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Proposed Alleen 2 Opencast Extension, Magdalena Colliery in Dannhauser, KwaZulu-Natal

Final Basic Assessment Report

Version – Final Amended

08 September 2014

1st Version submitted 6 May 2014

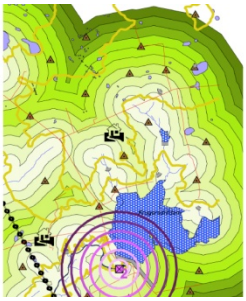
Zinoju Coal (Pty) Ltd

DEDTEA Reference Number:

DC25/0018/2013:KZN/EIA/0001359/2013

GCS Project Number: 13-727

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DOCUMENT ISSUE STATUS

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Director	Pieter Labuschagne	 PP	16 April 2014 22 August 2014

LEGAL NOTICE

PURPOSE OF THIS REPORT

Zinoju Coal (Pty) Ltd proposes the extension of open cast mining at the Magdalena Colliery, near Dundee, KwaZulu-Natal onto 18 portions of the Farm Alleen 2 No. 4280 by 55 hectares. This report constitutes an amended version of the Final Basic Assessment Report (BAR) submitted to the KwaZulu-Natal Department of Economic Development, Tourism and Environmental Affairs (DEDTEA) for the aforementioned project.

The proposed development triggers activities listed in the National Environmental Management Act (NEMA) (Act No.107 of 1998) Environmental Impact Assessment (EIA) Regulations requiring that an application for environmental authorisation be submitted to the DEDTEA. The application process includes an Environmental Basic Assessment (BA) which is compiled following a comprehensive site assessment and completion of any required specialist studies. GCS (Pty) Ltd has been appointed as the independent Environmental Assessment Practitioner (EAP) to conduct the BA for the Alleen 2 Open Cast Extension.

Final comments on the Final BAR were received from the Department of Water Affairs (DWA), Ezemvelo KZN Wildlife (EKZNW) and the Amajuba District Municipality, following which a site visit was held with representatives of DWA and DEDTEA on 9 July 2014.

The DEDTEA issued a letter on 14 July 2014 rejecting the Final BAR and requesting additional information. All correspondence and comments received following submission of the Final BAR have been included in Appendix E8 of this report.

The objective of this amended report is therefore to provide the competent authority with all additional requested information about the proposed activity, as well as an assessment of the potential impacts in order for an informed decision to be made as to whether the activity should be authorised and, if so, under what conditions. A summary of comments raised in the aforementioned correspondence, as well as during the site meeting, is given below:

Summary of Authority Comments, Information Requests and Actions required:

Table 1: Department of Economic Development, Tourism and Environmental Affairs (DEDTEA) Comments – 14 July 2014

COMMENTS	ACTION	Ref.
The comments/objection from the Department of Water Affairs dated 10 June 2014 needs to be addressed.	Comments from DWA have been addressed and/or actioned in the Revised Final BAR.	Please refer to the table below for specific references.
The rationale for following a Basic Assessment process is not clear. The vacant, undeveloped or derelict area to be disturbed is to be calculated and indicated in the report. The activity related to the transformation of land is not included in the report.	Section B3 (Activity Description) of Final BAR clarified.	Please refer to Table 1 of Section B3 within the Final BAR for an explanation of how the size of vacant land was determined.
A rehabilitation plan is not included in the report	A Rehabilitation Plan extracted from the approved Environmental Management Programme Report (EMPR) for Magdalena Colliery has been included in the Environmental Management Plan compiled for the Alleen 2 application.	Please refer to Section 7 of the EMP for a Rehabilitation Plan, included as Appendix F of the Final BAR.
The impact to livestock during blasting and mitigation measures needs to be assessed and included in the report.	Section of FBAR updated with impacts to livestock and mitigation measures.	Please refer to Section E3 (Impact Significance Tables) – Construction and Operational Phase – for updated mitigation measures.
A layout map indicating existing and proposed expansion with superimposed buffers should be included.	An updated Mine Work Programme has been produced indicating the existing open cast area and proposed expansion, including buffers from watercourses within the expansion area.	Please refer to Appendix C2 of the Final BAR for an amended Mine Work Programme.
A relocation plan for the affected houses is not included in the report	Details regarding the proposed relocation have been included in the Final BAR.	Please refer to Section B2 of the Final BAR.

Table 2: Department of Water Affairs (DWA) – 10 June 2014

COMMENTS	SITE VISIT	ACTION	Ref.
1. Page v of the executive summary makes mention of an application for the extension of a discard dump on site which is said to be underway. This office would be pleased to get a copy of that application for review and comments.	DWA need to understand what happens to waste generated on site. The report notes that an application for extension of the discard dump is underway. a) Mr Russell Stow (RS – GCS) noted that the application for the discard dump is underway, a Scoping Report has already been submitted to DWA. Noted that GCS will check who this report was submitted to and give another copy if	GCS - re-submit a copy of the Discard Dump Extension Scoping Report to DWA.	Not applicable – Scoping Report to be submitted separately.

COMMENTS	SITE VISIT	ACTION	Ref.
	necessary. b) Ms Zethu Makwabasa (ZM - DWA) noted that this probably went to Lindiwe. Agreed that DWA will need another copy to comment. The IWULA is also required, need as much information as possible, e.g. the size of the dump. c) RS – The approach was to include the dump and open cast extension into one IWULA amendment. d) Mr Fanie Muller (FM – Zinoju) noted the urgent timeframes for this project as the current open cast is almost exhausted and the mine might need to retrench staff if the extension is not granted.		
	Lwandle Sibango (LS – DWA) noted that DWA will need the calculation of undeveloped versus developed land, as this was not clear in the report. a) Poovi Moodley (PM – DAEA) agreed that they would require this information to clarify if the project is subject to a Basic Assessment or Scoping and EIA. b) Ms Kelly Taylor (KT – GCS) to send an addendum noting the size of the vacant land to DAEA and DWA.	GCS - Clarification of the calculation of undeveloped versus developed land. GCS – write up explanation of calculation and confirmation of EIA triggers and required process.	Please refer to Table 1 of Section B3 within the Final BAR for an explanation of how the size of vacant land was determined.
2. Page ix of the Executive summary and the Desktop Ecological Assessment conducted by GCS (2013) which is included as Appendix D concluded that:- 2.1 Nine degraded and incised first-order watercourses occur within the proposed mining footprint; Despite the report indicating that these are first-order watercourses it should be noted that this office has a mandate to protect all watercourses as stated in Chapter 1 of the	ZM – Regarding the Ecological Assessment and watercourses identified, what are the strategies to mitigate this damage? Also note that an IWULA is required. The report must make clear that no fish are present in these watercourses, etc. as per comments sent by DWA. Regarding the headwaters, the IWULA Amendment will be required for a description of the headwaters. a) RS – Agreed, this will be done. RS explained the proposed diversion of channels to keep flow through main watercourses, and that Zinoju has excluded the first channel and last channel (before the school) from the extended mining	GCS to prepare and submit an IWULA Amendment which would include: a) Strategies to mitigate damage to water courses[1]. (EMP/SWMP) b) Clarification on presence of fish. c) Description of the headwaters. d) More detailed description in the EMP on the diversion of water around the working mine area. e) Detailed description of mining approach for the extension. f) Anticipated programme for the	IWULA to be submitted as a separate process. a) Refer to EMP and Section E3 of the Final BAR for measures to mitigate damage to watercourses. b) Refer to Section E2.2b (Biological Environment) and Appendix D1. c) Refer to Section E2.2b (Biological Environment). d) Please refer to Section 6.10 of the EMP (Appendix F of

[1] 2008 EMPR section, EIA EMP, RSIP, IWWMP

COMMENTS	SITE VISIT	ACTION	Ref.
National Water Act, Act 36 of 1998, irrespective of their order and/or size. It should further be noted that first-order stream flow into and feed larger streams, are commonly headwater streams and constitute waterways in the upper reaches of the watershed. Therefore the protection of this level of watercourses is vital for the existence of larger ones. 2.2 The study area occurs within a sub-quaternary catchment classified as a Fish Support Area by National Freshwater Ecosystems Priority Area (NFEPA. Furthermore, Page 13 of the Desktop Ecological Assessment report confirms that the sub-catchment within which the site falls is a Fish Support Area (FSA). Despite the fact that the report indicates that the area is not a fish sanctuary, this office regards FSA as important for the migration of threatened or near-Threatened fish species. In this regard, this office would like to know what strategies will be in place to mitigate the impacts to this important migratory corridor.	operations. Exploration drilling found burnt coal in this area which was unfeasible to mine. b) RS noted that GCS will need to send an updated layout map from Zinoju showing this, and indicating the planned diversions. c) ZM suggested that Zinoju submit an IWULA Amendment now and allow DWA to review information available until such time as the ROD is received from DAEA. ZM noted that the headwaters will be the greatest challenge and will need a (c) and (i) application.	life of the mine. g) Provision of an updated layout showing newly revised mining area, mining blocks and diversion areas.	the Rehabilitation Plan). e) Please refer to Section B2 and Appendix G of the Final BAR for a detailed description of the mining approach. f) Please refer to Appendix G for a Mining Work Programme. g) Please refer to Appendix C2 of the Final BAR for an updated layout plan.
3 Page xv of the Executive summary states that "An Integrated Water Use Licence Application (IWULA) must be submitted to the Department of Water Affairs (DWA) for in terms of watercourse and wetland crossings (Section 21 c and i). The IWULA Amendment requirements will be incorporated into the IWULA amendment application currently in progress for the extension of the discard dump." 3.1 This office notes that statement with appreciation, in particular, the subsequent statement that the relevant approvals must be		Noted - GCS to prepare and submit an IWULA Amendment.	IWULA to be submitted as a separate process.

COMMENTS	SITE VISIT	ACTION	Ref.
in place prior to the commencement of any site clearing or construction activities. 3.2 Similarly to point 1 this office would be pleased to get a copy of this (IWULA) application for review.			
	PM requested details of water supply for the community, the end use of land, and plans for rehabilitation. a) FM and RS noted that there is a pipeline in place which supplies water to the community, and end use is grazing (as the land is unstable), with potential options for forestry / crops. Rehabilitation is undertaken as mining progresses. b) ZM – noted that the mine needs to inform DWA when rehabilitation is planned. c) LS requested that Zinoju investigate options to preserve the other watercourses on site as well, and not just two. RS responded that this is difficult as mining activities are always likely to cross watercourses, and need to look at this in context of the condition of the watercourses, as well as the planned diversions and rehabilitation. d) ZM asked how long it takes to mine a portion of land, and if the mine can separate sections out into 'mining blocks' for ease of assessment and rehabilitation. FM noted that layout plans do separate areas out into mining blocks and the mine can provide this to DWA. ZM asked if timeframes can also be provided with the plan. e) PM noted that houses still need to be relocated, and asked how these houses are profiled, and how monitoring is done for damage to houses. Shaun Lake (SL – Zinoju) noted that the mine undertake monitoring of houses for cracking, etc. and compensate where required.	Addendum to the Basic Assessment Report to confirm and emphasise: a) Details of water supply for the community. b) The end land use. c) Plans for rehabilitation[2]. d) Mining blocks. e) Mining programme time frames f) Description / reference to housing relocation plan.	a) Please refer to Section E2.2b (Community Housing). b) Please refer to Section B2 and E 2.4b (Increase in Land Capability) for a description of the end land use. c) Please refer to Section 7 of the EMP for a Rehabilitation Plan, included as Appendix F of the Final BAR. d) Please refer to Appendix C2 of the Final BAR. e) Please refer to Appendix G for the Mining Work Programme. f) Please refer to Section E2.2b (Community Housing).

[2] RSIP (2013) and IWWMP (2013)– requirement of IWULA

COMMENTS	SITE VISIT	ACTION	Ref.
4. Page 52 of the BAR lists 'water abstraction' as one of the activities likely to have an impact on the lives of the communities. This office would like to know the meaning of the term abstraction as well as the water resource to be used for this purpose. In the event that water abstraction will occur then this should be included in the IWULA.		Explanation of the term abstraction and the associated water uses.	Please refer to Section B 14 of the Final BAR (Water Use).
5. Page 53: Groundwater Contamination and flow reduction states that pit dewatering will continue during the operational phase which will create a cone of depression ... This office regards dewatering of a pit as a water use in terms of Section 210) of the National Water Act, Act 36 of 1998 and thus hopes that it is included as such in the IWULA mentioned above.	ZM and LS noted that the IWULA Amendment will need to include Section 21 (j) – pit dewatering.	Noted and to be included in IWULA Amendment.	Please refer to Section B 14 of the Final BAR (Water Use).
6. Page 54 of the FBAR indicates that "it is evident that the proposed open cast extension will reduce peak flows and volumes in the catchment. Page 82 of the FBAR : Section F : Recommendations of EAP recommends that "the Water Balance be updated and that the measures recommended in the signed Stormwater Management Plan (SWMP) be adhered to and that detailed SWMP designs are signed off by a registered engineer". This office appreciates such a move but would like to know as to when this recommendation will be implemented.	ZM and LS noted that the water balance must be updated and SWMP recommendations must be adhered to.	Noted: The updated water balance and signed off SWMP designs will be included in the IWULA Amendment.	N/A
7. Page 12 of the Desktop Ecological Assessment report states that there are two wetlands located closer to the site, but are not actually located along the Poonaspruit and	ZM - Watercourses and wetlands to be delineated to show the distance from wetlands to the open cast extension and how big the buffer zone is. Addendum must clarify issue about wetlands on site as per	Noted. A wetland assessment has been completed as part of the BA process. An additional map will	Refer to Section E2.2b (Biological Environment) and Appendix D1.

COMMENTS	SITE VISIT	ACTION	Ref.
Bloubanspruit whereas page 11 of the same report states that "no wetland areas appear to be present on or immediately downstream and/or adjacent to the project site". The presence of wetlands is also confirmed in Page 33 of this report which states that "there are also important wetlands (EGSAs) to the east of the site associated with the floodplain wetland located at the confluence of the Bloubanspruit and the Buffels River". This office would like to: 7.1 get clarity with regards to this contradiction. 7.2 be supplied with the exact distance between the proposed development and delineated boundaries (edges) of these wetlands.	requirements in DWA comment.	be provided showing the distance from the wetlands to the proposed site.	
8. Page 39 of the Desktop Ecological Assessment report: Recommended Mitigation Measures recommends that "the most northern watercourse within the property and mining footprint should be excluded from the mining footprint and afforded a 30m buffer." This section further recommends that "whenever possible, mining should be excluded from the watercourse and a small buffer through the breaking up of the open cast extension into segments separated by the watercourses". 8.1 This office would like to know the rationale for using 30m as a buffer for the watercourse(s) 8.2 This office would also like to know the meaning of the "small buffer" as indicated in the report 8.3 This office would further appreciate a representation (in a map) of the proposed	ZM – The Addendum must explain the rationale for the 30 m buffer from watercourses, and give a map showing all watercourses and buffer areas needed, if no buffer zone of 100m, then an IWULA is needed.	Note. IWULA and Final BAR Amendment to include: a) Explanation of rationale for 30m buffer zone. b) Define a small buffer zone from applicable watercourses. c) Explanation to note revision of mining plan to exclude the northern and southern-most drainage lines from mining operations.	Please refer to Section B4 of the Final BAR (Alternatives Assessment). It is noted that a 100m buffer has now been applied to the northern-most watercourse. IWULA Amendment to include full details required from comments.

COMMENTS	SITE VISIT	ACTION	Ref.
development area, with all watercourses on site as well as an overlay of the proposed buffer areas. 8.4 The applicant is reminded that in terms of the National Water Act, Act 36 of 1998, a distance of 100m from a water course or a 1: 100 flood line (whichever is greatest) is regarded as a regulated area and that no activities should occur within that area.			
9 (i) A majority of figures such as Figure 7 : Desktop vegetation communities; Figure 6 -1 : Magdalena Catchments; Figure 9-3 : Conceptual stormwater management indicate that the proposed development will bisect drainage lines and/or streams occurring within this sub-catchment which also serve as head waters of the Poonaspruit and Bloubankspruit . (ii) Page 27 of the Hydrological Assessment also states that " the mining activity and the catchments of streams are likely to be impacted by proposed mining, it is immediately apparent that a large number of watercourses cross the proposed opencast mining area... the entire site must be considered to fall within protected riparian zones. (iii) Page 24 of the Hydrological Assessment states that "... the most significant challenge in terms of Storm Water Management Planning will be to contain runoff from areas upstream of the proposed works and divert this clean water past the proposed mining activities. Page 27 of the Hydrological Assessment also states that in some instance it may be possible to design and construct cut-off drains and divert the 1:50 year flood expected from the catchments past the opencast areas.	ZM noted that altering of river characteristics is a fatal flaw, and the major issue from DWA is the watercourses and effect of headwaters on downstream. IWULA Amendment required with detailed documents.	Note. a) Zinoju / GCS to motivate need to cross catchment headwaters in IWULA Amendment.	Not applicable – IWULA to be submitted as a separate process.

COMMENTS	SITE VISIT	ACTION	Ref.
The northern drain will need to divert flows of up to 24m/s and will most likely need a grassed waterway that is 25m wide. An additional complication is that the local soils appear to be highly dispersive and prone to erosion. From the above statements it appears that the proposed mining activities will significantly alter the water resources' characteristics as this operation will involve bisecting and diversion of the affected watercourses. This office regards 'bisecting and diversion of watercourse(s) as a fatal flaw and therefore does not support any development involving diversion, re-routing or bisecting watercourses.			
	ZM and PM requested that an Addendum be submitted as soon as possible, including the following: a) Clarify method of mining. b) Maps and plans as discussed above. c) Clarification of watercourse / wetland impacts. d) Clarify method of rehabilitation. e) Confirm if EMP needs an Addendum / amendment. f) Include safety register audits. g) Also include any responses need to KZN Wildlife comments.	Noted. GCS to prepare the IWULA and Final BAR Amendment inclusive of the stated required documents.	a) Please refer to Section B2 and Appendix G of the Final BAR for a detailed description of the mining approach. b) Please see the above mentioned references. c) Refer to Section E2.2 – 2.4 (Biological Environment) and Appendix D1. d) Please refer to Section B2 of the Final BAR and Section 7 of the EMP. e) The EMP included in Appendix F of the Final BAR has been amended. An EMPR Amendment has already been submitted to the DMR for the proposed project. f) Regular Safety audits will be undertaken and details

COMMENTS	SITE VISIT	ACTION	Ref.
			thereof will be included in the IWULA Amendment. g) Responses to KZN Wildlife comments are included in the table below.

Table 3: Amajuba District Municipality Comments – 04 June 2014

ISSUE/COMMENT RAISED	COMMENTATOR/S	RESPONSE
1) There is a potential for dust generation from open cast mining activities on site as well as emissions from transport and mining vehicles. In terms of the Draft National Dust Control Regulations 2012, the dust fall rate at the boundary or beyond the boundary of the premises where dust originates should not exceed 600mg.m2/day measured using ASTM D1739 for residential areas and should be less than 1200mg/m2/day averaging over 30 days for non-residential and light commercial areas. It is therefore required that a detailed dust monitoring plan be prepared and submitted to this office. 2) Any form of waste material including rubble resulting from demolishing of buildings and other solid infrastructure generated during construction must be disposed of at a facility registered in terms of section 20(b) of the National Environmental Management: Waste Act (Act No. 59 of 2008), if it cannot be responsibly re-used on site or offsite. No waste material may be buried or burned on site. 3) On the proposed expansion there are five heritage sites situated more than 70m from the proposed mining band, these sites include two later Iron Age sites and three grave sites. However, a buffer of 15m must be maintained around the grave sites and 50m around the Iron Age sites as stipulated in section 2 of the National Heritage Resources Act, 1999. 4) There must be no impact on the quality of both surface and groundwater in the area. If pollution of any surface or groundwater occurs, it must be immediately reported to the Department of Water Affairs and the appropriate mitigation measures must be implemented. 5) Blasting at the open cast section must bear in mind breeding and nesting sites in close proximity of the area. Animal life must be left unharmed and must not be disturbed by mining activities or any other	Ms Nkaheleng Motaung (Amajuba District Municipality)	The following responses are made with respect to each stated comment: 1) Dust monitoring will be undertaken as per the existing EMPR for Magdalena Colliery. It is recommended that should the Alleen 2 opencast extension receive Environmental Authorisation (EA), that the submission of a dust monitoring plan to the Amajuba District Municipality be included as a condition of the EA. This has been included in the Amended EMP included as Appendix F of the BAR. 2) – 5) The comments are noted and have been included in the Amended EMP included as Appendix F of the BAR.

ISSUE/COMMENT RAISED	COMMENTATOR/S	RESPONSE
associated activities.		

Table 4: Ezemvelo KZN Wildlife (EKZNW) Comments - 11 April 2014

ISSUE/COMMENT RAISED	COMMENTATOR/S	RESPONSE
The abovementioned application has been reviewed by the Ezemvelo KZN Wildlife (Ezemvelo) IEM Planning Staff. Based on the information supplied and the interrogation of our databases, provided that the recorded outlined below are adhered to any potential negative impacts upon local biodiversity. Should a license for the proposed application be granted, it is recommended that the following be included into the conditions of the permit: 1) No access is allowed to ecologically sensitive areas, including inter alia: a) The 1:100 year flood line including a further ecological buffer zone of 20m; b) Wetlands, springs and pans, and their 200m ecological buffer (the outer edge of the hydromorphic zone must be delineated by a suitably qualified specialist); c) Streams, rivers and dams, and their 100m ecological buffer (the outer edge of the hydromorphic zone must be delineated by a suitably qualified specialist); d) Rocky outcrops and ridges; e) Sensitive areas identified by Ezemvelo, or any other suitably qualified specialist; and f) Known breeding, roosting and foraging sites of species of conservation significance and their required buffer zones (as identified by a suitably qualified specialist). 2) Existing access routes should be used as far as possible. New access routes should avoid all sensitive areas and their ecological buffers (see	Mr Musawenkozi Mkhize (EKZNW)	*Email (15 April 2014) - Kelly Taylor (GCS (Pty) Ltd):* Many thanks for submitting your comment on the Alleen 2 Open Cast Extension. Your comments have been included in the Final BAR due to be submitted to the DAEA shortly. In reference to Point 1 of the comment submitted, please note that Zinoju Coal are applying for the mining footprint to extend through a number of ephemeral streams, and that the preferred site cannot feasibly exclude these. Therefore the recommendation to exclude from the 1:100 year floodline and streams / rivers would not be applicable should Authorisation be granted for Zinoju to mine within the watercourses. However, an Ecological Assessment has been undertaken for the project which investigated impacts to watercourses in great detail. This Assessment is available in Appendix D of the Draft Basic Assessment Report, and the updated Assessment will be included in the Final Report. You will be notified of the availability of the Final Report for comment shortly. Further to the response submitted, the following comments are made with respect to each stated condition: 1a) Nine degraded and incised first-order watercourses occur within the proposed mining footprint none of which were recognised as ecologically sensitive. While these ephemeral streams are dry for much of the year, it is recognised that they still perform valuable functions. However, application of 1:100 year floodlines with additional 20m ecological buffer zones would exclude much of the proposed mining area and render the project

ISSUE/COMMENT RAISED	COMMENTATOR/S	RESPONSE
point 1 above); 3) A Stormwater Management Plan (SMP) is produced for this development to ensure that post-development stormwater runoff approximates pre-development conditions in terms of water quality, intensity of release and spatial distribution of release points; and 4) Permits for the removal of protected plant species must be obtained from Ezemvelo's Permits Office. Should any biodiversity issues arise or should you require any clarity on the points raised above, please do not hesitate to contact our offices.		unfeasible. b) No wetlands or their 100m buffer zones occur within the proposed mining zone. c) Continuing from 1a) above, application of a further 100m ecological buffer zone to each of the streams would render the project unfeasible and unpractical to mine small portions between buffer zones. d) No Rocky outcrops and ridges are present within the mining zone. e) Apart from the watercourses, no sensitive areas were identified. f) No known breeding, roosting and foraging sites of species of conservation significance were identified. 2) Existing access routes will be used as far as possible. New access routes will avoid all sensitive areas and their ecological buffers where possible; 3) A Stormwater Management Plan (SWMP) for mining operations at Magdalena does exist to ensure the principles of the Water Act are considered in the mine's activities pre-, during and post-mining with the separation of clean and dirty water as one of the primary objectives. The updated SWMP including the proposed open cast extension will be included in the pending IWULA Amendment. 3) Permits for the removal of protected plant species will be obtained from Ezemvelo's Permits Office as required.

YOUR COMMENT ON THE FINAL AMENDED BASIC ASSESSMENT REPORT

This Final Basic Assessment Report will be made available to all registered I&APs for public review and comment within 3 days of submission of the Final Amended BAR to the DEDTEA. I&AP's will be notified of the availability and will be sent an electronic copy on request. Copies will also be available for download from the GCS website: www.gcs-sa.biz.

Any comments on the Final Amended Basic Assessment Report must be submitted in writing, by fax, post or email (including any additional supporting material) within 30 days of notification directly to the DEDTEA Assessing Officer (details below), with GCS in copy:

Assessing Officer
Mr Poovi Moodley
District Manager
Department of Economic Development, Tourism and Environmental Affairs (DEDTEA)
Tel: 034 315 3936
Fax: 034 315 2472
Email: poovey.moodley@kzndae.gov.za
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EXECUTIVE SUMMARY

Introduction

Zinoju Coal (Pty) Ltd proposes the extension of open cast mining area at the Magdalena Colliery by 55 hectares, located approximately 25km north-northwest of the town of Dundee, GPS Co-ordinates: 27° 56' 55.64"S; 30° 10' 39.28"E, KwaZulu-Natal.

Magdalena Colliery is an existing coal mine with an approved Environmental Management Programme (EMPR) in accordance with the Minerals Petroleum Resource Development Act (Act 28 of 2002) (MPRDA). However, it is now the intention of Zinoju Coal (Pty) Ltd to extend the site's open cast mining area in order to accommodate the operational life of the company's mining operations at the Magdalena Colliery. An application for extension of the discard dump on site is currently underway (EIA Ref. No.: DC25/0018/2012). An application to amend the approved EMPR to include the open cast extension has been submitted to the Department of Mineral Resources (DMR).

In terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA), the proposed extension of open cast mining at Alleen 2 is listed as an activity that may be detrimental to the environment and thus, requires authorisation from the KwaZulu-Natal Department of Economic Development, Tourism and Environmental Affairs (DEDTEA) before it can proceed. Zinoju Coal (Pty) Ltd has appointed GCS as the Environmental Assessment Practitioner (EAP) to undertake the Environmental Impact Assessment (EIA) process for the project.

This Final Basic Assessment Report (BAR) for the proposed project has been prepared in accordance with the EIA Regulations published in Government Notice No. R543 of 2010. These Regulations were published by the National Department of Environmental Affairs under Section 24(5) read with Section 24M and 44 of the National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA) (as amended 2008) to control activities which may have a detrimental effect on the environment.

Public Participation Process

The public participation for this project has been undertaken in accordance with Regulation 54 of the EIA Regulations (GNR 543) and associated guidelines. As part of the prescribed process, the following tasks were undertaken:

- Identification and registration of stakeholders and interested and affected parties (I&APs) on a database.
- Notification of Key Stakeholders through letters, email and telephonic discussions.

- An invitation for the registration and participation of I&APs, was placed in the Newcastle Advertiser and Northern KwaZulu-Natal newspapers.
- Notice boards detailing information about the project and the BA Process, as well as invitation to register as I&APs, were strategically fixed at various points around the development site.
- A Background Information Document (BID) was compiled in English and Zulu and distributed to surrounding landowners. The BID contains information on the proposed project, the proponent, consultants, the BA process and associated PPP to be followed.
- The Draft BAR was made available for public review and comment from 17 January to 25 February 2014.
- A public meeting was held on 21 February 2014 in order to provide I&APs with a further opportunity to raise concerns and submit comments.
- All I&AP and Stakeholder comments and issues were recorded and all written comments received have been documented in the Comments and Response Report (CRR) which was included in the Final BA Report.
- The Final BAR was submitted to DEDTEA and made available to I&APs for a further 21 day comment period. All I&AP and Stakeholder comments submitted in response to the review of the Final BAR were submitted directly to the DEDTEA for consideration in the application.
- This amended report has been produced in order to address additional comments that were submitted by the Department of Water Affairs, Amajuba District Municipality and Ezemvelo KZN Wildlife (EKZNW).

Project Description

It is the intention of Zinoju to extend the site's open cast mining area in order to accommodate the operational life of the company's mining operations at the Magdalena Colliery. The existing open cast mining area is planned to be extended by a total of 79 ha. The open cast strip extension will be approximately 55 ha in extent, with 24ha for the open cast access area. The properties incorporated in the open cast extension include 18 portions of Alleen 2 No. 4280. The land is currently used by the local community for informal housing and grazing, and a number of ephemeral (seasonally wet) watercourses are present on site.

As the mine is currently operational, there is no intention to construct additional infrastructure to accommodate the open cast extension. All mineral processing will be undertaken in line with existing operations.

Alternatives

- Alternative S1: Preferred Site Alternative

The proposed site for the open cast extension at Alleen 2 is previously disturbed, and consists of rural settlements (Anville). Large portions of the land have evidence of misuse in terms of large erosion gullies and overgrazing while some subsistence farming (maize) and grazing also occurs on site. Several local access roads are present throughout the site.

The site selection process has been undertaken by Zinoju in consultation with landowners, and as part of various internal investigations. The locality of coal reserves predetermines site selection for this activity, as well as proximity to existing operations. For this reason, no other site alternatives have been considered in this report.

- Alternative A1: Preferred Process / Technology Alternative

The proposed method of open cast mining will be the sequential rollover method with rehabilitation occurring on an on-going basis. There will be no change to the existing operational regime for the proposed open cast extension. The preferred alternative layout plan has excluded two watercourses from the mining footprint, and is presented in Appendix C2. A 100m buffer on either side of the watercourses will be applied.

- Alternative A2:

The initial layout plan for the proposed open cast extension included two watercourses which would have been mined through and rehabilitated thereafter. However, following finalisation of the Desktop Ecological Assessment, a new layout plan (Alternative 1 above) was proposed.

- No-Go Alternative:

In the no-go alternative, the open cast mining section which provides a certain grade of coal, will not be extended and mining will only continue briefly at the current open cast as coal reserves are almost depleted. Without the open cast coal, mixing of coal grades cannot occur and buyers cannot be supplied with the correct coal grade as purchased. The mine will not be able to continue to employ the current number of employees if further sections are not mined.

Potential Environmental Impact and Issues

The environmental impacts and issues identified to date have been summarised into the following categories:

Construction Phase

- Visual Intrusion
- Noise and Vibration Disturbance
- Health and Safety Impacts
- Loss of Cultural and Heritage Resources
- Loss of Agricultural and Community Land
- Local Employment
- Soil Erosion and Nutrient Loss
- Groundwater Contamination and Quantity Reduction
- Surface Water Contamination
- Air Pollution
- Disturbance of Freshwater Ecosystems and Habitats
- Disturbance of Terrestrial Ecosystems and Habitats
- Community Housing

Operational Phase

- Visual Intrusion
- Noise and Vibration Disturbance
- Health and Safety Impacts
- Loss of Cultural and Heritage Resources
- Loss of Agricultural and Community Land
- Local Employment
- Groundwater Contamination and Quantity Reduction
- Surface Water Contamination and Change in Peak Flows and Volumes
- Air Pollution
- Disturbance of Freshwater Ecosystems and Habitats
- Disturbance of Terrestrial Ecosystems and Habitats

Closure Phase

- Noise and Vibration Disturbance
- Health and Safety Impacts
- Loss of Cultural and Heritage Resources
- Increase in Land Capability
- Rehabilitation of Watercourses
- Reshaping of Topography
- Soil Replacement

- Groundwater Contamination and Quantity Reduction
- Surface Water Contamination
- Disturbance of Freshwater Ecosystems and Habitats
- Disturbance of Terrestrial Ecosystems and Habitats

No-Go Alternative

- Loss of Local Employment

Specialist Studies

Summarised results of the specialist studies undertaken for the project are detailed below (Refer to Appendix D for the full reports):

Desktop Ecological Assessment:

A desktop ecological assessment was undertaken to provide background information on the ecosystems and habitats onsite and their potential conservation value. A desktop survey is considered satisfactory at this stage due to the highly transformed nature of Farm Alleen 2 and the amount of information available on the region from other projects. A wide range of spatial datasets derived from governmental and non-governmental conservation organisations and departments, as well as the latest colour aerial photography for the site were sampled and utilised to provide a preliminary indication of the characteristics, state and importance of the freshwater and terrestrial habitats onsite. A rapid site walkover along the main road that traverses the site from west to east along the northern boundary of the proposed mining strip was conducted to confirm the desktop findings but no formal vegetation or faunal sampling was undertaken.

An analysis of the available spatial and aerial photography for the study area, as well as a rapid site walkover, confirmed the following:

- Nine degraded and incised watercourses occur within the original proposed mining footprint (Alternative A2). The watercourses are classified as first-order in terms of their position in the landscape. While headwaters play an important role in the maintenance of the hydrological functions of river systems, the rapid site walkover concluded that these stream channels are highly eroded and degraded.
- The study area occurs within a sub-quaternary catchment classified as a Fish Support Area by the NFEPA. However, the rapid site walkover confirmed that all the stream channels within the mining footprint were dry and highly modified by erosion and human activities, and no suitable fish habitats were present within the property.
- Six potential/preliminary vegetation communities/habitats occur within the study area.

- With the exception of the 'intact secondary grassland' community, all the vegetation communities were highly degraded and likely of low to moderately-low conservation importance.
- Of the above communities/habitats, only the 'intact secondary grassland' and 'secondary dense closed woody vegetation' units do not occur within the proposed mining footprint.
- Based on the KZN Terrestrial Systematic Conservation Plan and a previous ecological study undertaken for the discard dump extension project in similar habitat south of the study area, there is a possibility that scattered individuals / populations of the red-listed (threatened) millipede, *Doratogonus minor*, and the endemic mollusc, *Cochlitoma simplex*, may be present within the steeper, rocky areas within the intact secondary grassland and woody encroached secondary grassland areas within the study area, despite the high level of habitat degradation. However, it is unlikely that the snail is present within the mining footprint.
- The study area was found to be of limited importance in terms of national and provincial biodiversity conservation and protected area planning.

In light of these desktop findings, there appear to be no major fatal flaws in terms of impacts to ecology and biodiversity provided that:

- Flow and water quality impacts to downstream freshwater ecosystems are minimised.
- The more valuable habitats upslope of the mining footprint are not disturbed by the mining activities.
- A 'search and rescue' for individual *Cochlitoma simplex* snails is undertaken by a qualified mollusc specialist prior to mining in order to relocate individuals to an identified offset area.

However, it is important to note that despite the degraded state of the onsite and local freshwater and terrestrial habitats, uncontrolled land clearing and mining operations, and the poor management of contaminated dirty water will still likely result in significant cumulative impacts.

Heritage Impact Assessment:

Consultation and a site walkover with local community members and Zinoju identified a number of graves within the mining footprint. Should authorisation be granted for the extension, an application will be lodged with Amafa in terms of the exhumation and relocation of these graves. The affected families will be engaged with in terms of the process of grave relocation.

A heritage survey of the proposed expansion identified a further five heritage sites in the project area. These sites include two Later Iron Age Sites, and three Grave Sites. All these sites, however, are situated more than 70m from the proposed mining band expansion as outlined by the developer. No mitigation is necessary for these sites as they are not threatened by the development. However, a buffer of 15m must be maintained around the grave sites and 50m around the Iron Age sites.

A second phase heritage impact assessment will be required should the developer decide to expand the mining development towards the north and within the buffer zones of the identified sites. Attention is drawn to the South African Heritage Resources Act, 1999 (Act No. 25 of 1999) and the KwaZulu-Natal Heritage Act (Act no 4 of 2008) which, requires that operations that expose archaeological or historical remains should cease immediately, pending evaluation by the provincial heritage agency.

Surface Water Assessment:

The purpose of the hydrological assessment for the proposed open cast extension activities was to understand the impact such activities will have on site hydrology. A conceptual Stormwater Management Plan (SWMP) was compiled for the project and included as part of the assessment. Results of the assessment indicate that the establishment of the open cast extension will reduce the catchment area and runoff volumes; however, the proposed development is not anticipated to have a large potential stream peak flow reduction impact on the runoff of the immediate and general areas.

Mitigation measures and recommendations included in the report centre on handling of waste and SWMP measures. It is recommended the Water Balance for the existing Magdalena Colliery operations be updated and that the measures recommended in the SWMP be adhered to, with detailed SWMP designs signed off by a registered engineer. This is to be included in the pending IWULA Amendment to be submitted to the Department of Water Affairs (DWA). Surface water quality samples of Poonaspruit Stream, downstream of the proposed open cast area should be collected and analysed. It is also recommended that a GN704 audit be performed at the mine.

Groundwater Assessment:

The purpose of this report was to assess the changes to the groundwater quality and quantity in the vicinity of the new Magdalena open cast extension. Results of the risk assessment concluded the following:

- It is anticipated that a cone of depression will develop around the proposed open cast pit during the construction and operational phase of pit development. The

extent of dewatering will be reduced by use of the Roll-Over Method. The cone of depression will also decrease over time after the decommissioning phase, as water flow resumes normally within the rehabilitated pit.

- Long term poor water quality seepage is anticipated in the form of a sulphate plume.
- Stockpiles and discard dumps have already been established at the site. These areas may need to be enlarged to cope with the expansion. New pollution control dams will need to be constructed to cope with the additional volume of water. Dirty water runoff must be diverted to the PCD's and monitoring of these surface operations should continue quarterly.

Recommendations for the construction, operational and closure phases of the project have been made in the report, as well as recommendations for ongoing monitoring.

Impact Assessment

The table below summarises all the identified impacts and their significance ratings without and with mitigation.

POTENTIAL ENVIRONMENTAL IMPACT	ENVIRONMENTAL SIGNIFICANCE BEFORE MITIGATION	ENVIRONMENTAL SIGNIFICANCE AFTER MITIGATION
	SP	SP
CONSTRUCTION PHASE ACTIVITIES: SITE PREPARATION, FOOTPRINT CLEARANCE, PIT DEVELOPMENT AND WASTE HANDLING		
VISUAL INTRUSION		
Visual intrusion and nuisance resulting from dust pollution.	M	L
Visual intrusion resulting from the presence of machinery and earth moving vehicles on site.	M	L
Change in sense of place from removal of vegetation	M	L
Visual intrusion resulting from creation of stockpiles	L	L
NOISE AND VIBRATION DISTURBANCE		
Noise pollution from earth moving activities on site	M	M
Noise from blasting affecting nearby residents and wildlife	M	L
Structural damage to nearby buildings from blasting	M	M
HEALTH AND SAFETY IMPACTS		
Health impacts to labourers and residents from particulate matter entering lungs	M	L
Safety impacts to pedestrians or residents from movement of vehicles	M	L
LOSS OF CULTURAL AND HERITAGE RESOURCES		
Loss of cultural and heritage resources	M	M
	H	M
	M	L
	M	L
LOSS OF AGRICULTURAL AND COMMUNITY LAND		
Reduction in the amount of available land for agricultural and	M	L

residential purposes.		
LOCAL EMPLOYMENT		
Continued employment to mine workers and prevent the laying off of staff.	M	
SOIL EROSION AND NUTRIENT LOSS		
Poor management of soil and soil stockpiles resulting in a loss of soil resources and valuable nutrients for regrowth of vegetation and agricultural potential	M	L
GROUNDWATER CONTAMINATION AND QUANTITY REDUCTION		
Impact on groundwater quantity during pit construction and blasting	M	M
Reduction in groundwater infiltration during diversion of watercourses.	L	L
Impact on groundwater quality: Exposure of soil will create an easy conduit for dirty water infiltration.	L	L
SURFACE WATER CONTAMINATION		
Clearance of vegetation and topsoil could cause blocking and sedimentation of drainage lines and obstruct the free flow of surface water.	M	L
Clean Runoff could flow into the dirty area and become polluted	M	L
AIR POLLUTION		
Dust generated by wind blowing over exposed soils and unprotected stockpiles	M	L
Vehicular emissions from earth moving machinery and transport vehicles	M	L
DISTURBANCE OF FRESHWATER ECOSYSTEMS AND HABITATS		
Direct Disturbance Impacts	L	L
Indirect Disturbance Impacts	L	L
Erosion and Sedimentation Impacts	L	L
Flow Reduction Impacts	L	L
Water Quality Impacts	L	L
Cumulative Impacts	L	L
DISTURBANCE OF TERRESTRIAL ECOSYSTEMS AND HABITATS		
Direct Disturbance Impacts	L	L
Indirect Disturbance Impacts	M	L
Erosion and Sedimentation Impacts	L	L
Habitat Reduction and Fragmentation Impacts	L	L
Population Impacts	L	L
Cumulative Impacts	L	L
COMMUNITY HOUSING		
Building Regulation compliant homes for relocated residents	M	
OPERATIONAL PHASE ACTIVITIES: PIT DEVELOPMENT, BLASTING, COAL EXTRACTION AND WASTE HANDLING		
VISUAL INTRUSION		
Visual intrusion and nuisance resulting from dust pollution.	M	L
Visual intrusion resulting from the presence of machinery and earth moving vehicles on site.	L	L
Visual intrusion resulting from creation of open cast workings	L	L
NOISE AND VIBRATION DISTURBANCE		
Noise pollution from earth moving activities on site and transportation of coal and materials	M	L
Noise from blasting affecting nearby residents and wildlife	M	L
Structural damage to nearby buildings from blasting	M	L

HEALTH AND SAFETY IMPACTS		
Health impacts to labourers and residents from particulate matter entering lungs	M	L
Safety impacts to pedestrians or residents from movement of vehicles	M	L
LOSS OF CULTURAL AND HERITAGE RESOURCES		
Loss of cultural and heritage resources	M	L
	M	L
	M	L
LOSS OF AGRICULTURAL AND COMMUNITY LAND		
Reduction in the amount of available land for agricultural and residential purposes.	M	L
LOCAL EMPLOYMENT		
Continued employment to mine workers and prevent the laying off of staff.	M	
GROUNDWATER CONTAMINATION AND QUANTITY REDUCTION		
Reduction in groundwater quantity during pit construction	M	M
Contamination of groundwater during dust suppression with contaminated re-use water	L	L
Contamination of groundwater during pit backfilling in the roll over method	H	M
Contamination of groundwater from seepage or spillage of contaminated water within pollution control dams	H	L
Contamination of groundwater from dirty water runoff from stockpiles	M	M
Contamination of groundwater during transport of coal via haulage roads to Coalfields	L	L
SURFACE WATER CONTAMINATION AND CHANGE IN PEAK FLOWS AND VOLUMES		
Clean Runoff could flow into the dirty area and become polluted	M	L
Fuel and toxic materials could spill and pollute water resources	H	L
Seepage to surface water resources from water disposal	M	L
Slope could contribute to erosion	H	L
Soil disturbance during soil turning	M	L
Continuing vegetation and topsoil clearance could obstruct drainage, cause water logging and pollute water resources	M	L
AIR POLLUTION		
Dust generated by wind blowing over exposed soils and unprotected stockpiles	M	L
Vehicular emissions from earth moving machinery and transport vehicles	M	L
DISTURBANCE OF FRESHWATER ECOSYSTEMS AND HABITATS		
Indirect Disturbance Impacts	L	L
Erosion and Sedimentation Impacts	L	L
Flow Reduction Impacts	L	L
Water Quality Impacts	L	L
Cumulative Impacts	M	L
DISTURBANCE OF TERRESTRIAL ECOSYSTEMS AND HABITATS		
Indirect Disturbance Impacts	M	M
Erosion and Sedimentation Impacts	L	L
Cumulative Impacts	L	L
DECOMISSIONING AND CLOSURE ACTIVITIES: PIT BACKFILL AND REHABILITATION OF DISTURBED AREAS		
NOISE AND VIBRATION DISTURBANCE		
Noise pollution from earth moving activities on site	M	L
HEALTH AND SAFETY IMPACTS		
Health impacts to labourers and residents from particulate matter entering lungs	M	L

Safety impacts to pedestrians or residents from movement of vehicles	M	L
LOSS OF CULTURAL AND HERITAGE RESOURCES		
Loss of cultural and heritage resources	M	L
INCREASE IN LAND CAPABILITY		
Restoration in the amount of available land for agricultural and residential purposes as per status quo.	M	
REHABILITATION OF WATERCOURSES		
Reshaping and rehabilitation of watercourses on site to prevent further erosion	M	
RESHAPING OF TOPOGRAPHY		
Potential soil erosion as a result of reshaping of topography and backfilling of pits	M	L
SOIL REPLACEMENT		
Restoration of soils from stockpiles to pits, increasing soil capability for vegetation establishment	M	
GROUNDWATER CONTAMINATION AND QUANTITY REDUCTION		
Impact on groundwater quantity: Residual dewatering resulting in a cone of depression	M	L
Impact on groundwater quality: Long term plume development	M	L
SURFACE WATER CONTAMINATION		
Pollution of water resources	M	L
Runoff and drainage from discard dump and stockpiles continue to yield polluted water	M	L
Siltation of water courses	M	L
Reduction in pollution of water resources	L	M
DISTURBANCE OF FRESHWATER ECOSYSTEMS AND HABITATS		
Direct Disturbance Impacts	L	L
Erosion and Sedimentation Impacts	L	L
Water Quality Impacts	L	L
Cumulative Impacts	M	L
DISTURBANCE OF TERRESTRIAL ECOSYSTEMS AND HABITATS		
Erosion and Sedimentation Impacts	L	L

NO-GO ALTERNATIVE	ENVIRONMENTAL SIGNIFICANCE OF NO-GO ALTERNATIVE
	SP
CONSTRUCTION PHASE ACTIVITIES: SITE PREPARATION, FOOTPRINT CLEARANCE, PIT DEVELOPMENT AND WASTE HANDLING	
LOCAL EMPLOYMENT	
Loss of employment at the Magdalena Colliery	M
SOIL EROSION AND HABITAT DEGRADATION	
Ongoing poor farming practices resulting in donga erosion and loss of soil resources	M
OPERATIONAL PHASE ACTIVITIES: PIT DEVELOPMENT, BLASTING, COAL EXTRACTION AND WASTE HANDLING	
LOCAL EMPLOYMENT	
Loss of employment at the Magdalena Colliery	M
SOIL EROSION AND HABITAT DEGRADATION	
Ongoing poor farming practices resulting in donga erosion and loss of soil resources	M

Proposed Monitoring and Auditing

Ongoing GN704 audits must be undertaken and all activities must be monitored against the current EMPR and Amendment, as well as the Environmental Management Programme (EMP) included in Appendix F of this document.

Recommendations

The impacts that have been identified for Alternative A1 can be mitigated to acceptable levels. Thus, no fatal flaws or unacceptable impacts would occur through the implementation of the Alleen 2 Open Cast Extension provided the environmental management programme is rigorously applied.

The implementation of the open cast extension project will also ensure continuation employment of local skilled and semi-skilled workers at the Magdalena Colliery, and will incorporate the transfer of technical skills.

For these reasons, GCS (Pty) Ltd recommends that the Alleen 2 Open Cast Extension be awarded Environmental Authorisation (EA) and that the No-go Alternative not be considered.

An Integrated Water Use License Application (IWULA) Amendment must, however, first be submitted to the DWA in terms of watercourse and wetland crossings (Section 21 (c) and (i)). The IWULA Amendment requirements will be incorporated into the IWULA amendment application currently in progress for the extension of the discard dump. The relevant approvals must be in place prior to the commencement of any site clearing or construction activities.

It is recommended that the implementation of mitigation measures contained in this document and in the EMP (Appendix F) be included as a condition of the EA. In addition, the following key recommendations are noted:

- Permits must be obtained from Amafa for the exhumation and relocation of graves.
- Mining and access routes are to be excluded from the northern and southern-most watercourses, as per the preferred alternative layout plan (Appendix C2).
- The intact secondary grassland and dense wooded areas outside of the proposed mining footprint must not be cleared and/or disturbed by the mining expansion. In this regard, it is important that the mining footprint be clearly demarcated and marked out by a professional surveyor using bard wire fencing and danger tape prior to the commencement of the mining operation.

- The rehabilitation plan contained in the EMP (Appendix F) and approved EMPR for Magdalena Colliery must be adhered to.
- It is recommended that a 'search and rescue' for individual *Cochlitoma simplex* snails that may occur within the mining strip be undertaken by a qualified mollusc specialist prior to mining in order to relocate individuals to an identified offset area.
- The existing SWMP and Water Balance for Magdalena Colliery must be updated to include the proposed open cast extension area, according to the best management practices. Detailed SWMP designs are to be included and signed off by a registered engineer. This is to be included in the IWULA Amendment to be submitted to the DWA.
- Surface water quality samples of the Poonaspruit stream, downstream of the proposed open cast area should be collected and analysed. It is also recommended that a GN704 audit be performed at the mine.
- Confirm groundwater and surface water monitoring protocol and plans. It is recommended that groundwater monitoring be conducted on a quarterly basis.
- The numerical groundwater model should be updated when changes in the mine plan and infrastructure plan occur, and every two years during operations.

Way Forward

The Final Amended BAR has been prepared using the latest template prescribed by the DAEA, and it is understood that this will be acceptable to the DEDTEA.

Registered I&APs and appropriate authorities will be informed of the availability of the Final Amended BAR for review. Electronic versions of the report will also be available on CD or can be downloaded from the GCS website (www.gcs-sa.biz) for those who wished to receive a copy. All comments received in response to the Final Amended BAR will be submitted to the DEDTEA Assessing Officer for consideration in the application for Environmental Authorisation. All I&AP's will be notified of the DEDTEA's decision on the application.

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Acronyms and Abbreviations

AMAFA:	AMAFA aKwaZulu-Natali
BID:	Background Information Document
CRR:	Comments and Response Report
DWA:	Department of Water Affairs
ECO:	Environmental Control Officer
DEDTEA:	KZN Department of Economic Development, Tourism and Environmental Affairs
EMP:	Environmental Management Programme
EMPR:	Environmental Management Programme (in terms of MPRDA)
EKZNW:	Ezemvelo KZN Wildlife
GNR:	Government Notice Regulation
HIA:	Heritage Impact Assessment
I&AP:	Interested and Affected Party
KZN:	KwaZulu-Natal
MPRDA:	Minerals Petroleum Resource Development Act (Act 28 of 2002)
NEMA:	National Environmental Management Act
NWA:	National Water Act
PPP:	Public Participation Programme
SWMP:	Stormwater Management Plan

agriculture
& environmental affairs

Department:
Agriculture
& Environmental Affairs
PROVINCE OF KWAZULU-NATAL

	(For official use only)
EIA File Reference Number:	DC/
NEAS Reference Number:	KZN/EIA/
Waste Management Licence Number: (if applicable)	
Date Received:	

BASIC ASSESSMENT REPORT

Submitted in terms of the Environmental Impact Assessment Regulations, 2010 promulgated in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998)

This template may be used for the following applications:

- Environmental Authorization subject to basic assessment for an activity that is listed in Listing Notices 1or 3, 2010 (Government Notices No. R 544 or No. R 546 dated 18 June 2010); or
- Waste Management Licence for an activity that is listed in terms of section 20(b) of the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) for which a basic assessment process as stipulated in the EIA Regulations must be conducted as part of the application (refer to the schedule of waste management activities in Category A of Government Notice No. 718 dated 03 July 2009).

Kindly note that:

1. This basic assessment report meets the requirements of the EIA Regulations, 2010 and is meant to streamline applications. This report is the format prescribed by the KZN Department of Agriculture & Environmental Affairs. Please make sure that this is the latest version.
2. The report must be typed within the spaces provided in the form. The size of the spaces provided is not indicative of the amount of information to be provided. The report is in the form of a table that can extend itself as each space is filled with text.
3. Where required, place a cross in the box you select.
4. An incomplete report will be returned to the applicant for revision.
5. The use of "not applicable" in the report must be done with circumspection because if it is used in respect of material information that is required by the competent authority for assessing the application, it will result in the rejection of the application as provided for in the regulations.
6. No faxed or e-mailed reports will be accepted.
7. The report must be compiled by an independent environmental assessment practitioner ("EAP").
8. Unless protected by law, all information in the report will become public information on receipt by the competent authority. Any interested and affected party should be provided with the information contained in this report on request, during any stage of the application process.
9. The KZN Department of Agriculture & Environmental Affairs may require that for specified types of activities in defined situations only parts of this report need to be completed.

10. The EAP must submit this basic assessment report for comment to all relevant State departments that administer a law relating to a matter affecting the environment. This provision is in accordance with Section 24 O (2) of the National Environmental Management Act 1998 (Act 107 of 1998) and such comments must be submitted within 40 days of such a request.
11. Please note that this report must be handed in or posted to the District Office of the KZN Department of Agriculture & Environmental Affairs to which the application has been allocated (please refer to the details provided in the letter of acknowledgement for this application).

DEPARTMENTAL REFERENCE NUMBER(S)

File reference number (EIA):	DC25/0018/2013:KZN/EIA/0001359/2013
File reference number (Waste Management Licence):	

SECTION A: DETAILS OF THE ENVIRONMENTAL ASSESSMENT PRACTITIONER AND SPECIALISTS

1 NAME AND CONTACT DETAILS OF ENVIRONMENTAL ASSESSMENT PRACTITIONER (EAP)

Name and contact details of the EAP who prepared this report:

Business name of EAP:	GCS Water and Environmental Consultants (Pty) Ltd		
Physical address:	4a Old Main Road, Judges Walk, Kloof, 3610		
Postal address:	PO Box 819, Gillitts, South Africa		
Postal code:	3603	Cell:	078 1711 889
Telephone:	031 764 7130	Fax:	031 764 7140
E-mail:	kellyt@gcs-sa.biz		

2 NAMES AND EXPERTISE OF REPRESENTATIVES OF THE EAP

Names and details of the expertise of each representative of the EAP involved in the preparation of this report:

Name of representative of the EAP	Education qualifications	Professional affiliations	Experience at environmental assessments (yrs)
Russell Stow	BSc Honours Environmental Biology, University of Natal, Durban BSc Biology and Environmental Management, University of Natal, Durban	Professional Member of the South African Council for Natural Scientists, 2007 Pr.Sci.Nat. No : 400089/07 International Association of Impact Assessment	14 years
Kelly Taylor	MSc Environmental Science, University of the Witwatersrand BSc Honours Geography, University of Pretoria BSc Environmental Sciences, University of Pretoria	-	4 years
Gareth Jones	BSocSci Geography & Environmental Management	-	4 years

3 NAMES AND EXPERTISE OF SPECIALISTS

Names and details of the expertise of each specialist that has contributed to this report:

Name of specialist	Education qualifications	Field of expertise	Section/ s contributed to in this basic assessment report	Title of specialist report/ s as attached in Appendix D
Nhlakanipho Zondi	BSc (Hydrology) BSc (Hons) Hydrology	Surface Water	Appendix D	Surface Water Assessment
Callie Pickering	BSc Geological Sciences BSc (Hons) Engineering and Environmental Geology	Ground Water	Appendix D	Ground Water Assessment
Frans Prins	MA (Archaeology)	Archaeologist / Heritage Resources Specialist	Appendix D	Heritage Impact Assessment
Ryan Edwards	MSc Environmental Science BSc (Hons) Geography and Environmental Management BSc Geography and Environmental Management	Ecological and Wetland Specialist	Appendix D	Desktop Ecological Assessment

SECTION B: ACTIVITY INFORMATION

1 PROJECT TITLE

Describe the project title as provided on the application form for environmental authorization:

Proposed Alleen 2 Open Cast Extension of the Magdalena Colliery in Dannhauser, KwaZulu-Natal

2 PROJECT DESCRIPTION

Provide a detailed description of the project:

Introduction:

Zinoju Coal (Pty) Ltd (hereafter referred to as Zinoju) proposes the extension of open cast mining at the Magdalena Colliery onto 18 portions of the Farm Alleen 2 No. 4280, located approximately 25km north-northwest of the town of Dundee, GPS Co-ordinates: 27° 56' 55.64"S; 30° 10' 39.28"E, KwaZulu-Natal (Appendix A1 – Locality Map). The open cast extension area will be 2350m long by 315m wide extending north from the existing open cast pit with an approximate area of 74 ha (55 ha open cast mining with a 24 ha access area).

The Magdalena Colliery is an existing coal mine that has been operational since 2003. The existing

mining area is operational under a number of Mining Rights, namely 227MR (Phase 1), 213MR (Phase 2) and 198MR (Phase 3) with corresponding approved Environmental Management Programmes (EMPR's) (see Table 1 below) in accordance with the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002) (MPRDA). In addition, an IWULA (Integrated Water Use License Application) process for all exiting water uses was completed in 2007 and issued. An application environmental authorisation for extension of the discard dump on site is currently underway (EIA Ref. No.: DC25/0018/2012).

Table 1: Magdalena Mining Rights

Phase Reference / Farm Portion	Approval Status	Approval References	Associated Documents
Phase 1: • Portions 1, 2 and of Magdalena No. 7574 • Rem. of Magdalena No. 7574	Mining Right	227MR / ML378/03	• Approved EMP (dated August 2002) • Approved Water Use Licence (07N32D/AGJ/986)
Phase 2: • Portions 1, 23, 24, 25 and 26 of Alleen 1 No. 15592 • Portions 1, 2, 3, 4, 7, 8, 9, 10, 21 and 22 of Mount Johanna No. 10987 • Rem. of Mount Johanna No. 10987	Mining Right	213MR	• Approved EMP (dated April 2008) • Approved Water Use Licence (07N32D/AGJ/986)
Phase 3: • Portions 5, 6, 11, 12, 13, 14, 15, 16, 17, 18, 19 and 20 of Mount Johanna No. 10987 • Rem. of Mount Johanna No. 10987 • Portion 1 of Mooidoorn Hoek No. 3722 • Rem. of Kemps Hoek No. 4271 • Slieve Donald No. 9229 • Mourne No. 9168	Mining Right	198MR	• Approved EMP (dated May 2008) • Approved Water Use Licence (07N32D/AGJ/986)

The property portions included in the Alleen 2 extension are as follows:

- Portions 1, 2, 3, 5, 6, 8, 9, 10, 11, 12, 13, 14, 25, 26 and 27 of Alleen 2 No. 4280.
- Rem. of Portion 4, Alleen 2 No. 4280.
- Rem. of Portion 7, Alleen 2 No. 4280.

Operational Overview of Magdalena Colliery:

The mineral deposit extracted at the Magdalena Colliery is coal from two seams. The sub outcrop of the top seam (Alfred) and the bottom seam (Gus). The quality of the coal is classified as a lean-bituminous coal. Mining occurs by open cast method using the sequential roll over method and underground bord and pillar method accessed by an Adit system from an old open cast high wall. The production rate of the mine is currently 90 000 Run of Mine (ROM) tons per month.

The following surface infrastructure exists on the Magdalena Colliery:

- Offices, change houses and lamprooms

- Workshops (Open cast, underground and washing plant)
- Processing/washing plant
- Haulage and access roads
- Storage areas
- Discard dump
- Domestic solid waste disposal facilities
- Single adit
- Septic tanks
- Explosives magazine
- Sub-stations and electrical reticulation
- Diesel tanks
- Crusher
- Weigh bridge
- Pollution control dams
- Abstraction dams and water reticulation

Offices, Change Houses and Lamprooms:
The administrative offices, change houses and lamprooms are housed together in a complex consisting of both brick built buildings and containerized offices with an associated covered car parking area for staff and visitors. The administrative complex is located within the central section of the site and is easily accessed from the main site entrance.

Open Cast Office & Workshop:
A steel framed, galvanized clad workshop exists specifically for the open cast operation. This area consists of a workshop, office with covered car parking, wash-bay and a storage area. This workshop is located adjacent to the site's weighbridge and site entrance. The workshop is generally well maintained and has a concrete surface to prevent any spills and leaks from infiltrating the ground.

Underground Office & Workshop:
A steel framed, galvanized clad workshop exists specifically for the underground operation and is situated adjacent to the administration office area and underground adit. The area consists of workshop, office with covered car parking bays, a lamp room and a change house and a storage area. The inside of the workshop is generally well maintained and has a concrete surface to prevent any spills and leaks from infiltrating the ground.

Washing Plant Office & Workshop:
The ROM from the underground operation is washed and screened at the washing plant situated within the central portion of the site. The washed product is stockpiled alongside the processing plant ready for distribution. The coal is transported from here by road to the markets with a portion of the product being taken to the Coalfields site ready for distribution by rail. All ROM from the open cast operation is however taken straight to the Coalfields plant in Dundee town for washing and processing. A workshop complex exists at the washing plant and is used for machinery maintenance. Behind the workshop is a general storage area and a stock yard for scrap metal and machinery.

Discard Dump:
The existing discard dump takes coal discard from both the Magdalena and Aviemore collieries. Presently, the discard dump is nearing capacity and needs to be extended to ensure disposal capacity requirements of the life of the mine for both these operations. The existing dump has a design life of 3 years and storage capacity of circa 2 million tonnes (53000 tonnes per month) and is therefore not sufficient to accommodate the life of mine requirements. An environmental authorisation application for extension of the discard dump on site is currently underway (EIA Ref. No.: DC25/0018/2012).

Roads:
The N11 from Newcastle to Ladysmith strategic road network is 22km to the west of Magdalena Colliery. In addition, the R33 Provincial road from Dundee to Vryheid is 18 km to the east of Magdalena Colliery. The P272 Provincial gravel road from Dundee to Osizweni runs from south to north to the east of the mine. The transportation of coal to the processing plant at Coalfields in Dundee will utilise the local road network and routes as agreed with the municipality.

Railway lines:
The Newcastle to Dundee railway line is located approximately 15km to the west of Magdalena Colliery. The existing siding at the Coalfields plant in Dundee will be used to load coal for distribution to the markets.

Powerlines:
Electrical power is obtained from the local ESKOM power grid. The existing 11 kV line from the farm Avalon, along the access road to the mining site will be used.

Sequential Rollover Mining Method used at the Magdalena Colliery:

The Sequential Rollover Mining Method is a coal extraction method where an open pit is dug from the surface using heavy plant machinery to extract coal from seams near to the surface as the most viable, practical and cost-effective method to remove the resource.

Initially a temporary ramp or haulage road is excavated to provide access to the coal horizon/s. Depending on the site, there may be one coal seam or more which can be mined by surface mining. The first strip is then mined with all overburden removed and stockpiled. This creates a working face perpendicular to the highwall. The working face of the pit is then blasted to loosen and collapse the wall and all the rock (overburden) is then excavated out and stored nearby. The coal is removed and taken to the stockpiles for storage and future washing. Once the material has been cleared the working face of the pit is again blasted and the extraction process repeated until the coal seam runs out, becomes too deep to surface mine or the quality deteriorates making mining unfeasible. As the pit moves in the direction of the coal seam perpendicular to the highwall, so the stored discard material is then dumped into the back of the pit and rehabilitated. In this way the size of the pit remains fairly constant – as rock material is excavated from the front working face so the same material is deposited at the back of the pit.

This is the method currently used by Zinoju at Magdalena's open cast pit which mines perpendicular to the escarpment. This operation has now reached the boundary of the Mining Right area and Zinoju now wish to extend the mining operation onto the adjacent Alleen 2 property.

The annotated image of the Magdalena Open Cast operation (Appendix C2) illustrates the above process. Please refer to Appendix G for a Mining Work Programme compiled by Zinoju for the proposed extension.

Proposed Alleen 2 Open Cast Extension

It is the intention of Zinoju to extend the site's open cast mining area in order to accommodate the operational life of the company's mining operations at the Magdalena Colliery. The open cast strip extension will be approximately 55 ha in extent, with 24 ha for the open cast access area. The properties included in the open cast extension are 18 portions of Alleen 2 No. 4280. As the mine is currently operational and the project is an extension of an existing operation, there is no intention to construct additional infrastructure to accommodate the open cast extension. All mineral processing will

be undertaken in line with existing operations. Open cast mining at the proposed extension area is expected to take place over a four year period, within mining progressing one block at a time as per the Mine Work Programme in Appendix C2. Rehabilitation will be undertaken at each block before progressing to the next mining block.

Current Land Use and Relocation Plan

The land is currently used by the local community for informal housing and grazing, and a number of ephemeral watercourses are present on site. The total size of developed occupied land with the Alleen 2 open cast extension area amounts to 43.38 ha, with 11.62 ha of land undeveloped / vacant. A number of houses are located within the portion Zinoju wishes to mine and these will need to be demolished for the proposed extension. Zinoju will initiate negotiations with the home owners and tenants to relocate to a site acceptable to them and build them new dwellings of the same square meterage as their existing dwellings all at Zinoju's cost.

Rehabilitation and Future Land Use

Rehabilitation of the open cast workings will take place concurrently with mining, leaving only a final void to be rehabilitated once mining ceases. Thereafter the area will require a two-year rest period before being handed back to the owners and community for their continued use of the rehabilitated land for grazing and/or agriculture. Rehabilitation is expected to improve the site's condition from the current status quo, where currently large dongas characterise much of the site. However the land will not be suitable for construction of houses, as mined land has the potential to be unstable.

Legislative Processes

In terms of the MPRDA, the approved EMPR (and mining right) under the MPRDA will need to be amended and updated to reflect the proposed changes to the existing operations and to accord with the requirements of the MPRDA. As part of this amendment, an impact assessment has been prepared as part of this Basic Assessment Report (BAR) to identify any new potential impacts that may occur, and inform and guide the selection of appropriate mitigation and management measures. In addition, the public will be informed of the proposal and provided with an opportunity to comment on the proposal as well as the BAR and revised EMPR.

An Integrated Water Use License Application (IWULA) Amendment must be submitted to the Department of Water Affairs (DWA) for in terms of watercourse and wetland crossings (Section 21 (c) and (i)). The IWULA Amendment requirements will be incorporated into the IWULA amendment application currently in progress for the extension of the discard dump.

In terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA), the proposal requires environmental authorisation from the KwaZulu-Natal Department of Economic Development, Tourism and Environmental Affairs (DEDTEA).

Zinoju has appointed GCS (Pty) Ltd to conduct the independent BA process for the proposed Alleen 2 open cast extension in terms of the NEMA, update the approved EMPR in terms of the MPRDA, and apply for an amendment to the IWULA. These three processes have been run together concurrently to ensure a thorough consultative process.

- The EMPR amendment has been compiled and submitted to the DMR for approval.
- The Final BAR was submitted to the DEDTEA but was rejected as the DWA had objected to the Document, and the DEDTEA had outstanding issues which required clarity. In addition, the

DEDTEA requested that final comments submitted by Ezemvelo KZN Wildlife (EKZN) be incorporated into the Final BAR. This report thus serves an amendment to the Final BAR in order to provide additional information required as detailed in the introduction to this report.

- The IWULA Amendment will be submitted to the DWA along with supporting documentation required.

3 ACTIVITY DESCRIPTION

Describe each listed activity in Listing Notice 1 (GNR 544, 18 June 2010), Listing Notice 3 (GNR 546, 18 June 2010) or Category A of GN 718, 3 July 2009 (Waste Management Activities) which is being applied for as per the project description:

Table 1: Identified Listed Activities in terms of the EIA Regulations to date

Relevant Notice	Listed Activity	Description of the activity
GNR 544 Activity 11	The construction of (xi) Infrastructure or structures covering 50 square metres or more Where such construction occurs within a watercourse or within 32 metres of a water course, measured from the edge of a watercourse, excluding where such construction will occur behind the development setback line.	The proposed open cast extension area includes a number of ephemeral watercourses, which are dry for the majority of the year. Therefore listed activity (xi) is applicable to the project.
GNR 544 Activity 18	The infilling or depositing of any material of more than 5 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 5 cubic metres from: (i) A watercourse	As the proposed open cast extension involves the clearing and levelling of a number of ephemeral watercourses, it is highly likely that infilling, depositing or excavation of soil, sand, pebbles or rock (more than 5 m^3) from the watercourses will occur in order for mining activities to progress. Accordingly, this activity is applicable to the project.
GNR 544 Activity 22	The construction of a road, outside urban area, (ii) where no reserve exists where the road is wider than 8 metres.	The proposed open cast extension will most likely require the construction of access roads for mining machinery and vehicles. These access roads may have a width of 8 metres or more. Accordingly, this activity is applicable to the project.
GNR 545 Activity 15	Physical alteration of undeveloped vacant or derelict land for residential retail, commercial, recreational, industrial or institutional use where the total area to be transformed is 20 hectares or more; except where such physical alteration takes place for: (i) linear development activities; or	Not applicable: The current land use on the preferred site is informal residential, subsistence farming and grazing. The size of vacant portions of land situated between houses and farmed areas totals approximately 11.62

	(ii) agriculture or afforrestation where activity 16 in this Schedule will apply.	hectares, which is less than the 20 hectare threshold of this activity. Therefore the activity is not applicable to the project.

Note on Calculation of Vacant Land: The applicable activities in terms of the 2010 EIA Regulations are GNR 544 Activities 11, 18 and 22. It is noted that GNR 545 Activity 15, which would require a Scoping and EIA process to be undertaken, is not applicable as the property is not vacant or derelict, and is currently occupied with residents' houses and used for subsistence farming and grazing. The vacant portions of land between houses and farms was calculated using a Geographic Information Systems (GIS) software programme called ArcGIS, creating polygons of the vacant portions and determining the m^2 area covered by each. The size of vacant land was determined to be approximately 11.62 ha, and therefore GNR 545 Activity 15 is not applicable to the project. A Basic Assessment (BA) is therefore required in terms of GNR 544.

4 FEASIBLE AND REASONABLE ALTERNATIVES

"alternatives", in relation to a proposed activity, means different means of meeting the general purpose and requirements of the activity, which may include alternatives to—

(a) the property on which or location where it is proposed to undertake the activity;
(b) the type of activity to be undertaken;
(c) the design or layout of the activity;
(d) the technology to be used in the activity;
(e) the operational aspects of the activity; and
(f) the option of not implementing the activity.

Describe alternatives that are considered in this report. Alternatives should include a consideration of all possible means by which the purpose and need of the proposed activity could be accomplished in the specific instance taking account of the interest of the applicant in the activity. The no-go alternative must in all cases be included in the assessment phase as the baseline against which the impacts of the other alternatives are assessed. The determination of whether site or activity (including different processes etc.) or both is appropriate needs to be informed by the specific circumstances of the activity and its environment. After receipt of this report the competent authority may also request the applicant to assess additional alternatives that could possibly accomplish the purpose and need of the proposed activity if it is clear that realistic alternatives have not been considered to a reasonable extent.

Sections B 5 – 15 below should be completed for each alternative.

ALTERNATIVE S1: PREFERRED SITE ALTERNATIVE

Prior to the establishment of the Magdalena Colliery, the middle and upper mid-slopes of the site were used for grazing, while the more productive land in the valley was used for the cultivation of maize and other market related products. Due to the topography, and the highly sensitive nature of the soils, intense farming has not taken place on large portions of the area in question. The physical and chemical nature of the soils and erratic climate render these areas agriculturally poor. The mine is surrounded by moderate to low density rural settlements consisting of traditional homesteads (imzi) and more formalised houses.

The proposed site for the open cast extension at Alleen 2 is previously disturbed, and consists of rural settlements (Anville). Large portions of the land have evidence of misuse in terms of large erosion

gullies and overgrazing. Some subsistence farming (maize) and grazing occurs on site. Local access roads are present throughout the site.

Please refer to Appendices A1 – A3 for the Locality Map, Proposed Open Cast and Magdalena Colliery Operations.

ALTERNATIVE S2 and S3:

The site selection process has been undertaken by Zinoju in consultation with landowners, and as part of various internal investigations. The locality of coal reserves predetermines site selection for this activity, as well as proximity to existing operations. For these reasons, no other site alternatives have been considered.

ALTERNATIVE A1: PREFERRED PROCESS/TECHNOLOGY ALTERNATIVE

The proposed method of open cast mining will be the sequential rollover method with rehabilitation occurring on an on-going basis. A pit ramp will be constructed during the opening of successive cuts, which will migrate forward with each successive cut. All storm water infrastructure (including clean and dirty water diversion systems) will be continuously installed and modified as the operation progresses. There will be no change to the existing operational regime for the proposed open cast extension. The ROM which is extracted from the open cast section is taken straight to the Magdalena Colliery plant where it is temporarily stockpiled before being processed. Transport of ROM material from the open cast pit will be by 25 tonne dump trucks. A pit ramp will be constructed during the opening of successive cuts, which will migrate forward with successive cuts. ROM leaving the site via truck is weighed at the exit on a weighbridge before being taken to the Coalfields Colliery for distribution via rail / truck.

The preferred alternative layout plan has excluded two watercourses (northern and southern-most) from the mining footprint, and is presented in Appendix C2. A 100m buffer on either side of the watercourses has been applied. The reason for this is that these two watercourses are the largest stream channels within the mining area, and have potential value as surface water catchments. Zinoju has therefore confirmed that these two channels will not be disturbed. An access road from the existing open cast area across the southern-most watercourse is already in place, and will be used for mining and haul vehicles to cross this watercourse. Zinoju intend to halt mining activities 100m before the far northern drainage line where the original intention had been to mine through this line to the boundary of the property adjacent to a nearby school and residences. The 100m buffer from this drainage line will now allow a greater buffer between mining activities and the nearby community.

Open cast mining at the proposed extension area is expected to take place over a four year period, within mining progressing one block at a time as per the Mine Work Programme in Appendix C2. Rehabilitation will be undertaken at each block before progressing to the next mining block.

ALTERNATIVE A2:
Alternative A2 is the initial layout plan for the proposed open cast extension, which included open cast mining through the northern and southern-most watercourses, from the existing open cast area extending north up to the boundary of the property adjacent to a nearby school and residences. The original layout plan for Alternative A2 is included as Appendix C3 of this report. This alternative has been rejected and has not been considered further in this report following findings of the Desktop Ecological Report and comments received from the DWA.
No further process or technology alternatives have been identified at this stage.

NO-GO ALTERNATIVE
In the no-go alternative, the open cast mining section will not be extended and mining will only continue at the current underground sections for the life of mine period of 17 years. Open cast life of mine will end in 2 months. However, it is noted that coal reserves are being depleted rapidly and that the mine will not be able to continue to employ the current number of employees if further sections are not mined.

As is required by the EIA Regulations, this option has been considered throughout this report.

5 ACTIVITY POSITION

Indicate the position of the activity using the latitude and longitude of the centre point of the site for each alternative site. The co-ordinates should be in degrees, minutes and seconds. List alternative sites were applicable.

Alternative:	Latitude (S):			Longitude (E):		
Alternative S1[3] (preferred or only site alternative)	27°	57‘	10.68“	30°	10‘	25.37“
Alternative S2 (if any)	0	‘	“	0	‘	“
Alternative S3 (if any)	0	‘	“	0	‘	“

In the case of linear activities: Alternative:	Latitude (S):			Longitude (E):		
Alternative S1 (preferred or only route alternative)						
• Starting point of the activity	0	‘	“	0	‘	“
• Middle point of the activity	0	‘	“	0	‘	“
• End point of the activity	0	‘	“	0	‘	“
Alternative S2 (if any)			“			“
• Starting point of the activity	0	‘	“	0	‘	“
• Middle point of the activity	0	‘	“	0	‘	“
• End point of the activity	0	‘	“	0	‘	“
Alternative S3 (if any)			“			“
• Starting point of the activity	0	‘	“	0	‘	“
• Middle point of the activity	0	‘	“	0	‘	“
• End point of the activity	0	‘	“	0	‘	“

For route alternatives that are longer than 500m, please provide an addendum with co-ordinates taken every 500m along the route for each alternative alignment.

6 PHYSICAL SIZE OF THE ACTIVITY

Indicate the physical size of the preferred activity/technology as well as alternative activities/technologies (footprints):

Alternative:	Size of the activity:
Alternative A1[4] (preferred activity alternative)	Open cast strip = 55 000m^2 Access area to open cast strip = 24 000m^2 Vacant land = 11 620 m^2

[3] “Alternative S..” refer to site alternatives.
[4] “Alternative A..” refer to activity, process, technology or other alternatives.

Alternative A2 (if any)	m^2
Alternative A3 (if any)	m^2

or, for linear activities:

Alternative:	Length of the activity:
Alternative A1 (preferred activity alternative)	M
Alternative A2 (if any)	M
Alternative A3 (if any)	M

Indicate the size of the alternative sites or servitudes (within which the above footprints will occur):

Alternative:	Size of the site/servitude:
Alternative A1 (preferred activity alternative)	180 000m^2
Alternative A2 (if any)	m^2
Alternative A3 (if any)	m^2

7 SITE ACCESS

Does ready access to the site exist?	YES	NO
	X	
If NO, what is the distance over which a new access road will be built		m

Describe the type of access road planned:

While current access to the site exists via dirt roads used by the local residents living on the site, it is proposed that existing access roads through the current open cast area be extended into the new strip as needed for the movement of mining vehicles and coal transport trucks. The construction of access roads will be completed as and when required with the progression of mining activities on site.

Include the position of the access road on the site plan and required map, as well as an indication of the road in relation to the site.

8 SITE OR ROUTE PLAN

A detailed site or route plan(s) must be prepared for each alternative site or alternative activity. It must be attached as Appendix A to this report.

The site or route plans must indicate the following:

1.1. the scale of the plan which must be at least a scale of 1:500;
1.2. the property boundaries and numbers/ erf/ farm numbers of all adjoining properties of the site;
1.3. the current land use as well as the land use zoning of each of the properties adjoining the site or sites;
1.4. the exact position of each element of the application as well as any other structures on the site;
1.5. the position of services, including electricity supply cables (indicate above or underground), water supply pipelines, boreholes, street lights, sewage pipelines, storm water infrastructure and telecommunication infrastructure;
1.6. walls and fencing including details of the height and construction material;
1.7. servitudes indicating the purpose of the servitude;
1.8. sensitive environmental elements within 100 metres of the site or sites including (but not limited thereto):
- rivers, streams, drainage lines or wetlands;
- the 1:100 year flood line (where available or where it is required by DWA);

- ridges;
- cultural and historical features;
- areas with indigenous vegetation including protected plant species (even if it is degraded or infested with alien species);

1.9. for gentle slopes the 1 metre contour intervals must be indicated on the plan and whenever the slope of the site exceeds 1:10, the 500mm contours must be indicated on the plan; and

1.10. the positions from where photographs of the site were taken.

9 SITE PHOTOGRAPHS

Colour photographs from the centre of the site must be taken in at least the eight major compass directions with a description of each photograph. Photographs must be attached under Appendix B to this report. It must be supplemented with additional photographs of relevant features on the site, if applicable.

10 FACILITY ILLUSTRATION

A detailed illustration of the facility must be provided at a scale of 1:200 and attached to this report as Appendix C. The illustrations must be to scale and must represent a realistic image of the planned activity/ies.

11 ACTIVITY MOTIVATION

11.1 Socio-economic value of the activity

What is the expected capital value of the activity on completion?	Approximately R10 million (Limited capex for basic infrastructure, use of contract mining)	
What is the expected yearly income that will be generated by or as a result of the activity?	Approximately R5 million EBITDA (depending on coal price and unforeseen costs)	
Will the activity contribute to service infrastructure?	YES	NO X
Is the activity a public amenity?	YES	NO X
How many new employment opportunities will be created in the development phase of the activity?	None – existing employees	
What is the expected value of the employment opportunities during the development phase?	N/A	
What percentage of this will accrue to previously disadvantaged individuals?	N/A	
How many permanent new employment opportunities will be created during the operational phase of the activity?	None – existing employees	
What is the expected current value of the employment opportunities during the first 10 years?	N/A	
What percentage of this will accrue to previously disadvantaged individuals?	N/A	

11.2 Need and desirability of the activity

Motivate and explain the need and desirability of the activity (including demand for the activity):

The need for the new open cast extension into Alleen 2 relates to the depleting surface coal reserves in the area. Should additional reserves which contain the required coal grades not be mined, the Magdalena Colliery will not be able to continue to operate at full capacity, resulting in retrenchment of

the majority of open cast workers currently employed at the mine.

Indicate any benefits that the activity will have for society in general:

Maintained economic development in the Dundee and Dannhauser region.

Indicate any benefits that the activity will have for the local communities where the activity will be located:

Continued employment of mine workers from local communities. Provision of arable land once rehabilitation of the rolled-over areas are complete.

12 APPLICABLE LEGISLATION, POLICIES AND/OR GUIDELINES

List all legislation, policies and/or guidelines of any sphere of government that are relevant to the application as contemplated in the EIA regulations, if applicable:

Title of legislation, policy or guideline:	Administering authority:	Date:
The Constitution of the Republic of South Africa, Section 24 (Environmental Right).	The Constitutional Assembly	1996
National Environmental Management Act (No. 107 of 1998)	Department of Environmental Affairs	1998
Environmental Impact Assessment Regulations, 2010 (GNR 543, 544 and 546)	Department of Environmental Affairs	2010
National Water Act (No. 36 of 1998)	Department of Water Affairs	1998
National Heritage Resources Act (No. 25 of 1999)	South African Heritage Resources Agency	1999
KwaZulu-Natal Heritage Act (No. 4 of 2008)	Amafa aKwaZulu-Natali	2008
National Environmental Management: Waste Act (No. 59 of 2008)	Department of Environmental Affairs	2008
National Environmental Management: Air Quality Act (No. 39 of 2004)	Department of Environmental Affairs	2004
South African National Standards (SANS): 10103 - The Measurement and Assessment of Environmental Noise with Respect to Land Use, Health, Annoyance and Speech Communication.	South African Bureau of Standards	2003
Occupational Health and Safety Act (No. 85 of 1993)	Department of Labour	1993

13 WASTE, EFFLUENT, EMISSION AND NOISE MANAGEMENT

13.1 Solid waste management

	YES	NO
Will the activity produce solid construction waste during the construction/initiation phase?	X	
If yes, what estimated quantity will be produced per month?	Unknown	

How will the construction solid waste be disposed of? (describe)

Rubble resulting from demolishing of buildings, roads, walls and other solid infrastructure currently used by local residents will be produced during the process of site clearing. All inert waste (rubble, sand and rock) generated will be disposed of on the discard dump. All other general waste will be disposed of at a registered landfill site.

Where will the construction solid waste be disposed of? (provide details of landfill site)

Dundee Municipal Waste Disposal Facility

	YES	NO
Will the activity produce solid waste during its operational phase?	X	
If yes, what estimated quantity will be produced per month?	Unknown	

How will the solid waste be disposed of? (provide details of landfill site)

Solid waste generated during the operational phase will comprise waste rock and coal discard extracted from the open cast sections during mining.

Where will the solid waste be disposed if it does not feed into a municipal waste stream (describe)?

This will be disposed of at the discard dump located at the Magdalena Colliery.

If the solid waste (construction or operational phases) will not be disposed of in a registered landfill site or be taken up in a municipal waste stream, then the applicant should consult with the competent authority to determine the further requirements of the application.

Can any part of the solid waste be classified as hazardous in terms of the relevant legislation?	YES	NO X

If yes, contact the KZN Department of Agriculture & Environmental Affairs to obtain clarity regarding the process requirements for your application.

Is the activity that is being applied for a solid waste handling or treatment facility?	YES	NO X

If yes, contact the KZN Department of Agriculture & Environmental Affairs to obtain clarity regarding the process requirements for your application.

13.2 Liquid effluent

Will the activity produce effluent, other than normal sewage, that will be disposed of in a municipal sewage system?	YES	NO X
If yes, what estimated quantity will be produced per month?		m^3
Will the activity produce any effluent that will be treated and/or disposed of on site?	Yes	NO X

If yes, contact the KZN Department of Agriculture & Environmental Affairs to obtain clarity regarding the process requirements for your application.

Will the activity produce effluent that will be treated and/or disposed of at another facility?	YES	NO X

If yes, provide the particulars of the facility:

Facility name:			
Contact person:			
Postal address:			
Postal code:			
Telephone:		Cell:	
E-mail:		Fax:	

Describe the measures that will be taken to ensure the optimal reuse or recycling of waste water, if any:

Water runoff from the open cast strip will be directed into a pollution control dam and excess water from the dam will be reused for dust suppression and in the wash plant at the Magdalena Colliery.

13.3 Emissions into the atmosphere

Will the activity release emissions into the atmosphere?	YES X	NO
If yes, is it controlled by any legislation of any sphere of government?	YES X	NO

If yes, contact the KZN Department of Agriculture & Environmental Affairs to obtain clarity regarding the process requirements for your application.

If no, describe the emissions in terms of type and concentration:

Emissions generated will be dust (particulate matter) from open cast mining activities on site, as well as vehicular emissions from transport and mining vehicles. Dust monitoring at the open cast section will be required to ensure that concentration levels are within acceptable and legislated standards. Dust monitoring is being undertaken on a regular basis at the existing open cast section, and dust levels are within the prescribed limits. The dust monitoring network will be extended to include any extension activities which may generate dust.

13.4 Generation of noise

Will the activity generate noise?	YES X	NO
If yes, is it controlled by any legislation of any sphere of government?	YES	NO X

If yes, the applicant should consult with the competent authority to determine whether it is necessary to change to an application for scoping and EIA.
If no, describe the noise in terms of type and level:

Blasting at the open cast section will give rise to noise and vibration. The noise of the blast will exceed 130dBA, although this will attenuate to within acceptable levels within a short distance of the blasting area. Trucks hauling extracted coal will generate noise levels in the region of 60dBA. Vehicle movement on onsite, access and haul roads will also elevate the noise levels in the vicinity of the project site and the surrounding areas.

14 WATER USE

Please indicate the source(s) of water that will be used for the activity by ticking the appropriate box(es):

Municipal	water board	groundwater	river, stream, dam or lake	Other X Pollution control dams	the activity will not use water

If water is to be extracted from groundwater, river, stream, dam, lake or any other natural feature, please indicate the volume that will be extracted per month:		litres
Does the activity require a water use permit from the Department of Water Affairs?	YES X	NO

If YES, please submit the necessary application to the Department of Water Affairs and attach proof thereof to this report.

A water use permit will be required for abstraction of water, but specifically in terms of collected runoff from open pits, and pumping this water to the processing plant and pollution control dams at the Magdalena Colliery for re-use. No raw water will be abstracted for mining use.

An Integrated Water Use License Application (IWULA) is required to be submitted to the Department of Water Affairs (DWA) in terms of potential diversion / changes to watercourses within the project footprint. This application will be run concurrently to the Basic Assessment for this project, in terms of Section 21 of the National Water Act (No 36 of 1998) (NWA). Therefore, the following Section 21 activities are relevant to the project:

(c) Impeding or diverting the flow of water in a watercourse.
(i) Altering the bed, banks, course or characteristics of a watercourse.
(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.

15 ENERGY EFFICIENCY

Describe the design measures, if any, that have been taken to ensure that the activity is energy efficient:

Not applicable

Describe how alternative energy sources have been taken into account or been built into the design of the activity, if any:

No alternative energy sources have been investigated.

SECTION C: SITE/ AREA/ PROPERTY DESCRIPTION

Important notes:

- For linear activities (pipelines, etc) as well as activities that cover very large sites, it may be necessary to complete this section for each part of the site that has a significantly different environment. In such cases please complete copies of Section C and indicate the area, which is covered by each copy No. on the Site Plan.

Section C Copy No. (e.g. A):

- Subsections 1 - 6 below must be completed for each alternative.

1 GRADIENT OF THE SITE

Indicate the general gradient of the site.

Alternative S1:

Flat	1:50 – 1:20	1:20 – 1:15	1:15 – 1:10	1:10 – 1:7,5	1:7,5 – 1:5	Steeper than 1:5
	X					

Alternative S2 (if any):

Flat	1:50 – 1:20	1:20 – 1:15	1:15 – 1:10	1:10 – 1:7,5	1:7,5 – 1:5	Steeper than 1:5

Alternative S3 (if any):

Flat	1:50 – 1:20	1:20 – 1:15	1:15 – 1:10	1:10 – 1:7,5	1:7,5 – 1:5	Steeper than 1:5

2 LOCATION IN LANDSCAPE

Indicate the landform(s) that best describes the site (Please cross the appropriate box).

Alternative S1 (preferred site):

Ridgeline	Plateau	Side slope of hill/mountain	Closed valley	Open valley	Plain	Undulating plain/low hills	Dune	Sea-front
		X						

Alternative S2 (if any):

Ridgeline	Plateau	Side slope of hill/mountain	Closed valley	Open valley	Plain	Undulating plain/low hills	Dune	Sea-front

Alternative S3 (if any):

Ridgeline	Plateau	Side slope of hill/mountain	Closed valley	Open valley	Plain	Undulating plain/low hills	Dune	Sea-front

3 GROUNDWATER, SOIL AND GEOLOGICAL STABILITY OF THE SITE

Has a specialist been consulted for the completion of this section?	YES X	NO

If YES, please complete the following:

Name of the specialist:	Callie Pickering			
Qualification(s) of the specialist:	BSc Geological Sciences BSc (Hons) Engineering and Environmental Geology			
Postal address:	PO Box 819, Gillitts			
Postal code:	3603			
Telephone:	031 764 7130	Cell:	082 878 4570	
E-mail:	calliep@gcs-sa.biz	Fax:	031 764 7140	

Are any further specialist studies recommended by the specialist?	YES	NO X
If YES, specify:		
If YES, is such a report(s) attached in Appendix D?	YES X	NO

Signature of specialist:  Date: 13 January 2013

Is the site(s) located on any of the following (cross the appropriate boxes)?

	Alternative S1:		Alternative S2 (if any):		Alternative S3 (if any):	
Shallow water table (less than 1.5m deep)	YES	NO X	YES	NO	YES	NO
Dolomite, sinkhole or doline areas	YES	NO X	YES	NO	YES	NO
Seasonally wet soils (often close to water bodies)	YES X	NO	YES	NO	YES	NO
Unstable rocky slopes or steep slopes with loose soil	YES	NO X	YES	NO	YES	NO
Dispersive soils (soils that dissolve in water)	YES	NO X	YES	NO	YES	NO
Soils with high clay content (clay fraction more than 40%)	YES	NO X	YES	NO	YES	NO
Any other unstable soil or geological feature	YES	NO X	YES	NO	YES	NO
An area sensitive to erosion	YES X	NO	YES	NO	YES	NO

If you are unsure about any of the above or if you are concerned that any of the above aspects may be an issue of concern in the application, an appropriate specialist should be appointed to assist in the completion of this section. (Information in respect of the above will often be available as part of the project information or at the planning sections of local authorities. Where it exists, the 1:50 000 scale Regional Geotechnical Maps prepared by the Council for Geo Science may also be consulted).

4 GROUNDCOVER

Has a specialist been consulted for the completion of this section?	YES X	NO

If YES, please complete the following:

Name of the specialist:	Ryan Edwards

Qualification(s) of the specialist:	MSc Environmental Science BSc (Hons) Geography and Environmental Management BSc Geography and Environmental Management		
Postal address:	GCS (Pty) Ltd, PO Box 819, Gillitts		
Postal code:	3603		
Telephone:	031 764 7130	Cell:	-
E-mail:	ryane@gcs-sa.biz	Fax:	031 764 7140

Are there any rare or endangered flora or fauna species (including red data species) present on any of the alternative sites?	YES	NOX
If YES, specify and explain:	It is improbable that red data / red-listed flora or fauna occur within the mining footprint. However, there is a possibility that the endemic mollusc, *Cochlitoma simplex*, may be present within the steeper, rocky areas within the intact secondary grassland and woody encroached secondary grassland areas within the study area upslope of the mining footprint, despite the high level of habitat degradation. Comment from Dr Dai Herbert, a mollusc specialist, confirmed that the likelihood of occurrence of *C. simplex* within the proposed mining footprint is low.	
Are there any special or sensitive habitats or other natural features present on any of the alternative sites?	YES	NO X
If YES, specify and explain:		
Are any further specialist studies recommended by the specialist?	YES X	NO
If YES, specify:	A Desktop Ecological Assessment was undertaken for the project and in presented in Appendix D.	
If YES, is such a report(s) attached in Appendix D?	YES X	NO

Signature of specialist:		Date:	12 December 2013

The location of all identified rare or endangered species or other elements should be accurately indicated on the site plan(s).

Natural veld - good condition[E]	Natural veld with scattered aliens[E] X	Natural veld with heavy alien infestation[E]	Veld dominated by alien species[E]	Gardens X
Sport field	Cultivated land X	Paved surface	Building or other structure X	Bare soil X

If any of the boxes marked with an "[E] "is ticked, please consult an appropriate specialist to assist in the completion of this section if the environmental assessment practitioner doesn't have the necessary expertise.

5 LAND USE CHARACTER OF SURROUNDING AREA

Cross the land uses and/or prominent features that currently occur within a 500m radius of the site and give a description of how this influences the application or may be impacted upon by the application:

Land use character			Description
Natural area	YES	NO X	
Low density residential	YES X	NO	A number of informal residences are

			present on and around the site (Anville).
Medium density residential	YES	NO X	
High density residential	YES	NO X	
Informal residential	YES X	NO	A number of informal residences are present on and around the site (Anville).
Retail commercial & warehousing	YES	NO X	
Light industrial	YES	NO X	
Medium industrial	YES	NO X	
Heavy industrial	YES X	NO	The Magdalena Colliery existing open cast mining area is situated adjacent to the site.
Power station	YES	NO X	
Office/consulting room	YES	NO X	
Military or police base/station/compound	YES	NO X	
Spoil heap or slimes dam	YES	NO X	
Quarry, sand or borrow pit	YES	NO X	
Dam or reservoir	YES	NO X	
Hospital/medical centre	YES	NO X	
School/ crèche	YES X	NO	A school is present directly to the north of the open cast extension footprint. The mine management will be required to engage with the school in terms of dust and noise management, however, the area disturbed by mining will not intersect with the school property.
Tertiary education facility	YES	NO X	
Church	YES	NO X	
Old age home	YES	NO X	
Sewage treatment plant	YES	NO X	
Train station or shunting yard	YES	NO X	
Railway line	YES	NO X	
Major road (4 lanes or more)	YES	NO X	
Airport	YES	NO X	
Harbour	YES	NO X	
Sport facilities	YES X	NO	The school located adjacent to the open cast extension footprint is expected to have some sport facilities (e.g. soccer fields).
Golf course	YES	NO X	
Polo fields	YES	NO X	
Filling station	YES	NO X	
Landfill or waste treatment site	YES	NO X	
Plantation	YES	NO X	
Agriculture	YES X	NO	Small scale agricultural (subsistence) farming occurs within and around the site.
River, stream or wetland	YES X	NO	A number of eroded ephemeral (seasonal) watercourses are present within and around the site.
Nature conservation area	YES	NO X	
Mountain, hill or ridge	YES X	NO	The site is located on an undulating plain

			with low hills and a ridge overlooking the site.
Museum	YES	NO X	
Historical building	YES	NO X	
Protected Area	YES	NO X	
Graveyard	YES X	NO	A number of local graves are present within the open cast footprint and within 500m of the site.
Archaeological site	YES X	NO	The Heritage Impact Assessment identified two Later Iron Age sites within 500m of the site.
Other land uses (describe)	YES	NO X	

6 CULTURAL/ HISTORICAL FEATURES

Are there any signs of culturally or historically significant elements, as defined in section 2 of the National Heritage Resources Act, 1999, (Act No. 25 of 1999), including archaeological or paleontological sites, on or within 20m of the site?	YES X	NO

If YES, contact a specialist recommended by AMAFA to conduct a heritage impact assessment. The heritage impact assessment must be attached as an appendix to this report.

Briefly explain the recommendations of the specialist:	A number of graves are present within the open cast footprint and have been identified by members of the local community. Should Authorisation be granted for the extension, Zinoju will engage with Amafa and the local community in terms of the relocation of these graves. A buffer of 15m must be maintained around the three graveyards outside of the mining footprint and the two Later Iron Age sites identified by the Heritage Specialist (Active Heritage cc) – Report attached in Appendix D. A second phase heritage impact assessment will be required should the developer decide to expand the mining development towards the north and within the buffer zones of the identified sites.

Will any building or structure older than 60 years be affected in any way?	YES	NO X
Is it necessary to apply for a permit in terms of the National Heritage Resources Act, 1999 (Act 25 of 1999)?	YES X	NO

If YES, please submit the necessary application to AMAFA and attach proof thereof to this report.

Note: An application has been submitted to Amafa via SAHRIS, and a reference number is currently pending. Should Authorisation be granted, an application for the relocation of graves must be submitted.

SECTION D: PUBLIC PARTICIPATION

1 ADVERTISEMENT

The person conducting a public participation process must take into account any guidelines applicable to public participation as contemplated in section 24J of the Act and must give notice to all potential interested and affected parties of the application which is subjected to public participation by—

(a) fixing a notice board (of a size at least 60cm by 42cm; and must display the required information in lettering and in a format as may be determined by the competent authority) at a place conspicuous to the public at the boundary or on the fence of—
  (i) the site where the activity to which the application relates is or is to be undertaken; and
  (ii) any alternative site mentioned in the application;
(b) giving written notice to—
  (i) the owner or person in control of that land if the applicant is not the owner or person in control of the land;
  (ii) the occupiers of the site where the activity is or is to be undertaken or to any alternative site where the activity is to be undertaken;
  (iii) owners and occupiers of land adjacent to the site where the activity is or is to be undertaken or to any alternative site where the activity is to be undertaken;
  (iv) the municipal councillor of the ward in which the site or alternative site is situated and any organisation of ratepayers that represent the community in the area;
  (v) the local and district municipality which has jurisdiction in the area;
  (vi) any organ of state having jurisdiction in respect of any aspect of the activity (as identified in the application form for the environmental authorization of this project); and
  (vii) any other party as required by the competent authority;
(c) placing an advertisement in—
  (i) one local newspaper; or
  (ii) any official *Gazette* that is published specifically for the purpose of providing public notice of applications or other submissions made in terms of these Regulations;
(d) placing an advertisement in at least one provincial newspaper or national newspaper, if the activity has or may have an impact that extends beyond the boundaries of the metropolitan or district municipality in which it is or will be undertaken: Provided that this paragraph need not be complied with if an advertisement has been placed in an official *Gazette* referred to in subregulation 54(c)(ii); and
(e) using reasonable alternative methods, as agreed to by the competent authority, in those instances where a person is desiring of but unable to participate in the process due to—
  (i) illiteracy;
  (ii) disability; or
  (iii) any other disadvantage.

2 CONTENT OF ADVERTISEMENTS AND NOTICES

A notice board, advertisement or notices must:
(a) indicate the details of the application which is subjected to public participation; and
(b) state—
  (i) that an application for environmental authorization has been submitted to the KZN Department of Agriculture & Environmental Affairs in terms of the EIA Regulations, 2010;(ii)

(iii) a brief project description that includes the nature and location of the activity to which the application relates;
(iv) where further information on the application can be obtained; and
(iv) the manner in which and the person to whom representations in respect of the application may be made.

3 PLACEMENT OF ADVERTISEMENTS AND NOTICES

Where the proposed activity may have impacts that extend beyond the municipal area where it is located, a notice must be placed in at least one provincial newspaper or national newspaper, indicating that an application will be submitted to the competent authority in terms of these regulations, the nature and location of the activity, where further information on the proposed activity can be obtained and the manner in which representations in respect of the application can be made, unless a notice has been placed in any *Gazette* that is published specifically for the purpose of providing notice to the public of applications made in terms of the EIA regulations.

Advertisements and notices must make provision for all alternatives.

4 DETERMINATION OF APPROPRIATE PROCESS

The EAP must ensure that the public participation process is according to that prescribed in regulation 54 of the EIA Regulations, 2010, but may deviate from the requirements of subregulation 54(2) in the manner agreed by the KZN Department of Agriculture & Environmental Affairs as appropriate for this application. Special attention should be given to the involvement of local community structures such as Ward Committees, ratepayers associations and traditional authorities where appropriate.

Please note that public concerns that emerge at a later stage that should have been addressed may cause the competent authority to withdraw any authorisation it may have issued if it becomes apparent that the public participation process was inadequate.

Advertisement of Alleen 2 Open Cast Extension, Magdalena Colliery

- Advertisements were placed in the Newcastle Advertiser and Northern KwaZulu-Natal Courier newspapers on 22 November 2013. Please refer to Appendix E for copies of these advertisements.
- Site Notices were placed onsite on 26 November 2013 in both English and Zulu. Photographic proof is presented in Appendix E.
- A Background Information Document (BID) was sent to all identified Interested and Affected Parties (I&APs) by either email or registered mail on 11 December 2013.
- BIDs were delivered to community members and landowners by the Magdalena Colliery: proof of delivery is included in Appendix E.
- The Draft BAR was made available for public review and comment from 17 January to 25 February 2014.
- A public meeting was held on 21 February 2014 in order to provide I&APs with a further opportunity to raise concerns and submit comments.

5 COMMENTS AND RESPONSE REPORT

The practitioner must record all comments and respond to each comment of the public before this application is submitted. The comments and responses must be captured in a comments and response

report as prescribed in the EIA regulations (regulation 57 in the EIA Regulations, 2010) and be attached as Appendix E to this report.

6 PARTICIPATION BY DISTRICT, LOCAL AND TRADITIONAL AUTHORITIES

District, local and traditional authorities (where applicable) are all key interested and affected parties in each application and no decision on any application will be made before the relevant local authority is provided with the opportunity to give input. The planning and the environmental sections of the local authority must be informed of this application and provided with an opportunity to comment.

Has any comment been received from the district municipality?	YES	NO
	X	

If "YES", briefly describe the feedback below (also attach any correspondence to and from this authority with regard to this application):

A comment was received from the Amajuba District Municipality after submission of the Final BAR, dated 4 June 2014. The comments have been included in Table 3 at the beginning of this document, as well as in Appendix E of this report.

Has any comment been received from the local municipality?	YES	NO X

If "YES", briefly describe the feedback below (also attach any correspondence to and from this authority with regard to this application):

No comment has yet been received from the Dannhauser Local Municipality; however Mboneni Nene (Dannhauser) was notified of the availability of the Draft and Final BAR and provided with an opportunity to comment.

Has any comment been received from a traditional authority?	YES	NO X

If "YES", briefly describe the feedback below (also attach any correspondence to and from this authority with regard to this application):

No comment has yet been received from the traditional authority; however the mine management at Magdalena Colliery is in communication with the local community leaders by means of the Community Liaison Forum on an ongoing basis.

7 CONSULTATION WITH OTHER STAKEHOLDERS

Any stakeholder that has a direct interest in the site or property, such as servitude holders and service providers, should be informed of the application and be provided with the opportunity to comment.

Has any comment been received from stakeholders?	YES	NO
	X	

If "YES", briefly describe the feedback below (also attach copies of any correspondence to and from the stakeholders to this application):

A public meeting was held on 21 February 2014 in order to provide I&APs with a further opportunity to raise concerns and submit comments. A copy of the meeting minutes and register have been attached in Appendix E7.

A written comment was received from Ezemvelo KZN Wildlife on 11 April 2014, and a copy of this comment has been included in Appendix E8. In addition, comments were received from the DWA and are included in Appendix E8 and Table 2 at the beginning of this document.

SECTION E: IMPACT ASSESSMENT

The assessment of impacts must adhere to the requirements in the EIA Regulations, 2010, and should take applicable official guidelines into account. The issues raised by interested and affected parties should also be addressed in the assessment of impacts.

1 ISSUES RAISED BY INTERESTED AND AFFECTED PARTIES

List the main issues raised by interested and affected parties.

1. Issues raised in the public meeting (21 February 2014):
   a. Blasting and vibrations and possible damage to nearby buildings and houses.
   b. Impacts on livestock from proposed project.
   c. Rehabilitation of voids and pits and available funds.
   d. Dust impacts.
   e. Proposed relocations of local residents.
   f. Water recycling and availability of water for the community.
   g. Soil erosion.
   h. Pollution and depletion of borehole water.
   i. Duration of mining activities on site.
   j. Impact to uBuhle Be-Alleen school.
   k. Employment processes.
   l. Communication with landowners.
   m. Residential buffer zone from mining area.
   n. Impact to graves within mining footprint.
   o. Community benefits from the mine.
   p. Community access to excess slurry.

2. Issues raised by Ezemvelo KZN Wildlife (11 April 2014):

Recommendations for inclusion in Environmental Authorisation are given as follows (summarised):

   a. No access is allowed within ecologically sensitive areas (i.e. 1:100 year flood lines, wetlands, watercourses, ridges, breeding areas, etc.).
   b. Existing access routes to be used as far as possible.
   c. Stormwater Management Plan must be produced.
   d. Permits to be obtained for removal of protected plants.

Response from the practitioner to the issues raised by the interested and affected parties (A full response must be given in the Comments and Response Report that must be attached as Appendix E to this report):

1. Responses given in the public meeting (21 February 2014):
   a. Should any damage to nearby houses or other structures be reported, the damage will be assessed and if necessary, Zinoju will repair damage caused by blasting.
   b. Livestock may be affected by noise, blasting, vibrations, dust and water qualities.
   c. Rehabilitation of voids and pits will be undertaken and funds are available from DMR.
   d. Dust suppression will be undertaken along with ongoing monitoring.
   e. Relocation and compensation will be negotiated with the relevant families if Authorisation is granted.
   f. Water recycling is undertaken at the mine. Water is not within drinking standards and therefore not suitable to provide for community use.
   g. Soil erosion mitigation measures will be put in place.
   h. Borehole water may be depleted from natural causes and pollution may not be as a result of the mine, but the Zinoju will assist where possible if new boreholes are required.

i. Mining is expected to last for 3.5 years.
j. Mining will not intersect with the uBuhle Be-Alleen school.
k. Employment processes are in place and the Community Forum engages with the mine in terms of candidates for employment.
l. Some clarification of correspondence with the landowners was given, and some of the comments submitted by landowners on contact detail forms have been excluded from the Final Basic Assessment Report, as there is dispute as to why these comments were included.
m. The safe residential buffer zone from mining area is estimated to be 150m, but is at the residents' discretion.
n. Graves within mining footprint have been identified and if Authorisation is given, the process of applying for permits and negotiation with the relevant family members will be undertaken.
o. The mine has a Social Labour Plan which details community benefits from the mine.
p. The mine with facilitate community access to excess slurry.

2. Responses given to Ezemvelo KZN Wildlife (15 April 2014):
a. It is noted that Zinoju are applying for the mining footprint to extend through a number of ephemeral streams, and that the preferred site cannot feasibly exclude all of these. Therefore the recommendation to exclude from the 1:100 year floodline and streams / rivers would not be applicable should Authorisation be granted for Zinjou to mine within the watercourses. However, an Ecological Assessment has been undertaken for the project which investigated impacts to watercourses in great detail. This Assessment is available in Appendix D of the Draft Basic Assessment Report, and the updated Assessment will be included in the Final Report.
b. The comment is noted and it is recommended that where possible, the construction of access roads should be excluded from sensitive areas.
c. The recommendation for an updated Stormwater Management Plan is included in the BAR and EMP (Appendix F).
d. The recommendation for permits to be obtained for removal of protected plants is included in the BAR and EMP (Appendix F).

2 IMPACTS THAT MAY RESULT FROM THE PLANNING AND DESIGN, CONSTRUCTION, OPERATIONAL, DECOMMISSIONING AND CLOSURE PHASES AS WELL AS PROPOSED MANAGEMENT OF IDENTIFIED IMPACTS AND PROPOSED MITIGATION MEASURES

2.1 IMPACTS THAT MAY RESULT FROM THE PLANNING AND DESIGN PHASE

a. Site alternatives

List the potential impacts associated with site alternatives that are likely to occur during the planning and design phase:

Alternative S1 (preferred alternative)

Planning and design entails limited, non-intrusive site survey and desktop design work. Accordingly, no direct, indirect or cumulative 'site' related impacts are anticipated during this phase.

Alternative S2 (if any)

No-go alternative (compulsory)

In this case there will be no planning and design, therefore no direct, indirect or cumulative 'site' related impacts are anticipated in the planning and design phase.

Indicate mitigation measures to manage the potential impacts listed above:

Alternative S1	Alternative S2
None required.	

b. Process, technology, layout or other alternatives

List the impacts associated with any process, technology, layout or other alternatives that are likely to occur during the planning and design phase (please list impacts associated with each alternative separately):

Alternative A1 (preferred alternative)

Planning and design entails limited, non-intrusive site survey and desktop design work. Accordingly, no direct, indirect or cumulative 'process, technology or layout' related impacts are anticipated.

Alternative A2 (if any)

No-go alternative (compulsory)

In this case there will be no planning and design, therefore no direct, indirect or cumulative 'process, technology or layout' related impacts are anticipated in the planning and design phase.

Indicate mitigation measures to manage the potential impacts listed above:

Alternative A1:	Alternative A2:
None required.	

2.2 IMPACTS THAT MAY RESULT FROM THE CONSTRUCTION PHASE

a. Site alternatives

List the potential impacts associated with site alternatives that are likely to occur during the construction phase:

Alternative S1 (preferred site)

No direct, indirect or cumulative 'site' related impacts are anticipated during the construction phase. Refer to section (b) below for potential impacts to the preferred site.

Alternative S2 (if any)

No-go alternative (compulsory)

No direct 'site' related impacts are likely to occur with the no-go alternative, as the status quo will remain.

Indicate mitigation measures to manage the potential impacts listed above:

Alternative S1	Alternative S2
None required.	

b. Process, technology, layout or other alternatives

List the impacts associated with process, technology, layout or other alternatives that are likely to occur during the construction phase (please list impacts associated with each alternative separately):

Alternative A1 (preferred alternative)

The construction phase of the open cast extension will essentially comprise preparation of the area for mining activities, which is expected to include:

- Demolishing of houses and associated structures on site.
- Footprint clearance and levelling (vegetation clearing, topsoil stripping & earthworks).
- Topsoil, subsoil and overburden removal and stockpiling.
- Establishment of clean water management system (watercourse diversions, berms, channels and dams).
- Establishment of dirty water management system (berms, channels and dams)
- Establishment of access and haulage roads and associated watercourse .crossings and stormwater management infrastructure.
- Blasting in preparation of mining of coal reserves.
- Personnel and materials transport and haulage.
- Solid waste disposal and management.

It is noted that the sequential rollover method will be followed for open cast mining, and therefore site preparation, operational mining and rehabilitation will be undertaken on an ongoing basis as mining progresses through the open cast strip. The impacts described below therefore do not necessarily follow a fixed timeframe, but describe the likely impacts which may occur in the various activities of the roll over method. It will be important for site preparation to ensure that effective runoff/erosion control and pollution prevention measures are undertaken at the outset (i.e. stormwater management and soil protection).

The following environmental aspects associated with the construction phase (i.e. site preparation) of the proposed Alleen 2 Open Cast Extension have been considered:

Direct Impacts:

- *Social Environment*

Visual Intrusion

During the construction phase, dust and machinery may be visible within a 2km radius of the open cast extension area, resulting in a visual intrusion. The removal of vegetation and topsoil, as well as the creation of stockpiles will affect the visual character (sense of place) of the site for receptors within the viewshed of the site. However, due to the existing open cast mining adjacent to Alleen 2, visual impacts are not expected to significantly alter present conditions in the area. The impact is expected to have a medium-term duration (life of mine), following which closure and rehabilitation will reshape topography and the site will be re-vegetated.

Noise and Vibration Disturbance

Earth moving equipment will be on site to undertake the site clearing and preparation for open cast mining. In addition, blasting will be undertaken in advance of mining commencing on site. This will elevate noise levels in the vicinity of the project site. This elevation in noise levels may be a nuisance to surrounding communities and to animal life on / surrounding the project site. Noise levels may be in excess of 130dBA during the open cast development blasting. The noise of the blast may be audible within a 2km radius of the mine. Structures occurring within a 500m radius of the open cast area may be affected by blasting vibrations. This impact is expected to be ongoing throughout the establishment of pits at the open cast extension and will cease upon closure.

Health and Safety Impacts

Health impacts may occur during the construction phase in terms of particulate matter (dust) entering the lungs of labourers on site and residents in the nearby vicinity. Dust is expected to be generated during site clearing activities. In addition, the movement of earth moving machinery and construction vehicles on haul roads will present a safety risk to pedestrians or residents living in the nearby vicinity.

This impact is expected to continue throughout the operational phase.

Loss of Cultural and Heritage Resources

Consultation and a site walkover with local community members and Zinoju identified a number of graves within the mining footprint. Should authorisation be granted for the extension, an application will be lodged with Amafa in terms of the exhumation and relocation of these graves. The affected families will be engaged with in terms of the process of grave relocation.

Results of the Heritage Impact Assessment (HIA) (November 2013) undertaken by Active Heritage cc are as follows:

- A further five heritage sites were identified, including two Later Iron Age Sites, and three Grave Sites.
- All these sites, however, are situated more than 70m from the proposed mining footprint expansion as outlined by the developer. No mitigation is necessary for these sites as they are not threatened by the development. However, a buffer of 15m must be maintained around the grave sites and 50m around the Iron Age sites.
- A second phase HIA will be required should the developer decide to expand the mining development towards the north and within the buffer zones of the identified sites.
- Attention is drawn to the South African Heritage Resources Act, 1999 (Act No. 25 of 1999) and the KwaZulu-Natal Heritage Act (Act no 4 of 2008) which, requires that operations that expose archaeological or historical remains should cease immediately, pending evaluation by the provincial heritage agency.

An application has been lodged with Amafa aKwaZulu-Natali regarding the above HIA (Reference number to be confirmed by Amafa).

Loss of Agricultural and Community Land

The clearing for open cast mining will reduce the amount of available land for agricultural and residential purposes. While residences will be relocated (process ongoing between community members and mine management), the land would only be available for community use (such as grazing) once complete rehabilitation after mining has been achieved.

Local Employment

The construction phase is expected to provide continued employment to mine workers and prevent the laying off of staff. This positive impact will continue throughout the operational phase.

- *Physical (Abiotic) Environment*

Soil Erosion and Nutrient Loss

Disruption of the soil profile will occur as a result of movement of top-and subsoil from the open cast pits. Topsoil will be stripped to a depth of 300mm and stockpiled on the topsoil stockpile. Subsoil will then be stripped and stockpiled on the subsoil stockpile. The topsoil stockpile height will not exceed 3m, and will be utilised as soon as possible thus minimising the possibility of leaching (nutrient loss). Should soil management not be correctly undertaken, soil loss via wind and water erosion may occur, with the resultant loss of nutrients and valuable soil resources from the project area. This impact is linked to that of the loss of agricultural and community land, as a loss in soil resources would impact further agricultural activities on site.

Groundwater Contamination and Quantity Reduction

A Groundwater Assessment was undertaken for the proposed project (GCS, 2013) and is included in Appendix D of this document. Summarised findings of this assessment are as follows:

Low risk construction phase activities include removing topsoil and diversion of watercourses. Watercourses are typically dry but will feed into the groundwater during summer rainfall months. Removal of topsoil will create a sink for infiltration of dirty water runoff to the underlying aquifer. Excavation of overburden material by blasting poses a medium risk as this will increase the fracturing at the receiving face of the pit. This will result in increased seepage into the pit which will need to be pumped to the PCD's.

Surface Water Contamination

A Surface Water Assessment was undertaken for the proposed project (GCS, 2013) and is included in Appendix D of this document. Summarised findings of this assessment are as follows:

Surface water quality in the Poonaspruit and Bloubankspruit Streams may be impacted upon. This could occur as a result of:

- Mobilisation of sediments from areas cleared ahead of mining.
- Mobilisation of sediments from inter-burden, over-burden and residue deposits.
- Release of contact water from the over-burden and inter-burden, which have variable potential to generate Acid Rock Drainage and Metal Leaching (ARDML) and mobilise salts.
- Release of chemicals associated with mining.
- The construction of haul roads and transport of product material could increase the quantity of airborne coal sediments. This dust would settle on the ground surface where it would present additional sediments during rainfall events.

Air Pollution

Dust will be generated by wind blowing over exposed soils and unprotected stockpiles. In addition, vehicular emissions will be generated from earth moving machinery and transport vehicles. This impact will continue throughout the operational phase of the project and will likely affect nearby residents or passing traffic/pedestrians.

- *Biological Environment*

Direct Loss of Freshwater and Terrestrial Habitat (and Fauna and Flora)

All terrestrial and freshwater habitats within the proposed open cast strip extension will be cleared and destroyed during clearing and levelling.

The Desktop Ecological Assessment and rapid site walkover conducted by GCS (2013) (Appendix D) concluded that nine watercourses occur within the original proposed mining footprint (Please refer to Appendix C3 for a mine works plan for Alternative A2). The watercourses are classified as first-order in terms of their position in the landscape. While headwaters play an important role in the maintenance of the hydrological functions of river systems, the rapid site walkover concluded that these stream channels are highly eroded and degraded. The initial mining layout plan (Appendix C3) included all nine watercourses in the proposed mining footprint, which would mean that each of these would be mined through one by one as mining progresses through the site, and rehabilitated thereafter. However, following the finalisation of the Ecological Assessment, a final preferred layout plan (Appendix C2) was compiled which excluded the northern and southern-most watercourses from the mining footprint. The retention of these two watercourses will form an integral part of the stormwater management system to ensure clean and dirty water separation and direct surface water runoff away from the mining area. A 100m buffer from either side of the two watercourses has been applied. Please refer to Appendix A5 for a map indicating the applicable buffers.

The study also found that the proposed expansion area occurs within a sub-quaternary catchment

classified as a Fish Support Area by the National Freshwater Ecosystems Priority Areas Project (NFEPA) (CSIR, 2011). The rapid site walkover confirmed, however, that all the stream channels within the mining footprint were dry and highly modified by erosion. In terms of the classification of the sub-catchment as a FSA, it is important to note that the NFEPA database and plan is a coarse plan that requires onsite/infield verification. In this case, the stream channels observed on site provided no suitable fish habitat. However, it is important to note that the streams downstream of the mining footprint were not visited.

According to the NFEPA database, the closest wetland that could be potentially affected by the mining development is a square-shaped area approximately 6km downstream of the proposed extension and approximately 5km downstream of the property. However, this wetland is by-passed by an eroded and incised stream channel, thus reducing the severity of the impact of upstream activities on the wetland. According to the NFEPA database, two wetland areas are closer to the property, but will not be affected as they do not occur along the portions of the watercourse downstream (they are on incoming tributaries of the downstream watercourse). Based on an analysis of colour aerial photography, no wetland areas appear to be present on or immediately downstream and/or adjacent to the project site. Please refer to Appendix A5 of this report for a map indicating the 100m from each of the nearby wetlands, as well as the 100m buffer from either side of the watercourses to be excluded from the mining footprint.

In terms of terrestrial habitats, six potential/preliminary vegetation communities/habitats occur within the study area that include:

- Intact secondary grassland.
- Eroded secondary grassland.
- Eroded woody encroached secondary grassland.
- Secondary dense closed woody vegetation.
- Bare and sparsely vegetated erosion gullies, dongas and channels.
- Rural settlement and farming areas.

With the exception of the 'intact secondary grassland' community, all the vegetation communities were highly degraded and likely of low to moderately-low conservation importance. Of the above communities/habitats, only the 'intact secondary grassland' and 'secondary dense closed woody vegetation' units do not occur within the proposed mining footprint. Based on the KZN Terrestrial Systematic Conservation Plan and a previous ecological study undertaken for the discard dump extension project in similar habitat south of the study area, there is a possibility that scattered individuals / populations of the red-listed (threatened) millipede, *Doratogonus minor*, and the endemic mollusc, *Cochlitoma simplex*, may be present within the steeper, rocky areas within the intact secondary grassland and woody encroached secondary grassland areas within the study area, despite the high level of habitat degradation. For this reason, Dr Dai Herbert was requested to provide comment on the likelihood of the occurrence of C. simplex within the proposed mining footprint. D Herbert concluded that the likelihood of occurrence of the mollusc was low within the mining footprint but that it might be present within area to the upslope of the mining footprint. The study area was found to be of limited importance in terms of national and provincial biodiversity conservation and protected area planning.

However, it is important to note that despite the degraded state of the onsite and local freshwater and terrestrial habitats, uncontrolled land clearing and mining operations, and the poor management of contaminated dirty water will still likely result in significant cumulative impacts.

Indirect / Cumulative Impacts:

- *Social Environment*

Community Housing

A number of houses will need to be demolished for the proposed extension. The proposed project will result in new engineered homes being built for those residents relocated from the project site. Zinoju will initiate negotiations with the home owners and tenants to relocate them to a site acceptable to them. Newly built dwellings will be the same square meterage as the existing dwellings. It is noted that water supply delivery lines will be relocated by the mine, and will be reconnected to the supply line (supplied by Uthukela District Municipality) where necessary. All relocations will be undertaken at Zinoju's cost.

- *Biological Environment*

Indirect Disturbance to Adjacent Freshwater and Terrestrial Habitats

Indirect disturbances to freshwater and terrestrial habitats resulting from the open cast activities that will occur during the construction phase include:

- Dust related biotic damage.
- Noise and nuisance disturbances to biota resulting from blasting, excavations, ongoing construction and mining activities, and human presence,
- Alien invasive plant invasion.

As the watercourses are already highly disturbed and the associated in-stream and riparian habitats are transformed by rural settlement land uses and substantial erosion, the impact of the anticipated indirect disturbances to freshwater habitats resulting from the proposed open cast extension is likely to not be significant. As most of the surrounding terrestrial habitats are highly degraded and of low conservation value, the significance of these impacts will likely be low. Nevertheless, in line with good environmental practice, these impacts should be minimised as far as possible. However, more valuable terrestrial habitats are located upslope and south-west of the mining footprint, namely the intact secondary grassland and dense woody areas. It is important that the indirect impacts to these areas are minimised.

Erosion of Freshwater and Terrestrial Habitat

Watercourse erosion and sedimentation impacts will likely result from the following construction phase activities:

- Construction disturbances associated with clearing and earthworks activities in close proximity to watercourses.
- Exposure of bare slopes and surfaces that drain directly into the watercourses within the mining footprint.
- Increased discharge velocities at the clean water diversion discharge/inlet points.
- Disturbances during the construction of the watercourse crossings.
- Uncontrolled road stormwater discharges.

During the construction phase, the establishment of infrastructure in close proximity to watercourses could lead to the exacerbation of erosion and sedimentation within the watercourses if poor construction practices are implemented.

As the aquatic and riparian habitats of onsite streams and the downstream Poonaspruit and Bloubankspruit are already severely degraded, the above potential impacts are likely to be significantly reduced and not result in significant changes as long as proper clean and dirty surface water management measures are implemented. Nevertheless, substantial flow alteration to, and erosion of, the downstream watercourses as a result of poor design and implementation of best practice mine

surface water management is still unacceptable and must be minimised as far as possible.

Terrestrial habitat erosion and sedimentation impacts will likely result from the following construction phase activities:

- Exposure of bare slopes and surfaces within the mining footprint.
- Uncontrolled road stormwater discharges.

As most of the surrounding terrestrial habitats are already highly eroded and of low conservation value, the significance of these erosion impacts will likely be low. As the more valuable habitats are located upslope and south-west of the mining footprint, further erosion impacts to these areas resulting from the proposed mining extension are likely to be low.

Streamflow Reduction and Freshwater Habitat Degradation

It is best practice water management to contain and capture dirty water generated by the proposed open cast extension in the form of a network of artificial berms and ditches that drain into pollution control dams. However, the downside of such measures is that the dams will capture surface and subsurface flows and effectively remove a portion of the catchment from contributing to streamflow and ultimately reduce streamflows downstream. In addition, the timing and pattern of flows will also be altered through the attenuating effect of the dams. Such flow alteration will likely result in further downstream channel modification as the channels adjust to reduced discharges and peak flow pattern changes. However, the impact of the flow reduction on the integrity of the watercourses is substantially reduced as the watercourses and associated habitats are already highly altered and transformed. Nevertheless, in line with good environmental practice, these impacts should be minimised as far as possible.

Pollution of Watercourses and Freshwater Habitat Degradation

During all phases of the life of the mine (e.g. construction and commissioning, operation, closure and post-closure), the operation of the mine will pose serious water quality risks to the downstream watercourses. These risks/impacts include:

- Oils and hydrocarbon spills and runoff contamination.
- The generation of coal contaminated runoff and seepage from mine infrastructure, processing plant, waste and stockpile areas.
- Contaminated mine decant water discharges.

These risks are usually reduced through the containment and collection of all the dirty surface and subsurface water onsite through the use of berms, artificial drainage channels and pollution control dams. In addition, the amount of dirty water generated by the mining areas is usually reduced by ensuring that clean water is diverted away from these dirty water areas and re-directed back into the watercourses downstream.

In this case, the major pollutant sources are the pollution control dams themselves through leaking, breaching, overtopping and subsurface seepage if not lined. Ultimately, the negative impacts of watercourse contamination is the continued degradation of in-stream aquatic habitats downstream and the cumulative water quality and in-stream habitat degradation and biodiversity impacts to the greater Buffels River and Thukela River systems.

Terrestrial Habitat Reduction and Fragmentation

The reduction in habitat patch size and the fragmentation of habitat patches are known to disrupt important ecological processes and ultimately result in the reduction in the integrity and viability of ecological systems and habitats. The major cause of patch size reduction and fragmentation is the clearance and transformation of habitats for development. In this case, the habitats within the mining

footprint have all largely been transformed by rural development and overgrazing. The intact patches of secondary vegetation/habitats that remain are highly fragmented and small in size further contributing to their poor ecological integrity. Therefore, the fragmentation and patch size reduction impacts resulting from the proposed mining operation on the onsite and surrounding habitats will likely be limited.

Population Impacts

As the habitats onsite are highly degraded and transformed it is expected that the natural floral and faunal populations that would have occurred within these areas have long been transformed, displaced or destroyed. Therefore, the proposed impacts on faunal and floral populations within the mining footprint will likely be of limited significance. However, it is important to note that moderately important floral and faunal populations may be present within the intact secondary grassland and dense secondary wooded areas located upslope of the mining footprint.

Cumulative Impacts

The potential cumulative impacts resulting from the above-described impacts combining with the local and regional watercourse impacts are:

- The degeneration of local and regional ecosystem services and degradation of Buffels River hydro-geomorphic and ecological integrity.
- The degradation of local and regional water quality and in-stream habitat of the Buffels River.

Due to the intensive mining of the Buffels River catchment, the river system is under severe pressure from water pollution and flow alteration impacts. As a result, additional substantial impacts on water quality and quantity could, when combined with all the local impacts, result in a significant impact to freshwater ecosystem integrity. Therefore, it is important to ensure that the mitigation measures recommended are strictly adhered to.

Typical cumulative impacts to terrestrial ecosystems and biodiversity are:

- Cumulative loss of habitat in the region, province and country.
- Impacts on National and Provincial conservation obligations & targets.
- Cumulative increase in local and regional fragmentation / isolation of habitat.

Due to the highly degraded state of the land proposed to be mined, the significance of the above-listed impacts on local biodiversity and ultimately provincial and national biodiversity goals, targets and plans is likely to be low. As discussed above, the study area is of limited significance in terms of provincial and national biodiversity conservation planning. Therefore, it is anticipated that the cumulative impacts of the proposed construction phase on terrestrial systems will be limited.

In light of these desktop findings, there appear to be no major fatal flaws in terms of impacts to freshwater and terrestrial ecology and biodiversity provided that:

- Flow and water quality impacts to downstream freshwater ecosystems are minimised; and
- Impacts to the intact secondary grassland and dense secondary wooded areas are avoided and minimised.

Alternative A2

No-go alternative (compulsory)

Direct impacts:

No direct process/technology/layout related impacts are likely with the no-go alternative, as the status quo will remain.

Indirect / Cumulative impacts:

Loss of Potential Local Employment

Should the construction phase not go ahead, it is possible that the mine may need to lay off mine workers as the resources from the Alleen 2 section will not be available to Magdalena Colliery and operations will not be able to sustain the current number of employees.

Soil Erosion and Habitat Degradation

Should the project not go ahead, continued environmental degradation is expected on site as a result of poor farming practices and natural donga erosion.

Indicate mitigation measures to manage the potential impacts listed above:

Alternative A1:	Alternative A2:
The Magdalena Colliery has an approved EMPR which has been developed to provide mitigation measures in response to potential impacts related to all aspects of the mine. An EMP has been compiled for this open cast extension application and has been included in Appendix F.	

2.3 IMPACTS THAT MAY RESULT FROM THE OPERATIONAL PHASE

a. Site alternatives

List the potential impacts associated with site alternatives that are likely to occur during the operational phase:

Alternative S1 (preferred alternative)

No direct, indirect or cumulative 'site' related impacts are anticipated during the operational phase. Refer to section (b) below for potential impacts to the preferred site.

Alternative S2 (if any)

No-go alternative (compulsory)

In this case there will be no operational activities, therefore no direct, indirect or cumulative 'site' related impacts are anticipated in the operational phase.

Indicate mitigation measures to manage the potential impacts listed above:

Alternative S1	Alternative S2
None required.	

b. Process, technology, layout or other alternatives

List the impacts associated with process, technology, layout or other alternatives that are likely to occur during the operational phase (please list impacts associated with each alternative separately):

Alternative A1 (preferred alternative)

The following activities, which may impact on the wellbeing of people and the environment, will occur at the Alleen 2 open cast extension during the operational phase:

- Construction of access roads as required.
- Open cast mining (Sequential rollover method).
- Topsoil, subsoil and overburden stockpiling (management of soil stockpile areas).
- Product stockpiling (management of product stockpile areas).
- Product transport and conveyance.

- Mine residue deposit discard and dumping (management of discard dump at the Magdalena Colliery).
- Dust control (re-use of dirty water for dust suppression).
- Operation and management of clean water management system.
- Operation and management of dirty water management system.
- Open cast void workings dewatering.
- Water abstraction and recycling.
- Solid waste disposal and management.
- Hazardous materials handling and storage.
- Hazardous waste disposal and management.
- Personnel and materials transport and haulage.

The following environmental aspects associated with the operational phase of the proposed Alleen 2 open cast extension have been considered:

Direct Impacts:

- *Social Environment*

Visual Disturbance

During the operational phase, dust and machinery may be visible within a 2km radius of the open cast extension area, resulting in a visual intrusion. Some of the open cast workings may be visible to local communities and neighbouring farms within the viewshed of the site. However, due to the existing open cast mining adjacent to Alleen 2, visual impacts are not expected to significantly alter present conditions in the area. The impact is expected to have a medium-term duration (life of mine), following which closure and rehabilitation will reshape topography and the site will be re-vegetated.

Noise and Vibration Disturbance

Blasting will be required to enable the removal of overburden layers and the coal seam. Blasting gives rise to noise and vibration. The noise of the blast will exceed 130dBA, although this will attenuate to within acceptable levels within a short distance of the blasting area. Vehicle movement on onsite, access and haul roads will also elevate the noise levels in the vicinity of the project site and the surrounding areas. The elevation in noise levels will affect both surrounding communities as well as livestock and local fauna. Structures occurring within a 500m radius of the open cast area may be affected by blasting vibrations. This impact is expected to be ongoing throughout mining at Alleen 2 and will cease upon closure.

Health and Safety Impacts

Health impacts may occur during the operational phase in terms of particulate matter (dust) entering the lungs of labourers on site and residents in the nearby vicinity. Dust is expected to be generated during blasting and the rollover method of mining. In addition, the movement of earth moving machinery and coal transportation vehicles on haul roads will present a safety risk to pedestrians or residents living in the nearby vicinity. This impact is expected to continue throughout the operational phase.

Loss of Cultural and Heritage Resources

Consultation and a site walkover with local community members and Zinoju identified a number of graves within the mining footprint. Should authorisation be granted for the extension, an application will be lodged with Amafa in terms of the exhumation and relocation of these graves. The affected families will be engaged with in terms of the process of grave relocation.

Results of the Heritage Impact Assessment (HIA) (November 2013) undertaken by Active Heritage cc are as follows:

- A further five heritage sites were identified, including two Later Iron Age Sites, and three Grave Sites.
- All these sites, however, are situated more than 70m from the proposed mining footprint expansion as outlined by the developer. No mitigation is necessary for these sites as they are not threatened by the development. However, a buffer of 15m must be maintained around the grave sites and 50m around the Iron Age sites.
- A second phase HIA will be required should the developer decide to expand the mining development towards the north and within the buffer zones of the identified sites.
- Attention is drawn to the South African Heritage Resources Act, 1999 (Act No. 25 of 1999) and the KwaZulu-Natal Heritage Act (Act no 4 of 2008) which, requires that operations that expose archaeological or historical remains should cease immediately, pending evaluation by the provincial heritage agency.

An application has been lodged with Amafa aKwaZulu-Natali for review of the HIA.

Loss of Agricultural and Community Land

Open cast mining at Alleen 2 will reduce the amount of available land for agricultural and residential purposes. While residences will be relocated (process ongoing between community members and mine management), the land would only be available for community use (such as grazing) once complete rehabilitation after mining has been achieved.

Local Employment

The operational phase is expected to provide continued employment to mine workers and prevent the laying off of staff. This positive impact will continue throughout the operational phase.

- *Physical (Abiotic) Environment*

Groundwater Contamination and Quantity Reduction

Summarised findings of the Groundwater Assessment (Appendix D) are as follows:

Pit dewatering will continue during the operational phase which will create a cone of depression around the open cast pit. Once the overburden has been removed the coal seam will be exposed. This will need to be transported via haulage roads to the stockpile area. Transportation via the haulage road poses a low risk to groundwater quality as spillages will be small. The risk can be furthered reduced by cleaning any spillages that occur. The coal stockpiles pose a medium risk as the coal has a high acid generation potential. The base of the stockpile should be compacted to reduce seepage to the underlying aquifer. Dirty water runoff from the stockpile must be diverted to the PCD's. The PCD's pose a high risk to groundwater quality as all polluted runoff will be diverted to these dams. However, the risk can be reduced significantly by lining these dams. Lining the PCD's will result in a low risk.

Change in Surface Water Quantity (Peak Flows and Volumes)

Summarised findings of the Surface Water Assessment (Appendix D) are as follows:

It is anticipated that the proposed open cast extension will affect the nature of the natural drainage catchment on site and alter the rainfall runoff response in the area. It should be noted that the effective area of the catchment could be significantly reduced due to the assumed capture, retention and reuse of rainfall within the proposed open cast extension area. It is evident that the proposed open cast extension will reduce peak flows and volumes in the catchment. The comparison between the baseline and post development figures shows an average net decrease of roughly 6% in both 50- and 100-year peak flows and volumes.

Surface Water Contamination

Summarised findings of the Surface Water Assessment (Appendix D) are as follows:

The catchment characteristics of the Poonaspruit catchment will be altered by the proposed extension. The open cast extension area has been classified as 'dirty' in terms of the DWA Best Practice Guidelines. Every effort must be made to separate clean and dirty areas by containing runoff from 'dirty' areas. Surface water runoff and rainwater from the open cast area should be collected and contained in order to ensure the following objectives are met:

- Minimisation of contaminated areas reuse of dirty water (where possible).
- Minimisation of seepage from the open cast facility by dewatering the pits.
- Prevention of overflows and minimization of seepage losses from storage facilities (pollution control dams) Prevention of further deterioration of water quality.

Air Pollution

Dust will be generated by blasting and wind blowing over exposed soils and unprotected stockpiles. In addition, vehicular emissions will be generated from earth moving machinery, mining and transport vehicles. Increased traffic will generate more dust on gravel roads. The vehicles moving over the area are expected to generate dust which will likely affect nearby residents or passing traffic/pedestrians within 200m of all the gravel roads.

- *Biological Environment*

Direct Loss of Freshwater and Terrestrial Habitat (and Fauna and Flora)

All terrestrial and freshwater habitats within the proposed open cast strip extension will be cleared and destroyed during operational activities.

As per Section 2.2b above, the Desktop Ecological Assessment (Appendix D) concluded that with the exception of the 'intact secondary grassland' community, all the vegetation communities were highly degraded and likely of low to moderately-low conservation importance. However, it is important to note that despite the degraded state of the onsite and local freshwater and terrestrial habitats, uncontrolled land clearing and mining operations, and the poor management of contaminated dirty water will still likely result in significant cumulative impacts.

Indirect / Cumulative Impacts:

- *Biological Environment*

Indirect Disturbance to Adjacent Terrestrial and Freshwater Habitat

Indirect disturbances to freshwater and terrestrial habitats resulting from the open cast activities that will occur during the operational phase include:

- Dust related biotic damage.
- Noise and nuisance disturbances to biota resulting from blasting, excavations, ongoing construction and mining activities, and human presence.
- Alien invasive plant invasion.

As the watercourses are already highly disturbed and the associated in-stream and riparian habitats are transformed by rural settlement land uses and substantial erosion, the impact of the anticipated indirect disturbances to freshwater habitats resulting from the proposed open cast extension is likely to not be significant. As most of the surrounding terrestrial habitats are highly degraded and of low conservation value, the significance of these impacts will likely be low. Nevertheless, in line with good environmental

practice, these impacts should be minimised as far as possible. However, more valuable terrestrial habitats are located upslope and south-west of the mining footprint, namely the intact secondary grassland and dense woody areas. It is important that the indirect impacts to these areas are minimised.

Erosion of Freshwater and Terrestrial Habitat

Watercourse erosion and sedimentation impacts will likely result from the following operational phase activities:

- Uncontrolled road stormwater discharges.
- Canalisation/concentration of flow through watercourse crossings.
- Increased floodpeaks generated during the overtopping and breaching of the pollution control dams during floods.
- Exposure of bare slopes and surfaces of that drain directly into the watercourses during dismantling and rehabilitation.

During operation, the exposure of bare slopes and surfaces to the elements will likely lead to rill and gully erosion over time if runoff and erosion control measures are not effectively implemented. Upstream channelled flow and surface runoff will need to be diverted into artificial drainage channels that ultimately divert flows around the mining footprint and into the channels downstream. Such an activity could have the following potential impacts:

- The erosion of the artificial diversion channels and the resultant sedimentation of the downstream watercourses at the diversion discharge / inlet point.
- Erosion of downstream watercourses at the diversion discharge / inlet point.
- Sedimentation of the downstream watercourses as a result of erosion at the discharge / inlet point.

Another potential impact to flows is the episodic overtopping of the pollution control dams and/or the breaching of the pollution control dams during flood events which would result in a floodpeak pulse progressing downstream and ultimately significant channel erosion. As the aquatic and riparian habitats of onsite streams and the downstream Poonaspruit and Bloubankspruit are already severely degraded, the above potential impacts are likely to be significantly reduced and not result in significant changes as long as proper clean and dirty surface water management measures are implemented. Nevertheless, substantial flow alteration to, and erosion of, the downstream watercourses as a result of poor design and implementation of best practice mine surface water management is still unacceptable and must be minimised as far as possible.

Terrestrial habitat erosion and sedimentation impacts will likely result from the following operational phase activities:

- Exposure of bare slopes and surfaced within the mining footprint.
- Uncontrolled road stormwater discharges.

As most of the surrounding terrestrial habitats are already highly eroded and of low conservation value, the significance of these erosion impacts will likely be low. As the more valuable habitats are located upslope and south-west of the mining footprint, further erosion impacts to these areas resulting from the proposed mining extension are likely to be low.

Streamflow Reduction and Freshwater Habitat Degradation

It is best practice water management to contain and capture dirty water generated by the proposed open cast extension in the form of a network of artificial berms and ditches that drain into pollution control dams. However, the downside of such measures is that the dams will capture surface and subsurface flows and effectively remove a portion of the catchment from contributing to streamflow and ultimately reduce streamflows downstream. In addition, the timing and pattern of flows will also be

altered through the attenuating effect of the dams. Such flow alteration will likely result in further downstream channel modification as the channels adjust to reduced discharges and peak flow pattern changes. However, the impact of the flow reduction on the integrity of the watercourses is substantially reduced as the watercourses and associated habitats are already highly altered and transformed. Nevertheless, in line with good environmental practice, these impacts should be minimised as far as possible.

Pollution of Watercourses and Freshwater Habitat Degradation

During all phases of the life of the mine (e.g. construction and commissioning, operation, closure and post-closure), the operation of the mine will pose serious water quality risks to the downstream watercourses. These risks/impacts include:

- Oils and hydrocarbon spills and runoff contamination.
- The generation of coal contaminated runoff and seepage from mine infrastructure, processing plant, waste and stockpile areas.
- Contaminated mine decant water discharges.

These risks are usually reduced through the containment and collection of all the dirty surface and subsurface water onsite through the use of berms, artificial drainage channels and pollution control dams. In addition, the amount of dirty water generated by the mining areas is usually reduced by ensuring that clean water is diverted away from these dirty water areas and re-directed back into the watercourses downstream.

In this case, the major pollutant sources are the pollution control dams themselves through leaking, breaching, overtopping and subsurface seepage if not lined. Ultimately, the negative impacts of watercourse contamination is the continued degradation of in-stream aquatic habitats downstream and the cumulative water quality and in-stream habitat degradation and biodiversity impacts to the greater Buffels River and Thukela River systems.

Cumulative Impacts

The potential cumulative impacts resulting from the above-described impacts combining with the local and regional watercourse impacts are:

- The degeneration of local and regional ecosystem services and degradation of Buffels River hydro-geomorphic and ecological integrity.
- The degradation of local and regional water quality and in-stream habitat of the Buffels River.

Due to the intensive mining of the Buffels River catchment, the river system is under severe pressure from water pollution and flow alteration impacts. As a result, additional substantial impacts on water quality and quantity could, when combined with all the local impacts, result in a significant impact to freshwater ecosystem integrity. Therefore, it is important to ensure that the mitigation measures recommended are strictly adhered to.

Typical cumulative impacts to terrestrial ecosystems and biodiversity are:

- Cumulative loss of habitat in the region, province and country.
- Impacts on National and Provincial conservation obligations & targets.
- Cumulative increase in local and regional fragmentation / isolation of habitat.

Due to the highly degraded state of the land proposed to be mined, the significance of the above-listed impacts on local biodiversity and ultimately provincial and national biodiversity goals, targets and plans is likely to be low. As discussed above, the study area is of limited significance in terms of provincial and national biodiversity conservation planning. Therefore, it is anticipated that the cumulative impacts of the proposed construction phase on terrestrial systems will be limited.

In light of these desktop findings, there appear to be no major fatal flaws in terms of impacts to freshwater and terrestrial ecology and biodiversity provided that:

- Flow and water quality impacts to downstream freshwater ecosystems are minimised; and
- Impacts to the intact secondary grassland and dense secondary wooded areas are avoided and minimised.

Alternative A2

No-go alternative (compulsory)

Direct impacts:

No direct process/technology/layout related impacts are likely with the no-go alternative, as the status quo will remain.

Indirect / Cumulative impacts:

Loss of Potential Local Employment

Should the operational phase not go ahead, it is possible that the mine may need to lay off mine workers as the resources from the Alleen 2 section will not be available to Magdalena Colliery and operations will not be able to sustain the current number of employees.

Soil Erosion and Habitat Degradation

Should the project not go ahead, continued environmental degradation is expected on site as a result of poor farming practices and natural donga erosion.

Indicate mitigation measures to manage the potential impacts listed above:

Alternative A1	Alternative A2
The Magdalena Colliery has an approved EMPR which has been developed to provide mitigation measures in response to potential impacts related to all aspects of the mine. An EMP has been compiled for this open cast extension application and has been included in Appendix F.	

2.4 IMPACTS THAT MAY RESULT FROM THE DECOMISSIONING OR CLOSURE PHASE

a. Site alternatives

List the potential impacts associated with site alternatives that are likely to occur during the decommissioning or closure phase:

Alternative S1 (preferred alternative)

No direct, indirect or cumulative 'site' related impacts are anticipated during the decommissioning or closure phase.

Alternative S2

No-go alternative (compulsory)

In this case there will be no decommissioning or closure. Accordingly, no 'site' related impacts are anticipated during the decommissioning or closure phase.

Indicate mitigation measures to manage the potential impacts listed above:

Alternative S1	Alternative S2
None required.	

b. Process, technology, layout or other alternatives

List the impacts associated with process, technology, layout or other alternatives that are likely to occur during the decommissioning or closure phase (please list impacts associated with each alternative separately):

Alternative A1 (preferred alternative)

The following activities are expected to occur at the Alleen 2 open cast extension during the closure phase:

- Rehabilitation of pollution control dams and reuse of water contained therein for dust suppression.
- Surface and ground water monitoring.
- Filling of voids created by open cast pits.
- Rehabilitation of diverted watercourses and installation of erosion control structures.
- Replacement of subsoil and topsoil on all rehabilitated areas, with agricultural fertilisers added to supplement the soil where necessary.

The following environmental aspects associated with the closure phase of the proposed Alleen 2 open cast extension have been considered:

Direct Impacts:

- *Social Environment*

Reduction in Noise Levels

Although blasting and transportation of coal along the various roads will cease, noise will be generated through earth moving equipment operating on site during rehabilitation. This will limit the noise generated in terms of levels and extent.

Health and Safety Impacts

The same health and safety impacts are expected as for the construction and operational phases. Health impacts may occur during the closure phase in terms of particulate matter (dust) entering the lungs of labourers on site and residents in the nearby vicinity during rehabilitation activities. Dust is expected to be generated during rehabilitation activities. In addition, the movement of earth moving machinery and vehicles on haul roads will present a safety risk to pedestrians or residents living in the nearby vicinity.

Loss of Cultural and Heritage Resources

Consultation and a site walkover with local community members and Zinoju identified a number of graves within the mining footprint. Should authorisation be granted for the extension, an application will be lodged with Amafa in terms of the exhumation and relocation of these graves. The affected families will be engaged with in terms of the process of grave relocation.

Results of the Heritage Impact Assessment (HIA) (November 2013) undertaken by Active Heritage cc are as follows:

- A further five heritage sites were identified, including two Later Iron Age Sites, and three Grave Sites.
- All these sites, however, are situated more than 70m from the proposed mining footprint expansion as outlined by the developer. No mitigation is necessary for these sites as they are not threatened by the development. However, a buffer of 15m must be maintained around the grave sites and 50m around the Iron Age sites.

- A second phase HIA will be required should the developer decide to expand the mining development towards the north and within the buffer zones of the identified sites.
- Attention is drawn to the South African Heritage Resources Act, 1999 (Act No. 25 of 1999) and the KwaZulu-Natal Heritage Act (Act no 4 of 2008) which, requires that operations that expose archaeological or historical remains should cease immediately, pending evaluation by the provincial heritage agency.

An application has been lodged with Amafa aKwaZulu-Natali regarding the above HIA.

Increase in Land Capability

Due to the gradual cessation of mining operations and continued rehabilitation of the areas, the land capability will steadily increase from mining to grazing or agricultural capability. Rehabilitated land will be made available once again for agricultural / grazing purposes by the local community. Rehabilitation is expected to improve the site's condition from the current status quo, where currently large dongas characterise much of the site. However the land will not be suitable for construction of houses, as mined land has the potential to be unstable. All residents currently living on the site will be consulted with in terms of their relocation and construction of new residences.

- *Physical Environment*

Rehabilitation of Watercourses

All watercourses disturbed during mining will be reshaped and stone-pitched to prevent further erosion of drainage lines. Rehabilitation is expected to improve the site's condition from the current status quo, where currently large dongas characterise much of the site.

Reshaping of Topography

In the open cast areas, an altered topography, generally steeper than the original, can be expected as a result of the bulking factor during backfilling. This may increase the potential for soil erosion. Uneven surfaces may arise due to differential settling of the backfilled areas. In addition, it will be necessary to create a slightly convex topography in order to encourage drainage off the backfilled areas and ensure that the site is free draining. Thus, post-mining topography will differ slightly from the original.

Soil Replacement

Removal of a 150mm layer of subsoil from the stockpiling and road areas. Ongoing rehabilitation during the decommissioning phase of the project will restore soils from their stockpiled positions to a more natural situation. Sub and top-soils will be placed back onto the land in the correct sequence. Note that some soils will be contaminated, and thus reduce probability of vegetation establishment. Placement of a 150mm topsoil layer over these places will ensure that vegetation establishment will be successful. Some of these soils will be compacted and thus leached. Ripping of the soils, and placement of a 150mm soil layer will increase soil capability for vegetation establishment.

Ground Water Contamination and Quantity Reduction

Summarised findings of the Groundwater Assessment (Appendix D) are as follows:

Backfilling the open cast pit will also pose a high risk to groundwater quality as the geology, most significantly shale, has an acid generation potential and high sulphur content. Long term sulphate plume development is anticipated. The risk to groundwater quality will be reduced if the shale is put back into the pit first and compacted. The cone of depression created during the operational phase will reduce over time as natural groundwater ingress and flow regime resumes.

Surface Water Contamination

Summarised findings of the Surface Water Assessment (Appendix D) are as follows:

Surface water quality in the Poonaspruit and Bloubankspruit Streams may be impacted upon. This could occur as a result of removal of infrastructure and rehabilitation activities, resulting in pollution of water resources, polluted runoff from discard dump and stockpiles and siltation of watercourses. However, ongoing monitoring and maintenance following closure is expected to result in a reduction in the pollution of water resources.

- *Biological Environment*

Direct Loss of Freshwater Habitat (and Fauna and Flora)

The rehabilitation and closure phases may result in disturbances to watercourses and freshwater habitats during decommissioning of road watercourse crossings, PCDs and upgrading of PCDs to be retained.

As per Section 2.2b above, the Desktop Ecological Assessment (Appendix D) concluded that with the exception of the 'intact secondary grassland' community, all the vegetation communities were highly degraded and likely of low to moderately-low conservation importance. However, it is important to note that despite the degraded state of the onsite and local freshwater and terrestrial habitats, the poor management of contaminated dirty water will still likely result in significant cumulative impacts.

Indirect / Cumulative Impacts:

- *Biological Environment*

Erosion of Freshwater and Terrestrial Habitat

Watercourse erosion and sedimentation impacts will likely result from the following activities:

- The decommissioning of dirty water pollution control dams.
- The decommissioning of the clean water dams.
- The re-instatement of the natural watercourses.
- Exposure of poorly vegetated slopes and surfaces where soil stabilisation and re-vegetation was unsuccessful.
- Increased inputs from mine decant water discharges.
- Increased floodpeaks generated during the overtopping and breaching of the retained pollution control dams during floods.

Upstream channelled flow and surface runoff will need to be diverted into artificial drainage channels that ultimately divert flows around the mining footprint and into the channels downstream. Such an activity could have the following potential impacts:

- The erosion of the artificial diversion channels and the resultant sedimentation of the downstream watercourses at the diversion discharge / inlet point.
- Erosion of downstream watercourses at the diversion discharge / inlet point.
- Sedimentation of the downstream watercourses as a result of erosion at the discharge / inlet point.

Another potential impact to flows is the episodic overtopping of the pollution control dams and/or the breaching of the pollution control dams during flood events which would result in a floodpeak pulse progressing downstream and ultimately significant channel erosion.

As the aquatic and riparian habitats of onsite streams and the downstream Poonaspruit and

Bloubankspruit are already severely degraded, the above potential impacts are likely to be significantly reduced and not result in significant changes as long as proper clean and dirty surface water management measures are implemented. Nevertheless, substantial flow alteration to, and erosion of, the downstream watercourses as a result of poor design and implementation of best practice mine surface water management is still unacceptable and must be minimised as far as possible.

Terrestrial habitat erosion and sedimentation impacts will likely result from the following activities:

- Exposure of bare slopes and surfaces during dismantling and rehabilitation.
- Exposure of poorly vegetated slopes and surfaces where soil stabilisation and re-vegetation was unsuccessful.
- Increased inputs from mine decant water discharges.

As most of the surrounding terrestrial habitats are already highly eroded and of low conservation value, the significance of these erosion impacts will likely be low. As the more valuable habitats are located upslope and south-west of the mining footprint, further erosion impacts to these areas resulting from the proposed mining extension are likely to be low.

Pollution of Watercourses and Freshwater Habitat Degradation

During all phases of the life of the mine (e.g. construction and commissioning, operation, closure and post-closure), the operation of the mine will pose serious water quality risks to the downstream watercourses. These risks/impacts include:

- Oils and hydrocarbon spills and runoff contamination.
- The generation of coal contaminated runoff and seepage from mine infrastructure, processing plant, waste and stockpile areas.
- Contaminated mine decant water discharges.

These risks are usually reduced through the containment and collection of all the dirty surface and subsurface water onsite through the use of berms, artificial drainage channels and pollution control dams. In addition, the amount of dirty water generated by the mining areas is usually reduced by ensuring that clean water is diverted away from these dirty water areas and re-directed back into the watercourses downstream.

In this case, the major pollutant sources are the pollution control dams themselves through leaking, breaching, overtopping and subsurface seepage if not lined. In addition, acid mine drainage from rehabilitated mine workings is always a risk in the closure and post-closure phases if the pollution control dams are decommissioned.

Ultimately, the negative impacts of watercourse contamination is the continued degradation of in-stream aquatic habitats downstream and the cumulative water quality and in-stream habitat degradation and biodiversity impacts to the greater Buffels River and Thukela River systems.

Cumulative Impacts

The potential cumulative impacts resulting from the above-described impacts combining with the local and regional watercourse impacts are:

- The degeneration of local and regional ecosystem services and degradation of Buffels River hydro-geomorphic and ecological integrity.
- The degradation of local and regional water quality and in-stream habitat of the Buffels River.

Due to the intensive mining of the Buffels River catchment, the river system is under severe pressure from water pollution and flow alteration impacts. As a result, additional substantial impacts on water quality and quantity could, when combined with all the local impacts, result in a significant impact to

freshwater ecosystem integrity. Therefore, it is important to ensure that the mitigation measures recommended are strictly adhered to.

Typical cumulative impacts to terrestrial ecosystems and biodiversity are:

- Cumulative loss of habitat in the region, province and country.
- Impacts on National and Provincial conservation obligations & targets.
- Cumulative increase in local and regional fragmentation / isolation of habitat.

Due to the highly degraded state of the land proposed to be mined, the significance of the above-listed impacts on local biodiversity and ultimately provincial and national biodiversity goals, targets and plans is likely to be low. As discussed above, the study area is of limited significance in terms of provincial and national biodiversity conservation planning. Therefore, it is anticipated that the cumulative impacts of the proposed construction phase on terrestrial systems will be limited.

In light of these desktop findings, there appear to be no major fatal flaws in terms of impacts to freshwater and terrestrial ecology and biodiversity provided that:

- Flow and water quality impacts to downstream freshwater ecosystems are minimised; and
- Impacts to the intact secondary grassland and dense secondary wooded areas are avoided and minimised.

Alternative A2

No-go alternative (compulsory)

In this case, there will be no closure of the open cast extension, and the operational phase will continue until all coal reserves on site have been completed. However, should the closure phase not go ahead, there will be no rehabilitation of the site. Other than impacts already identified for the operational phase, no further direct, indirect or cumulative impacts are anticipated.

Indicate mitigation measures to manage the potential impacts listed above:

Alternative A1	Alternative A2
None required.	

2.5 PROPOSED MONITORING AND AUDITING

For each phase of the project and for each alternative, please indicate how identified impacts and mitigation will be monitored and/or audited.

Alternative S1 (preferred site)	Alternative S2
N/A	

Alternative A1 (preferred alternative)	Alternative A2
The EMP provides a comprehensive programme for mitigation impacts at the Alleen 2 open cast extension (Appendix F).	

3 ENVIRONMENTAL IMPACT STATEMENT

Taking the assessment of potential impacts into account, please provide an environmental impact statement that summarises the impact that the proposed activity and its alternatives may have on the environment after the management and mitigation of impacts have been taken into account, with specific reference to types of impact, duration of impacts, likelihood of potential impacts actually occurring and the significance of impacts.

Methodology for Impact Significance Scoring

The significance (quantification) of potential environmental impacts identified during the Basic Assessment have been determined using a ranking scale, based on the following (terminology has been taken from the Guideline Documentation on EIA Regulations, by the Department of Environmental Affairs and Tourism, April 1998):

Status of Impact	
+: Positive (A benefit to the receiving environment)	
N: Neutral (No cost or benefit to the receiving environment)	
-: Negative (A cost to the receiving environment)	
Magnitude:=M	*Duration:=D*
10: Very high/don't know	5: Permanent
8: High	4: Long-term (ceases with the operational life)
6: Moderate	3: Medium-term (5-15 years)
4: Low	2: Short-term (0-5 years)
2: Minor	1: Immediate
0: Not applicable/none/negligible	0: Not applicable/none/negligible
Scale:=S	*Probability:=P*
5: International	5: Definite/don't know
4: National	4: Highly probable
3: Regional	3: Medium probability
2: Local	2: Low probability
1: Site only	1: Improbable
0: Not applicable/none/negligible	0: Not applicable/none/negligible

The environmental significance of each potential impact is assessed using the following formula:

Significance Points (SP) = (Magnitude + Duration + Scale) x Probability

The maximum value is 100 significance points (SP). Potential environmental impacts were rated on the following basis:

Significance	*Environmental Significance Points*	*Colour Code*
High (positive)	>60	H
Medium (positive)	30 to 60	M
Low (positive)	<30	L
Neutral	0	N
Low (negative)	>-30	L
Medium (negative)	-30 to -60	M
High (negative)	<-60	H

The tables below summarises all the identified impacts and their significance ratings without and with mitigation.

Alternative S1 (preferred site)

No direct, indirect or cumulative 'site' related impacts are anticipated.

Alternative S2

Alternative A1 (preferred alternative)

Note: Mitigation measures relating to the below impacts are contained in the EMP (Appendix F).

POTENTIAL ENVIRONMENTAL IMPACT	ACTIVITY	ENVIRONMENTAL SIGNIFICANCE BEFORE MITIGATION							RECOMMENDED MITIGATION MEASURES	ENVIRONMENTAL SIGNIFICANCE AFTER MITIGATION						
		M	D	S	P	TOTAL	STATUS	SP		M	D	S	P	TOTAL	STATUS	SP
CONSTRUCTION PHASE ACTIVITIES: SITE PREPARATION, FOOTPRINT CLEARANCE, PIT DEVELOPMENT AND WASTE HANDLING																
VISUAL INTRUSION																
Visual intrusion and nuisance resulting from dust pollution.	**Site Preparation -** clearing of vegetation and soil, creation of stockpiles	4	2	2	4	32	-	M	Implementation of dust suppression measures	4	2	2	2	16	-	L
Visual intrusion resulting from the presence of machinery and earth moving vehicles on site.	**Site Preparation -** clearing of vegetation and soil, creation of stockpiles	4	2	2	4	32	-	M	Keep vegetation removal to a minimum, clear areas only within the open cast strip, and not all at one time (i.e. clearing with roll over method).	4	2	2	3	24	-	L
Change in sense of place from removal of vegetation	**Footprint Clearance -** clearing of vegetation, gardens and residences	6	2	2	4	40	-	M	Keep vegetation removal to a minimum, clear areas only within the open cast strip, and not all at one time (i.e. clearing with roll over method).	4	2	2	3	24	-	L
Visual intrusion resulting from creation of stockpiles	**Formation of stockpiles** - Placement of material outside of open cast pit	4	2	2	3	24	-	L	Keep stockpile height to a minimum.	4	2	2	2	16	-	L
NOISE AND VIBRATION DISTURBANCE																
Noise pollution from earth moving activities on site	**Footprint Clearance** - movement of earth moving vehicles and machinery on site	8	2	2	5	60	-	M	Equipment on site to be properly muffled and maintained so as to reduce noise generation to the minimum.	6	2	2	3	30	-	M
Noise from blasting affecting nearby residents, livestock and wildlife	**Construction** - Pit construction and blasting	8	2	2	5	60	-	M	Utilise the minimum possible explosives to achieve maximum affect. Working area to be fenced off and livestock to be kept in a designated grazing area.	6	2	2	2	20	-	L

									Nearby residents and farmers to be notified at least one day prior to blasting. The blasting area must be checked for livestock (500m radius of blast recommended) prior to blasting.							
Structural damage to nearby buildings from blasting	**Construction** - Pit construction and blasting	8	2	2	5	60	-	M	All such structures to be inspected on a 6-monthly basis (or at the residents request) for signs of vibration or blasting damage. Any damage which arises as a result of blasting or activities at the mine, to be repaired by the mine, at the mine's expense.	6	2	2	3	30	-	M
HEALTH AND SAFETY IMPACTS																	
Health impacts to labourers and residents from particulate matter entering lungs	**Footprint Clearance** - movement of earth moving vehicles and machinery on site	8	5	2	2	30	-	M	Ensure that dust suppression measures are implemented.	6	5	1	2	24	-	L
Safety impacts to pedestrians or residents from movement of vehicles	**Footprint Clearance** - movement of earth moving vehicles and machinery on site	8	5	2	2	30	-	M	Ensure that dust suppression measures are implemented.	8	5	1	2	28	-	L
LOSS OF CULTURAL AND HERITAGE RESOURCES																	
Loss of cultural and heritage resources	**Construction** - Pit construction and blasting	8	5	2	2	30	-	M	Strictly maintain a 15m buffer zone around the graves and iron age sites. No disturbance is allowed within the buffer zone.	4	4	2	4	40	-	M
	Footprint Clearance - clearing of vegetation and soil may disturb graves and archaeological sites	8	5	2	5	75	-	H	Strictly maintain a 15m buffer zone around the graves and iron age sites. No disturbance is allowed within the buffer zone.	8	5	2	2	30	-	M
	Formation of stockpiles - Placement of material outside of open cast pit	8	5	2	3	45	-	M	Strictly maintain a 15m buffer zone around the graves and iron age sites. No disturbance is allowed within the buffer zone.	8	5	2	1	15	-	L
	Construction - Pit construction and blasting	8	5	2	2	30	-	M	Strictly maintain a 15m buffer zone around the graves and iron age sites. No disturbance is allowed within the buffer zone.	8	5	2	1	15	-	L

LOSS OF AGRICULTURAL AND COMMUNITY LAND																	
Reduction in the amount of available land for agricultural and residential purposes.	**Footprint Clearance -** clearing of buildings and vegetation on site.	6	3	1	4	40	-	M	Keep vegetation removal to a minimum, clear areas only within the open cast strip, and not all at one time (i.e. clearing with roll over method).	4	2	1	4	28	-	L
LOCAL EMPLOYMENT																	
Continued employment to mine workers and prevent the laying off of staff.	**All Construction Activities**	6	4	2	5	60	+	M	None required.							
SOIL EROSION AND NUTRIENT LOSS																	
Poor management of soil and soil stockpiles resulting in a loss of soil resources and valuable nutrients for regrowth of vegetation and agricultural potential.	**Site Preparation -** Soil stockpile management and earth moving activities	6	2	1	4	36	-	M	Disturbed areas will be kept to a minimum. Stockpile height and length of stockpiling time to be kept to a minimum.	4	2	1	3	21	-	L
GROUNDWATER CONTAMINATION AND QUANTITY REDUCTION																	
Impact on groundwater quantity	**Construction** - Pit construction and blasting	6	2	2	4	40	-	M	Keep mining areas small and dewater for as short as duration as possible.	4	4	2	4	40	-	M
	Diversion of watercourses-reduction in groundwater infiltration	2	4	1	2	14	-	L	None required- impact is low and watercourse diversion is necessary.	2	4	1	2	14	-	L
Impact on groundwater quality	**Footprint Clearance -** exposure of soil will create an easy conduit for dirty water infiltration	2	2	1	4	20	-	L	Prevent seepage of dirty water to the aquifer.	2	2	1	2	10	-	L
SURFACE WATER CONTAMINATION																	
Clearance of vegetation and topsoil could cause blocking and sedimentation of drainage lines and obstruct the free flow of surface water.	**Footprint Clearance-** Obstruction and Pollution	4	4	2	3	30	-	M	Overburden should be spread and rehabilitated with drainage plans in place. Ensure that clean and dirty water separation infrastructure is in place prior to the commencement of construction.	4	2	2	2	16	-	L
Clean Runoff could flow into the dirty area and become polluted	**Footprint Clearance-** Obstruction and Pollution	4	4	2	3	30	-	M	Identify dirty water footprint area and ensure that clean and dirty water separation infrastructure is in place.	4	2	2	2	16	-	L

AIR POLLUTION																	
Dust generated by wind blowing over exposed soils and unprotected stockpiles	**Site Preparation -** clearing of vegetation and soil, creation of stockpiles	4	2	2	4	32	-	M	Ensure that dust suppression measures are implemented.	2	2	1	4	20	-	L
Vehicular emissions from earth moving machinery and transport vehicles	**Site Preparation and Footprint Clearance**	4	2	2	4	32	-	M	All machinery employed on site to be maintained in good running order and fitted with specified correct exhaust systems.	2	2	1	4	20	-	L
DISTURBANCE OF FRESHWATER ECOSYSTEMS AND HABITATS																	
Direct Disturbance Impacts: Clearing, infilling, flooding or levelling of watercourses and freshwater habitat	**Site Preparation -** Construction and establishment of clean and dirty water systems, levelling of mining footprint and construction of road crossings	2	3	2	4	28	-	L	Wherever possible, mining should be excluded from the watercourses.	2	3	2	4	28	-	L
Indirect Disturbance Impacts: Disturbance of neighbouring freshwater habitats as a result of noise and dust pollution, blasting vibrations, increased human presence. Onsite alien plant proliferation	**Site Preparation -** Clearing and levelling of mining footprint, blasting, construction and materials transportation.	3	2	2	4	28	-	L	The approved dust and noise management and suppression measures for the mine must be adopted for the open cast extension. No hunting of any fauna onsite or in the surrounding area is allowed. Alien vegetation control must be implemented on an ongoing basis.	3	2	2	4	28	-	L
Erosion and Sedimentation Impacts: Construction disturbances to watercourses and freshwater habitat from clearing and earthworks, erosion of bare slopes and surfaces, increased discharge velocities, river crossings and stormwater discharge	**Site Preparation -** Clearing and levelling of mining footprint and infrastructure, operation of clean water management system, construction of river crossings and road stormwater management	4	3	2	3	27	-	L	Implement surface water runoff and erosion control for the bare slopes and working areas within the dirty and clean water areas. For new watercourse crossings, flow must not canalised and constricted through/under road crossings. Energy dissipation measures and/or attenuation measures must be installed.	2	3	2	3	21	-	L
Flow Reduction Impacts: Reduction in water inputs and throughflow discharges as a result of capture and containment of subsurface and surface flows from clean and dirty water areas, and from abstraction of water from dams.	**Site Preparation -** Operation of clean and dirty water management system, water abstraction and recycling	4	3	2	3	27	-	L	The size of the dirty water areas should be minimised as far as practically possible.	4	3	2	3	27	-	L

Water Quality Impacts: Reduction in water quality from contamination of clean water areas from spillage and leakages of hazardous materials, and from road runoff draining into watercourses	**Site Preparation -** Storage and handling of hazardous materials, operation and maintenance of vehicles and access roads	4	2	3	3	27	-	L	The exposure of mined rock to air must be minimised to reduce rock decomposition and oxidation. An updated stormwater management plan must be compiled for the project according to the best management practices. Good housekeeping in terms of spillage and runoff contamination minimisation within the dirty water areas must be implemented to reduce levels of water contamination.	3	2	3	3	24	-	L
Cumulative Impacts: Degeneration and degradation of local and regional ecosystem services and degradation of Buffels River hydrogeomorphic and ecological integrity and water quality	**All Construction Activities**	3	3	3	3	27	-	L	Implementation of mitigation measures recommended above.	3	2	2	3	21	-	L
DISTURBANCE OF TERRESTRIAL ECOSYSTEMS AND HABITATS																	
Direct Disturbance Impacts: Clearing and destruction of terrestrial habitat for construction of clean and dirty water dams, within the mining footprint and for access roads. Faunal fatalities during habitat clearing and levelling	**Site Preparation and Footprint Clearance** - Construction of clean and dirty water systems, access roads and clearing and levelling in mining footprint	3	3	1	4	28	-	L	The intact secondary grassland and dense wooded areas outside of the proposed mining footprint must not be cleared and/or disturbed by the mining expansion. The establishment of new haulage roads must be avoided and existing dirt roads must be utilised as haulage roads. The rehabilitation plan contained in the EMP (Appendix F) and approved EMPR for Magdalena Colliery must be adhered to.	3	3	1	4	28	-	L
Indirect Disturbance Impacts: Disturbance of neighbouring terrestrial habitats as a result of noise and dust pollution, blasting vibrations, increased human presence. Onsite alien plant proliferation	**Site Preparation -** Clearing and levelling of mining footprint, blasting, construction and materials transportation.	3	3	2	4	32	-	M	The approved dust and noise management and suppression measures for the mine must be adopted for the open cast extension. No hunting of any fauna onsite or in the surrounding area is allowed. Alien vegetation control must be implemented on an ongoing basis.	2	3	2	4	28	-	L

Erosion and Sedimentation Impacts: Erosion and sedimentation of terrestrial habitat from erosion of bare slopes and surfaces and uncontrolled stormwater discharges	**Site Preparation -** Clearing and levelling of mining footprint and road stormwater management	2	4	1	4	28	-	L	Implement surface water runoff and erosion control for the bare slopes and working areas within the dirty and clean water areas. Stormwater generated by the roads must be discharged in a controlled manner to ensure that erosion at these discharge points does not occur.	2	3	1	3	18	-	L
Habitat Reduction and Fragmentation Impacts: Reduction and fragmentation of local habitats from habitat loss and transformation during clearing and levelling	**Site Preparation -** Clearing and levelling of mining footprint	2	3	2	4	28	-	L	Implementation of mitigation measures recommended above.	2	3	2	4	28	-	L
Population Impacts: Faunal population reduction from fatalities and loss of habitat	**Site Preparation -** Clearing and levelling of mining footprint	2	3	2	4	28	-	L	Implementation of mitigation measures recommended above.	2	3	2	4	28	-	L
Cumulative Impacts: Cumulative loss of habitat in the region, province and country, impacts on conservation targets and increase in local and regional habitat fragmentation	**All Construction Activities**	2	3	2	3	21	-	L	Implementation of mitigation measures recommended above.	2	3	2	3	21	-	L
COMMUNITY HOUSING																	
Building Regulation compliant homes for relocated residents	**Relocation of Residents**	6	4	2	5	60	+	M	None required.								

POTENTIAL ENVIRONMENTAL IMPACT	ACTIVITY	ENVIRONMENTAL SIGNIFICANCE BEFORE MITIGATION							RECOMMENDED MITIGATION MEASURES	ENVIRONMENTAL SIGNIFICANCE AFTER MITIGATION						
		M	D	S	P	TOTAL	STATUS	SP		M	D	S	P	TOTAL	STATUS	SP
OPERATIONAL PHASE ACTIVITIES: PIT DEVELOPMENT, BLASTING, COAL EXTRACTION AND WASTE HANDLING																
VISUAL INTRUSION																
Visual intrusion and nuisance resulting from dust pollution.	**Operational Activities-** Clearing and levelling of mining footprint, construction and materials transportation.	4	2	2	4	32	-	M	Implementation of dust suppression measures	4	2	2	2	16	-	L

Visual intrusion resulting from the presence of machinery and earth moving vehicles on site.	**Operational Activities-** Clearing and levelling of mining footprint, construction and materials transportation.	3	2	2	4	28	-	L	None	3	2	2	4	28	-	L
Visual intrusion resulting from creation of open cast workings	**Operational Activities-** Clearing and levelling of mining footprint, open cast workings	4	2	2	3	24	-	L	None	4	2	2	3	24	-	L
NOISE AND VIBRATION DISTURBANCE																	
Noise pollution from earth moving activities on site and transportation of coal and materials	**All Operational Activities**	8	2	2	5	60	-	M	Equipment on site will be properly muffled and maintained so as to reduce noise generation to the minimum.	4	2	2	3	24	-	L
Noise from blasting affecting nearby residents, livestock and wildlife	**Operational Activities** - Pit construction and blasting	8	2	2	5	60	-	M	Utilise the minimum possible explosives to achieve maximum affect. Working area to be fenced off and livestock to be kept in a designated grazing area. Nearby residents and farmers to be notified at least one day prior to blasting. The blasting area must be checked for livestock (500m radius of blast recommended) prior to blasting.	4	2	2	3	24	-	L
Structural damage to nearby buildings from blasting	**Operational Activities** - Pit construction and blasting	8	2	2	5	60	-	M	All such structures will also be inspected on a 6-monthly basis (or at the residents request) for signs of vibration or blasting damage. Any damage, which arises as a result of blasting or activities at the mine, will be repaired by the mine, at the mine's expense.	4	2	2	3	24	-	L
HEALTH AND SAFETY IMPACTS																	
Health impacts to labourers and residents from particulate matter entering lungs	**Operational Activities-** Clearing and levelling of mining footprint, construction and materials transportation.	8	5	2	2	30	-	M	Ensure that dust suppression measures are implemented.	6	5	1	2	24	-	L
Safety impacts to pedestrians or residents from movement of vehicles	**Operational Activities-** Clearing and levelling of mining footprint, construction and materials transportation.	8	5	2	2	30	-	M	Ensure that dust suppression measures are implemented.	8	5	1	2	28	-	L

LOSS OF CULTURAL AND HERITAGE RESOURCES																	
Loss of cultural and heritage resources	**Pit excavation and coal extraction** - Extension of open cast mining (including blasting)	8	5	2	3	45	-	M	Strictly maintain a 15m buffer zone around the cemetery. No disturbance is allowed within the buffer zone.	8	5	2	1	15	-	L
	Road construction - Construction of access roads as required	8	5	2	2	30	-	M	Strictly maintain a 15m buffer zone around the cemetery. No disturbance is allowed within the buffer zone.	8	5	2	1	15	-	L
	Transportation of coal and waste - Movement of transportation vehicles in the vicinity of the open cast strip	8	5	2	2	30	-	M	Strictly maintain a 15m buffer zone around the cemetery. No disturbance is allowed within the buffer zone.	8	5	2	1	15	-	L
LOSS OF AGRICULTURAL AND COMMUNITY LAND																	
Reduction in the amount of available land for agricultural and residential purposes.	**Operational Activities-** Clearing and levelling of mining footprint, open cast workings	6	3	1	4	40	-	M	Keep vegetation removal to a minimum, clear areas only within the open cast strip, and not all at one time (i.e. clearing with roll over method)	4	2	1	4	28	-	L
LOCAL EMPLOYMENT																	
Continued employment to mine workers and prevent the laying off of staff.	**All Operational Activities**	6	4	2	5	60	+	M	None required.							
GROUNDWATER CONTAMINATION AND QUANTITY REDUCTION																	
Impact on groundwater quantity	**Construction** - Pit construction	6	4	2	4	48	-	M	Keep mining areas small and dewater for as short a duration as possible	4	4	2	4	40	-	M
Impact on groundwater quality	**Dust suppression**	4	4	1	2	18	-	L	None required- impact is low	4	4	1	2	18	-	L
	Pit Backfilling - Roll over method	10	4	2	4	64	-	H	Backfill pit correctly- geology with the highest acid generation capacity must be placed at the bottom of the pit and compacted	8	4	2	4	56	-	M
	Pollution Control Dams	10	4	2	4	64	-	H	Line dams	0	1	1	2	4	-	L
	Formation of stockpiles	8	4	1	4	52	-	M	Divert dirty water runoff to PCD, prevent infiltration to aquifer, compact base of stockpile	6	4	1	3	33	-	M
	Coal transport via haulage roads to Coalfields	4	4	2	2	20	-	L	Clean spillages regularly	2	2	2	2	12	-	L

SURFACE WATER CONTAMINATION AND CHANGE IN PEAK FLOWS AND VOLUMES																	
Clean Runoff could flow into the dirty area and become polluted	**Footprint Clearance -** Obstruction and Pollution	4	4	2	3	30	-	M	Identify dirty water footprint area and Ensure that clean and dirty water separation infrastructure is in place.	4	2	2	2	16	-	L
Fuel and toxic materials could spill and pollute water resources	**Waste Handling -** Pollution	10	4	2	5	80	-	H	Appropriate design criteria for the 1:50 year storm event to be contained and re-used.	6	1	1	3	24	-	L
Seepage to surface water resources from water disposal	**Pollution**	6	3	3	3	36	-	M	Measures should put in place to prevent and contain spills and enable safe collection and disposal of waste	4	3	2	2	18	-	L
Slope could contribute to erosion	**Erosion**	10	4	2	5	80	-	H	Sloping areas to allow free runoff and management of runoff velocity	6	4	1	2	22	-	L
Soil disturbance during soil turning	**Siltation**	4	4	2	3	30	-	M	Adhere to SWMP and compact adequately	4	2	2	2	16	-	L
Continuing vegetation and topsoil clearance could obstruct drainage, cause water logging and pollute water resources	**Pollution**	4	4	2	3	30	-	M	Overburden should be spread and rehabilitated with drainage plans in place. Ensure that clean and dirty water separation infrastructure is in place prior to the commencement of construction.	4	2	2	2	16	-	L
AIR POLLUTION																	
Dust generated by wind blowing over exposed soils and unprotected stockpiles	**Operation -** ongoing clearing of vegetation and soil, creation of stockpiles	4	2	2	4	30	-	M	Ensure that dust suppression measures are implemented.	2	2	1	4	16	-	L
Vehicular emissions from earth moving machinery and transport vehicles	**All Operational Activities**	4	2	2	4	30	-	M	All machinery employed on site will be maintained in good running order. All machinery will be fitted with specified correct exhaust systems.	2	2	1	4	16	-	L
DISTURBANCE OF FRESHWATER ECOSYSTEMS AND HABITATS																	
Indirect Disturbance Impacts: Disturbance of neighbouring freshwater habitats as a result of noise and dust pollution, blasting vibrations, increased human presence. Onsite alien plant proliferation	**Operational Activities-** Clearing and levelling of mining footprint, blasting, construction and materials transportation.	3	2	2	4	28	-	L	The approved dust and noise management and suppression measures for the mine must be adopted for the open cast extension. No hunting of any fauna onsite or in the surrounding area is allowed. Alien vegetation control must be implemented on an ongoing basis.	2	2	2	4	24	-	L

Erosion and Sedimentation Impacts: Disturbances to watercourses and freshwater habitat from erosion of bare slopes and surfaces, sedimentation of drainage channels, increased discharge velocities, river crossings, stormwater discharge and increased floodpeaks from overtopping or breaching of PCDs in floods.	**Operational Activities** - Rollover method, operation of clean water management system, road crossings, stormwater management and operation of PCDs	3	3	3	3	27	-	L	Implement surface water runoff and erosion control for the bare slopes and working areas within the dirty and clean water areas. For new watercourse crossings, flow must not canalised and constricted through/under road crossings. Energy dissipation measures and/or attenuation measures must be installed.	3	3	3	2	18	-	L
Flow Reduction Impacts: Reduction in water inputs and throughflow discharges as a result of capture and containment of subsurface and surface flows from clean and dirty water areas, and from abstraction of water from onsite dams	**Operational Activities -** Operation of clean and dirty water management system, water abstraction and recycling	2	3	2	4	28	-	L	The size of the dirty water areas should be minimised as far as practically possible.	2	3	2	3	21	-	L
Water Quality Impacts: Reduction in water quality of watercourses from overtopping or breaching of PCDs, leakages or seepages from PCDs, groundwater contamination from exposed rock, and contamination of clean water areas from spillages and leakages of hazardous materials	**Operational Activities -** Storage and handling of hazardous materials, operation of PCDs, open cast mining, pit dewatering, operation and maintenance of vehicles and access roads	3	3	2	3	24	-	L	The exposure of mined rock to air must be minimised to reduce rock decomposition and oxidation. An updated stormwater management plan must be compiled for the project according to the best management practices. Good housekeeping in terms of spillage and runoff contamination minimisation within the dirty water areas must be implemented to reduce levels of water contamination.	2	3	2	3	21	-	L
Cumulative Impacts: Degeneration and degradation of local and regional ecosystem services and degradation of Buffels River hydrogeomorphic and ecological integrity and water quality	**All Operational Activities**	2	3	3	4	32	-	M	Implementation of mitigation measures recommended above.	1	3	3	4	28	-	L

DISTURBANCE OF TERRESTRIAL ECOSYSTEMS AND HABITATS																	
Indirect Disturbance Impacts: Disturbance of neighbouring terrestrial habitats as a result of noise and dust pollution, blasting vibrations, increased human presence. Onsite alien plant proliferation	**Operational Activities-** Clearing and levelling of mining footprint, blasting, construction and materials transportation.	3	3	2	5	40	-	M	The approved dust and noise management and suppression measures for the mine must be adopted for the open cast extension. No hunting of any fauna onsite or in the surrounding area is allowed. Alien vegetation control must be implemented on an ongoing basis.	3	3	2	4	32	-	M
Erosion and Sedimentation Impacts: Erosion and sedimentation of terrestrial habitat from erosion of bare slopes and surfaces and uncontrolled stormwater discharges	**Operational Activities** - Rollover method, road stormwater management	2	4	1	4	28	-	L	Implement surface water runoff and erosion control for the bare slopes and working areas within the dirty and clean water areas. Stormwater generated by the roads must be discharged in a controlled manner to ensure that erosion at these discharge points does not occur.	2	3	1	3	18	-	L
Cumulative Impacts: Cumulative loss of habitat in the region, province and country, impacts on conservation targets and increase in local and regional habitat fragmentation	**All Operational Activities**	2	3	2	3	21	-	L	Implementation of mitigation measures recommended above.	1	3	2	3	18	-	L

POTENTIAL ENVIRONMENTAL IMPACT	ACTIVITY	ENVIRONMENTAL SIGNIFICANCE BEFORE MITIGATION							RECOMMENDED MITIGATION MEASURES	ENVIRONMENTAL SIGNIFICANCE AFTER MITIGATION						
		M	D	S	P	TOTAL	STATUS	SP		M	D	S	P	TOTAL	STATUS	SP
DECOMISSIONING AND CLOSURE ACTIVITIES: PIT BACKFILL AND REHABILITATION OF DISTURBED AREAS																
NOISE AND VIBRATION DISTURBANCE																
Noise pollution from earth moving activities on site	**Rehabilitation and Closure Activities**	6	2	2	3	30	-	M	Equipment on site to be properly muffled and maintained so as to reduce noise generation to the minimum.	4	2	1	3	21	-	L

HEALTH AND SAFETY IMPACTS																	
Health impacts to labourers and residents from particulate matter entering lungs	**Rehabilitation and Closure Activities**	8	5	2	2	30	-	M	Ensure that dust suppression measures are implemented.	6	5	1	2	24	-	L
Safety impacts to pedestrians or residents from movement of vehicles	**Rehabilitation and Closure Activities**	8	5	2	2	30	-	M	Ensure that warning signs and road safety measures are implemented.	8	5	1	2	28	-	L
LOSS OF CULTURAL AND HERITAGE RESOURCES																	
Loss of cultural and heritage resources	**Pit Backfilling- Roll over method -** Movement of TLBs and excavators, backfilling of stockpiled material	8	5	2	2	30	-	M	Strictly maintain a 15m buffer zone around the cemetery. No disturbance is allowed within the buffer zone.	8	5	2	1	15	-	L
INCREASE IN LAND CAPABILITY																	
Restoration in the amount of available land for agricultural and residential purposes as per status quo.	**Rehabilitation and Closure Activities**	6	3	1	4	40	+	M	None required								
RESHAPING OF TOPOGRAPHY																	
Potential soil erosion as a result of reshaping of topography and backfilling of pits	**Pit Backfilling- Roll over method -** Movement of TLBs and excavators, backfilling of stockpiled material	6	2	1	4	36	-	M	Backfilling and reshaping of topography to allow for drainage off backfilled areas and include soil erosion prevention measures	4	2	1	3	21	-	L
SOIL REPLACEMENT																	
Restoration of soils from stockpiles to pits, increasing soil capability for vegetation establishment	**Rehabilitation and Closure Activities**	6	3	1	4	40	+	M	None required								
GROUNDWATER CONTAMINATION AND QUANTITY REDUCTION																	
Impact on groundwater quantity	**Residual dewatering cone of depression**	6	3	2	4	44	-	M	No mitigation measure required- cone of depression will decrease over time until original water levels are achieved	2	3	1	2	12	-	L
Impact on groundwater quality	**Long term plume development**	6	3	2	4	44	-	M	Groundwater monitoring down gradient of the pit to monitor plume development. Mitigation measures should be implemented during the operational phase	2	3	1	2	12	-	L

SURFACE WATER CONTAMINATION																	
Pollution of water resources	**Removal of infrastructure -** improper waste handling and fuel/oil spills	4	5	2	3	33	-	M	Manage waste effectively to prevent pollution of water resources	4	5	2	1	11	-	L
Runoff and drainage from discard dump and stockpiles continue to yield polluted water	**Rehabilitation**	6	5	3	4	56	-	M	Maintain dirty water separation systems until the site is rehabilitated and free draining	6	5	1	2	24	-	L
Siltation of water courses	**Removal of infrastructure** - including water and Magdalena pipelines	6	2	2	4	40	-	M	Rehabilitate as soon as possible, maintain erosion control for the duration of rehabilitation	4	2	2	3	24	-	L
Reduction in pollution of water resources	**Monitoring & Maintenance -** site will revert back to free-draining state	4	5	2	1	11	-	L	Continue water monitoring to determine possible impacts	6	5	2	4	52	+	M
DISTURBANCE OF FRESHWATER ECOSYSTEMS AND HABITATS																	
Direct Disturbance Impacts: Disturbances to watercourses and freshwater habitats during decommissioning of road watercourse crossings, PCDs and upgrading of PCDs to be retained	**Decommissioning and Closure:** Dismantling of watercourse crossings, removal of PCDs and upgrading of PCDs to be retained	2	3	2	4	28	-	L	Wherever possible, mining should be excluded from the watercourses.	3	2	2	3	21	-	L
Erosion and Sedimentation Impacts: Disturbances to watercourses and freshwater habitat from erosion of bare slopes and surfaces, decommissioning of clean and dirty water management systems and re-instatement of natural watercourses. Impacts may also arise during post-closure from unsuccessful rehabilitation, mine decant water discharges and overtopping or breaching of PCDs.	**Decommissioning and Closure:** Dismantling of infrastructure, removal of PCDs and upgrading of PCDs and clean water dams, watercourse rehabilitation and post-rehabilitation recovery	2	3	2	4	28	-	L	Implement surface water runoff and erosion control for the bare slopes and working areas within the dirty and clean water areas. For new watercourse crossings, flow must not canalised and constricted through/under road crossings. Energy dissipation measures and/or attenuation measures must be installed.	3	3	1	3	21	-	L
Water Quality Impacts: Reduction in water quality of watercourses from decommissioning of dirty PCDs. Post closure reduction in water quality of watercourses from acid mine drainage, decant water, overtopping or breaching of PCDs, and seepage or leakage from PCDs	**Decommissioning and Closure:** Dismantling and removal of PCDs and all post closure activities	3	2	3	3	24	-	L	The exposure of mined rock to air must be minimised to reduce rock decomposition and oxidation. An updated stormwater management plan must be compiled for the project according to the best management practices. Good housekeeping in terms of spillage and runoff contamination minimisation within the dirty water	2	2	3	3	21	-	L

									areas must be implemented to reduce levels of water contamination.							
Cumulative Impacts: Degeneration and degradation of local and regional ecosystem services and degradation of Buffels River hydrogeomorphic and ecological integrity and water quality	**All closure and post-closure activities**	5	2	3	3	30	-	M	Implementation of mitigation measures recommended above.	4	2	3	3	27	-	L
DISTURBANCE OF TERRESTRIAL ECOSYSTEMS AND HABITATS																
Erosion and Sedimentation Impacts: Disturbances to terrestrial habitat from erosion of bare slopes and surfaces during dismantling and rehabilitation. Impacts may also arise during post-closure from unsuccessful rehabilitation and mine decant water discharges.	**Decommissioning and Closure:** Dismantling of infrastructure, removal of PCDs and upgrading of PCDs and clean water dams, watercourse rehabilitation and post-rehabilitation recovery	3	3	1	3	21	-	L	Implement surface water runoff and erosion control for the bare slopes and working areas within the dirty and clean water areas. Stormwater generated by the roads must be discharged in a controlled manner to ensure that erosion at these discharge points does not occur.	2	3	1	3	18	-	L
REHABILITATION OF WATERCOURSES																
Reshaping and rehabilitation of watercourses on site to prevent further erosion	**Rehabilitation and Closure Activities**	6	4	2	5	60	+	M	None required						-	

Alternative A2

No-go alternative (compulsory)

NO-GO ALTERNATIVE	ENVIRONMENTAL SIGNIFICANCE OF NO-GO ALTERNATIVE						
	M	D	S	P	TOTAL	STATUS	SP
CONSTRUCTION PHASE ACTIVITIES: SITE PREPARATION, FOOTPRINT CLEARANCE, PIT DEVELOPMENT AND WASTE HANDLING							
LOCAL EMPLOYMENT							
Loss of employment at the Magdalena Colliery	6	4	2	5	60	-	M
SOIL EROSION AND HABITAT DEGRADATION							
Ongoing poor farming practices resulting in donga erosion and loss of soil resources	6	5	2	4	52	-	M
OPERATIONAL PHASE ACTIVITIES: PIT DEVELOPMENT, BLASTING, COAL EXTRACTION AND WASTE HANDLING							
LOCAL EMPLOYMENT							
Loss of employment at the Magdalena Colliery	6	4	2	5	60	-	M
SOIL EROSION AND HABITAT DEGRADATION							
Ongoing poor farming practices resulting in donga erosion and loss of soil resources	6	5	2	4	52	-	M

SECTION F: RECOMMENDATION OF EAP

Is the information contained in this report and the documentation attached hereto in the view of the EAPr sufficient to make a decision in respect of this report? If "NO", please contact the KZN Department of Agriculture & Environmental Affairs regarding the further requirements for your report.	YES X	NO

If "YES", please attach the draft EMPr as Appendix F to this report and list any recommended conditions, including mitigation measures that should be considered for inclusion in any authorisation that may be granted by the competent authority in respect of the application:

Recommendations

The impacts that have been identified for Alternative A1 can be mitigated to acceptable levels. Thus, no fatal flaws or unacceptable impacts would occur through the implementation of the Alleen 2 Open Cast Extension.

The implementation of the open cast extension project will ensure continuation of job opportunities to local skilled and semi-skilled workers at the Magdalena Colliery, and will incorporate the transfer of technical skills. For this reason and the lack of fatal flaws identified, GCS (Pty) Ltd recommends that the Alleen 2 Open Cast Extension be awarded Environmental Authorisation (EA) and that the No-go Alternative not be considered.

It is important to note that a Water Use License must be applied with DWA for in terms of watercourse and wetland crossings (Section 21 (c) and (i)). The relevant approvals must be in place prior to the commencement of any site clearing or construction activities.

It is recommended that the implementation of mitigation measures contained in this document and in the EMP (Appendix F) be included as a condition of the EA. In addition, the following key recommendations are noted:

- Permits must be obtained from Amafa KwaZulu-Natal for the exhumation and relocation of graves.
- Mining and access routes are to be excluded from the northern and southern-most watercourses, as per the preferred alternative layout plan (Appendix C2). Buffer zones of 100m on either side of the two watercourses must be maintained, and no mining is to take place within these buffer zones.
- The intact secondary grassland and dense wooded areas outside of the proposed mining footprint must not be cleared and/or disturbed by the mining expansion. In this regard, it is important that the mining footprint be clearly demarcated and marked out by a professional surveyor using bard wire fencing and danger tape prior to the commencement of the mining operation.
- The rehabilitation plan contained in the EMP (Appendix F) and approved EMPR for Magdalena Colliery must be adhered to.
- It is recommended that a 'search and rescue' for individual *Cochlitoma simplex* snails that may occur within the mining strip be undertaken by a qualified mollusc specialist prior to mining in order to relocate individuals to an appropriate habitat outside of the mining footprint.
- The existing SWMP and Water Balance for Magdalena Colliery must be updated to include the proposed open cast extension area, according to the best management practices. Detailed SWMP designs are to be included and signed off by a registered engineer. This is to be included in the IWULA Amendment to be submitted to the DWA.
- Surface water quality samples of the Poonaspruit stream, downstream of the proposed open cast area should be collected and analysed. It is also recommended that a GN704 audit be performed at the mine.

- Confirm groundwater and surface water monitoring protocol and plans. It is recommended that groundwater monitoring be conducted on a quarterly basis.
- The numerical groundwater model should be updated when changes in the mine plan and infrastructure plan occur, and every two years during operations.

SECTION G: APPENDICES

The following appendixes must be attached as appropriate:

Appendix A: Site plan(s)
- A1: Locality Map
- A2: Proposed Opencast
- A3: Land Use
- A4: Magdalena Colliery Operations
- A5: Wetland and Drainage Line Buffer Map

Appendix B: Photographs

Appendix C: Facility illustration(s)
- C1: Prospecting Plan
- C2: Alternative A1 Mine Work Programme
- C3: Alternative A2 Mine Work Programme

Appendix D: Specialist reports
- D1: Desktop Ecological Assessment
- D2: Heritage Assessment
- D3: Surface Water Assessment
- D4: Groundwater Assessment

Appendix E: Public Participation
- E1: Comments and responses report
- E2: Proof of advertisement
- E3: Proof of site notices
- E4: Background Information Document
- E5: Background Information Document – Proof of BID Delivery
- E6: List of Interested and Affected Parties
- E7: Public Meeting Minutes and Register
- E8: Copies of Comments Received

Appendix F: Environmental Management Programme

Appendix G: Mining Work Programme