geology of the area consists primarily of sandstone, shale and coal beds of the Vryheid formation, the Elders Colliery coal resource falls within the Highveld Coalfield, comprising sediments of the Dwyka Formation and the coal-bearing Ecca Group of the Karoo Sequence that were deposited on an undulating pre-Karoo surface. The five coal seams of the Ecca Group (numbered from the base upwards), namely the No. 1 to No. 5 coal seams are all present in the northern and western parts of the coalfield. The two lower coal seams are absent over the eastern and southern parts of the Highveld coalfield (JMA, 2015).

Soils

The soils mapped range from shallow sub-outcrop and outcrop of hard plinthite and parent materials (sediments and intrusive dolerite) to moderately deep sandy loams and sandy clay loams, all of which are associated with either a rocky outcrop of sedimentary parent rock, or ferricrete/laterite “C” horizon at differing depths. The saprolitic horizons are generally quite thin, with soil occurring on hard bedrock in most instances mapped.

The growth potential and the ability of these soils to return a cropping yield equal to or better than the national average, post mining is lacking. This is due mainly to the poor rainfall. The majority of the study area is classified as low intensity grazing land or wilderness status A significant but relatively small proportion of the study area classifies as having wet based soils. However it is important to note that a significantly large area of the open pit and infrastructure development being planned encroaches on soils with a wet base. These zones are considered very important, highly sensitive and vulnerable due to their ability to contain and hold water for periods through the summer and into the dry winter seasons.

Biodiversity

The Elders Colliery is located within the grassland biome of South Africa. The grassland biome is one of the most threatened biomes in South Africa, due to agricultural and mining activities. According to the latest national vegetation study of South Africa (Mucina & Rutherford 2006) the proposed Elders Colliery area is located within the Eastern Highveld Grassland. This regional vegetation unit is considered to be Endangered.

The Eastern Highveld Grassland is associated with slightly to moderately undulating plains, including some low hills and pan depressions. The vegetation is short dense grassland, dominated by the usual Highveld grass composition (*Aristida*, *Digitaria*, *Eragrostis*, *Themeda*, *Tristachya* etc.) with small, scattered rocky outcrops with wiry, sour grasses and some woody species (*Acacia caffra*, *Celtis africana*, *Diospyros lycioides* subsp *lycioides*, *Parinari capensis*, *Protea caffra*, *P. welwitschii* and *Rhus magalismontanum*).

The Eastern Highveld Grassland is endangered, with a 24% conservation target. Only a very small fraction is conserved in statutory reserves (Nooitgedacht Dam and Jericho am Nature Reserves) and in private reserves (Holkranse, Kransbank, Morgenstond). Some 44% is transformed primarily by cultivation, plantations, mines, urbanisation and by building of dams. Cultivation may have had a more extensive impact, indicated by land cover data. No serious alien invasions are reported, but *Acacia mearnsii* can become dominant in disturbed sites. Erosion is very low (EkoInfo, 2015).

The extent of cultivated land within the regional area of influence supports the statement with regards to its impact on the vegetation. Cultivation covers 46% of the regional area of influence with 48% of the area being transformed.

In similar studies to the north west of the project area, it was found that soil texture, soil moisture and human influence determine the distribution of communities and/ or variations within this vegetation unit (de Frey 2002a, de Frey 2002b). While in phytosociological studies to the south west in the Moist Clay Highveld regional vegetation unit, it was found that soil texture, altitude and human influence determine the distribution of plant communities (de Frey 2002c).

Therefore, soil texture seems to be a key factor influencing vegetation distribution, followed by either altitude or soil moisture content, which is reflected in human influences such as over utilisation and poor land use planning.

Surface Water

The site is located within Catchment Management Unit 8 (CMU 8). Much of the underground mining area underlies the Vlakkuilen and Viskuile Rivers and their floodplains. The mining area drains into Vlakkuilen and Viskuile River. These streams are tributaries of the Olifants River, which flows through the northern portion of the mine boundary. The Olifants River flows into the Witbank Dam, which in turn flows into the Loskop Dam. From the Loskop Dam, the Olifants River flows through Mpumalanga and the central part of the Kruger National Park to Mozambique.

Groundwater

The regional geohydrological attributes of the Elders Colliery is a function of the geological formation distribution. Although dominated by the Ecca Group, there are three distinctly separate stratigraphic sequences within the study area, each with their own geohydrological manifestations. These are:

- Arenaceous rocks of the Ecca Group which occur extensively across the Elders proposed mining right area,
- Mafic intrusive (dolerite) igneous rocks of the Lebombo Group which occur in the south western regions of the Elders proposed mining right area; and
- Rhyolite extrusive rocks of the Rooiberg Group which occur in the upper (i.e. northern) regions of the Elders proposed mining right (JMA, 2015).

The groundwater within the study area primarily occurs within the weathered zone or in joints and fractures of the competent arenaceous rocks, related to tensional or compressional stresses and offloading. Groundwater also occurs along sedimentary – sedimentary, or sedimentary – igneous rock, contacts.

Localised large water bearing fractures generally occur along the sedimentary – igneous contact zones related to the heating and cooling of the arenaceous host rock caused by the intrusion of dolerite dykes and sills as well (JMA, 2015)

The borehole yielding potential within the study area is classified as d2, which implies an expected average yield of between 0.1 l/s and 0.5 l/s from within the weathered (intergranular) and fractured aquifers. The groundwater potential for the area is given as between 40% and 60%, which indicates the probability of drilling a successful borehole (yield >0.1 l/s). The probability of obtaining a yield in excess of 2 l/s is low with a probability of between only 10% and 20% (JMA, 2015)

Wetlands

Extensive wetland areas totalling more than 2 647 hectares in extent were identified and delineated within the study area. The wetlands cover roughly 46 % of the mining right area and include different hydro-geomorphic wetland types such as:

- Floodplain wetlands;
- Channelled valley bottom wetlands;
- Channel wetlands;
- Unchannelled valley bottom wetlands;
- Pan wetlands; and
- Hillslope seepage wetlands (Footslope and Valleyhead seepage wetlands).

In addition to the natural wetlands systems, a number of artificial wetlands such as dams and quarries are also within the project area (WCS, 2015).

Hillslope seepage wetlands make up more than 60% of the wetland area on site and covering over 28% of the surface area. In addition to the extensive hillslope seepage wetlands a number of large floodplain and valley bottom wetlands occur on site. These wetland systems are associated with the following rivers:

- Olifants River – floodplain wetland;
- Viskuile – channelled valley bottom and floodplain wetland;
- Joubertsvleispruit – channelled valley bottom wetland; and
- Vlakkuilenspruit – floodplain wetland and unchannelled valley bottom wetland.

Six pan wetlands are located within the study area, with a further nine pans falling in close proximity to the study area boundary. The largest of these pans, is located on the farm Vlakkuilen. Both saline and freshwater pans occur on site and vary between being seasonal or permanent.

Most of the wetlands are considered to be moderately modified, according to the Present Ecological Statues Assessment (PES category C) as a result of degradation due to agricultural activities adjacent to the wetlands and within the wetlands' catchments. Extensive areas of hillslope seepage wetland have been cultivated and are considered largely modified (PES category D).

The Vlakkuilen/Viskuile floodplain wetland is considered one of the most important wetlands within the Upper Olifants River Catchment (UORC). This is due to the fact that it is one of the largest wetlands still largely intact within the UORC, it is a reference wetland system for floodplain type wetlands in UORC which are considered to be critically endangered and the wetland system is of high biodiversity value with a number of protected species.

The Vlakkuilen/Viskuile floodplain wetlands are considered to be of Very High ecological importance and sensitivity, while the Olifants River floodplain is considered to be of High ecological importance and sensitivity. The majority of hillslope seepage wetlands are considered to be of Moderate to Low/Marginal ecological importance and sensitivity.

Refer to Figure 3 indicating the delineated wetlands in the area.

The upper reach of the Viskuile system has been classified as a wetland Freshwater Ecosystem Priority Area (FEPA), which extends into the project area. However this wetland falls outside the proposed underground mining area.

Figure 6: Elders Colliery in relation to the Mpumalanga C-Plan

Figure 7: Delineated wetlands for the Elders Colliery project

Figure 8: PES classification of wetlands for the Elders Colliery project

Figure 9: EIS classification of wetlands for the Elders Colliery

Aquatics

Aquatic Macroinvertebrates

Aquatic macroinvertebrates are potentially useful indicators of long-term changes in the Olifants River, but the naturally seasonal nature of the river within the Study Area limits the use of the SASS5 biomonitoring method to the wet season only. Sensitive aquatic macroinvertebrate taxa recorded in the Olifants River within the Study Area included leptophlebiid mayflies, freshwater shrimps (Atyidae), lestid dragonflies and ecnomid caddisflies. Freshwater shrimps are potentially useful indicators for monitoring conditions downstream of the proposed mine because they are common in the area and are sensitive to water quality deterioration. Aquatic macroinvertebrates are of limited use for monitoring changes in the wetland systems within the Study Area because of the hardy nature of the taxa and the seasonal nature of these systems.

Fish

The diversity and abundance of fish was highly variable, both spatially and over time, and this reflects the seasonal nature of the aquatic ecosystems within the Study Area. Fish are likely to migrate into the floodplain wetlands during wet periods, although migration is restricted by a number of weirs that create formidable barriers to upstream migration for most of the time, except during large floods. Deep, permanent pools along the Olifants River and lower Viskuile provide important refuge areas for fish during dry periods.

Air Quality

The area is dominated by strong winds from the east and north-west, with moderate winds from most of the north- eastern and south-western sectors. An average wind speed of 3.8 m/s was recorded over the 2011 to 2013 period.

Ambient air pollutant levels in the proposed project area are currently affected by the following sources of emission; mining; vehicles tail-pipe emissions; power generation; domestic fuel combustion and open areas exposed to wind erosion.

Sensitive receptors around the Elders Colliery boundary include Middelkraal and Vlakkuilen Communities, Egdaar, Schurvkop, Hirsaw estates, Elandsfontein, and Halfgewonnen (Airshed, 2015).

Noise

The current ambient noise levels in the Elders Colliery Project area are dominated by noise emissions from road traffic on the R35. This is particularly disturbing for the settlement north of the proposed Elders Colliery and a farmstead located south-west of the Colliery. Surrounding mines in the area also contribute to the current ambient noise levels, however much less than previously, as many mines have since closed down.

At the settlement, the current ambient noise levels range from approximately 45 dBA and 55 dBA during day-time and between 40 dBA and 50 dBA during night-time. The day-time noise levels fall within the SANS 10103 levels for urban districts and World Health Organisation (WHO) recommendations for residential areas. However, current ambient night-time noise levels of 50 dBA exceed SANS 10103 and WHO by 5 dBA, largely due to the close proximity of the settlement to the R35 and the road traffic emissions.

At the farmstead, the current ambient noise levels range from 45 dBA during day-time and between 35 dBA and 40 dBA during night-time. These measurements fall within WHO recommended limits of 55 dBA for day-time and 45 dBA night-time, as well as fall within the SANS 10103 guidelines of 45 dBA day-time and 35 dBA night-time noise levels (FMAC, 2015).

Traffic

The road network surrounding the Elders Colliery area enables excellent access to the site as they are all regional roads and connect to all surrounding major towns. The roads are in good condition and are all asphalt surfaced roads which are managed by the National Department of Transport.

Traffic flows on the immediate surrounding road network were observed to be low and no extensive traffic counting was deemed necessary. The Elders Colliery area and surrounding sites are currently not developed and do not generate any traffic.

Road safety conditions on the roads surrounding the site were assessed using observations as there was no accident data available to validate any conclusions from what was observed on these roads (Aurecon, 2014).

Heritage

A heritage assessment for the Elders boxcut area and conveyor route between Elders Colliery and Block 20 was undertaken by Johnny van Schalkwyk during 2012 and again in 2015. According to the study, no site, features or objects of cultural significance are known to exist in the study area, therefore there would be no impact on heritage resources as a result of the proposed boxcut and new conveyor belt development.

An additional heritage assessment was undertaken by Archaetnos Culture and Cultural Resource Consultants in 2015. This heritage assessment was undertaken for AOL's proposed Hope 4 seam mining project. Areas investigated in this assessment overlap with the upgrade of the existing conveyor belt and construction of a new conveyor section to Goedehoop Colliery – which forms part of the Elders Colliery project. Two heritage sites were identified in this study. These sites are described below and are shown in Figure 10.

Old building at demolished New Town Village

This site is located on portion 9 of the farm Goedehoop 46 IS, approximately 800 m south of the R542 tar road, on the eastern side of the demolished Newtown Village of Goedehoop South Colliery.

GPS coordinates: 26° 06' 54.8''S, 29°24' 40.9''E

This is a building used that was formerly used as a church at the demolished New Town Village. It is in a reasonably good condition and may be older than 60 years of age. It has low significance. The field rating given for the site is General protection C. It means that the heritage report compiled by Archaetnos is seen as ample documentation and mitigation of the site, and that the building may be demolished if necessary (Archaetnos, 2015).

Graveyard

The graveyard identified is located on portion 9 of the farm Goedehoop 46 IS, approximately 1.5 km south of the R 542 tar road.

GPS coordinates: 26°07'20.1''S, 29°24'37.3''E

There seem to be approximately six graves. An official from the mine indicated that there may be 16. However, no sign of more graves were visible during the site visit. One has a brick border and cement headstone. The other graves are stone packed without headstones. No surname or date of death was legible. Graves are always regarded as having a high cultural significance. The field rating is Local Grade IIIB. It should be included in the heritage register and mitigation measures must be implemented if any mining related activities take place in its vicinity (Archaetnos, 2015).

Figure 10: Heritage sites identified at the Elders Colliery

Social

The Elders Colliery falls under the Govan Mbeki Local Municipality (GMLM) within Gert Sibande District Municipality (GSDM) in Mpumalanga Province. The GMLM is characterised by high population growth rates as a result of migration of people from other provinces due to mining activities within the Municipality. As the population continues to grow, minimal health facilities and poor access to such facilities remain a growing cause for concern for the area. Delivery of services such as water, sanitation and refuse removal is also relatively poor.

Unemployment in the GMLM is very high, as a majority of households are dependent on government grants, particularly pension, disability and child support grants. Levels of education and skills in the area are also very poor, which is attributed to high levels of poverty, unemployment, and the remoteness of some of the rural schools.

There are several towns and communities within close proximity to the proposed development, which includes:

- Kriel/ Thubelihle (12 km west);
- Bethal/ Emzinoni (20 km south);
- Hendrina (30 km north west);
- Middelburg (47 km north); amd
- Emalahleni (55 km north west).

Some of these towns fall within the Zone of Influence (ZoI) of the proposed Elders Project. The ZoI is the area within which a project has impacts or influence, these impacts can be either direct physical impacts or induced or interactive impacts.

The primary ZoI of the proposed Elders Colliery includes the 'footprints' of and areas immediately adjacent to the primary and service infrastructure of the mine. This includes the Vlakkuilen, Middelkraal and Mahlathini Communities.

The Vlakkuilen community is predominantly located on the southern portion of the Hirsaw Estate; two households are detached from the main community and reside on the northern side of the estate. The Hirsaw Estate is located along the R35 national road between Bethal and the Goedehoop Colliery. The Vlakkuilen Community is a rural community with a total population of 127 people living in 23 households.

The Middelkraal Community is made up of 18 households located on the northern side of the Olifants River. This community was relocated in 2007 from the Kleinfontein farm by Umcebo Mining, currently known as Glencore, to make way for the Middelkraal Mine.

The Mahlathini Community is located approximately 1 km from Hope Village (Portion 7 of Goedehoop 46-IS and small section located on Portion 9 of Goedehoop 46-IS) has been in existence for more than a decade and has grown considerably since 2005. It can be assumed that the settlement came about due to an influx of jobseekers looking for employment at the mines, power stations and related industries in the area. It is estimated that approximately 800 people reside at Mahlathini and the Steve Tshwete LM does not regard it as a legal informal settlement.

The Secondary ZoI includes Bethal and Emzinoni which are both located in the GMLM. It is anticipated that Bethal and Emzinoni will both experience impacts from the proposed development. Furthermore, due to the location of the mining operation future activities and interaction will be focused upon the GMLM..

The Tertiary ZoI includes Kriel and Thubelihle, both located in the Emalahleni Local Municipality (ELM). It is also anticipated that both Kriel and Thubelihle might experience changes and impacts due to their proximity to the proposed mine (SRKb, 2015).

(b) Description of the current land uses.

The land use in the study area was assessed using a number of data sets, both historical as well as from recent studies, the aerial photographic coverage and discussions with the project team. In addition, the time spent in field while mapping the soils and classifying the land capability added to the understanding of the land use and land coverage.

In general, the land use of the study area is considered to be altered, with a significant portion of the area having been changed from its original grassland biome to commercial farmlands.

The lower lying areas associated with the streams, rivers are for the most part unchanged, albeit that cultivation and utilisation of areas within this zone for livestock grazing and crop production are noted. On balance, the remainder of the site has been developed to either intensive grazing of the natural veld grasses or to commercial crops and cultivated pastures.

There is little to no subsistence farming practiced in the area, and no other commercial industry or urban dwellings exist.

A small area of existing coal mining is mapped in the north western corner of the site (ESS, 2015).

(c) Description of specific environmental features and infrastructure on the site.

Environmental features:

As described in the baseline and the current land use sections above, the major sensitive feature of the proposed site are as follows:

- Watercourses (Olifants River and associated tributaries);
- Wetlands (mainly channel led valley bottom and floodplain wetlands); and
- Heritage (graves); and
- Flora and fauna species.

Existing infrastructure in the area

Roads

R35

The R35 is a single carriageway with 3.5m lanes in both directions and 1.5m hard shoulders. This road runs north to south and links the towns of Bethal and Middelburg. The R35's design speed is high at 120km/h. The road edge is well maintained and the grass cut short in the road reserve (Aurecon, 2014).

R544

The R544 is a single carriageway with one 3.5m lane in each direction and grassed shoulders. The design speed is at 60km/h and sight distance is good at the intersection of R544 and R35 with no obstruction on the R35. The R544 is stop controlled at the intersection with the R35 being the major road having right of way (Aurecon, 2014).

R542

The R542 is also a single carriageway road with a single 3.5m lane in each direction having grassed shoulders on both sides. Sight distance is excellent, however, the road surface conditions vary from good

to poor with evidence of significant road repairs and potholes together with severe rutting at the road edges. The indicated speed limit is 100km/h and reduces to 60km/h on approach to the intersection with the R35 (Aurecon, 2014).

Railway lines

There are no railway lines or infrastructure in the immediate vicinity of the project site and from the preliminary project description it is not required. A rail line does exist approximately 5km east of the R35 and is aligned approximately in a north – south direction, thereafter heading southeast when travelling further south (Aurecon, 2014).

Existing conveyor belts

A series of conveyor belts run between Block 20 Shaft (currently on care and maintenance) and Goedehoop Colliery's existing Hope Shaft Complex (adjacent to the Goedehoop plant). These conveyors will receive coal from the new Elders overland conveyor (the servitude of which is discussed in section 3 above) and transfer the coal to three new conveyors leading into Goedehoop plant. The three new conveyors will be constructed parallel to the existing conveyor 201, 202 and 203 running between Hope Shaft and Goedehoop plant. This conveyor system will be used during the operational phase of the Elders underground mine.

Dwellings

Vlakkuilen Community

The Vlakkuilen community is predominantly located on the southern portion of the Hirsaw Estate; two households are detached from the main community and reside on the northern side of the estate. The Hirsaw Estate is located along the R35 national road between Bethal and the Goedehoop Colliery. The Vlakkuilen Community is a rural community with a total population of 128 people living in 23 households. (SRK, 2015).

Middelkraal Community

The Middelkraal community is made up of 18 households located on the northern side of the Olifants River. This community was relocated in 2007 from the Kleinfontein farm by Umcebo Mining, currently known as Glencore, to make way for the Middelkraal Mine (SRK, 2015).

Hirsaw Estate

Hirsaw Estate is located along the R35 national road between Bethal and the Goedehoop Colliery in the Govan Mbeki Municipality. Hirsaw Estate is owned by AAC, however, is currently being leased and used for agricultural purposes.

Mahlathini Community

Mahlathini, located approximately 1 km from Hope Village (Portion 7 of Goedehoop 46-IS and small section located on Portion 9 of Goedehoop 46-IS) has been in existence for more than a decade and has grown considerably since 2005. This informal township is not recognised by the local authority. It can be assumed that the settlement came about due to an influx of jobseekers looking for employment at the mines, power stations and related industries in the area. It is estimated that approximately 800 people reside at Mahlathini and the Steve Tshwete LM does not regard it as a legal informal settlement. Services are limited and unemployment and illiteracy levels are high. The settlement experiences increasing social problems relating to alcohol and drug abuse and crime. Residents own in the region of 400 to 500 cattle and cattle graze on private land and servitudes without permission, management or control (SRK, 2015).

(d) Environmental and current land use map.

(Show all environmental, and current land use features)

Refer to Figure 11 for the land use map of the Elders Colliery.

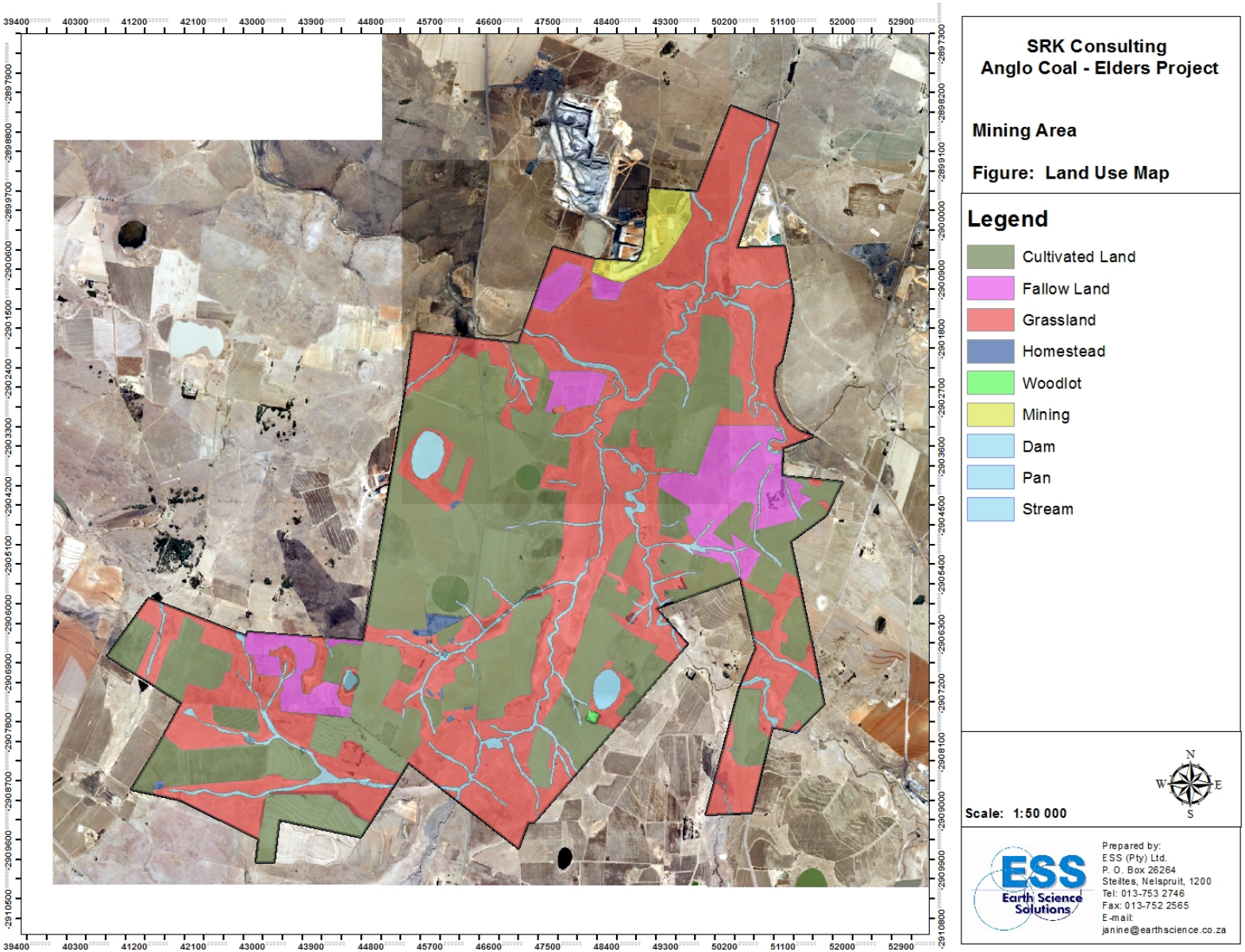


Figure 11: Elders Colliery land use map (ESS, 2015)

v) Impacts and risks identified including the nature, significance, consequence, extent, duration and probability of the impacts, including the degree to which these impacts

(Provide a list of the potential impacts identified of the activities described in the initial site layout that will be undertaken, as informed by both the typical known impacts of such activities, and as informed by the consultations with affected parties together with the significance, probability, and duration of the impacts. Please indicate the extent to which they can be reversed, the extent to which they may cause irreplaceable loss of resources, and can be avoided, managed or mitigated).

The environmental impact assessment has been undertaken according to SRK's impact assessment methodology which follows internationally recognised and accepted impact assessment principles and is compliant with NEMA regulations. The method used to define and evaluate the impacts is explained in Section A (d) (vi)

Refer to Table 8 to Table 10 where potential impacts were identified and rated for significance without mitigation measures in place.

Stakeholder comments with mitigation measures are shown in Table 7.

vi) Methodology used in determining and ranking the nature, significance, consequences, extent, duration and probability of potential environmental impacts and risks;

(Describe how the significance, probability, and duration of the aforesaid identified impacts that were identified through the consultation process was determined in order to decide the extent to which the initial site layout needs revision).

The impact significance rating process serves two purposes: firstly, it helps to highlight the critical impacts requiring consideration in the management and approval process; secondly, it serves to show the primary impact characteristics, as defined above, used to evaluate impact significance.

The impact significance rating system is presented in Table 5 and involves three parts:

Part A: Define impact consequence using the three primary impact characteristics of magnitude, spatial scale/population and duration;

Part B: Use the matrix to determine a rating for impact consequence based on the definitions identified in Part A; and

Part C: Use the matrix to determine the impact significance rating, which is a function of the impact consequence rating (from Part B) and the probability of occurrence.

Table 5: Significance rating methodology

PART A: DEFINING CONSEQUENCE IN TERMS OF MAGNITUDE, DURATION AND SPATIAL SCALE ***Use these definitions to define the consequence in Part B***		
Impact characteristics	**Definition**	**Criteria**
MAGNITUDE	Major -	Substantial deterioration or harm to receptors; receiving environment has an inherent value to stakeholders; receptors of impact are of conservation importance; or identified threshold often exceeded
	Moderate -	Moderate/measurable deterioration or harm to receptors; receiving environment moderately sensitive; or identified threshold occasionally exceeded
	Minor -	Minor deterioration (nuisance or minor deterioration) or harm to receptors; change to receiving environment not measurable; or identified threshold never exceeded
	Minor +	Minor improvement; change not measurable; or threshold never exceeded
	Moderate +	Moderate improvement; within or better than the threshold; or no observed reaction
	Major +	Substantial improvement; within or better than the threshold; or favourable publicity
SPATIAL SCALE OR POPULATION	Site or local	Site specific or confined to the immediate project area
	Regional	May be defined in various ways, e.g. cadastral, catchment, topographic
	National/ International	Nationally or beyond
DURATION	Short term	Up to 18 months.
	Medium term	18 months to 5 years
	Long term	Longer than 5 years

PART B: DETERMINING CONSEQUENCE RATING ***Rate consequence based on definition of magnitude, spatial extent and duration***					
			SPATIAL SCALE/ POPULATION		
			Site or Local	**Regional**	**National/ international**
MAGNITUDE					
Minor	**DURATION**	**Long term**	Medium	Medium	High
		Medium term	Low	Low	Medium
		Short term	Low	Low	Medium
Moderate	**DURATION**	**Long term**	Medium	High	High
		Medium term	Medium	Medium	High
		Short term	Low	Medium	Medium
Major	**DURATION**	**Long term**	High	High	High
		Medium term	Medium	Medium	High
		Short term	Medium	Medium	High

PART C: DETERMINING SIGNIFICANCE RATING ***Rate significance based on consequence and probability***				
		CONSEQUENCE		
		Low	**Medium**	**High**
PROBABILITY (of exposure to impacts)	**Definite**	Medium	Medium	High
	Possible	Low	Medium	High
	Unlikely	Low	Low	Medium

vii) The positive and negative impacts that the proposed activity (in terms of the initial site layout) and alternatives will have on the environment and the community that may be affected.

(Provide a discussion in terms of advantages and disadvantages of the initial site layout compared to alternative layout options to accommodate concerns raised by affected parties)

Table 6: Positive and negative impacts regarding project alternatives for Elders Colliery

Positive Impacts	Negative impacts
Mining alternatives	
Open cast mining (alternative)	
• Employment opportunities providing livelihood to mine workers.	• Decrease in agricultural area. • Removal of vegetation and decrease in associated wetland areas. • Decrease of surface water runoff due to open pit capturing rain water. • Potential formation of groundwater cone of depression. • Potential for acid mine drainage due to contamination of groundwater and surface water. • Increased dust generation due to open cast blasting and operations. • Increased noise generation due to construction and operational vehicles.
Underground mining (current scope)	
• Reduced impact on current land uses. • Minimal loss of livelihood for surrounding communities and adjacent land owners. • Reduced impact on biodiversity (including vegetation and wetlands). • Reduced impact on surface water quality and quantity. • Reduced impacts on air quality and noise generation. • Reduced rehabilitation costs. • Reduced socio-economic impacts as there will be limited economic and physical displacement.	• Potential for acid mine drainage due to contamination of groundwater and surface water. • Potential for groundwater contamination resulting in impacts on borehole qualities. • Potential decrease in yields of boreholes. • Potential decrease in groundwater interaction with wetlands.
Transportation	
Trucking (alternative)	
• Use of existing road networks, therefore no construction of alternative transport infrastructure is required, therefore limiting impact of construction additional infrastructure.	• Increase of traffic volumes on existing road networks. • Increased possibilities for road accidents including cars and pedestrians. • Increase in dust fallout and noise generation on the existing road network. • Deterioration of existing road network due to additional heavy vehicles.

Positive Impacts	Negative impacts
Conveying (current scope)	
• Larger volumes of coal can be transported by means of conveying, therefore the economic impact of the project is greater. • Area where conveyor belt is planned is sparsely populated and therefor minimal impact of nuisance dust and noise on surrounding communities and adjacent landowners. • From Block 20 to Goedehoop Colliery use will be made of an existing conveyor belt that will be upgraded, therefore minimising additional surface infrastructure required.	• Construction of new linear activity. • Increased noise levels due to operation of conveyor belt. • Increase in dust fallout due to conveyor belt not covered. • Potential fragmentation of habitat could occur as a barrier is created with the construction of the conveyor belt. • Potential for surface water contamination at watercourse crossings

viii) The possible mitigation measures that could be applied and the level of risk.

(With regard to the issues and concerns raised by affected parties provide a list of the issues raised and an assessment/ discussion of the mitigations or site layout alternatives available to accommodate or address their concerns, together with an assessment of the impacts or risks associated with the mitigation or alternatives considered).

Comments and concerns raised by stakeholders are included in Table 4. These comments have been taken into consideration and have informed the mitigation outlined in Table 8 to Table 10.

Table 7: Mitigation measures for potential impacts identified for the Elders Colliery – with stakeholder comments

Activity	Potential impact	Stakeholder Comment	Mitigation measure
Construction and operation of Elders Colliery	Contamination of surface and groundwater resources	The quantity of water used by the mine and the quality of drinking water must be monitored on a regular basis. Stakeholders must be kept informed of this monitoring information. (Nic Britz)	• Implement surface and groundwater monitoring programme throughout all phases of the mining operation.
Underground mining of the No. 2 and No.4 coal seams	Influx of groundwater into mine workings Formation of a groundwater cone of depression	Boreholes used by famers surrounding the proposed Elders Colliery must be assessed and monitored. (Nic Britz) How will mining affect boreholes and the availability of water from boreholes close to the proposed mine? (Johan Engelbrecht)	• Mining will not take place in the weathered overlying strata. • Identified deep boreholes within the underground mining area will be sealed to prevent inflow into the mine. • Grouting of fissures to prevent excess groundwater entering the underground mining sections. • Confirm private borehole users as part of hydro census and monitoring groundwater levels and yields.
Closure of the underground mine	Surface decant of AMD water	The Forzando West project will come on line within the next couple of years. We require full understanding of the environmental issues for Elders Colliery that is foreseen such as decanting. Total Coal will provide comment on the Scoping Report that will be made available for public comment. (William Seabi)	• Optimise storage of mine water in mined-out underground sections. • Install high pressure seal in the boxcut underground development to the No. 2 seam workings. • The boxcut will be sealed, backfilled and made free draining. • The underground workings will be left to fill to a pre-determined environmental safe level (below decant level) before active water level management is implemented. • Monitoring of water levels in the mine and the associated water quality is committed to. This will allow both calibration of the post mining water quality and water volumes. • The water level in the workings will be actively managed to ensure it remains below the decant elevation. • The water treatment plant will be decommissioned within 3 years of mine closure. Thereafter the water make from underground workings will be managed such that it will be allowed to fill up through natural recharge to a pre-determined environmental safe level below decant level. • The rise of water will be closely monitored to ensure that the environmental safe level is not exceeded and that appropriate extraction works and treatment facilities are

Activity	Potential impact	Stakeholder Comment	Mitigation measure
			constructed in time to treat the surplus water once the environmental safe level is reached. The water will then be actively maintained at or below the environmental safe level. • A detailed decant management plan will be developed at mine closure. Ultimately water treatment solutions, either passive or active, will be implemented. • Monitoring of the water table rebound will continue post-closure and the modelling updated to quantify the long-term impacts. If necessary, the management measures should be revised based on the modelling results. • Treated water will be discharged to the river system.
Construction and operation of Elders Colliery	Increase of dust fallout	The Vlakkuilen Community will be affected by the impacts of mining activities such as dust and other impacts. (Johannes Motau) Even though mitigation measures for dust pollution are in place at many mining operations, many of these measures are not effective. What other dust prevention measures will be in place? (Jan Venter)	• Clearing will be limited to the designed footprint. • Water sprays on unpaved roads, stockpiles and material handling points. • Traffic control done through restriction of traffic volumes on internal roads and vehicle speeds. • Vehicle speeds within the mining area will be limited to 40 km/h. • Use water sprays on all stockpiles with special attention given to active stockpiles. • Net screens with fine mist sprays around stockpiles areas. • Maintain a complaints register and capture the dust related complaints in the grievance mechanism. The grievance will be investigated by the applicable Elders Colliery representative in order for the complaint to be resolved and closed out. • Implementation of a dust monitoring programme to monitor dust impacts. • Adhere to specified design for conveyor belt (with a roof and one side covered). The conveyor covering will be in the direction where most sensitive receptors are located (westerly direction of the mine)
Construction and operation of Elders Colliery	Improved employment and enterprise development opportunities through skills	Elders Colliery must employ local contractors and communities in preference to external labour. (Joseph)	• In order to promote skills development and capacity building initiatives to both employees and the broader population and, in particular amongst youth, the SLP

Activity	Potential impact	Stakeholder Comment	Mitigation measure
	development and capacity building initiatives	Commitments made in Social Labour Plans (SLPs) of other mines in the area have not been complied with. For example, communities have not been informed when blasting will take place at adjacent mines. Elders Colliery must therefore comply with the commitments made in their SLP and EMP. (Joseph) AOL must ensure that the local communities benefit from the proposed development. (Joseph) Please ensure that the youth from local communities are provided with employment opportunities at Elders Colliery, and that this is set out in the Social Labour Plan for the project. (Leonard Mahlangu / Simpiwe Ngobesa) AOL must provide the community with various opportunities for employment, for example as employees and as contractors. (Ronni Nkosi) AOL must develop small business opportunities in the community so that the wealth is shared equally. The mine needs to consider employing women and the youth, not only the men. (Sarafina Mndebele) Please inform us of potential jobs that will be available during the life of the mine. Please inform us timeously of these employment opportunities in order for the Vlakkuilen community to apply for these positions before anyone else. Vlakkuilen could form companies that are contracted to AOL. (Sakhi Sam Mahlangu) Will you bring in your own employees during construction, or will you use people from the Vlakkuilen community? If I am skilled in a certain area, but I don't have matric, will you still consider hiring me? (Petunia Muozanani) We are in a crisis – there are no jobs. Will there be employment and training opportunities for skills during the Elders project? Some of us have companies. Will there be opportunities for contracting?	should focus on enterprise development and capacity building; • AOL's closure plan will aim to reinforce the objectives of the SLP by reducing the reliance on AOL for employment by promoting skills transfer to enable alternative livelihoods; and, • Develop a clear and concise employment policy prioritizing local employment and skills development. • Develop a clear and concise employment policy prioritizing local employment; • Implement vocational training programmes to promote local workforce capacity as per the Labour and Human Resources Plan (LHRP); • Employ local workers if qualified applicants with the appropriate skills are available. Formalize this policy in company Human Resources guidelines and contractors' agreements; • Purchase goods and services at a local level, if available. Formalize this policy in company purchasing guidelines and contractors' agreements; • Work closely with the local communities before and during the project to identify and communicate required skills and resources that the local community could provide; • Provide or facilitate training of local people in mining and general business skills before and during mining activities, such as through internships, scholarships, and/or vocational and skills training programs; • Prepare a detailed vocational training program in consultation with the local community to be implemented during the construction phase; and, • Through the stakeholder engagement process ensure that expectations are managed around employment opportunities and practices. • Develop a clear and concise employment policy prioritizing local employment; • Employ staff from across community groups and the project area and keep recruitment and employment

Activity	Potential impact	Stakeholder Comment	Mitigation measure
		(Abraham Mokoena) Is the training for the underground mine machinery taught at home or would you need to train at the mine? Because when there are job opportunities at Goedehoop Colliery, the minimum requirements is that one need to have a relative working for the mine (Xolani Pikwa) Some Mahlathini community members were not given the opportunity to go to school. How will the project benefit these people? (Novageli Mayifele) The meeting was focused on Mahlathini community members only. Please will AOL consider surrounding farms for opportunities as well, as there is a need for skills and capacity building initiatives. We require skills and capacity building opportunities that will enable us to be employable with other mine houses or industries (Simphiwe Vilikazi)	records, distributing short-term opportunities to as many as possible; and, • Update SLP to consider integrated development of communities impacted by the Project.
Underground mining of the No. 2 and No.4 coal seams	Potential subsidence due to underground mining activities	If underground mining takes place, will subsidence not take place, and will we not fall into those areas? (Sophie Mahlangu) Sophie's question regarding the subsidence should not be taken lightly. There have been underground mines in the area where subsidence has taken place and the people who lived there are no longer around. We have also seen a lot of smoke coming from these mining areas which has a negative impact on the environment and the communities living in this area. (Sakhi Sam Mahlangu)	• Maintain a pillar size/safety factor that will ensure that no surface subsidence occurs. • Mining will not take place in the weathered zone.
Construction and operation of Elders Colliery	Contamination of surface and groundwater resources	Will the mining project affect our surface water, and groundwater? (Solomon Nzimande – Middelkraal)	• A stormwater management plan will be implemented through the life of mine • Implement surface and groundwater monitoring programme throughout all phases of the mining operation.

Operation of STP and WTP	**Contamination of surface water resources**	Please provide clarity on the uses of discharged water (Pinky Monyela) Will mining activities at Elders Colliery affect the Olifants River? (Alexander Adam)	• All domestic waste water will be treated in the STP. • Sewage water will be treated IRWQOs standards set for the Olifants River. • Sludge will be deposited in drying beds within the designated dirty water area and removed by a licensed waste contractor. • An inspection and maintenance plan will be implemented to ensure that the STP always operates within specification. • A surface water quality monitoring programme will be implemented to detect any impacts. • The WTP will be isolated within a designated dirty water area. All runoff and spills from the treatment plant will be collected in a sump, from which water will be pumped to the PCD. • Water will be treated to achieve both drinking water standards (SANS 241:2011) and the Interim Resource Water Quality Objectives (IRWQO) for the Olifants River. Surplus treated water that cannot be reused in the operations will be discharged to the Olifants River system. • All chemicals and additives will be stored in dedicated bunded areas, where any spills will be contained. • An inspection and maintenance plan • Discharge water quality will be continuously monitored for early detection of discharge water quality problems. • Should upset conditions occur, or poor discharge water quality be detected, the WTP discharge will be directed to the PCD.

Activity	Potential impact	Stakeholder Comment	Mitigation measure
Storage of water underground	Contamination of surface water resources	It must be reflected in the water balance that storage of water will take place in the underground workings and therefore minimises the need for surface water. (Pinky Monyela)	• Excess water that cannot be treated or reused will be pumped to storage in underground compartments at around 2025, when storage becomes available at Elders 2 Seam underground sections. Prior to storage becoming available underground, surplus water will need to be pumped to Goedehoop Colliery, should a review of the LOM plan not enable the early provision of storage on the 2 Seam.
Underground mining of the No. 2 and No.4 coal seams	Decrease flows in wetlands due to dewatering of underground aquifers	The Freshwater assessment as determined in the Mpumalanga Biodiversity Sector Plan (MBSP) indicates that the proposed mine will undermine large portions of an Ecological Support Area: Wetland area that supports and feeds cleaner water into the upper Olifants River. The effect of the dewatering on this wetland during the underground mining process and the costs to provide a constant supply of clean water into this wetland system, needs to be considered and addressed in the studies that will be conducted. (Dr MC Lotter)	• Maintain a recommended pillar size/safety factor that will ensure that no surface subsidence occurs under any of the wetlands on site. • Identified deep boreholes within the underground mining area will be sealed to prevent inflow into the mine.
Closure of the Elders Colliery	Potential for formation of AMD	The accumulative impacts of AMD from the proposed underground mine and the nearby existing mines should be quantified. Liability for water purification and rehabilitation must be determined. (Dr MC Lotter) The decanting points must be determined and also the mitigating actions to prevent dirty water and AMD to reach the river. (Dr MC Lotter)	• Optimise storage of mine water make in mined out underground section to minimise exposure to oxygen. • Develop a groundwater monitoring programme in order to assess the groundwater quality. Frequency of monitoring to take place as per the groundwater monitoring plan. • Verify AMD generation potential of the overburden through sampling and analyses of core samples from the boxcut location. • Ensure that backfilled boxcut is shaped in order to be free-draining. • Continue with monitoring (including quality and levels) of boreholes around backfilled boxcut identify any potential contamination of groundwater resources. • Should pollution be identified in the groundwater resources, the source of the pollutants will be investigated and the applicable remediation measures will be implanted.

Activity	Potential impact	Stakeholder Comment	Mitigation measure
Construction of boxcut	Impacts on the R35	Will the conveyor cross over the R35, and will this road be used during construction? (Mainah Medupi) Will blasting activities take place close to the R35, and if so, will the R35 be closed during this time? (Anton)	• Blasting parameters applied to blasting activity will ensure that ground vibration levels are within acceptable standards near the R35. • Close the R35 during blasts. • Obtain required authorisations from the roads agency/department to close road and blast in close proximity to R35. • Notification of road closures will be communicated prior to the blasting activities. • Monitoring will be undertaken during blasting activities • Roads will be cleared after blasting should any material have landed on the road.

ix) Motivation where no alternative sites were considered.

Alternatives have been considered for this project, as listed above in Section 3 (g) (i) above.

x) Statement motivating the alternative development location within the overall site. **(Provide a statement motivating the final site layout that is proposed)**

The current position for the boxcut and associated infrastructure was influenced by the following factors:

- Position of coal resource;
- Distance to Goedehoop Colliery for coal processing;
- Existing conveyor between Block 20 and Goedehoop Colliery;
- Access to boxcut from major road networks;
- Land owned by AOL;
- Depth to the groundwater table in order to delay possible decant;
- The extent of the Viskuile and Vlakkuilen wetland system and the proximity to the Olifants River; and
- Proximity of communities to boxcut area in order to avoid resettlement

The underground mining method was selected as the preferred option based on the following:

- The extent and sensitivity of the wetlands;
- Depth to reserve (including 2 and 4 seam); and
- Reduced impact on current land use activities.

The high level positive and negative impacts for each alternative have been addressed in Table 6 above, PART A, section 3 (g) (vii).

h) Full description of the process undertaken to identify, assess and rank the impacts and risks the activity will impose on the preferred site (In respect of the final site layout plan) through the life of the activity. *(Including (i) a description of all environmental issues and risks that erer identified during the environmental impact assessment process and (ii) an assessment of the significance of each issue and risk and an indication of the extent to which the issue and risk could be avoided or addressed by the adoption of mitigation measures.)*

A summary of all the anticipated impacts and risks, as well as significance for the proposed project during the life of the project have been included in Table 11, PART A, Section 3 (g)(vi) above. Mitigation measures associated with each impact and risk are included in Table 14, PART A, Section 3 (g)(viii).

Impacts and risks were identified using a standardised method that forms part of methodology that the EAP utilized (PART A, Section 3 (g)(vi)) for the EIA and EMP. This process involved:

- Observations based on the site visits;
- Input from the specialist surveys, baseline assessments and recommendations;
- Input from public participation;
- Input from the desktop analysis of relevant sector plans and available land use planning tools;
- Consultation and discussions with the engineering project team; and
- Application of previous knowledge and experience by the EAP for these types of projects in Mpumalanga Highveld region.

Additionally, the EAP has provided inputs into the AACSA design processes and continued to do so during the EIA process. This included the identification and discussion of project risks from various disciplines involved in the project. Environmental and Social risks have been incorporated into this process throughout the duration of the EIA process. Currently this process has resulted in a positive influence on the design and proposed layout based on environmental and social risks.

The first stage of risk/impact assessment was the identification of environmental activities, aspects and impacts. This was supported by the identification of receptors and resources, which allows for an understanding of the impact pathway and an assessment of the sensitivity to change. The definitions used in the impact assessment are given below:

An activity is a distinct process or task undertaken by an organization for which a responsibility can be assigned. Activities also include facilities or pieces of infrastructure that are possessed by an organization;

- An environmental aspect is an 'element of an organizations activities, products and services which can interact with the environment. The interaction of an aspect with the environment may result in an impact;
- Environmental risks/impacts are the consequences of these aspects on environmental resources or receptors of particular value or sensitivity, for example, disturbance due to noise and health effects due to poorer air quality. Receptors can comprise, but are not limited to, people or human-made systems, such as local residents, communities and social infrastructure, as well as components of the biophysical environment such as aquifers, flora and palaeontology. In the case where the impact is on human health or well-being, this should be stated. Similarly, where the receptor is not anthropogenic, then it should, where possible, be stipulated what the receptor is;
- Receptors comprise, but are not limited to people or man-made structures;
- Resources include components of the biophysical environment;
- Frequency of activity refers to how often the proposed activity will take place;
- Frequency of impact refers to the frequency with which a stressor (aspect) will impact on the receptor;
- Severity refers to the degree of change to the receptor status in terms of the reversibility of the impact; sensitivity of receptor to stressor; duration of impact (increasing or decreasing with time); controversy potential and precedent setting; threat to environmental and health standards;
- Spatial scope refers to the geographical scale of the impact; and
- Duration refers to the length of time over which the stressor will cause a change in the resource or receptor.

The significance of the impact was then assessed by rating each variable according to defined criteria. The purpose of the rating was to develop a clear understanding of influences and processes associated with each impact. The severity, spatial scope and duration of the impact together comprise the consequence of the impact. The frequency of the activity and the frequency of the impact together comprise the likelihood of the impact occurring. The likelihood and consequence of the impact were then read off a significance rating matrix to determine the significance of the impact and whether mitigation is necessary.

The assessment of significance was undertaken twice. Initial significance was based only on natural and existing mitigation measures (including built-in engineering designs). The subsequent assessment took into account the recommended management measures required to mitigate the impacts. Measures such as demolishing infrastructure, and reinstatement and rehabilitation of land, were considered post-mitigation.

The model outcome of the impacts was then assessed in terms of impact certainty and consideration of available information. The Precautionary Principle was applied in line with South Africa's National Environmental Management Act (No. 108 of 1997) in instances of uncertainty or lack of information by increasing assigned ratings or adjusting final model outcomes. In certain instances where a variable or outcome required rational adjustment due to model limitations, the model outcomes were adjusted.

i) Assessment of each identified potentially significant impact and risk

(This section of the report must consider all the known typical impacts of each of the activities (including those that could or should have been identified by knowledgeable persons) and not only those that were raised by registered interested and affected parties).

ACTIVITY whether listed or not listed. **(E.g. Excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc…etc…etc.)**.	**POTENTIAL IMPACT** **(e.g. dust, noise, drainage surface disturbance, fly rock, surface water contamination, groundwater contamination, air pollution etc….etc…)**	**ASPECTS AFFECTED**	**PHASE** In which impact is anticipated **(e.g. Construction, commissioning, operational, Decommissioning, closure, post-closure)**	**SIGNIFICANCE** if not mitigated	**MITIGATION TYPE** **(modify, remedy, control, or stop) through (e.g. noise control measures, storm-water control, dust control, rehabilitation, design measures, blasting controls, avoidance, relocation, alternative activity etc. etc)** **E.g.** **Modify through alternative method.** **Control through noise control** **Control through management and monitoring through rehabilitation..**	**SIGNIFICANCE** if mitigated

The comprehensive impact assessment is included in Table 8 to Table 10. A separate appendix has not been provided.

Stakeholder comments with mitigation measures are shown in Table 7.

Table 8: Assessment of potential impacts of the Elders Colliery during the Construction Phase

Assessment of potential impacts of the Elders Colliery during the Construction Phase						
Number	**Activity**	**Environmental aspect**	**Potential Impact**	**Significance rating (not mitigated)**	**Mitigation Measures**	**Significance rating (if mitigated)**
C.1.	Site clearing and grubbing of the footprint areas associated with the boxcut and associated surface infrastructure. Construction of boxcut and associated surface infrastructure.	Topography	**Alteration of topography** The development of the boxcut involves the removal of topsoil and overburden and will change the local topography of the site. This will have visual impact on the Middelkraal community.	M: Moderate D: Long term S: Site C: Medium P: Definite SI: Medium (-)	• Demarcate development footprint area. No development outside of this footprint will take place. • Vegetate stockpiles in order to minimise visual transformation of topography and ensure that the stockpiles are free draining.	M: Moderate D: Long term S: Site C: Medium P: Definite SI: Medium (-)
C.2.	Site clearing and grubbing of the footprint areas associated with the boxcut and associated surface infrastructure. Construction of boxcut and associated surface infrastructure.	Soils	**The loss of utilisable resource (sterilisation and erosion), compaction and contamination or salinisation.** During the construction phase the loss of the utilisation of the soil resource will impact the land use, reducing the land capability from low intensity grazing land to mining. The construction for the mining and its support activities will, if un-managed and without mitigation: • Have a definite negative impact on the environment due to the loss of the soil area and thus the use of the utilisable resource; • Have the potential for contamination (hydrocarbon and reagent chemical spills, raw materials and spillage of coal, etc.), compaction of working/laydown areas and storage facility footprint and the potential for erosion (wind and water – dust and suspended solids) over unprotected areas; • Have a moderate negative intensity potential ranking based on the confined (limited to footprint of impact) and compact nature of the infrastructure for the relative size of the infrastructure; • Will continue throughout the construction phase and into the operational phase; • Will be permanent but reversible (can be broken down or backfilled) and rehabilitated; and • Is confined to site only.	M: Major D: Long term S: Site C: High P: Definite SI: High (-)	• Concurrent rehabilitation of all affected sites that are not required for the operation – rehabilitation of temporary structures and footprint areas used during the feasibility investigation (geotechnical pits, trenching etc.) and the construction phase; • Separation of the utilisable soils and ferricrete base materials from each other and from the soft overburden; • Effective cladding of the berms and soil, ferricrete stockpiles/heaps with vegetation or large rock fragments, and the minimising of the height of storage facilities to 15m and soil berms to 1,5m wherever possible; • Restriction of vehicle movement over unprotected or sensitive areas, this will reduce compaction. This will be undertaken by fencing the boxcut and associated surface infrastructure area; • Vehicles are to remain on the service road and will be limited to a speed of 40 km/h; • Soil amelioration (cultivation) to enhance the oxygenation and growing capability (germination) of natural regeneration and/or seed within the stockpiled soils (maintain the soils viability during storage) and areas of concurrent rehabilitation. • Limiting the area of impact to as small a footprint as possible, inclusive of resource stockpiles and the length of servitudes, access and haulage ways and conveyor systems wherever possible; • The development and inclusion of soil management as part of the general housekeeping operations, and the independent auditing of this management; • Regular servicing of all vehicles in bunded areas to reduce spillage and contamination;	M: Moderate D: Long term S: Site C: Medium P: Possible SI: Medium (-)
C.3.	Construction of the conveyor belt and associated servitude (including the upgrade of the existing conveyor belt)	Soils	**The loss of the utilisation of the soil resource will impact the land use practice of low to moderate intensity livestock grazing and commercial cultivation of crops that are the major activities on the dryland soils at present.** These activities are perceived to be of great economic benefit to the local economy and land owners (Figure 1). The construction for the mining and its support activities will, if un-managed and without mitigation: • Have a definite negative impact on the environment due to the loss of the soil area and thus the use of the utilisable resource – eco system services; • Have the potential for contamination (hydrocarbon and reagent chemical spills, raw materials and spillage of coal, etc.), compaction of working/laydown areas and storage facility footprint and the potential for erosion (wind and water – dust and suspended solids) over unprotected areas, • Have a medium/moderate negative intensity potential ranking based on the confined (limited to footprint of impact) and compact nature of the infrastructure for the relative size of the mining venture and its associated infrastructure (all of the mining is underground); • Will continue throughout the construction phase and into the operational phase; • Will be permanent but reversible (can be broken down or backfilled and rehabilitated), and	M: Major D: Long term S: Site C: High P: Definite SI: High (-)		M: Moderate D: Long term S: Site C: Medium P: Possible SI: Medium (-)

Assessment of potential impacts of the Elders Colliery during the Construction Phase						
Number	**Activity**	**Environmental aspect**	**Potential Impact**	**Significance rating (not mitigated)**	**Mitigation Measures**	**Significance rating (if mitigated)**
			• Is confined to the site only, or at worst is localised (off site effects of erosion by wind and water).			
C.4.	Construction of boxcut and associated surface infrastructure and conveyor belt (including upgrade of existing conveyor belt)	Soils	**Contamination of soil resources during construction** It is anticipated that during the construction of the Elders Colliery and conveyer, there is the potential of spillage of carbonaceous material and contamination of soils. Contamination by dirty water run-off and/or spillage of hydrocarbons and/or chemicals is also expected from construction vehicles and machinery, as well as dust and emissions from the process. The impact of the Elders Colliery on the soil resource will have a negative medium significance. Although the magnitude will be minor, the impact will last for the life of the operation (long term) and will be permanent to irreversible if not rehabilitated.	M: Minor D: Long term S: Site specific C: Medium P: Possible SI: Medium (-)	• Develop a leak/spill procedure for all possible areas of leaks/spillages. • Spill kits will be provided for on site for spill clearing. • Spills will be cleared and remediated immediately as per the mine's Leak/Spill Procedure.	M: Minor D: Short term S: Site specific C: Low SI: Low (-)
C.5.	Site clearing and grubbing of the footprint areas associated with the boxcut and associated surface infrastructure. Construction of boxcut and associated surface infrastructure.	Biodiversity	**Permanent loss of habitat for flora and fauna** Based on the surface area of the proposed boxcut and associated infrastructure, it is evident that the boxcut and associated infrastructure will not contribute significantly to direct habitat loss and fragmentation on a local scale. The change in land use is mainly related to existing transformed areas, namely cultivated land (more than 50%). However, should the lost cultivated land be replaced by transforming natural vegetation, additional natural vegetation will be lost. The non-linear surface infrastructure associated with the mining activity has a limited negative impact on the natural vegetation on a local and regional scale. ***This impact will continue during the construction and operational phases.***	M: Minor D: Long term S: Site C: Medium P: Definite SI: Medium (-)	• Fence development footprint area prior to commencement of construction to limit impact on adjacent vegetation areas. • Removal of vegetation should be restricted to the relevant infrastructure footprints only. • Topsoil should be stored separately to be used in rehabilitation and landscaping. • No off-road driving into the natural remaining vegetation should be allowed especially by heavy machinery. • The development of erosion gullies will be monitored and managed. • Prevent any and all effluent from the mining activities of entering the wetland habitat. • Prevent all open fires, provide fire-safe zones, facilities and suitable fire control measures. • Use of branches of trees, shrubs or any vegetation for fire making purposes is strictly prohibited. • Provide sufficient on-site ablution, sanitation and waste management and hazardous materials management facilities. • The use of the natural veld for ablution purposes shall not be permitted under any circumstances. • Dust control on all roads should be prioritised. • A road management plan should be compiled prior to commencement of construction activities.	M: Moderate D: Long term S: Site C: Medium P: Definite SI: Medium (-)
C.6.	Site clearing and grubbing of the footprint areas associated with the boxcut and associated surface infrastructure. Construction of boxcut and associated surface infrastructure.	Biodiversity	**Habitat fragmentation** The boxcut and associated infrastructure will negatively impact on already isolated patches of natural vegetation, and therefore will consolidate the transformed area. Therefore the magnitude of the boxcut and associated infrastructure to habitat fragmentation locally is considered to be minor. However, as the impact will be long term, the significance rating is medium. ***This impact will continue during the construction and operational phases.***	M: Minor D: Long term S: Site C: Medium P: Definite SI: Medium (-)		M: Minor D: Long term S: Site C: Medium P: Definite SI: Medium (-)
C.7.	Site clearing and grubbing of the footprint areas associated with the boxcut and associated surface infrastructure. Construction of boxcut and associated surface infrastructure.	Biodiversity	**Loss of species of concern** More than 50% of the area associated with the boxcut and associated infrastructure is already transformed and therefore the potential for impacting negatively on species of concern is lower. Furthermore the use of underground mining as opposed to open cast mining effectively has reduced the potential impact of loss of species of concern. The magnitude of the boxcut and associated infrastructure to loss of species of concern is considered to be minor. However, as the impact will be long term, the significance rating is medium. ***This impact will continue during the construction and operational phases.***	M: Minor D: Long term S: Site C: Medium P: Possible SI: Medium (-)	• Areas of natural vegetation within the boxcut and associated infrastructure area will be inspected for the presence of species of concern during the optimal time prior to construction by a registered and experienced biodiversity team. • Employees at the mine will be educated about the environment, the species of concern present and how to deal with them. • Employees will not be allowed to harvest, utilise, manage or control any natural resource (water, soil, flora, fauna) unless it is done within the framework of a biodiversity action plan. • No alien invasive plant or feral animal (domestic or wild) will be introduced into the area or be allowed to establish or spread in the area. • An alien invasive eradication programme will be developed and implemented during the life of mine. • No animal may be hunted, trapped, snared or captured for any purpose whatsoever. Fences and boundaries will be patrolled weekly in order to locate and remove snares and traps. • Speed of vehicles will be limited to 40 km/h.	M: Minor D: Long term S: Site C: Medium P: Possible SI: Medium (-)

Assessment of potential impacts of the Elders Colliery during the Construction Phase						
Number	**Activity**	**Environmental aspect**	**Potential Impact**	**Significance rating (not mitigated)**	**Mitigation Measures**	**Significance rating (if mitigated)**
C.8.	Construction of conveyor belt servitude between Elders Colliery and Block 20	Biodiversity	**Permanent loss of habitat for flora and fauna** The proposed conveyor belt between the Elders shaft and Goedehoop Block 20 shaft transects the natural grassland found in this area. The conveyor route is approximately 10 km long and will cover a servitude of 55 m wide. The servitude will be fenced on both sides throughout the length of the conveyor. Most of the vegetation in this servitude will be cleared, and continual clearing (mowing of grass) will be undertaken throughout the life of mine. Due to the sensitive nature of the grassland along the conveyor, this is impact has a major magnitude that will remain in the long term. ***This impact will continue during the construction and operational phases.***	M: Major D: Long term S: Regional C: High P: Definite SI: High (-)	• Fence the conveyor servitude prior to commencement of construction to limit impact on adjacent vegetation areas. • Removal of vegetation should be restricted to the relevant infrastructure footprints only. • No off-road driving into the natural remaining vegetation should be allowed especially by heavy machinery. • The development of erosion gullies will be monitored and managed. • Maintaining access to water resources for ground dwelling mammals will be undertaken. • The movement of mammals through the landscape will be facilitated by the construction of underpasses/culverts underneath the conveyor belt at regular intervals • Ensure sufficient space under the conveyor and fence to allow free movement of small mammals.	M: Major D: Long term S: Regional C: High P: Definite SI: High (-)
C.9.	Construction of conveyor belt servitude between Elders Colliery and Block 20	Biodiversity	**Habitat fragmentation** The conveyor belt between the proposed Elders Colliery and Block 20 will fragment approximately 10 km with a width of 55 m of natural vegetation. As a result, a barrier will be created, fragmenting the natural habitat and negatively influence the movement and dispersal of fauna and flora. Furthermore it will limit free roaming ground dwelling mammals to the perennial water of the Olifants River. Currently the only linear structures which transect this area is low density, low volume gravel secondary and other access roads which have a limited influence on free roaming ground dwelling mammals. The fence along the conveyor belt will result in an impermeable barrier, which will have a higher negative impact on the mobility of free roaming mammals than the general cattle fences used on farm boundaries. For the placement of the conveyor, the proximity to the Olifants River was taken into account and the conveyor was moved as far away from the Olifants River as possible. ***This impact will continue during the construction and operational phases.***	M: Major D: Long term S: Regional C: High P: Definite SI: High (-)		M: Moderate D: Long term S: Regional C: High P: Possible SI: High (-)
C.10.	Construction of conveyor belt servitude between Elders Colliery and Block 20	Biodiversity	**Loss of species of concern** More than 80% of the area associated with the linear mining infrastructure (Elders to Goedehoop conveyor belt) represents natural vegetation of which 74%is classified as very high total ecological significance. This area also overlaps with national and provincial conservation important areas, therefore it is highly likely that it will impact on both Red Data and protected species directly. ***This impact will continue during the construction and operational phases.***	M: Major D: Long term S: Site C: High P: Possible SI: High (-)	• The conveyor route servitude will be inspected for the presence of Red Data and protected plant species during the optimal time prior to construction by a registered and experienced biodiversity team. • Should any Red Data or protected species be identified, the necessary permits will be obtained to remove and possibly relocate the plant species. • Employees at the mine will be educated about the environment, the species of concern present and how to deal with them. • Employees will not be allowed to harvest, utilise, manage or control any natural resource (water, soil, flora, fauna) unless it is done within the framework of a biodiversity action plan. • No alien invasive plant or feral animal (domestic or wild) will be introduced into the area or be allowed to establish or spread in the area. • An alien invasive eradication programme will be developed and implemented during the life of mine. • No animal may be hunted, trapped, snared or captured for any purpose whatsoever. Fences and boundaries will be patrolled weekly in order to locate and remove snares and traps. • Speed of vehicles will be limited to 40 km/h.	M: Moderate D: Long term S: Site C: Medium P: Unlikely SI: Low (-)
C.11.	Upgrade of existing conveyor belt and construction of new conveyor belt section within Goedehoop Colliery	Biodiversity	**Loss of habitat for flora and fauna and loss of species of concern** The existing conveyor belt requiring upgrade and the new section up to the Goedehoop plant is located within the Goedehoop Colliery	M: Minor D: Long term S: Site	Management measures will be implemented as per C.8 and C.10.	M: Minor D: Long term S: Site

Assessment of potential impacts of the Elders Colliery during the Construction Phase						
Number	**Activity**	**Environmental aspect**	**Potential Impact**	**Significance rating (not mitigated)**	**Mitigation Measures**	**Significance rating (if mitigated)**
			mining right area. The area along the existing conveyor belt has already been cleared and therefore the magnitude of the impact on biodiversity is considered to be low. However, as the impact will be long term, the significance is medium. The new section of the conveyor belt runs through a transformed area, and will therefore have minimum impact on the biodiversity.	C: Medium P: Possible SI: Medium		C: Medium P: Possible SI: Medium
C.12.	Site clearing and grubbing of the footprint areas associated with the boxcut, associated surface infrastructure and conveyor belt (including upgrade of the existing conveyor belt)	Surface Water	**Pollution of surface water resources** During the construction phase topsoil will be stripped and civil works, in the form of earthworks and terracing, will be undertaken as part of the preparation of the area for the construction of infrastructure such as roads, change house, wash bays, offices, workshops, crushers, water treatment plant, sewage treatment plant, etc., including the conveyor. Construction equipment will be mobile on the site. Impacts may arise from: • Erosion of soils during rainfall events, with elevated suspended solids in the runoff water. • Resultant elevated suspended solids in the watercourses, as well as sedimentation in the watercourses. • Hydrocarbon spillages from fuel storage, servicing areas or construction equipment itself, with resultant elevated hydrocarbon concentrations in runoff water and watercourses. The Olifants River catchment is considered a stressed water resource in terms of both the quantity of water in the system and the quality of the water. It also forms the main water supply for the Witbank area (from the Witbank Dam), as well as for irrigation water further downstream (from the Loskop Dam). Any impact on the quantity or quality of water in the system has the potential to affect the quality and assurance of supply to the community and agriculture. There is an existing conveyor and road crossing over the Olifants River. The updated conveyor belt will make use of this existing crossing.	M: Moderate D: Short term S: Local C: Medium P: Possible SI: Medium (-)	• Construction will be limited to the project footprint. • "No-go" zones will be delineated for contractor's camp. • Appropriate stormwater management measures will be implemented, including the temporary diversion of upstream run-off from the construction and laydown areas. • Surface water management measures, such as stormwater canals, sediment traps and PCDs are to be constructed first to ensure that runoff and dirty water spills are contained. • Servicing of construction vehicles will take place only in dedicated areas that are equipped with drip trays. • Bunded containment and settlement facilities will be provided for hazardous materials, such as fuel and oil. • Spill-sorb or a similar product will be kept on site, and used to clean up hydrocarbon spills in the event that they should occur. • Erosion protection measures will be implemented at steep areas. • A waste management plan will be developed for the construction phase. • An appropriate sewage management strategy will be implemented during the construction phase. • Water quality monitoring will be undertaken downstream of the construction areas, before and during construction where practical, in order to detect any increase in suspended solids or turbidity. • If erosion is evident, or the water quality monitoring indicates an increase in suspended solids, water management around the construction areas will be reviewed.	M: Minor D: Short term S: Local C: Low P: Possible SI: Low (-)
C.13.	Development of boxcut	Surface water	**Pollution of surface water resource** During the development of the boxcut, much of the overburden removed prior to the exposing of coal has the potential to contain some carbonaceous material. The boxcut will be excavated selectively, any overburden material contaminated with acidifying carbonaceous material will be excavated and transported to the existing mineral residue disposal facility at the Goedehoop South Mine complex. The excavated hard material (overburden) that is clean will be stockpiled to the south of the inclined shaft and later used to backfill the mine shaft at mine closure. This material will remain in the stockpiles for the duration of mining until closure. Impacts may arise from: • Erosion during rainfall events, resulting in increased turbidity and suspended solids in the runoff water, reporting to the local watercourses. • Deposition of sediments in the local watercourses, impacting on the aquatic ecology. Overburden stockpiles will potentially contain carbonaceous material, with the potential to affect downstream watercourses by increasing sulfate and TDS concentrations.	M: Moderate D: Short term S: Local C: Medium P: Possible SI: Medium (-)	• Surface water management measures, such as stormwater canals, sediment traps and PCDs are to be constructed first to ensure that runoff and dirty water spills are contained. • The stormwater runoff from the overburden stockpile will be caught in a clean water cut off channel. The channel will convey the water to a silt trap from where it will discharge into the proposed clean water cannel at the office area and conveyed into the veld. • Prior to discharge to the veld, the water quality from overburden stockpile channel will be assessed and pumped to the PCD if not suitable for discharge to the environment. • Water quality monitoring will be undertaken downstream of the construction areas before and during construction, where practical, in order to detect any increase in suspended solids or turbidity	M: Minor D: Short term S: Local C: Low P: Possible SI: Low (-)
C.14.	Development of boxcut	Surface water	**Impact on surface water quality due to dewatering of water ingress to boxcut and inclined shaft**	M: Moderate D: Short term	• The maximum volume of water expected to be generated at the start of mining at the boxcut in 2018 is likely to be around 167 m^3/day during the summer period. The water will be contained	M: Minor D: Short term

Assessment of potential impacts of the Elders Colliery during the Construction Phase						
Number	**Activity**	**Environmental aspect**	**Potential Impact**	**Significance rating (not mitigated)**	**Mitigation Measures**	**Significance rating (if mitigated)**
			Water that enters the boxcut and incline shaft excavations, both from groundwater seepage and direct rainfall, is expected to be largely clean. However, there is a possibility that this water makes contact with carbonaceous and pyritic materials. The water quality from the boxcut and incline shaft is therefore likely to be slightly to moderately impacted in terms of sulfate, TDS and suspended solids. Impacts may arise from: • Discharge of the potentially impacted water to the environment, with a resultant increase in sulfate and TDS concentrations in the natural watercourses. • Deposition of sediments in the local watercourses, impacting on the aquatic ecology.	S: Local C: Medium P: Possible SI: Medium (-)	at the site, in the PCD, for re-use in dust suppression on haul roads, and as construction water, if the quality is suitable. The water will not be discharged. • Surface water management measures, such as storm water canals, sediment traps and PCDs are to be constructed first to ensure that runoff and dirty water spills are contained	S: Local C: Low P: Unlikely SI: Low (-)
C.15.	Construction of boxcut, associated surface infrastructure and conveyor belt (including upgrade of existing conveyor belt)	Surface water	**Reduction in catchment yield** During construction, prior to the commissioning of the PCD, surface runoff will be released to the catchment once sediment has settled out. The water management infrastructure will be constructed first to enable the containment of dirty water generated during the remainder of the construction period. Impacts may arise from: • Containment of contaminated runoff water emanating from the site, including the mine infrastructure area with no release to the catchment. The duration of the potential impacts is therefore long term. Although runoff from dirty areas will be contained (see management measures below) and the probability of impact is definite, its magnitude has still been assessed as minor on the basis of the very small area that will be contained.	M: Minor D: Long term S: Regional C: Medium P: Definite SI: Medium (-)	• The aerial extent of the disturbed and potentially contaminated areas will be kept to the demarcated construction footprint. • Areas where dirty construction activities are carried out (e.g. servicing areas and workshops, fuel storage areas, waste storage areas) surrounded by bunds. • Clean upslope runoff will be diverted around construction activities.	M: Minor D: Long term S: Regional C: Medium P: Possible SI: Medium (-)
C.16.	Truck transport of coal from Elders Colliery to Goedehoop	Surface water	**Pollution of surface water resource** Transport of coal by truck has the potential to impact on watercourses and general runoff quality, primarily due to spillage of coal, as well as contaminated water from the truck itself and at transfer stations. Impacts may arise from: • Spillage of water from truck load boxes	M: Moderate D: Long term S: Site C: Medium P: Definite SI: Medium (-)	• Loading and offloading of trucks will take place only within the designated dirty water areas and Goedehoop. • Loading of trucks will be carefully controlled to ensure that overloading will not take place. • Truck load boxes will be covered with tarpaulins to prevent spillage of coal from the backs of trucks during transport.	M: Minor D: Long term S: Site C: Medium P: Unlikely SI: Low
C.17.	Storage of overburden material, overburden stockpile	Groundwater	**The formation of acid mine drainage (AMD) as a result of ingress water and oxygen into the stockpiled overburden** The potential impact of seepage water into shallow weathered aquifer from the overburden stockpile is considered to be moderate. Potential contaminants may impact on the groundwater usage, which includes domestic and agricultural use. Generally, overburden is considered inert and therefore does not have a great potential for AMD. However, during the removal of the overburden in the construction of the boxcut, there is the potential to remove some of the coal from the No. 2 and No.4 and possible No. 5 seams. This coal has AMD potential as per the results of the geochemical analysis of the coal. The AMD potential of the overburden stockpile is considered moderate in the long term as the overburden will be stockpiled for the LOM. The impact will be limited to the site.	M: Moderate D: Long term S: Site C: Medium P: Definite SI: Medium (-)	• Verify AMD generation potential of the overburden only through sampling and analyses of core samples from the boxcut location. • Ensure that all coal is removed from the overburden before placement on the stockpile. • Coal removed from overburden to be taken to Goedehoop Colliery and included in the processing plant. • Place the overburden on a properly prepared and compacted footprint. • A civil engineering design, incorporating footprint preparation, leachate control and storm water management, must be undertaken and submitted to DWS for approval. • Compact and shape overburden stockpile to be free draining to minimise rainfall infiltration.	M: Minor D: Long term S: Site C: Medium P: Unlikely SI: Low (-)
C.18.	Construction of boxcut	Groundwater	**Influx of groundwater into boxcut void** The void in the boxcut will lead to an influx of groundwater. This will result in the potential dewatering of the surrounding shallow and deep aquifers. This will manifest as a groundwater cone of depression in the water table with negative consequences of the availability of groundwater for existing borehole users around the proposed boxcut. The magnitude is considered minor due to the limited extent of the impact (500 m around boxcut). However the	M: Minor D: Long term S: Site C: Medium P: Definite SI: Medium (-)	• Sealing of boxcut walls with shotcrete/gunite which will allow groundwater levels to reduce and re-establish the cone of depression. • Provide affected borehole users with alternative sources of water.	M: Minor D: Long term S: Site C: Medium P: Possible SI: Medium (-)

Assessment of potential impacts of the Elders Colliery during the Construction Phase						
Number	**Activity**	**Environmental aspect**	**Potential Impact**	**Significance rating (not mitigated)**	**Mitigation Measures**	**Significance rating (if mitigated)**
			significance is medium due to the duration of the impact throughout the construction and operational phases of the project.			
C.19.	Construction of boxcut	Groundwater	**Contamination of groundwater resources due to spillage** It is anticipated that deterioration of groundwater quality may occur from the infiltration from contaminants including hydrocarbons, chemicals and carbonaceous material affecting surface water from the boxcut area into the adjacent aquifers. However, these impacts will only occur within the boxcut and associated infrastructure footprint.	M: Moderate D: Long term S: Site C: Medium P: Definite SI: Medium (-)	• A leak/spill detection plan should be devised and implemented for all possible areas of leaks/spillages. • Regular groundwater monitoring from existing and proposed monitoring boreholes will be undertaken to identify any potential contamination of groundwater resources. • Should pollution be identified within the groundwater resources, the source of the pollutants will be identified and the applicable remediation measures will be implemented.	M: Minor D: Short term S: Site C: Low P: Possible SI: Low (-)
C.20.	Site clearing and grubbing of the footprint areas associated with the boxcut and associated surface infrastructure. Construction of boxcut and associated surface infrastructure.	Wetland	**Loss and disturbance of wetland habitat** The clearing of vegetation and soil stripping from the proposed boxcut and surface infrastructure areas will result in the complete and permanent loss of wetland habitat located within the proposed footprints. In total approximately 16 ha of hillslope seepage wetland habitat will be lost. The PES of theses hillslope seepage wetlands have been rated as moderately and largely modified. It is further likely that site clearing activities will result in disturbances to wetland habitat outside the direct development footprints through activities such as temporary stockpiles, construction camps, vehicle turning circles etc. The loss of wetland habitat cannot be totally avoided. It is however possible to minimise the disturbance of wetland habitat outside the direct development footprint through implementation management measures.	M: Major D: Long term S: Site C: High P: Definite SI: High (-)	• The proposed development footprint will be fenced off and all activities contained within the fenced off area. • Clearly demarcate the proposed development footprints and limit all activities to the demarcated area. • Develop and implement a construction stormwater management plan prior to the commencement of site clearing activities. • Rehabilitate and re-vegetate all disturbed areas as soon as possible following disturbance. • Inform contractors regarding the location and sensitive of all wetland areas. • Areas in and around the wetlands should not be cleaned, graded and ditched/trenched more than a week before construction activities commence. • Divert flows from upslope of the construction area around the cleared area. • Regular low level humps will be installed along linear preferential flow paths such as construction roads/tracks that run perpendicular to the slope to slow down and disperse flows. • Divert flows from upslope of the construction area around the cleared area. • No washing of equipment or machinery in any waterbody or wetland on site. • Store potential contaminants in designated areas with spill containment measures. • Keep sufficient spill clean-up material on site to deal with small spills • Develop emergency response procedures to deal with large spills. • Compile and implement alien vegetation management plan to remove and control establishment and spread of alien species. • Wetland offset project will be investigated.	M: Moderate D: Long term S: Site C: High P: Definite SI: Medium (-)
C.21.	Site clearing and grubbing of the footprint areas associated with the boxcut and associated surface infrastructure. Construction of boxcut and associated surface infrastructure.	Wetland	**Increased surface runoff from bare soil areas and sedimentation into adjacent wetlands** Vegetation clearing and soil stripping will result in large areas of bare, compacted soils that will increase surface runoff volumes and velocities. Changes in runoff will be most significant during regular storm events and lead to increased sedimentation in receiving streams, increasing the erosive energy of flows and enhancing channel incision and lateral erosion. This will lead to further desiccation of the valley bottom wetlands. In addition, the increase of surface runoff volumes and velocities ,will increase sediment loads transported off the cleared area and into downslope wetlands. Where flows enter wetland areas, sediment will be deposited and changes in vegetation are likely to occur, with pioneer species such as *Typha capensis* and *Phragmites australis* likely to become dominant. The establishment of dense reed beds can, depending on their location, present significant flow obstacles during flood events and lead to channel switching.	M: Moderate D: Long term S: Site C: Medium P: Possible SI: Medium (-)		M: Moderate D: Short term S: Site C: Low P: Possible SI: Low (-)
C.22.	Site clearing and grubbing of the footprint areas associated with the boxcut and associated surface infrastructure. Construction of boxcut and associated surface infrastructure.	Wetland/Surface water	**Water quality deterioration** During the construction phase, as activities are taking place within and adjacent to wetlands, there is a possibility that water quality can be impaired. Typically impairment will occur as a consequence of sediment disturbance resulting in an increase in turbidity. Water quality may also be impaired as a consequence of accidental spillages and the intentional washing and rinsing of equipment within the wetlands. It is likely that hydrocarbons will be stored and used on site, as well as cement and other potential pollutants.	M: Moderate D: Long term S: Site C: Medium P: Possible SI: Medium (-)		M: Minor D: Medium term S: Site C: Low P: Possible SI: Low (-)
C.23.	Site clearing and grubbing of the footprint areas associated with the boxcut and associated surface infrastructure. Construction of boxcut and associated surface infrastructure. Construction of conveyor, pipeline, service road and	Wetland	**Establishment and spread of alien species** Areas disturbed during the construction process will be susceptible to invasion by alien vegetation, e.g. *Acacia mearnsii* (black wattle). These alien species could spread to the adjacent wetland areas and result in decreased flows, increased erosion and decreased biodiversity in these systems.	M: Moderate D: Long term S: Local C: Medium P: Possible SI: Medium (-)		M: Minor D: Short term S: Site C: Low P: Possible SI: Low (-)

Assessment of potential impacts of the Elders Colliery during the Construction Phase						
Number	**Activity**	**Environmental aspect**	**Potential Impact**	**Significance rating (not mitigated)**	**Mitigation Measures**	**Significance rating (if mitigated)**
	powerlines (including upgrade of existing conveyor belt)					
C.24.	Construction of conveyor, pipeline, service road and powerlines (including upgrade of existing conveyor)	Wetland	**Loss and disturbance of wetland habitat** Fifteen (15) wetland crossings have been identified along the proposed conveyor servitude between Elders and Goedehoop, consisting of a number of channelled valley bottom wetlands and hillslope seepage wetlands. Wetland habitat falling within the footprint of the proposed linear infrastructure, especially the conveyor and the service road, will be disturbed during the construction process, and some wetland habitat is also likely to be lost. PES values of these wetlands (Figure 8) vary between largely natural with few modification to largely modified. In addition, construction vehicles accessing the route, turning, offloading materials on site etc. are also likely to contribute to disturbance and destruction of wetland habitat outside the servitude. Disturbance of the wetland vegetation is also likely to provide opportunity for invasion by alien vegetation and increase the risk of erosion.	M: Major D: Long term S: Local C: High P: Definite SI: High (-)	• The extent of disturbance should be limited by limiting all construction activities to the servitude as far as practically possible. • Fence off the conveyor servitude prior to the commencement of vegetation clearing and earthmoving activities. • No materials should be stockpiled within the wetland areas along the route and driving within the wetland areas will be kept to an absolute minimum. Clearly defined access routes should be used. • No stockpiling of materials or placement of temporary construction infrastructure in the wetlands or within 50m of the wetlands. • Use existing farms tracks and roads for access where possible. • The conveyor should span the entire width of the active channel in valley bottom crossings. Conveyor footings within the wetlands will be kept to a minimum. • Post construction all alien invasive vegetation should be removed from site. This will also require long-term follow up to ensure establishment of natural vegetation in all disturbed areas. • Inform contractors regarding the location and sensitivity of all wetland areas.	M: Moderate D: Short term S: Local C: Low P: Definite SI: Medium (-)
C.25.	Construction of conveyor, pipeline, service road and powerlines (including upgrade of existing conveyor)	Wetland	**Increase risk of erosion within wetlands** The soils within the wetlands along the conveyor servitude are generally fairly shallow and underlain by a ferricrete horizon. These soils are highly susceptible to erosion. The clearing of vegetation, together with the disturbance of the soil and the potential flow concentration within wetlands during the construction phase pose a significant erosion risk, with eroded sediment transported downstream and into the Olifants River.	M: Major D: Long term S: Local C: High P: Definite SI: High (-)	• Clearly demarcate the required construction servitude and maintain all activities within the demarcated area. • No conveyor footings should be placed within the active channel of any valley bottom wetlands. The active channel should be spanned. • Locate all stockpiles, laydown areas and temporary construction infrastructure at least 50m from the edge of delineated wetlands. • Service road crossings over valley bottom wetlands should be via low level bridges – low flows will be accommodated via culverts and flood flows should overtop the low level bridge. • Culvert capacity should be such to prevent impoundment upslope of the crossing and flow concentration downslope. • Install erosion prevention measures and sediment barriers prior to the commencement of construction activities. • Clearly demarcate the required construction servitude and maintain all activities within the demarcated area. • Revegetate and rehabilitate areas as soon as possible after completion of construction.	M: Moderate D: Short term S: Local C: Low P: Possible SI: Low (-)
C.26.	Construction of conveyor, pipeline, service road and powerlines (including upgrade of existing conveyor)	Wetland	**Increased sediment transport into wetlands** Sediment washed off the bare soil areas associated with construction areas will be deposited in wetland areas and eventually enter the Olifants River. Sediment deposition in wetlands will lead to changes in wetland vegetation. The soils within the wetlands along the conveyor servitude are generally fairly shallow and underlain by a ferricrete horizon. These soils are highly susceptible to erosion. The clearing of vegetation, together with the disturbance of the soil and the potential flow concentration within wetlands during the construction phase pose a significant erosion risk, with eroded sediment transported downstream.	M: Moderate D: Long term S: Local C: Medium P: Definite SI: Medium (-)		M: Moderate D: Short term S: Local C: Low P: Possible SI: Low (-)
C.27.	Construction of conveyor, pipeline, service road and powerlines (including upgrade of existing conveyor)	Wetland/Surface water	**Water quality deterioration** During construction, as activities are taking place adjacent to wetlands, there is a possibility that water quality can be impaired. Typically impairment will occur as a consequence of sediment disturbance resulting in an increase in turbidity. Water quality may also be impaired as a consequence of accidental spillages and the intentional washing and rinsing of equipment within the wetlands. It is likely that hydrocarbons will be stored and used on site, as well as cement and other potential pollutants.	M: Moderate D: Long term S: Local C: Medium P: Possible SI: Medium (-)	• No washing of equipment or machinery in any waterbody or wetland on site. • Store potential contaminants in designated areas with spill containment measures. • Keep sufficient spill clean-up material on site to deal with small spills • Develop emergency response procedures to deal with large spills.	M: Minor D: Medium term S: Site C: Low P: Possible SI: Low (-)
C.28.	Site clearing and grubbing of the footprint areas associated with the boxcut and associated surface infrastructure.	Air Quality	**Increase in dust fallout, PM_{10} and $PM_{2.5}$ particles affecting adjacent communities** The air quality specialist study modelled the daily and annual PM10 and PM2.5 Ground Level Concentrations (GLC) expected during the	M: Minor D: Short term S: Local C: Low	• Clearing will be limited to the designed footprint. • Water sprays on unpaved roads, stockpiles and material handling points.	M: Minor D: Short term S: Local C: Low

Assessment of potential impacts of the Elders Colliery during the Construction Phase						
Number	**Activity**	**Environmental aspect**	**Potential Impact**	**Significance rating (not mitigated)**	**Mitigation Measures**	**Significance rating (if mitigated)**
	Construction of boxcut and associated surface infrastructure. Construction of conveyor belt between Elders Colliery and Block 20. Upgrade of existing conveyor belt and construction of new section to Goedehoop Colliery plant		construction phase. In addition, the expected dustfall was also modelled. The plot for PM_{10} and $PM_{2.5}$ GLC annual average is provided for the year 2013, in Figure 12 and Figure 13 respectively. The simulated PM_{10} and $PM_{2.5}$ frequency of exceedance (FOE) result in exceedance of their respective 4-day per-year South African National Air Quality Standards (SA NAAQS) outside the Elders boundary. The impact extends outside the Elders boundary along the conveyor belt. However, the simulated annual average PM_{10} and $PM_{2.5}$ GLCs does not result in exceedance of their respective SA NAAQS value outside the Elders boundary. Isopleth plot due to nuisance effect of dustfall during construction is provided in Figure 14. The simulated maximum daily dustfall deposition rate result in exceedance of the National Dust Control Regulations (NDCR) residential limit (600 mg/m^2-day) and non-residential limit (1200 mg/m^2-day) outside the Elders boundary, along the conveyor belt. The exceedance, pre- mitigation, will have a medium impact on the Middelkraal and Vlakkuilen community. There are no communities or sensitive receptors within 500 m of the existing conveyor belt to be upgraded. It is unlikely that the upgrade of the conveyor belt will cause any additional impact to sensitive receptors. The new section of the conveyor belt to Goedehoop Colliery plant has been re-routed to avoid the Mahlathini community. This new section of the conveyor belt falls within the existing mining area directly adjacent to existing mining related activities. It will run pass the existing Hope Village along an existing conveyor belt route. Additional impact is anticipated to be low based on the operation of the existing conveyor belt	P: Definite SI: Medium (-)	• Traffic control done through restriction of traffic volumes on internal roads and vehicle speeds. • Vehicle speeds within the mining area will be limited to 40 km/h. • Use water sprays on all stockpiles with special attention given to active stockpiles. • Net screens with fine mist sprays around stockpiles areas. • Maintain a complaints register and capture the dust related complaints in the grievance mechanism. The grievance will be investigated by the applicable Elders Colliery representative in order for the complaint to be resolved and closed out. • Implementation of a dust monitoring programme to monitor dust impacts.	P: Possible SI: Low (-)
C.29.	Construction of boxcut and associated infrastructure. Upgrade of existing conveyor belt and construction of new section to Goedehoop Colliery plant.	Noise	**General rise in ambient noise levels** During construction the modelled noise levels for daytime indicate that the increase in noise will be limited to the construction site. The Middelkraal community and adjacent farmstead are unaffected by increased noise levels. The model indicates that there will be no increase in ambient noise levels at both the Middelkraal community and the farmstead during daytime. Refer to Figure 15. During night time the increase in ambient noise levels extends much further due to the very low baseline ambient noise levels. However, the Middelkraal community will remain unaffected and at the farmstead the increase will be insignificant. The model indicates that there will be a zero dBA increase at the Middelkraal community and the farmstead will have a 1 dBA increase during night time. Refer to Figure 16. There are no communities or sensitive receptors within 500 m of the existing conveyor belt to be upgraded. It is unlikely that the upgrade of the conveyor belt will cause any additional impact to sensitive receptors. The new section of the conveyor belt to Goedehoop Colliery plant has been re-routed to avoid the Mahlathini community. This new section of the conveyor belt falls within the existing mining area directly adjacent to existing mining related activities. It will run pass the existing Hope Village along an existing conveyor belt route. Additional impact is anticipated to be low based on the operation of the existing conveyor belt	M: Minor D: Short term S: Local C: Low P: Possible SI: Low (-)	• Ensure high level of equipment maintenance, especially intake and exhaust mufflers. • Withdraw equipment for maintenance if change in noise emission characteristics is noticeable. • Replace pure tone (beeping) with broadband (hissing) reversing alarms. • Maintain complaints and grievance register and act promptly to complaints regarding noise.	M: Minor D: Short term S: Local C: Low P: Possible SI: Low (-)
C.30.	Site clearing and grubbing of the footprint areas associated with the boxcut and associated surface infrastructure.	Heritage	**Impact on heritage resources** No sites, features or objects of cultural heritage significance were identified at the boxcut and associated infrastructure area, or along	No impact	As no cultural heritage significant features were found during the specialist study, no mitigation is required. However, should any features be found during the construction phase, a chance find procedure will be implemented to manage historical sites that may be identified during clearing activities.	No impact

Assessment of potential impacts of the Elders Colliery during the Construction Phase						
Number	**Activity**	**Environmental aspect**	**Potential Impact**	**Significance rating (not mitigated)**	**Mitigation Measures**	**Significance rating (if mitigated)**
	Construction of boxcut and associated surface infrastructure. Construction of the conveyor belt from Elders Colliery to Block 20		the conveyor route from Elders Colliery to Block 20. Therefore, in this area, there would be no impact from the proposed development.		Contractors will be informed of chance find procedure as part of environmental awareness and training.	
C.31.	Upgrading of existing conveyor belt between Block 20 and Goedehoop Colliery, construction of new section of conveyor belt	Heritage	**Impact on heritage resources – Old building** This is a building used as a church at the demolished New Town Village. It is in a reasonably good condition and the age thereof is currently unknown. It has low significance. The field rating given for the site is General protection C. It means that the heritage report compiled by Archaetnos is seen as ample documentation and mitigation of the site, and that the building may be demolished if necessary. The upgrading of the existing conveyor route will not have any impact on the old building as it has been re-routed to the western side of the demolished New Town Village.	No impact	The upgrading of the existing conveyor route will not have any impact on the old building as it has been re-routed to the western side of the demolished New Town Village. The old building may be demolished, should mine management deem it necessary.	No impact
C.32.	Upgrading of existing conveyor belt between Block 20 and Goedehoop Colliery, construction of new section of conveyor belt	Heritage	**Impact on heritage resources – Graves** Approximately six graves (possibly up to 16) have been identified in the graveyard adjacent to the existing conveyor belt to be upgraded. Graves are always regarded as having a high cultural significance. The field rating is Local Grade IIIB. The graveyard is located approximately 200 m from the conveyor belt. Therefore the potential impact on the graveyard is low. Grave exhumation permits will be obtained from SAHRA should it be necessary to exhume the graves.	M: Major D: Long term S: Site C: High P: Unlikely SI: Medium (-)	• Graveyard to be fenced off and clearly demarcated. Upgrading should take place well outside of the fenced off area. • The graveyard will be accessible to descendants. • A management plan for the preservation of the graves will be compiled by a heritage expert and will be implemented by the mine and appointed construction contractor. • Dust control around the graveyard will be implemented.	M: Major D: Long term S: Site C: High P: Unlikely SI: Medium (-)
C.33.	Construction of boxcut – blasting	Blasting	**Ground vibration: Impact on surface infrastructure** The boxcut operation was evaluated for expected levels of ground vibration from future blasting operations. Review of the site and the surrounding surface infrastructure showed that structures vary in distances from the boxcut area. The structures identified range in distance from very close to very far for the boxcut area and could be problematic. The evaluation took mainly up to 1 500 m from the mining areas into consideration. The closest structures found are the R35 Road and the proposed 9T silo at. The silo will be part of the infrastructure for the mine. The ground vibration limit currently on the silo is 50 mm/s. The silo construction is a continuous concrete pouring process and during this period the limits on fresh concrete is very low at 5 mm/s. Coordination between blasting and erection of silo will be required. The Olifants and Viskuile Rivers are relatively far from the proposed boxcut area at 914m to 1 197 m respectively and no impact from ground vibration is anticipated.	M: Moderate D: Short term S: Local C: Medium P: Possible SI: Medium (-)	• Revisit the boxcut blast design and undertake a proper detail design. Manage ground vibration at the R35 and Middelkraal communities • Maintain a minimum safe distance of 207 m (recommended is a minimum of 500 m) from any blasting done. This may be greater but not less. The blaster has a legal obligation concerning the safe distance and will determine this distance prior to the construction phase. • All persons within 500 m from a blast will be cleared and where necessary evacuation will be conducted with all the required pre-blast negotiations. • Ensure that ground vibration is within limits. • The current proposed stemming lengths (4.1 m) as defined in the blast design will be maintained to ensure control on fly rock. Specific designs where distances and blast is known should be considered. • Blasting should be undertaken when the road usage is low. Early mornings and late afternoons should be avoided. • No blasting will take place in fog conditions. • Blasting will not be undertaken during night time. • Blasting will not be undertaken when strong winds are blowing. • Blasting times will be fixed. • Blasting notice boards will be setup at various routes around the project area, informing road users, farmers and communities of blasting dates and times. • The Middelkraal and Vlakkuilen communities will be informed of planned blasting. • Third party consultation and monitoring will be undertaken for all ground vibration and air blast monitoring work.	M: Minor D: Short term S: Local C: Low P: Possible SI: Low (-)
C.34.	Construction of boxcut – blasting	Blasting	**Ground vibration: Human perception** Review of the maximum charge in relation to human perception has proven that people may experience levels of ground vibration as perceptible within a 3 500 m area. At 1 250 m the expected ground vibration levels are still less than the lower safe blasting limit – less than 6 mm/s, but will be experienced by people as “unpleasant”. Distances closer than 950 m will exceed the minimum 6 mm/s proposed safe limit for poorly constructed structures. There are no private houses, farmsteads or communities within a 1 000 m radius but definitely within 1500 m from the box-cut area. The Middelkraal community could potentially feel ground vibration of the blasts undertaken at the boxcut.	M: Moderate D: Short term S: Local C: Low P: Possible SI: Low (-)		M: Minor D: Short term S: Local C: Low P: Possible SI: Low (-)

Assessment of potential impacts of the Elders Colliery during the Construction Phase						
Number	**Activity**	**Environmental aspect**	**Potential Impact**	**Significance rating (not mitigated)**	**Mitigation Measures**	**Significance rating (if mitigated)**
C.35.	Construction of boxcut – blasting	Blasting	**Ground vibration: Impact on R35** The R35 road is on the south western side of the box-cut area and is at closest 64m away from the planned box-cut area. Expected ground vibration levels at this road are higher than the recommended limits. The current maximum charge mass may not be used at the nearest point to the road as the ramp down into the boxcut is sloping down deeper away from the road. This means that at closest point to the road the required blasting will be much less than the maximum or minimum charge. Specific designs will be required to determine the actual possible influence at the road and only then can the exact possible levels be determined and course of action decided upon.	M: Major D: Short term S: Local C: Medium P: Definite SI: Medium (-)	• Blasting parameters applied to blasting activity will ensure that ground vibration levels are within acceptable standards near the R35. • Close the R35 during blasts. • Obtain required authorisations from the roads agency/department to close road and blast in close proximity to R35. • Notification of road closures will be communicated prior to the blasting activities. • Monitoring will be undertaken during blasting activities • Roads will be cleared after blasting should any material have landed on the road.	M: Minor D: Short term S: Local C: Low P: Possible SI: Low (-)
C.36.	Construction of boxcut – blasting	Blasting	**Airblast: Impact on surface infrastructure** Air blast predicted for the maximum charge ranges between 114.5 and 117 dB where structures are of concern. The predictions indicate that air blast levels at nearest house structures are low and not expected to have any significant influence or reason for damage concern. Complaints from air blast are normally based on the actual effects that are experienced due to rattling of roofs, windows, doors etc. These effects could startle people and raise concern of possible damage. The possible negative effects from air blast are expected to be less than that of ground vibration. It is maintained that if stemming control is not exercised this effect could be greater with greater range of complaints or damage. This boxcut is located such that “free blasting” – meaning no controls on blast preparation – will not be possible.	M: Minor D: Short term S: Local C: Low P: Possible SI: Low (-)	Mitigation measures as per C.33 to C.35.	M: Minor D: Short term S: Local C: Low P: Possible SI: Low (-)
C.37.	Construction of boxcut – blasting	Blasting	**Fly rock: Impact on surface infrastructure** After review of the factors that contribute to fly rock it is certain that if no stemming control is exerted there will be fly rock from blasting. A stemming length of 4.1 m as defined in the blast design is expected to yield fly rock that could travel as far as 207 m. Further reduction of stemming length will certainly see fly rock travelling further. At a distance of 207 m as the minimum exclusion zone, the R35 and proposed 9 T silo can be impacted upon. Optimal throw distance is also observed at 45 degree angles of departure and at the elevated levels of blasting care must be taken on fly rock as travel distance may be further than anticipated. Careful attention will need to be given to stemming control to ensure that fly rock minimised as much as possible. A 207 m exclusion zone is recommended.	M: Major D: Short term S: Local C: Medium P: Definite SI: Medium (-)	Mitigation measures as per C.33 to C.35. • Remove fallen rocks from topsoil stockpiles.	M: Minor D: Short term S: Local C: Low P: Possible SI: Low (-)
C.38.	Development of the Elders Colliery	Socio-Economic	**Conflict with communities within the Primary ZoI should expectations to benefit from economic opportunities and improved living conditions not be met** The Vlakkuilen and Middelkraal communities are the closest communities to the mine, and are having expectations that the development of the mine will improve their living conditions in terms of employment and poverty alleviation. However, due to the fact that most of the local community members do not have the required skills and education levels required for these employment opportunities, it is possible that people from outside of the project area might benefit from these opportunities ahead of local people. It has also been established that the area surrounding the Elders Colliery project is already experiencing influx that is not related to mining; as a result it is possible that local communities could associate this influx with the Elders Colliery. Similarly, if they do not access any job opportunities, they might blame the mine for hiring people who do not belong to the local areas, thus resulting in conflicts with the mine.	M: Major D: Medium term S: Local C: Medium P: Possible S: Medium (-)	• Compile and implement the management measures detailed in the SLP • Prioritise the employment of the communities residing within the Primary ZoI for semi-skilled and unskilled job opportunities during construction; • Enforce the contractor management plan, especially relating to local recruitment and procurement; and, • Where possible, engage with the Govan Mbeki Local Municipality and Steve Tshwete District Municipality to identify opportunities of collaboration and capacity building for the provision of social services to the communities within the Primary ZoI.	M: Moderate D: Medium term S: Local C: Medium P: Possible S: Medium (-)

Assessment of potential impacts of the Elders Colliery during the Construction Phase						
Number	**Activity**	**Environmental aspect**	**Potential Impact**	**Significance rating (not mitigated)**	**Mitigation Measures**	**Significance rating (if mitigated)**
			Levels of services in the Primary ZoI are also poor, leading to expectations for the mine to contribute towards the improvement of these services. Having established during the focus group meetings that the Middelkraal community is distancing itself from local government because they refer to themselves as private landowners, it is possible that the mine would be expected to play the role of government in local service delivery. While it is acknowledged that local service delivery is not the competency of the mine, it is important for Elders Colliery to manage this expectation through their stakeholder engagement protocol, and to continue making sure that all Elders employees (including contractors) interfacing with communities provide consistent messages regarding this.			
C.39.	Development of the Elders Colliery	Socio-Economic	**Influx of people and construction workers leading to increased pressure on social services and infrastructure, social pathologies and disruptions, resulting in spontaneous settlements** The development of a substantial mining project can mean a high public profile even before project activities commence. Such speculation raises expectations of, and interest in, the potential benefits of a project (IFC, 2009). It is possible that as potential jobseekers and contractors start moving into the project area in expectation of economic benefits from the project, spontaneous settlements could develop to cater for their housing needs. While it is unlikely that the jobseekers could establish their housing within the Primary ZoI (Vlakkuilen and Middelkraal), it is likely that Emzinoni, and Mahlathini within the Secondary ZoI and Thubelihle in the Tertiary ZoI might experience a further growth of informal housing, It is anticipated that influx and opportunistic settlement will peak during the construction phase of the mine when demand for unskilled local labour is at its highest. Engagements with key informants in 2015 have raised influx of mineworkers into the area as a concern, mostly in relation to the competition for services. On the other hand, the renting out of backyard shacks and rooms in Emzinoni provides for income for the households. It was also gathered during focus group meetings at Middelkraal that the households also used to rent out outside rooms to the employees of Middelkraal (Umcebo) Mine, before it was closed in June 2015. However, it seems as if the employees have now vacated the area, suggesting that influx for construction workers may be temporary. It is therefore possible that should there be a need for housing of employees close to the project area, this community will continue to earn incomes from renting out their outside rooms. However, this will only be for the construction period of 18 months, after which it is assumed that the construction workers will move to potential new areas of development in the region. The development of spontaneous settlements could potentially lead to an increase in the current social pathologies currently experienced, particularly prostitution and alcohol abuse, due to the presence of construction workers. Influx is already occurring in these settlements. It has been confirmed through discussions with key informants in 2015 that these social pathologies have been increasing in the area. There will be no contractor accommodation on site, it is anticipated that construction workers will be self-accommodated or sourced in Bethal, Emzinoni, Kriel and Thubelihle. An influx of people into the area will increase the demand for existing services and infrastructure that are already under pressure to deliver adequate services to the local population. This impact, if not adequately managed, will exacerbate and worsen poor service delivery in the area. With the levels of unemployment in the area being so high, there is also a potential for the communities within the Primary ZoI (Vlakkuilen and Middelkraal) to rent out backrooms to mine	M: Moderate D: Long term S: Local C: Medium P: Definite SI: Medium (-)	• Develop a clear and concise employment and recruitment policy that prioritizes local recruitment. Ensure that contractors adhere to this policy; • Identify and support community development programmes that address challenges raised by population influx and spontaneous settlement; • Enforce the Anglo American Contractor Management Plan, which should in addition address accommodation, living standard, transport and health and safety standards of contractors; • Enforce the Anglo American principles regarding employee and contractor behaviour; • Continuously monitor the housing and living conditions of employees receiving living out allowances; • Support local government capacity for integrated development planning; • Participate in the local government's strategy to address issues related to and potentially enhanced by project-induced influx. This strategy will be developed in order to clearly define how participants, including AOL, local government and relevant stakeholders, intend to manage the impacts caused by influx where possible; and, • Compile and implement the community health and safety initiatives of the Community Health and Safety Plan (CHSP), such as education and awareness programs that address social pathologies in neighbouring communities through established government departments.	M: Moderate D: Long term S: Local C: Medium P: Possible SI: Medium (-)

Assessment of potential impacts of the Elders Colliery during the Construction Phase						
Number	**Activity**	**Environmental aspect**	**Potential Impact**	**Significance rating (not mitigated)**	**Mitigation Measures**	**Significance rating (if mitigated)**
			contractors and employees to make additional income. Middelkraal households have provided accommodation to mine workers on the Middelkraal Mine (Umcebo). Vlakkuilen has not experienced an influx, despite the announcement of the Elders project since as early as 2005. These communities already have limited access to services, and the rental income gained will further reduce access to these resources. ***This impact will continue throughout the operation phase***			
C.40.	Development of the Elders Colliery	Socio-Economic	**Benefits resulting from employment and income opportunities created by Elders Colliery** Employment and a secure income provide many socio-economic benefits to employees and their dependents, including: • Improved material wealth and standard of living; • Enhanced potential to invest in and improve access to social services such as education, health services, etc. (which may be provided directly by the company to employees and/or employees may now have the funds to pay for these services); and, • Employment and training of unskilled workers facilitates skills development and improves the future employment prospects of such workers. Secure wage employment can also contribute towards a sense of independence, freedom, and pride, and it may promote a good work ethic. The mine will create various types of employment: • Direct employment for the workforce • Indirect employment at the supplier companies (procurement); and • Induced employment The local employment generated or sustained during the construction phase is expected to have an impact of moderate magnitude and short-term duration. It is also expected to impact at a local scale as it is likely that earnings will benefit extended family and commercial networks. Local employment benefits may be further increased by sourcing as many goods and services as possible from within the study area. However, due to technical requirements and constrained local supply that limit procurement options, the scope to expand local employment and procurement is limited. The Anglo American local procurement policy supports sustainable, responsible local procurement that positively contributes to a resilient supply chain and the economic and social development of the communities in which they operate. While Elders Colliery had not provided their procurement strategy at the time of writing this report, it is expected that they will adhere to the Anglo American local procurement policy. ***This impact will continue throughout the operation and closure phases.***	M: Moderate D: Short term S: Local C: Low P: Possible SI: Low (+)	• Enforce the Anglo American Contractor Management Plan, which should in addition address accommodation, living standard, transport and health and safety standards of contractors; • Develop a clear and concise employment policy prioritizing local employment; • Implement vocational training programs to promote local workforce capacity as per the Labour and Human Resources Plan (LHRP); • Employ local workers if qualified applicants with the appropriate skills are available. Formalize this policy in company Human Resources guidelines and contractors' agreements; • Purchase goods and services at a local level, if available. Formalize this policy in company purchasing guidelines and contractors' agreements; • Work closely with the local communities before and during the project to identify and communicate required skills and resources that the local community could provide; • Provide or facilitate training of local people in mining and general business skills before and during mining activities, such as through internships, scholarships, and/or vocational and skills training programs; • Prepare a detailed vocational training program in consultation with the local community to be implemented during the construction phase; and, • Through the stakeholder engagement process ensure that expectations are managed around employment opportunities and practices.	M: Moderate D: Short term S: Local C: Low P: Possible SI: Low (+)
C.41.	Development of the Elders Colliery	Socio-economic	**Dissatisfaction over employment opportunities and conditions of procurement which could potentially lead to community protests and unrests, as well as conflicts within communities** The Social Impact Assessment report identified poverty, unemployment and low education and skills levels in the local areas as potential deterrents of employment for local communities. As a result, the majority will not benefit and will therefore continue living off alternative methods, such as social grants, rental income, small-scale commerce etc. Many of these activities are expected to yield a lower and more uncertain income than that associated with mine employment. It is generally perceived that people who will benefit	M: Major D: Short term S: Local C: Medium P: Definite SI: Medium (-)	• Develop a clear and concise employment policy prioritizing local employment and communicate this through established communication protocols; • Enforce the Anglo American Contractor Management Plan, which should in addition address local procurement; • Employ staff from across community groups and the Project area and keep recruitment and employment records, distributing short-term opportunities to as many as possible; and,	M: Moderate D: Short term S: Local C: Low P: Possible SI: Low (-)

Assessment of potential impacts of the Elders Colliery during the Construction Phase						
Number	**Activity**	**Environmental aspect**	**Potential Impact**	**Significance rating (not mitigated)**	**Mitigation Measures**	**Significance rating (if mitigated)**
			most from mining employment are those with the highest levels of education and experience, leaving behind those with the lowest education qualifications. Any new development similar to the Elders project, where surrounding communities are characterised by abject poverty, high expectations for employment and low levels of skills, has a potential to contribute to the marginalization of specific groups within a community, specifically the poorly educated and women (particularly those with children). If not properly managed, this could result in increasing economic disparity, where people who are not successful in getting employment cannot maintain the same living standard as people who are employed. This could further contribute to a number of changes, such as: • Diminished social cohesion as some members of the community can afford more goods and/or adopt different lifestyles; • A change in social values away from community cantered-values towards individual-centred values; and, • A change in local power structures in line with earning power.		• Develop an SLP that considers integrated development of communities impacted by the Project.	
C.42.	Development of the Elders Colliery	Socio-economic	**Improved employment and enterprise development opportunities through skills development and capacity building initiatives** Preferential employment and skills development opportunities for local communities are some of the key concerns raised by stakeholders particularly communities within the Primary and Secondary ZoI in the 2013 and 2015 stakeholder engagement meetings. However, according to the baseline, the levels of skills and education in the areas surrounding the proposed Elders Colliery are low. This will make it difficult for these communities to gain any meaningful employment opportunities from the project and result in conflict situations should people from other areas benefit from these opportunities that are generally perceived to belong to local communities. While skills development for local communities is not mentioned in the Elders SLP, Elders Colliery has a skills development strategy for their existing employees, which is based on the following: • Providing the opportunity for all employees to obtain a minimum educational level equivalent to ABET Level 4; • Ensuring that the operation has the required skills and competencies within the workforce to enable us to achieve our business and operating mandate; and, • Providing a conducive environment for employees to develop and pursue clear career paths within the organisation as a whole. Furthermore, Anglo American Coal SA manages a bursary scheme designed to provide feedstock for the core and critical skills required by the organisation. In terms of this scheme, bursaries are awarded to candidates (sourced both from local communities and elsewhere) to study in key disciplines such as Mining Engineering, Electrical and Mechanical Engineering, Geology, Survey, Metallurgy, Human Resources and Finance. Upon successful completion of their studies the graduates are placed across the various operations to complete a training (internship) period. While there are opportunities regarding the planned upskilling of communities surrounding the mine, it is important to note that these opportunities might not be available directly from the Elders Colliery's intervention. However, in order to make some contribution towards skills development in the surrounding areas, AOL could potentially contribute towards government's training and skills development initiatives.	M: Moderate D: Short term S: Local C: Low P: Possible SI: Low (+)	• In order to promote skills development and capacity building initiatives to both employees and the broader population and, in particular amongst youth, the SLP should focus on enterprise development and capacity building; • Support local government in their skills development and training initiatives; • Furthermore, AOL's closure plan will aim to reinforce the objectives of the SLP by reducing the reliance on AOL for employment by promoting skills transfer to enable alternative livelihoods; and, • Develop a clear and concise employment policy prioritizing local employment.	M: Moderate D: Short term S: Local C: High P: Possible SI: Low (+)

Assessment of potential impacts of the Elders Colliery during the Construction Phase						
Number	**Activity**	**Environmental aspect**	**Potential Impact**	**Significance rating (not mitigated)**	**Mitigation Measures**	**Significance rating (if mitigated)**
C.43.	Development of the Elders Colliery	Socio-economic	**Improved infrastructure in the study area due to social investment activities** Elders Colliery has developed an SLP which has the potential to promote and support community development, capacity building and empowerment, which includes job creation, skills and SMME development and infrastructure development. Projects identified in their SLP, derived from the GMLM IDP document, have the potential to improve the quality of life of people living in the project area. The development and implementation of these activities requires consultation with local development partners including local government, Non-Governmental Organisations (NGOs), and CBOs. The impact will be most significant during the operations phase of the mine. While benefits will cease with mine closure, sustainable projects and infrastructure will endure post closure.	M: Minor D: Short term S: Local C: Low P: Possible SI: Low (+)	• Implement management and enhancement measures as per the SLP.	M: Moderate D: Short term S: Local C: Low P: Definite SI: Medium (+)
C.44.	Development of the Elders Colliery	Socio-economic	**Increased direct revenue to local government, resulting in local government's ability to provide services to communities** During construction, income to the government is mostly expected to result from import duties as well as taxes on locally procured services and goods. The construction phase is expected to have a minor (positive) impact of short term duration and local scale (due to the relatively limited contribution) on government revenue. This impact is one of the downstream socio-economic effects directly resulting from the operation of the mine and mitigation of this impact is very difficult. The Extractive Industries Transparency Initiative (EITI) is an initiative to improve the transparency of the payment and spending of revenues from the extractive sector so as to improve development outcomes, reduce the potential for corruption or large scale embezzlement of funds by host governments and stimulate debate about the uses to which these revenues are put. Anglo American supports and is a participant in the process. The EITI sets a global standard for transparency in the oil, mining and gas sectors. This coalition between governments, companies and civil society endeavours to make natural resources benefit everyone by providing a standard for companies to publish what they pay and for governments to disclose what they receive. However, it is difficult to rate this impact without any financial information.	M: Minor D: Short term S: Local C: Low P: Possible SI: Low (+)	• Support, participate and report on the payment and spending of revenue s to government according to the EITI principles and guidelines.	M: Minor D: Short term S: Local C: Low P: Possible SI: Low (+)
C.45.	Development of the Elders Colliery	Socio-economic	**Improved relations with local communities and stakeholders** AOL has developed a relationship with the Vlakkuilen Community dating back to 2005 when original consultation commenced. It is important for this relationship to continue, especially if the community will not be relocating as per previous mine plans. Stakeholder comments from this community in 2013 and 2015 indicate that the relationship with Elders is gradually deteriorating (See Table 2-6). However, transparent and regular consultation with the Vlakkuilen community, will not only prevent potential future conflict but will also benefit the community and improve AOL's social license to operate. The Middelkraal community, relocated in 2007 by Umcebo Mine, has not previously been considered as the primary zone of influence by the Elders Colliery. However, since the changes to the mine footprint, they are the neighbouring community to the Elders project and closest to the infrastructure. As a result, it is important that Elders Colliery starts engaging regularly with this community to ensure that they are well appraised about all issues pertaining to the mine development. Considering the previous relocation of this community by Umcebo Mine, and the dissatisfactions related to this relocation process as was gathered during the focus group meeting with this community, it is imperative for Elders to exercise caution when engaging with this community, and also to ensure that expectations are properly managed. Consideration should be given to other external factors beyond the control and responsibility of Elders, which could potentially affect	M: Minor D: Medium term S: Local C: Low P: Possible SI: Low (+)	• Include affected communities in the decision making processes of the project, particularly around potential Corporate Social Investment (CSI) opportunities, and SLP projects; • Ensure that all stakeholder engagement includes women, youth and vulnerable groups; • Provide regular and transparent feedback to the Vlakkuilen and Middelkraal communities specifically; • Discuss and manage issues, concerns, changes and impacts related to the project as soon as they arise; • Monitor and implement the Grievance Management Mechanism; • Involve Local Ward Councillors and keep them informed about project developments, and included in all stakeholder engagement processes. Their involvement will assist with the successful development of relationships between the mine, the municipality and the communities; • Regularly consult with local government through the GMLM around issues of community development, employment, co-operation and project activities; • Where possible CSI initiatives and SLP projects with the GMLM IDP with the goal of improving both sustainability and feasibility (this would only occur once the mine was operational);	M: Minor D: Medium term S: Local C: Low P: Possible SI: Low (+)

Assessment of potential impacts of the Elders Colliery during the Construction Phase						
Number	**Activity**	**Environmental aspect**	**Potential Impact**	**Significance rating (not mitigated)**	**Mitigation Measures**	**Significance rating (if mitigated)**
			Elders Colliery's best intentions to improve stakeholder relations with its communities. Some of these could be: • Political influences; • Unpredictability of human behaviour; • Unmet expectations from previous engagements with mines in general • Unmanaged expectations for benefits from mining; • Lack of delivery of social and infrastructure services from the Local Municipality. Based on the factors above, our level of confidence in assessing level is low.		• Durable participatory and consultative structures should be in place pre-closure to mitigate the impacts of closure.	
C.46.	Development of the Elders Colliery	Socio-economic	**Dissatisfactions emanating from unmet expectations for the relocation of the Vlakkuilen community and a potential loss of social license** In 2007 an ESIA and EMP was completed for the proposed project but not submitted to the authorities for approval. During the assessment 23 households located on the farm Vlakkuilen 76 IS were identified for potential physical displacement resulting from strip mining (i.e. open cast mine). Due to the anticipated construction of the opencast pit, it was unavoidable that the Vlakkuilen Community would have to be resettled. Resettlement activities began in 2007. Additional consultations, including a census and asset inventory, were conducted in 2012 following the revised Project description. In 2014, the mine plans were revised again and it was confirmed that the Vlakkuilen community would not need to relocate at all as the impacts could be avoided. Due to the cut-off date that was determined as October 2012, this community was not allowed to make any improvements on their properties and as a result, were living in houses that were not maintained due to the imminent resettlement that never happened since 2007. AOL acknowledges the negative impact of not relocating the Vlakkuilen community, and is putting strategies in place to compensate the households for some of the issues listed above. AOL met with the community to explain he changes in mine plan and the impact on the community (July 2015). AOL has set up a Working Group with the community and the local Ward Councillor to discuss three major topics: land management; graves and water. In addition, in September 2015, SRK Consulting was appointed to do another household census and asset inventory to assess if there have been any changes to the living conditions of this community since 2012. Based on the comments raised by the Vlakkuilen Community during stakeholder engagement meetings in 2013 and 2015, it seems as if AOL's relationship with the Vlakkuilen community has been neglected during this period. However, it has been noted that AOL has re-established the Vlakkuilen Community Working Group, and is continuing to meet with this community. The working group includes the local municipality and is set up to discuss the way forward and strategies. If AOL continues to properly engage with this community, this relationship can improve, but if not, this relationship can deteriorate, resulting in a potential loss of a social licence to operate. This could be manifested through local unrests and demonstrations at the mine. Transparency and openness in relation to what Elders can or cannot deliver regarding livelihoods restoration is important for managing expectations with this community. The confidence level for this impact is low, based on the difficulties related to the management of impacts that arose from the relocation that was unmet.	M: Major D: Short term S: Local C: Medium P: Definite SI: Medium (-)	• Continue the monthly discussion with the Vlakkuilen community until the rezoning to a rural residential area has been completed. • Continue engaging the community and Ward Councillor to provide information about the project progress; and, • Monitor and implement the Grievance Management Mechanism.	M: Moderate D: Short term S: Local C: Low P: Possible SI: Low (-)

* M – Magnitude, D – Duration, S – Scale, C – Consequence, P – Probability, SI – Significance

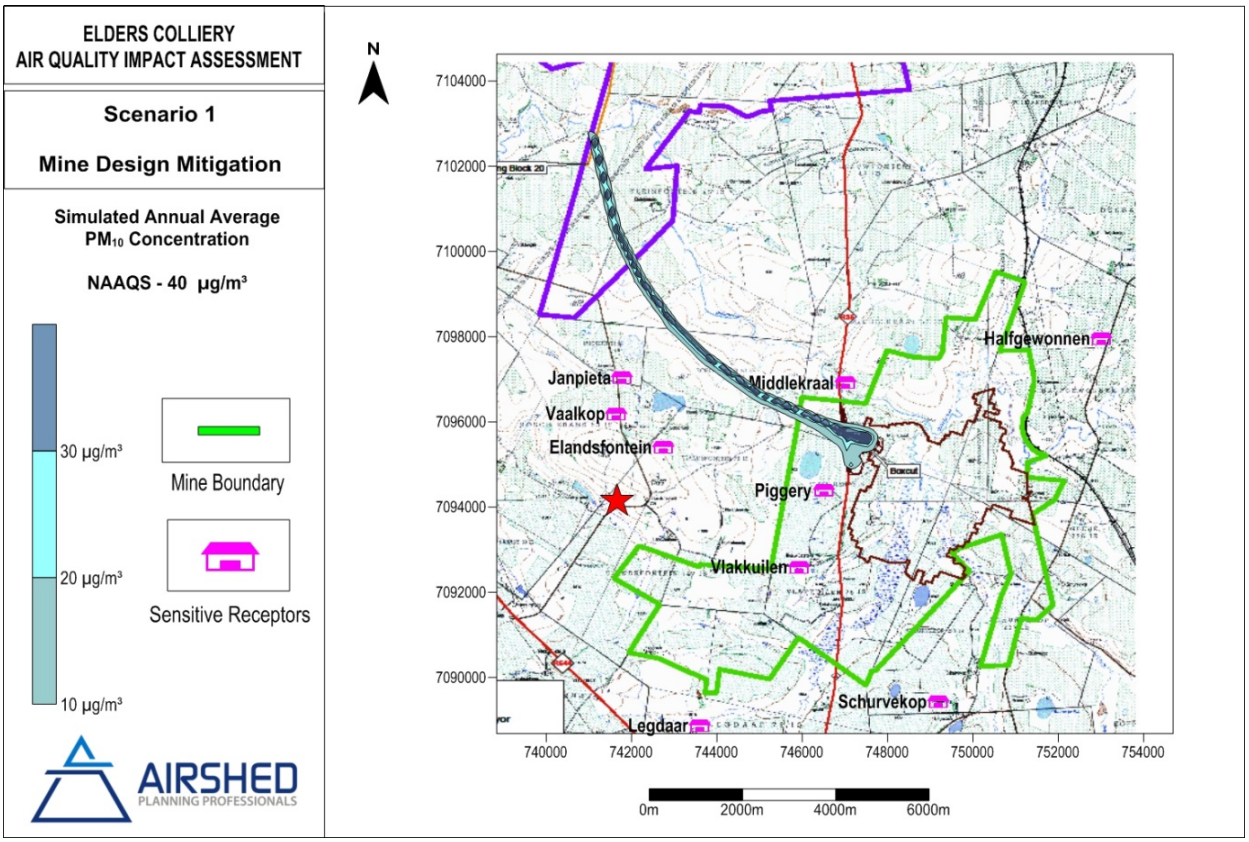


Figure 12: Simulated annual average PM_{10} GLCs during construction (post mitigation) (Airshed, 2015)

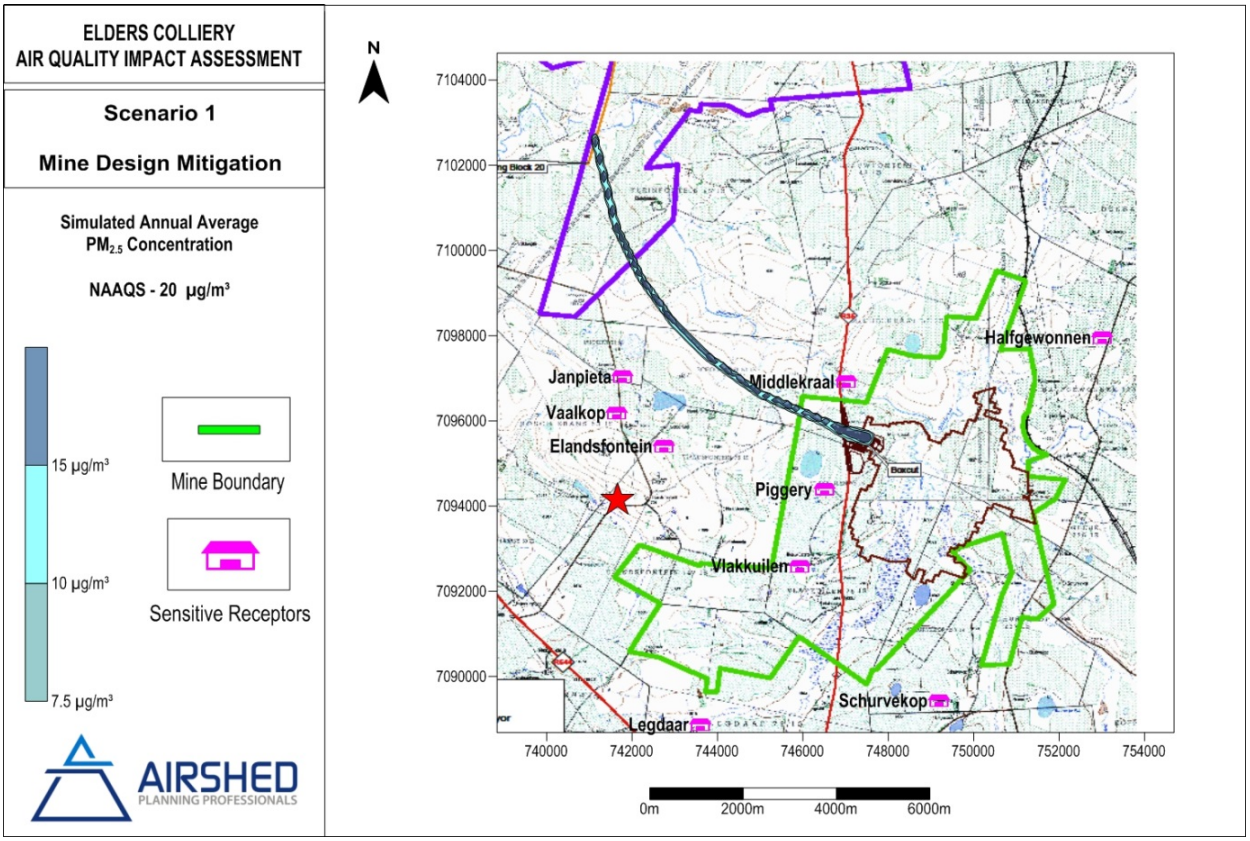


Figure 13: Simulated annual average $PM_{2.5}$ GLCs during construction (post mitigation) (Airshed, 2015)

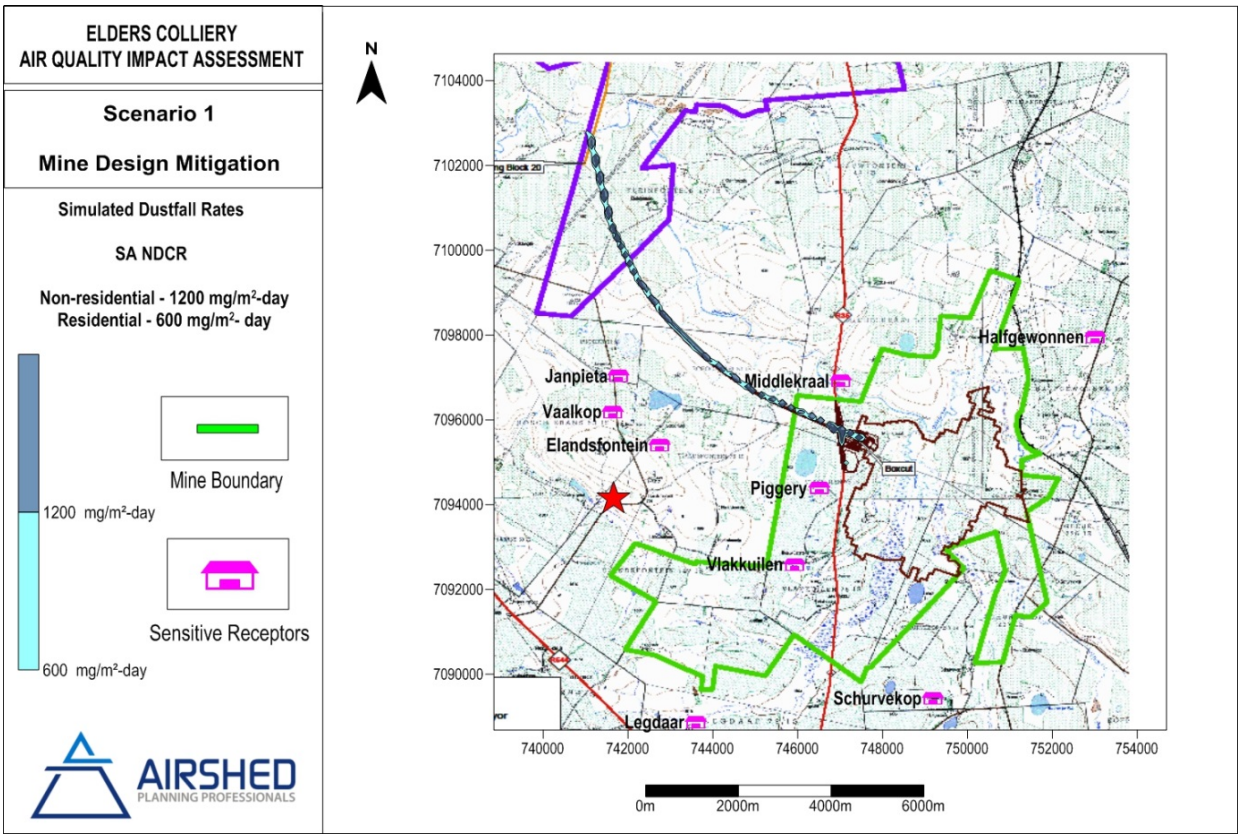


Figure 14: Area of exceedance of the dustfall limit for residential and non-residential areas during construction (post mitigation) (Airshed, 2015)

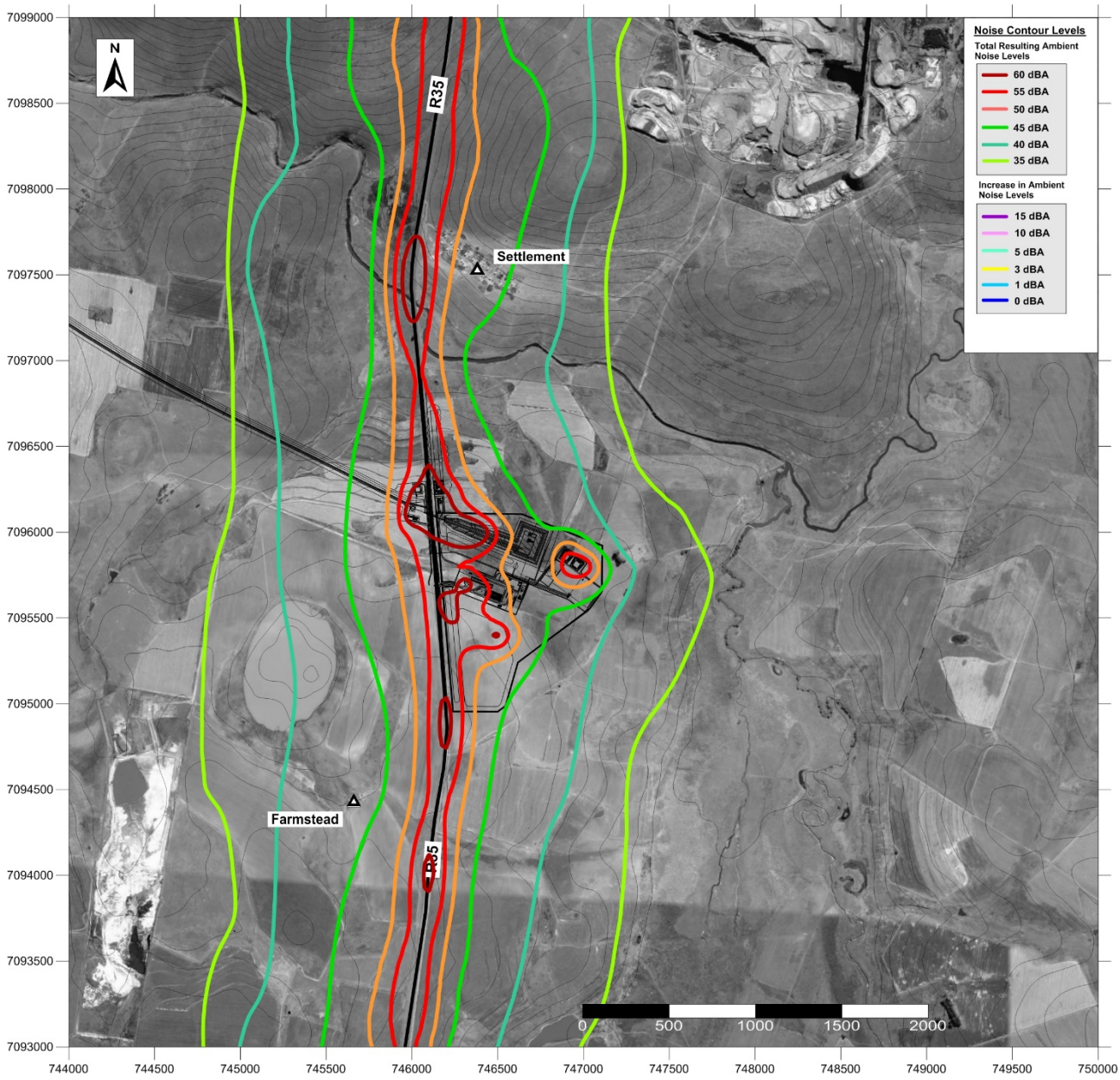


Figure 15: Modelled noise impacts during construction in daytime expressed as the total resulting ambient noise levels (FMAC, 2015)

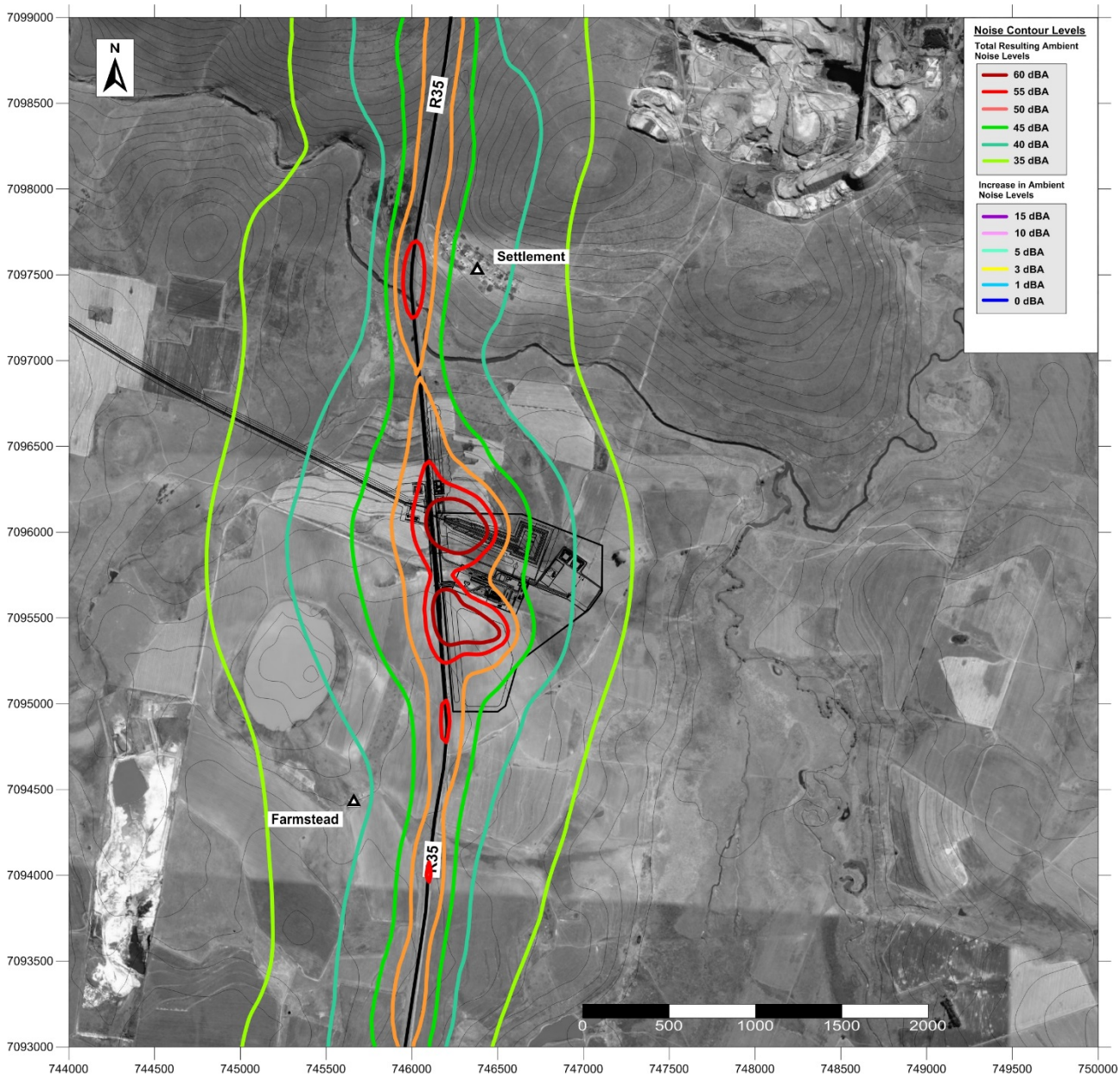


Figure 16: Modelled noise impacts during construction in the night time expressed as the total resulting ambient noise levels (FMAC, 2015)

Table 9: Assessment of potential impacts of the Elders Colliery during the Operational Phase

Assessment of potential impacts of the Elders Colliery during the Operational Phase						
Number	**Activity**	**Environmental aspect**	**Potential Impact**	**Significance rating (not mitigated)**	**Mitigation Measures**	**Significance rating (if mitigated)**
O.1.	Underground mining of No. 2 and No. 4 seams	Topography	**Potential subsidence due to underground mining activities** The underground mining activities will remove the No. 2 and No.4 coal seams by means of bord and pillar mining methods. The removal of the seams could potentially lead to surface subsidence.	M: Major D: Long term S: Local C: High P: Possible SI: High (-)	• Maintain recommended pillar size/safety factor that will ensure that no surface subsidence occurs. • Mining will not take place in the weathered zone. • No total pillar extraction mining method.	M: Minor D: Long term S: Local C: Medium P: Unlikely SI: Low (-)
O.2.	Operation of boxcut and associated surface infrastructure Conveying coal from Elders Colliery to Goedehoop Colliery	Soils	**Loss of utilisable resource (sterilisation and erosion), compaction, de-nutrification and contamination** The operation of the mining venture (underground bord and pillar) and its associated activities (haulage and stockpiling of materials) will see the impact of transportation of materials into and out of the complex, the potential for spillage and contamination of the in-situ and stockpiled materials, contamination due to dirty water run-off and/or contaminated dust deposition/dispersion, the de-nutrification of the stockpiled soils due to excessive through flow of rain water on unconsolidated and poorly protected soils and the flushing of the nutrient pool from the stockpiled materials if not well protected. While the potential for compaction of the in-situ materials by uncontrolled vehicle movement and the loss to the environment (down-wind and downstream) of soil by wind and water erosion over un-protected ground are also possible if not well managed. In summary, the operation will potentially result in: • The sterilisation of the soil resource on which the facilities are constructed. This will be an on-going loss for the duration of the operation; • The creation of dust and the possible loss (erosion) of utilisable soil down-wind and/or downstream, and the potential for contamination of the soils from dust fallout and dirty water runoff; • The compaction of the in-situ and stored soils and the potential loss of utilisable materials from the system; • The contamination of the soils by dirty water run-off and or spillage of hydrocarbons from vehicle and machinery; • Contamination of soils by use of dirty water for road wetting (dust suppression) and irrigation of the stockpile vegetation; • Potential contamination of soils by chemical spills of reagents being transported to site; • Sterilization and loss of soil nutrient pool, organic carbon stores and fertility of stored soils; • Impact on soil structure and soil water balance. • Un-managed soil stockpiles and soil that is left uncovered/unprotected will be lost to wind and water erosion, will loss the all-important, albeit moderately poor nutrient content and organic carbon stores (fertility) and will be prone to compaction. • Contamination of in-situ and/or stored soils by release of un-treated water (from WTP), slippage or leakage from raw water dams or sewage works and or impacts of dried sewage sludge and/or salts from unprotected waste storage piles by wind.	M: Moderate D: Long term S: Local C: Medium P: Definite SI: Medium (-)	• Effective soil cover and adequate protection from wind (dust) and dirty water contamination – vegetate and/or rock cladding; • Regular servicing of all vehicles in well-constructed and bunded areas to reduce spillage and contamination; • Soil replacement and the preparation of a seed bed to facilitate and accelerate the re-vegetation programme and to limit potential erosion on all areas that become available for rehabilitation (temporary servitudes); • Soil amelioration (rehabilitated and stockpiled) to enhance the growth capability of the soils and sustain the soils ability to retain oxygen and nutrients, thus sustaining vegetative material during the storage stage; and • Management of soils as per the soil management plan. • Regular servicing of all vehicles in well-constructed and bunded areas to reduce spillage and contamination; • Regular cleaning and maintenance of conveyancing routes and service ways, drains and storm water control facilities; • Containment and management of hydrocarbon and dirty water spillage;	M: Moderate D: Long term S: Local C: Medium P: Possible SI: Medium (-)
O.3.	Operation of underground mine and conveying of coal	Soils	**Contamination of soil resources during operations** It anticipated that during the operation of the Elders Colliery and conveyer, there is the potential of spillage of carbonaceous material and contamination of soils. Contamination by dirty water run-off and/or spillage of hydrocarbons and/or chemicals is also expected	M: Minor D: Long term S: Site specific C: Medium P: Possible	• Develop a hydrocarbon and carbonaceous leak/spill procedure for all possible areas of leaks/spillages. • Spill kits will be provided for on site for spill clearing. • Spills will be cleared and remediated immediately as per the mine's Leak/Spill Procedure.	M: Minor D: Short term S: Site specific C: Low P: Possible

<table>
<tr><th colspan="6">Assessment of potential impacts of the Elders Colliery during the Operational Phase</th></tr>
<tr><th>Number</th><th>Activity</th><th>Environmental aspect</th><th>Potential Impact</th><th>Significance rating (not mitigated)</th><th>Mitigation Measures</th><th>Significance rating (if mitigated)</th></tr>
<tr><td></td><td></td><td></td><td>from operations vehicles and machinery, as well as dust and emissions from the process.
The impact of the Elders Colliery on the soil resource will have a negative medium significance. Although the magnitude will be minor, the impact will last for the life of the operation (long term) and will be permanent to irreversible if not rehabilitated.</td><td>SI: Medium (-)</td><td></td><td>SI: Low (-)</td></tr>
<tr><td>O.4.</td><td>Operation of underground mine</td><td>Biodiversity</td><td>Permanent loss of habitat for flora and fauna
As per C.5 in the construction phase.</td><td colspan="3"></td></tr>
<tr><td>O.5.</td><td>Operation of underground mine</td><td>Biodiversity</td><td>Habitat fragmentation
As per C.6 in the construction phase.</td><td colspan="3"></td></tr>
<tr><td>O.6.</td><td>Operation of underground mine</td><td>Biodiversity</td><td>Loss of species of concern
As per C.7. in the construction phase.</td><td colspan="3"></td></tr>
<tr><td>O.7.</td><td>Conveying coal from Elders Colliery to Goedehoop Colliery</td><td>Biodiversity</td><td>Permanent loss of habitat for flora and fauna
As per C.8. in the construction phase.</td><td colspan="3"></td></tr>
<tr><td>O.8.</td><td>Conveying coal from Elders Colliery to Goedehoop Colliery</td><td>Biodiversity</td><td>Habitat fragmentation
As per C.9. in the construction phase.</td><td colspan="3"></td></tr>
<tr><td>O.9.</td><td>Conveying coal from Elders Colliery to Goedehoop Colliery</td><td>Biodiversity</td><td>Loss of species of concern
As per C.10 in the construction phase.</td><td colspan="3"></td></tr>
<tr><td>O.10.</td><td>Discharge of mine water to the natural watercourses</td><td>Surface water</td><td>Pollution of surface water resources
The water balance modelling indicates that the mine will have an average water surplus over the LOM of approximately 910 m^3/day, after re-use on site.
The assumed water quality used in this assessment is given in the table below (as estimated by JMA Consulting):
<table>
<tr><th>Parameter</th><th>Most likely operational quality</th><th>Possible high concentration</th></tr>
<tr><td>pH</td><td>6.1 – 8.1</td><td>5.5</td></tr>
<tr><td>TDS</td><td>800 – 110 mg/l</td><td>6 500 mg/l</td></tr>
<tr><td>SO_4</td><td>350 – 800 mg/l</td><td>4 500 mg/l</td></tr>
</table>
The potential impact on in-stream aquatic life and downstream users is assessed as follows:
The potential impact on aquatic life or downstream users of water within the rivers is highly dependent on the pH of the water discharged. This is because acidic conditions will result in mobilisation of metals, and this would be a major contributing factor to the potential toxicity of the water. Based on the assumption that the water is unlikely to be acidic during the operational phase, the following is predicted:
• It is possible that metals such as Fe and Al, will be present in significantly elevated concentrations (values of <1 to 10 mg/l and <1 to 5 mg/l predicted respectively).
• An increase in electrical conductivity and overall salinity such that the water is unfit for potable use, as well as informal drinking.
• Sulfate levels could be significantly elevated to the point that there is a risk of developing diarrhoea in infants that may drink the water. Miscarriages in cattle will also be possible at the higher levels of around 4 500 mg/l.
• SAR (Sodium Adsorption Ratio) levels may be impacted on, the Target Water Quality Range <= 2.0mg/l. it is possible that the SAR levels will be significantly elevated, making the water unsuitable for irrigation without some form of mitigation, with Na</td><td>M: Major
D: Long term
S: Regional
C: High
P: Definite
SI: High (-)</td><td>• Containment of all dirty water generated on the mine in a lined PCD, sized to have a risk of spill of 2% or less in any one year. The PCD will be designed to accommodate at least a 1:50 year flood event.
• Provision of a water treatment plant to treat a maximum of 5.0 Mℓ/day of dirty water generated at the mining operations.
• Treatment of excess dirty water for re-use at the Elders operations, including supply of domestic and service water requirements.
• Water will be treated to achieve both drinking water standards (SANS 241:2011) and the Interim Resource Water Quality Objectives (IRWQO) for the Olifants River. Surplus treated water that cannot be reused in the operations will be discharged to the Olifants River system.
• Excess water that cannot be treated or reused will be pumped to storage in underground compartments at around 2025, when storage becomes available at Elders 2 Seam underground sections. Prior to storage becoming available underground, surplus water will need to be pumped to Goedehoop Colliery, should a review of the LOM plan not enable the early provision of storage on the 2 Seam.
• Provision of water management facilities with a risk of spill that is lower than 2% in any one year.
• A surface water quality monitoring programme will be implemented, to detect any impacts.
• A water balance monitoring programme will be implemented to enable calibration of the water balance.</td><td>M: Moderate
D: Medium term
S: Regional
C: High
P: Unlikely
SI: Low (-)</td></tr>
</table>

Assessment of potential impacts of the Elders Colliery during the Operational Phase						
Number	**Activity**	**Environmental aspect**	**Potential Impact**	**Significance rating (not mitigated)**	**Mitigation Measures**	**Significance rating (if mitigated)**
			levels of around 45 mg/l , but possibly as high as 250 mg/l, predicted. The potential impact in terms of salt loading on dams is assessed as follows: The salt loading within the Witbank catchment is critical, particularly in terms of sulfate. Based on an average surplus water make of some 910 m^3/day, and a sulfate concentration of around 4 500 mg/l (the worst case predicted by JMA for the operational period), the mine could generate an average of 4.1 tonnes SO_4 per day.			
O.11.	Operation of boxcut area and associated infrastructure	Surface water	**Pollution of surface water resources** The mine surface infrastructure will be constructed at the start of mining and will remain in place for the duration of mining. The wash bays, offices, and workshop areas have the potential to generate poor quality runoff due to contact of the water with coal, hydrocarbons and waste material. Impacts associated with the incline shaft area would be as a result of runoff entering the underground workings and coming in contact with carbonaceous material. Impacts may arise from: • Contaminated storm water runoff, as well as wash down water and hydrocarbon spills that discharge from the site, with resultant deterioration in water quality within the Olifants River catchment, associated with increased suspended solids, hydrocarbons (oils and greases), siltation of carbonaceous materials, increase in salinity and potential decrease in pH in the watercourses. • Leakage of contaminated water from pipelines, poorly maintained storm water channels, sumps, sediment traps and oil skimmers, etc. • Erosion at the clean canal discharge points could result in the formation of erosion gullies on surface, with elevated suspended solids in the runoff water, potentially impacting on the water quality in the watercourses in terms of suspended solids and deposition of silt. • Increase in sulfate, turbidity, suspended solids and TDS due to runoff entering the boxcut and becoming contaminated. • Runoff coming into contact with carbonaceous material in and around the boxcut.	M: Major D: Long term S: Regional C: High P: Definite SI: High (-)	• All facilities with the potential to generate dirty storm water runoff, effluent or washdown water will be located within the designated dirty water area. • Clean runoff will be diverted around the designated dirty areas by means of cut-off canals, sized to accommodate at least the 1:50 year peak flow event. • Adequate erosion protection will be provided at the clean canal discharge locations. • All spills will be contained within dedicated bunded areas (at wash bays, workshops, waste handling areas, etc.). • Both general and hazardous wastes will be stored in skips until removed from the site. The skips in turn will be located under in bunded areas. • There will be capacity to store a maximum of 132 m^3 of general waste in waste bins during the life of the project. • The storage period will be less than 90 days before removal from the site by an appropriately licensed waste removal contractor and disposed of at a licensed general waste facility. • Hazardous waste will be stored according to the applicable regulations under the National Environmental Management: Waste Act (Act 59 of 2008) and the DWS Minimum Requirements. • The waste storage area will, as a minimum, be paved with concrete, covered and provided with bunds and drainage facilities to collect and contain any spills or adversely affected runoff. • Waste oil will be stored in drums in a bunded storage area. • Bunded containment and settlement facilities will be provided for hazardous materials, such as fuel and oil. • All contaminated runoff and spills that escape bunded areas will be collected and contained in the PCD. • All pipeline routes will be inspected regularly to enable early detection of leaks. • All dirty storm water and wash down water will be collected in the PCD. • Washdown and waste water from the workshops will be passed through oil skimmers before discharging to the storm water system for containment in the PCD and eventual treatment for reuse, or pumping to underground storage. • An inspection and maintenance plan will be implemented on the storm water system to ensure that all oil skimming and sediment handling facilities are maintained and that storm water canals and pipelines remain unblocked and free flowing – monthly inspections will be carried out. • Spill-sorb or a similar type product must be kept on site and used to clean up hydrocarbon spills in the event that they should occur. • Contain all dirty water from the boxcut area.	M: Moderate D: Short term S: Regional C: Medium P: Unlikely SI: Low (-)

Assessment of potential impacts of the Elders Colliery during the Operational Phase						
Number	**Activity**	**Environmental aspect**	**Potential Impact**	**Significance rating (not mitigated)**	**Mitigation Measures**	**Significance rating (if mitigated)**
					• A surface water quality monitoring programme will be implemented to detect any impacts.	
O.12.	Operation of sewage treatment plant	Surface water	**Pollution of surface water resource** Water from the ablution facilities will contain organic matter, which is high in nitrogen and could therefore cause eutrophication if enters the water resource. The STP will be located adjacent to the PCD. During operations the treated effluent from the STP will be discharged into the Olifants River system. Impacts may arise from: • Discharge of untreated sewage into the watercourse. • Discharge of treated water not meeting the specified discharge standards into the watercourse.	M: Moderate D: Long term S: Regional C: High P: Possible SI: High (-)	• All domestic waste water will be treated in the STP. • Sewage water will be treated IRWQOs standards set for the Olifants River. • Sludge will be deposited in drying beds within the designated dirty water area and removed by a licensed waste contractor. • An inspection and maintenance plan will be implemented to ensure that the STP always operates within specification. • A surface water quality monitoring programme will be implemented to detect any impacts.	M: Minor D: Short term S: Regional C: Low P: Unlikely SI: Low (-)
O.13.	Operation of PCD – storage of contaminated water	Surface water	**Pollution of surface water resources** The water in the PCDs will be of poor quality, with potential to impact on the downstream water resources, primarily in terms of increased salinity (particularly sulfate) and potentially reduced pH if there are spillages or leaks from the dams. Impacts may arise from: • Inadequate sizing or lining system on the dams. • Poor maintenance resulting in loss of storage capacity due to sediment build-up in the dams • Spilling/overflow from PCD into the Olifants River system	M: Major D: Long term S: Regional C: High P: Definite SI: High (-)	• The PCDs will be engineered to have sufficient capacity to limit the risk of spill to less than 2% in any one year. The PCD will be designed to accommodate at least a 1:50 year flood event. • In line with best practice, the PCDs will be operated as empty as possible at all times to ensure that sufficient stormwater retention capacity is available at all times. • In the event that there is insufficient available capacity in the main PCD during extreme rainfall conditions, excess storm water will be pumped to the Elders underground storage compartments (if available). • The PCDs will be equipped with geomembrane liners to minimise leakage of contaminated water to the surface or ground water systems. • The lining system on the PCDs will include a sub-surface drainage layer to detect any leakages, as well as to prevent the build-up of hydrostatic pressure beneath the geomembrane liner. Water collected in the sub-surface drainage system will be discharged to a sump and pumped back into the PCD. • A silt trap will be constructed at the PCD to remove sediment before entering the PCD. The silt trap will be cleaned regularly. • An inspection and maintenance plan will be implemented to ensure that the dams are kept in good working order and to monitor sediment build-up. When sediment levels reach a pre-determined level, sediment will be removed to ensure that sufficient storm water storage capacity is maintained at all times. • A surface water quality monitoring programme will be implemented to detect any impacts.	M: Moderate D: Short term S: Regional C: Medium P: Unlikely SI: Low (-)
O.14.	Dust and fire suppression with contaminated water	Surface water	**Pollution of surface water resources** Dust and fire suppression systems will be provided along haul roads and the conveyor. These will involve spraying of water onto coal handling areas, as well as a deluge system in case of fire. This water will become contaminated once it comes into contact with the coal. Impacts may arise from: • Spraying of dust suppression or fire water could potentially enter the watercourse resulting in deterioration in water quality, in terms of elevated salinity, particularly sulfate.	M: Minor D: Short term S: Site C: Low P: Possible SI: Low (-)	• Excess water will drain via the dirty storm water system to the PCD and will be pumped back to the WTP or reuse in the mining operations.	M: Minor D: Short term S: Site C: Low P: Unlikely SI: Low (-)
O.15.	Operation of water treatment plant	Surface water	**Pollution of surface water** Water will be drawn from the PCD and treated in the water treatment plant (WTP) for reuse in the mining operations, with surplus being discharged to the Olifants River. The WTP will comprise a combination of filtration and Reverse Osmosis (RO).	M: Major D: Long term S: Regional C: High P: Possible	• The WTP will be isolated within a designated dirty water area. All runoff and spills from the treatment plant will be collected in a sump, from which water will be pumped to the PCD. • Water will be treated to achieve both drinking water standards (SANS 241:2011) and the Interim Resource Water Quality Objectives (IRWQO) for the Olifants River for discharge.	M: Minor D: Short term S: Site C: Low P: Unlikely

Assessment of potential impacts of the Elders Colliery during the Operational Phase						
Number	**Activity**	**Environmental aspect**	**Potential Impact**	**Significance rating (not mitigated)**	**Mitigation Measures**	**Significance rating (if mitigated)**
			Impacts may arise from: • Spillage of chemical additives, which could result in deterioration of water quality in the watercourses. • Spillage of the water treatment waste products, in the form of brine and gypsum to the receiving environment. • Discharge of water that does not meet the discharge standards, or untreated water during upset conditions at the WTP.	SI: High (-)	Surplus treated water that cannot be reused in the operations will be discharged to the Olifants River. System. • All chemicals and additives will be stored in dedicated bunded areas, where any spills will be contained. • An inspection and maintenance plan will be implemented to ensure that the water treatment plant always operates within specification. • A surface water quality monitoring programme, will be implemented to detect any impacts. • Discharge water quality will be continuously monitored for early detection of discharge water quality problems. • Should upset conditions occur, or poor discharge water quality be detected, the WTP discharge will be directed to the PCD.	SI: Low (-)
O.16.	Handling and storing of brine and gypsum	Surface water	**Pollution of surface water** The proposed water treatment plant will generate both liquid waste (brine), and solid waste in the form of a gypsum sludge. Impacts may arise from: • Spillage of brine and gypsum onto the ground surface. • Inadequate lining systems, or leakage from the liners at the brine pond and gypsum drying bed.	M: Moderate D: Long term S: Regional C: High P: Possible SI: High (-)	• Initially one brine dam will be constructed, with a second to be constructed at a later stage, as the WTP's treatment capacity is increased. • The brine dams will be lined with compacted clay layer with a 1.5 mm thick HPDE geomembrane to minimise seepage of contaminated water to the groundwater system. The brine dams will also be equipped with a leak detection sump. • The gypsum pads will be paved with concrete. The concrete slabs will be underlain by a 1.5 mm thick HDPE geomembrane liner. The gypsum pad will be provided with concrete bunds to ensure no storm water runoff from the area. The storm water will be directed to a sump at the lower end of the gypsum area, from where water will be directed to the brine dam via a sloping pad and concrete lined channel. • Gypsum will be removed from the site on a regular basis. This will occur in a timely manner to prevent overloading of the gypsum drying pad. • Removal from site of gypsum will be undertaken by an appropriately licensed waste removal contractor. • Disposal of gypsum will be at a licensed hazardous waste disposal facility, such as Holfontein Landfill. Alternative use for gypsum will be investigated. • An inspection and maintenance plan will be implemented to ensure that the pipelines and dams are kept in good working order. • A surface water quality monitoring programme will be implemented to detect any impacts.	M: Minor D: Short term S: Site C: Low P: Unlikely SI: Low (-)
O.17.	Discharge of treated water from the WTP	Surface water	**Pollution of surface water resources** Water will be drawn from the PCD and treated in the water treatment plant (WTP), with surplus treated water discharged to the Olifants River. The water treatment plant will have the capacity to treat up to 5.0 Mℓ/day. The release of surplus treated water into the catchment will influence the water quality of the receiving resource and erosion may occur at the discharge point. The baseline water quality shows that the Olifants River is already heavily impacted. The quality of water should therefore improve slightly in a localised area due to dilution effects.	M: Minor D: Short term S: Local C: Low P: Possible SI: Low (+)	• Erosion protection measures at the discharge point. • The quality of the water discharged will be closely monitored to ensure that it falls within the specified IRWQO at all times.	M: Minor D: Short term S: Local C: Low P: Definite SI: Low (+)
O.18.	Discharge of treated water to the Olifants River system	Surface water	**Alteration of flow patterns in watercourses** The discharge of treated water to the river system will result in a net increase in the flow of water in the Olifants River system. While this has a net positive impact on the availability of water in the system, it has the potential to negatively impact on the aquatic ecology by changing the seasonal flow patterns in the river system.	M: Minor D: Short term S: Local C: Low P: Possible	• No mitigation as increase in yield is positive.	M: Minor D: Short term S: Local C: Low P: Possible

Assessment of potential impacts of the Elders Colliery during the Operational Phase						
Number	**Activity**	**Environmental aspect**	**Potential Impact**	**Significance rating (not mitigated)**	**Mitigation Measures**	**Significance rating (if mitigated)**
			The water make at the Elders Colliery will be seasonal, with a consequent strong seasonality in the discharge of treated water to the Olifants River. The magnitude of the expected summer and winter discharges of treated water during the last year of mining (i.e. the year of maximum water make) have been compared with the natural stream flow in the Olifants River at DWS flow gauging station B1H018, located approximately 7 km downstream of the mine. The net percentage increase in flow during summer amounts to some 1.0% and in winter to around 2.7%. The net increase in MAR amounts to 1.4%.	SI: Low (+)		SI: Low (+)
O.19.	Operation of dirty water pipeline from Goedehoop Colliery to Elders Colliery	Surface water	**Pollution of surface water resources** The dirty water pipeline from Goedehoop Colliery to the Elders Colliery has the potential to impact on surface water through leaks and spillages. The pipe will be buried along the conveyor route and mounted to the conveyor structure at river crossings. Impacts may arise from: • Damage to the pipeline or deterioration of joints, causing leaks of dirty water, with a resultant deterioration in water quality, with increased salinity, particularly sulfate.	M: Moderate D: Long term S: Regional C: High P: Possible SI: High (-)	• The pipe will be pressure tested before commissioning backfilling the trench to ensure that all joints are properly sealed. • The pipe will be will be attached to the conveyor surface infrastructure. • Monitoring will be implemented downstream of all watercourse crossings to detect any impacts.	M: Moderate D: Long term S: Regional C: High P: Unlikely SI: Medium (-)
O.20.	Operation of underground mine	Surface water	**Reduction in catchment yield** The loss in yield associated with mining at the Elders Colliery will be primarily due to the mine infrastructure area, which will be isolated from the catchment, as well as potential ingress to shallow underground workings below the Viskuile and Vlakkuilen wetland system. Percentage reduction: • Elders mine infrastructure (at boxcut): 100% • Viskuile & Vlakkuilen Rivers upstream of Olifants River: 2.27% • Mining right area: 18.29% • Olifants River downstream of mining right area: 1% • Witbank dam: 0.38% • Loskop dam: 0.12% It is evident that the impact on surface water yield to the watercourses is Moderate.	M: Moderate D: Long term S: Regional C: High P: Definite SI: High (-)	• The site layout has been designed to minimise the dirty footprint, and therefore to minimise the impact on the catchment yield. • A water treatment plant will be provided, which will treat excess mine water make to discharge quality, which will be returned to the Olifants River system.	M: Minor D: Long term S: Site C: Low P: Definite SI: Medium (-)
O.21.	Conveying coal from Elders Colliery to Goedehoop Colliery	Surface water	**Pollution of surface water resource** Transport of coal by conveyor has the potential to impact on watercourses and general runoff quality, primarily due to spillage of coal, as well as contaminated water from belt itself and at transfer stations. Impacts may arise from: • Dripping of water from the conveyor belt at low points, as well as spillage at transfer stations; • Spillage o coal a t transfer, on-loading and offloading stations; • Wind-blown dust at transfer stations settling on the adjacent surface and in watercourses; • Storm water runoff coming into contact with these emissions would suffer a deterioration in water quality with increased salinity, particularly sulfate,	M: Moderate D: Long term S: Site C: Medium P: Definite SI: Medium (-)	• The belt drive and transfer infrastructure at either end of the conveyor will be paved with concrete, bunded to prevent run-on of clean water and to contain dirty runoff. • Conveyors will be rotated at the either end to ensure that the dirty side faces upwards at all times. • Belt scrubbers will be provided at either end to clean the belt to prevent carbonaceous material from being dropped along the route. • The conveyor will be enclosed at channelled watercourse crossings to prevent any spillage of water or coal into the watercourses. • Watercourse crossings will be designed to accommodate at least the 1:100 year event without overtopping. • Dust suppression will be employed at transfer stations to minimise dust emissions. • A doghouse sheeting will be provided along the entire conveyor length, on the upwind side, to prevent rain from falling directly onto the conveyor and to protect it from wind. • Monitoring will be implemented downstream of all watercourse crossings along the conveyor route.	M: Minor D: Short term S: Site C: Low P: Possible Low (-)

Assessment of potential impacts of the Elders Colliery during the Operational Phase						
Number	**Activity**	**Environmental aspect**	**Potential Impact**	**Significance rating (not mitigated)**	**Mitigation Measures**	**Significance rating (if mitigated)**
O.22.	Storage of overburden material, overburden stockpile	Groundwater	**The formation of acid mine drainage (AMD) as a result of ingress water and oxygen into the stockpiled overburden** The potential impact of seepage water into shallow weathered aquifer from the overburden stockpile is considered to be moderate. Potential contaminants may impact on the groundwater usage, which includes domestic and agricultural use. Generally, overburden is considered inert and therefore does not have a great potential for AMD. However, during the removal of the overburden in the construction of the boxcut, there is the potential to remove some of the coal from the No. 2 and No.4 and possible No. 5 seams. This coal has AMD potential as per the results of the geochemical analysis of the coal. The AMD potential of the overburden stockpile is considered moderate in the long term as the overburden will be stockpiled for the LOM. The impact will be limited to the site.	M: Moderate D: Long term S: Site C: Medium P: Definite SI: Medium (-)	• Verify AMD generation potential of the overburden only through sampling and analyses of core samples from the boxcut location. • Include monitoring of boreholes around overburden stockpile in overall groundwater monitoring plan to identify any potential contamination of groundwater resources. • Should pollution be identified in the groundwater resources, the source of the pollutants will be investigated and the applicable remediation measures will be implanted. • Maintain compaction and shape to ensure free draining of surface run-off to minimise rainfall infiltration.	M: Minor D: Long term S: Site C: Medium P: Unlikely SI: Low (-)
O.23.	Underground mining of the No.2 and No. 4 coal seams by means of bord and pillar mining methods	Groundwater	**Influx of groundwater into the mine workings** Influx of groundwater into boxcut, the No. 2 and No. 4 seams mine workings will result in the potential dewatering of the overlying aquifers, manifesting as a groundwater cone of depression in the water table which could influence the availability of groundwater. The average depths to the No. 2 and No.4 seams are 40 and 60 metres respectively. Wetlands to be undetermined are illustrated in in Figure 7. Mining will take place below the weathered zone where the interaction between the wetlands and groundwater table takes place. Therefore it is unlikely that if the bord and pillar mining method is implemented, that influx of groundwater into the mine workings will take place. Impacts of underground mining on wetland functionality are described in O.26.	M: Major D: Long term S: Site C: High P: Definite SI: High (-)	• Detailed geological mapping in order to identify geological features. • Underground mining will take place by bord and pillar mining methods to ensure stability integrity of overlying strata. • Mining will take place according to design mine stability safety factors, as per the WUL's specifications. • Mining will not take place in the weathered overlying strata. • Identified deep boreholes within the underground mining area will be sealed to prevent inflow into the mine. • Grouting of fissures to prevent excess groundwater entering the underground mining sections. • Manage excess water make as part of the operational phase water balance. • Confirm private borehole users as part of hydro census and monitoring groundwater levels and yields.	M: Moderate D: Long term S: Site C: Medium P: Possible SI: Medium (-)
O.24.	Underground mining of the No.2 and No. 4 coal seams by means of bord and pillar mining methods	Groundwater	**The formation of AMD in groundwater resources** The formation of the AMD could occur as a result of the ingress of water and oxygen into strata containing sulfide minerals. As modelled by the groundwater specialist, the overall reactions of the rock matrix and the forming of secondary minerals will be overall in concurrence with the mineral reactions predicted in the modelling. Local patches of mine water in contact with only carbonaceous material will be acidic as the carbonate minerals are not efficient to neutralize the acid produced. As the mine gets flooded this acidic parts will come within contact with the neutral-alkaline drainage from the silicate minerals. Although the heterogeneity and the probable non-ideal mixing of different geochemically units give uncertainty to the exact quantification of the groundwater parameters, the average mine water will only be slightly acidic over the long term in the post-closure mine system under the conditions assumed in the modelling. No acidification will occur in the underground mines during the operational phase. In the box-cut it will take about 17 years for the spoils to start acidify (pH < 5.5).	M: Moderate D: Long term S: Site C: Medium P: Possible SI: Medium (-)	• Optimise storage of mine water make in mined out underground section to minimise exposure to oxygen. • Develop a groundwater monitoring programme in order to assess the groundwater quality. Frequency of monitoring to take place as per the groundwater monitoring plan. • Should pollution be identified within the groundwater resources, the source of the pollutants will be identified and the applicable remediation measures will be implemented.	M: Moderate D: Long term S: Site C: Medium P: Possible SI: Medium (-)
O.25.	Operation of PCD	Groundwater	**Deterioration of groundwater quality due to seepage from PCD, water treatment plant and sewage treatment plant (and associated infrastructure)** The seepage on contaminated stormwater through the PCD into the sub-surface could lead to groundwater pollution. This contamination will be throughout the operational phase of the mine but will be limited to the site.	M: Moderate D: Long term S: Site C: Medium P: Possible SI: Medium (-)	• Suitable liner designs have been incorporated during the design phase and will be approved by DWS. • Maintain underdrain system and dam integrity. • Operate PCD at lowest volumes as possible. • An inspection and maintenance plan will be implemented to ensure that the PCD, brine pond and gypsum pad operates within specifications.	M: Moderate D: Long term S: Site C: Medium P: Unlikely SI: Low (-)

Assessment of potential impacts of the Elders Colliery during the Operational Phase						
Number	**Activity**	**Environmental aspect**	**Potential Impact**	**Significance rating (not mitigated)**	**Mitigation Measures**	**Significance rating (if mitigated)**
O.26.	Underground mining of the No.2 and No. 4 coal seams by means of bord and pillar mining methods	Wetland/ Groundwater	**Decreased flows in wetlands due to dewatering of groundwater aquifers** Operation of the underground mine will result in a drawdown of the local groundwater table. Typically two groundwater aquifers exist on the Highveld, a shallow weathered aquifer and a second deeper aquifer. The deeper aquifer is not thought to play a role in supporting the wetlands on site, though further work in this regard is still being undertaken as part of the reserve study. The majority of wetlands on site, specifically the hillslope seepage wetlands, are however predominantly maintained by shallow perched water tables and the shallow weathered aquifer that are generally separate from deeper groundwater and are thus considered unlikely to be affected by the dewatering. The large valley bottom wetlands, the Vlakkuilen Wetland and the Viskuile Wetland, are characterised by vertic clay soils that expand when wet and become almost impermeable. Surface flows within these wetlands are thus also likely to be largely unaffected by the groundwater draw down cone. This is supported by observations from other areas on the Highveld - shallow undermining and subsequent stooping of the Rietspruit floodplain on the Mpumalanga Highveld has not resulted in the desiccation of the system, but rather in the formation of numerous depressions on the floodplain where water accumulates and which are now characterised by increased wetness.	M: Minor D: Long term S: Local C: Medium P: Possible SI: Medium (-)	• Maintain recommended pillar size/safety factor that will ensure that no surface subsidence occurs under any of the wetlands on site. • Identified deep boreholes within the underground mining area will be sealed to prevent inflow into the mine. • Refer to management measures in O.23.	M: Minor D: Long term S: Local C: Medium P: Possible SI: Medium (-)
O.27.	Operation of stockpiles	Wetland/Surface water	**Water quality deterioration and increased sedimentation in adjacent wetlands** Various stockpiles will be required as part of the Elders Colliery operation, overburden and topsoil stockpiles. Stockpiles will be characterised by bare soil, steep side slopes that generate significant surface run-off. Run-off from these stockpiles is likely to be sediment rich. Where run-off from these stockpiles enters adjacent wetlands, water quality deterioration is likely to result, including increases in turbidity, sulfates and metal concentrations (e.g. Aluminium and Iron), and a drop in pH. Where sediment is deposited, changes in vegetation are also likely to occur with pioneer species such as *Typha capensis* and *Phragmites australis* likely to become dominant.	M: Moderate D: Long term S: Local C: Medium P: Definite SI: Medium (-)	• Run-off from topsoil stockpiles should enter a sediment trap prior to discharge to the environment. • Topsoil stockpiles should ideally be vegetated to stabilise slopes and minimise sediment loss.	M: Minor D: Long term S: Local C: Low P: Possible SI: Low (-)
O.28.	Operation of stockpiles	Wetland	**Establishment and spread of alien species** Stockpiles and cleared areas will be susceptible to invasion by alien vegetation, e.g. *Acacia mearnsii* (black wattle). These alien species could spread to the adjacent wetland areas and result in decreased flows, increased erosion and decreased biodiversity in these systems.	M: Moderate D: Long term S: Local C: Medium P: Definite SI: Medium (-)	• Implement alien vegetation management plan to remove and control establishment and spread of alien vegetation species.	M: Minor D: Short term S: Local C: Low P: Possible SI: Low (-)
O.29.	Conveying coal from Elders Colliery to Goedehoop Colliery	Wetland/Surface water	**Water quality deterioration** Coal spillages and coal dust from the conveyor can lead to pollution of wetlands and other water resources along the conveyor route. However, coal spillages from coal transported via conveyor are generally considered to be less than spillages from coal trucks.	M: Moderate D: Long term S: Local C: Medium P: Definite SI: Medium (-)	• Regular inspection and maintenance of the entire conveyor route will be undertaken. • The conveyor belt will be partially enclosed to minimise coal dust being blown into wetlands. • Gantries/decking should be installed at all channelled watercourses and transfer points to prevent spillages directly entering wetlands • All vehicular and machinery movement along the servitude must be restricted to the service road. No off-road driving.	M: Minor D: Long term S: Local C: Medium P: Unlikely SI: Low (-)
O.30.	Operation of water treatment plant	Wetland/Surface water	**Altered flows within Olifants River** It is proposed that all water from the water treatment plant be discharged into the Olifants River system. At full capacity it is expected that a maximum of 5Ml/day will be discharged. Currently a single discharge point is proposed.	M: Moderate D: Long term S: Local C: Medium P: Definite	• Protect discharge point against erosion and incorporate energy dissipaters. • Ensure discharge water quality is always in line with the IRWQOs set for the Olifants River system.	M: Minor D: Short term S: Local C: Medium P: Possible

Assessment of potential impacts of the Elders Colliery during the Operational Phase						
Number	**Activity**	**Environmental aspect**	**Potential Impact**	**Significance rating (not mitigated)**	**Mitigation Measures**	**Significance rating (if mitigated)**
			The impact of such a discharge is likely to be insignificant during high flow events, but during low flow periods the impact is likely to be more significant. Increased flows could lead to increased erosion. However, shortly downstream of the infrastructure area the Olifants River enters a fairly confined reach characterised by a mostly rocky/bedrock stream bed. Channel erosion is thus considered unlikely to be a significant problem. Erosion at the point of discharge is likely to occur.	SI: Medium (-)	• Implement recommended water quality monitoring and biomonitoring plan	SI: Medium (-)
O.31.	Operation of water treatment plant	Wetland/Surface water	**Altered water quality within the Olifants River** Discharge of treated water into the Olifants River could lead to altered water quality within the river, impacting on the aquatic ecosystem. Water will be treated to be in line with the IRWQO set for the Upper Olifants River. Given the existing water quality impacts to the Olifants River, the discharge of treated water to the system could have a low and localised positive impact on the system if the treated water is of such a quality as to dilute the water within the system. Such a positive impact is only likely to be realised during low flow periods. During high flow periods the impact is likely to be insignificant. If discharge water is however of a poor quality and contributes to further water quality deterioration in the system, the impact would be negative.	M: Minor D: Short term S: Local C: Low P: Possible SI: Low (-)	• Ensure discharge water quality is always in line with the IRWQOs objectives set for the Olifants River and does not contribute to further water quality impairment. • Only treated water to be discharged. • Implement a water quality monitoring and biomonitoring plan	M: Minor D: Short term S: Local C: Low P: Possible SI: Low (+)
O.32.	Operation of water treatment plant	Wetland/Surface water	**Water quality deterioration** Seepage, leakage or overflow of contaminated water out of the brine ponds and/or sludge dams will likely enter the downslope wetlands and lead to water quality deterioration unless contained.	M: Major D: Long term S: Local C: High P: Possible SI: High (-)	• All brine ponds and sludge dams should be lined. A suitable engineered multiple liner should be installed in the brine ponds and sludge dams to ensure zero seepage of water out of the ponds. • Leak detection mechanisms should form part of the liner system. • Ponds should be of sufficient capacity to ensure that no overflow occurs. • Brine will be temporarily stored on site and disposed of offsite in a suitable facility. • A surface water quality monitoring plan and biomonitoring program will be implemented to monitor downslope water resources for signs of pollution derived from the brine ponds and sludge dams.	M: Moderate D: Long term S: Local C: Medium P: Unlikely SI: Low (-)
O.33.	Operation of sewage treatment plant	Wetland/Surface water	**Water quality deterioration** Discharge or spillages of water from the sewage treatment plant could lead to water quality deterioration within receiving wetlands, specifically the eutrophication of such systems and the loss of sensitive aquatic species. Discharge of untreated or poorly treated sewage could also pose a health risk to downstream water users.	M: Moderate D: Long term S: Regional C: High P: Possible SI: High (-)	• Sewage water will be treated IRWQOs standards set for the Olifants River. • Wetlands downslope of the treatment plant will be included in the water quality and biomonitoring plan for the mine. • Regular inspections and maintenance activities will be undertaken on the treatment plant to ensure optimal operation at all times. • Emergency response procedures will be developed to deal with sewage spills.	M: Minor D: Long term S: Local C: Medium P: Unlikely SI: Low (-)
O.34.	Operation of underground mine, conveying of coal to Block 20	Air Quality	**Increase in dust fallout, PM_{10} and $PM_{2.5}$ particles** The air quality specialist study modelled the daily and annual PM10 and $PM_{2.5}$ Ground Level Concentrations (GLC) expected during the operational phase. In addition, the expected dustfall was also modelled. The plot for PM_{10} and $PM_{2.5}$ GLC annual average plot for the year 2013 is provided in Figure 17 and Figure 18 respectively. The simulated PM_{10} and $PM_{2.5}$ FOE result in exceedance of their respective 4-day per-year SA NAAQS outside the Elders boundary. The impact extends outside the Elders boundary along the conveyor belt. However, the simulated annual average PM_{10} and $PM_{2.5}$ GLCs does not result in exceedance of their respective SA NAAQS value outside the Elders boundary. Exceedance of the 4-day per-year SA NAAQS FOE and annual average SA NAAQS for PM_{10} and $PM_{2.5}$ was not simulated at the Middelkraal or Vlakkuilen communities.	M: Minor D: Long term S: Local C: Medium P: Definite SI: Medium (-)	• Water sprays on unpaved roads, stockpiles and material handling points. • Enclose the crusher and fit with a dust extraction system. • Traffic control done through restriction vehicle speeds on roads. • Vehicle speeds within the mining area will be limited to 40 km/h. • Use water sprays on all stockpiles with special attention given to active stockpiles. • Net screens with fine mist sprays around stockpiles areas. • Soil stockpiles will be vegetated or turfed. • Adhere to specified design for conveyor belt (with a roof and one side covered). The conveyor covering will be in the	M: Minor D: Long term S: Local C: Medium P: Unlikely SI: Low (-)

Assessment of potential impacts of the Elders Colliery during the Operational Phase						
Number	**Activity**	**Environmental aspect**	**Potential Impact**	**Significance rating (not mitigated)**	**Mitigation Measures**	**Significance rating (if mitigated)**
			Isopleth plot due to nuisance effect of dustfall is provided in Figure 19 for operation. The simulated maximum daily dustfall deposition rate result in exceedance of the sensitive receptor residential limit (600 mg/m^2-day) and non-residential limit (1200 mg/m^2-day) outside the Elders boundary, along the conveyor belt. The exceedance does not impact on the Middelkraal or Vlakkuilen communities. There are no communities or sensitive receptors within 500 m of the upgraded conveyor belt. It is unlikely that the operation of the upgraded conveyor belt will cause any additional impact to sensitive receptors. The new section of the conveyor belt to Goedehoop Colliery plant has been re-routed to avoid the Mahlathini community. This new section of the conveyor belt falls within the existing mining area directly adjacent to existing mining related activities. It will run pass the existing Hope Village along an existing conveyor belt route. Additional impact is anticipated to be low based on the operation of the existing conveyor belt.		direction where most sensitive receptors are located (westerly direction of the mine) • Implementation of recommended dust monitoring programme to monitor dust impacts. • Maintain complaint and grievance register and act promptly to complaints regarding dust.	
O.35.	Operation of the boxcut and conveyor belt	Noise	**General rise in ambient noise levels** During both daytime and night time the noise levels from the overland conveyor have a significant impact on the ambient noise levels west of the R35. This is due to the fact that the conveyer is a line source of noise. However, the impact on the Middelkraal community and farmstead is limited due to their distance from the conveyor belt and the dominant noise contribution of road traffic on the R35. The model indicates that there will be no increase in ambient noise levels at both the Middelkraal community and the farmstead during daytime. Refer to Figure 20Figure 15. During night time the increase in ambient noise levels extends much further due to the very low baseline ambient noise levels. However, the Middelkraal community will remain unaffected and at the farmstead the increase will be insignificant. The model indicates that there will be a zero dBA increase at the Middelkraal community and the farmstead will have a 1 dBA increase during night time. Refer to Figure 16. There are no communities or sensitive receptors within 500 m of the upgraded conveyor belt. It is unlikely that the operation of the upgraded conveyor belt will cause any additional impact to sensitive receptors. The new section of the conveyor belt to Goedehoop Colliery plant has been re-routed to avoid the Mahlathini community. This new section of the conveyor belt falls within the existing mining area directly adjacent to existing mining related activities. It will run pass the existing Hope Village along an existing conveyor belt route. Additional impact is anticipated to be low based on the operation of the existing conveyor belt.	M: Minor D: Long term S: Local C: Medium P: Unlikely SI: Low (-)	• Conveyor will be partially enclosed (top cover and one side); • Ensure high level of equipment maintenance, especially intake and exhaust mufflers • Withdraw equipment for maintenance if change in noise emission characteristics is noticeable • Maintain complaint and grievance register and act promptly to complaints regarding noise.	M: Minor D: Long term S: Local C: Medium P: Unlikely SI: Low (-)
O.36.	Operation of the Elders Colliery	Heritage	**Impact on heritage resources – Old building and graveyard** As per C.31 and C.32 in the construction phase.			
O.37.	Operation of the Elders Colliery	Socio-economic	**Conflict with communities within the Primary ZoI should expectations to benefit from economic opportunities and improved living conditions not be met** As per C.38 in the construction phase.			
O.38.	Operation of the Elders Colliery	Socio-economic	**Influx of people and construction workers leading to increased pressure on social services and infrastructure, social pathologies and disruptions, resulting in spontaneous settlements** As per C.39 in the construction phase.			

Assessment of potential impacts of the Elders Colliery during the Operational Phase						
Number	**Activity**	**Environmental aspect**	**Potential Impact**	**Significance rating (not mitigated)**	**Mitigation Measures**	**Significance rating (if mitigated)**
O.39.	Operation of the Elders Colliery	Socio-economic	**Benefits resulting from employment and income opportunities created by Elders Colliery** Employment and a secure income provide many socio-economic benefits to employees and their dependents, including: • Improved material wealth and standard of living; • Enhanced potential to invest in and improve access to social services such as education, health services, etc. (which may be provided directly by the company to employees and/or employees may now have the funds to pay for these services); and, • Employment and training of unskilled workers facilitates skills development and improves the future employment prospects of such workers. Secure wage employment can also contribute towards a sense of independence, freedom, and pride, and it may promote a good work ethic. The mine will create various types of employment: • Direct employment for the workforce • Indirect employment at the supplier companies (procurement); and • Induced employment During operations, it is expected that skilled labour will be moved from Goedehoop Colliery to Elders in an attempt to reduce retrenchments as operations close at Goedehoop. As such, the local employment generated during the operation phase is expected to have a minimal impact to the Elders local communities, apart from maintaining jobs at Goedehoop.	M: Minor D: Medium-term S: Regional C: Low P: Possible SI: Low (+)	• Enforce the Anglo American Contractor Management Plan, which should in addition address accommodation, living standard, transport and health and safety standards of contractors; • Develop a clear and concise employment policy prioritizing local employment; • Implement vocational training programs to promote local workforce capacity as per the Labour and Human Resources Plan (LHRP); • Employ local workers if qualified applicants with the appropriate skills are available. Formalize this policy in company Human Resources guidelines and contractors' agreements; • Purchase goods and services at a local level, if available. Formalize this policy in company purchasing guidelines and contractors' agreements; • Work closely with the local communities before and during the project to identify and communicate required skills and resources that the local community could provide; • Provide or facilitate training of local people in mining and general business skills before and during mining activities, such as through internships, scholarships, and/or vocational and skills training programs; • Prepare a detailed vocational training program in consultation with the local community to be implemented during the construction phase; and, • Through the stakeholder engagement process ensure that expectations are managed around employment opportunities and practices.	M: Minor D: Medium-term S: Regional C: Low P: Possible SI: Low (+)
O.40.	Operation of the Elders Colliery	Socio-economic	**Dissatisfaction over employment opportunities and conditions of procurement which could potentially lead to community protests and unrests, as well as conflicts within communities** As per C.41 in the construction phase.			
O.41.	Operation of the Elders Colliery	Socio-economic	**Improved employment and enterprise development opportunities through skills development and capacity building initiatives** As per C.42 in the construction phase.	M: Moderate D: Medium term S: Local C: Medium P: Possible SI: Medium (+)	• Implement and monitor the SLP; • Support local government in their skills development and training initiatives; • Develop a clear and concise employment policy prioritizing local employment; and, • Furthermore AOL's closure plan should aim at reinforcing the objectives of the SLP by reducing the reliance on AOL for employment by promoting skills transfer to enable alternative livelihoods.	M: Major D: Medium term S: Local C: Medium P: Definite SI: Medium (+)
O.42.	Operation of the Elders Colliery	Socio-economic	**Improved infrastructure in the study area due to social investment activities** As per C.43 in the construction phase.			
O.43.	Operation of the Elders Colliery	Socio-economic	**Increased direct revenue to local government, resulting in local government's ability to provide services to communities** During operations, income to the government is mostly expected to result from royalties, dividends and duties and taxes paid on locally procured services and goods. The operations phase is expected to have a medium (positive) impact of medium-term duration and local scale (due to the relatively limited contribution) on government revenue. Government income is determined by tax regimes and world market prices for commodities. It is however difficult to rate this impact without any financial information.	M: Moderate D: Long term S: Local C: Medium P: Definite SI: Medium (+)	• Support, participate and report on the payment and spending of revenues to government according to the EITI principles and guidelines. • Support, participate and report on the payment and spending of revenues to government according to the EITI principles and guidelines.	M: Moderate D: Long term S: Local C: Medium P: Definite SI: Medium (+)
O.44.	Operation of the Elders Colliery	Socio-economic	**Improved relations with local communities and stakeholders** A per C.45 in the construction phase			

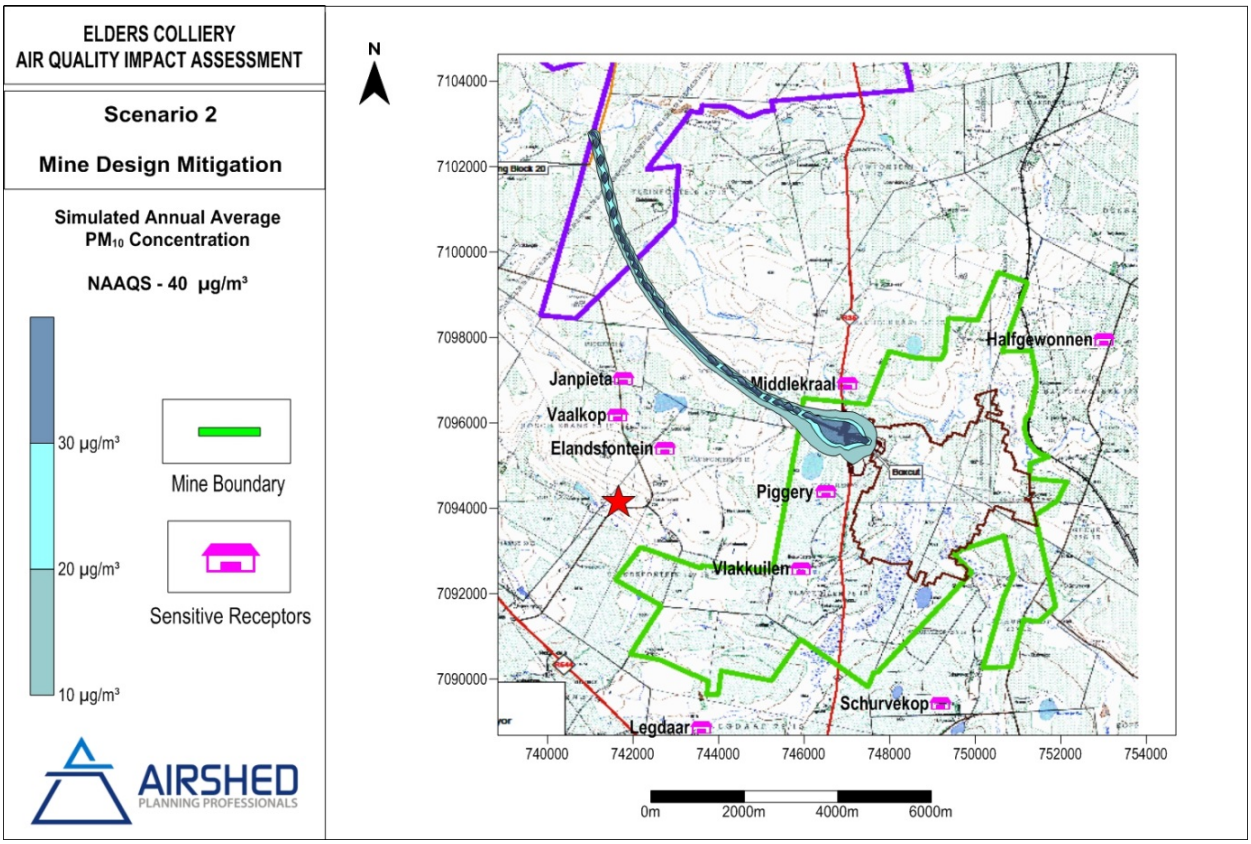


Figure 17: Simulated annual average PM_{10} GLCs during operations (post mitigation) (Airshed, 2015)

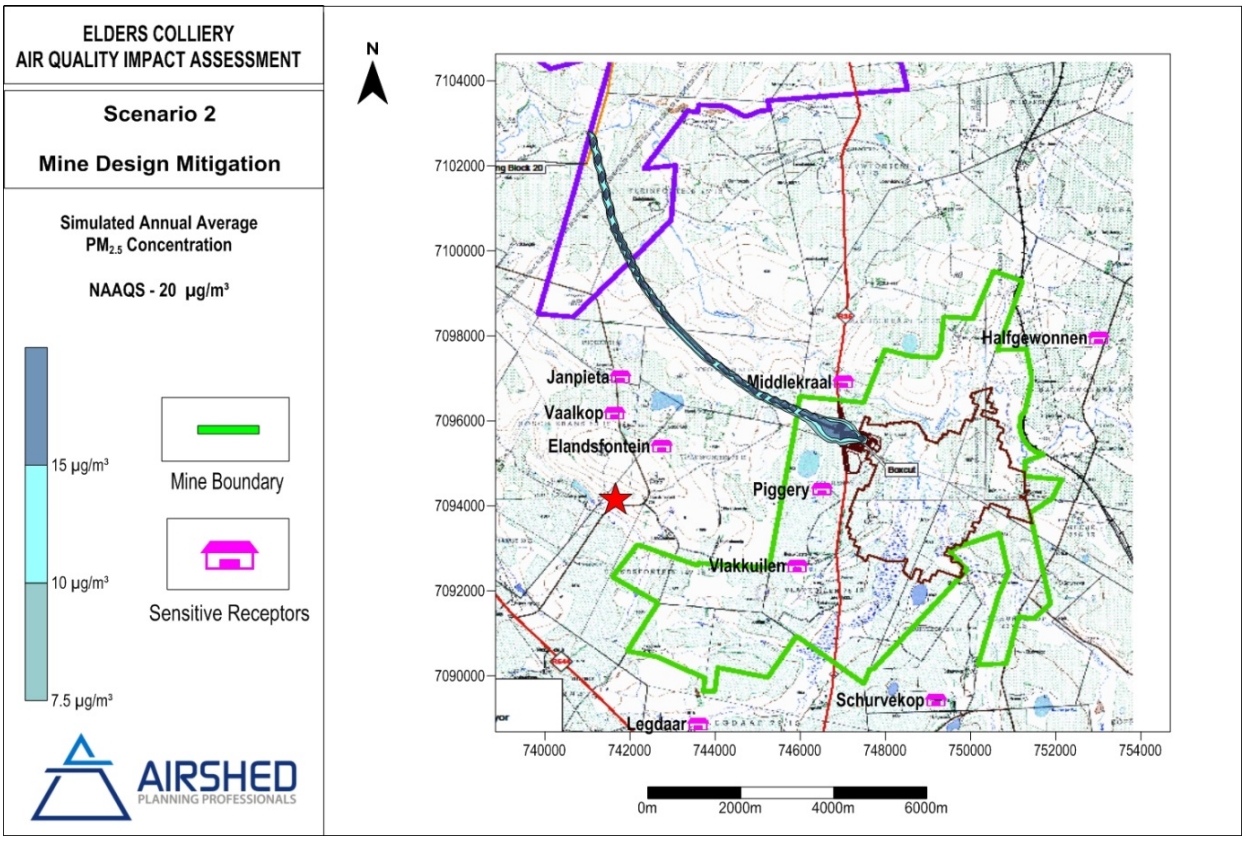


Figure 18: Simulated annual average $PM_{2.5}$ GLCs during operation (post mitigation) (Airshed, 2015

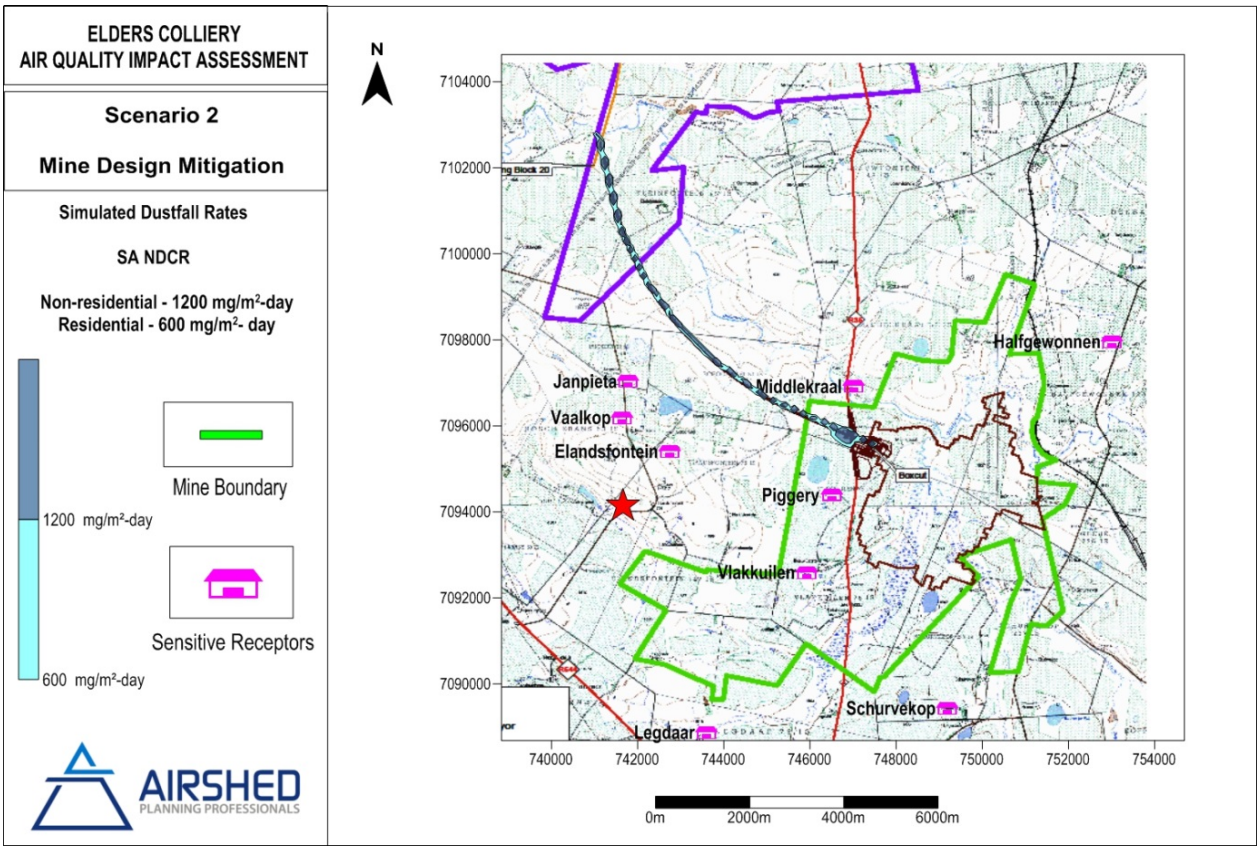


Figure 19: Area of exceedance of the dustfall limit for residential and non-residential areas during operation (post mitigation) (Airshed, 2015)

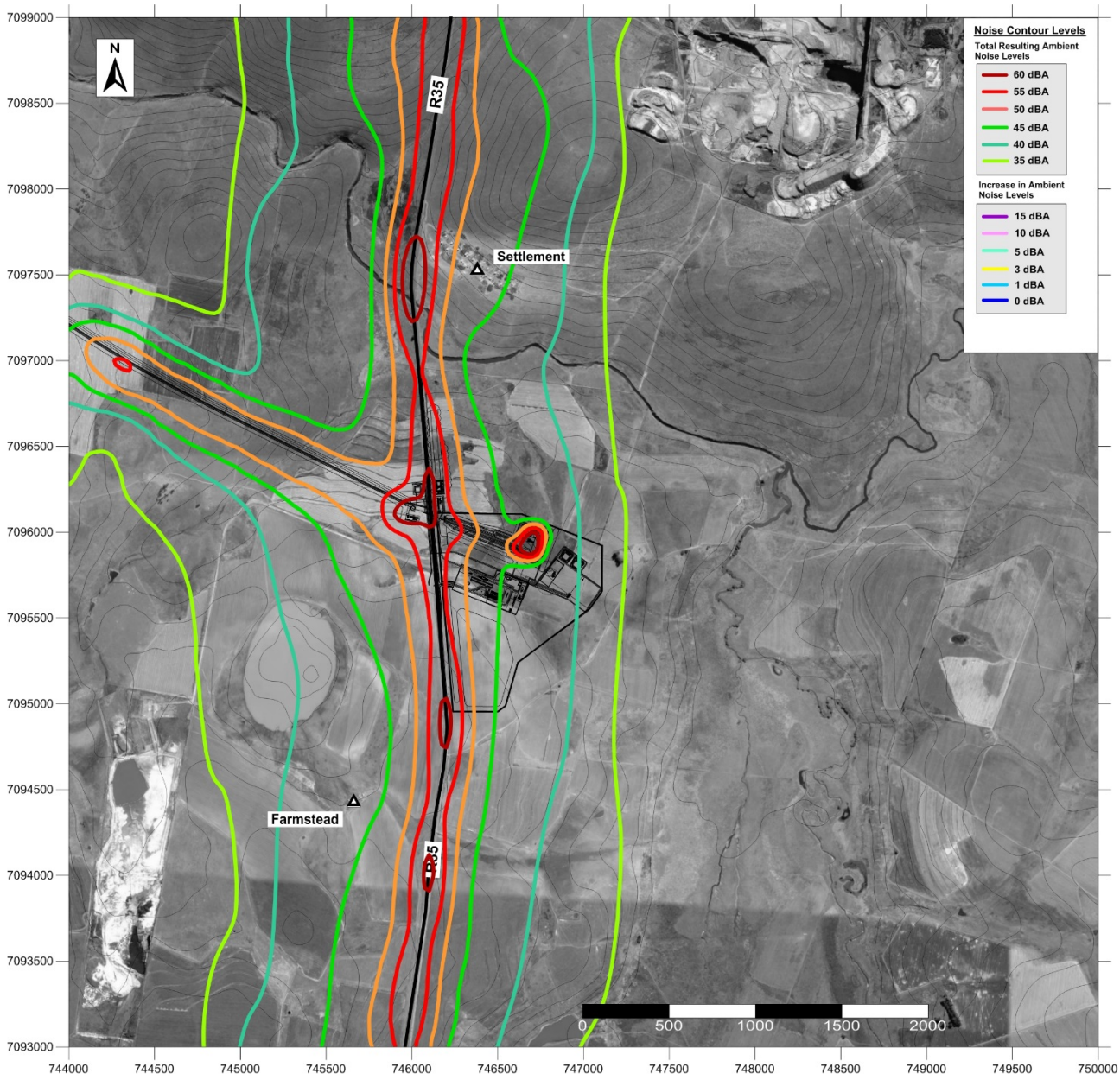


Figure 20: Modelled noise impacts during operation in daytime expressed as the total resulting ambient noise levels (FMAC, 2015)

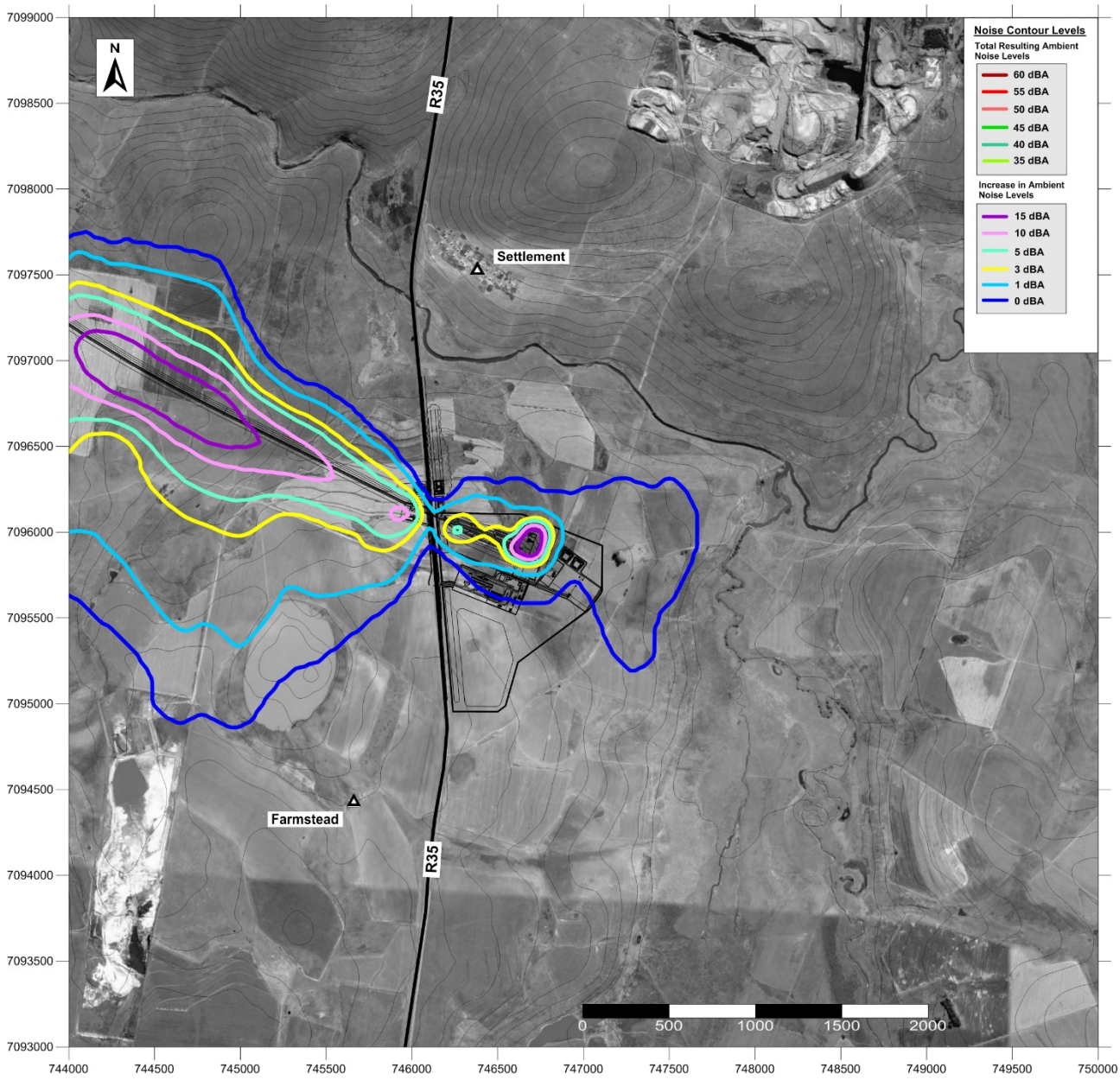


Figure 21: Modelled noise impacts during operation at night time expressed as the total resulting ambient noise levels (FMAC, 2015)

Table 10: Assessment of potential impacts of the Elders Colliery during the Closure Phase

Assessment of potential impacts of the Elders Colliery during the Closure Phase						
Number	**Activity**	**Environmental aspect**	**Potential Impact**	**Significance rating (not mitigated)**	**Mitigation Measures**	**Significance rating (if mitigated)**
D.1.	Demolishment of surface infrastructure	Soils	**Potential for compaction and contamination from heavy vehicles usage and spillage of hydrocarbons, reagents (from infrastructure and machinery), raw materials and dirty water runoff, and the loss of soil due to erosion by wind and or water.** The impact will remain the net loss of the soil resource if no intervention or mitigating strategy is implemented. The magnitude of impact will remain moderate and negative for all of the activities if there is no active management (rehabilitation and intervention) in the decommissioning phase, and closure will not be possible. This will result in an irreversible impact that is continuous. However, with interventions and well planned management, there will be a net positive impact on the rehabilitated area (soils are replaced and fertilization of the soils is implemented after removal of the infrastructure). The land capability will likely be reduced to grazing status.	M: Moderate D: Medium term S: Site C: Medium P: Definite S: Medium (-)	• Re-instatement of the stored soils onto areas of disturbance where infrastructure has been demolished and removed. • Contour and stabilise slopes to be free draining and limit/control vehicle movement and dirty water outflows, vehicle maintenance and assessment of risk of contamination from infrastructure prior to demolition. • Cultivate, amelioration and oxygenation of growing medium, the planting of required vegetative cover and irrigation if required, will reduce/mange erosion, decrease compaction and stabilise the land form. This will once cover has been obtained, effectively see the sites returned to a grazing land capability rating.	M: Moderate D: Medium term S: Site C: Medium P: Possible S: Medium (-)
D.2.	Rehabilitation of boxcut areas and conveyor route servitude	Soils	**Net loss of soil volumes and utilisation potential due to change in material status (physical and chemical) and loss of nutrient base.** The impacts on the soil resource during the decommissioning and closure phase will potentially have both a positive and a negative effect, with: • The loss of the soils original nutrient store and organic carbon by leaching of the soils while in storage; • Erosion and de-oxygenation of materials while stockpiled; • Compaction and dust contamination due to vehicle movement while rehabilitating the shaft site and conveyer servitude; • Contamination of replaced soils by use of dirty water for plant watering and dust suppression on roadways; • Hydrocarbon or chemical spillage from contractor and supply vehicles. • Positive impacts of reduction in areas of disturbance and return of soil utilisation potential, uncovering of areas of storage and rehabilitation of compacted materials. • Erosion management/reduction due to slope stabilization and re-vegetation of disturbed.	M: Moderate D: Medium term S: Site C: Medium P: Possible SI: Medium (-)	• Replace soils on rehabilitated areas as per the soils management plan. • The area must be fenced, and all animals kept off the area until the vegetation is self-sustaining. • Newly seeded/planted areas must be protected against compaction and erosion (Vetiver hedges etc.). • Traffic should be limited were possible while the vegetation is establishing itself. • Plants should be watered and weeded as required on a regular and managed basis were possible and practical. • Replace unhealthy or dead plant material. • Fertilise, hydro seeded and grassed areas soon after germination • Repair any damage caused by erosion.	M: Moderate D: Medium term S: Site C: Medium P: Possible S: Medium (-)
D.3.	Rehabilitation of boxcut areas and conveyor route servitude	Biodiversity	**Re-vegetation of rehabilitated areas** Re-vegetation of areas where demolition and clearing of surface infrastructure has taken place will positively impact on the biodiversity of the area. Strict rehabilitation management measures should be implemented to ensure establishment of indigenous vegetation of rehabilitated areas. Should no rehabilitation and re-vegetation take place during the closure phase, it is anticipated that erosion and further loss of biodiversity will be eminent. The cleared areas will encourage infestation of alien invasive species that will further degrade the natural occurring biodiversity.	M: Moderate D: Long term S: Site C: Medium P: Definite SI: Medium (-)	• Only regionally, biome specific indigenous species should be used in the landscaping and rehabilitation of the boxcut area and conveyor route. • A suitably qualified biodiversity team will assist with the rehabilitation and landscaping plans. • The mine will inspect vegetation establishment. • Ensure the removal of the alien and weed species encountered on the rehabilitated area.	M: Moderate D: Long term S: Site C: Medium P: Definite SI: Medium (+)
D.4.	Backfilling of boxcut void	Groundwater	**The formation of AMD in backfilled boxcut area** The backfilling of the overburden material into the boxcut during closure could potentially result the in the formation of AMD. This will be as a result of ingress of water and oxygen into strata containing sulfide minerals. As the overburden is considered to be inert, as all coal would have been removed during the construction phase, this impact is rated as unlikely and a low significance.	M: Minor D: Long term S: Site C: Medium P: Unlikely SI: Low (-)	• Verify AMD generation potential of the overburden through sampling and analyses of core samples from the boxcut location. • Ensure that backfilled boxcut is shaped in order to be free-draining. • Continue with monitoring (including quality and levels) of boreholes around backfilled boxcut identify any potential contamination of groundwater resources.	M: Minor D: Long term S: Site C: Medium P: Unlikely SI: Low (-)

<table>
<tr><th colspan="6">Assessment of potential impacts of the Elders Colliery during the Closure Phase</th></tr>
<tr><th>Number</th><th>Activity</th><th>Environmental aspect</th><th>Potential Impact</th><th>Significance rating (not mitigated)</th><th>Mitigation Measures</th><th>Significance rating (if mitigated)</th></tr>
<tr><td></td><td></td><td></td><td></td><td></td><td>• Should pollution be identified in the groundwater resources, the source of the pollutants will be investigated and the applicable remediation measures will be implanted.</td><td></td></tr>
<tr><td>D.5.</td><td>Closure of the underground mine</td><td>Groundwater</td><td>The formation of AMD in underground workings
At closure, the voids from mining the No. 2 and No.4 seam could lead to potential AMD formation as a result of the ingress of water and oxygen into strata containing sulfide minerals.
A detailed geochemical assessment and modelling exercise was conducted to determine the post closure quality of mine water associated with the both the underground and box-cut sections at Elders.
Local patches of mine water in contact with only carbonaceous material will be acidic as the carbonate minerals are not efficient to neutralize the acid produced. As the mine gets flooded this acidic parts will came within contact with the neutral-alkaline drainage from the silicate minerals.
Although the heterogeneity and the probable non-ideal mixing of different geochemically units give uncertainty to the exact quantification of the groundwater parameters, the average mine water will only be slightly acidic over the long term in the post-closure mine system under the conditions assumed in the modelling.
Based on the laboratory leaching tests (ICP scans, SO4 analysis and pH values), modelling results of GWB, and previous modelling experience on coal mines, the table below gives an estimation of the mine water quality expected during the various mining phases.
<table><tr><th>Parameter</th><th>Post closure mine water quality (closure to full flooding)</th></tr><tr><td>pH</td><td>5.5</td></tr><tr><td>TDS</td><td>4 500 – 6 500</td></tr><tr><td>Ca</td><td>950 – 750*</td></tr><tr><td>Mg</td><td>250</td></tr><tr><td>Na</td><td>250 – 800</td></tr><tr><td>K</td><td>30 – 80</td></tr><tr><td>SO_4</td><td>1 600 – 4 500</td></tr><tr><td>Total alkalinity</td><td>5</td></tr><tr><td>Al</td><td>< 5</td></tr><tr><td>Fe</td><td>< 10</td></tr></table>* Concentration decrease due to precipitation
• The long-term average estimated pH in table above of pH 5.5 is the general value for the mine and local patches where insufficient buffering is present acidification to pH 3 will be present as modelled.
The TDS may increase to nearly 6500 mg/l in the long-term but it will depend on the mineral content of the surrounding rock.
Ca and Mg will be near the concentrations as predicted in the table above and the drop in the long-term concentration of Ca from the maximum at the initial stage is due to:
• the precipitation of gypsum and other secondary minerals containing Ca, and
• the depletion of calcite. Long-term concentrations for K and Na are difficult to predict and although their concentration will increase with time due to silicate reactions, precipitation will occur for especially K as K-Jarosite and Alunite.</td><td>M: Major
D: Long term
S: Local
C: High
P: Definite
SI: High (-)</td><td>• Optimise storage of mine water in mined-out underground sections.
• Install high pressure seal in the boxcut underground development to the No. 2 seam workings.
• The boxcut will be sealed, backfilled and made free draining.
• The underground workings will be left to fill to a pre-determined environmental safe level (below decant level) before active water level management is implemented.
• Monitoring of water levels in the mine and the associated water quality is committed to. This will allow both calibration of the post mining water quality and water volumes.
• The water level in the workings will be actively managed to ensure it remains below the decant elevation.
• The rise of water will be closely monitored to ensure that the environmental safe level is not exceeded and that appropriate extraction works and treatment facilities are constructed in time to treat the surplus water once the environmental safe level is reached. The water will then be actively maintained at or below the environmental safe level.
• A detailed decant management plan will be developed at mine closure. Ultimately water treatment solutions, either passive or active, will be implemented.
• Monitoring of the water table rebound will continue post-closure and the modelling updated to quantify the long-term impacts. If necessary, the management measures should be revised based on the modelling results.
• Treated water will be discharged to the river system.</td><td>M: Major
D: Long term
S: Local
C: High
P: Definite
SI: High (-)</td></tr>
</table>

Assessment of potential impacts of the Elders Colliery during the Closure Phase						
Number	**Activity**	**Environmental aspect**	**Potential Impact**	**Significance rating (not mitigated)**	**Mitigation Measures**	**Significance rating (if mitigated)**
			SO_4 will increase due to pyrite oxidation in the long term and will reach a maximum of 4500 mg/l. It follows from the above that should this quality water decant onto surface and then be allowed to eventuate into the surface water resources of the area, it would have a significant impacting potential – pollution of the surface water resource.			
D.6.	Closure of the underground mine	Groundwater	**Surface decant of AMD** When underground (70 years) and opencast (box-cut) (35 years) mining sections reach full flooding post closure, the potential for surface decant of mine water is possible. The decant mechanism is uncomplicated and simply comprise the outflow of water from the mine workings when the water pressure in the mine reaches an elevation which is higher than the surface elevation at the discharge point. Typical discharge points are at adit or shaft entrances and/or at the lowest surface elevation in a rehabilitated box-cut or open cast mine. The mine voids as such provide the preferential flow path for decant. For the Elders project, two relevant decant points have been identified and which are shown in Figure 22 - denoted S1 and S2 The actual physical decant point at Elders will be where the underground workings exit into the box-cut and then where the box-cut perimeter actually intersects the lowest surface point. This point is denoted as S1 is at an elevation of 1 590 mamsl. The lowest surface elevation point within the proposed mining area is located along the Viskuile Spruit and is denoted as S2 on the map. The surface elevation at this point is 1 575 mamsl. This elevation represents the critical elevation for flooding in the mine as no decant will occur unless this flooding elevation is reached. However, none of the mine voids directly surface at this elevation and therefore this point merely represents a theoretical surface decant elevation. The box cut was selected along the highest topographical part of the sub-catchment in which it is located, hence also representing the highest possible hydraulic head elevation in the catchment. This implies that decant from this point is actually theoretically impossible as there would not exist any hydraulic pressure in the sub-catchment that could force water out at this point. The post closure pressure in the mine cannot be at a head higher than the highest surface elevation in the catchment.	M: Major D: Long term S: Regional C: High P: Possible SI: High (-)		M: Minor D: Long term S: Site C: Medium P: Unlikely SI: Low (-)
D.7.	Closure of underground mine	Groundwater	**Influx of groundwater into the No. 2 and No. 4 seams leading to dewatering of the overflying aquifer** During the closure of the underground operations, influx of groundwater into the No. 2 and No. 4 seam mine workings will take place. This will result in the potential dewatering of the overlying aquifers, manifesting as a groundwater cone of depression in the water table with negative consequences on the availability of groundwater.	M: Minor D: Long term S: Site C: Medium P: Unlikely SI: Low (-)	• The bord and pillar mine plan will be followed for the underground operations. • Ensure stability and integrity of the overlying strata, specifically the weathered zone. • Mine according to the design mine stability safety factor	M: Minor D: Long term S: Site C: Medium P: Unlikely SI: Low (-)
D.8.	Demolishment of surface infrastructure and rehabilitation of cleared areas	Surface water	**Pollution of surface water resources** Impacts resulting from general rehabilitation and decommissioning works will be similar to those during the construction phase, with rehabilitation earthworks and movement of construction equipment on the site. Impacts may arise from: • Erosion of soils during rainfall events, with elevated suspended solids in the runoff water. • Resultant elevated suspended solids in the watercourses, as well as sedimentation in the watercourses and the adjacent pans. • Hydrocarbon spillages from fuel storage, servicing areas or construction equipment itself, with resultant elevated	M: Moderate D: Short term S: Site C: Low P: Possible SI: Low (-)	• The footprint of disturbed areas will be minimised. • The storm water management infrastructure, including the PCD will be decommissioned last, to ensure adequate storm water management during the rehabilitation phase. • Servicing of heavy vehicles will take place only in dedicated areas that are equipped with drip trays. • Bunded containment and settlement facilities will be provided for hazardous materials, such as fuel and oil. • Spill-sorb or a similar type product will be kept on site and used to clean up hydrocarbon spills in the event that they should occur. • Erosion protection measures will be implemented at steep areas.	M: Minor D: Short term S: Site C: Low P: Possible SI: Low (-)

Assessment of potential impacts of the Elders Colliery during the Closure Phase						
Number	**Activity**	**Environmental aspect**	**Potential Impact**	**Significance rating (not mitigated)**	**Mitigation Measures**	**Significance rating (if mitigated)**
			hydrocarbon concentrations in runoff water, watercourses and the adjacent pans. • Contaminated soils below the stockpiles area may have a long term impact in terms of leaching contaminants to the ground and surface water systems. These impacts are expected to be relatively small, with the resultant impact post decommissioning being positive in comparison with the operational phase.		• A waste management plan will be developed for the closure phase, which will include the handling of contaminated materials / soils found on site. • All traces of hydrocarbons and residual waste will be removed before infrastructure is demolished. • Contaminated soils will be excavated and placed on the discard facilities prior to their rehabilitation, or removed from site by an appropriately licensed waste contractor. • An appropriate sewage management strategy will be implemented during the decommissioning phase, including decommissioning of the sewage treatment plant as late as possible in the process. • Water quality monitoring will be undertaken downstream of the demolished areas, in order to detect any increase in suspended solids or turbidity. • If erosion is evident or the water quality monitoring indicates an increase in suspended solids, water management around the decommissioning areas will be reviewed.	
D.9.	Decommissioning of water management infrastructure	Surface water	**Pollution of surface water resources** The water management berms and canals isolate active areas from the catchment by diverting upslope clean runoff around the active areas and containing runoff generated on the active areas. These can only be removed once the area has been rehabilitated, but may result in increased erosion if not properly planned. The PCD will be used to contain affected runoff and from the mine infrastructure area until such time as the area becomes clean. Impacts may arise from: • Erosion of soils during rainfall events, with elevated suspended solids in the runoff water. • Resultant elevated suspended solids in the watercourses, as well as sedimentation in the watercourses and the adjacent pans. These impacts are expected to be relatively small, with the resultant impact post decommissioning being positive in comparison with the operational phase.	M: Moderate D: Short term S: Regional C: Medium P: Possible SI: Medium (-)	• This infrastructure will be decommissioned and rehabilitated last. • Mitigation measures to be implemented as per D.8.	M: Minor D: Short term S: Site C: Low P: Possible SI: Low (-)
D.10.	Recovery of water levels and possible decant of groundwater	Surface water/ Groundwater	**Pollution of surface water resources** Once the mining has ceased and the boxcut has been backfilled and re-shaped dewatering will cease and water levels will begin to recover in the workings. The underground workings will not fill to decant level during the decommissioning phase.	M: Moderate D: Medium term S: Regional C: Medium P: Definite SI: Medium (-)	• The boxcut will be sealed, backfilled and made free draining. • The underground workings will be left to fill to a pre-determined environmental safe level (below decant level) before active water level management is implemented. • Monitoring of water levels in the mine and the associated water quality is committed to. This will allow both calibration of the post mining water quality and water volumes. • The water level in the workings will be actively managed to ensure it remains below the decant elevation. • The rise of water will be closely monitored to ensure that the environmental safe level is not exceeded and that appropriate extraction works and treatment facilities are constructed in time to treat the surplus water once the environmental safe level is reached. The water will then be actively maintained at or below the environmental safe level. • A detailed decant management plan will be developed at mine closure. Ultimately water treatment solutions, either passive or active, will be implemented. • Monitoring of the water table rebound will continue post-closure and the modelling updated to quantify the long-term impacts. If necessary, the management measures should be revised based on the modelling results.	M: Minor D: Medium term S: Site C: Low P: Possible SI: Low (-)

Assessment of potential impacts of the Elders Colliery during the Closure Phase						
Number	**Activity**	**Environmental aspect**	**Potential Impact**	**Significance rating (not mitigated)**	**Mitigation Measures**	**Significance rating (if mitigated)**
					• Treated water will be discharged to the river system.	
D.11.	Decant of mine water	Surface water/ Groundwater	**Pollution of surface water resources** Post closure, the infrastructure areas will have been rehabilitated and made free draining. Two aspects have been considered here, namely, the volume of decant that could be generated, and the potential quality of decant. If the water levels in the underground workings are not controlled, the potential time to decant is estimated as follows: The rate of recharge to the mine areas is expected to vary, with groundwater inflows reducing as the water level increases within the mine due to a reduced hydraulic gradient towards the mined out areas. However, for the purposes of the calculation, recharge rates are assumed to be relatively constant over the period from cessation of dewatering until (without mitigation) decant reaches the potential decant level. If the decant is not managed, there could be an impact on both the downstream catchment and the downstream dams. This impact is quantified following the discussion of the potential decant qualities. It is considered valuable to assess the potential sulfate loading of the mine on the catchment. This assessment is based on the assumption that the entire water make were to be discharged to the catchment. The water balance at closure indicates that an average water make in the order of 2 600 m^3/day can be expected. Using the expected post closure sulfate concentrations (from JMA Consulting) of 4 500 mg/l, this equates to around 11.7 tonnes SO_4 per day, or around 4 270 tonnes SO_4 per year. The estimates given above are proposed to be refined over the life of mine as follows: • On-going sampling and monitoring of parameters important to the final water quality and water volumes. • Quantification and verification of the groundwater model, the water balance model, and the geochemical model. • Evaluation and reassessment of alternative options for the final water use and required associated water quality, together with the technologies required to achieve the required quality.	M: Major D: Long term S: Regional C: High P: Definite SI: High (-)	• The incline shaft will be backfilled, rehabilitated and made free-draining. • Monitoring of water levels in the mine and the associated water quality is committed to. This will allow both calibration of the post mining water quality and water volumes. • The water level in the workings will be actively managed to ensure it remains below the decant elevation. • The rise of water will be closely monitored to ensure that the environmental safe level is not exceeded and that appropriate extraction works and treatment facilities are constructed in time to treat the surplus water once the environmental safe level is reached. The water will then be actively maintained at or below the environmental safe level. • A detailed decant management plan will be developed at mine closure. Ultimately water treatment solutions, either passive or active, will be implemented. • Monitoring of the water table rebound will continue post-closure and the modelling updated to quantify the long-term impacts. If necessary, the management measures should be revised based on the modelling results. • Discharge of clean water to the river system.	M: Minor D: Long term S: Regional C: Medium P: Unlikely SI: Low (-)
D.12.	Demolishment of surface infrastructure and rehabilitation of cleared areas	Wetland	**Disturbance of wetland habitat** Removal of surface infrastructure could result in disturbance to adjacent wetland habitat. Disturbed areas will subsequently be prone to erosion and establishment of alien vegetation, leading to overall wetland degradation. The decommissioning of the conveyor and associated service road as well as the pipelines and powerlines could result in the disturbance and destruction of wetland habitat. In addition, vehicles accessing the route, turning, loading materials on site etc. could also contribute to disturbance and destruction of wetland habitat outside the 50m servitude. Disturbance of the wetland vegetation is also likely to provide opportunity for erosion and invasion by alien vegetation.	M: Moderate D: Short term S: Local C: Low P: Possible SI: Low (-)	• All decommissioning activities will be restricted to the disturbed footprint and make use of existing access routes and roads. • Fences around wetland areas should be maintained until completion of decommissioning and closure activities. • All solid waste should be removed from site and disposed of at suitable waste disposal sites offsite. • Disturbance footprints should be revegetated as soon as possible following completion of demolition activities. • Alien vegetation management plan should be implemented following re-vegetation to clear alien species. • No activities should take place outside the 55m conveyor servitude. • Inform all contractors and staff on the sensitivity and location of adjacent wetland areas. • No access to wetland areas should be allowed unless infrastructure that needs to be removed is located within a wetland area.	M: Minor D: Short term S: Local C: Low P: Possible SI: Low (-)

Assessment of potential impacts of the Elders Colliery during the Closure Phase						
Number	**Activity**	**Environmental aspect**	**Potential Impact**	**Significance rating (not mitigated)**	**Mitigation Measures**	**Significance rating (if mitigated)**
D.13.	Demolishment of surface infrastructure and rehabilitation of cleared areas	Wetland	**Increased sedimentation in adjacent wetland** The demolition of infrastructure, will expose extensive areas of bare soils to erosion by wind and water. Vehicle tracks are likely to create preferential flow paths along which runoff water concentrates, leading to gully erosion on site and extensive sediment deposition in the downslope wetlands. Areas of sediment deposition within the wetland are likely to become colonised by pioneer species as well as alien vegetation. Depending on the degree of saturation of the deposited sediments, species such as *Typha capensis* (permanent to near permanently saturated areas) are likely to dominate. In more temporary areas, deposited sediments are likely to be colonised by weeds such as *Conyza, Tagetes*, *Verbena* etc. The rehabilitated areas will be susceptible to erosion following rehabilitation, especially in areas that are sparsely vegetated or not vegetated at all. This will result in increased sediment loads in the downslope wetlands, leading to deteriorating water quality (increased turbidity and TSS) and changes in the aquatic fauna. Changes in wetland vegetation can also occur as sediment loving plants (e.g. *Phragmites australis*) become dominant. Erosion of replaced soils on the boxcut footprint will also decrease the likelihood of successful re-vegetation of the area.	M: Moderate D: Long term S: Local C: Medium P: Definite SI: Medium (-)	• All decommissioning activities should be restricted to the disturbed footprint and make use of existing access routes and roads. • Fences around wetland areas should be maintained until completion of decommissioning and closure activities. • All solid waste should be removed from site and disposed of at suitable waste disposal sites offsite. • Disturbance footprints should be revegetated as soon as possible following completion of demolition activities. • Landscape disturbed area to the approximate natural landscape profile and to drain into the adjacent wetland as in the predevelopment state. • Post mining landscape will avoid steep slopes and concentrated runoff. • Re-vegetate replaced soils as soon as possible following placement using a suitable mix of indigenous species. • Implement a long term management and monitoring plan. • Repair erosion damage immediately.	M: Minor D: Short term S: Local C: Low P: Definite SI: Low (-)
D.14.	Demolishment of surface infrastructure and rehabilitation of cleared areas	Wetland	**Water quality deterioration** Where activities have resulted in contamination of the underlying soils due to leaks or spills, decommissioning activities and the associated earthworks could result in mobilisation of the pollutants if the contaminated sediments are disturbed. Pollutants could then enter downslope wetlands via surface runoff.	M: Minor D: Short term S: Local C: Low P: Possible SI: Low (-)	• Remove all solid waste and potentially polluting material from site. • Areas where soils could potentially have been contaminated should be tested to determine contamination levels and appropriate remediation activities. • Rehabilitate contaminated soils in situ if possible. If not possible, remove and dispose of off-site.	M: Minor D: Short term S: Local C: Low P: Possible SI: Low (-)
D.15.	Demolishment of surface infrastructure and rehabilitation of cleared areas	Wetland	**Establishment and spread of alien species** Following the completion of decommissioning, the recently placed and disturbed soils will be susceptible to invasion by alien vegetation, e.g. *Acacia mearnsii* (black wattle). These alien species could spread to the adjacent wetland areas and result in decreased flows, increased erosion and decreased biodiversity in these systems.	M: Moderate D: Long term S: Local C: Medium P: Possible SI: Medium (-)	• Implement alien vegetation management plan to remove and control establishment and spread of alien species.	M: Minor D: Short term S: Local C: Low P: Possible SI: Low (-)
D.16.	Closure of Elders Colliery – potential decant of groundwater	Wetland/Groundwater	**Water quality deterioration** The mined out areas are likely to fill with water following the completion of mining activities. Once pumping of groundwater stops, groundwater levels will recharge and, if left unmanaged, will eventually start decanting. Decanting water is likely to be acidic as well as metal and sulfate rich. Given the location of the proposed boxcut, decant is likely to enter into the Olifants River if left unmitigated.	M: Major D: Long term S: Regional C: High P: Possible SI: High (-)	• Operate a water treatment plant to treat water to the IRWQO standards for the Olifants River. • Discharge treated water into the environment. • Manage water levels within the mined out areas to prevent decant.	M: Minor D: Long term S: Local C: Medium P: Possible SI: Medium (-)
D.17.	Closure of Elders Colliery – potential decant of groundwater	Wetland	**Loss of wetland habitat/establishment of acid seeps** Decant from the mined out areas is likely to occur within low-lying points in the landscape, typically in wetland areas, and take the form of acid seeps. Decanting water could become acidic as well as metal and sulfate rich, and will result in a die-off of the vegetation within the affected area. Such areas will then also be subject to erosion.	N: Moderate D: Long term S: Local C: Medium P: Definite SI: Medium (-)	• Prevent decant from the mined out areas by actively managing water levels within the mined out areas. • Operate a water treatment plant to treat water to the IRWQO standards for the Olifants River.	M: Minor D: Short term S: Site C: Low P: Possible SI: Low (-)
D.18.	Demolishment of surface infrastructure and rehabilitation of cleared areas	Air Quality	**Increased nuisance dust affecting adjacent communities during closure** Potential dust impacts from the Elders Colliery during decommissioning and closure will include demolition, land clearing, grading, bulldozing and compaction. This will result in an increase in nuisance dust and aesthetic impacts associated with fugitive dust emissions.	M: Moderate D: Short term S: Local C: Low P: Possible SI: Low (-)	• Continued implementation of a dust monitoring programme to monitor dust impacts. • Inspection of vegetation establishment. • Maintain a grievance and complaints register and capture the dust related complaints in the grievance mechanism. The grievance will be investigated by the applicable Elders Colliery	M: Minor D: Short term S: Local C: Low P: Possible SI: Low (-)

Assessment of potential impacts of the Elders Colliery during the Closure Phase						
Number	**Activity**	**Environmental aspect**	**Potential Impact**	**Significance rating (not mitigated)**	**Mitigation Measures**	**Significance rating (if mitigated)**
			However, the extent of the dust emissions is likely to be short term and varying depending on the level of activity and meteorological conditions. Dust impacts will also be site specific as clearing activities will be limited to the immediate footprint of the Elders Colliery and will only be during the decommissioning phase.		representative in order for the complaint to be resolved and closed out.	
D.19.	Closure of the Elders Colliery	Noise	**General rise in ambient noise levels** The anticipated ambient noise levels for daytime and night time during the decommissioning and closure phase will be similar to noise levels modelled during construction. Refer to xxx.	M: Minor D: Short term S: Site C: Low P: Unlikely SI: Low (-)	• Ensure high level of equipment maintenance, especially intake and exhaust mufflers. • Withdraw equipment for maintenance if change in noise emission characteristics is noticeable. • Replace pure tone (beeping) with broadband (hissing) reversing alarms. • Maintain complaint and grievance register and act promptly to complaints regarding noise.	M: Minor D: Short term S: Site C: Low P: Unlikely SI: Low (-)
D.20.	Closure of the Elders Colliery	Heritage	**Impact on heritage resources –Old building and graveyard** As per C.31 and C.32 in the construction phase.			
D.21.	Rehabilitation and closure of mine	Socio-economic	**Loss of employment and enterprise development opportunities due to closure of mine** During decommissioning and closure, all mining activities will cease and therefore employment opportunities will be limited. It is anticipated that there will be a negative effect on employees as a result of job losses.	M: Major D: Long term S: Local C: High P: Definite SI: High (-)	• Develop and implement the LHRP that addresses the impacts associated with retrenchment, job losses and reduced demand for local goods and services; and, • Develop a closure plan which will aim to reinforce the objectives of the SLP by reducing the reliance on AOL for employment by promoting skills transfer to enable alternative livelihoods.	M: Moderate D: Long term S: Local C: Medium P: Definite SI: Medium (-)
D.22.	Development of the Elders Colliery	Socio-economic	**Improved infrastructure in the study area due to social investment activities** As per C.43 in the construction phase.			

* M – Magnitude, D – Duration, S – Scale, C – Consequence, P – Probability, SI - Significance

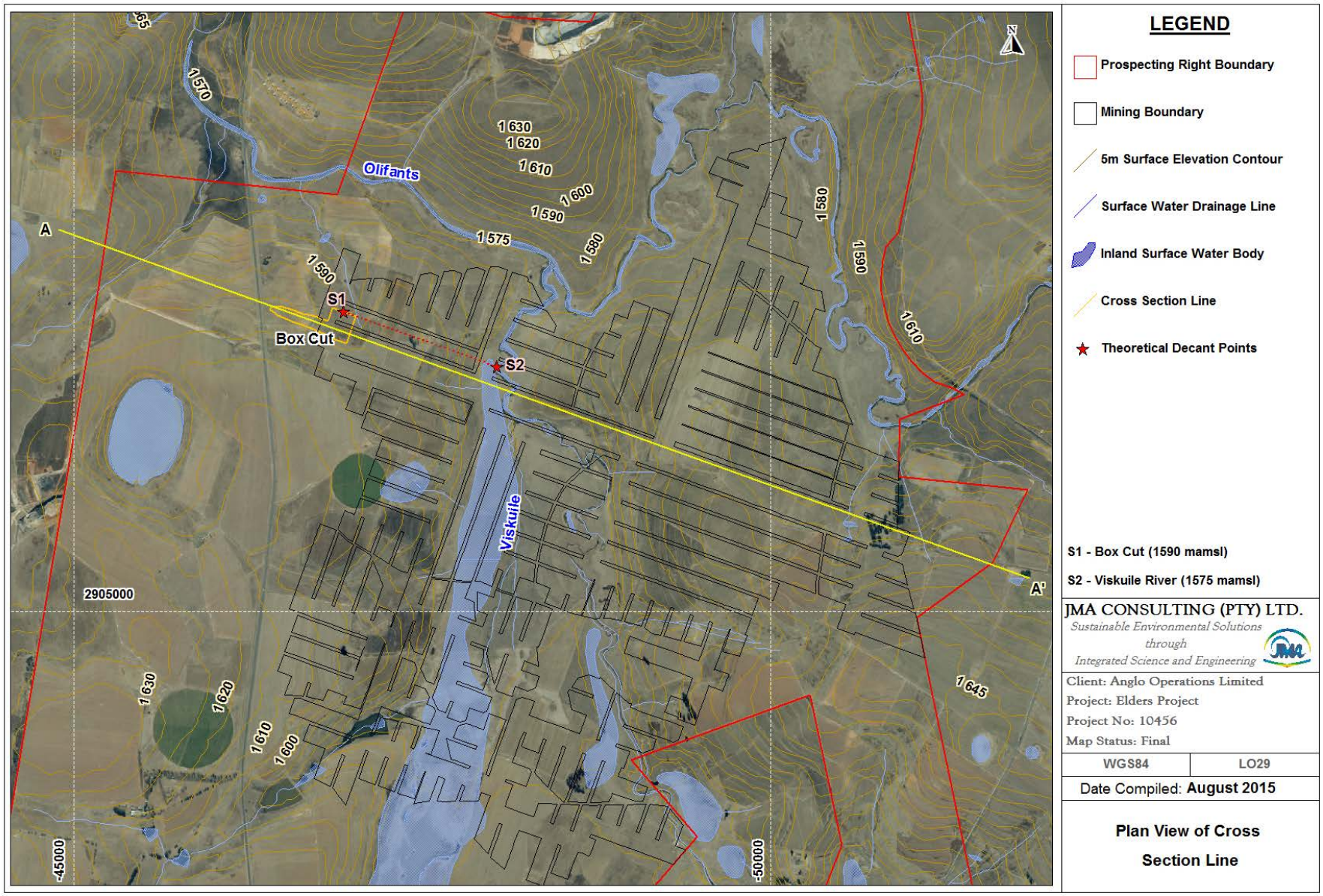


Figure 22: Location of potential decant points for Elders Colliery (JMA, 2015)

j) Summary of specialist reports.

(This summary must be completed if any specialist reports informed the impact assessment and final site layout process and must be in the following tabular form):-

All specialist studies undertaken for the EIA/EMP have provided recommended management commitments to minimise or mitigate the potential impacts identified for the proposed Elders Colliery. These recommendations have been provided in Table 11. Most of these management recommendations have been incorporated into the EMP, however management measures that are not applicable or feasible have been excluded by the EAP.

Table 11: Summary of specialist studies undertaken and recommendations proposed for the Elders Colliery

LIST OF STUDIES UNDERTAKEN	RECOMMENDATIONS OF SPECIALIST REPORTS	RECOMMENDATIONS INCLUDED IN THE EIA REPORT	REFERENCE
Air Quality Airshed Planning Professional	Water sprays; this will results in 50% control efficiency	**X**	Table 8, Table 9
	Machinery used in the process may be located further from the mine boundary.		This is not feasible
	Water sprays on unpaved roads, stockpiles and material handling points; this will results in 50% control efficiency	**X**	Table 8, Table 9
	Temporarily cover earthworks or have a barrier around the construction site, if possible.		This is not feasible due to the extent of the construction area
	Increase coal's moisture content thought the uses of water sprays.		Due to the length of the conveyor this is not feasible.
	Enclose the crusher and fit with a dust extraction system.	**X**	Table 8, Table 9
	Reduce the extent of the roads through paving as a minimum or use chemical treatment on the road surface to ensure a 80% reduction in emissions.		This is not applicable as there will be no hauling of coal
	Traffic control done through restriction of traffic volumes on roads and vehicle speeds.	**X**	Table 8, Table 9
	Use water sprays on all stockpiles with special attention given to active stockpiles.	**X**	Table 8, Table 9
	Netting, rock cladding or wind breaks may be used on old stockpiles		There will be no old stockpiles for this project. The only stockpile will be the overburden stockpile
	Long-term stockpiles should be vegetated or turfed.	**X**	Only included on soil stockpiles
	Net screens with fine mist sprays around stockpiles areas.	**X**	Table 8, Table 9

LIST OF STUDIES UNDERTAKEN	RECOMMENDATIONS OF SPECIALIST REPORTS	RECOMMENDATIONS INCLUDED IN THE EIA REPORT	REFERENCE
	Adhere to specified design (with a roof and one side covered). The conveyor covering should be in the direction where most sensitive receptors are located (westerly direction of the mine)	**X**	Table 8, Table 9
Biodiversity EkoInfo	Removal of vegetation should be restricted to the relevant infrastructure footprints only	**X**	Table 8
	Rocky areas within grasslands are particularly sensitive due to high levels of diversity; these rocky areas should be excluded from all activities related to the proposed project.		This was taken into consideration as far as possible during the design phase
	Topsoil should be stored separately to be used in rehabilitation and landscaping	**X**	Table 8,
	No off-road driving into the natural remaining vegetation should be allowed especially by heavy machinery	**X**	Table 8, Table 9, Table 10
	The development of erosion gullies should be monitored and managed	**X**	Table 8, Table 9, Table 10
	Transformation of natural areas should exclude any areas designated as having high or very high sensitivities		This was taken into consideration as far as possible during the design phase
	Prevent any and all effluent from the mining activities of entering the wetland habitat	**X**	Table 8, Table 9, Table 10
	Prevent contamination of all natural habitat from any source of pollution (air, soil and water)		This is not feasible however will impacts will be mitigated to avoid and reduce effects on the environment
	Prevent all open fires, provide fire-safe zones, facilities and suitable fire control measures	**X**	Table 8
	Use of branches of trees, shrubs or any vegetation for fire making purposes is strictly prohibited	**X**	Table 8
	Provide sufficient on-site ablution, sanitation and waste management and hazardous materials management facilities	**X**	Table 8
	The use of the natural veld for ablution purposes shall not be permitted under any circumstances	**X**	Table 8
	Dust control on all roads should be prioritised	**X**	Table 8
	A road management plan should be compiled prior to commencement of construction activities	**X**	Table 8

LIST OF STUDIES UNDERTAKEN	RECOMMENDATIONS OF SPECIALIST REPORTS	RECOMMENDATIONS INCLUDED IN THE EIA REPORT	REFERENCE
	Infrastructure footprint should be kept to the edge of remaining natural areas		This was taken into consideration as far as possible during the design phase
	Infrastructure footprint should be appended to existing transformed areas		
	Preference should be given to all ready transformed areas		
	The movement of mammals through the landscape is vital; underpasses/culverts should be mandatory at all linear structures	**X**	Table 8
	Remaining areas of natural vegetation, irrespective of their ecological state (poor or good) should be inspected for the presence of species of concern during the optimal time prior to construction by a registered and experienced biodiversity team. This might require a number of visits over a number of months.	**X**	Table 8
	Employees at the mine should be educated about the environment, the species of concern present and how to deal with them. Ignorance paves the way for prejudice.	**X**	Table 8
	Employees should not be allowed to harvest, utilise, manage or control any natural resource (water, soil, flora, fauna) unless it is done within the framework of a biodiversity action plan	**X**	Table 8
	No alien invasive plant or feral animal (domestic or wild) should be introduced into the area or be allowed to establish or spread in the area. Alien invasive or feral species already in the areas should be managed and controlled within the framework of a biodiversity action plan5	**X**	Table 8
	Only regionally, biome specific indigenous species should be used in the landscaping and rehabilitation. The seed and seedlings can be obtained by effectively managing the topsoil prior to construction. A professionally registered biodiversity team consisting of pedologists, botanists and zoologists should assist with the rehabilitation and landscaping plans.	**X**	Table 10
	No animal may be hunted, trapped, snared or captured for any purpose whatsoever. Fences and boundaries should be patrolled weekly in order to locate and remove snares and traps. Fences should be made visible, especially for flying fauna, specifically avifauna	**X**	Fence visibility was taken into consideration as far as possible during the design phase
	Vehicular traffic should not be allowed after dark in order to limit accidental killing of nocturnal animals.		The construction phase will only be undertaken during day life hours, however operations phase is 24hours
	Speed of vehicles should be limited to allow for sufficient safety margins.		
Groundwater JMA Consulting	Shape stockpiles to optimize run-off and re-vegetate to minimize rainfall infiltration		This included in management measures as part of soils
	The soil stockpiles do not need to be provided with a liner system as leachate is expected to be inert.		Taken into consideration in the design phase

LIST OF STUDIES UNDERTAKEN	RECOMMENDATIONS OF SPECIALIST REPORTS	RECOMMENDATIONS INCLUDED IN THE EIA REPORT	REFERENCE
	Verify AMD generation potential through sampling and analyses of actual overburden excavated.	**X**	Table 8, Table 9, Table 10
	Place the overburden on a properly prepared and compacted footprint This will optimize lateral drainage of percolated water and minimize infiltration into the sub-surface.	**X**	Table 8
	A civil engineering design, incorporating footprint preparation, leachate control and storm water management, must nevertheless be done for the Overburden Stockpile and submitted to DWS for approval.	**X**	Table 8
	The cone of depression can be minimized by sealing the box-cut walls with shotcrete/gunite which will allow groundwater levels to re-establish and the cone of depression to become smaller. However, the maximum distance of groundwater lowering around the box-cut was calculated as 208 m which is insignificant in terms of a groundwater availability impact.	**X**	Table 8
	Maintain compaction and shape to ensure free draining of surface run-off to minimize rainfall infiltration.	**X**	Table 8, Table 9, Table 10
	Do not deviate from the planned bord and pillar mining and ensure stability integrity of overlying strata.	**X**	Table 9
	Mine according to design mine stability safety factor.		Table 9
	Optimize storage of mine water make in mined out underground sections.	**X**	Table 9
	Monitor groundwater quality.	**X**	Table 8, Table 9, Table 10
	Maintain underdrain system and dam integrity.	**X**	Table 8, Table 9, Table 10
	Monitor groundwater quality and level in backfilled box-cut during closure	**X**	Table 10
	Abstract water from boreholes around backfilled box-cut and treat before discharge into surface resources if quality requires it.		In order to not limit the mine, the following management measure has been included in the EMP: Should pollution be identified within the groundwater resources, the source of the pollutants will be identified and the applicable remediation measures will be implemented
Surface Water	The footprint of disturbed areas will be minimised.		Included as part of design phase

LIST OF STUDIES UNDERTAKEN	RECOMMENDATIONS OF SPECIALIST REPORTS	RECOMMENDATIONS INCLUDED IN THE EIA REPORT	REFERENCE
Jones & Wagener	"No-go" zones will be delineated for construction plant and personnel.	**X**	Delineation of no-go zones will be undertaken for the contractors camp
	Appropriate storm water management measures will be implemented, including the temporary diversion of upstream run-off from the construction and laydown areas.	**X**	Table 8
	Surface water management measures, such as storm water canals, sediment traps and PCDs are to be constructed first to ensure that runoff and dirty water spills are contained.	**X**	Table 8
	Servicing of construction vehicles will take place only in dedicated areas that are equipped with drip trays.	**X**	Table 8
	Bunded containment and settlement facilities will be provided for hazardous materials, such as fuel and oil.	**X**	Table 8
	Spill-sorb or a similar product will be kept on site, and used to clean up hydrocarbon spills in the event that they should occur.	**X**	Table 8
	Erosion protection measures will be implemented at steep areas.	**X**	Table 8
	A waste management plan will be developed for the construction phase.	**X**	Table 8
	An appropriate sewage management strategy will be implemented during the construction phase.	**X**	Table 8
	Water quality monitoring will be undertaken downstream of the construction areas, before and during construction where practical, in order to detect any increase in suspended solids or turbidity.	**X**	Table 8
	If erosion is evident, or the water quality monitoring indicates an increase in suspended solids, water management around the construction areas will be reviewed.	**X**	Table 8
	The storm water runoff from the overburden stockpile will be caught in a clean water cut off channel. The channel will convey the water to a silt trap from where it will discharge into the proposed clean water cannel at the office area and conveyed into the veld.	**X**	Table 8
	Prior to discharge to the veld, the water quality from overburden stockpile channel will be assessed and pumped to the PCD if not suitable for discharge to the environment.	**X**	Table 8
	The maximum volume of water expected to be generated at the start of mining at the boxcut in 2018 is likely to be around 167 m^3/day during the summer period. The water will be contained at the site, in the PCD, for re-use in dust suppression on haul roads, and as construction water, if the quality is suitable. The water will not be discharged.	**X**	Table 8
	The aerial extent of the disturbed and potentially contaminated areas will be kept to the demarcated construction footprint.	**X**	Table 8

LIST OF STUDIES UNDERTAKEN	RECOMMENDATIONS OF SPECIALIST REPORTS	RECOMMENDATIONS INCLUDED IN THE EIA REPORT	REFERENCE
	Areas where dirty construction activities are carried out (e.g. servicing areas and workshops, fuel storage areas, waste storage areas) will be minimised and surrounded by bunds.	**X**	Table 8
	Clean upslope runoff will be diverted around construction activities.	**X**	Table 8
	Containment of all dirty water generated on the mine in a lined PCD, sized to have a risk of spill of 2% or less in any one year.	**X**	Table 8
	Provision of a water treatment plant to treat a maximum of 5.0 Ml/day of dirty water generated at the mining operations.	**X**	Table 9
	Treatment of excess dirty water for reuse at the Elders operations, including supply of domestic and service water requirements.	**X**	Table 9
	Water will be treated to achieve both drinking water standards (SANS241:2011) and the IRWQO for the Olifants River. Surplus treated water that cannot be reused in the operations will be discharged to the Olifants River system.	**X**	Table 9
	Excess water that cannot be treated or reused will be pumped to storage in underground compartments at around 2025, when storage becomes available at Elders 2 Seam underground sections. Prior to storage becoming available underground, surplus water will need to be pumped to Goedehoop Colliery, should a review of the LOM plan not enable the early provision of storage on the 2 Seam.	**X**	Table 9
	Provision of water management facilities with a risk of spill that is lower than 2% in any one year.	**X**	Table 9
	A surface water quality monitoring programme will be implemented detect any impacts.	**X**	Table 9
	A water balance monitoring programme will be implemented to enable calibration of the water balance.	**X**	Table 9
	All facilities with the potential to generate dirty storm water runoff, effluent or washdown water will be located within the designated dirty water area.	**X**	Table 9
	Clean runoff will be diverted around the designated dirty areas by means of cut-off canals, sized to accommodate at least the 1:50 year peak flow event.	**X**	Table 9
	Adequate erosion protection will be provided at the clean canal discharge locations.	**X**	Table 9
	All spills will be contained within dedicated bunded areas (at wash bays, workshops, waste handling areas, etc.).	**X**	Table 9
	Both general and hazardous wastes will be stored in skips until removed from the site. The skips in turn will be located under cover, in bunded areas, to prevent ingress of direct rainfall.	**X**	The covering of skips will be included in the waste management plan

LIST OF STUDIES UNDERTAKEN	RECOMMENDATIONS OF SPECIALIST REPORTS	RECOMMENDATIONS INCLUDED IN THE EIA REPORT	REFERENCE
			Table 9
	There will be capacity to store a maximum of 132 m^3 of general waste in waste bins during the life of the project.	**X**	Specific capacities will be included in the waste management plan Table 9
	The storage period will be less than 90 days before removal from the site by an appropriately licensed waste removal contractor and disposed of at a licensed general waste facility.	**X**	Table 9
	Hazardous waste will be stored according to the applicable regulations under the National Environmental Management: Waste Act (Act 59 of 2008) and the DWS Minimum Requirements.	**X**	Table 9
	The storage area will, as a minimum, be paved with concrete, covered and provided with bunds and drainage facilities to collect and contain any spills or adversely affected runoff.	**X**	Table 9
	Waste oil will be stored in drums in a bunded storage area.	**X**	Table 9
	Bunded containment and settlement facilities will be provided for hazardous materials, such as fuel and oil.	**X**	Table 9
	All contaminated runoff and spills that escape bunded areas will be collected and contained in the PCD.	**X**	Table 9
	All pipeline routes will be inspected regularly to enable early detection of leaks.	**X**	Table 9
	All storm water and wash down water will be collected in the PCD.	**X**	Table 9
	Washdown and waste water from the workshops will be passed through oil skimmers before discharging to the storm water system for containment in the PCD and eventual treatment for reuse, or pumping to underground storage.	**X**	Table 9
	An inspection and maintenance plan will be implemented on the storm water system to ensure that all oil skimming and sediment handling facilities are maintained and that storm water canals and pipelines remain unblocked and free flowing – monthly inspections will be carried out.	**X**	Table 9
	Spill-sorb or a similar type product must be kept on site and used to clean up hydrocarbon spills in the event that they should occur.	**X**	Table 9
	Contain all dirty water from the shaft area.	**X**	Specific to the box cut area Table 9
	All domestic waste water will be treated in the sewage treatment plant.	**X**	Table 9

LIST OF STUDIES UNDERTAKEN	RECOMMENDATIONS OF SPECIALIST REPORTS	RECOMMENDATIONS INCLUDED IN THE EIA REPORT	REFERENCE
	The sewage water will be treated in the plant to acceptable effluent standards.	**X**	Standards in line with IRWQO for the Olifants River. Table 9
	Sludge will be deposited in drying beds within the designated dirty water area and removed by a licensed waste contractor.	**X**	Table 9
	An inspection and maintenance plan will be implemented to ensure that the sewage treatment plant always operates within specification.	**X**	Table 9
	The pollution control dams will be engineered to have sufficient capacity to limit the risk of spill to less than 2% in any one year.	**X**	Table 9
	In line with best practice, the PCDs will be operated as empty as possible at all times to ensure that sufficient storm water retention capacity is available at all times.	**X**	Table 9
	In the event that there is insufficient available capacity in the main PCD during extreme rainfall conditions, excess storm water will be pumped to the Elders underground storage compartments.	**X**	If capacity is available in the underground workings Table 9
	The pollution control dams will be equipped with geomembrane liners to minimise leakage of contaminated water to the surface or ground water systems.	**X**	Table 9
	The lining system on the PCDs will include a sub-surface drainage layer to detect any leakages, as well as to prevent the build-up of hydrostatic pressure beneath the geomembrane liner. Water collected in the sub-surface drainage system will be discharged to a sump and pumped back into the PCD.	**X**	Table 9
	An inspection and maintenance plan will be implemented to ensure that the dams are kept in good working order and to monitor sediment build-up. When sediment levels reach a pre-determined level, sediment will be removed to ensure that sufficient storm water storage capacity is maintained at all times.	**X**	Table 9
	All dust and fire suppression will take place within the designated dirty water areas.		This is not feasible
	Excess water will therefore drain via the dirty storm water system to the PCD and will be pumped back to the water treatment plant for reuse in the mining operations.	**X**	Table 9
	The WTP will be isolated within a designated dirty water area. All runoff and spills from the treatment plant will be collected in a sump, from which water will be pumped to the PCD.	**X**	Table 9
	All chemicals and additives will be stored in dedicated bunded areas, where any spills will be contained.	**X**	Table 9

LIST OF STUDIES UNDERTAKEN	RECOMMENDATIONS OF SPECIALIST REPORTS	RECOMMENDATIONS INCLUDED IN THE EIA REPORT	REFERENCE
	An inspection and maintenance plan will be implemented to ensure that the water treatment plant always operates within specification.	**X**	Table 9
	Discharge water quality will be continuously monitored for early detection of discharge water quality problems.	**X**	Table 9
	Should upset conditions occur, or poor discharge water quality be detected, the WTP discharge will be directed to the PCD	**X**	Table 9
	Initially one brine dam will be constructed, with a second to be constructed at a later stage, as the WTP's treatment capacity is increased.	**X**	Table 9
	The brine dams will be lined with 300mm compacted clayey layer with a 1.5 mm thick HPDE geomembrane above and below a 6 mm hi-drain, to minimise seepage of contaminated water to the groundwater system. The brine dams will also be equipped with a leak detection sump.	**X**	Table 9 Detailed of liner is not included as this is still being investigated
	The gypsum pads will be paved with concrete. The concrete slabs will be underlain by a 1.5 mm thick HDPE geomembrane liner. The gypsum pad will be provided with concrete bunds to ensure no storm water runoff from the area. The storm water will be directed to a sump at the lower end of the gypsum area, from where water will be directed to the brine dam via a sloping pad and concrete lined channel.	**X**	Table 9
	Gypsum will be removed from the site on a regular basis. This will occur in a timely manner to prevent overloading of the gypsum drying pad.	**X**	Table 9
	Removal from site of gypsum will be undertaken by an appropriately licensed waste removal contractor.	**X**	Table 9
	Disposal of gypsum will be at a licensed hazardous waste disposal facility, such as Holfontein Landfill.	**X**	Table 9
	The gypsum pad will be bunded to prevent clean storm water from entering the pad and to contain all storm water generated on the pad itself. Storm water from the pad will be collected in a sump and pumped to the PCD.	**X**	Table 9
	An inspection and maintenance plan will be implemented to ensure that the pipelines and dams are kept in good working order.	**X**	Table 9
	A surface water quality monitoring programme will be implemented to detect any impacts. The WTP will be isolated within a designated dirty water area. All runoff and spills from the treatment plant will be collected	**X**	Table 9
	Erosion protection measures at the discharge point	**X**	Table 9

LIST OF STUDIES UNDERTAKEN	RECOMMENDATIONS OF SPECIALIST REPORTS	RECOMMENDATIONS INCLUDED IN THE EIA REPORT	REFERENCE
	The quality of the water discharged will be closely monitored to ensure that it falls within the specified IRWQO at all times.	**X**	Table 9
	The Goedehoop pipe will be pressure tested before commissioning backfilling the trench to ensure that all joints are properly sealed.	**X**	Table 9
	The pipe will be will be attached to the conveyor surface infrastructure.	**X**	Table 9
	Monitoring will be implemented downstream of all watercourse crossings to detect any impacts.	**X**	Table 9
	With the exception of the conveyor, conveyor service road, power lines and pipeline from Goedehoop, no mine infrastructure will be located within the 1:100 year floodline of any water course.		This has been taken into consideration during the design phase
	The conveyor will be elevated at least 1 m above the 1:100 year flood level at all watercourse crossings.		This has been taken into consideration during the design phase
	The water supply pipeline from Goedehoop Colliery will be either buried at least 1 m deep and encased in concrete at all watercourse crossings, or mounted onto the conveyor structure.		This has been taken into consideration during the design phase
	The conveyor service road will cross the watercourses by means of low-level crossings. These will be designed to withstand the flow velocities expected during extreme floods with minimal damage.	**X**	Table 9
	The belt drive and transfer infrastructure at either end of the conveyor will be paved with concrete, bunded to prevent run-on of clean water and to contain dirty runoff.	**X**	Table 9
	Loading and offloading of trucks will take place only within the designated dirty water areas and Goedehoop.	**X**	Table 9
	Conveyors will be rotated at the either end to ensure that the dirty side faces upwards at all times.	**X**	Table 9
	Belt scrubbers will be provided at either end to clean the belt to prevent carbonaceous material from being dropped along the route.	**X**	Table 9
	The conveyor will be completely enclosed at the bridge crossing to prevent any spillage of water or coal into the watercourses.	**X**	Table 9
	Watercourse crossings will be designed to accommodate at least the 1:100 year event without overtopping.	**X**	Table 9

LIST OF STUDIES UNDERTAKEN	RECOMMENDATIONS OF SPECIALIST REPORTS	RECOMMENDATIONS INCLUDED IN THE EIA REPORT	REFERENCE
	Dust suppression will be employed at the either end of the conveyor to minimise dust emissions.	**X**	Table 9 At all transfer points
	A shroud will be provided along the entire conveyor length, on the upwind side, to prevent rain from falling directly onto the conveyor and to protect it from wind.	**X**	Table 9
	Loading of trucks will be carefully controlled to ensure that overloading will not take place.	**X**	Table 9
	Truck load boxes will be covered with tarpaulins to prevent spillage of coal from the backs of trucks during transport.	**X**	Table 9
	Monitoring will be implemented downstream of all watercourse crossings along the conveyor route.	**X**	Table 9
	The storm water management measures, including the PCD will be decommissioned last, to ensure adequate storm water management during the rehabilitation phase.	**X**	Table 10
	A waste management plan will be developed for the closure phase, which will include the handling of contaminated materials / soils found on site.	**X**	Table 10
	All traces of hydrocarbons and residual waste will be removed before infrastructure is demolished.	**X**	Table 10
	All coal will be removed from the stockpiles prior to rehabilitation.		This has been removed during the construction phase
	Contaminated soils will be excavated and placed on the discard facilities prior to their rehabilitation, or removed from site by an appropriately licensed waste contractor.	**X**	Table 10
	An appropriate sewage management strategy will be implemented during the decommissioning phase, including decommissioning of the sewage treatment plant as late as possible in the process.	**X**	Table 10
	Water quality monitoring will be undertaken downstream of the demolished areas, in order to detect any increase in suspended solids or turbidity.	**X**	Table 10
	If erosion is evident or the water quality monitoring indicates an increase in suspended solids, water management around the decommissioning areas will be reviewed.	**X**	Table 10
	The incline shaft will be sealed, backfilled and made free draining.	**X**	Table 10
	The underground workings will be left to fill to a pre-determined environmental safe level (below decant level) before active water level management is implemented.	**X**	Table 10
	Monitoring of water levels in the mine and the associated water quality is committed to. This will allow both calibration of the post mining water quality and water volumes.	**X**	Table 10

LIST OF STUDIES UNDERTAKEN	RECOMMENDATIONS OF SPECIALIST REPORTS	RECOMMENDATIONS INCLUDED IN THE EIA REPORT	REFERENCE
	The water level in the workings will be actively managed to ensure it remains below the decant elevation.	**X**	Table 10
	The post closure mine water make will be pumped from the mine workings and treated in a water treatment plant, which will remain operational post closure. This may be the same treatment plant as used in the operational phase, or a regional treatment plant.		The WTP will be decommissioned within 3 years of mine closure. Thereafter the water make from underground workings will be managed such that it will be allowed to fill up through natural recharge to e pre-determined environmental safe level below decant level.
	Treated water will be discharged to the river system.	**X**	Table 10
	The incline shaft will be backfilled, rehabilitated and made free-draining.	**X**	Table 10
	Monitoring of water levels in the mine and the associated water quality is committed to. This will allow both calibration of the post mining water quality and water volumes.	**X**	Table 10
	The water level in the workings will be actively managed to ensure it remains below the decant elevation.	**X**	Table 10
	The post closure mine water make will be pumped from the mine workings and treated in a water treatment plant, which will remain operational post closure.		The water treatment plant will be decommissioned within 3 years of mine closure. Thereafter the water make from underground workings will be managed such that it will be allowed to fill up through natural recharge to a pre-determined environmental safe level below decant level.
	Discharge of clean water to the river system.	**X**	Table 10
Heritage Johnny van Schalkwyk	As no sites, features or objects of cultural heritage significance were identified in the study area, there would be no impact from the proposed development.	**X**	A chance find procedure will be implemented to manage historical sites that may be identified during clearing

LIST OF STUDIES UNDERTAKEN	RECOMMENDATIONS OF SPECIALIST REPORTS	RECOMMENDATIONS INCLUDED IN THE EIA REPORT	REFERENCE
			activities as part of the construction phase.
Heritage Archaetnos	Graveyard to be fenced off and clearly demarcated. Upgrading should take place well outside of the fenced off area.	**X**	Table 8
	The graveyard will be accessible to descendants.	**X**	Table 8
	A management plan for the preservation of the graves will be compiled by a heritage expert and will be implemented by the mine and appointed construction contractor.	**X**	Table 8
	Dust control around the graveyard will be implemented.	**X**	Table 8
	Should the graves fall directly within the proposed conveyor footprint, the graves must be exhumed and relocated.		Not applicable
	Grave exhumation permits will be obtained from SAHRA should it be necessary to exhume the graves.		Not applicable
Noise FMAC	Ensure high level of equipment maintenance, especially intake and exhaust mufflers	**X**	Table 8
	Withdraw equipment for maintenance if change in noise emission characteristics is noticeable	**X**	Table 8
	Replace pure tone (beeping) with broadband (hissing) reversing alarms	**X**	Table 8
	Maintain noise complaint register and act promptly to complaints	**X**	A complaint and grievance register will be compiled Table 8
	Ensure high level of equipment maintenance, especially intake and exhaust mufflers	**X**	Table 8
	Enclose the conveyor as indicated in noise report		The conveyor will be partially enclosed, in order to facilitate maintenance
	Place conveyor in a trench with a depth of at least 2m		Due to the low increase in noise levels this additional mitigation measure was deemed not necessary
Soils, land use and land capability	Limiting the area of impact to as small a footprint as possible, inclusive of waste management facilities, resource stockpiles and the length of servitudes, access and haulage ways and conveyor systems wherever possible.	**X**	Table 8

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Earth Science Solutions	Construction of the facility and associated infrastructure over the less sensitive soil groups (reduce impact over wetlands and soils sensitive to erosion and/or compaction).		This has been included as far as possible during the design phase and therefore is not included in the EMP
	An awareness of the length of time that the resource will need to be stored and managed.		This is not applicable as the soil stockpiled will remain throughout life of mine
	The development and inclusion of soil management as part of the general housekeeping operations, and the independent auditing of this management.	**X**	Table 8
	Concurrent rehabilitation of all affected sites that are not required for the operation – rehabilitation of temporary structures and footprint areas used during the feasibility investigation (geotechnical pits, trenching etc.) and the construction phase.	**X**	Table 8
	When possible, effective soil stripping during the less windy months when the soils are less susceptible to erosion.		This mitigation measure is not feasible as soil stripping will be undertaken as per the construction timeframes
	Separation of the utilisable soils and ferricrete base materials from each other and from the soft overburden.	**X**	Table 8
	Effective cladding of the berms and soil, ferricrete stockpiles/heaps with vegetation or large rock fragments, and the minimising of the height of storage facilities to 15m and soil berms to 1,5m wherever possible.	**X**	Table 8
	Restriction of vehicle movement over unprotected or sensitive areas, this will reduce compaction.	**X**	Table 8
	Soil amelioration (cultivation) to enhance the oxygenation and growing capability (germination) of natural regeneration and/or seed within the stockpiled soils (maintain the soils viability during storage) and areas of concurrent rehabilitation.	**X**	Table 8
	The area must be fenced, and all animals kept off the area until the vegetation is self-sustaining.	**X**	Table 8
	Newly seeded/planted areas must be protected against compaction and erosion (Vetiver hedges etc.).	**X**	Table 8
	Traffic should be limited were possible while the vegetation is establishing itself.	**X**	Table 8
	Plants should be watered and weeded as required on a regular and managed basis were possible and practical.	**X**	Table 8

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	Replace unhealthy or dead plant material.	**X**	Table 8
	Fertilise, hydro seeded and grassed areas soon after germination	**X**	Table 8
	Contour and stabilise slopes to be free draining and limit/control vehicle movement and dirty water outflows, vehicle maintenance and assessment of risk of contamination from infrastructure prior to demolition.	**X**	Table 8
	Re-instatement of the stored soils onto areas of disturbance where infrastructure has been demolished and removed.	**X**	Table 8
	Cultivate, amelioration and oxygenation of growing medium, the planting of required vegetative cover and irrigation if required, will reduce/mange erosion, decrease compaction and stabilise the land form. This will once cover has been obtained, effectively see the sites returned to a grazing land capability rating.	**X**	Table 8
	Replace soils on rehabilitated areas as per the soils management plan.	**X**	Table 8
	Minimisation of the area that can potentially be impacted (eroded, compacted, sterilized or de-nutrified).		Included as part of the design and construction phase
	Timeous replacement of the soils so as to minimise/reduce the area of affect and disturbance.		Soils stockpiles will remain for life of mine, will only be replaced during closure phase.
	Effective soil cover and adequate protection from wind (dust) and dirty water contamination – vegetate and/or rock cladding.	**X**	Table 8
	Regular servicing of all vehicles in well-constructed and bunded areas.	**X**	Table 8
	Regular cleaning and maintenance of all access ways, conveyors and service ways, drains and storm water control facilities.	**X**	Table 8
	Containment and management of spillage.	**X**	Table 8
	Soil replacement and the preparation of a seed bed to facilitate and accelerate the re-vegetation program and to limit potential erosion on all areas that become available for rehabilitation (temporary servitudes).	**X**	Table 8
	Soil amelioration (rehabilitated and stockpiled) to enhance the growth capability of the soils and sustain the soils ability to retain oxygen and nutrients, thus sustaining vegetative material during the storage stage. Monitoring should always be carried out at the same time of the year and at least six weeks after the last application of fertilizer.	**X**	Inspection of vegetation growth will be undertaken throughout closure Table 10

LIST OF STUDIES UNDERTAKEN	RECOMMENDATIONS OF SPECIALIST REPORTS	RECOMMENDATIONS INCLUDED IN THE EIA REPORT	REFERENCE
Wetland Wetland Consulting Services	Fence off all wetland areas outside the direct development footprint. Include a 50m buffer zone around all wetlands within the fenced off area. Where fencing of the wetlands is not practical/desirable, the proposed development footprint should be fenced off and all activities contained within the fenced off area.	**X**	Only the development footprint area will be fenced off.
	Clearly demarcate the proposed development footprints and limit all activities to the demarcated area.	**X**	Table 8
	Minimise the size of the proposed development footprints through optimising the design.		This has been taken into consideration in the design phase
	Locate all temporary stockpiles, constructor's camps, laydown areas, ablution facilities etc. a minimum of 50m from any delineated wetland area.		This has been taken into consideration in the design phase
	Develop and implement a construction stormwater management plan prior to the commencement of site clearing activities.	**X**	Table 8
	Rehabilitate and re-vegetate all disturbed areas as soon as possible following disturbance.	**X**	Table 8
	Phase vegetation clearing and soil stripping activities to minimise the extent of bare soil areas exposed at any one time.		This is not applicable as the duration of construction is limited to 18 months and clearing will be directly followed by construction of infrastructure
	Areas in and around the wetlands should not be cleaned, graded and ditched/trenched more than a week before construction activities commence.	**X**	Table 8
	Where construction is proposed to take place within a wetland or its catchment, this should take place during the low flow (winter) months where possible, in order to minimise the risk to the hydrology of the systems as well as to prevent excessive sediment and debris being washed into wetland areas		This will not be feasibility as the construction timeframes is 18 months, which does not exclude the low flow months
	Divert flows from upslope of the construction area around the cleared area.	**X**	Table 8
	Concentrate soil stripping activities to the dry season as far as possible.		This will not be feasibility as the construction timeframes is 18 months, which does not exclude the low flow months
	No washing of equipment or machinery in any waterbody or wetland on site.	**X**	Table 8

LIST OF STUDIES UNDERTAKEN	RECOMMENDATIONS OF SPECIALIST REPORTS	RECOMMENDATIONS INCLUDED IN THE EIA REPORT	REFERENCE
	Discharge stormwater runoff into terrestrial grassland areas rather than directly into wetlands.		This is not feasibility as the hill slope seepage wetlands are located in the low lying areas were water will naturally drain to
	Store potential contaminants in designated areas with spill containment measures.	**X**	Table 8
	Keep sufficient spill clean-up material on site to deal with small spills	**X**	Table 8
	Develop emergency response procedures to deal with large spills.	**X**	Table 8
	Locate laydown area at least 50m from any delineated wetland area.		This has been taken into consideration in the design phase
	Fence off laydown area and restrict all activities to fenced off area.	**X**	Table 8
	Inform contractors regarding the location and sensitivity of all wetland areas	**X**	Table 8
	Compile and implement alien vegetation management plan to remove and control establishment and spread of alien species.	**X**	Table 8
	Limit all activities to the conveyor servitude.	**X**	Table 8
	Fence off the conveyor servitude prior to the commencement of vegetation clearing and earthmoving activities.	**X**	Table 8
	Concentrate within wetland activities in the dry season as far as possible.		This will not be feasibility as the construction timeframes is 18 months, which does not exclude the low flow months
	No stockpiling of materials or placement of temporary construction infrastructure in the wetlands or within 50m of the wetlands.	**X**	Table 8
	No materials should be stockpiled within the wetland areas along the route and driving within the wetland areas should be kept to an absolute minimum. Clearly defined access routes should be used.	**X**	Table 8
	Use existing farm tracks and roads for access, as well as for service road as far as possible.	**X**	Table 8
	Minimise the construction footprint within the wetland area. Clearly demarcate the required construction servitude and maintain all activities within the demarcated area.	**X**	Table 8

LIST OF STUDIES UNDERTAKEN	RECOMMENDATIONS OF SPECIALIST REPORTS	RECOMMENDATIONS INCLUDED IN THE EIA REPORT	REFERENCE
	The conveyor should span the entire width of the active channel in valley bottom crossings. Conveyor footings within the wetlands should be kept to a minimum.	**X**	Table 8
	Post construction all alien invasive vegetation should be removed from site. This will also require long-term follow up to ensure establishment of natural vegetation in all disturbed areas.	**X**	Table 8
	Maintain flow connectivity in valley bottom wetlands during the construction phase by temporarily diverting streams around the construction area.		This is not applicable as the construction of the conveyor will not prevent flow completely within the watercourses during construction
	Install erosion prevention measures prior to the onset of construction activities	**X**	Table 8
	No conveyor footings should be placed within the active channel of any valley bottom wetlands. The active channel should be spanned.	**X**	Table 8
	Locate all stockpiles, laydown areas and temporary construction infrastructure at least 50m from the edge of delineated wetlands.	**X**	Table 8
	Service road crossings over valley bottom wetlands should be via low level bridges – low flows should be accommodated via culverts and flood flows should overtop the low level bridge.	**X**	Table 8
	Culvert capacity should be such to prevent impoundment upslope of the crossing and flow concentration downslope.	**X**	Table 8
	Limit cleared areas to as small an area as possible at any one time	**X**	Table 8
	Revegetate and rehabilitate areas as soon as possible after completion of construction.	**X**	Table 8
	Fence off the conveyor servitude using a standard 5 strand cattle fence to allow free movement of small mammals.		The fence will be designed to prevent people from gaining access to the conveyor route
	Ensure sufficient space under the conveyor to allow free movement of small mammals.	**X**	Table 8
	Maintain a pillar size/safety factor that will ensure that no surface subsidence occurs under any of the wetlands on site.	**X**	Table 8

LIST OF STUDIES UNDERTAKEN	RECOMMENDATIONS OF SPECIALIST REPORTS	RECOMMENDATIONS INCLUDED IN THE EIA REPORT	REFERENCE
	Minimise blasting activities underground.		There will be no blasting activities associated with bord and pillar underground mining
	Stockpiles containing carbonaceous material should be classified as dirty water areas and isolated from the surrounding catchment. No run-off from these areas should be discharged.		This is not applicable as all carbonaceous material from the stockpiles will be removed during the construction phase.
	Run-off from topsoil stockpiles should enter a sediment trap prior to discharge to the environment.	**X**	Table 9
	Topsoil stockpiles should ideally be vegetated to stabilise slopes and minimise sediment loss.	**X**	Table 9
	Regular inspection and maintenance of the entire conveyor route should be undertaken.	**X**	Table 9
	The conveyor should be designed and operate to minimise the likelihood of spillages. A conveyor belt loading of 76 % should not be exceeded.		This has been taken into consideration in the design phase
	Gantries/decking should be installed at all wetland crossings to prevent spillages directly entering wetlands.	**X**	This will be undertaken at channel watercourses, not all wetlands
	All wetlands along the conveyor servitude must be clearly demarcated as sensitive habitats.	**X**	Table 9
	All vehicular and machinery movement along the servitude must be restricted to the service road. No off-road driving.	**X**	Table 9
	Protect discharge point against erosion and incorporate energy dissipaters.	**X**	Table 9
	Investigate opportunities of reintroducing water into the environment using alternative means, e.g. irrigation.		Discharge of water is the current preferred option
	Ensure discharge water quality is always in line with the RQO's set for the Olifants River	**X**	IRWQO for the Olifants River
	Implement a water quality monitoring and biomonitoring plan	**X**	Table 9
	Only treated water to be discharged.	**X**	Table 9

LIST OF STUDIES UNDERTAKEN	RECOMMENDATIONS OF SPECIALIST REPORTS	RECOMMENDATIONS INCLUDED IN THE EIA REPORT	REFERENCE
	All brine ponds and sludge dams should be lined. A suitable engineered multiple liner should be installed in the brine ponds and sludge dams to ensure zero seepage of water out of the ponds.	**X**	Table 9
	Leak detection mechanisms should form part of the liner system.	**X**	Table 9
	Ponds should be of sufficient capacity to ensure that no overflow occurs.	**X**	Table 9
	Brine should be temporarily stored on site and disposed of offsite in a suitable facility.	**X**	Table 9
	A surface water quality monitoring plan and biomonitoring program should be implemented to monitor downslope water resources for signs of pollution derived from the brine ponds and sludge dams.	**X**	Table 9
	All treated sewage water should be reused on site within the mining operations.		The sewage water will be treated in the plant to acceptable effluent standards and then discharged
	No discharge of treated or untreated sewage should be allowed.		
	Wetlands downslope of the treatment plant should be included in the water quality and biomonitoring plan for the mine.	**X**	Table 9
	Regular inspections and maintenance activities should be undertaken on the treatment plant to ensure optimal operation at all times.	**X**	Table 9
	Emergency response procedures will be developed to deal with sewage spills.	**X**	Table 9
	All decommissioning activities should be restricted to the disturbed footprint and make use of existing access routes and roads.	**X**	Table 10
	Fences around wetland areas should be maintained until completion of decommissioning and closure activities.	**X**	Table 10
	All solid waste should be removed from site and disposed of at suitable waste disposal sites offsite.	**X**	Table 10
	Disturbance footprints should be revegetated as soon as possible following completion of demolition activities.	**X**	Table 10
	Alien vegetation management plan should be implemented following re-vegetation to clear alien species.	**X**	Table 10
	All solid waste should be removed from site and disposed of at suitable waste disposal sites offsite.	**X**	Table 10
	Remove all solid waste and potentially polluting material from site.	**X**	Table 10

LIST OF STUDIES UNDERTAKEN	RECOMMENDATIONS OF SPECIALIST REPORTS	RECOMMENDATIONS INCLUDED IN THE EIA REPORT	REFERENCE
	Areas where soils could potentially have been contaminated should be tested to determine contamination levels and appropriate remediation activities.	**X**	Table 10
	Rehabilitate contaminated soils in situ if possible. If not possible, remove and dispose of off-site.	**X**	Table 10
	Limit decommissioning activities to the disturbed footprint.	**X**	Table 10
	No activities should take place outside the 50m conveyor servitude.	**X**	Table 10
	No access to wetland areas should be allowed unless infrastructure that needs to be removed is located within a wetland area.	**X**	Table 10
	Landscape disturbed area to the approximate natural landscape profile and to drain into the adjacent wetland as in the predevelopment state.	**X**	Table 10
	Post mining landscape should avoid steep slopes and concentrated runoff.	**X**	Table 10
	Re-vegetate replaced soils as soon as possible following placement using a suitable mix of indigenous species.	**X**	Table 10
	Implement a long term management and monitoring plan.	**X**	Table 10
	Repair erosion damage immediately.	**X**	Table 10
	Construct and operate a water treatment plant during closure to treat water to acceptable levels (RQO).	**X**	IRWQO for the Olifants River
	Discharge treated water into the environment.	**X**	Table 10
	Manage water levels within the mined out areas to prevent decant.	**X**	Table 10
	Prevent decant from the mined out areas by actively managing water levels within the mined out areas.	**X**	Table 10
Blasting Blast Management & Consulting	**Blast Design and Initiation** A typical box-cut blast design was applied for this report. It is strongly recommended that the box-cut blast design be revisited and a proper detail design is done for the box-cut that will take these variables into consideration. In this design the initiation can be designed in such a way that ground vibration levels are managed at the points of concern identified.	**X**	Table 8
	Safe blasting distance A minimum safe distance of 207 m is required but recommended is that a minimum of 500 m must be maintained from any blast done. This may be greater but not less. The blaster has a legal obligation concerning the safe distance and he needs to determine this distance.	**X**	

LIST OF STUDIES UNDERTAKEN	RECOMMENDATIONS OF SPECIALIST REPORTS	RECOMMENDATIONS INCLUDED IN THE EIA REPORT	REFERENCE
	Evacuation All persons and animals within 500 m from a blast must be cleared and where necessary evacuation must be conducted with all the required pre-blast negotiations.	**X**	
	Road Closure The R35 road is on the south western side of the box-cut area and is at closest 64m away from the planned box-cut area. Expected ground vibration levels at this road are higher than the recommended limits. Changed blasting parameters will have to be applied to ensure levels are within accepted norms. The road will also have to be closed during the time of blasting. The necessary authorisations from the roads agency / department will be required when blasting is done in the box-cut. It is recommended as well that all necessary precautions be taken for cleaning of the road should there be any material landing on the road.	**X**	
	Stemming length The current proposed stemming lengths as defined in the blast design must be maintained to ensure control on fly rock. Specific designs where distances and blast is known should be considered with this.	**X**	
	Recommended ground vibration and air blast levels General ground vibration and air blast levels are recommended for blasting operations in the box-cut area, as per Table 22 in the blasting report	**X**	
	Blasting times Blasting times should consider the times where the road usage is low. This will reduce the impact on travellers using the road when road closure for blasting is done. A further consideration of blasting times is when weather conditions could influence the effects yielded by blasting operations. Recommended is not to blast too early in the morning when it is still cool or the possibility of inversion is present or too late in the afternoon in winter as well. Do not blast in fog. Do not blast in the dark. Refrain from blasting when wind is blowing strongly in the direction of an outside receptor. Do not blast with low overcast clouds. These 'do not's stem from the influence that weather has on air blast. The energy of air blast cannot be increased but it is distributed differently to unexpected levels where it was not expected. It is recommended that a standard blasting time is fixed and blasting notice boards setup at various routes around the project area that will inform road users and farming community of blasting dates and times.	**X**	
	Third party monitoring Third party consultation and monitoring should be considered for all ground vibration and air blast monitoring work. Additionally assistance may be sought when blasting is done close to the highways. This will bring about unbiased evaluation of levels and influence from an	**X**	

LIST OF STUDIES UNDERTAKEN	RECOMMENDATIONS OF SPECIALIST REPORTS	RECOMMENDATIONS INCLUDED IN THE EIA REPORT	REFERENCE
	independent group. Monitoring could be done using permanent installed stations. Audit functions may also be conducted to assist the mine in maintaining a high level of performance with regards to blast results and the effects related to blasting operations.		
Socio-Economic SRK Consulting	Compile and implement the management measures detailed in the SLP.	**X**	Table 8
	Prioritise the employment of the communities residing within the Primary ZoI for semi-skilled and unskilled job opportunities during construction.	**X**	Table 8
	Enforce the contractor management plan, especially relating to local recruitment and procurement.	**X**	Table 8
	Where possible, engage with the Govan Mbeki Local Municipality to identify opportunities of collaboration and capacity building for the provision of social services to the communities within the Primary ZoI.	**X**	Table 8
	Develop a clear and concise employment and recruitment policy that prioritizes local recruitment. Ensure that contractors adhere to this policy.	**X**	Table 8
	Identify and support community development programmes that address challenges raised by population influx and spontaneous settlement.	**X**	Table 8
	Enforce the Anglo American principles regarding employee and contractor behaviour;	**X**	Table 8
	Continuously monitor the housing and living conditions of employees receiving living out allowances.	**X**	Table 8Table 8
	Support local government capacity for integrated development planning.	**X**	Table 8
	Participate in the local government's strategy to address issues related to and potentially enhanced by project-induced influx. This strategy will be developed in order to clearly define how participants, including AOL, local government and relevant stakeholders, intend to manage the impacts caused by influx where possible.	**X**	Table 8
	Compile and implement the community health and safety initiatives of the Community Health and Safety Plan (CHSP), such as education and awareness programs that address social pathologies in neighbouring communities through established government departments.	**X**	Table 8
	Implement vocational training programs to promote local workforce capacity as per the Labour and Human Resources Plan (LHRP).	**X**	Table 8

LIST OF STUDIES UNDERTAKEN	RECOMMENDATIONS OF SPECIALIST REPORTS	RECOMMENDATIONS INCLUDED IN THE EIA REPORT	REFERENCE
	Purchase goods and services at a local level, if available. Formalize this policy in company purchasing guidelines and contractors' agreements.	**X**	Table 8
	Work closely with the local communities before and during the project to identify and communicate required skills and resources that the local community could provide;	**X**	Table 8
	Provide or facilitate training of local people in mining and general business skills before and during mining activities, such as through internships, scholarships, and/or vocational and skills training programs.	**X**	Table 8
	Prepare a detailed vocational training program in consultation with the local community to be implemented during the construction phase.	**X**	Table 8
	Through the stakeholder engagement process ensure that expectations are managed around employment opportunities and practices.	**X**	Table 8
	In order to promote skills development and capacity building initiatives to both employees and the broader population and, in particular amongst youth, the SLP should focus on enterprise development and capacity building;	**X**	Table 8
	Support local government in their skills development and training initiatives;	**X**	Table 8
	Furthermore, AOL's closure plan will aim to reinforce the objectives of the SLP by reducing the reliance on AOL for employment by promoting skills transfer to enable alternative livelihoods; and,	**X**	Table 10
	Support, participate and report on the payment and spending of revenue s to government according to the EITI principles and guidelines.	**X**	Table 8
	Include affected communities in the decision making processes of the project, particularly around potential Corporate Social Investment (CSI) opportunities, and SLP projects;	**X**	Table 8
	Ensure that all stakeholder engagement includes women, youth and vulnerable groups;	**X**	Table 8
	Provide regular and transparent feedback to the Vlakkuilen and Middelkraal communities specifically;	**X**	Table 8
	Discuss and manage issues, concerns, changes and impacts related to the project as soon as they arise;	**X**	Table 8
	Monitor and implement the Grievance Management Mechanism;	**X**	Table 8
	Involve Local Ward Councillors and keep them informed about project developments, and included in all stakeholder engagement processes. Their involvement will assist with the	**X**	Table 8

LIST OF STUDIES UNDERTAKEN	RECOMMENDATIONS OF SPECIALIST REPORTS	RECOMMENDATIONS INCLUDED IN THE EIA REPORT	REFERENCE
	successful development of relationships between the mine, the municipality and the communities;		
	Regularly consult with local government through the Govan Mbeki Local Municipality around issues of community development, employment, co-operation and project activities;	**X**	Table 8
	Where possible CSI initiatives and SLP projects with the Govan Mbeki Local Municipality IDP with the goal of improving both sustainability and feasibility (this would only occur once the mine was operational);	**X**	Table 8
	Durable participatory and consultative structures should be in place pre-closure to mitigate the impacts of closure.	**X**	Table 8
	Continue the discussions with and planning for the livelihoods restoration for the Vlakkuilen community;	**X**	Table 8
	Continue engaging the community and Ward Councillor to provide information about the project progress; and,	**X**	Table 8
	Enforce the Anglo American Contractor Management Plan, which should in addition address accommodation, living standard, transport and health and safety standards of contractors;	**X**	Table 8
	Employ local workers if qualified applicants with the appropriate skills are available. Formalize this policy in company Human Resources guidelines and contractors' agreements;	**X**	Table 8
	Develop a clear and concise employment policy prioritizing local employment;	**X**	Table 8
	Through the stakeholder engagement process ensure that expectations are managed around employment opportunities and practices.	**X**	Table 8
	Furthermore AOL's closure plan should aim at reinforcing the objectives of the SLP by reducing the reliance on AOL for employment by promoting skills transfer to enable alternative livelihoods.	**X**	Table 10

The specialist reports are available in **Appendix 7**.

k) Environmental impact statement

(i) Summary of the key findings of the environmental impact assessment;

The impact assessment confirmed that the proposed activities (without mitigation) are expected to have impacts of high significance rating in relation to: wetlands, groundwater, surface water, air quality (dust generation), noise and socio-economic conditions.

The key impacts that relate to the proposed Elders Colliery, and are rated as having a high significance, are included in Table 12. Table 8 to Table 10 describes all impacts identified in detail and includes mitigation measures to reduce the significant ratings.

Table 12: Summary of impacts and significant ratings pre and post implementation of management commitments

Activity	Potential Impact	Aspects	Phase	Significance pre-mitigation	Significance post-mitigation
Site clearing and grubbing of the footprint areas associated with the boxcut and associated surface infrastructure. Construction of boxcut and associated surface infrastructure.	The loss of utilisable resource (sterilisation and erosion), compaction and contamination or salinisation.	Soils	Construction	SI: High (-)	SI: Medium (-)
Construction of the conveyor belt and associated servitude	The loss of the utilisation of the soil resource will impact the land use practice of low to moderate intensity livestock grazing and commercial cultivation of crops that are the major activities on the dryland soils at present.	Soils	Construction	SI: High (-)	SI: Medium (-)
Construction of conveyor belt servitude between Elders Colliery and Block 20	Permanent loss of habitat for flora and fauna	Biodiversity	Construction	SI: High (-)	SI: High (-)
Construction of conveyor belt servitude between Elders Colliery and Block 20	Habitat fragmentation	Biodiversity	Construction	SI: High (-)	SI: High (-)
Construction of conveyor belt servitude between Elders Colliery and Block 20	Loss of species of concern	Biodiversity	Construction	SI: High (-)	SI: Low (-)
Site clearing and grubbing of the footprint areas associated with the boxcut and associated surface infrastructure. Construction of boxcut and associated surface infrastructure. Construction of conveyor, pipeline, service road and powerlines	Loss and disturbance of wetland habitat	Wetland	Construction	SI: High (-)	SI: Medium (-)

Activity	Potential Impact	Aspects	Phase	Significance pre-mitigation	Significance post-mitigation
Construction of conveyor, pipeline, service road and powerlines	Increase risk of erosion within wetlands	Wetland	Construction	SI: High (-)	SI: Low (-)
Underground mining of No. 2 and No. 4 seams	Potential subsidence due to underground mining activities	Topography	Operations	SI: High (-)	Low (-)
Discharge of mine water to the natural watercourses	Pollution of surface water resources due to discharge of mine water to natural watercourses	Surface water	Operations	SI: High (-)	SI: Low (-)
Operation of boxcut area and associated infrastructure	Pollution of surface water resources due to operation of boxcut and associated surface area	Surface water	Operations	SI: High (-)	SI: Low (-)
Operation of sewage treatment plant	Pollution of surface water resource	Surface water	Operations	SI: High (-)	SI: Low (-)
Operation of PCD – storage of contaminated water	Pollution of surface water resource	Surface water	Operations	SI: High (-)	SI: Low (-)
Operation of water treatment plant	Pollution of surface water resource	Surface water	Operations	SI: High (-)	SI: Low (-)
Handling and storing of brine and gypsum	Pollution of surface water	Surface water	Operations	SI: High (-)	SI: Low (-)
Operation of dirty water pipeline from Goedehoop Colliery to Elders Colliery	Pollution of surface water	Surface water	Operations	SI: High (-)	SI: Medium (-)
Operation of underground mine	Reduction in catchment yield	Surface water	Operations	SI: High (-)	SI: Medium (-)
Underground mining of the No.2 and No. 4 coal seams by means of bord and pillar mining methods	Influx of groundwater into the mine workings	Groundwater	Operations	SI: High (-)	SI: Medium (-)
Underground mining of the No.2 and No. 4 coal seams by means of bord and pillar mining methods	Loss of surface water to groundwater	Groundwater	Operations	SI: High (-)	SI: Low (-)
Operation of water treatment plant and sewage treatment plant	Water quality deterioration	Wetland/ Surface water	Operations	SI: High (-)	SI: Low (-)
Closure of underground mine	The formation of AMD in underground workings	Groundwater	Closure	SI: High (-)	SI: High (-)
Closure of the underground mine	Surface decant of AMD	Surface water	Closure	SI: High (-)	SI: Low (-)
Closure of the underground mine	Loss of employment and enterprise development opportunities due to closure of mine	Socio-economic	Closure	SI: High (-)	SI: Medium (-)

(ii) Final Site Map

Provide a map at an appropriate scale which superimposes the proposed overall activity and its associated structures and infrastructure on the environmental sensitivities of the preferred site indicating any areas that should be avoided, including buffers .Attach as Appendix

A map with all Elders Colliery's activities and associated infrastructure has been attached as **Appendix 8**. All environmental and social aspects have been included to identify project area sensitivities, including wetland buffers.

(iii) Summary of the positive and negative implications and risks of the proposed activity and identified alternatives;

All alternatives have been assessed along with the advantages and disadvantages of the various alternative options and preferred site layout options. These positive and negative implications have been described in Table 6 above in PART A, Section 3 (d)(vii).

l) Proposed impact management objectives and the impact management outcomes for inclusion in the EMPr;

Based on the assessment and where applicable the recommendations from specialist reports, the recording of proposed impact management objectives, and the impact management outcomes for the development for inclusion in the EMPr as well as for inclusion as conditions of authorisation.

The purpose of the EMP is to provide relevant management measures to conduct activities with due care and diligence, as well as avoid/ limit any adverse impacts of the mining operation. The EMP is compiled to help control impacts that may occur to meet acceptable standards, both as a legal and social responsibility to the environment within which the activities take place.

The objective of the EMP is to create management structures that address the comments of stakeholders with regards to the development, establishes a method of monitoring and auditing environmental management practices during all phases of the activity and ensures that safety recommendations are complied with. Additionally, the EMP provides a method to ensure performance and compliance with all the relevant regulatory authority provisions and guidelines while monitoring of the commitments allows for continual feedback and opportunities to improve.

m) Final proposed alternatives.

(Provide an explanation for the final layout of the infrastructure and activities on the overall site as shown on the final site map together with the reasons why they are the final proposed alternatives which respond to the impact management measures, avoidance, and mitigation measures identified through the assessment)

Proposed alternatives are detailed above in PART A, Section 3 (g)(i) and the positive and negative impacts of the alternatives and preferred option have been described in PART A, Section 3 (g)(vii). The preferred infrastructure option is attached as **Appendix 4**.

The EAP's approach to assess, minimise and avoid impacts is outlined in PART A, Section 3(h) above.

n) Aspects for inclusion as conditions of Authorisation.

Any aspects which have not formed part of the EMPr that must be made conditions of the Environmental Authorisation

- The following should form part of the conditions of the environmental authorisation to ensure compliance with the EMP:
  - To ensure compliance with and implementation of the EMP by:
  - Appointing of a suitably qualified individual to oversee implementation of the EMP during all phases of the project; and

- Appointing a suitably qualified Environmental Control Officer/Superintendent to undertake audits on a regular basis.

- To ensure that all staff, contractors and sub-contractors are aware of and understand the requirements of the EMP and environmental issues in relation to their individual areas of work by:
  - Developing an induction and training program covering the EMP, environmental awareness, dealing with environmental incidents and waste management; and
  - Advising staff commissioned during pre-construction and construction, including sub-contractors, of EMP requirements through the induction program as well as on notice boards at the contractor's camps during construction and notice boards during operation. These notice boards should cover the EMP, environmental awareness, dealing with emergencies and waste management.
- To be able to manage all environmental incidents and emergencies relating to all activities in accordance with the EMP and to identify root causes of incidents and to implement prevention plans by:
  - Implementing an Environmental Emergency preparedness procedure and the non-conformance and compiling the corrective action procedure for Elders Colliery. This is to be implemented in emergency situations such as Oil or fuel leaks and spills, fires, sewage spillage. The Emergency preparedness procedure must include requirements to contact the Environmental Coordinator following an emergency or incident.

o) Description of any assumptions, uncertainties and gaps in knowledge.

(Which relate to the assessment and mitigation measures proposed)

The following assumptions and limitations have been identified with regards to the environmental baseline, impacts and mitigation measures:

- All the technical data, project description and information provided by the proponent to the EAP and specialists are accurate and up-to-date. The EAP and specialists have identified all possible impacts based on the information provided and these have been assessed and rated accordingly;
- All specialist modelling undertaken for this authorisation process is predictive modelling and therefore will need to be updated once quantitative data becomes available during the construction and operation phase;
- The public participation process has been sufficiently effective in identifying the critical issues that needed to be addressed through specialist investigations and/or by the EAP. Specialist input has thus been appropriately scoped to investigate the critical issues;
- The public participation process has sought to involve key stakeholders and individual landowners. It is assumed that where participation has been sought from the organizational representative/s, that these parties have the authority to comment on behalf of their organisation;
- The public participation process provided ample opportunity for stakeholders to express any issues and concerns. It has thus been effective in identifying critical issues that the specialist investigations and/or EAP needed to address;
- All comments received from the authorities are informed and considered;
- AOL and its contractors will implement the management measures contained in the EMP;
- A monitoring and evaluation system, including auditing, will be established, in line with this EMP, to track the implementation of this specific EMP to ensure that management measures are effective to avoid, minimize and mitigate impacts; and that corrective action is being undertaken to address shortcomings and/or non-performances;

- AOL will adopt a process of continual improvement when managing and/or mitigating negative environmental impacts arising from the project. The EMP will be used as the basis of environmental management and will be improved and refined regularly; and
- The monitoring required of the project will determine the validity and accuracy of the predictions made. Any exceedances of parameters or complaints from stakeholders will be investigated and remedied by the mine when required to do so.

Air Quality

The assumptions applicable to the air quality specialist study are as follows:

- The quantification of existing sources of emission was restricted to Elders Colliery operations.
- Particulates including TSP, PM10 and PM2.5 were regarded the main pollutant of concern with no gaseous emissions quantified as part of the study.
- Information required to quantify emissions from fugitive dust sources for Elders Colliery was provided by SRK personnel and the information is assumed to be correct and accurate. Where information was lacking assumptions were based on similar studies done in the area.

The data limitations can be summarised as follows:

- No on-site meteorological data was available for the site and use was made of Eskom's Elandsfontein weather station data. The assessment utilized meteorological data for a period of three years (2011 to 2013).
- Emissions rates calculated reflect only normal operating conditions and non-routine operations are not accounted for.
- The dispersion model cannot compute real-time mining and production processes; and planned throughputs were therefore used. Operational locations and periods were selected to reflect the representative worst-case scenarios.

Biodiversity

Field investigations commonly employed for EIA studies are normally limited by time and budget and scientific approaches generally have to be adapted to allow for these limitations. Ecology and biodiversity are growing fields of science and much is still unknown. As always, information on the herpetofauna and invertebrates of the region and farms is lacking in detail and significant information gaps exist in this regard.

- Findings, results, observations, conclusions and recommendations presented in the biodiversity report are based on the authors' best scientific and professional knowledge as well as the interpretation of information available to them at the time of compiling this report.
- Due care and diligence is exercised by the authors, consultants and/or specialist investigators in rendering services and preparing this document. The consultants and/or specialist investigators accepts no liability for conclusions, suggestions, limitations and recommendations made in good faith, based on available information, or based on data that was obtained from surveys.
- Results presented in the biodiversity report are based on a snapshot investigation of the study area and not on detailed and long-term investigations of all environmental attributes and the varying degrees of biological diversity that may be present in the study area.
- Rare and endemic species normally do not occur in great densities and, because of customary limitations in the search and identification of Red Listed species, the detailed investigation of these species was not possible. Results are ultimately based on estimations and specialist interpretation of imperfect data.

- It is emphasised that information, as presented in the biodiversity report, only have bearing on the site as indicated on accompanying maps. This information cannot be applied to any other area, however similar in appearance or any other aspect, without proper investigation.
- Furthermore, additional information may become known during a later stage of the process or development. The authors therefore reserve the right to modify aspects of the biodiversity report including the recommendations should new information may become available from ongoing research or additional work in this particular area, or pertaining to this investigation.
- The biodiversity report should always be considered as a whole. Reading and representing portions of the report in isolation could lead to incorrect conclusions and assumptions. In case of any uncertainty, the authors should be contacted to clarify any viewpoints, recommendations and/ or results.

Blasting

Considering the stage of the project, the data observed was sufficient to conduct an initial study. Surface surroundings change continuously and this should be taken into account prior to any final blast design and review of this report. This report is based on data provided and international accepted methods and methodology used for calculations and predictions.

Groundwater

The Aquifer Dewatering Assessment:

The aquifer dewatering assessment was done through utilizing empirical and analytical calculation techniques to calculate the maximum steady state cone of depression above and/or around the proposed underground mining areas, as well as around the box-cut.

The following assumptions are made:

- The hydraulic parameters used in the calculations (obtained form site specific testing, the JMA data base on shallow weathered zone Karoo aquifers and literature) are representative of the groundwater zone overlying and surrounding the underground mining sections;
- The maximum dewatering impact will manifest at the conclusion of mining prior to re-flooding of the underground workings and the box-cut.

These assumptions will result in a conservative answer as regarding the lateral and depth extents of the cones of dewatering likely to manifest above and around the proposed underground mining sections as well as the box-cut.

The Generation of AMD from Overburden Stockpiles and in Mined Out Areas:

The geochemical assessment for potential AMD generation from overburden stockpiles as well as in the mined out underground sections, was conducted using data and information generated through a site specific geochemical sampling and analyses program.

The following standard assumptions are applicable:

- Samples taken are representative of the overburden to be stockpiled as well as of material left/present in and adjacent to the underground sections;
- Average material composition is assumed (no heterogeneity);
- All material will come into contact with percolating process/rain water;
- All neutralization minerals are available for reaction;
- Pyrite is the only sulphide present;
- A rainfall recharge value for overburden stockpiles is assumed based on literature values;

- Oxygen infiltration into the overburden and into the underground mined sections is often the rate limiting step for acid-mine drainage (AMD) generation. The oxygen infiltration is also assessed based on assumptions such as overburden porosity, moisture and pyrite content.

The Groundwater Migration Assessment:

The groundwater migration assessment was done through utilizing analytical calculation techniques to calculate the steady state lateral groundwater flux rates.

The following assumptions are made:

- The hydraulic parameters used in the calculations (obtained from site specific testing, the JMA data base on shallow weathered zone Karoo aquifers and literature) are representative of the groundwater zone surrounding the assessment areas;

These assumptions will result in a conservative answer as regarding the lateral sub-surface migration of potentially contaminated water/leachates originating from the identified potential groundwater pollution sources.

The Mine Groundwater Balance:

The mine groundwater balance is done with a spreadsheet model.

The following assumptions are made:

- Mining will be conducted in accordance with the proposed mine layouts;
- Mining will occur according to the proposed mining schedule;
- The recharge rate from the overlying aquifer is varied depending on surface conditions (vegetation, wetland areas, rocky outcrops, dolerite intrusions, etc.);
- The No.2 seam will be mined first and the overlap time between the No.2 seam and the No.4 seam mining will be restricted to 4 years;
- The No.2 seam workings will be available for storage of mine water during mining of the No.4 seam.

Uncertainties

- Uncertainties with respect to the calculations and modelling performed for the groundwater impact assessments relate to the following:
- Representativeness of geohydrological and geochemical data. Both the geohydrological and geochemical regimes in the mining environment possess significant degrees of heterogeneity. The number of samples taken will in the end determine the statistical validity of the values used during modelling. The more samples taken, the more representative the data used would be;
- The validity of assumptions. Assumptions were made to result in conservative outcomes;
- With reference to the water balance, uncertainties relate primarily to the allocated recharge rates for varying surface conditions over the project area;
- In order to cater for these potential uncertainties it is recommended that the mine/groundwater balance, be updated annually as a routine matter during the operational and decommissioning phases of the mining activities. This will require ongoing sampling, analyses and monitoring.

Knowledge gaps

No significant knowledge gaps are deemed to exist and the groundwater base line description and impact assessment are considered to represent a high level of accuracy and integrity. Quantitative information was available for all the critical geological, geochemical and geohydrological parameters which are relevant to this study for the Elders Reserve.

The following should be noted:

- The geohydrological base line description is based on a wealth of quantitative, site specific information that was generated over an extended time period during comprehensive geological exploration, hydro census and geohydrological drilling, profiling, sampling, testing and monitoring programmes;
- Furthermore the study was informed by a detailed project description and therefore no significant knowledge gaps are deemed to exist in either the data sets or the proposed activities which could cause groundwater impacts;
- The proposed mining comprises underground bord and pillar mining, the associated geohydrological impacts of which are clearly definable, can be accurately quantified and which can be managed effectively through the application of proven technologies.

Heritage

It is assumed that the description of the proposed project, provided by the client, is accurate.

- It is assumed that the public consultation process undertaken as part of the Environmental Impact Assessment (EIA) is sufficient and that it does not have to be repeated as part of the heritage impact assessment.
- The unpredictability of archaeological remains occurring below the surface.
- This report does not consider the palaeontological potential of the project site, as this is to be addressed by an appropriately qualified specialist.

Soils

It has been assumed that the total area of possible disturbance was included in the area of study, that the mining plan as tabled has documented and catered for all actions and activities that could potentially have an impact on the soils land use and land capability, and that the recommendations made, and impact ratings tabled will be re-assessed if the development plan changes.

Limitations to the accuracy of the pedological mapping (as recognised within the pedological industry) are accepted at between 50% (reconnaissance mapping) and 80% (detailed mapping), while the degree of certainty for the soils physical and chemical (analytical data) results has been based on “composite” samples taken from the dominant soil types mapped in the study area.

The area in question has been mapped on a comprehensive reconnaissance base, the degree and intensity of mapping and geochemical sampling being considered and measured based on the complexity of the soils noted in field during the field mapping, and the interplay of geomorphological aspects (ground roughness, slope, aspect and geology etc.).

Surface Water

By their nature, models are theoretical estimates of natural phenomena that are too complex to be derived exactly. It is inevitable that there will be variations in the actual flows when compared to the predicted flows. This can only be addressed by the recalibration of modelled data with measured data, from which more reliable estimates of extreme and average water make and runoff volumes can be developed.

Wetlands

The baseline wetland assessment is based on existing information from the 2006 study (WCS, 2006) as well as field work undertaken in October/November 2012 and August 2015.

Wetland boundaries reflect the ecological boundary where the interaction between water and plants influences the soils, but more importantly the plant communities. The depth to the water table where this begins to influence plant communities is approximately 50 centimetres. This boundary, based on plant species composition, can vary depending on antecedent rainfall conditions, and can introduce a degree of variability in the wetland boundary between years and/or sampling period. The wetlands systems were mapped from the most recent aerial imagery available at a scale of 1:5000 wherever possible and where the imagery is of sufficient resolution for this purpose. Due to the extent of the area

and the mapping scale used, the actual extent of the boundaries of these systems may be underestimated or overestimated in places. This may range from metres to tens of metres but generally is regarded as being of sufficient accuracy for the purposes of this study.

- Detailed groundtruthing was undertaken in areas of expected surface disturbance, i.e. along the direct conveyor servitude and the proposed surface infrastructure areas. Outside of these areas the wetlands within the entire mining rights area were delineated using a combination of desktop mapping with targeted field verification. As a result, not every wetland boundary was walked and/or verified in the field.
- The temporary zones of especially hillslope seepage wetlands were extensively cultivated and transformed on site, precluding the use of vegetation indicators in determining wetland boundaries in these areas and thus reducing the confidence of the delineation accuracy in those areas where cultivation (past and present) extends into the wetlands.
- Reference conditions are unknown. This limits the confidence with which the present ecological category (PES) is assigned.

p) Reasoned opinion as to whether the proposed activity should or should not be authorised

i) Reasons why the activity should be authorized or not.

No fatal flaws in the project have been identified thus far through the EIA process. However, several environmental and social impacts are envisaged from construction phase through to post-closure, which require careful mitigation and monitoring. It is the opinion of the EAP that all major impacts have been identified and have been assigned appropriate management measures. Most HIGH negative impacts with mitigation, are reduced to a MEDIUM or LOW significance, and can be managed accordingly.

It is recommended by the EAP that the proposed Elders Colliery is allowed to proceed, on the assumption that the environmental and social management commitments included in this EIA/EMP are adhered to, the project description remains as per the description provided in this document and considering the positive social impacts associated with the project. The Elders Colliery will ensure continuation coal supply to the Goedehoop Colliery.

ii) Conditions that must be included in the authorisation

(1) Specific conditions to be included into the compilation and approval of EMPr

Potential impacts identified should be monitored during all phases of the Elders Colliery project. Monitoring will form an important aspect of the mine's operations. Management measures will be amended to address the impacts if analysis of monitoring trends indicates this may be necessary. Monitoring of the operations, in accordance with their operating plans and protocols, will also form an important activity to ensure their long-term sustainability.

Through Elders Colliery's internal auditing and reporting processes and bi-annual performance assessment reporting (as per the requirements of Regulation 55 of the MPRDA) and other legislated reporting, AOL should continue to examine the proposed management commitments for the life of mine with a view to continually improve and reduce negative impacts and enhance positive impacts where achievable.

(2) Rehabilitation requirements

A Rehabilitation Action Plan has been compiled as part of this authorisation. AOL should continue to examine the management commitments included in the Rehabilitation Action Plan with a view to continually improve and reduce negative impacts and enhance positive impacts where achievable. Rehabilitation requirements for all proposed infrastructure throughout the operations and closure phases have been outlined in PART B, Section 1 (i)(1)(c) below.

q) Period for which the Environmental Authorisation is required.

Environmental authorisation will be required for the following periods:

Construction = 2 years

Operation = 14 years

Closure = 2 years

Post-closure = 5 years

If any of the above mentioned timeframes change, the department will be notified of such change.

r) Undertaking

Confirm that the undertaking required to meet the requirements of this section is provided at the end of the EMPr and is applicable to both the Basic assessment report and the Environmental Management Programme report.

The EAP undertakes that the information provided in PART A is correct, and that the comments and inputs from stakeholders and Interested and Affected parties have been correctly recorded in the report. This is only applicable to the EIA/EMP as a basic assessment process has not been undertaken.

Refer to PART B, Section 2 for the EAP's signed undertaking.

s) Financial Provision

State the amount that is required to both manage and rehabilitate the environment in respect of rehabilitation.

The amount required to rehabilitate the environment for the Elders Colliery and associated infrastructure is approximately R 113 843 340.00. This value is informed by the environmental sensitivity, nature of terrain/ accessibility and proximity to urban areas. A detailed breakdown of the costing is included in PART B, Section 1 (i) and the methodology used to calculate the financial provision is included in PART A, Section 3 (s)(i) below.

i) Explain how the aforesaid amount was derived.

The liability for closure of the aspects associated with the proposed Elders Colliery has been determined using the approach advocated in the Department of Minerals and Energy (DME) now the Department of Mineral Resources (DMR) Guideline Document for the Evaluation of the Quantum of Closure-Related Financial Provisions Provided by a Mine (2005).

The approach to calculating the closure quantum as specified in the DMR Guideline which was utilised in the assessment is summarised as follows and is reported below.

- Step 1: Determine the Mineral Mined
  - In the first step the mineral mined has been identified in the tables provided in the DMR guideline (Table B.12) as “Coal.”
- Step 2A: Determine Primary Risk Class
  - The “Primary Risk Class” has been determined from Table B.12 of the DMR Guideline as “A (High Risk)”.
- Step 2B: Revision of Primary Risk Class
  - The Primary Risk Class can be revised on the basis of saleable by-products if required. However, this is not applicable at the proposed Elders Colliery.
- Step 3: Determine Environmental Sensitivity
  - The “Environmental Sensitivity” has been determined by reference to Table B.4 of the DMR Guideline as “High”.
- Step 4.4 determination of weighting factors:
  - Weighting Factor 1: The nature of the terrain where the operation is located is flat.
  - Weighting Factor 2: The proximity of the operation to an urban centre. In this instance the proposed Elders Colliery is considered peri urban.

ii) Confirm that this amount can be provided for from operating expenditure.

(Confirm that the amount, is anticipated to be an operating cost and is provided for as such in the Mining work programme, Financial and Technical Competence Report or Prospecting Work Programme as the case may be).

In terms of Section 41, Regulations 53 and 54 of the Mineral and Petroleum Resources Development Act (Act 28 of 2002), Elders Colliery is required to make financial provision for the interim and final rehabilitation activities on the site. This provision is reviewed annually for adequacy and amended to compensate for new activities and/or inflation. During the annual review, confirmation will be provided that this amount can be provided for from operating expenditure.

AOL Elders Colliery will provide for the closure liability associated with the Destoning Plant project either through a contribution to a Trust Fund or the purchase of a Bank Guarantee or a combination of the two methods as allowed by Regulation 527 of the MPRDA.

t) Deviations from the approved scoping report and plan of study.

i) Deviations from the methodology used in determining the significance of potential environmental impacts and risks.

(Provide a list of activities in respect of which the approved scoping report was deviated from, the reference in this report identifying where the deviation was made, and a brief description of the extent of the deviation).

The methodology to rate the impacts and risks associated with the proposed Elders Colliery detailed in this EIA/EMP have not deviated from those described in the Scoping Report.

However, during the impact assessment phase it was decided by the Elders Colliery project team to move the primary crusher out of the boxcut area and place this on the western side of

the R35, adjacent to the proposed 9T silo. This change has been modelled as part of specialist studies undertaken for the project.

ii) Motivation for the deviation.

The location of the crusher, which was previously proposed to be located in the pit, has been moved adjacent to the silo, west of the R35. This change was mainly driven by ease of access to the crusher.

There is restricted maintenance capacity inside the pit. By placing the crusher adjacent to the silo, ease of access for maintenance purposes is secured. In addition, during decommissioning, ease of access will ensure effective demolishing of the crusher.

u) Other Information required by the competent Authority

i) Compliance with the provisions of sections 24(4)(a) and (b) read with section 24 (3) (a) and (7) of the National Environmental Management Act (Act 107 of 1998). the EIA report must include the:-

(1) Impact on the socio-economic conditions of any directly affected person.

*(Provide the results of Investigation, assessment, and evaluation of the impact of the mining, bulk sampling or alluvial diamond prospecting on any directly affected person including the landowner, lawful occupier, or, where applicable, potential beneficiaries of any land restitution claim, attach the investigation report as **Appendix 2.19.1** and confirm that the applicable mitigation is reflected in 2.5.3; 2.11.6.and 2.12.herein).*

All impacts on socio-economic condition are assessed in the Social Impact Assessment (Appendix 7-9).

Specific impacts include the following as are described in Table 8 and Table 10.

C.38, C.39, C.40, C.41, C.42, C.43, C.44, O.39, O.41, O.43, D.21

(2) Impact on any national estate referred to in section 3(2) of the National Heritage Resources Act.

*(Provide the results of Investigation, assessment, and evaluation of the impact of the mining, bulk sampling or alluvial diamond prospecting on any national estate referred to in section 3(2) of the National Heritage Resources Act, 1999 (Act No. 25 of 1999) with the exception of the national estate contemplated in section 3(2)(i)(vi) and (vii) of that Act, attach the investigation report as **Appendix 2.19.2** and confirm that the applicable mitigation is reflected in 2.5.3; 2.11.6.and 2.12.herein).*

The heritage assessment for the Elders boxcut area and conveyor route between Elders Colliery and Block 20 was undertaken by Johnny van Schalkwyk during 2012 and again in 2015. According to the study, no site, features or objects of cultural significance are known to exist in the study area, therefore there would be no impact on heritage resources as a result of the proposed boxcut and new conveyor belt development.

An additional heritage assessment was undertaken by Archaetnos Culture and Cultural Resource Consultants in 2015. This heritage assessment was undertaken for AOL's proposed Hope 4 seam mining project. Areas investigated in this assessment overlaps with the upgrade of the existing conveyor belt and construction of a new conveyor section to

Goedehoop Colliery – which forms part of the Elders Colliery project. Two heritage sites were identified in this study which will be impacted by the proposed Elders Colliery:

- Old building at demolished New Town Village
- Graveyard

The old building used as a church is in a reasonably good condition and may be older than 60 years of age. It has low significance. The field rating given for the site is General protection C. It is unlikely that the Elders Colliery development will impact on this structure.

The graveyard seems to hold approximately six graves (possibly 16) and is located approximately 200m from the conveyor. Graves are always regarded as having a high cultural significance. The field rating is Local Grade IIIB. It is unlikely that the Elders Colliery development will impact on this graveyard.

v) Other matters required in terms of sections 24(4)(a) and (b) of the Act.

*(the EAP managing the application must provide the competent authority with detailed, written proof of an investigation as required by section 24(4)(b)(i) of the Act and motivation if no reasonable or feasible alternatives, as contemplated in sub-regulation 22(2)(h), exist. The EAP must attach such motivation as **Appendix 4)**.*

Based on the information available, discussions with stakeholders, discussions with the applicant and discussions with authorities, the EAP has not identified any other authorisation processes currently being undertaken within or adjacent to the site.

PART B

ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT

1) Draft environmental management programme.

a) Details of the EAP, *(Confirm that the requirement for the provision of the details and expertise of the EAP are already included in PART A, section 1(a) herein as required).*

The details and expertise of the EAP are detailed in PART A Section 3 (i) and PART A Section 3 (a)(ii).

b) Description of the Aspects of the Activity *(Confirm that the requirement to describe the aspects of the activity that are covered by the draft environmental management programme is already included in PART A, section (1)(h) herein as required).*

The details of the aspects of the activity are described above in Part A Section 3 (b) and Section 1 (h).

c) Composite Map

(Provide a map (Attached as an Appendix) at an appropriate scale which superimposes the proposed activity, its associated structures, and infrastructure on the environmental sensitivities of the preferred site, indicating any areas that any areas that should be avoided, including buffers)

Refer to **Appendix 8** for the Elders Colliery layout with all sensitivities and buffers identified.

d) Description of Impact management objectives including management statements

i) **Determination of closure objectives.** (ensure that the closure objectives are informed by the type of environment described in 2.4 herein)

According to Regulation 61 of the MPRDA, closure objectives for a mine should form part of the environmental management programme, and must:

- Identify the key objectives for mine closure to guide the project design, development and management of environmental impacts;
- Provide broad future land use objectives(s) for the site; and
- Provide proposed closure costs.

Closure objectives for Elders Colliery were based on the EAP's extensive experience with coal related EIAs, appropriate and site specific management objectives were determined and suggested for each activity. These objectives and outcomes meet

regulatory requirements, applicable standards, management requirements outlined in sector plans and tools and Anglo American policy and standards. The EAP has also employed the mitigation hierarchy where ever possible to ensure that risks and impacts are minimized. Additionally the management objectives and outcomes were discussed with closure requirements in mind.

Management objectives for each activity took into consideration the biophysical and social environment and features identified in the impact assessment process and were developed with closure in mind. The EAP also incorporated management measures identified through the stakeholder engagement process.

Closure management objectives and outcomes were designed in a way that is auditable, logical and site specific and will include pragmatic undertakings for the applicant and realistic timeframes.

The EAP has also been involved with this project since concept phase and has discussed various risk management options with the client throughout.

ii) **The process for managing any environmental damage, pollution, pumping and treatment of extraneous water or ecological degradation as a result of undertaking a listed activity.**

The sources that could potentially impact on the water resource and the potential mechanism of impact are indicated in Table 13 below

Table 13: Potential pollution sources of the Elders Colliery (Jones and Wagener, 2015c)

Potential pollution source	Description	Potential mechanism of impact
CONSTRUCTION PHASE		
General earthworks	Stripping of topsoil and civil works undertaken	Increased turbidity and suspended solids enters watercourses
Construction vehicles	Movement of construction vehicles through watercourses	Increased turbidity and suspended solids
	Servicing of construction vehicles close to watercourses	Increase in hydrocarbon concentrations
Borrow pits	Establishment of borrow pits within or close to watercourses	Increased turbidity and suspended solids enters watercourses
Box-cut	Dewatering of water accumulated in box-cut	Discharge or spillage into watercourses result in increases suspended solids, turbidity, as well as sulphate and TDS when coal is exposed.
OPERATIONAL PHASE		
Advancing mine workings	Potential decant points	Seepage to aquifers or decant into surface water
	Storage of dirty water in underground workings	
	Underground workings located close to or within wetland areas	Potential destruction of or damage to sensitive wetlands

Potential pollution source	Description	Potential mechanism of impact
Pollution control dams and associated silt traps	Lined facilities	Seepage to aquifers if liner integrity is compromised. Spillage will be captured in dirty water management system and could result in an impact if not contained.
Overburden stockpile	Non carbonaceous material stockpiled on compacted area with drainage	Seepage into aquifers and contaminated run-off entering watercourses
Dirty water conveyance system	Concrete lined canals	Seepage to aquifers if integrity is compromised. Potential spillage into watercourses if design capacity is breached due to lack of maintenance.
Sewage treatment plant	Package plant with effluent to watercourses	Seepage to aquifers through leakages Discharge of affected water to watercourse during upset conditions
Sludge drying beds at sewage treatment plant	Concrete facilities with liner	Seepage to aquifers if liner integrity is compromised. Contaminated run-off if storage capacity is exceeded
Workshops	Oil and silt traps	Local hydrocarbon impact if compromised
Bulk oil storage facilities	Bunded areas	Local hydrocarbon impact if compromised
Salvage yards	Various waste streams	Seepage to aquifers or contaminated run-off if adequate protection (e.g. lining/bunding) is not provided
Coal transport from boxcut via existing roads	Spillage of carbonaceous material into watercourses along route	Increased turbidity, suspended solids, sulphate and TDS
Conveyor system	Watercourse crossings	Potential spillage of carbonaceous material or contaminated water to the water course if not properly contained
	Coal transport conveyors	Potential for carbonaceous dust and contaminated runoff
Water used for dust suppression	Pre-treated water used for dust suppression on haul roads and internal roads	Seepage into aquifer and runoff into surface water resources.
Discharge from water treatment plant and sewage treatment plant	Effluent from WTP and STP discharged into Olifants River system	Deterioration in water quality if discharge standards are not met
Spill from PCD	In excess of 1:50 year flood event	Deterioration in water quality
CLOSURE PHASE		
Removal of infrastructure	All material and infrastructure removed for reuse, or for disposal at an appropriately licensed facility. Rehabilitation of the footprint.	Increased turbidity and suspended solids
Construction vehicles	Movement of construction vehicles through watercourses	Increased turbidity and suspended solids
	Servicing of construction vehicles close to watercourses	Increase in hydrocarbon concentrations

Potential pollution source	Description	Potential mechanism of impact
Discharge from water treatment plant	Effluent from WTP discharged into Olifants River system	Deterioration in water quality if discharge standards are not met
POST CLOSURE PHASE		
Decant	Decant of impacted water from mined out areas	Increase in sulphate and TDS

Table 8 to Table 10 in PART A, Section 3 (g)(viii) describes each project specific activity, along with identified potential impacts associated with each project phase and applicable management measures, in order to ensure that risks and impacts are avoided or minimized. These management measures address the potential for environmental damage, pollution and treatment of water.

An IWULA and IWWMP have been compiled for Elders Colliery to include water and waste management associated with the project. Included in the IWWMP is the Stormwater Management Plan which includes all water related management measures.

iii) **Potential risk of Acid Mine Drainage**. (Indicate whether or not the mining can result in acid mine drainage).

All information related to AMD was obtained from JMA's Groundwater report available in **Appendix 7-4**.

The potential for the generation of Acid Mine Drainage (AMD) in the underground workings is highly probable and therefore an in-situ groundwater quality impact of high consequence and high significance will occur within the underground mining sections. This impact will commence during the operational phase and it is estimated that it will continue throughout the operational and decommissioning phases right through to post closure. It is estimated that the mine workings will take 70 years to flood, after which the generation of AMD will possibly taper off (JMA, 2015).

However, the potential for this AMD to decant onto surface, or to migrate laterally from the mine workings as groundwater seepage and to eventually contaminate water resources in the catchment, was assessed to be manageable to a medium consequence with a low significance.

The results of the geochemical assessment for AMD are as follows:

- Because of the inter-mine flow that could be present, the Box-cut and the U/G mine are modelled as a unity. The model presents the chemical reactions that occur as the box-cut and the underground sections are progressively filled up until the decant elevation is reached.
- The overall reactions of the rock matrix and the forming of secondary minerals will be overall in concurrence with the mineral reactions predicted in the modelling.
- Local patches of mine water in contact with only carbonaceous material will be acidic as the carbonate minerals are not efficient to neutralize the acid produced. As the mine gets flooded this acidic parts will came within contact with the neutral-alkaline drainage from the silicate minerals.
- Although the heterogeneity and the probable non-ideal mixing of different geochemically units give uncertainty to the exact quantification of the groundwater parameters, the average mine

water will only be slightly acidic over the long term in the post-closure mine system under the conditions assumed in the modelling.

- No acidification will occur in the underground mines during the operational phase. In the box-cut it will take about 17 years for the spoils to start acidify (pH < 5.5).
- Based on the laboratory leaching tests (ICP scans, SO_4 analysis and pH values), modelling results of GWB, and previous modelling experience on coal mines, Table 14 was compiled to give the estimated mine water quality during the various mining phases.

Table 14: Estimated Water Qualities at Different Mining Phases

Parameter		Operational Phase Mine Water Quality (up to 17 years)	Post Closure Mine Water Quality (closure to full flooding)
pH		7.8 to 5.5 (or pH < 3)*	5.5
TDS	(*mg/l*)	200 to 4500	4500 to 6500
Ca	(*mg/l*)	24 to 950	950 to 750 **
Mg	(*mg/l*)	12 to 250	250
Na	(*mg/l*)	23 to 250	250 to 800
K	(*mg/l*)	6 to 30	30 to 80
SO_4	(*mg/l*)	6 to 1600	1600 to 4500
Total. Alkalinity	(*mg/l*)	200 (to 5)*	5
Al	(*mg/l*)	< 1 to 5	<5
Fe	(*mg/l*)	<1 to 10	<10

- The long-term average estimated pH in Table 1.4(a) of pH 5.5 is the general value for the mine and local patches where insufficient buffering is present acidification to pH 3 will be present as modelled.
- The TDS may increase to nearly 6500 mg/l in the long-term but it will depend on the mineral content of the surrounding rock.
- Ca and Mg will be near the concentrations as predicted in Table 14 and the drop in the long-term concentration of Ca from the maximum at the initial stage is due to:
  - the precipitation of gypsum and other secondary minerals containing Ca, and
  - the depletion of calcite. Long-term concentrations for K and Na are difficult to predict and although their concentration will increase with time due to silicate reactions, precipitation will occur for especially K as K-Jarosite and Alunite.
- SO_4 will increase due to pyrite oxidation in the long term and will reach a maximum of 4500 mg/l.

iv) Steps taken to investigate, assess, and evaluate the impact of acid mine drainage.

The geochemical characterization of relevant materials at Elders Colliery commenced with an assessment of the geological lithological profile in the Elders Coal Reserve. Based on geological information, the overall lithology, from a geochemical perspective can be divided into the following units:

- Soft Overburden (soil, clay and highly weathered rock)
- Hard Overburden (weathered and un-weathered sandstone, siltstone and shale)
- No.2, No.4 and No.5 coal seams, with the No.2 and No.4 coal seams the most extensively developed and the ones relevant to this study
- Coal Inter-Burden and adjacent sedimentary rocks (sandstone, siltstone and shale, often carbonaceous).

Nine of the investigative boreholes drilled by JMA at the proposed mining area were sampled to determine the geochemical characteristics of the lithological units including No.4 and No.2 coal seams. Care was taken during the sampling procedure to ensure that representative geochemical samples were taken from each borehole. The following geochemical units are represented by the sampling:

- Soft overburden (soil and clay)
- White, greyish sandstone (non- to slightly carbonaceous)
- Carbonaceous lithological units (siltstone and shale)
- Coal seams

Acid Base Accounting (ABA) and various Leaching Tests were performed on 29 individual samples from these four units using the Modified Sobek (Lawrence) Method.

In order to achieve more quantitative results, the oxidation and neutralization reactions were modelled in order to observe the resultant chemical parameters of the mine water drainage produced. Geochemist Workbench 5 was used in order to perform the numerical modelling.

Conceptual Model

The coal seams will not fully be recovered during mining and the uneconomical part of the coal will be left together with clastic carbonaceous units and the pyrite-rich sandstones, all of which are classified as potentially acid forming.

The results of the Acid Base Accounting (ABA) show that in the case of sufficient oxygen supply enough pyrite and insufficient neutralization potential exists in the rocks around the mining horizon so that drainage from these rocks will turn acidic. However, the ABA does not take cognizance of the long term neutralization potential of the silicate minerals, the kinetic rate of the oxidation of pyrite or the infiltration of oxygen and recharge water. For the modelling of any potential Acid Mine Drainage (AMD) producing system, it is important to note that the rate determining step for AMD are the availability of oxygen to the system; no oxygen will lead to no oxidation and no AMD production.

Box Cut

The Box Cut will be backfilled with waste rock that will comprise of sandstone and shale. Rainfall recharge would percolate through the unsaturated spoils and the water would serve as a transport mechanism for the products of oxidation & neutralization reactions present of the unsaturated zone. The percolating water will eventually accumulate on the mine floor and the mine water level would slowly rise within the strip mines after mining. Inter-mine flow will occur from the strip mines towards the adjacent underground mines.

The rate at which the waste rocks are flooded (saturated) with water after backfilling is of the utmost importance. The rate determining step for AMD are the availability of oxygen to the system and the quicker a mine can be flooded, the less oxidation will occur. Influx into the Box Cut will consist of rainfall recharge and ground water influxes. The ground water influxes will be both from the Karoo aquifer and also the Vlakkuilen and Viskuile wetlands and the Olifants River.

Underground Mining

The carbonaceous shale and the sandstones adjacent to the mined out coal seams contain a substantial amount of pyrite. The underground mines are filled with air for a fairly long time after mining. Oxygen is supplied during mining to these horizons (for mine workers), but after mining oxygen will be progressively used up in the underground mine by the oxidation of sulphides. Oxygen then has to diffuse to the mined out horizon via the shafts, boreholes intersecting the U/G workings, vertical fractures and faults.

The water make of the underground mines will primarily consist of recharge from the overlying aquifer.

Because of the inter-mine flow that will be present, the box cut and the U/G mine are modelled as a unity. The model presents the chemical reactions that occur as all the mining sections are progressively filled up until the decant elevation is reached.

v) Engineering or mine design solutions to be implemented to avoid or remedy acid mine drainage.

The probability for poor quality leachate (AMD) generation, the quality of water contained in the PCD's and Brine Ponds and Pads, and the footprint liners provided at each of these localities will determine the significance and risk for groundwater quality impacts to originate from these facilities.

Soil Stockpiles

The soil profile is assumed to represent a highly weathered and leached horizon of the geological lithology and as such is deemed to be inert from a geochemical perspective, at least as far as AMD generation is concerned. Soils furthermore represent the natural surface cover through which groundwater recharge occurs and as such does not represent an anomaly as far as induced solute transport is concerned.

For this reason, liner systems are generally not required for soil stockpiles.

Overburden Stockpiles

The overburden to be stockpiled will be excavated from the box-cut and will represent the lithology present above the No.4 coal seam. The excavated coal will be removed from the box-cut and will not form part of the overburden to be stockpiled.

The overburden comprise predominantly of a light greyish, low pyrite, non to slightly carbonaceous sandstone. In terms of its Acid Generation Potential this material is classified as Rock Type III which is interpreted as Non-Acid forming.

The overburden stockpile will be present on surface for the duration of the mining at Elders, which is scheduled to last for 13 years, after which it will be used to backfill the box-cut. The geochemical assessment further indicated the time required for Acid Formation in backfilled voids to manifest, to be some 17 years.

Based on all this information, it appears that a comprehensive liner system may not be required for the Overburden Stockpile. It is general practice, however, to place the overburden on a properly prepared and compacted footprint. This will optimize lateral drainage of percolated water and minimize infiltration into the sub-surface.

A civil engineering design, incorporating footprint preparation, leachate control and storm water management, must nevertheless be done for the Overburden Stockpile and submitted to DWS for approval.

Additional AMD tests for the overburden is currently being undertaken in order to confirm the potential for AMD.

Pollution Control Dams (PCD's)

It is safe to assume that water contained in PCD's will have the capacity to pollute the underlying groundwater resource. Due to this common understanding, it follows that these facilities must be licensed as NWA section 21(g) Water Uses and a standard requirement is for them to be lined. The facility must be designed by a qualified civil engineer and the design must be submitted to DWS for approval.

Water Treatment Plant Brine Dams

Brines originating from WTP's at coal mines contain highly concentrated inorganic effluent characterized by elevated salinity. The brine undoubtedly has the potential to severely impact on the quality of the groundwater resource underlying the Brine Dams.

As a result of this, these facilities must be licensed as NWA section 21(g) Water Uses and a standard requirement is for them to be lined. The facility must be designed by a qualified civil engineer and the design must be submitted to DWS for approval.

Water Treatment Plant Gypsum Pads

Gypsum originating from WTP's at coal mines contains highly concentrated inorganic salts characterized by elevated salinity. The gypsum undoubtedly has the potential to severely impact on the quality of the groundwater resource underlying the Gypsum Pads.

As a result of this, these facilities must be licensed as NWA section 21(g) Water Uses and a standard requirement is for them to be lined. The facility must be designed by a qualified civil engineer and the design must be submitted to DWS for approval.

vi) Measures that will be put in place to remedy any residual or cumulative impact that may result from acid mine drainage.

Influx of groundwater into the boxcut void, resulting in the potential dewatering of the surrounding aquifers, manifesting as a groundwater cone of depression in the water table with negative consequences on the availability of groundwater.

Management measures:

The cone of depression can be minimized by sealing the boxcut walls with shotcrete/gunite which will allow groundwater levels to re-establish and the cone of depression to become smaller. However, the maximum distance of groundwater lowering around the box-cut was calculated as 208 m which is insignificant in terms of a groundwater availability impact.

All water ingress into the box-cut during the construction phase must be assumed to be pollutes and if removed must be contained in an appropriately lined PCD.

A qualified civil engineer must design the shotcrete lining if one is to be used.

The decant of AMD from the box-cut into the surface water resources post closure, can only be managed through managing the post closure water level in the box-cut to a level below the decant elevation through groundwater abstraction from a borehole(s), treatment of the abstracted water and the subsequent release of the treated water into the surface water system. Evaporation of water from final voids in open pits or box-cuts is not an option any longer.

The decant of AMD from the underground workings into the surface water resources post closure, can be managed through two options. The preferred option is to install high integrity seals in the developments from the box-cut into the two coal seams, thereby sealing the AMD generated in the mine workings, underground. The second option is to also manage the post closure water level in the underground workings to a level below the decant elevation through groundwater abstraction from a borehole(s), treatment of the abstracted water and the subsequent release of the treated water into the surface water system.

The lateral seepage of contaminated ground water from the box-cut post closure can either be prevented from happening if the water level in the rehabilitated box-cut is managed, or either through interception of the migration of contaminated groundwater from boreholes around the box-cut, also of course with subsequent treatment and release.

vii) **Volumes and rate of water use required for the mining, trenching or bulk sampling operation.**

Refer to Figure 23.

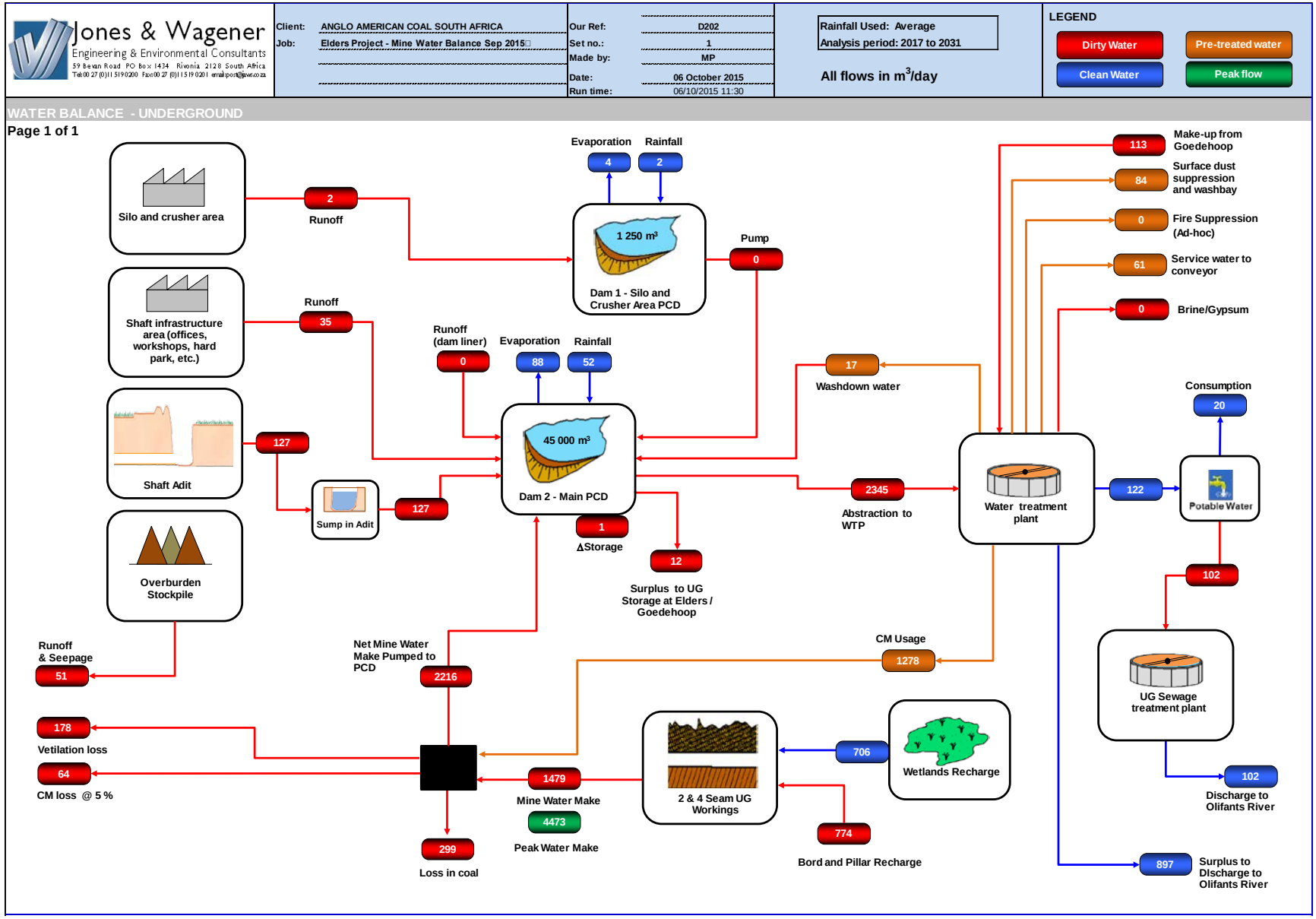


Figure 23: Schematic water balance diagram – average flows over the life of mine (2018 – 2030) (Jones and Wagener, 2015c)

viii) Has a water use licence has been applied for?

Yes, an IWULA will be submitted to the DWS. Table 15 lists the various water uses being applied for under Section 21 of the NWA for the Elders Colliery project.

Table 15: List of water uses for the Elders Colliery (Jones and Wagener, 2015b)

Section 21 Water Use	Description of water use
Section 21(a): Taking water from a water resource	• Abstraction of water from boreholes ESW25, ESW42 and ESW43 • Abstraction from boxcut and underground workings and treatment in WTP for re-use • Abstraction from Goedehoop Colliery Block 8 workings for construction purposes
S21(c) Impeding or diverting the flow of water in a watercourse **and/or S21(i)** altering the bed, banks, course or characteristics of a watercourse	• Mining underneath wetlands • Infrastructure development within wetlands, or within 500 m of wetlands: Boxcut and incline shaft, shaft area infrastructure and fence line • Infrastructure development within wetland: Discharge point from WTP & STP • Infrastructure development within wetland: Discharge from Main PCD • Crossing of watercourse with new conveyor between Elders Colliery and Goedehoop Colliery Block 20: Crossings 1 - 12 • Re-establishment of watercourse crossing within existing conveyor route: Crossing 13 • Crossing of watercourse with new conveyor between Goedehoop Colliery Hope Shaft and Goedehoop Colliery Processing plant: Crossing 14 and 15 • Infrastructure development within/close to wetland: Sump at conveyor Transfer 1 • Infrastructure development within wetland: Sump at conveyor Transfer 2 • Borrow pit 1 within wetland • Borrow pit 2 within 500 m from wetland
Section 21(g): Disposal of waste in a manner that could detrimentally impact on a water course	• Silo and crusher PCD • Main PCD • Brine dams at WTP • Gypsum storage area at WTP • Sludge drying beds at STP • Overburden stockpile • Storage of water in underground section • Dust suppression on roads at shaft area and on service road within conveyor servitude • Conservancy tank at guard house • Conservancy tanks during construction phase • 9 Mℓ Storage tank at WTP • 1.7 Mℓ Storage tank at WTP (partially treated water) • Sump at transfer point 1 • Sump at transfer point 2 • Sump at transfer point 3 • Sump at silo and crusher area
Section 21(j): 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	• Abstraction from boxcut and underground workings

ix) Impacts to be mitigated in their respective phases

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

ACTIVITIES (as listed in 2.11.1)	**PHASE** of operation in which activity will take place. State; Planning and design, Pre-Construction' Construction, Operational, Rehabilitation, Closure, Post closure.	**SIZE AND SCALE of disturbance** (volumes, tonnages and hectares or m²)	**MITIGATION MEASURES** (describe how each of the recommendations in herein will remedy the cause of pollution or degradation and migration of pollutants)	**COMPLIANCE WITH STANDARDS** (A description of how each of the recommendations herein will comply with any prescribed environmental management standards or practices that have been identified by Competent Authorities)	**TIME PERIOD FOR IMPLEMENTATION** Describe the time period when the measures in the environmental management programme must be implemented Measures must be implemented when required. With regard to Rehabilitation specifically this must take place at the earliest opportunity. .With regard to Rehabilitation, therefore state either:-.. Upon cessation of the individual activity; or. Upon the cessation of mining, bulk sampling or alluvial diamond prospecting as the case may be.

All of the above requirements are addressed in Table 16

Table 16: Measures to rehabilitate the environment affected by the undertaking of any listed activity including management outcomes

Activity	Size	Environmental aspect	Potential Impact	Mitigation Measure	Phase	Standard to be achieved	Compliance with standards	Time period
Boxcut and associated surface infrastructure, conveyor belt (new and upgraded)	65 ha, 17 km	Air Quality	Increase in dust fallout, PM_{10} and $PM_{2.5}$ particles affecting adjacent communities	Water sprays; this will results in 50% control efficiency	Construction, operation, closure	To minimise the entrapment potential of dust. To keep PM10 (and in the future, PM2.5) and dust fallout levels at key receptor sites around the project area within guideline levels. As the guidelines vary depending on the priority area and year, the South African Air Quality Information System (http://www.saaqis.org.za/) will be consulted for the most recent guidelines. These aforementioned standards will be achieved by: Developing a dust monitoring programme; and Providing evidence of dust suppression.	GNR 893 Minimum Emission Standards. Anglo Air Quality Performance Standards. Highveld Priority Area Air Quality Management Plan.	Throughout entire life of project including construction, operation and closure phases
				Water sprays on unpaved roads, stockpiles and material handling points; this will results in 50% control efficiency	Construction, operation, closure			
				Enclose the crusher and fit with a dust extraction system.	Construction, operations			
				Traffic control done through restriction of traffic volumes on roads and vehicle speeds.	Construction, operation, closure			
				Use water sprays on all stockpiles with special attention given to active stockpiles.	Construction, operation, closure			
				Long-term stockpiles should be vegetated or turfed.	Construction, operation, closure			
				Net screens with fine mist sprays around stockpiles areas.	Construction, operation, closure			
				Adhere to specified design (with a roof and one side covered). The conveyor covering should be in the direction where most sensitive receptors are located (westerly direction of the mine)	Construction, operation			
Boxcut and associated infrastructure	65 ha	Biodiversity	Permanent loss of habitat for flora and fauna Habitat fragmentation	Removal of vegetation should be restricted to the relevant infrastructure footprints only	Construction	To demonstrate active stewardship of land and biodiversity by: Identifying and removing relevant species if necessary; and Implementing the Biodiversity Action Plan	Anglo American Biodiversity Performance Standards Manage soils in line with the requirements of the National Norms and Standards for the Remediation of Contaminated Land and Soil Quality (GN 37603 No 331). Anglo American Policies and Guidelines to manage and remediate spills. GNR 893 Minimum Emission Standards. Anglo American Air Quality Performance Standards. Highveld Priority Area Air Quality Management Plan.	Throughout entire life of project including construction, operation and closure phases
				Topsoil should be stored separately to be used in rehabilitation and landscaping	Construction, operations			
				No off-road driving into the natural remaining vegetation should be allowed especially by heavy machinery	Construction, operation, closure			
				The development of erosion gullies should be monitored and managed	Construction, operation, closure			
				Prevent any and all effluent from the mining activities of entering the wetland habitat	Construction, operation, closure			
				Prevent all open fires, provide fire-safe zones, facilities and suitable fire control measures	Construction, operation, closure			
				Use of branches of trees, shrubs or any vegetation for fire making purposes is strictly prohibited	Construction, operation, closure			
				Provide sufficient on-site ablution, sanitation and waste management and hazardous materials management facilities	Construction, operation, closure			
				The use of the natural veld for ablution purposes shall not be permitted under any circumstances	Construction, operation, closure			
				Dust control on all roads should be prioritised	Construction, operation, closure			
				A road management plan should be compiled prior to commencement of construction activities	Construction, operation, closure			
Conveyor belt between Elders Colliery and Goedehoop Colliery	17 km	Biodiversity	Loss of species of concern	Remaining areas of natural vegetation, irrespective of their ecological state (poor or good) should be inspected for the presence of species of concern during the optimal time prior to construction by a registered and experienced biodiversity team. This might require a number of visits over a number of months.	Construction			

Activity	Size	Environmental aspect	Potential Impact	Mitigation Measure	Phase	Standard to be achieved	Compliance with standards	Time period
				Employees at the mine should be educated about the environment, the species of concern present and how to deal with them. Ignorance paves the way for prejudice.	Construction, operation, closure			
				Employees should not be allowed to harvest, utilise, manage or control any natural resource (water, soil, flora, fauna) unless it is done within the framework of a biodiversity action plan	Construction, operation, closure			
				No alien invasive plant or feral animal (domestic or wild) should be introduced into the area or be allowed to establish or spread in the area. Alien invasive or feral species already in the areas should be managed and controlled within the framework of a biodiversity action plan5	Construction, operation, closure			
				Only regionally, biome specific indigenous species should be used in the landscaping and rehabilitation. The seed and seedlings can be obtained by effectively managing the topsoil prior to construction. A professionally registered biodiversity team consisting of pedologists, botanists and zoologists should assist with the rehabilitation and landscaping plans.	Closure			
				No animal may be hunted, trapped, snared or captured for any purpose whatsoever. Fences and boundaries should be patrolled weekly in order to locate and remove snares and traps. Fences should be made visible, especially for flying fauna, specifically avifauna	Construction, operation, closure			
Overburden stockpile	14 ha	Groundwater	The formation of acid mine drainage (AMD) as a result of ingress water and oxygen into the stockpiled overburden	Verify AMD generation potential through sampling and analyses of actual overburden excavated.	Pre-construction	No dirty water spillage to the catchment thereby preventing contamination of waterbodies downstream by: Developing a groundwater monitoring programme and model; and Responding to complaints and implementing a grievance mechanism with regards to groundwater.	Anglo American Policies and Guidelines to manage and remediate spills.	Throughout construction and operation
				Place the overburden on a properly prepared and compacted footprint. This will optimize lateral drainage of percolated water and minimize infiltration into the sub-surface.	Construction			
				A civil engineering design, incorporating footprint preparation, leachate control and storm water management, must nevertheless be done for the Overburden Stockpile and submitted to DWS for approval.	Pre-construction			
Boxcut	7 ha		Influx of groundwater into boxcut void	The cone of depression can be minimized by sealing the box-cut walls with shotcrete/gunite which will allow groundwater levels to re-establish and the cone of depression to become smaller. However, the maximum distance of groundwater lowering around the box-cut was calculated as 208 m which is insignificant in terms of a groundwater availability impact.	Construction	Replace external users boreholes lost due to mining	Complaints register to record complaints regarding groundwater Groundwater study report	Throughout construction and operation
				Maintain compaction and shape to ensure free draining of surface run-off to minimize rainfall infiltration.	Construction, operation			
Underground mining Boxcut/Underground mining	65 ha		Influx of groundwater into the mine workings	Do not deviate from the planned bord and pillar mining and ensure stability integrity of overlying strata.	Operation			
				Mine according to design mine stability safety factor.	Operation			
			The formation of AMD in groundwater resources	Optimize storage of mine water make in mined out underground sections.	Operation	Prevent decant of AMD water to surface water resources	Water Quality Objectives as specified in the Water Use License issued by DWS \South African National Standard (SANS) 241:2011 Drinking Water Standards	Throughout entire life of project including construction, operation, closure and post closure phases
				Monitor groundwater quality.	Construction, operation, closure			
				Maintain underdrain system and dam integrity.	Construction, operation			
				Monitor groundwater quality and level in backfilled box-cut during closure	Closure, post closure			
	65 ha	Surface Water	Pollution of surface water resource					

Activity	Size	Environmental aspect	Potential Impact	Mitigation Measure	Phase	Standard to be achieved	Compliance with standards	Time period
Boxcut and associated infrastructure				Appropriate storm water management measures will be implemented, including the temporary diversion of upstream run-off from the construction and laydown areas.	Construction, operation, closure	To avoid or where not possible, minimise and remedy pollution of water Implementing a Leak/Spill Procedure; Compiling monitoring report; Implementing the Stormwater Management Plan; and Responding to complaints and implementing a grievance mechanism.	Drinking water standards (SANS241:2011) IRWQO for the Olifants River. Anglo American Policies and Guidelines to manage and remediate spills.	Throughout entire life of project including construction, operation, closure and post closure phases
				Servicing of construction vehicles will take place only in dedicated areas that are equipped with drip trays.	Construction, operation, closure			
				Bunded containment and settlement facilities will be provided for hazardous materials, such as fuel and oil.	Construction, operation, closure			
				Spill-sorb or a similar product will be kept on site, and used to clean up hydrocarbon spills in the event that they should occur.	Construction, operation, closure			
				Erosion protection measures will be implemented at steep areas.	Construction, operation, closure			
				A waste management plan will be developed	Construction, operation, closure			
				Water quality monitoring will be undertaken downstream of the construction areas, before and during construction where practical, in order to detect any increase in suspended solids or turbidity.	Construction, operation, closure			
				The storm water runoff from the overburden stockpile will be caught in a clean water cut off channel. The channel will convey the water to a silt trap from where it will discharge into the proposed clean water cannel at the office area and conveyed into the veld.	Construction, operation, closure			
				Prior to discharge to the veld, the water quality from overburden stockpile channel will be assessed and pumped to the PCD if not suitable for discharge to the environment.	Construction, operation, closure			
				The maximum volume of water expected to be generated at the start of mining at the boxcut in 2018 is likely to be around 167 m^3/day during the summer period. The water will be contained at the site, in the PCD, for re-use in dust suppression on haul roads, and as construction water, if the quality is suitable. The water will not be discharged.	Construction, operation, closure			
				The aerial extent of the disturbed and potentially contaminated areas will be kept to the demarcated construction footprint.	Construction			
				Areas where dirty construction activities are carried out (e.g. servicing areas and workshops, fuel storage areas, waste storage areas) will be minimised and surrounded by bunds.	Construction			
				Clean upslope runoff will be diverted around construction activities.	Construction			
				Containment of all dirty water generated on the mine in a lined PCD, sized to have a risk of spill of 2% or less in any one year.	Construction, operation, closure			
				Provision of a water treatment plant to treat a maximum of 5.0 Ml/day of dirty water generated at the mining operations.	Construction, operation, closure			
				Treatment of excess dirty water for reuse at the Elders operations, including supply of domestic and service water requirements.	Construction, operation, closure			
				Excess water that cannot be treated or reused will be pumped to storage in underground compartments at around 2025, when storage becomes available at Elders 2 Seam underground sections. Prior to storage becoming available underground, surplus water will need	Construction, operations			

Activity	Size	Environmental aspect	Potential Impact	Mitigation Measure	Phase	Standard to be achieved	Compliance with standards	Time period
				to be pumped to Goedehoop Colliery, should a review of the LOM plan not enable the early provision of storage on the 2 Seam.				
				Provision of water management facilities with a risk of spill that is lower than 2% in any one year.	Construction, operation, closure			
				All pipeline routes will be inspected regularly to enable early detection of leaks.	Construction, operation, closure			
				Washdown and waste water from the workshops will be passed through oil skimmers before discharging to the storm water system for containment in the PCD and eventual treatment for reuse, or pumping to underground storage.	Construction, operation, closure			
				An inspection and maintenance plan will be implemented on the storm water system to ensure that all oil skimming and sediment handling facilities are maintained and that storm water canals and pipelines remain unblocked and free flowing – monthly inspections will be carried out.	Construction, operation, closure			
				In line with best practice, the PCDs will be operated as empty as possible at all times to ensure that sufficient storm water retention capacity is available at all times.	Construction, operation, closure			
				In the event that there is insufficient available capacity in the main PCD during extreme rainfall conditions, excess storm water will be pumped to the Elders underground storage compartments.	Construction, operation, closure			
				The pollution control dams will be equipped with geomembrane liners to minimise leakage of contaminated water to the surface or ground water systems.	Construction, operation, closure			
				The lining system on the PCDs will include a sub-surface drainage layer to detect any leakages, as well as to prevent the build-up of hydrostatic pressure beneath the geomembrane liner. Water collected in the sub-surface drainage system will be discharged to a sump and pumped back into the PCD.	Construction, operation, closure			
				Excess water will therefore drain via the dirty storm water system to the PCD and will be pumped back to the water treatment plant for reuse in the mining operations.	Construction, operation, closure			
				The WTP will be isolated within a designated dirty water area. All runoff and spills from the treatment plant will be collected in a sump, from which water will be pumped to the PCD.	Construction, operation, closure			
				Discharge water quality will be continuously monitored for early detection of discharge water quality problems.	Construction, operation, closure			
				Should upset conditions occur, or poor discharge water quality be detected, the WTP discharge will be directed to the PCD	Construction, operation, closure			
				Initially one brine dam will be constructed, with a second to be constructed at a later stage, as the WTP's treatment capacity is increased.	Construction, operation, closure			
				The brine dams will be lined with a compacted clay layer with a 1.5 mm thick HPDE geomembrane , to minimise seepage of contaminated water to the groundwater system. The brine dams will also be equipped with a leak detection sump.	Construction, operation, closure			
				The gypsum pads will be paved with concrete. The concrete slabs will be underlain by a 1.5 mm thick HDPE geomembrane liner. The gypsum pad will be provided	Construction, operation, closure			

Activity	Size	Environmental aspect	Potential Impact	Mitigation Measure	Phase	Standard to be achieved	Compliance with standards	Time period
				with concrete bunds to ensure no storm water runoff from the area. The storm water will be directed to a sump at the lower end of the gypsum area, from where water will be directed to the brine dam via a sloping pad and concrete lined channel.				
				Gypsum will be removed from the site on a regular basis. This will occur in a timely manner to prevent overloading of the gypsum drying pad.	Construction, operation, closure			
				Removal from site of gypsum will be undertaken by an appropriately licensed waste removal contractor.	Construction, operation, closure			
				Disposal of gypsum will be at a licensed hazardous waste disposal facility, such as Holfontein Landfill.	Construction, operation, closure			
				The gypsum pad will be bunded to prevent clean storm water from entering the pad and to contain all storm water generated on the pad itself. Storm water from the pad will be collected in a sump and pumped to the PCD.	Construction, operation, closure			
				An inspection and maintenance plan will be implemented to ensure that the pipelines and dams are kept in good working order.	Construction, operation, closure			
				A surface water quality monitoring programme will be implemented to detect any impacts. The WTP will be isolated within a designated dirty water area. All runoff and spills from the treatment plant will be collected	Construction, operation, closure			
				Erosion protection measures at the discharge point	Construction, operation, closure			
				The quality of the water discharged will be closely monitored to ensure that it falls within the specified IRWQO at all times.	Construction, operation, closure			
Conveyor belt and servitude	17 km	Surface Water	Pollution of surface water resource	The Goedehoop pipe will be pressure tested before commissioning backfilling the trench to ensure that all joints are properly sealed.	Construction	To avoid or where not possible, minimise and remedy pollution of water Implementing a Leak/Spill Procedure; Compiling monitoring report; Implementing the Stormwater Management Plan; and Responding to complaints and implementing a grievance mechanism.	Drinking water standards (SANS241:2011) IRWQO for the Olifants River. Anglo American Policies and Guidelines to manage and remediate spills.	Throughout entire life of project including construction, operation, closure and post closure phases
				Monitoring will be implemented downstream of all watercourse crossings to detect any impacts.	Construction, operation, closure			
				The conveyor service road will cross the watercourses by means of low-level crossings. These will be designed to withstand the flow velocities expected during extreme floods with minimal damage.	Construction			
				The belt drive and transfer infrastructure at either end of the conveyor will be paved with concrete, bunded to prevent run-on of clean water and to contain dirty runoff.	Construction			
				Conveyors will be rotated at the either end to ensure that the dirty side faces upwards at all times.	Construction, operation, closure			
				Belt scrubbers will be provided at either end to clean the belt to prevent carbonaceous material from being dropped along the route.	Construction, operation, closure			
				The conveyor will be completely enclosed at the bridge crossing to prevent any spillage of water or coal into the watercourses.	Construction, operation, closure			
				Watercourse crossings will be designed to accommodate at least the 1:100 year event without overtopping.	Construction, operation, closure			
				Dust suppression will be employed at the either end of the conveyor to minimise dust emissions.	Construction, operation, closure			

Activity	Size	Environmental aspect	Potential Impact	Mitigation Measure	Phase	Standard to be achieved	Compliance with standards	Time period
				A shroud will be provided along the entire conveyor length, on the upwind side, to prevent rain from falling directly onto the conveyor and to protect it from wind.	Construction, operation, closure			
				Monitoring will be implemented downstream of all watercourse crossings along the conveyor route.	Construction, operation, closure			
Trucking of ore to Goedehoop	N/A	Surface Water	Pollution of surface water resources	Loading and offloading of trucks will take place only within the designated dirty water areas and Goedehoop.	Construction			
				Loading of trucks will be carefully controlled to ensure that overloading will not take place.	Construction			
				Truck load boxes will be covered with tarpaulins to prevent spillage of coal from the backs of trucks during transport.	Construction			
Boxcut and associated infrastructure, underground mining area	65ha	Surface water		The storm water management measures, including the PCD will be decommissioned last, to ensure adequate storm water management during the rehabilitation phase.	Closure			
				A waste management plan will be developed for the closure phase, which will include the handling of contaminated materials / soils found on site.	Closure			
				All traces of hydrocarbons and residual waste will be removed before infrastructure is demolished.	Closure			
				Contaminated soils will be excavated and placed on the discard facilities prior to their rehabilitation, or removed from site by an appropriately licensed waste contractor.	Closure			
				An appropriate sewage management strategy will be implemented during the decommissioning phase, including decommissioning of the sewage treatment plant as late as possible in the process.	Closure			
				Water quality monitoring will be undertaken downstream of the demolished areas, in order to detect any increase in suspended solids or turbidity.	Closure			
				If erosion is evident or the water quality monitoring indicates an increase in suspended solids, water management around the decommissioning areas will be reviewed.	Closure			
				The incline shaft will be sealed, backfilled and made free draining.	Closure			
				The underground workings will be left to fill to a pre-determined environmental safe level (below decant level) before active water level management is implemented.	Closure			
				Monitoring of water levels in the mine and the associated water quality is committed to. This will allow both calibration of the post mining water quality and water volumes.	Closure, post closure			
				The water level in the workings will be actively managed to ensure it remains below the decant elevation.	Closure, post closure			
				Treated water will be discharged to the river system.	Closure, post closure			
				The incline shaft will be backfilled, rehabilitated and made free-draining.	Closure			
				Monitoring of water levels in the ine and the associated water quality is committed to. This will allow both calibration of the post mining water quality and water volumes.	Closure, post closure			

Activity	Size	Environmental aspect	Potential Impact	Mitigation Measure	Phase	Standard to be achieved	Compliance with standards	Time period
				The water level in the workings will be actively managed to ensure it remains below the decant elevation.	Closure, post closure			
				Discharge of clean water to the river system.	Closure, post closure			
Conveyor belt between Block 20 and Goedehoop Colliery	17 km	Heritage	Impact on heritage resources – Graves	Graveyard to be fenced off and clearly demarcated. Upgrading should take place well outside of the fenced off area.	Construction, operation, closure	To ensure heritage resources are not damaged during the mining process	Ordinance on Excavations (Ordinance no. 12 of 1980) (replacing the old Transvaal Ordinance no. 7 of 1925).	Only applicable should heritage resource be removed
				The graveyard will be accessible to descendants.	Construction, operation, closure			
				A management plan for the preservation of the graves will be compiled by a heritage expert and will be implemented by the mine and appointed construction contractor.	Construction, operation, closure			
				Dust control around the graveyard will be implemented.	Construction, operation, closure			
				Should the graves fall directly within the proposed conveyor footprint, the graves must be exhumed and relocated.	Pre-construction			
				Grave exhumation permits will be obtained from SAHRA should it be necessary to exhume the graves.	Pre-construction			
Boxcut and associated infrastructure, conveyor belt	65 ha	Noise	General rise in ambient noise levels	Ensure high level of equipment maintenance, especially intake and exhaust mufflers	Construction, operation, closure	To minimise noise impacts on sensitive receptors by: Developing a complaints register to record complaints regarding noise. To maintain noise levels at the standards for suburban areas (SANS 10103) as far as practicable.	Compliance with SANS 10103 Acceptable Ambient Levels.	Throughout construction, operation and closure phases
				Withdraw equipment for maintenance if change in noise emission characteristics is noticeable	Construction, operation, closure			
				Replace pure tone (beeping) with broadband (hissing) reversing alarms	Construction, operation, closure			
				Maintain noise complaint register and act promptly to complaints	Construction, operation, closure			
				Ensure high level of equipment maintenance, especially intake and exhaust mufflers	Construction, operation, closure			
Boxcut and associated infrastructure, conveyor belt	65 ha	Soils	The loss of utilisable resource (sterilisation and erosion), compaction and contamination or salinisation.	Limiting the area of impact to as small a footprint as possible, inclusive of waste management facilities, resource stockpiles and the length of servitudes, access and haulage ways and conveyor systems wherever possible.	Construction	To prevent soil contamination by implementation of: Inspection and maintenance Plan; Leak/Spill Procedure' Emergency Preparedness Plan; Waste Management; and GN704 Audit Report.	Manage soils in line with the requirements of the National Norms and Standards for the Remediation of Contaminated Land and Soil Quality (GN 37603 No 331). Anglo American Policies and Guidelines to manage and remediate spills.	Throughout construction, operation and closure phases
				The development and inclusion of soil management as part of the general housekeeping operations, and the independent auditing of this management.	Construction, operation, closure			
				Concurrent rehabilitation of all affected sites that are not required for the operation – rehabilitation of temporary structures and footprint areas used during the feasibility investigation (geotechnical pits, trenching etc.) and the construction phase.	Construction			
				Separation of the utilisable soils and ferricrete base materials from each other and from the soft overburden.	Construction			
				Effective cladding of the berms and soil, ferricrete stockpiles/heaps with vegetation or large rock fragments, and the minimising of the height of storage facilities to 15m and soil berms to 1,5m wherever possible.	Construction, operation			
				Restriction of vehicle movement over unprotected or sensitive areas, this will reduce compaction.	Construction, operation, closure			
				Soil amelioration (cultivation) to enhance the oxygenation and growing capability (germination) of natural regeneration and/or seed within the stockpiled soils	Construction, operation, closure			

Activity	Size	Environmental aspect	Potential Impact	Mitigation Measure	Phase	Standard to be achieved	Compliance with standards	Time period
				(maintain the soils viability during storage) and areas of concurrent rehabilitation.				
				The area must be fenced, and all animals kept off the area until the vegetation is self-sustaining.	Construction, operation, closure			
				Newly seeded/planted areas must be protected against compaction and erosion (Vetiver hedges etc.).	Construction, operation, closure			
				Traffic should be limited were possible while the vegetation is establishing itself.	Construction, operation, closure			
				Plants should be watered and weeded as required on a regular and managed basis were possible and practical.	Construction, operation, closure			
				Replace unhealthy or dead plant material.	Construction, operation, closure			
				Fertilise, hydro seeded and grassed areas soon after germination	Construction, operation, closure			
				Contour and stabilise slopes to be free draining and limit/control vehicle movement and dirty water outflows, vehicle maintenance and assessment of risk of contamination from infrastructure prior to demolition.	Construction, operation, closure			
				Re-instatement of the stored soils onto areas of disturbance where infrastructure has been demolished and removed.	Construction, operation, closure			
				Cultivate, amelioration and oxygenation of growing medium, the planting of required vegetative cover and irrigation if required, will reduce/mange erosion, decrease compaction and stabilise the land form. This will once cover has been obtained, effectively see the sites returned to a grazing land capability rating.	Construction, operation, closure			
				Replace soils on rehabilitated areas as per the soils management plan.	Closure			
				Effective soil cover and adequate protection from wind (dust) and dirty water contamination – vegetate and/or rock cladding.	Construction, operation, closure			
				Regular servicing of all vehicles in well-constructed and bunded areas.	Construction, operation, closure			
				Regular cleaning and maintenance of all access ways, conveyors and service ways, drains and storm water control facilities.	Construction, operation, closure			
				Containment and management of spillage.	Construction, operation, closure			
				Soil replacement and the preparation of a seed bed to facilitate and accelerate the re-vegetation program and to limit potential erosion on all areas that become available for rehabilitation (temporary servitudes).	Closure			
				Soil amelioration (rehabilitated and stockpiled) to enhance the growth capability of the soils and sustain the soils ability to retain oxygen and nutrients, thus sustaining vegetative material during the storage stage. Monitoring should always be carried out at the same time of the year and at least six weeks after the last application of fertilizer.	Construction, operation, closure			
Construction and operation of boxcut, associated infrastructure and conveyor belt	65 ha 17 km	Wetland	Loss and disturbance of wetland habitat Increased surface run-off from bare soil areas	Fence off all wetland areas outside the direct development footprint. Include a 50m buffer zone around all wetlands within the fenced off area. Where fencing of the wetlands is not practical/desirable, the proposed development footprint should be fenced off and all activities contained within the fenced off area.	Construction	To avoid or where not possible, minimise and remedy pollution of water Implementing a Leak/Spill Procedure;	Drinking water standards (SANS241:2011) IRWQO for the Olifants River.	Throughout entire life of project including construction, operation,

Activity	Size	Environmental aspect	Potential Impact	Mitigation Measure	Phase	Standard to be achieved	Compliance with standards	Time period
			Increased sedimentation in adjacent wetlands Water quality deterioration Establishment of alien species Increased risk of erosion within wetlands Decreased flows in wetlands due to dewatering of underground aquifer Altered flow within Olifants river Altered water quality within Olifants River	Develop and implement a construction stormwater management plan prior to the commencement of site clearing activities.	Construction, operation, closure	Compiling monitoring report; Implementing the Stormwater Management Plan; and Responding to complaints and implementing a grievance mechanism. To demonstrate active stewardship of land and biodiversity by: Identifying and removing relevant species if necessary; and Implementing the Biodiversity Action Plan	Anglo American Policies and Guidelines to manage and remediate spills. Anglo American Biodiversity Performance Standards Manage soils in line with the requirements of the National Norms and Standards for the Remediation of Contaminated Land and Soil Quality (GN 37603 No 331). Anglo American Policies and Guidelines to manage and remediate spills. GNR 893 Minimum Emission Standards. Anglo Air Quality Performance Standards. Highveld Priority Area Air Quality Management Plan	closure and post closure phases
				Rehabilitate and re-vegetate all disturbed areas as soon as possible following disturbance.	Construction			
				Areas in and around the wetlands should not be cleaned, graded and ditched/trenched more than a week before construction activities commence.	Construction			
				Divert flows from upslope of the construction area around the cleared area.	Construction			
				No washing of equipment or machinery in any waterbody or wetland on site.	Construction, operation, closure			
				Store potential contaminants in designated areas with spill containment measures.	Construction, operation, closure			
				Keep sufficient spill clean-up material on site to deal with small spills	Construction, operation, closure			
				Develop emergency response procedures to deal with large spills.	Construction, operation, closure			
				Inform contractors regarding the location and sensitivity of all wetland areas	Construction			
				Compile and implement alien vegetation management plan to remove and control establishment and spread of alien species.	Construction, operation, closure			
				Limit all activities to the conveyor servitude.	Construction,			
				No stockpiling of materials or placement of temporary construction infrastructure in the wetlands or within 50m of the wetlands.	Construction,			
				Use existing farm tracks and roads for access, as well as for service road as far as possible.	Construction, operation, closure			
				The conveyor should span the entire width of the active channel in valley bottom crossings. Conveyor footings within the wetlands should be kept to a minimum.	Construction			
				Post construction all alien invasive vegetation should be removed from site. This will also require long-term follow up to ensure establishment of natural vegetation in all disturbed areas.	Closure			
				Install erosion prevention measures prior to the onset of construction activities	Construction			
				No conveyor footings should be placed within the active channel of any valley bottom wetlands. The active channel should be spanned.	Construction			
				Service road crossings over valley bottom wetlands should be via low level bridges – low flows should be accommodated via culverts and flood flows should overtop the low level bridge.	Construction			
				Culvert capacity should be such to prevent impoundment upslope of the crossing and flow concentration downslope.	Construction			
				Ensure sufficient space under the conveyor to allow free movement of small mammals.	Construction, operation, closure			
				Maintain a pillar size/safety factor that will ensure that no surface subsidence occurs under any of the wetlands on site.	Operation			

Activity	Size	Environmental aspect	Potential Impact	Mitigation Measure	Phase	Standard to be achieved	Compliance with standards	Time period
				Run-off from topsoil stockpiles should enter a sediment trap prior to discharge to the environment.	Construction, operation, closure			
				Regular inspection and maintenance of the entire conveyor route should be undertaken.	Construction, operation, closure			
				All vehicular and machinery movement along the servitude must be restricted to the service road. No off-road driving.	Construction, operation, closure			
				Protect discharge point against erosion and incorporate energy dissipaters.	Construction, operation, closure			
				Ensure discharge water quality is always in line with the IRQO's set for the Olifants River	Construction, operation, closure			
				Only treated water to be discharged.	Construction, operation, closure			
				All brine ponds and sludge dams should be lined. A suitable engineered multiple liner should be installed in the brine ponds and sludge dams to ensure zero seepage of water out of the ponds.	Construction			
				Leak detection mechanisms should form part of the liner system.	Construction			
				Ponds should be of sufficient capacity to ensure that no overflow occurs.	Construction			
				Brine should be temporarily stored on site and disposed of offsite in a suitable facility.	Construction, operation, closure			
				A surface water quality monitoring plan and biomonitoring program should be implemented to monitor downslope water resources for signs of pollution derived from the brine ponds and sludge dams.	Construction, operation, closure			
				Wetlands downslope of the treatment plant should be included in the water quality and biomonitoring plan for the mine.	Construction, operation, closure			
				All decommissioning activities should be restricted to the disturbed footprint and make use of existing access routes and roads.	Closure			
				All solid waste should be removed from site and disposed of at suitable waste disposal sites offsite.	Construction, operation, closure			
				Areas where soils could potentially have been contaminated should be tested to determine contamination levels and appropriate remediation activities.	Construction, operation, closure			
				Landscape disturbed area to the approximate natural landscape profile and to drain into the adjacent wetland as in the predevelopment state.	Construction, closure			
				Post mining landscape should avoid steep slopes and concentrated runoff.	Closure			
				Re-vegetate replaced soils as soon as possible following placement using a suitable mix of indigenous species.	Construction, closure			
				Implement a long term management and monitoring plan.	Construction, operation, closure			
				Construct and operate a water treatment plant during closure to treat water to acceptable levels (RQO).	Closure			
				Manage water levels within the mined out areas to prevent decant.	Closure, post closure			

Activity	Size	Environmental aspect	Potential Impact	Mitigation Measure	Phase	Standard to be achieved	Compliance with standards	Time period
				Prevent decant from the mined out areas by actively managing water levels within the mined out areas.	Closure, post closure			
Development of the Elders Colliery	65 ha 17 km	Socio-economic	Improved relation with local communities and stakeholders Unmet expectation for the relocation of the Vlakkuilen community and loss of social licence due to changes in mine planning Unmet expectations from communities within the primary ZOI to benefit from economic opportunities and improved living conditions Increased pressure on social services and infrastructure and in increase in social pathologies and social disruptions due to influx of people and construction workers resulting in spontaneous settlements Employment and income Dissatisfaction over employment opportunities and conditions of procurement Improved employment and enterprise development opportunities through skills development and capacity building initiatives Improved infrastructure in the study area due to social investment activities Increased direct revenue to local government Increased direct revenue to local government Loss of employment and enterprise development opportunities due to closure of mine	Compile and implement the management measures detailed in the SLP.	Construction, operation, closure	To enhance benefits from the development of the Project; To maximize opportunities for local residents; To facilitate employment of local labour on the Mine; and To avoid creating unrealistic expectations. These standards will be achieved by the implementation of the SLP. To ensure that retrenched employees can pursue alternative livelihoods by: Developing a Closure Plan.	Anglo American Closure Toolbox. Anglo American Social Way Anglo American Environmental Way	Throughout entire life of project including construction, operation, closure and post closure phases
				Prioritise the employment of the communities residing within the Primary ZoI for semi-skilled and unskilled job opportunities during construction.	Construction, operation, closure			
				Enforce the contractor management plan, especially relating to local recruitment and procurement.	Construction, operation, closure			
				Where possible, engage with the Govan Mbeki Local Municipality to identify opportunities of collaboration and capacity building for the provision of social services to the communities within the Primary ZoI.	Construction, operation, closure			
				Develop a clear and concise employment and recruitment policy that prioritizes local recruitment. Ensure that contractors adhere to this policy.	Construction, operation, closure			
				Identify and support community development programmes that address challenges raised by population influx and spontaneous settlement.	Construction, operation, closure			
				Enforce the Anglo American principles regarding employee and contractor behaviour;	Construction, operation, closure			
				Continuously monitor the housing and living conditions of employees receiving living out allowances.	Construction, operation, closure			
				Support local government capacity for integrated development planning.	Construction, operation, closure			
				Participate in the local government's strategy to address issues related to and potentially enhanced by project-induced influx. This strategy will be developed in order to clearly define how participants, including AOL, local government and relevant stakeholders, intend to manage the impacts caused by influx where possible.	Construction, operation, closure			
				Compile and implement the community health and safety initiatives of the Community Health and Safety Plan (CHSP), such as education and awareness programs that address social pathologies in neighbouring communities through established government departments.	Construction, operation, closure			
				Implement vocational training programs to promote local workforce capacity as per the Labour and Human Resources Plan (LHRP).	Construction, operation, closure			
				Purchase goods and services at a local level, if available. Formalize this policy in company purchasing guidelines and contractors' agreements.	Construction, operation, closure			
				Work closely with the local communities before and during the project to identify and communicate required skills and resources that the local community could provide;	Construction, operation, closure			
				Provide or facilitate training of local people in mining and general business skills before and during mining activities, such as through internships, scholarships, and/or vocational and skills training programs.	Construction, operation, closure			
				Prepare a detailed vocational training program in consultation with the local community to be implemented during the construction phase.	Construction, operation, closure			
				Through the stakeholder engagement process ensure that expectations are managed around employment opportunities and practices.	Construction, operation, closure			

Activity	Size	Environmental aspect	Potential Impact	Mitigation Measure	Phase	Standard to be achieved	Compliance with standards	Time period
				In order to promote skills development and capacity building initiatives to both employees and the broader population and, in particular amongst youth, the SLP should focus on enterprise development and capacity building;	Construction, operation, closure			
				Support local government in their skills development and training initiatives;	Construction, operation, closure			
				Furthermore, AOL's closure plan will aim to reinforce the objectives of the SLP by reducing the reliance on AOL for employment by promoting skills transfer to enable alternative livelihoods; and,	Construction, operation, closure			
				Support, participate and report on the payment and spending of revenue s to government according to the EITI principles and guidelines.	Construction, operation, closure			
				Include affected communities in the decision making processes of the project, particularly around potential Corporate Social Investment (CSI) opportunities, and SLP projects;	Construction, operation, closure			
				Ensure that all stakeholder engagement includes women, youth and vulnerable groups;	Construction, operation, closure			
				Provide regular and transparent feedback to the Vlakkuilen and Middelkraal communities specifically;	Construction, operation, closure			
				Discuss and manage issues, concerns, changes and impacts related to the project as soon as they arise;	Construction, operation, closure			
				Monitor and implement the Grievance Management Mechanism;	Construction, operation, closure			
				Involve Local Ward Councillors and keep them informed about project developments, and included in all stakeholder engagement processes. Their involvement will assist with the successful development of relationships between the mine, the municipality and the communities;	Construction, operation, closure			
				Regularly consult with local government through the Govan Mbeki Local Municipality around issues of community development, employment, co-operation and project activities;	Construction, operation, closure			
				Where possible CSI initiatives and SLP projects with the Govan Mbeki Local Municipality IDP with the goal of improving both sustainability and feasibility (this would only occur once the mine was operational);	Construction, operation, closure			
				Durable participatory and consultative structures should be in place pre-closure to mitigate the impacts of closure.	Construction, operation, closure			
				Continue the discussions with and planning for the livelihoods restoration for the Vlakkuilen community;	Construction, operation, closure			
				Continue engaging the community and Ward Councillor to provide information about the project progress; and,	Construction, operation, closure			
				Enforce the Anglo American Contractor Management Plan, which should in addition address accommodation, living standard, transport and health and safety standards of contractors;	Construction, operation, closure			
				Employ local workers if qualified applicants with the appropriate skills are available. Formalize this policy in company Human Resources guidelines and contractors' agreements;	Construction, operation, closure			

Activity	Size	Environmental aspect	Potential Impact	Mitigation Measure	Phase	Standard to be achieved	Compliance with standards	Time period
				Develop a clear and concise employment policy prioritizing local employment;	Construction, operation, closure			
				Through the stakeholder engagement process ensure that expectations are managed around employment opportunities and practices.	Construction, operation, closure			
				Furthermore AOL's closure plan should aim at reinforcing the objectives of the SLP by reducing the reliance on AOL for employment by promoting skills transfer to enable alternative livelihoods.	Construction, operation, closure			

e) Impact Management Outcomes

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

ACTIVITY whether listed or not listed. **(E.g. Excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc…etc…etc.).**	**POTENTIAL IMPACT** **(e.g. dust, noise, drainage surface disturbance, fly rock, surface water contamination, groundwater contamination, air pollution etc….etc…)**	**ASPECTS AFFECTED**	**PHASE** In which impact is anticipated **(e.g. Construction, commissioning, operational decommissioning, closure, post-closure)**	**MITIGATION TYPE** **(modify, remedy, control, or stop) through (e.g. noise control measures, storm-water control, dust control, rehabilitation, design measures, blasting controls, avoidance, relocation, alternative activity etc. etc)** **E.g.** • **Modify through alternative method.** • **Control through noise control** • **Control through management and monitoring** • **Remedy through rehabilitation..**	**STANDARD TO BE ACHIEVED** **(Impact avoided, noise levels, dust levels, rehabilitation standards, end use objectives) etc.**

All of the above requirements are addressed in Table 16.

f) Impact Management Actions

(A description of impact management actions, identifying the manner in which the impact management objectives and outcomes contemplated in paragraphs (c) and (d) will be achieved).

ACTIVITY whether listed or not listed. **(E.g. Excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc…etc…etc.).**	**POTENTIAL IMPACT** **(e.g. dust, noise, drainage surface disturbance, fly rock, surface water contamination, groundwater contamination, air pollution)**	**MITIGATION TYPE** **(modify, remedy, control, or stop) through (e.g. noise control measures, storm-water control, dust control, rehabilitation, design measures, blasting controls, avoidance, relocation, alternative activity etc. etc)** **E.g.** • **Modify through alternative method.** • **Control through noise control**	**TIME PERIOD FOR IMPLEMENTATION** Describe the time period when the measures in the environmental management programme must be implemented Measures must be implemented when required. With regard to Rehabilitation specifically this must take place at the earliest opportunity. .With regard to Rehabilitation, therefore state either:-.. Upon cessation of the individual activity	**COMPLIANCE WITH STANDARDS** (A description of how each of the recommendations in 2.11.6 read with 2.12 and 2.15.2 herein will comply with any prescribed environmental management standards or practices that have been identified by Competent Authorities)

		• **Control through management and monitoring** • **Remedy through rehabilitation..**	or. Upon the cessation of mining, bulk sampling or alluvial diamond prospecting as the case may be.	

All of the above requirements are addressed in Table 16.

i) Financial Provision

(1) Determination of the amount of Financial Provision.

(a) Describe the closure objectives and the extent to which they have been aligned to the baseline environment described under Regulation 22 (2) (d) as described in 2.4 herein.

The overall closure goal for the proposed Elders Colliery area is to re-instate an area that is safe, stable, and non-polluting with the final landform not adversely affecting water resources.

The above overall goal is underpinned by the more specific objectives listed below:

- Decommissioning all surface infrastructure that has no beneficial post-closure use;
- Identify potential post-closure uses of the land occupied by mine infrastructure in consultation with the surrounding land owners and land users. Should a suitable use for mine infrastructure not be found, it will be removed;
- Rehabilitate disturbed land to a state that is suitable for its post-closure uses;
- Rehabilitate disturbed land to a state that facilitates compliance with applicable environmental quality objectives (air quality objectives and water quality guidelines);
- Reduce the visual impact of the site through rehabilitation of all disturbed land and residue deposits;
- Rehabilitation that results in landforms that emulate the surroundings and would facilitate drainage;
- Rehabilitate all disturbed land to a state where post-closure management is minimised;

The closure objective are largely developed to manage residual and latent risks and establish post closure land uses aligned with the pre-mining land capability, established during the baseline investigation. The current status quo relating to pre-mining land capability is that the area influenced by the proposed Elders Colliery is limited in terms of the land capability classes present (as defined by the Chamber of Mines Guideline, 1991), with the area soils derived from rocky outcrop of sedimentary parent rock, or ferricrete/laterite “C” horizon at differing depths with a land capability rated as low intensity grazing land or wilderness status. Areas of wet base soils (wetland land capability as per the Chamber of Mine classification) surround the mine, but these areas will not be significantly directly influenced by the construction of infrastructure.

Given that the majority of the area influenced by the proposed Elders Colliery is limited grazing potential, the post closure land use objectives will be implemented in a manner whereby rehabilitation activities are undertaken to develop post closure land capabilities that will support grazing activities once the proposed Elders Colliery has relinquished responsibility for the management of the footprint after a closure certificate has been issued.

Besides being aligned with the baseline land capability of the area, the above post closure land use objective is aligned with the baseline vegetation conditions, which will be influenced by the construction of project infrastructure.

(b) Confirm specifically that the environmental objectives in relation to closure have been consulted with landowner and interested and affected parties.

During the stakeholder engagement process for the Impact Assessment Phase, the objectives outlined in PART B, Section 1 (i)(1)(a) above were introduced and discussed.

Stakeholder engagement during the Impact Assessment Phase involved the availability of the EIA/EMP for public review and meetings with stakeholders to provide information on the following:

- The project description (final site layout, all alternatives investigated) and the surrounding baseline environment;
- Findings from the specialist studies undertaken;
- Potential biophysical and socio-economic impacts during construction, operations, closure and post-closure phases of the project;
- Management/mitigation measures developed to address the potential impacts;
- The closure objectives, plan and financial provision; and
- Details on how stakeholders can comment on the EIA/EMP.

(c) Provide a rehabilitation plan that describes and shows the scale and aerial extent of the main mining activities, including the anticipated mining area at the time of closure.

The rehabilitation plan has been developed based on available information including environmental data. Some of the information currently available may need to be supplemented during the operational period. Therefore, a number of assumptions were made about general conditions, and closure and rehabilitation of the facilities at the site to develop the proposed closure actions. As additional information is collected during operations, these assumptions will be reviewed and revised as appropriate.

The assumptions used to prepare this plan include the following:

- The battery limit for this Preliminary Mine Closure Plan (PMCP) is the end of the existing upgraded overland conveyor as it ties into existing infrastructure supplying the Goedehoop Beneficiation Plant. This PMCP excludes any rehabilitation associated with Block 20 or any rehabilitation from the tie in to the infrastructure leading to the Goedehoop beneficiation plant;
- The closure period will commence once all of the ore has been mined and processed;
- Vegetation establishment will be in line with the Biodiversity Action Plan (BAP) that Elders Colliery is expected to develop to manage its impacts on biodiversity;
- Closure water quality compliance criteria will be governed by the Water Use Licence;
- Water management infrastructure developed for the operational phase will be retained for closure at the end of the life of the project as necessary;
- Buildings that are not retained for post-closure use, sold or used by another party will require demolition;
- All demolition rubble is considered non-hazardous and can therefore be incorporated into the backfill during the closure of the box cut;
- The roads constructed to access the site will not be needed for post closure monitoring.

The rehabilitation actions that the mine intends undertaking at the end of the life of the proposed Elders Colliery project are described below. These actions are designed to comply with the requirements of this rehabilitation plan's objectives, as well as the requirements of Best Practice Guidelines (BPG).

The full closure and rehabilitation action plan is available in **Appendix 7-10**.

(d) Explain why it can be confirmed that the rehabilitation plan is compatible with the closure objectives.

The rehabilitation actions that Elders Colliery intends on undertaking at the end of the life of project are designed to comply with the requirements of the closure objectives.

Using available baseline and operational information, as well as identifying the opportunities and constraints imposed by the colliery on the environment and vice versa, the following post closure land use vision has been developed for the colliery. To progressively reinstate a post-mining landscape that improves local spatial development patterns and maximises socio-economic opportunities, by supporting sustainable agricultural production, while maintaining essential ecosystem services.

(e) Calculate and state the quantum of the financial provision required to manage and rehabilitate the environment in accordance with the applicable guideline.

Calculating the quantum is supported by a Guideline used by the DMR (Guideline Document for the Evaluation of the Quantum of Closure Related Financial Provision Provided by a Mine, Department of Minerals and Energy, 2005). The approach to calculating the closure quantum as specified in the DMR Guideline which was utilised in this assessment has been summarised in PART A, Section 3 (g)(iv)(s)(i) above.

The financial provision is detailed in Table 17.

Table 17: Summary of Elders Colliery environmental liability assessment

					YEAR OF ASSESSMENT		2015
					RISK CLASS		High risk (A)
					ENVIRONMENTAL SENSITIVITY		High
					NATURE OF TERRAIN/ACCESSIBILITY (WF 1)		Flat
					PROXIMITY TO URBAN AREA (WF 2)		Peri Urban
	Main Description	**Units**	**Amount**	**DMR Master Rate**	**DMR Multiplication Factor**	**Weighing Factor 1**	**Amount**
1	Dismantling of processing plant and related structures (including overland conveyors and powerlines)	**m^3**	361	**12.91**	**1.00**	**1.00**	R 4 662.89
2 (A)	Demolition of steel buildings and structures	**m^2**		**179.89**	**1.00**	**1.00**	R 0.00
2(B)	Demolition of reinforced concrete buildings and structures	**m^2**	3 342	**265.11**	**1.00**	**1.00**	R 885 997.62
3	Rehabilitation of access roads	**m^2**	30 000	**32.19**	**1.00**	**1.00**	R 965 700.00
4(a)	Demolition and rehabilitation of electrified railway lines	**m**		**312.45**	**1.00**	**1.00**	R 0.00
4(b)	Demolition and rehabilitation of non-electrified railway lines	**m**		**170.43**	**1.00**	**1.00**	R 0.00
5	Demolition of housing and facilities	**m^2**	6 000	**359.79**	**1.00**	**1.00**	R 2 158 740.00
6	Opencast rehabilitation including final voids and ramps	**ha**	7	**188 604**	**1.00**	**1.00**	R 1 250 442.73
7	Sealing of shafts, adits and inclines	**m^2**		**96.57**	**1.00**	**1.00**	R 0.00
8(a)	Rehabilitation of overburdens and spoils	**ha**		**125 736**	**1.00**	**1.00**	R 0.00
8(b)	Rehabilitation of processing waste deposits and evaporation ponds (basic, salt producing waste)	**ha**		**156 602**	**1.00**	**1.00**	R 0.00
8(c)	Rehabilitation of processing waste deposits and evaporation ponds (acid, metal rich waste)	**ha**	4	**454 846**	**1.00**	**1.00**	R 1 728 413.01
9	Rehabilitation of subsided areas	**ha**		**105 285**	**1.00**	**1.00**	R 0.00
10	General surface rehabilitation, including grassing of all denuded areas	**ha**	80.1	**99 603.98**	**1.00**	**1.00**	R 7 981 266.92
11	River diversions	**ha**		**99 603.98**	**1.00**	**1.00**	R 0.00
12	Fencing	**m**	10 000	**113.62**	**1.00**	**1.00**	R 1 136 200.00
13	Water management (separating clean and dirty water, managing polluted water and managing the impact on ground water, including treatment when required)	**ha**	80.1	**37 872.23**	**1.00**	**1.00**	R 3 033 565.62
14	2 to 3 years of maintenance and aftercare	**ha**	80.1	**13 255.28**	**1.00**	**1.00**	R 1 061 747.93
15	Backfill of Box cut void	m3	1650000	35	**1**	**1.00**	R 57 750 000.00
					Sub Total 1 (At Closure)		**R 77 956 736.72**
					Weighting Factor 2	1.05	R 81 854 573.56
1	Preliminary and General	12% of Sub Total 1 if less than R100 mill 6% of Sub Total 1 if more than R100 mill					R9 822 548
2	Contingency	10 of Sub Total 1					R 8 185 457.36
						Sub Total 2	**R 18 008 006.18**
						Sub Total 3	**R 99 862 579.74**
	VAT @ 14%						R 13 980 761.16
						Grand Total - Sub Total 3	**R 113 843 340**

(f) Confirm that the financial provision will be provided as determined.

The provision is reviewed annually for adequacy and amended to compensate for new activities and/or inflation. During the annual review, confirmation will be provided that this amount can be provided for from operating expenditure.

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

- **Monitoring of Impact Management Actions**
- **Monitoring and reporting frequency**
- **Responsible persons**
- **Time period for implementing impact management actions**
- **Mechanism for monitoring compliance**

g) Monitoring of Impact Management Actions

Elders Colliery will implement an ongoing monitoring programme for its proposed operations as recommended ensuring environmental requirements stipulated in this EMP are complied with. The following impacts and environmental components are being monitored:

- Blasting;
- Surface water;
- Groundwater;
- Terrestrial ecology;
- Air quality; and
- Noise.

h) Monitoring and reporting frequency

The monitoring of impacts and reporting frequency will be different for the various environmental aspects. Table 24 details the environmental aspects to be monitored, the component of the aspect and the frequency of data collection and reporting.

Table 19 to Table 23 lists the proposed monitoring points for the Elders Colliery and are illustrated in Figure 24 to Figure 26.

Table 18: Environmental components to be monitored and frequency of monitoring

Aspect	Component	Data collection frequency	Reporting frequency
Surface water	Water quality	Monthly sampling	Quarterly reporting
Groundwater	Water quality	Quarterly monitoring	Quarterly reporting
	Borehole level	Annually	Annual reporting
Biomonitoring	Biomonitoring in wetlands and tributaries.	Annually	Annual reporting
Air quality	Dust fallout, PM_{10} $PM_{2.5}$	Monthly sampling	Annual reporting
Noise	Decibel readings of machinery and vehicles	Random readings will be taken	Annual reporting
	Updating of baseline noise information	Random readings will be taken	Every two years, or when complaint is received
Blasting	Air blast and vibrations	During each blast	After each blast

Table 19: Proposed surface water quality monitoring points for the Elders Colliery

Monitoring point	Description	Coordinates	
		South	East
ESW01	At the Pan (Vlakkuilen Pan)	26°14' 28.28" S	29°27' 19.73" E
ESW02	At the Pan to the east of the Vlakkuilen River	26°16' 25.31" S	29°28' 59.57" E
ESW03	Along the proposed conveyor	26°13' 51.82" S	29°27' 13.77" E
ESW04	Along the proposed conveyor	26°11' 23.80" S	29°24' 36.60" E
ESW05	Along the proposed conveyor	26°11' 35.32" S	29°24' 42.52" E
ESW06	Along the proposed conveyor	26°12' 8.09" S	29°25' 8.95" E
ESW07	Along the proposed conveyor	26°12' 27.17" S	29°25' 26.33" E
ESW08	Along the proposed conveyor	26°12' 59.46" S	29°26' 9.00" E
ESW09	Along the Olifants River downstream of the workings	26°13' 17.63" S	29°27' 43.11" E
ESW10	Tributary of the Olifants River downstream of the proposed activities	26°15' 10.58" S	29°24' 22.19" E
ESW11	Along Vlakkuilen River upstream of the proposed activities	26°17' 11.64" S	29°27' 45.27" E
ESW12	Along Viskuile River upstream of the proposed activities	26°17' 29.23" S	29°30' 3.96" E
EWS13	Along Viskuile River upstream of the proposed activities	26°16' 40.74" S	29°30' 32.44" E
ESW14	Along a Tributary Viskuile River upstream of the proposed activities	26°16' 15.59" S	29°30' 45.28" E
ESW15	Along Viskuile River upstream of the proposed activities	26°16' 25.31" S	29°28' 59.57" E
ESW16	Along Viskuile River downstream of the proposed activities	26°14' 19.11" S	29°28' 52.72" E
ESW17	Tributary of the Olifants River upstream of the proposed activities	26°14' 17.84" S	29°30' 51.74" E
ESW18	Along the Leeufonteinspruit	26°11' 34.07" S	29°30' 30.67" E
ESW19	Along the Olifants River upstream of the proposed activities	26°13' 27.41" S	29°29' 39.42" E

Table 20: Proposed biomonitoring points for the Elders Colliery

Site No.	Type of waterbody	Description	Coordinates	
			South	East
Wetlands				
E7	Wetland	Upper Vlakkuilen immediately downstream of the R35 road bridge between Bethal and Middelburg.	26°17’07.8”S	29°27’46.9”E
E9	Wetland	Lower Vlakkuilen near confluence with Viskuile	26°15’42.2”S	29°28’45.8”
E8	Wetland	Viskuile, near upper boundary of proposed mine	26°16’08.6”S	29°29’41.2”E
E13	Wetland	Viskuile 1.9 km downstream of Site E8	26°15’11.3”S	29°29’15.3”E
E15	Wetland	Viskuile near confluence with Olifants River	26°14’02.9”S	29°28’56.2”E
Olifants River				
E10	River	Olifants River immediately downstream of the confluence with the Viskuile and Vlakkuilen, and downstream of a small weir	26°13’49.8”S	29°29’03.0”E
E14	River	Olifants River between R35 road bridge and gauging weir B1H018	26°13’21.8”S	29°27’46.7”E
Pans				
D	Pan	Large semi-permanent pan (about 28 ha)	26°14’41.4”S	29°27’22.0”E
F	Pan	Large temporary pan (about 17 ha)	26°16’35.1”S	29°28’59.7”E

Table 21: Proposed air quality points for the Elders Colliery

Monitoring point	Description	Pollutant to be samples	Coordinates	
			South	East
A1	Near crusher	Dustfall	26°14'2.68"S	29°27'45.15"E
A2	South of Middelkraal community and north of the main operations	Dustfall, PM_{10} and $PM_{2.5}$	26°13'36.93"S	29°27'51.57"E
A3	East of the main operations	Dustfall	26°13'54.11"S	29°28'37.85"E
A4	South of the main operations	Dustfall	26°15'6.76"S	29°27'44.84"E
A5	West of the main operations	Dustfall	26°14'14.73"S	29°27'13.71"E
A6	West of the conveyer near Goedehoop boundary	Dustfall	26°11'29.523"S	29°24'33.706"E
A7	Sewage works (west of the conveyor)	Dustfall	26° 6'53.66"S	29°24'34.53"E
A8	Goedehoop (west of the conveyor) (existing point – part of Goedehoop Colliery dust monitoring programme)	Dustfall	26° 6'12.20"S	29°24'32.30"E

Figure 24: Proposed environmental monitoring points for Elders Colliery

Table 22: Proposed groundwater monitoring points for the Elders Colliery – external users

Nr on Map	Site Type	Site Status	Latitude	Longitude
VKN-1	Borehole	In Use	26 15' 58.72"	29 27' 14.43"
VKN-2	Borehole	In Use	26 15' 49.39"	29 27' 21.06"
VKN-6	Borehole	In Use	26 14' 56.33"	29 27' 26.89"
VKN-7	Borehole	In Use	26 14' 35.44"	29 28' 14.12"
VKN-8	Borehole	In Use	26 14' 40.03"	29 28' 24.38"
VKN-9	Borehole	In Use	26 14' 55.81"	29 28' 15.62"
VKN-10	Borehole	In Use	26 15' 22.43"	29 28' 36.01"
VKN-12	Borehole	Not In Use	26 15' 23.69"	29 27' 4.96"
VKN-13	Borehole	Destroyed	26 15' 28.73"	29 27' 20.52"
SVK-1	Borehole	Destroyed	26 16' 40.08"	29 28' 45.59"
SVK-2	Borehole	Not In Use	26 15' 34.58"	29 29' 39.59"
SVK-5	Borehole	In Use	26 16' 29.21"	29 29' 37.97"
SVK-6	Borehole	In Use	26 14' 40.03"	29 28' 24.38"
SVK-7	Borehole	In Use	26 15' 54.21"	29 30' 00.90"
SVK-P1	Dug Well	Not In Use	26 16' 13.66"	29 29' 59.14"
SVK-F2	Fountain	In Use	26 15' 48.82"	29 29' 38.62"
MKL-1	Borehole	Not In Use	26 14' 8.59"	29 28' 30.22"
MKL-8	Borehole	Not In Use	26 14' 11.69"	29 28' 06.17"
MKL-F1	Fountain	Not In Use	26 13' 4.92"	29 29' 21.41"
MKL-F2	Fountain	In Use	26 13' 37.88"	29 27' 50.54"
HGN-2	Borehole	In Use	26 14' 15.35"	29 31' 42.03"
HGN-3	Borehole	In Use	26 14' 15.40"	29 31' 34.36"
HGN-4	Borehole	In Use	26 14' 49.19"	29 29' 59.14"
HGN-5	Borehole	In Use	26 14' 41.74"	29 29' 49.85"
HGN-F1	Fountain	Not In Use	26 14' 14.86"	29 31' 28.17"
HGN-F3	Fountain	In Use	26 13' 49.83"	29 31' 14.81"
GLK-1	Borehole	Destroyed	26 14' 57.29"	29 30' 30.57"
GLK-2	Borehole	In Use	26 15' 04.79"	29 31' 09.45"
GLK-3	Borehole	In Use	26 15' 19.98"	29 31' 22.34"
GLK-4	Borehole	In Use	26 15' 18.15"	29 31' 22.34"
EFN-12	Borehole	Not In Use	26 15' 00.78"	29 26' 49.70"

Table 23: Proposed groundwater monitoring points for the Elders Colliery –boxcut area

Sample Nr	Sample Description	Latitude	Longitude
Elders-1	South East of Overburden Stockpile	26 14' 32.90"	29 28' 07.38"
Elders-2	North East of Overburden stockpile	26 14' 22.32"	29 28' 06.28"
Elders-3	East of Main Pollution Control Dams	26 14' 16.16"	29 28' 24.29"

Sample Nr	Sample Description	Latitude	Longitude
Elders-4	North West of Brine Dams and Gypsum Pad	26 14' 07.04"	29 28' 16.90"
Elders-5	North of Boxcut	26 14' 01.58"	29 28' 13.11"
Elders-6	North West of Crusher PCD	26 13' 55.48"	29 27' 44.59"

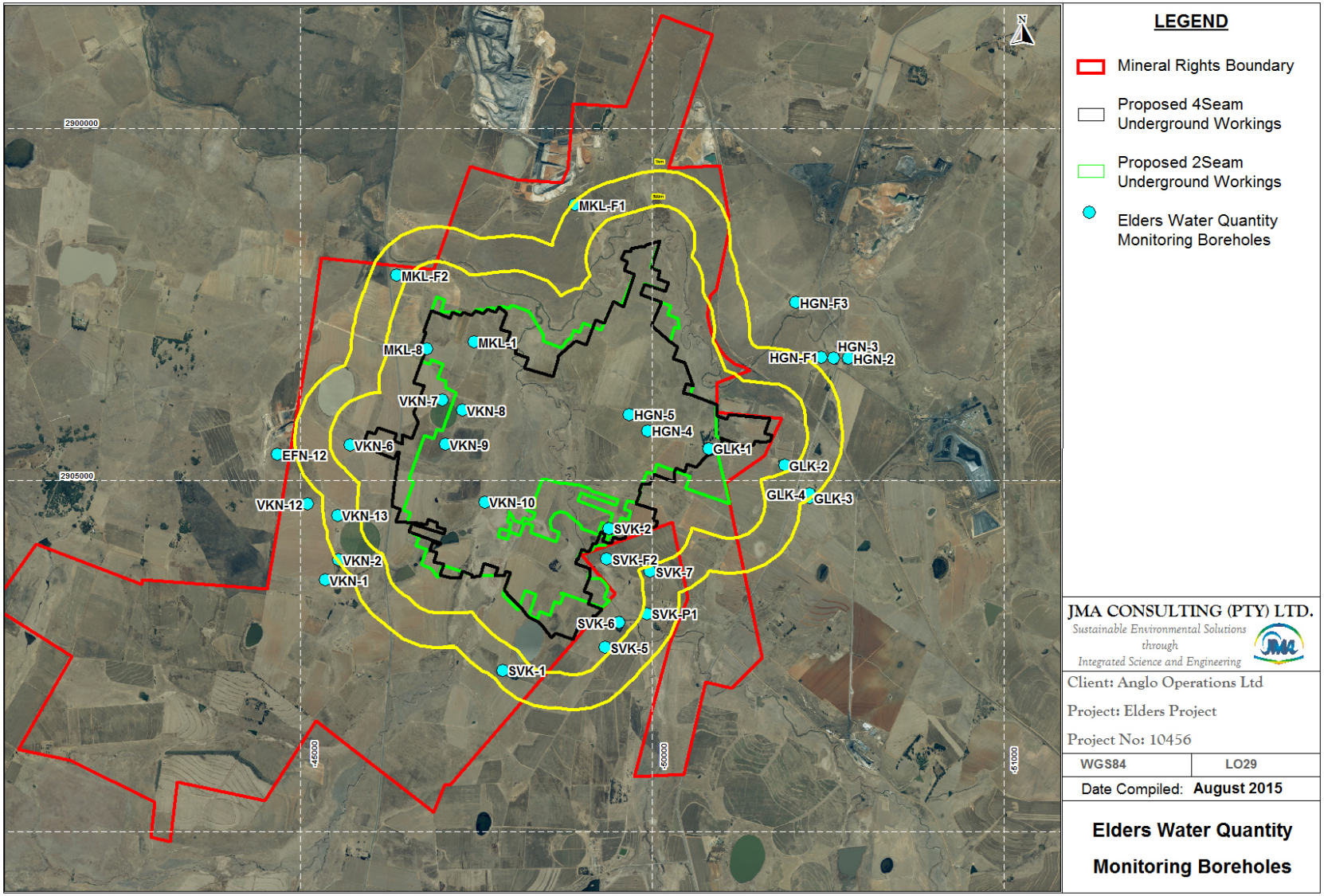


Figure 25: Proposed groundwater monitoring points for Elders Colliery - external users (JMA, 2015)

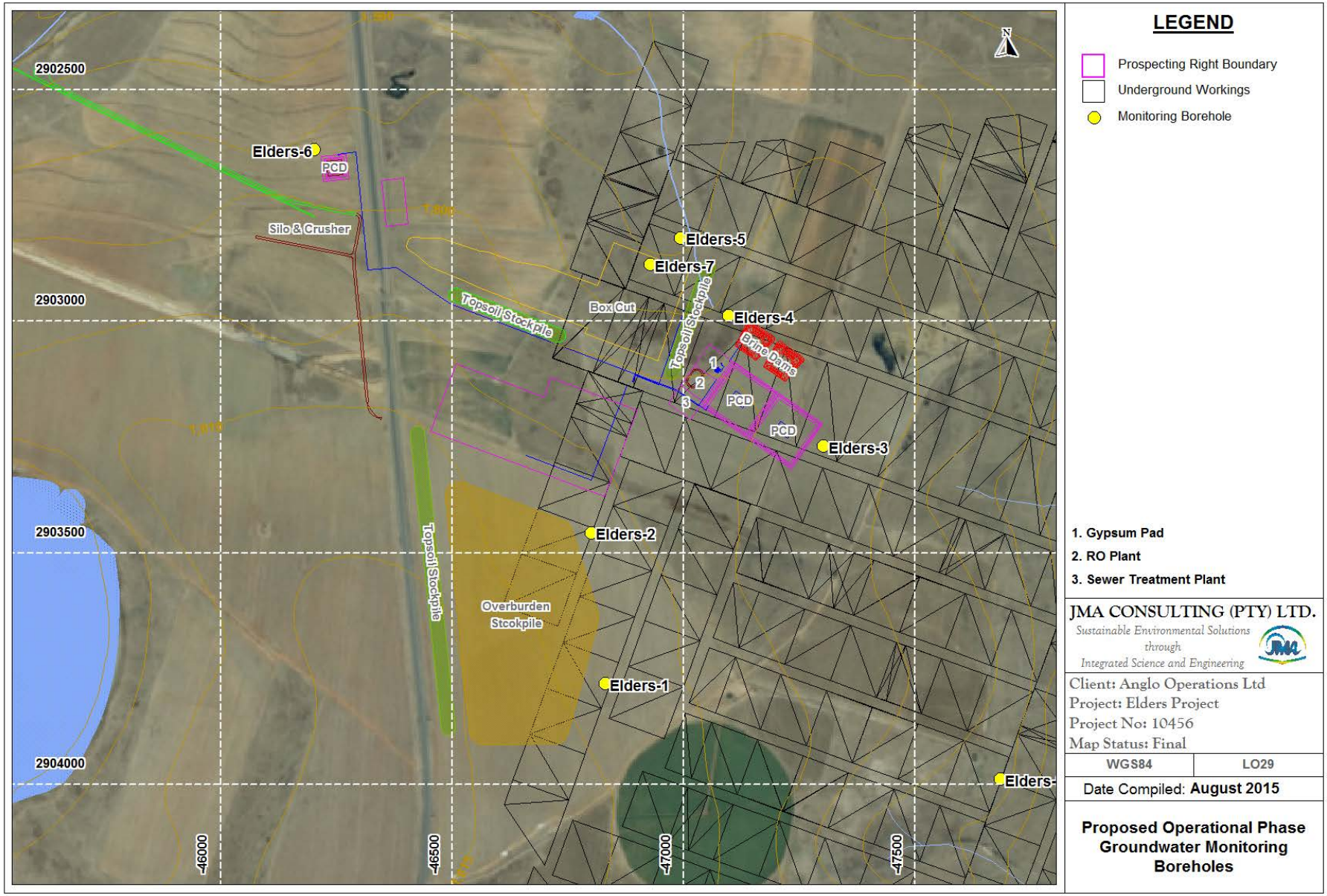


Figure 26: Proposed groundwater monitoring points – external users (JMA, 2015)

i) Responsible persons

An Environmental Coordinator will be responsible for ensuring that all necessary environmental monitoring required for the Elders Colliery is undertaken as per the monitoring programmes.

j) Time period for implementing impact management actions

Impact management actions will be undertaken throughout each phase of the project, which includes construction, operation and closure. The time period for implementation has been included in Table 18 PART B, Section 1 (e) and (f) above.

k) Mechanism for monitoring compliance

The mechanism for monitoring compliance is described in Table 24.

Table 24: Elders Colliery mechanisms for monitoring compliance

SOURCE ACTIVITY	IMPACTS REQUIRING MONITORING PROGRAMMES	FUNCTIONAL REQUIREMENTS FOR MONITORING	ROLES AND RESPONSIBILITIES (FOR THE EXECUTION OF THE MONITORING PROGRAMMES)	MONITORING AND REPORTING FREQUENCY and TIME PERIODS FOR IMPLEMENTING IMPACT MANAGEMENT ACTIONS
Blasting	Ground vibration: Impact on surface infrastructure and human perception	Ground vibration and air blast monitoring using a seismograph	The Environmental Co-ordinator at the Mine will be responsible for sourcing the necessary specialist to undertake the water monitoring.	• During each blast
	Airblast: Impact on surface infrastructure			
Boxcut and associated infrastructure Underground mining of No. 2 and No. 4 seams Conveyor belt and conveying of coal from Elders Colliery to Goedehoop Colliery	Pollution of surface water	A grab surface water sample will be required from watercourses and water management facilities within the Project footprint as per the monitoring network.	The Environmental Co-ordinator at the Mine will be responsible for sourcing the necessary specialist to undertake the water monitoring.	• Surface water (quality and quantity) will be sampled monthly and a monitoring report will be generated on a quarterly basis. • Impacts will be managed immediately should water monitoring detect contamination or a change in water quantity during all phases of the Project.
		The South African Scoring System (Version 5) (SASS5) and Integrated Habitats Assessment System (IHAS) will be implemented.	The Environmental Co-ordinator at the Mine will be responsible for sourcing the necessary specialist to undertake the water monitoring.	• Biomonitoring (and reporting) will be undertaken bi-annually (once during the low flow and once during the high flow season.
	Increase in dust fallout, PM_{10} and $PM_{2.5}$ particles affecting adjacent communities	Gravimetric analysis will be required for all dust buckets	The Environmental Co-ordinator at the Mine will be responsible for sourcing the necessary specialist to undertake the water monitoring.	• Dust fallout, PM10 and PM2.5 will be monitored on a monthly basis. • An annual report will be generated to illustrate the findings. • Air quality impacts will be managed immediately should monitoring detect an increase in nuisance dust. • Management actions will be applicable for all phases of the Project.
	General rise in ambient noise levels	Noise readings undertaken with a hand held monitoring device will be required.	The Ventilation Occupational Hygiene Superintendent at the Mine will be responsible for sourcing the necessary	• Baseline noise levels will be monitored and updated from random readings, and will be

SOURCE ACTIVITY	IMPACTS REQUIRING MONITORING PROGRAMMES	FUNCTIONAL REQUIREMENTS FOR MONITORING	ROLES AND RESPONSIBILITIES (FOR THE EXECUTION OF THE MONITORING PROGRAMMES)	MONITORING AND REPORTING FREQUENCY and TIME PERIODS FOR IMPLEMENTING IMPACT MANAGEMENT ACTIONS
			specialist to undertake the noise monitoring.	reported on every two years, or when a complaint has been received. • Decibel readings of machinery and vehicles will also be undertaken and an annual report will be generated to illustrate the findings.
	Potential dewatering of the overlying aquifers; Contamination of groundwater resources The formation of AMD in groundwater resources	Pump tests from the boreholes will be required and undertaken in accordance with the Elders Colliery borehole network.	The Environmental Co-ordinator at the Mine will be responsible for sourcing the necessary specialist to undertake the water monitoring.	• Groundwater quality and quantity will be monitored on a quarterly basis and reports will be compiled accordingly. • Borehole depth will also be monitored on an annual basis and reported on annually. • Impacts will be managed immediately should groundwater monitoring detect contamination or a change in water quantity or depth in monitoring boreholes during all phases of the Project.

l) Indicate the frequency of the submission of the performance assessment report.

The EMP performance assessment must be undertaken every year, or as required by the Minister, by an external auditor and a report must be compiled and submitted.

Operational internal environmental inspections will need to be done once a month by the mine's Environmental personnel. An internal peer audit is done at least once a year by Anglo American Environmental Services. This involves environmental personnel from other mines coming to audit the mine on the Environmental Management Systems (EMS) and other environmental parameters.

m) Environmental Awareness Plan

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

Environmental conditions are included in any operational contracts, thereby making contractors aware of the potential environmental risks associated with the project and the necessity to prevent accidental spillages by the implementation of good housekeeping practices.

The following principles will apply to the Environmental Awareness Plan (safety, health and environmental (SHE) training):

- All personnel are as a minimum, undergo general SHE induction and awareness training;
- An Environmental Management Systems (EMS) coordinator has been appointed;
- The EMS coordinator will identify the SHE training requirements for all AACSA personnel and contractors. The training requirements are recorded in a training needs matrix indicating particular training that must be undertaken by identified personnel and contractors. The training matrix is administered by the Environmental Co-ordinator;
- Development of Training Programme; and
- General Awareness Training.

Personnel

All employees, current, new and contractors are to undergo induction, a part of which is environmental awareness training. At the end of this training, personnel are required to complete the awareness test and the level of awareness assessed by the Training Department. Re-testing or induction may be required.

All personnel performing tasks which can cause significant or major environmental impacts shall be competent on the basis of training, education and/or experience. This applies to, but is not limited to, supervisor level and above – i.e. operators, artisans.

Type

Awareness training will include the potential consequences of departure from specified operating procedures as well as significant environmental impacts, actual or potential, of their work activities.

Training is appropriate to the activity of individual employees.

Monthly environmental topics are generated to raise awareness of employees on environmental issues.

Evaluation

Evaluation of awareness and competency training are carried out through questionnaires or post-training tests conducted during training sessions and are also done through questioning of employees during audits.

(2) Manner in which risks will be dealt with in order to avoid pollution or the degradation of the environment.

Prior to the commencement of construction, AOL will compile an Emergency Preparedness Response Plan (EPRP) for the proposed Elders Colliery. The EPRP provides guidance on emergency procedures and should be updated for the operational phase following detailed engineering design of the project. The operational EPRP needs to provide comprehensive and site-specific measures and information for successful response to, and management of, emergencies arising from either internal or external factors. The EPRP applies to emergencies within the Elders Colliery project area, and as such encompasses incidents affecting the facilities, infrastructure and operations. It further pertains to transportation of goods, raw material and finished products to and from the Elders Colliery mining area. The scope of the EPRP also extends to natural disasters, as well as to manmade and third party events with potential to impact on health and safety within the mine area. It furthermore covers emergencies arising from all mine phases, namely the construction, operation, closure and post-closure.

The EPRP will be subject to annual review and updating with records being retained of key changes, and those responsible for changes. A protocol for distribution and accessibility of components of the plan will need to be developed should aspects of the plan require confidentiality, such as for security reasons.

A description of the ongoing monitoring and management measures to be implemented, to provide the early warning systems necessary to avoid environmental emergencies.

Sound environmental management is a priority for Elders Colliery. A key component of implementing strong environmental practice will be the development of an environmental management system, which includes the EPRP and Occupational Health and Safety Plan (OHSP). In the event of an environmental emergency, these plans link to each other with actions commencing in terms of the relevant individual business unit emergency preparedness plans and procedures and escalating upwards to the corporate level.

Standard operating procedures (SOPs) should be developed for the following potential risk sources: accidents involving mine vehicles resulting in human injuries, accidental leaks and chemical and/or hydrocarbon spills. These SOPs should be reviewed annually to:

- Determine their effectiveness;
- Injuries or fatalities during all mining phases;
- Fires and/or explosions due to the lack of hydrocarbon management;
- Failure of the overburden facility;
- Subsidence of land; and
- Flooding of the mine.

Training will be an important activity supporting the implementation of a management system in the form of induction training on general environmental management and job specific training such as control and clean-up of hydrocarbon spills. The objective of an environmental training program should be to develop a culture of environmental awareness, accountability, responsibility and prevention. Personnel at all levels should have sufficient

knowledge and authority to proactively identify and prevent a situation that could potentially result in an environmental or safety emergency.

In addition, figures of the site layout with emergency response information for key areas will be made available to all personnel. Furthermore, a generic description of the dangers associated with being exposed to hazardous chemicals or materials will be developed as well as a description on the procedures to be implemented to help control hazardous substance releases.

Emergency response procedures will be developed for:

- Flammable and combustible materials;
- Corrosive materials;
- Oxidizing materials;
- Reactive materials;
- Biological and infectious materials; and
- Gaseous releases.

Environmental and social emergency planning and response requires the involvement of local communities, authorities and other external stakeholders in the EPRP. At present there is likely to be a very limited level of resources and capacity within the local communities and amongst local authorities in the greater project area to deal with emergency response.

n) Specific information required by the Competent Authority

(Among others, Confirm that the financial provision will be reviewed annually).

In terms of Section 41, Regulations 53 and 54 of the Mineral and Petroleum Resources Development Act (Act 28 of 2002), Elders Colliery is required to make financial provision for the interim and final rehabilitation activities on the site. This provision is reviewed annually for adequacy and amended to compensate for new activities and/or inflation. During the annual review, confirmation will be provided that this amount can be provided for from operating expenditure.

Elders Colliery, will provide for the closure liability either through a contribution to a Trust Fund or the purchase of a Bank Guarantee or a combination of the two methods as allowed by Regulation 527 of the MPRDA.

2) UNDERTAKING

The EAP herewith confirms

a) the correctness of the information provided in the reports ☒

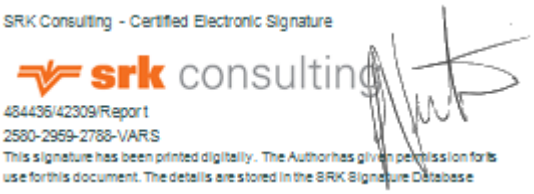
b) the inclusion of comments and inputs from stakeholders and I&APs ; ☒

c) the inclusion of inputs and recommendations from the specialist reports where relevant; ☒and

d) the acceptability of the project in relation to the finding of the assessment and level of mitigation proposed; ☒

-END-

Prepared by



Suzanne van Rooy *Pr.Sci.Nat*

Senior Environmental Scientist

Beth Candy *Pr.Sci.Nat*

Principal Environmental Scientist

Reviewed by

Briony Liber *CEAPSA*

Partner

All data used as source material plus the text, tables, figures, and attachments of this document have been reviewed and prepared in accordance with generally accepted professional engineering and environmental practices.

UNDERTAKING

I _____ the undersigned and duly authorised by Anglo Operations (Pty) Ltd hereby undertake to give effect to every undertaking contained in Part A and B of this document, and accept full responsibility therefor.

Signed at _____ on this _____ day of _____.

_____

Witnesses:

1. _____ 2. _____

_____ _____

Signature Signature

Approved

Approved in terms of the provisions of the Minerals and Petroleum Resources Development Act (Act No. 28 of 2002) (MPRDA).

Signed at _____ on this _____ day of _____.

_____

Director

Region: _____

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Appendices

Appendix 1: Qualification of the EAP

Appendix 2: EAP Curriculum Vitae

Appendix 3: Locality Map

Appendix 4: Site layout plan

Appendix 5: Detailed layout of the Elders Colliery boxcut area

Appendix 6: Stakeholder Engagement Documentation

Appendix 6-1: List of Interested and Affected Parties

Appendix 6-2: Background information letter

Appendix 6-3: Delivery of pre-application documentation to communities

Appendix 6-4: Pre-application focus group meetings

Appendix 6-5: Announcement letters

Appendix 6-6: Site Notices

Appendix 6-7: Advertisements – Project announcement

Appendix 6-8: Advertisements – Availability of EIA/EMP

Appendix 6-9: Letters – Availability of the EIA/EMP

Appendix 6-10: EIA/EMP Feedback Meetings

Appendix 6-11: Comments from Stakeholders

Appendix 7: Specialist Reports

Appendix 7-1: Soils, Land Use and Land Capability

Appendix 7-2: Biodiversity

Appendix 7- 3: Surface Water

Appendix 7-4: Groundwater

Appendix 7-5: Air Quality

Appendix 7-6: Noise

Appendix 7-7: Heritage

Appendix 7-8: Blasting

Appendix 7-9: Socio-Economic

Appendix 7-10: Closure and Rehabilitation Plan

Appendix 7-11: Wetlands

Appendix 8: Elders Colliery site map including environmental and social sensitivities

Appendix 9: Elders Colliery water quality closure cost

(using a passive treatment scenario)

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