




**DE BEERS CONSOLIDATED MINES –
NAMAQUALAND MINES**

**APPLICATION FOR THE CONSTRUCTION OF
AN ASBESTOS WASTE DISPOSAL FACILITY
IN THE BUFFELS MARINE MINING RIGHT ON
THE FARM TWEEPAD 176, KLEINZEE,
NORTHERN CAPE**

Draft Environmental Impact Report
And
Draft Environmental Management Plan Report

DMR Ref: NCS 30/5/1/2/2/ (520)MR
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Document Title:	APPLICATION FOR THE CONSTRUCTION OF AN ASBESTOS WASTE DISPOSAL FACILITY IN THE BUFFELS MARINE MINING RIGHT ON THE FARM TWEEPAD 176, KLEINZEE, NORTHERN CAPE – DRAFT ENVIRONMENTAL IMPACT ASSESSMENT REPORT AND ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT
Author:	Werner Nel
Revision Number:	1
Approved by:	Werner Nel
Signature:	
For:	W Nel Environmental Consulting Services (Pty) Ltd



mineral resources

Department:
Mineral Resources
REPUBLIC OF SOUTH AFRICA

ENVIRONMENTAL IMPACT ASSESSMENT REPORT
And
ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT

SUBMITTED FOR ENVIRONMENTAL AUTHORIZATIONS IN TERMS OF THE NATIONAL ENVIRONMENTAL MANAGEMENT ACT, 1998 AND THE NATIONAL ENVIRONMENTAL MANAGEMENT WASTE ACT, 2008 IN RESPECT OF LISTED ACTIVITIES THAT HAVE BEEN TRIGGERED BY APPLICATIONS IN TERMS OF THE MINERAL AND PETROLEUM RESOURCES DEVELOPMENT ACT, 2002 (MPRDA) (AS AMENDED).

NAME OF APPLICANT: De Beers Consolidated Mines: Namaqualand Mines

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FILE REFERENCE NUMBER SAMRAD: NCS 30/5/1/2/2/ (520)MR

1. IMPORTANT NOTICE

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

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

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

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

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

2. OBJECTIVE OF THE ENVIRONMENTAL IMPACT ASSESSMENT PROCESS

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

- (a) determine the policy and legislative context within which the activity is located and document how the proposed activity complies with and responds to the policy and legislative context;
- (b) describe the need and desirability of the proposed activity, including the need and desirability of the activity in the context of the preferred location;
- (c) identify the location of the development footprint within the preferred site based on an impact and risk assessment process inclusive of cumulative impacts and a ranking process of all the identified development footprint alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects of the environment;
- (d) determine the—
 - (i) nature, significance, consequence, extent, duration and probability of the impacts occurring to inform identified preferred alternatives; and
 - (ii) degree to which these impacts—
 - (aa) can be reversed;
 - (bb) may cause irreplaceable loss of resources, and
 - (cc) can be avoided, managed or mitigated;
- (e) identify the most ideal location for the activity within the preferred site based on the lowest level of environmental sensitivity identified during the assessment;
- (f) identify, assess, and rank the impacts the activity will impose on the preferred location through the life of the activity;
- (g) identify suitable measures to manage, avoid or mitigate identified impacts; and
- (h) identify residual risks that need to be managed and monitored.

PART A

SCOPE OF ASSESSMENT AND ENVIRONMENTAL IMPACT ASSESSMENT REPORT

3. Contact Person and correspondence address

a) Details of:

i) Details of the EAP

Name of The Practitioner: W Nel Environmental Consulting Services (Pty) Ltd - WNECS

Tel No.: 082 447 5255

Fax No.: 086 604 7737

e-mail address: info@wnecs.co.za

ii) Expertise of the EAP.

(1) The qualifications of the EAP

(with evidence).

M. Sc, University of Stellenbosch

B. Sc (Honours), University of Port Elizabeth

B. Sc, University of Port Elizabeth

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

(In carrying out the Environmental Impact Assessment Procedure)

Werner Nel graduated with a BSc and BSc (Honours) from the University of Port Elizabeth and a Masters in Zoology from the University of Stellenbosch. He began working in the environmental field during his studies and fulltime as Environmental Officer in 2007 within the mining sector. In 2013 he joined a general environmental consulting firm and left in 2016 to start W Nel Environmental Consulting Services. He has experience in environmental management, rehabilitation and restoration of degraded landscapes, Environmental Management Systems (EMS), including ISO 14001 and in environmental compliance auditing and site monitoring especially in the arid West Coast environment. He has gained environmental experience within various industries including construction, linear projects, mining, wine industry, manufacturing and retail and provided various services within these. A full CV is attached as **Appendix 2**.

b) Description of the property.

Farm Name:	Twee Pad 176
Application area (Ha)	4 Ha
Magisterial district:	Richtersveld Local Municipality within the Namakwa District.
Distance and direction from nearest town	The proposed development is located between the towns of Kleinzee and Port Nolloth, within the Buffels Marine Mining Complex. Kleinzee is located approximately 23 km south and Port Nolloth approximately 28 km north of the proposed development site. Other towns or settlements in relatively close proximity include Kommagas (approximately 57km), Nababeeb (approximately 75km) and Springbok (approximately 85km).
21-digit Surveyor General Code for each farm portion	C0530000000001760000
Property Owner's Details	The farm Twee Pad 176 is owned by the applicant, De Beers Consolidated Mines Ltd.

c) Locality map

(show nearest town, scale not smaller than 1:250000). See **Appendix 3**. The proposed development is located within the boundaries of the Buffels Marine Mining Right, between the towns of Kleinzee (South) and Port Nolloth (North). No inhabitants live in close proximity to the proposed development.



Figure 1: Location of the proposed waste disposal sites on Farm Tweepad 176

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

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

The proposed development will consist of a single mine void, preferred alternative, to be used as a facility to be used for the once-off disposal of asbestos waste generated on the mine throughout the life of mine. This waste includes asbestos sheeting and pipes which are removed from decommissioned infrastructure and buildings on and within the mining area.

(i) Listed and specified activities

NAME OF ACTIVITY (All activities including activities not listed) (E.g. Excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc...etc...etc.)	Aerial extent of the Activity Ha or m²	LISTED ACTIVITY Mark with an X where applicable or affected.	APPLICABLE LISTING NOTICE (GNR 544, GNR 545 or GNR 546)/NOT LISTED
GN R. 983 Activity 31: The decommissioning of existing facilities, structures or infrastructure for - (i) any development and related operation activity or activities listed in this Notice, Listing Notice 2 of 2014 or Listing Notice 3 of 2014. The proposed project would consist of the development, related operation and decommissioning of a facility for the storage, handling and disposal of approximately 1000 tons (approximately 3000 m ³) of asbestos generated from the demolition of existing mine infrastructure	4 Ha	X	GN R.983, Activity 31
GN R.984 Activity 4: The development and related operation of facilities or infrastructure, for the storage, or storage and handling of a dangerous good, where such storage occurs in containers with a combined capacity of more than 500 cubic metres. The proposed project would consist of the development, related operation and decommissioning of a facility for the storage, handling and disposal of approximately 1000 tons (approximately 3000 m ³) of asbestos generated from the demolition of existing mine infrastructure	4 Ha	X	GN R.984, Activity 4

(ii) Description of the activities to be undertaken

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

The activities will incorporate the proposed development of a Class A Hazardous waste disposal site, for the disposal of asbestos waste, in the Buffels Marine Mining Complex between the towns of Kleinzee and Port Nolloth in the Northern Cape.

The source of the asbestos waste is the existing mine buildings that are in the process of being demolished. The mine in the process of closure and all infrastructure that does not have an alternative use or future purpose need to be demolished. This ensure that a number of different buildings constructed with asbestos sheeting, as well as various asbestos pipes used for transportation of both potable and process water while the mine had been operational.

The estimated volume of asbestos to be disposed of at the site amounts to approximately 1000 tons (approximately 3000 m3).

The area had been screened for potential sites, based on available open mining voids. The proposed sites had been selected based on the distance from the waste source, accessibility and the proximity to potential future mining activities. Only areas where all mineral resources had been previously mined out had been included for selection.

Three possible sites had been identified within the mining area that complies to the abovementioned criteria. These sites are located at the following co-ordinates (please see the attached map for more information). Site 1 is the preferred site based on the above-mentioned criteria.

e) Policy and Legislative Context

APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT (A description of the policy and legislative context within which the development is proposed including an identification of all legislation, policies, plans, guidelines, spatial tools, municipal development planning frameworks and instruments that are applicable to this activity and are to be considered in the assessment process);	REFERENCE WHERE APPLIED (i.e. Where in this document has it been explained how the development complies with and responds to the legislation and policy context)	HOW DOES THIS DEVELOPMENT COMPLY WITH AND RESPOND TO THE POLICY AND LEGISLATIVE CONTEXT (E.g In terms of the National Water Act:-Water Use Liscence has/has not been applied for).
Mineral and Petroleum Resources Development Act, Act 28 of 2002 (As amended) (MPRDA)	Application for an Environmental Authorisation to amend the existing mining right to allow for the disposal of asbestos waste on site.	A mining right amendment in terms of section 102 of the act has been submitted to include the proposed asbestos disposal facility within the mining right boundary.
National Environmental Management Act, Act 107 of 1998 (As amended) including Environmental Impact Assessment Regulations and Listing Notices. (NEMA)	The Scoping EIA Report and EMP for Environmental authorizations in terms of NEMA in respect of listed activities that have been triggered by applications in terms of the MPRDA, act 28 of 2002 (as amended).	An Application for Environmental Authorisation was submitted to the DMR. The application was accepted by the DMR and requested submission of Scoping Environmental Impact Report. The Scoping Report had been submitted and a stakeholder consultation process had been conducted with consideration of the EIA regulations. The Environmental Impact Assessment and Environmental Management Program will follow a similar consultation process and all comments and responses will be included in the final submission.
National Environmental Management: Waste Act, Act 59 of 2008 (As amended) including Regulations.	Application for an Environmental Authorisation to amend the existing mining right to allow for the disposal of asbestos waste	A mining right amendment in terms of section 102 of the act has been submitted to include the proposed asbestos disposal facility within the mining right boundary.

	on site.	
National Environmental Management: Waste Amendment Act, Act 26 of 2014	Application for an Environmental Authorisation to amend the existing mining right to allow for the disposal of asbestos waste on site.	A mining right amendment in terms of section 102 of the act has been submitted to include the proposed asbestos disposal facility within the mining right boundary.
National Heritage Resources Act, 1999	The activity may trigger the requirements under Section 38 of the NHRA. However, the requirements for permits are not known at this stage.	The South African Heritage Resources Agency (SAHRA) is contacted as part of the stakeholder engagement process.

f) Need and desirability of the proposed activities.

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

Situated on the north-west coast of South Africa, the Namaqualand Mine falls within the Namakwa District Municipality jurisdiction; which consists of three local municipalities, namely the Nama Khoi Local Municipality in which the southern portion of the Buffels Marine Right fall, the Richtersveld Local Municipality in which the northern portion of the Buffels Marine Right lies and the Kamiesberg Local Municipality further South. The proposed development is located within Ward 4 of the Richtersveld Local Municipality.

The effects of down-scaling of mines are driving population growth in both positive and negative directions. Retrenched mine workers from other areas are returning home, contributing to the population growth in the area. However, the down-scaling of mines may also drive an outflow of the population to a larger degree as time progresses, with skilled mine workers expected to leave for urban areas to seek employment opportunities.

The Namakwa District Municipality is faced with a declining economy in all sectors and the downscaling of mining activities, resulting in increased pressure on the employment sector. Capital investment in the economy is needed, but is not financially possible for municipalities. The major constraints to economic development in the Namakwa District Municipality includes the loss of skilled and educated workers to other areas, maintenance of infrastructure, lack of accessibility to funds, lack of secondary industries and no organised business sector.

The major driving factors of the economy within the Namakwa District Municipality are government services and the retail and services industry, following the decline of mining as the predominant sector. The tourism sector may provide support to economic development in the greater area through projects such as: ecotourism, proposed marine aquaculture ventures, energy generation initiatives, however these initiatives suffer under the limited capacity of the Namakwa District municipality to serve as an institution that will drive a strategic agenda to improve the primary sectors of the economy (most likely due to limited capacity and funding). The disrepair of municipal infrastructure and the disrepair of the road network also contribute to the weakening local economy.

The development of the proposed asbestos waste disposal sites may pose an opportunity to grow new skills in the area with the associated construction and disposal activities that would be required for the successful operation of the proposed site and facility. At present the closest facility registered to dispose of asbestos waste is located at Vissershok near Cape Town in the Western Cape.

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

development footprint within the approved site.

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

i) Details of the development footprint alternatives considered.

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

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

a) The Property or Location where it is proposed to undertake the activity:

The proposed development will be located within the Buffels Marine Mining Complex (BMC). The BMC was screened for potential sites, based on available open mining voids. Three proposed sites had been selected using the following criteria:

1. The distance from the waste source/s;
2. Accessibility to the proposed disposal site; and,
3. Proximity to potential future mining activities.

Only areas where all mineral resources had been previously mined out had been included or considered for selection. The three alternative sites are located at the following co-ordinates (please see the attached map for more information). Site 1 is the preferred alternative based on the above-mentioned criteria.

	Latitude	Longitude
Asbestos Site 1	S29° 28' 37,182"	E17° 2' 28,280"
Asbestos Site 1	S29° 28' 39,087"	E17° 2' 17,019"
Asbestos Site 1	S29° 28' 41,262"	E17° 2' 18,085"
Asbestos Site 1	S29° 28' 39,259"	E17° 2' 30,177"
Asbestos Site 2	S29° 28' 44,283"	E17° 2' 34,780"
Asbestos Site 2	S29° 28' 41,052"	E17° 2' 31,820"
Asbestos Site 2	S29° 28' 39,137"	E17° 2' 44,286"
Asbestos Site 2	S29° 28' 42,366"	E17° 2' 46,747"
Asbestos Site 3	S29° 28' 29,587"	E17° 2' 33,752"
Asbestos Site 3	S29° 28' 31,292"	E17° 2' 22,734"
Asbestos Site 3	S29° 28' 31,249"	E17° 2' 35,918"
Asbestos Site 3	S29° 28' 33,123"	E17° 2' 24,577"

Specialists were appointed following a Pre-Application consultation meeting with DEA to assess all three proposed site alternatives and provide comment and feedback regarding the potential impact of the proposed development on the environment prior to selecting the final site for approval. The following specialist inputs were considered and their recommendation are included in the EMPr and Assessment process. The specialist findings are summarised below.

Geo-Hydrology:

It had been determined that the proposed disposal of asbestos waste would not negatively affect the geo-hydrological features in the area and that the proposed sites were all suitable with the implementation of the proposed mitigation measures for the development of the proposed site.

Heritage:

The specialist, who did various previous assessments within the proposed area, did not believe

that the proposed development of the waste disposal site at any of the proposed site alternatives would have any impacts on heritage resources.

Fresh Water:

Due to the altered topography of the proposed site areas, it had been assessed that there is not a significant difference in the potential freshwater impacts associated with either of the sites. The preferred alternative does however have a slightly lower potential for flooding than the two alternative sites. It had however been assessed that the proposed design of the site would play a more important role in the final associated impacts than the location at either of the three alternatives.

Ecology:

Due to the already complete transformed nature of the proposed sites, it had been concluded from an ecological perspective that proposed development would not have any negative impacts or repercussions on the general receiving environment. No plant communities, important faunal habitat features or essential ecological processes would be lost due to the proposed project.

b) Type of Activity to be undertaken:

The proposed activity will include the proposed development of a Class A Hazardous waste disposal site, for the disposal of asbestos waste, in the BMC between the towns of Kleinzee and Port Nolloth in the Northern Cape. disposal of asbestos waste to a landfill site.

Since the mine became operational, asbestos was used as a primary building material due to its properties to insulate buildings, and the resistance to rust in the coastal environment. Once the health concerns became evident and legislations changed, new construction and maintenance to older buildings and infrastructure were done with new alternative materials. This have led to large volumes (approximately 1000 tons or 3000m³) of asbestos being present on the mine.

The proposed project will consist of the development, related operation and decommissioning of an asbestos waste facility (Class A Hazardous Waste Disposal Site) within one of the proposed open mining voids identified above. The asbestos is to be generated form the decommissioning and demolition of existing mine infrastructure.

c) Design or Layout of the Activity

The preferred site for the proposed facility is Site Alternative 1. All of the proposed site alternatives are similar in character and have much the same appearance. They had all previously been mined out to bedrock and have relatively steep slopes. The bedrock in some of the alternatives are more undulating than others, but similar characteristics had been observed. Wind blown sand has accumulated on the floor of the voids and sparse vegetation has established. Various specialist inputs, following DEA's feedback, had been included and below a summary of their findings are provided.

Following consultation with the Department of Environmental Affairs (DEA) and Department of Mineral Resources (DMR) it had been agreed that due to the transformed nature, caused by mining, of the potential sites only specialist comments were required to inform the Impact Assessment process. The full reports or comments are attached as an appendix hereto.

Botanical:

A desktop study had been conducted based on GoogleEarth images and photos provided of the proposed site alternatives and surrounds. Due to the disturbance associated with the historical mining activities the land had been completely transformed and the original vegetation removed. it is likely that the original vegetation in the area may have been Richtersveld Coastal Duneveld, however, it have been completely transformed due to mining activities and along with it the ecological processes of the area have also been severely compromised. Therefore it is the specialist opinion tha the proposed development of an asbestos waste disposal site in any of the three provided alternatives would not have any negative impacts on the surrounding environment or plant communities.

Fauna:

A terrestrial fauna assessment was conducted based on the information provided as described above. It was observed that no substantial natural rock outcrops were present in any of the

proposed site alternatives. The lack of these outcrops minimised the potential habitats for small mammals or reptiles in the mined out areas. Due to the completely transformed condition of the sites, no unique faunal habitats were present and it had been considered to be unlikely that any of the sites would offer suitable or essential habitat conditions for any faunal species of conservation concern. It is the specialist opinion that the proposed development would not have any negative impacts on the general receiving environment.

Aquatic Ecology:

The Kwaganap River historically appears to have passed through the area where the proposed disposal sites are located. The river has a poorly defined channel once it leaves the hillslopes and enters the relatively flat coastal plain. The coastal zone at the foot of the hillslope has been subjected to open cast mining for many years that has completely altered the topography and course of the river. This had the effect that there are no longer any discernable river channel or flow path near the proposed waste disposal sites. Currently any flow associated with this river appears to be diverted north of the sites. Flow within the river is episodic, only occurring for a short period of time after rainfall events within the catchment of the river. Given the altered flow of the river there is potential for flood events to flow into site alternatives 2 and 3. The potential impacts on water quality are not considered to be significant, given the inert nature of the proposed material to be disposed of. The only freshwater impact may be increased turbidity, which is already naturally high for these rivers when they flow. The freshwater impacts associated with the proposed development of the asbestos waste disposal facility is considered to be of very low significance.

Hydrogeology:

A desktop specialist comment was completed for the proposed development. Based on the locality of the proposed disposal site, the groundwater is not regarded as a sensitive environment. Groundwater found within the bedrock in other studies in the area had been found to be of very poor quality. Further the nature of asbestos, the proposed waste to be disposed of at the site, is such that it does not leach or dissolve. The impact assessment considered surface water transport to outdoor and found that the final capping of such a facility would be of crucial importance to prevent run-off from occasional rain events to expose the asbestos fibers. The potential for leaching to ground water is found to be so unlikely that the proposed mitigation of a Class A lining, as prescribed by law is considered to be unnecessary. The potential impact of the proposed disposal site is therefore considered to be insignificant.

The proposed design drawings as provided below provide an overview of Site Alternative 1 and the proposed measures that would be required for the successful operation of the proposed facility.

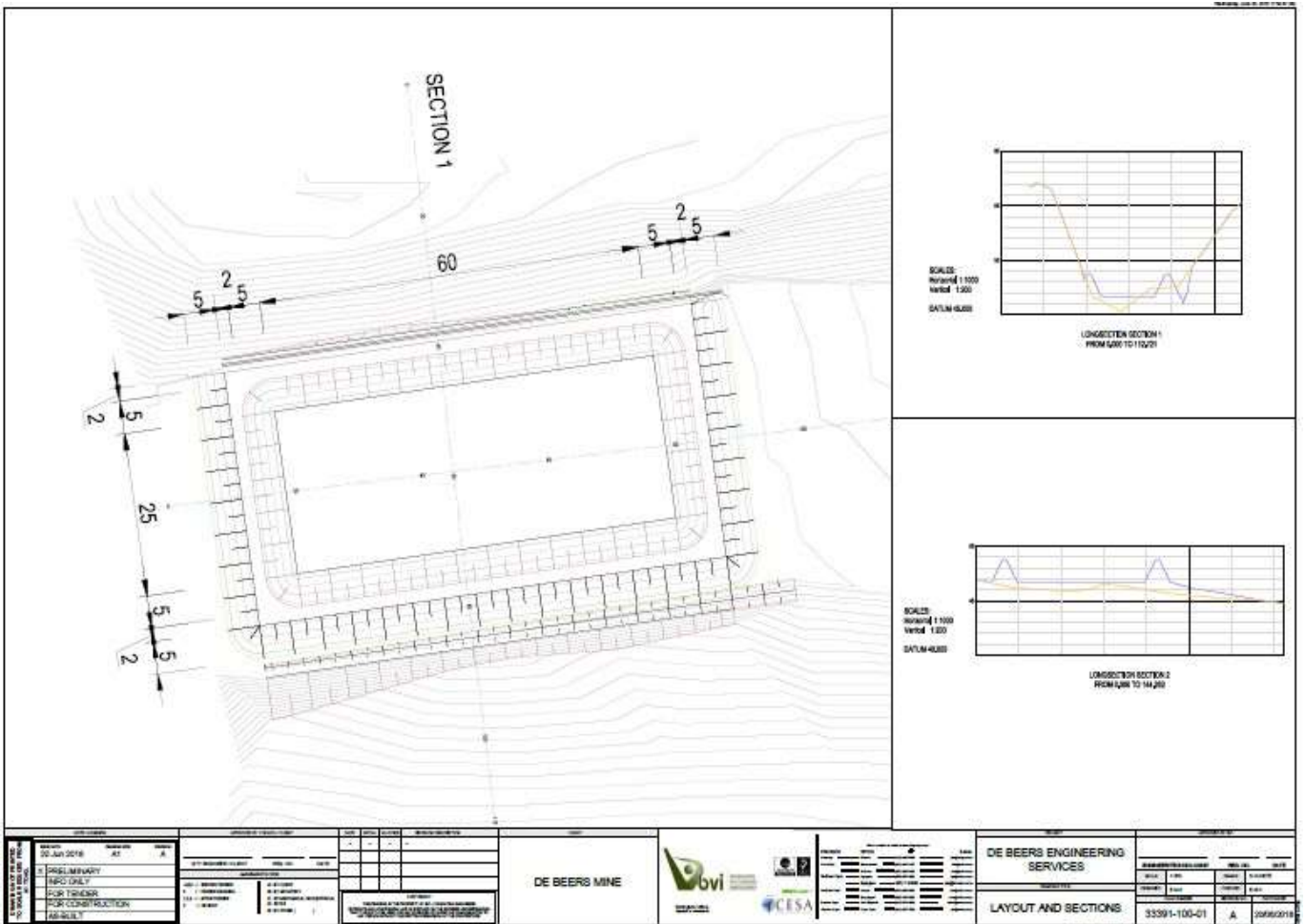


Figure 2: Design drawing for the proposed asbestos waste disposal site to be constructed within the Buffels Marine Mining Complex.

Even though a Class A lining is recommended for waste treatment facilities disposing of asbestos waste, it was the view of the specialists that should Site Alternative 1 be approved that the current sites may not require such a lining. The site is currently an already mined out open void. The mining void had been mined to bedrock level and it had not been envisaged that any leachate or run-off will occur from the proposed disposal of asbestos waste. Asbestos fibres are believed to be basically chemically inert, or nearly so. They do not evaporate, dissolve, burn, or undergo significant reactions with most chemicals. In acid and neutral aqueous media, magnesium is lost from the outer brucite layer of chrysotile. Amphibole fibres are more resistant to acid attack and all varieties of asbestos are resistant to attack by alkalis (Chissick 1985; WHO 1998). It is therefore considered that the proposed asbestos waste will have a very limited effect on any soil or groundwater once it had been disposed of in the proposed landfill. The Specification of a Class A lining is illustrated below.

It is recommended that the waste be covered with a sufficiently thick layer of overburden prior to completing and rehabilitating the site following the final disposal in the site. the final rehabilitation of the asbestos waste disposal facility needs to be in line with the mine's current closure and rehabilitations plans,

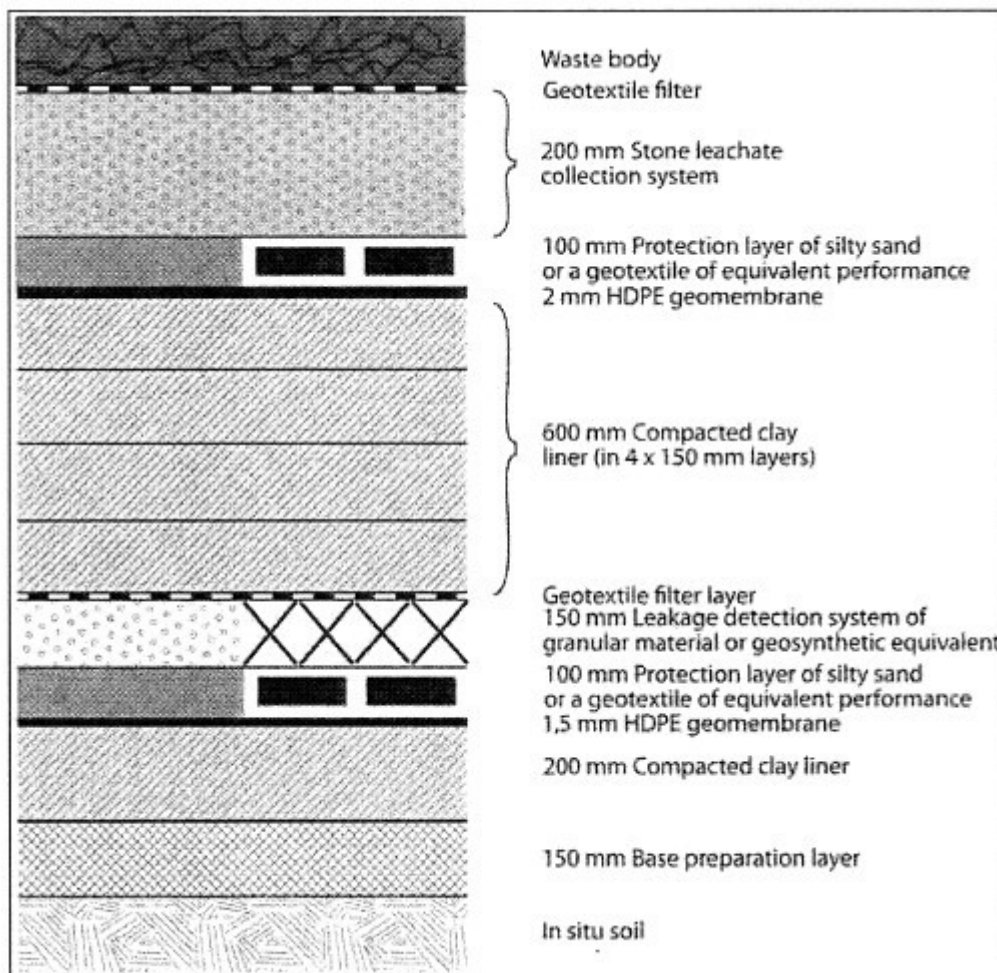


Figure 3: Containment barrier design for a Class A Landfill as described in GNR 36784.

d) The Technology to be used in the Activity

The proposed activity will use available earthmoving and other equipment from the mine to dispose of the specified asbestos waste. The team that will ultimately do the work will have to be trained as asbestos workers and there have been a number of individuals on the mining staff that have already undergone the specialised training in order to allow them to work with and dispose of asbestos in a correct and safe manner. The equipment will include excavators, dozers and other earthmoving equipment currently on the mine.

e) The Operational Aspects of the Activity

The waste site will be operated as part of the mine's regular operations, and focussed on a single disposal event which is associated with the demolition of a number of structures. The demolition of the specific structures has been approved following a Basic Assessment process and have been granted an Environmental Authorisation to do so. Staff will be trained to run the daily operation of the proposed waste site. The mine has a number of registered waste sites which had been operational for a number of years.

f) The Option of Not Implementing the Activity

If the proposed activity is not authorised, the associated asbestos waste would need to be discarded at another facility. At present the closest facility which is registered to treat such waste is Vissershok Landfill site near Cape Town. This would entail transporting the potentially hazardous waste approximately 600km via road for final disposal. Other than having a massive cost implication to the applicant, this once off disposal event will minimise potential larger scale exposure to potentially harmful fibres from the associated materials.

It is therefore considered that the construction and operation of an asbestos waste disposal facility in the Buffels Marine Mining Complex would not only minimize environmental risk but also potential health risks associated with transporting large volumes of asbestos waste between the Northern and Western Cape.

ii) Details of the Public Participation Process Followed

Describe the process undertaken to consult interested and affected parties including public meetings and one on one consultation. NB the affected parties must be specifically consulted regardless of whether or not they attended public meetings. (Information to be provided to affected parties must include sufficient detail of the intended operation to enable them to assess what impact the activities will have on them or on the use of their land.

Previously identified and registered I&APs had been notified through registered mail and electronically, receiving a copy of all relevant information in order to provide feedback and comment on the proposed development. In addition, a newspaper advertisement was published in the Plattelander newspaper (17 January 2020) and site notices have been placed on site at the mine along with copies of a Background Information Document providing an overview of the proposed development. Copies of these documents are included in Appendix 5.

The Draft Scoping Report was delivered to the Port Nolloth and Springbok Municipal Libraries for public viewing. Copies of the report and other information had also been provided to the Mine for public viewing. Stake holders were given the opportunity to register their interest in the application process in order to review and comment on the Draft Scoping Report for a period of 30 days.

Very limited interest were shown by the local community to the proposed development. All requests were regarding the possibility of job opportunities at the mine. Those comments were not logged, but rather directed to the mine's HR department to provide them with additional information.

The document was forwarded to the Department of Environment and Nature Conservation (DENC) which responded that they did not have any objections to the proposed development of the proposed waste disposal facility on the farm Tweepad. They have requested that it be confirmed who the landowner of the farm Tweepad is and which post closure monitoring will be conducted at the site.

Copies have also been forwarded to the Department of Water and Sanitation (DWS) and South African Heritage Resources Association (SAHRA), neither of them have provided any response to the Scoping Report. They will be again be included as commenting authorities for the EIA Report.

iii) **Summary of issues raised by I&Aps**

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

Please see the Report on the Results of Consultation completed following the submission of the Scoping Report (attached as Appendix 5) for more details, this section will be updated and included in the Final Environmental Impact Report to be submitted.

Interested and Affected Parties List the names of persons consulted in this column, and Mark with an X where those who must be consulted were in fact consulted.	Date Comments Received	Issues raised	EAPs response to issues as mandated by the applicant	Section and paragraph reference in this report where the issues and or response were incorporated.
<u>AFFECTED PARTIES</u>				
Landowner/s				
Lawful occupier/s of the land				
Landowners or lawful occupiers on adjacent properties				
Municipal councillor				
Municipality				
Organs of state (Responsible for infrastructure that may be affected Roads Department, Eskom, Telkom, DWA e				

Communities					
Dept. Land Affairs					
Traditional Leaders					
Dept. Environmental Affairs					
Other Competent Authorities affected					
<u>OTHER AFFECTED PARTIES</u>					
<u>INTERESTED PARTIES</u>					

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

(1) Baseline Environment

The Namaqualand Mine Rights forms part of the Succulent Karoo Biome. A special feature of this Biome and area is the high degree of endemism due to adaptation to very specific habitats. As a result, there are many species found in the Succulent Karoo that are not found anywhere else in the world. The area had, however, been heavily transformed through intensive open cast diamond mining activities over the last four decades and all vegetation removed.

The mining rights area are located along the coastal stretch of the Namaqualand West Coast. The Buffels Marine mining right is located between Port Nolloth, in the North, and Kleinsee, in the South. The mining right, at the proposed development locations, stretches from the approximately 30m below the low water mark at the coast to approximately 10km inland.

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

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

The proposed asbestos waste disposal sites are located within the Buffels Marine Right and falls within the quaternary drainage region F20 as part of the Coastal sub-catchment of the Lower Orange Water Management Area (WMA). The aquatic feature within this area is the Kwaganab River, a relatively small coastal river. The Kwaganab River is not considered highly significant from a biodiversity point of view although as a river with a FEPA sub-catchment, it is important that the ecological condition of the river is not degraded by the proposed activities.

The Namaqualand Mine Rights forms part of the Succulent Karoo Biome. According to SANBI, the majority of the area is Veld Type SKs7 (Namaqualand Strandveld) and SKs8 (Namaqualand Coastal Duneveld) with small portions being Type SKs11 (Namaqualand Arid Grassland), SKn4 (Namaqualand Heuweltjieveld), SKs10 (Riethuis-Wallekraal Quartz Vygjieveld) and FFd1 (Namaqualand Sand Fynbos).

The terrain varies from coastal sandy flats to mountain ranges of varying geological strata. The rainfall in Namaqualand, although low is reliable and this is the fundamental explanation for its diversity of leaf succulents, bulbs and high numbers of succulents. A special feature of the area is the high degree of endemism due to adaptation to very specific habitats. As a result, there are many species found in the Succulent Karoo that are not found anywhere else in the world.

The area is impacted by small scale agricultural activities as well as the development of infrastructure for mining. Agricultural activities which are associated with this area commonly include game and livestock farming; intensive crop production is costly and uncommon as a result of the low fertility of the soil, harshness of the climate and low rainfall which the area experiences.

Four distinct conservation areas currently occur in the region, namely; Namaqua and Richtersveld National Parks, as well as the Goegap and Kleinsee Nature Reserves.

(b) Description of the current land uses.

The predominant land use within the specific area is related to open cast diamond mining. These activities had been ongoing for more than 50 years and the concentration of people

living within the Namakwa District Municipality is due largely to these mining activities in the area. The town of Kleinsee had originated due to the needs of the mine to house their employees in close proximity.

Farming in the area has always been severely limited as a result of the low rainfall. Livestock farming is practiced in certain sectors however the major land use lends itself to that of conservation areas being established. Land reform through the redistribution of land to previously disadvantaged communities and individuals poses threats to the environment, particularly through the sub-division of available land, change of land use and associated impacts, waste management and sewerage in settlement projects.

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

The proposed asbestos disposal sites are located within the Buffels Marine Right which forms part of the Succulent Karoo Biome. The area had, however, been heavily transformed through intensive open cast mining activities over the last four decades and all vegetation removed.

The terrain varies from coastal sandy flats to mountain ranges of varying geological strata. The rainfall in Namaqualand, although low is reliable and this is the fundamental explanation for its diversity of leaf succulents, bulbs and high numbers of succulents. A special feature of the area is the high degree of endemism due to adaptation to very specific habitats. As a result, there are many species found in the Succulent Karoo that are not found anywhere else in the world.

The area is impacted by small scale agricultural activities as well as the development of infrastructure for mining. Agricultural activities which are associated with this area commonly include game and livestock farming; intensive crop production is costly and uncommon as a result of the low fertility of the soil, harshness of the climate and low rainfall which the area experiences.

All existing infrastructure in the Buffels Marine Right had been constructed for mining activities and include the existing voids, proposed for the asbestos disposal facility. However, no power lines, public roads or infrastructure are located within 100m from the proposed development site. There are no structures in the immediate area and the nearest being a small substation located approximately 1.5km to the north and the Twepad Mine Plant area 2.5km to the northwest.

(d) Environmental and current land use map.

(Show all environmental, and current land use features)

The proposed development is located within the the Succulent Karoo Biome. The terrain varies from coastal sandy flats to mountain ranges of varying geological strata. No permanent water courses are located in the vicinity of the proposed developments and the majority of the area had been heavily transformed by mining activities stretching over more than forty years as indicated in Figure 4 below.

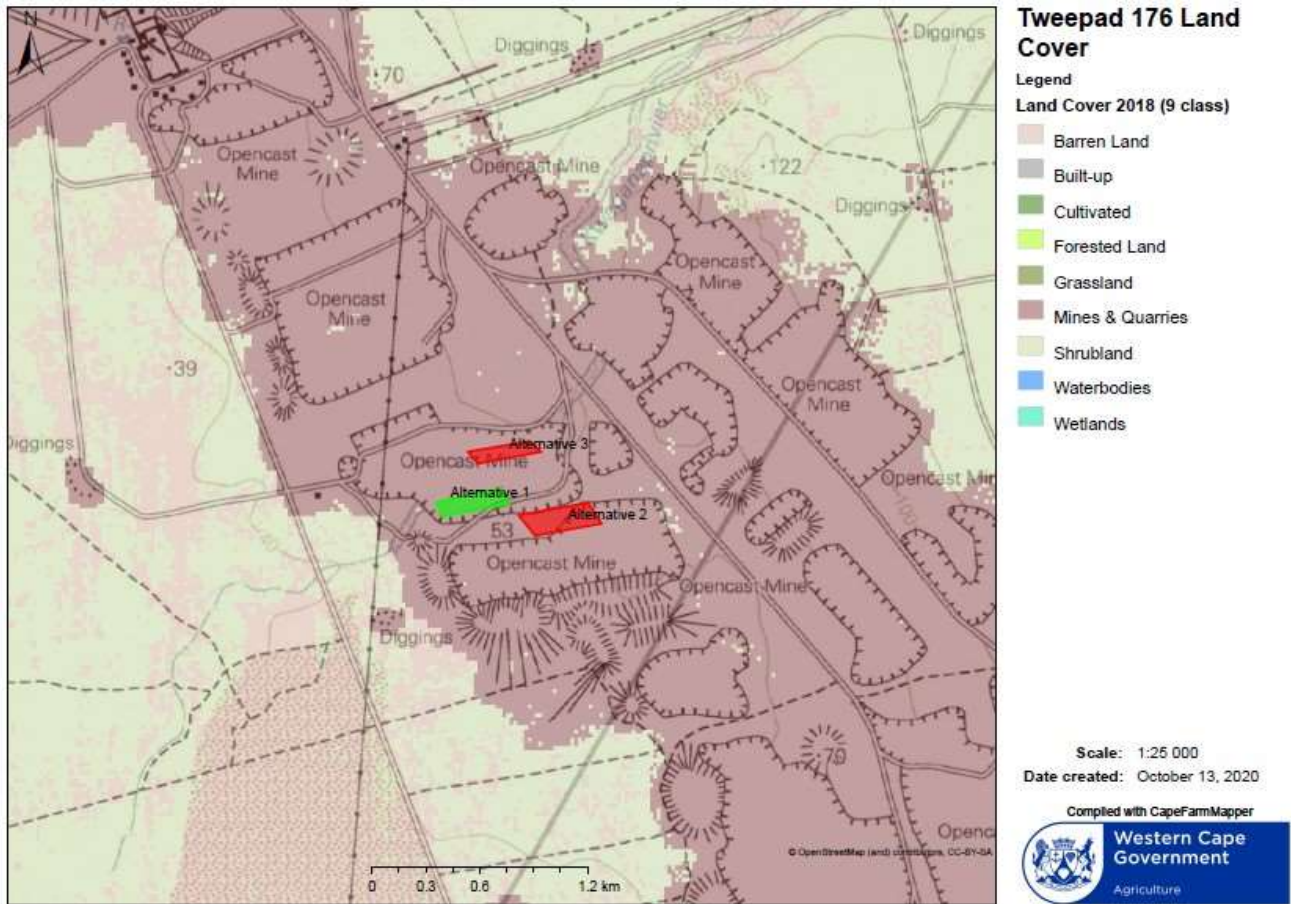


Figure 4: Map of Tweepad 176 indicating the different land cover as described by the National Landcover Survey (2018) showing a variety of open cast mines and mining dumps in the vicinity of the proposed development.

The area has no permanent water features in the vicinity of the proposed development. The Kwaganap River appears to have passed through the area; however, the watercourse has a very poorly defined channel and the area have previously been subjected to open cast mining activities that has completely altered the topography and course of the river to such an extent that there is no longer a discernible river or flow path near the proposed development sites.

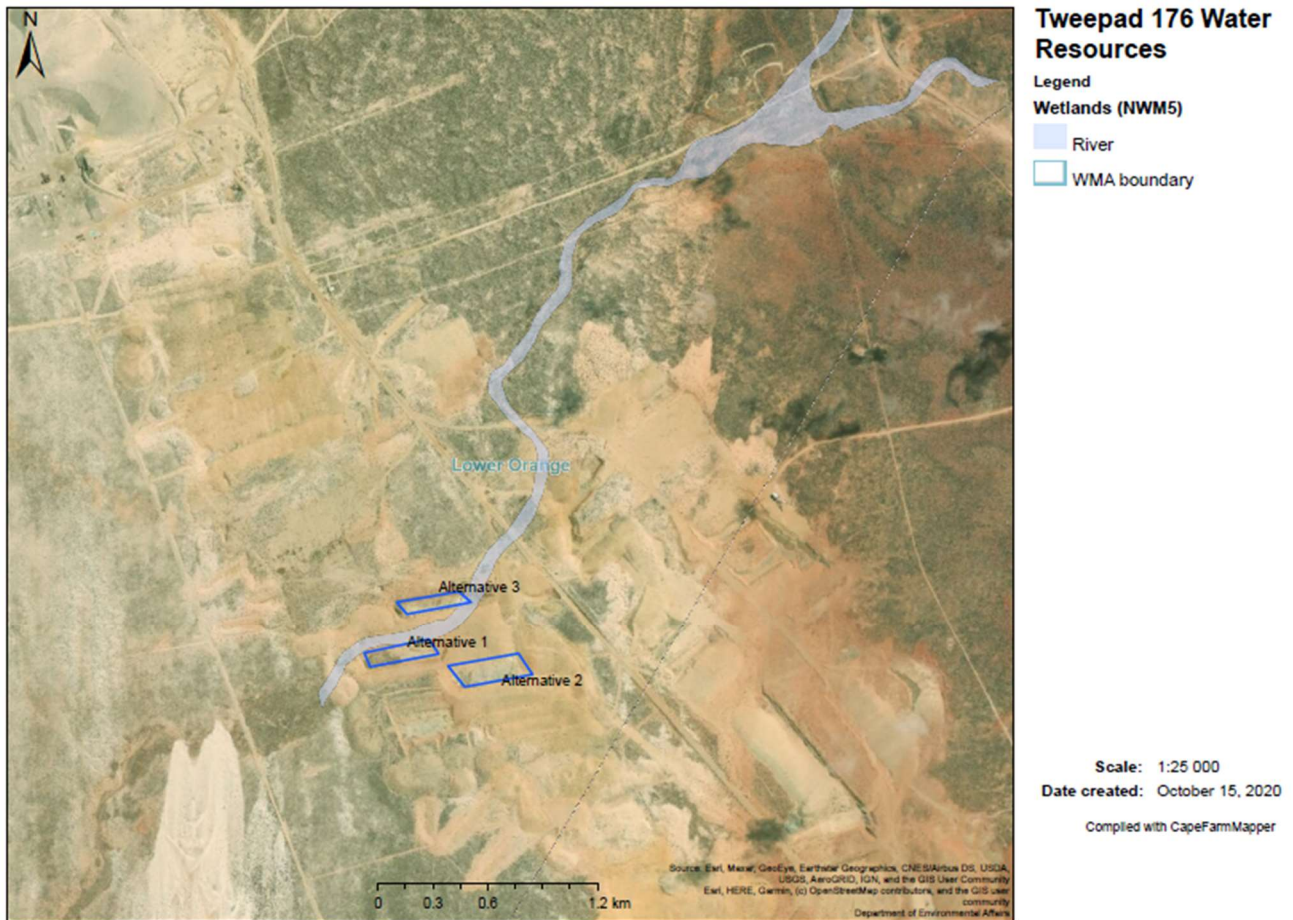


Figure 5: Original flow direction of the Kwaganab River.

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

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

The area had been screened for potential sites, based on available open mining voids. Three proposed sites were selected based on the distance from the waste source, accessibility and the proximity to potential future mining activities. Only areas where all mineral resources had been previously mined out had been included for selection. Following the feedback from a Pre-Application Consultation with DEA, specialists were appointed to assess all three sites and provide comment and feedback regarding the potential impact of the proposed development on the environment prior to selecting the final site for approval.

Based on the findings of the DEA Screening Report (Attached as Appendix 6), the environment is considered to have a very high sensitivity in terms of aquatic and terrestrial biodiversity. This area have however been previously subject to opencast mining and all of the specific site alternatives are open cast diamond mines which had not yet been rehabilitated prior to this application. For this reason, the feedback received from DEA, DENC and DMR required only statements from the specialists to confirm the state of the environment, rather than full Impact Assessments.

The natural environment have been subject to mining activities for the past forty years and mined out to bedrock, limiting any potential impacts that a project of this nature will have.

Theme	Very High Sensitivity	High Sensitivity	Medium Sensitivity	Low Sensitivity
Agriculture Theme			X	
Animal Species Theme			X	
Aquatic Biodiversity Theme	X			
Archaeological and Cultural Heritage Theme				
Civil Aviation Theme				X
Plant Species Theme			X	
Defence Theme				X
Terrestrial Biodiversity Theme	X			

Geo-Hydrology:

It had been determined that the proposed disposal of asbestos waste would not negatively affect the geo-hydrological features in the area and that the proposed sites were all suitable with the implementation of the proposed mitigation measures for the development of the proposed site.

Heritage:

The specialist, who did various previous assessments within the proposed area, did not believe that the proposed development of the waste disposal site at any of the proposed site alternatives would have any impacts on heritage resources. All of the proposed site alternatives were previously mined out voids. These area were scouted for and assessed for heritage resources at the time of the original mining activities. If any artefacts were observed the area were identified and mitigated prior to the commencement of any mining activities. Heritage resources were recorded on a heritage register for the mine and appropriate mitigation measures followed.

Fresh Water:

Due to the altered topography of the proposed site areas, it had been assessed that there is no significant difference in the potential freshwater impacts associated with either of the proposed sites. The preferred alternative, Site 1, do however have have a slightly lower potential for flooding than the two alternative sites. It had however been assessed that the proposed design of the site would play a more important role in the final associated impacts than the location at either of the three alternatives.

Ecology:

Due to the already completely transformed nature of the proposed sites, it had been concluded from an ecological perspective that proposed development would not have any additional negative impacts or repercussions on the general receiving environment. No plant communities, important faunal habitat features or essential ecological processes would be lost due to the proposed project.

Site 1 is the preferred site based on the above-mentioned criteria and feedback received.

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

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

The impacts associated with the proposed development of the Asbestos waste disposal facility within the mining areas have been determined for the entire life cycle of the facility. The final design of the facilities will incorporate the potential environmental and other impacts determined by the specialist assessments and further inputs provided during the Public participation process to be followed. The management objectives will be aligned with legislative requirements as well as the commitments of the mine, documented in the current

EMPr and other associated documentation. These may include licenses, permits and authorisations of associated projects and developments on the mine.

The EIA methodology assists in evaluating the overall effect of a proposed activity on the environment. The determination of the effect on an environmental impact on an environmental parameter is determined through a systematic analysis of the various components associated with the potential impact. This is undertaken using information that is available to the EAP through the process of the environmental impact assessment. The impact evaluation of predicted impacts was undertaken through an assessment of the significance of the impacts. Impacts have been consolidated into one rating. In assessing the significance of each issue, the following criteria is used:

NATURE	
Include a brief description of the impact of environmental parameter being assessed in the context of the project. This criterion includes a brief written statement of the environmental aspect being impacted upon by a particular action or activity.	
EXTENT (GEOGRAPHICAL)	
Site	The impact will only affect the site
Local/ district	Will affect the local area or district
Province/region	Will affect the entire province or region
International and National	Will affect the entire country
DURATION	
Construction period / Short term	Up to 3 years
Medium term	Up to 6 years after construction
Long term	More than 6 years after construction
PROBABILITY	
Definite	Impact will certainly occur (>75% probability of occurring)
Probable	Impact likely to occur (50 – 75% probability of occurring)
Possible	Impact may occur (25 – 50% probability of occurring)
Unlikely	Impact unlikely to occur (0 – 25% probability of occurring)
REVERSIBILITY	
Reversible	Impacts are permanent and can't be reversed by the implementation of mitigation measures
Irreversible	Impacts can be reserved though the implementation of mitigation measures
IRREPLACEABLE LOSS OF RESOURCES	
High	The impact is result in a complete loss of all resources
Medium	The impact will result in significant loss of resources
Low	The impact will result in marginal loss of resources
No Loss	The impact will not result in the loss of any resources
CUMULATIVE EFFECTS	
High	The impact would result in significant cumulative effects
Medium	The impact would result in moderate cumulative effects
Low	The impact would result in minor cumulative effects
SIGNIFICANCE RATINGS	

Significance is determined through a synthesis of impact characteristics. Significance is an indication of importance of the impact in terms of both physical (geographical) extent and time scale (duration), and therefore indicated the level of mitigation required. This describes the significance of the impact on the environmental parameter.

High	<ul style="list-style-type: none"> - Province/region and medium/long term - International and National and medium/long term - Local/District and long term - Site specific and long term
Medium	<ul style="list-style-type: none"> - Site specific and medium term - Local/ District and medium term - Province/region and short term/construction phase - International and National and short term/construction phase
Low	<ul style="list-style-type: none"> - Site specific and short term/construction phase - Local/ District and short term/construction phase

The above methodology had been provided to all specialists when requesting their comment letters and assessments.

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

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

The area had been screened for potential sites, based on available open mining voids. Three proposed sites were selected based on the distance from the waste source, accessibility and the proximity to potential future mining activities. Only areas where all mineral resources had been previously mined out had been included for selection. Following the feedback from a Pre-Application Consultation with DEA, specialists were appointed to assess all three sites and provide comment and feedback regarding the potential impact of the proposed development on the environment prior to selecting the final site for approval. Site 1 is the preferred site based on the above-mentioned criteria and feedback received. The following specialist inputs were considered and their recommendation will be included in the final EMP and Assessment process.

Geo-Hydrology:

It had been determined that the proposed disposal of asbestos waste would not negatively affect the geo-hydrological features in the area and that the proposed sites were all suitable with the implementation of the proposed mitigation measures for the development of the proposed site. The geo-hydrological assessment determined that capping of the proposed disposal site is crucial to prevent asbestos from being washed from the site by occasional rainfall events from where wind dispersion could distribute harmful fibres. It further also determined that the proposed Class A liner do not serve any purpose in a site that only contain asbestos waste, if it is capped. The liner is designed to prevent leaching, which does not apply to insoluble asbestos.

Heritage:

The specialist, who did various previous assessments within the proposed area, did not believe that the proposed development of the waste disposal site at any of the proposed site alternatives would have any impacts on heritage resources. All of the proposed site alternatives were previously mined out voids. These area were scouted for and assessed for heritage resources at the time of the original mining activities. If any artefacts were observed the area were identified and mitigated prior to the commencement of any mining activities. Heritage resources were recorded on a heritage register for the mine and appropriate mitigation measures followed.

Fresh Water:

Due to the altered topography of the proposed site areas, it had been assessed that there is no significant difference in the potential freshwater impacts associated with either of the proposed sites. The preferred alternative, Site 1, do however have have a slightly lower potential for flooding than the two alternative sites. It had however been assessed that the proposed design of the site would play a more important role in the final associated impacts than the location at either of the three alternatives.

Ecology:

Due to the already completely transformed nature of the proposed sites, it had been concluded from an ecological perspective that proposed developemnt would not have any additional negative impacts or repercussions on the general receiving environment. No plant communities, important faunal habitat features or essential ecological processes would be lost due to the proposed project.

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

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

The impacts associated with the proposed development of the Asbestos waste disposal facility within the mining areas have been detemined for the enitre life cycle of the facility. The view of the specialists is that the environmental risks associated with the proposed development and operation of the Asbetos waste facility is consiered to be very low on all accounts. The reasons for this being:

- The already degraded state of the potential site due to open cast mining activities;
- The lack of vegetation in the proposed sites;
- The lack of evidence of rocky outcrops in the proposed site that can be considered to be potential animal habitats;
- The lack of any significant surface water sources in the area that may be contaminated;
- The low rainfall in the area;
- The distance from communities and other dwellings, minimizing the risk of potential airbourne contamination.
- The availability of sufficient overburden and other materials form previous mining activities to appropriately cap the proposed facility and allow for successful rehabilitation in line with the mine's rehabilitation and closure plans.

The final design of the facilities will incorporate the potential environmental and other impacts determined by the specialist assessments and imputs from the Public Participation Process.

ix) Motivation where no alternative sites were considered.

The area had been screened for potential sites, based on available open mining voids. The proposed sites had been selected based on the following criteria:

- distance from the waste source;
- accessibility; and,
- the proximity to potential future mining activities.

Only areas where all mineral resources had been previously mined out and required to be filled or profiled as part of mine closure and rehabilitation had been included for selection.

Three possible sites had been identified within the mining area that complies to the abovementioned criteria. These sites are located in the Northern portion of the Buffels Marine Mining Complex and not in close proximiaty to any towns or permanent dwellings. Please

see the attached maps for the specific co-ordinates and locations of the proposed sites.

All of the proposed site alternatives are similar in character and have much the same appearance. They had all previously been mined out to bedrock and have relatively steep slopes. The bedrock in some of the alternatives are more undulating than others, but similar characteristics had been observed. Wind blown sand has accumulated on the floor of the voids and sparse vegetation has established.

Specialist inputs, identifying the potential impacts to the Ecology, Heritage, Aquatic Environment and Geohydrology of the proposed sites had been included following consultation with Department of Environmental Affairs (DEA) and Department of Mineral Resources (DMR). Based on the recommendations from both DMR and DEA it had been agreed that due to the transformed nature, caused by mining, of the potential sites only specialist comments were required to inform the Impact Assessment process. The full reports or comments are attached as an appendix hereto.

Botanical:

Dave MacDonald partnered with SLR Consulting to provide an ecological comment for the proposed development and identify potential impacts. A desktop study had been conducted based on GoogleEarth images and photos provided of the proposed site alternatives and surrounds. Due to the disturbance associated with the historical mining activities the land had been completely transformed and the original vegetation removed. It is likely that the original vegetation in the area may have been Richtersveld Coastal Duneveld, however, it has been completely transformed due to mining activities and along with it the ecological processes of the area have also been severely compromised. Therefore it is the specialist opinion that the proposed development of an asbestos waste disposal site in any of the three provided alternatives would not have any negative impacts on the surrounding environment or plant communities.

Fauna:

SLR Consulting conducted a terrestrial fauna assessment based on the information provided as described above. It had been observed that no substantial natural rock outcrops were present in either of the proposed site alternatives. The lack of these outcrops minimised the potential habitats for small mammals or reptiles in the mined out areas. Due to the completely transformed condition of the sites, no unique faunal habitats were present and it had been considered to be unlikely that any of the sites would offer suitable or essential habitat conditions for any faunal species of conservation concern. It is the specialist opinion that the proposed development would not have any negative impacts on the general receiving environment.

Aquatic Ecology:

BlueScience had been appointed to provide a specialist assessment in terms of the potential impacts on aquatic systems in the area associated with the proposed development. The Kwaganap River historically appears to have passed through the area where the proposed disposal sites are located. The river has a poorly defined channel once it leaves the hillslopes and enters the relatively flat coastal plain. The coastal zone at the foot of the hillslope has been subjected to open cast mining for many years that has completely altered the topography and course of the river. This had the effect that there are no longer any discernable river channel or flow path near the proposed waste disposal sites. Currently any flow associated with this river appears to be diverted north of the sites. Flow within the river is episodic, only occurring for a short period of time after rainfall events within the catchment of the river. Given the altered flow of the river there is potential for flood events to flow into site alternatives 2 and 3. The potential impacts on water quality are not considered to be significant, given the inert nature of the proposed material to be disposed of. The only freshwater impact may be increased turbidity, which is already naturally high for these rivers when they flow. The freshwater impacts associated with the proposed development of the asbestos waste disposal facility is considered to be of very low significance.

Hydrogeology:

Geo Pollution Technologies had been appointed to provide a desktop specialist comment for the proposed development. Based on the locality of the proposed disposal site, the groundwater is not regarded as a sensitive environment. Groundwater found within the bedrock in other studies in the area had been found to be of very poor quality. Further the

nature of asbestos, the proposed waste to be disposed of at the site, is such that it does not leach or dissolve. The impact assessment considered surface water transport to outdoor and found that the final capping of such a facility would be of crucial importance to prevent run-off from occasional rain events to expose the asbestos fibers. The potential for leaching to ground water is found to be so unlikely that the proposed mitigation of a Class A lining, as prescribed by law is considered to be unnecessary. The potential impact of the proposed disposal site is therefore considered to be insignificant.

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

Three possible sites had been identified within the mining area that complies to the abovementioned criteria. These sites are located in the Northern portion of the Buffels Marine Mining Complex and not in close proximity to any towns or permanent dwellings. All the sites do however have road access via the mine's road network for delivery.

Although it has been the view of all specialists that the proposed development will have an insignificant impact on the environment, given the mined out status and current surface disturbance caused by mining and altered topography, site alternatives 2 and 3 have a slightly higher risk of potential flooding from the Kwaganab River which historically appears to have passed through the area. The river is mostly dry and flow is only episodic, only occurring for a short period of time after rainfall events within the catchment of the river. These flow events are likely very infrequent but may be of high intensity.

The location of the preferred site, Site 1, had been selected in line with the feedback received in the specialist comments. The selection also took into account the available access, the distance from the waste source, accessibility and the proximity to potential future mining activities.

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

Please see Appendix 7 for the Assessment Criteria used during this process. These criteria had been provided to all specialists and have been used throughout the process.

i) Assessment of each identified potentially significant impact and risk

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

ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE	SIGNIFICANCE if not mitigated	MITIGATION TYPE	SIGNIFICANCE if mitigated
whether listed or not listed. (E.g. Excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc...etc...etc.).	(e.g. dust, noise, drainage surface disturbance, fly rock, surface water contamination, groundwater contamination, air pollution etc....etc...)		In which impact is anticipated (e.g. Construction, commissioning, operational Decommissioning, closure, post-closure)		(modify, remedy, control, or stop) through (e.g. noise control measures, storm-water control, dust control, rehabilitation, design measures, blasting controls, avoidance, relocation, alternative activity etc. etc) E.g. Modify through alternative method. Control through noise control Control through management and monitoring through rehabilitation.	
Site development	Geneation of Dust,	Bio Physical Aspects	Construction	Low negative	Dust impacts will be minimised in line with the existine EMPr and management plans Appropriate dust management measures in the EMPr include the use if water bosers and wetting of the surface, as well as the erection of shade netting screens to prevent the offsite movement of dust. Dust monitoring will be included as the ongoing monitoring program on mine.	Very low negative
	Increase in heavy traffic during the construction and	Socio-Economic Aspects	Construction and operation.	Low negative	All drivers will be competent and in posession of an appropriate drivers permit.	Very low negative

ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE	SIGNIFICANCE if not mitigated	MITIGATION TYPE	SIGNIFICANCE if mitigated
	operation of the proposed disposal site.				All movement of vehicles will be controlled and follow the existing mine roads.	
Operation, Loading and Hauling, and Disposal of asbestos waste and operation of asbestos waste disposal site.	Generation of dust.	Physical Aspects.	Operational	High	All current mitigation measures previously implemented in the existing Mining EMPr will also be followed for the proposed development. Any additional measures to be determined during the Impact Assessment process may be included.	Minimal negative risk
	Health and safety of employees working with or residing in close proximity to the proposed site during the construction and operation.	Socio-economic aspects	Operational and Decommissioning	Very High	All employees or operators need to be appropriately trained in the implementation of Health and Safety Policies and specific requirements associated with Asbestos work. Appropriate signage need to be installed in and around the demarcated area to the proposed site creating awareness of potential Health and Safety risks. Implement appropriate capping technology and or techniques once disposal are completed.	Low
	Potential increase in semi-skilled employment opportunities.	Socio-economic aspects	Construction, Operation and Decommissioning	Medium (Positive)	Labourers and operators should be sourced from the surrounding area as far as possible. All operational staff would require specific Asbestos work permits and special training.	Medium (Positive)
	Potential increase in solid and liquid waste.	Socio-economic aspects	Construction, Operation and Decommissioning	Medium (Negative)	Waste must be categorised by the contractor and disposed of in a suitable manner into	Low (Negative)

ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE	SIGNIFICANCE if not mitigated	MITIGATION TYPE	SIGNIFICANCE if mitigated
					<p>different waste streams (including general and hazardous waste).</p> <p>Solid waste (construction waste and builders rubble) must be collected by independent contractors and disposed of at the registered licensed landfill site on mine.</p> <p>General waste must be collected and disposed of on the registered landfill site on mine.</p> <p>Separate bins should be provided for various materials to facilitate recycling. The bins should have liner bags for easy control and safe disposal of waste.</p> <p>Particular care should be taken with the disposal of materials that could be windborne or waterborne to ensure that the release of these materials is minimised. The use of netting covers or sealed containers may be considered. Areas should be demarcated for specific activities including food consumption, with suitable receptacles provided.</p> <p>No burning of waste is</p>	

ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE	SIGNIFICANCE if not mitigated	MITIGATION TYPE	SIGNIFICANCE if mitigated
					<p>permitted.</p> <p>The use of temporary toilets during the construction phase of the development must not cause any pollution to water resources or pose a health hazard.</p> <p>No wastewater to be disposed of on soil or into the stormwater channels.</p> <p>The contractor shall ensure that the construction site, working and eating areas are maintained in a clean, hygienic and orderly state.</p> <p>Sufficient quantities of suitable hydrocarbon absorption or remediation materials must be present on site at all times.</p>	
	Potential increase in Noise	Noise	Construction and Operational phase	Low	<p>The impact can be easily mitigated by implementing appropriate noise-reduction and management measures.</p> <p>No noise generating work is to be conducted outside of normal working hours.</p>	Very Low
	Potential loss of vegetation	Botanical	Construction and Operational phase	Very low to negligible	The proposed site alternative is located in an already mined out void and would therefore not have an additional loss of vegetation.	Negligible

ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE	SIGNIFICANCE if not mitigated	MITIGATION TYPE	SIGNIFICANCE if mitigated
	Potential loss of terrestrial fauna.	Fauna	Construction and Operational phase	Negligible	The proposed site alternative is located in an already mined out area. The proposed site does not have any rocky outcrops that may offer suitable habitat conditions for any faunal species of conservation concern.	Negligible
	Potential storm water runoff and contamination.	Fresh water	Construction and operation	Very Low	The proposed design and location of the asbestos waste disposal site at site alternative 1 would negate additional mitigation due to the already transformed topography and direction of runoff from the Kwaganab River associated with these changes. The turbidity of these types of rivers is already naturally high when they do occasionally flow and the proposed development will not negatively affect it any further.	Very Low
	Potential transport of asbestos fibers from water to outdoor air.	Geo-Hydrology	Construction, Operational and Decommissioning phase	High Negative	Capping of the proposed asbestos site using suitable coarse material and overburden prior to final rehabilitation and revegetation. Capping will prevent storm water from washing asbestos out of the landfill site from where it can be distributed by wind.	Low
	Potential leaching from asbestos waste to ground water.	Geo-Hydrology	Operational and Decommissioning phase	Low negative.	Based on the physical properties of asbestos waste it is considered that it would make no difference whether a lining be placed underneath the waste	Low negative.

ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE	SIGNIFICANCE if not mitigated	MITIGATION TYPE	SIGNIFICANCE if mitigated
					source prior to disposing of it or not. No appreciable ground water is present in the area and the waste will not generate leachate. No additional mitigation measures are proposed.	
	Potential loss of Heritage resources and artefacts.	Heritage and Palaeontological Aspects.	Operation and Decommissioning phase	Negligible	Due to the proposed site alternatives are mined to bedrock, all heritage and palaeontological resources had already been impacted or disturbed. No Additional mitigation measures are recommended.	Zero

j) Summary of specialist reports.

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

LIST OF STUDIES UNDERTAKEN	RECOMMENDATIONS OF SPECIALIST REPORTS	SPECIALIST RECOMMENDATIONS THAT HAVE BEEN INCLUDED IN THE EIA REPORT (Mark with an X where applicable)	REFERENCE TO APPLICABLE SECTION OF REPORT WHERE SPECIALIST RECOMMENDATIONS HAVE BEEN INCLUDED.
Botanical	Dave MacDonald partnered with SLR Consulting to provide an ecological comment for the proposed development and identify potential impacts. A desktop study had been conducted based on GoogleEarth images and photos provided of the proposed site alternatives and surrounds. Due to the disturbance associated with the historical mining activities the land had been completely transformed and the original vegetation removed. It is likely that the original vegetation in the area may have been Richtersveld Coastal Duneveld, however, it has been completely transformed due to mining activities and along with it the ecological processes of the area have also been severely compromised. Therefore it is the specialist opinion that the proposed development of an asbestos waste disposal site in any of the three provided alternatives would not have any negative impacts on the surrounding environment or plant communities.	.X	The inputs from the specialist reports have been used throughout this report and EMP.
Fauna	SLR Consulting conducted a terrestrial fauna assessment based on the information provided as described above. It had been observed that no substantial natural rock outcrops were present in either of the proposed site alternatives. The lack of these outcrops minimised the potential habitats for small mammals or reptiles in the mined out areas. Due to the completely transformed condition of the sites, no unique faunal habitats were present and it had been considered to be unlikely that any of the sites would offer suitable or essential habitat conditions for any faunal species of conservation concern. It is the specialist opinion that the proposed development would not have any negative impacts on the general receiving environment.	X	The inputs from the specialist reports have been used throughout this report and EMP.
Fresh water	BlueScience had been appointed to provide a specialist assessment in terms of the potential impacts on aquatic systems in the area associated	X	The inputs from the specialist reports have

LIST OF STUDIES UNDERTAKEN	RECOMMENDATIONS OF SPECIALIST REPORTS	SPECIALIST RECOMMENDATIONS THAT HAVE BEEN INCLUDED IN THE EIA REPORT (Mark with an X where applicable)	REFERENCE TO APPLICABLE SECTION OF REPORT WHERE SPECIALIST RECOMMENDATIONS HAVE BEEN INCLUDED.
	<p>with the proposed development. The Kwaganap River historically appears to have passed through the area where the proposed disposal sites are located. The river has a poorly defined channel once it leaves the hillslopes and enters the relatively flat coastal plain. The coastal zone at the foot of the hillslope has been subjected to open cast mining for many years that has completely altered the topography and course of the river. This had the effect that there are no longer any discernable river channel or flow path near the proposed waste disposal sites. Currently any flow associated with this river appears to be diverted north of the sites. Flow within the river is episodic, only occurring for a short period of time after rainfall events within the catchment of the river. Given the altered flow of the river there is potential for flood events to flow into site alternatives 2 and 3.</p> <p>The potential impacts on water quality are not considered to be significant, given the inert nature of the proposed material to be disposed of. The only freshwater impact may be increased turbidity, which is already naturally high for these rivers when they flow. The freshwater impacts associated with the proposed development of the asbestos waste disposal facility is considered to be of very low significance.</p>		been used throughout this report and EMP.
Geo Hydrology	<p>Geo Pollution Technologies had been appointed to provide a desktop specialist comment for the proposed development. Based on the locality of the proposed disposal site, the groundwater is not regarded as a sensitive environment. Groundwater found within the bedrock in other studies in the area had been found to be of very poor quality. Further the nature of asbestos, the proposed waste to be disposed of at the site, is such that it does not leach or dissolve. The impact assessment considered surface water transport to outdoor and found that the final capping of such a facility would be of crucial importance to prevent runoff from occasional rain events to expose the asbestos fibers. The potential for leaching to ground water is found to be so unlikely that the proposed mitigation of a Class A lining, as prescribed by law is</p>	X	The inputs from the specialist reports have been used throughout this report and EMP.

LIST OF STUDIES UNDERTAKEN	RECOMMENDATIONS OF SPECIALIST REPORTS	SPECIALIST RECOMMENDATIONS THAT HAVE BEEN INCLUDED IN THE EIA REPORT (Mark with an X where applicable)	REFERENCE TO APPLICABLE SECTION OF REPORT WHERE SPECIALIST RECOMMENDATIONS HAVE BEEN INCLUDED.
	considered to be unnecessary. The potential impact of the proposed disposal site is therefore considered to be insignificant.		
Heritage	ASHA Consulting, who did various previous assessments within the proposed area, did not believe that the proposed development of the waste disposal site at any of the proposed site alternatives would have any impacts on heritage resources.	X	The inputs from the specialist reports have been used throughout this report and EMP.

Copies of the Specialists Comments are provided in Appendix 6

k) Environmental impact statement

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

Based on the inputs from various specialists, communication with commenting and competent authorities prior to and during the assessment process, the degraded, mined out state of the proposed development sites informed the findings of the environmental impact assessment. In all instances it was the view of the specialists that the impact of the proposed development of an asbestos disposal facility in one of the proposed locations would be low to very low. When the individual comments are considered it is noted that site alternatives 2 and 3 have only a slightly higher impact on the environment than that of the preferred site, Site 1. In all three alternatives the lack of natural vegetation, suitable habitat for fauna and the surface disturbance due to mining outweigh the potential impacts associated with the construction and operation of an asbestos disposal site in that location.

The final closure of the site will be incorporated in the current rehabilitation plans of the mine, which entails the filling and covering of the waste with overburden to fit in with the natural topography. The site will then be covered with growth medium after which it will be revegetated in line with the closure commitments and rehabilitation plans of the mine.

(ii) Final Site Map

Provide a map at an appropriate scale which superimposes the proposed overall activity and its associated structures and infrastructure on the environmental sensitivities of the preferred site indicating any areas that should be avoided, including buffers. Attached as **Appendix 3**

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

The impacts associated with the proposed development of the Asbestos waste disposal facility within the mining areas have been determined for the entire life cycle of the facility. The view of the specialists is that the environmental risks associated with the proposed development and operation of the Asbestos waste facility is considered to be very low on all accounts. The reasons for this being:

- The already degraded state of the potential site due to open cast mining activities;
- The lack of vegetation in the proposed sites;
- The lack of evidence of rocky outcrops in the proposed site that can be considered to be potential animal habitats;
- The lack of any significant surface water sources in the area that may be contaminated;
- The low rainfall in the area;
- The distance from communities and other dwellings, minimizing the risk of potential airborne contamination.
- The availability of sufficient overburden and other materials from previous mining activities to appropriately cap the proposed facility and allow for successful rehabilitation in line with the mine's rehabilitation and closure plans.

Based on the inputs from various specialists, communication with commenting and competent authorities prior to and during the assessment process, the degraded, mined out state of the proposed development sites informed the findings of the environmental impact assessment. In all instances it was the view of the specialists that the impact of the proposed development of an asbestos disposal facility in one of the proposed locations would be low to very low.

Potential Negative Impacts and or Risks Associated with the proposed development at the preferred location:

- Very Low probability of flooding of the proposed disposal site from storm water runoff generated by the occasional flow of the Kwagganab River.
- Low probability of increased turbidity due to storm water runoff and additional loose soil and

- material.
- Low probability of surface water transport of asbestos fibres to outdoor air if the appropriate capping of the waste is implemented.
- Very low probability of any leaching from asbestos to ground water, even without specified lining.

Potential Positive Impacts and Risks Associated with the proposed development at the preferred location:

- The area has historically been subject to extensive open cast mining operations, forming the open cast voids proposed to be developed for an asbestos waste disposal site.
- The proposed site does not have any natural vegetation present, it had previously been removed due to mining.
- The proposed site does not have any specialised habitats that would offer suitable conditions for faunal species of conservation concern.
- The preferred site alternative have very little risk of flooding due to the altered flow of the river caused by changes in the topography by mining.
- The disposal of asbestos at this site, would limit the distance the waste needs to be transported between the source and final disposal site.
- The location of the site would limit potential of exposure to asbestos due to limited population and rural nature of the surrounding area.
- The preferred site have no heritage or palaeontological artefacts present, the are have already been opened up and all artefacts removed prior to mining.
- The proposed site have very limited ground water present and would not be susceptible to leaching due to the inert properties of asbestos.
- The operation of the proposed site within the mining area would allow for possible job opportunities and skills development to employees allowing future specialised employment, asbestos working permits.

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

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

Please see the recommendations documented in Part B: Environmental Management Program.

m) Final proposed alternatives.

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

It is recommended that the proposed development be approved for construction on Site Alternative 1. The location of this site is in line with the proposed selection criteria and have a slightly lower overall impacts in terms of the specialist assessments and comments.

In terms of the specialist assessments and comments it is believed that development of an asbestos disposal site on any of the proposed development alternatives will have an acceptable risk. All three proposed sites have access via existing mine roads. No virgin land will be disturbed in the development of the proposed disposal sites and all sites have already been excavated and mined to bedrock level which would limit proposed earthmoving activities to the development and relatively minor preparations required for the disposal facility.

n) Aspects for inclusion as conditions of Authorisation.

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

Any additional aspects highlighted during the Public Comment Period will be included in the Final

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

(Which relate to the assessment and mitigation measures proposed)

Following the outcome of a meeting with the Department of Environmental Affairs, as well as the additional inputs received during the Scoping Phase of this Assessment, it was considered that due to the degraded nature of the environment only specialist comments would be required and not in-depth specialist assessments.

Specialist comments had been provided via desktop studies of the proposed site alternatives, providing them with arial images and background information required to provide an educated assessment. All specialists that had been selected and involved with this project had extensive experience and knowledge within this particular mining environment and had previously been on mine for other assessments or studies.

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

Following the assessment of the potential environmental impacts associated with the proposed development and operation of an asbestos site within the Buffels Marine Mining Right, on the farm Tweepad 179, it is the opinion of the EAP that the associated risks are acceptable and will be fully mitigatable in line with the current and proposed closure objectives of the mine and those documented in the EMPr.

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

Following the assessment of the potential environmental impacts associated with proposed development of an asbestos site within the Buffels Marine Mining Right it is the opinion of the EAP that the proposed development should be authorized.

The following

ii) Conditions that must be included in the authorisation

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

As per the recommendation of the Geo Hydrological specialist, it is compulsory for the asbestos waste to be capped in order to prevent potential transport of asbestos fibres from surface water to air.

Proposed storm water designs as indicated in the Freshwater comments should be implemented in the final design and construction of the proposed disposal site.

(2) Rehabilitation requirements

Please note the current rehabilitation requirements and closure commitments as described in the Buffels Marine Mining Right EMPr. These are described in Section d)i of the Attached EMPr document.

q) Period for which the Environmental Authorisation is required.

The project is envisaged to be completed within five (5) years from approval, the proposed asbestos waste facility is envisaged to be utilised for the disposal of asbestos waste currently on the mine and that which will be generated during the previously approved demolition program.

r) Undertaking

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

An undertaking by the EAP is provided in Section 2 of the Environmental Management Program (Part B) and is applicable to both the Environmental Impact Report and Environmental Management Program.

s) Financial Provision

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

The proposed development will not have an additional financial provision, this project fall within the scope of the current financial provision calculated for the Buffels Marine Mining Right and is described and set out in the Amended EMP (2012).

i) Explain how the aforesaid amount was derived.

Components of the Namaqualand Mines 2009 Closure Cost Model, as provided by Golder and Associates, was used. This model was the first of its kind for a mine in Namaqualand West Coast. This environment has no standard since it differs significantly from the majority of mining environments. Some components were impractical but the cost values were still used due to a lack of alternatives. The model was developed taking the philosophies and standards of the time in to account. The 2009 Closure Cost Model accommodates rehabilitation principles and methods in line with the environmental conditions of the Namaqualand West Coast (Amended EMP of Buffels marine Right, 2012).

The financial provision is set out in the Amened EMP for the Buffels Marine Mining Right, 2012.

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

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

Namaqualand Mines raises provision for closure over the life-of-mine through the use of bank guaranteed cheques (Amended EMP for the Buffels Marine Right, 2012).

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

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

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

No deviations from the methodology used in the Scoping Report.

ii) Motivation for the deviation.

Not applicable, no deviations from the methodology used in the Scoping Report.

u) Other Information required by the competent Authority

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

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

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

No potential socio-economic impacts had been identified. The proposed development may however have a slight positive impact in that asbestos disposal is a specialised skill and there are limited facilities that are equipped to dispose of asbestos. Should local labourers be utilised for this project, it would assist in the uplifting of the skills level of the community and provide potential employment opportunities to locals.

With correct training and the use of the correct PPE the health risks associated with asbestos handling and disposal can be minimised and controlled.

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

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

It was the view of the heritage specialist, who did various previous assessments within the proposed area, that the proposed development of the waste disposal site at any of the proposed site alternatives would not have any impacts on heritage resources.

The reason for his conclusions was the fact that the proposed sites have already been mined out and the bedrock exposed. This would have unearthed any potential artefacts that may have been found in the area. Since the mine pits are mined out to bedrock, there will be no heritage impacts in relation to the waste disposal site for any of the three alternatives. Because existing mine roads would be used for access, no impacts are envisaged in the surrounding areas.

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

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

PART B

ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT

1) Draft environmental management programme.

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

The requirement for the provision of the details and expertise of the EAP are included in Part A, Section (1)(a).

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

The requirement to describe the aspects of the activity that are covered by the draft environmental management programme is included in Part A, Section (1)(h).

c) Composite Map

(Provide a map (**Attached as an Appendix 3**) at an appropriate scale which superimposes the proposed activity, its associated structures, and infrastructure on the environmental sensitivities of the preferred site, indicating any areas that any areas that should be avoided, including buffers)

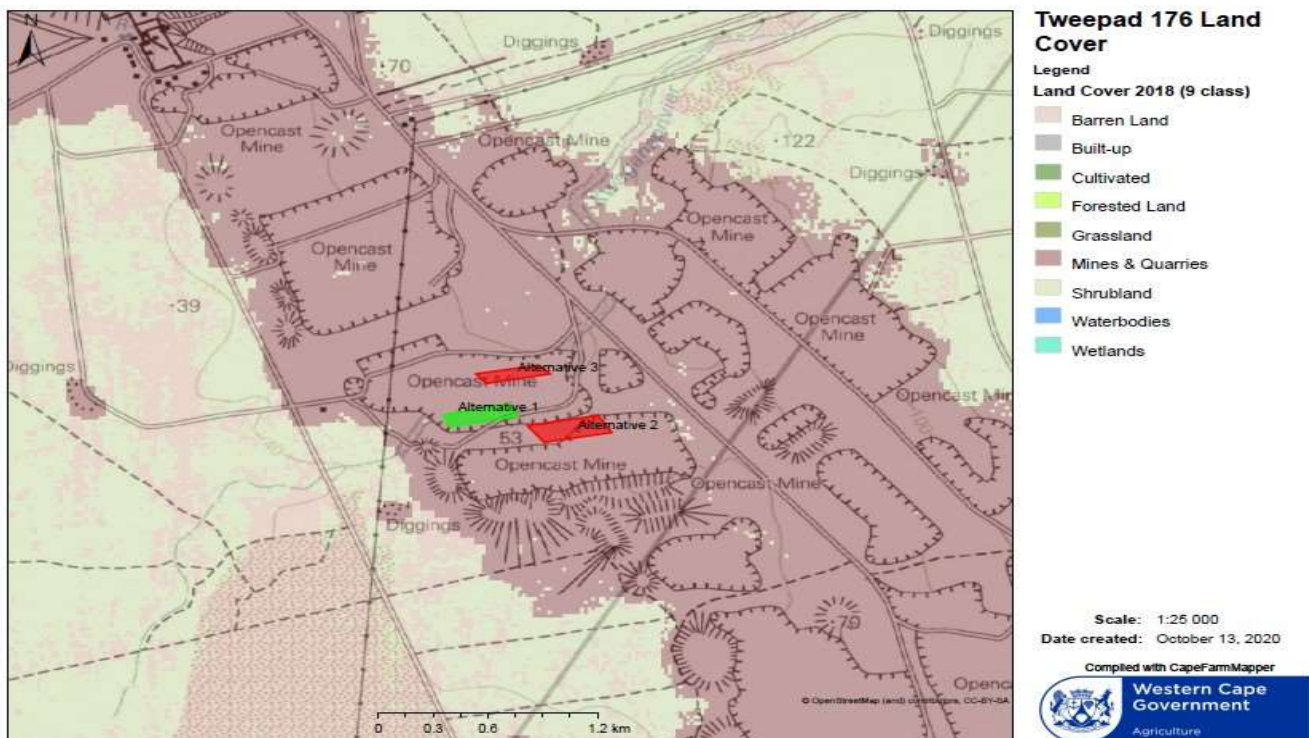


Figure 6: Preferred Asbestos disposal site (Site Alternative 1) indicated as green with associated surrounding land cover and uses.

d) Description of Impact management objectives including management statements

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

The overall goal for the closure of Namaqualand Mines is to create a mixture of land uses, especially wilderness or natural vegetation and small stock farming area together with other land uses which could support sustainable development where possible. Six distinctive land use zones have been identified for the entire Namaqualand Mines area in line with the closure objectives described in the Amended EMP of the Buffels Marine Right (2012). The various initiatives identified to assist in the successful closure of the mine in line with the planned final land use are categorised into seven focus areas. These are:

- Physical stability: Involves removing and/or stabilising surface infrastructure, unavoidable mining residues and open pits to facilitate the implementation of the planned land use;
- Environmental quality: Involves ensuring local environmental quality is not adversely affected by physical effects and chemical contamination arising from the mining areas as well as to sustain catchment yield post-closure;
- Health and safety: Involve limiting possible health and safety threats to humans and animals that would use the reclaimed mine areas as these areas enter the post closure phase;
- Land use/land capability: Involves re-instatement of suitable land capability over mining areas in line with the planned zoning for each area, and ensuring adequate safety measures to limit access to unavoidable mine residues and open pits;
- Aesthetic quality: Involves leaving each reclaimed mine area that is acceptably aesthetically pleasing and is aligned to the respective planned land use;
- Biodiversity: Involves encouraging, where appropriate in terms of the planned land use, the re-establishment of native vegetation on reclaimed mine areas such that terrestrial and aquatic biodiversity can largely re-instate over time. A specific initiative underway is the creation and expansion of a wilderness area through the Namaqua Park (South African National Parks, Conservation International (CI) and De Beers);
- Social: Involves ensuring infrastructure transfer, and measures and contributions made by the mine towards long term socio-economic benefit for the local communities are sustainable.

The table below contains the detailed performance objectives and associated measures as described in the Amended EMP of Buffels Marine Right (2012).

Topic	Objective	Measure
Upfront planning	To provide overall guidance and direction to closure planning and eventual site relinquishment.	
Closure plan, field trials and progressive closure.		<ul style="list-style-type: none"> ■ Compile an initial reclamation and closure plan to identify the key aspects that need to be addressed for closure; ■ Conduct full scale field trials to inform reclamation targets and the required measures to achieve these targets related to the identified aspects; ■ Obtain further information from field trials, work sessions and other reclamation work to inform and finalise closure planning; and

Topic	Objective	Measure
		<ul style="list-style-type: none"> ■ Set the framework for progressive closure of reclaimed areas, both technically and regulatory, to facilitate site relinquishment and /or transfer to third parties as these areas become available after successful reclamation.
Physical stabilisation	To remove and/or stabilise surface infrastructure and mining residue and/or disturbances that remain on the site after closure to allow for the planned final land use.	
Surface infrastructure	To demolish buildings, plant and related surface infrastructure with no post-closure beneficial use to facilitate the implementation of the planned land use.	<ul style="list-style-type: none"> ■ Demolish non-usable buildings, plant and related surface infrastructure and dispose of the demolition waste in accordance with disposal options. As a contingency measure, institute a process to investigate possible suitable sites for safe on-site disposal of demolition waste; ■ Clean machinery, equipment, and storage tanks and dispose as above; ■ Remove concrete structures, foundations and slabs to 1 m below final ground level; ■ Dismantle power transmission lines, pipelines, and remove from the site; ■ Decommission and remove buried support infrastructures (tanks, pipes, underground services etc.) in a safe, acceptable manner. Buried infrastructure remaining on site will be identified on site closure maps; ■ Fill decommissioned septic tanks with inert material and cover; ■ Decontaminate steel and scrap metal for salvage and recycling, if valuable; ■ Encapsulate or dispose off-site of hazardous material; ■ Conduct assessments of contaminated soils and amelioration and/or dispose; and ■ Shape and re-vegetate the disturbed areas from which infrastructure have been removed.
Coarse residue deposit (CAD)	CAD included as part of the NM mineral resource and will be retreated.	<ul style="list-style-type: none"> ■ Profile portions of the CAD to reduce visual impact.
Fine residue deposit (FAD)	FAD is considered to be a potential source of alternative commodities (for example heavy minerals).	<ul style="list-style-type: none"> ■ Shape the outer walls of the FAD ■ Preparation of the upper surfaces of all FADs ■ FADs are to be capped with CAD material. ■ The seaward wall of the AK3 FAD (the western wall of which is adjacent to the beach) is to be armoured with oversize material. ■ Erect netting only as required to eliminate possible dust plumes.
Haul and access roads	To reclaim salt treated primary haul and access roads to the planned final land use for the mine site.	<ul style="list-style-type: none"> ■ Deep rip the road surface and related areas; ■ Load and haul the ripped material for disposal in available mining voids. If possible, the material will be dozed into nearby voids;

Topic	Objective	Measure
		<ul style="list-style-type: none"> ■ Shape the cleared areas to emulate the natural surface topography as far as possible; ■ Shape cuttings and embankment suitably to ensure safety and decrease erosion potential; Breach earth embankments associated with access roads and haul roads that could impede long term surface drainage and shape as above; ■ Ameliorate and vegetate disturbed areas. Ensuring that the surface soil is a suitable growth medium, and has a rough surface topography. This can be topsoil, topsoil mixed with subsoil, or where such soil is limited, patches of topsoil/subsoil and CRD. Growth medium should cover a minimum depth of approximately 150 to 300 mm depending on type; ■ Address possible wind effects on vegetation establishment as follows: <ul style="list-style-type: none"> • If the width of the disturbed area > 50 m, or exposed to wind erosion, erect wind netting as per specifications for the region; • If the width of the disturbed area < 50 m and adjacent to natural vegetation, natural dispersal and succession is sufficient for reclamation; and • If the width of the disturbed area > 50 m or not adjacent to natural vegetation, seeds, seedlings and transplants of indigenous species, and soil ameliorates are to be added in a manner that benefits from ecological dynamics. Specifications to be determined by soil type and habitat.
Secondary haul and access roads	To reclaim historically or sporadically salt treated secondary haul and access roads to the planned final land use of the mine site	<ul style="list-style-type: none"> ■ Conduct salinity, compaction and related testing of the material from the road surface and related areas to determine the suitability of the material for re-vegetation; ■ Based on the test results, determine whether the material: <ul style="list-style-type: none"> • needs to be addressed similarly as the material from the primary haul and access roads; and • can be ameliorated in situ if the surface soil provides a suitable growth medium. Ensure that the surface soil is a suitable growth medium, and has a rough surface topography. A suitable growth medium need to have some biological activity, not have too high a clay content, and will have some primary nutrients (relative to agricultural soils, only very small amounts are necessary). This can be topsoil, topsoil mixed with subsoil, or where such soil is limited, patches of topsoil/subsoil and CRD. Growth medium should cover a minimum depth of approximately 150 to 300 mm depending on type. ■ Ameliorate and vegetate disturbed areas:

Topic	Objective	Measure
		<ul style="list-style-type: none"> • If the width of the disturbed area > 50 m, or exposed to wind erosion. erect wind netting as per specifications for the region; • If the width of the disturbed area < 50 m and adjacent to natural vegetation, natural dispersal and succession is sufficient for restoration; and • If the width of the disturbed area > 50 m or not adjacent to natural vegetation, seeds, seedlings and transplants of indigenous species, and soil ameliorates are to be added in a manner that benefits from ecological dynamics. Specifications to be determined by soil type and habitat.
Gravel roads and paths	To reclaim untreated (salt water) gravel roads and paths to the planned final land use for the mine site	<ul style="list-style-type: none"> ■ Deep rip the road surface and related areas. If road surface does not consist of natural surface soils, apply a suitable growth medium as above; ■ If roads are not compacted and consist of natural surface soils, deep ripping is not necessary, only roughen the surface topography; ■ Ameliorate and vegetate the disturbed/ripped areas: <ul style="list-style-type: none"> • If the width of the disturbed area > 50 m, or exposed to wind erosion. erect wind netting as per specifications for the region; • If the width of the disturbed area < 50 m and adjacent to natural vegetation, natural dispersal and succession is sufficient for restoration; and • If the width of the disturbed area > 50 m or not adjacent to natural vegetation, seeds, seedlings and transplants of indigenous species, and soil ameliorates are to be added in a manner that benefits from ecological dynamics. Specifications to be determined by soil type and habitat.
Fugitive tracks	To reclaim fugitive tracks to the planned final land use for the mine	<ul style="list-style-type: none"> ■ Erect barriers to prevent access by vehicles; and ■ Allow road to colonise naturally. If the width of the disturbed area < 50 m and adjacent to natural vegetation, natural dispersal and succession is sufficient for restoration.
Overburden and spoils	To render the overburden and spoils stable in the long-term and aligned to the planned final land use of the mine site.	<ul style="list-style-type: none"> ■ Doze and/or load and haul spoils into available voids; ■ Profile the remaining spoils to suitable outer slopes and integrate the shaped outer slopes with the shaped upper surface; ■ Re-vegetate the shaped outer slopes and upper surface; ■ Erect wind netting as per specifications for the region; and ■ Add seeds, seedlings and transplants of indigenous species and soil ameliorates in a manner that benefit from

Topic	Objective	Measure
		ecological dynamics. Specifications to be determined by soil type and habitat.
Vegetation	To ensure that the established vegetation on reclaimed areas becomes self-sustaining and is integrated into the overall vegetation community.	<ul style="list-style-type: none"> ■ Maintain wind netting, i.e. repair or replace as necessary; ■ Conduct in-fill vegetation as required to ensure that predetermined basal cover and species mix are achieved; and ■ Hand-pull woody weeds/exotic/alien vegetation if present and dispose of this in a manner that would not result in secondary infestation
Environmental quality	To ensure that local environmental quality is not adversely affected by possible physical and chemical effects arising from the mine site after closure.	
Dust	To limit the potential for dust generation on the reclaimed mine site that could cause nuisance and/or health effects.	<ul style="list-style-type: none"> ■ Conduct surface reclamation as stipulated above; ■ Establish vegetation as stipulated above; and ■ Conduct monitoring and maintenance as stipulated.
Surface erosion	To prevent surface erosion on disturbed/reclaimed areas to curb sediment wash-off and/or the creation of condition that could impede site re-vegetation.	<ul style="list-style-type: none"> ■ Stabilise slopes by shaping and contouring emulating local stable land forms providing suitable conditions for sustaining vegetation; ■ Avoid the creation of conditions that could create gullies and/or rills on shaped slopes; ■ Provide diversion banns/trenches to direct excess/concentrated surface runoff from shaped slopes; and ■ Create suitable conditions (growth medium, vegetation mix, etc) for sustainable vegetation cover to contribute/assist with the prevention of surface erosion.
Surface water	To prevent the impairment of local surface water sources.	<ul style="list-style-type: none"> ■ Re-instate local drainage lines as far as possible as part of site reclamation as stated in the initial reclamation and closure plan and/ or subsequent plans; and ■ Implement the stipulated measures in terms of prevention of erosion and sediment mobilization, assessment of salinisation as well as the re-vegetation of disturbed areas to protect local surface water sources.
Soil clean- up	To conduct soil clean-up/reclamation to ensure that the planned land use can be implemented.	<ul style="list-style-type: none"> ■ Conduct site inspections at mine decommissioning to determine possible sources of soil contamination; ■ Conduct soil tests to identify the possible nature of contamination, (i.e., organic or inorganic contamination); ■ If the contamination is primarily of an organic nature, the following will be done; ■ Collect composite soil samples within the identified contaminated area and analyze for total petroleum hydrocarbons (TPH). If the TPH concentrations are below 500 milligrams per kilogram, no decontamination is required. If the TPH concentrations are above 500 milligrams per kilogram, the contaminated soil will be removed if it is in manageable volumes. The collected soil will be deposited onto a dedicated on-site bioremediation facility. The reclamation of the soil will be successful if the TPH analyses of three composite

Topic	Objective	Measure
		<p>samples indicate that the average TPH concentration is below 500 milligrams per kilogram;</p> <ul style="list-style-type: none"> ■ In the cases of large volumes of organically contaminated soils a suitably qualified person will conduct an assessment and prepare appropriate reclamation strategy; <p>In the cases where the TPH standard of 500 milligrams per kilogram is not applicable, other appropriate standards such as United States Environmental Protection Agency(US EPA) risk-based concentrations or action levels for industrial soil remedial goals for direct contact exposure pathways will be used;</p> <ul style="list-style-type: none"> ■ If the contamination is primarily of an inorganic nature, the following will be done: <ul style="list-style-type: none"> • Collect composite soil samples in the identified contaminated areas and analyze for total concentrations of the appropriate chemicals of concern (COG). The selection of COCs will be dictated by the historical activities that were conducted within or nearby the contaminated area(s); • Compare the results of the chemical analyses with the USEPA Preliminary Remediation Goals (PRGs) for industrial sites. If the values are not exceeded, no reclamation is required. If the values are exceeded, a suitably qualified specialist will assess the situation and devise an appropriate reclamation strategy for implementation including the recycling of these soils to recover any copper and/or cobalt metals.
Health and safety	To limit the health and safety threats due to possible terrain hazards to humans and domestic animals utilising the reclaimed mine site after mine closure.	
Organic contaminated soils	To demonstrate upfront through soil testing that the remaining organic contaminated soils on site are acceptable	<ul style="list-style-type: none"> ■ Identify areas that during the operation of the mine could have exposed to organic contamination. These could include: <ul style="list-style-type: none"> • Transformer areas; • Workshop areas; • Conduct sampling at two horizons (0-150 mm and greater than 150 mm); • Conduct shake-flask or other appropriate tests and analyse for Total Petroleum Hydrocarbons (TPH). In the cases where the TPH standard of 1 000 mg/kg is not applicable, other appropriate standards such as the Dutch Intervention Values for Soil Contaminants or US EPA Risk Based Concentrations or action levels for Industrial Soil Remedial Goals (PRGs) for Direct Contact Exposure Pathways or other procedures considered as best practice at the time of closure must be applied; • Interpret chemical analysis results and assess the potential for contamination; and • If the TPH concentrations are below 1 000 mg/kg, no remediation is required. If the TPH

Topic	Objective	Measure
		<p>concentrations are above 1 000 mg/kg, the contaminated soil will be removed</p> <ul style="list-style-type: none"> • if it is in manageable volumes. The collected soil will be taken to a bioremediation facility for reclamation. Reclamation will continue until the TPH analyses of three composite samples indicate that the average TPH concentration is below 1 000 mg/kg. <p><i>Note: If large volumes of organically contaminated soil and/or small areas with organic contamination other than normal petroleum products such as diesel, petrol (gasoline), and lubrication oil are found, the area will be assessed by a suitably qualified person and an appropriate remediation strategy devised.</i></p>
Chemical related contaminants	To ensure that no potential contaminants such as hydrocarbons, chemicals and associated waste remain on the site after closure.	<ul style="list-style-type: none"> ■ Consume remaining chemicals, reagents and hydrocarbon products during mine decommissioning and/or return the remaining chemicals, reagents and hydrocarbon products to their respective suppliers; and ■ Ensure that no product of the above nature is disposed of on the mine site.
Slopes	To shape embankments and trenches to safe slopes as required.	<ul style="list-style-type: none"> ■ Stabilisation of slopes rendering them safe.
Environmental quality	To ensure that the environmental quality as reflected above is achieved.	<ul style="list-style-type: none"> ■ Environmental quality that should ensure that the local environment after closure should not be exposed to health and safety threats.
Land capability/land use	To ensure that the required land capability is achieved at mine closure to facilitate the implementation of the planned land use.	
Soil clean-up	To identify and assess potentially contaminated soils associated with the workshop and related areas to ensure that these areas are not potential sources of contamination to both local surface and groundwater, as well to ensure they may be reinstated as grazing areas	<ul style="list-style-type: none"> • Delineate areas that could have been potentially contaminated by organic substances; • Select sampling points based on a predetermined gee-statistical grid over the delineated areas; • Conduct sampling at two horizons (0-150 mm and greater than 150 mm); • Conduct shake-flask or other appropriate tests and analyse for Total Petroleum Hydrocarbons (TPH). In the cases where the TPH standard of 1 000 mg/kg is not applicable, other appropriate standards such as the Dutch Intervention Values for Soil Contaminants or US EPA Risk Based Concentrations or action levels for Industrial Soil Remedial Goals (PRGs) for Direct Contact Exposure Pathways or other procedures considered as best practice at the time of closure must be applied; ■ Interpret chemical analysis results and assess the potential for contamination; and • If the TPH concentrations are below 1 000 mg/kg, no remediation is required. If the TPH concentrations are above 1 000 mg/kg, the contaminated soil will be removed if it is in

Topic	Objective	Measure
		<p>manageable volumes. The collected soil will be taken to a bioremediation facility for reclamation. Reclamation will continue until the TPH analyses of three composite samples indicate that the average TPH concentration is below 1000 mg/kg.</p> <p><i>Note: If large volumes of organically contaminated soil and/or small areas with organic contamination other than normal petroleum products such as diesel, petrol (gasoline), and lubrication oil are found, the area will be assessed by a suitably qualified person and an appropriate remediation strategy devised.</i></p>
Stockpiled soils	To ameliorate disturbed stockpiled soils to alleviate shortcomings related to low fertility, low organic matter content and possible compaction.	<ul style="list-style-type: none"> ● Clean-up and trim areas from which surface infrastructure has been removed and/or those that were disturbed due to mining activities; ● Ensuring that the soil is a suitable growth medium, and has a rough surface topography. This can be topsoil, topsoil mixed with subsoil, or where such soil is limited, patches of topsoil/subsoil; ● Conduct relevant testing of the material from the stockpiles to determine the suitability of the material for re-vegetation; ● Based on the test results, determine whether the material can be ameliorated in situ. A suitable growth medium will have some biological activity, not have too high a clay content, and will have some primary nutrients (relative to agricultural soils, only very small amounts are necessary); ● Apply the stockpiled topsoil to the areas to a depth matching the original topsoil depth; and ● Shape and level the top-soiled areas with a single pass of earth moving equipment, after surface infrastructure has been removed and the area cleaned-up, aligned with ● Sustainable development initiatives.
Demolition of surface infrastructure	To demolish non-useable surface infrastructure and reclaim disturbed areas for re-use.	<ul style="list-style-type: none"> ● Clean-up areas from which buildings and surface infrastructure have been removed; ● Identify and remove any hazardous material that accumulated on components of the buildings, machinery and equipment for safe off-site disposal; ● Demolish remaining buildings and other infrastructure and dispose of the resultant demolition waste and any other inert non-hazardous materials that cannot be reused or recycled as stipulated in the initial reclamation and closure plan and/or subsequent plans; ● Check the areas from which surface infrastructure has been removed for organic contamination and remediate;

Topic	Objective	Measure
		<ul style="list-style-type: none"> • Shape the areas from which buildings, plant and surface infrastructure have been removed to roughly emulate the natural surface topography, especially terrace and hard stand areas; • Ensure that the reclaimed sites are free draining and that, where possible, local drainage lines are re-instated; and • Prepare the shaped areas for re-vegetation and vegetate.
Transfer of surface infrastructure	To transfer mining-related surface infrastructure to third parties for beneficial use as part of progressive closure and/or at final closure.	<ul style="list-style-type: none"> ■ Select suitable surface infrastructure for beneficial reuse, based on predetermined criteria below; ■ Develop the criteria for the selection of infrastructure for reuse, taking cognisance of the following: <ul style="list-style-type: none"> ■ Possible heritage sites; ■ Suite of final land uses as these are evolving; ■ Mine areas suitable for the transfer to responsible/suitable third parties; ■ Suitable third parties for transfer; ■ Long-term health and safety considerations; ■ Ongoing regulatory requirements; ■ Commercial value to Namaqualand Mines; ■ Re-zoning requirements; and ■ Develop a business case for each cluster of surface infrastructure identified for beneficial reuse for decision-making and if feasible implement.
Shallow bedrock areas	To reclaim shallow exposed bedrock areas to the planned final land use for the mine site.	<ul style="list-style-type: none"> • Shape the perimeter of the shallow bedrock areas to a suitable gradient; • In-fill with available/suitable material "deep" cavities that could pose a safety risk; and • Create randomly spaced clusters of vegetation using a different suite of plants, adapted to rocky outcrops. • In-fill the void areas with available material to emulate the surrounding surface
Deep bedrock areas	To reclaim deep exposed bedrock areas to the planned final land use for the mine site.	<ul style="list-style-type: none"> ■ topography as far as possible; and ■ Ensure that the surface soil is a suitable growth medium, and has a rough surface topography.
	To render shallow (less than 3 m high) benches safe and aligned to the planned final land use of the mine site.	<ul style="list-style-type: none"> ■ Shape shallow high walls to a suitable gradient; and ■ Re-vegetate the shaped areas.
	To reclaim deep exposed bedrock areas to the	<ul style="list-style-type: none"> ■ Shape high walls to a suitable gradient; and ■ Re-vegetate the shaped areas.

Topic	Objective	Measure
	planned final land use for the mine site. To render high walls (exceeding 3 m in height) safe and aligned to the planned final land use of the mine site.	
	To render the spoils stable in the long-term and aligned to the planned final land use of the mine site	<ul style="list-style-type: none"> ■ Doze and/or load and haul spoils into available voids; ■ Profile the remaining spoils to suitable outer slopes and integrate the shaped outer slopes with the shaped upper surface; ■ Apply growth medium from stockpiled areas to a thickness of approximately 300 mm; and ■ Re-vegetate the shaped outer slopes and upper surface.
Aesthetic quality	To ensure that the reclaimed mine site will display, at a minimum, an acceptable aesthetic appearance that would not detract from the planned land use.	
Biodiversity		
Vegetation	To re-instate native species to create self-sustaining vegetation cover to stabilise disturbed/reclaimed areas against surface erosion and associated sediment mobilisation	<p>Disturbed areas < 50 m</p> <p>If the width of the disturbed area < 50 m and adjacent to natural vegetation, natural dispersal and succession is sufficient for restoration.</p> <p>Width of disturbed areas < 50 m but not adjacent to natural vegetation</p> <p>Seeds, seedlings and transplants of indigenous species, and soil ameliorates are to be added in a manner that benefits from ecological dynamics. Specifications to be determined by soil type and habitat.</p>
Animal life	To facilitate the re-introduction of animal life to the reclaimed site area	To conduct surface reclamation and related work as required.
Progressive closure	To consider areas of the mine as these become available after reclamation for relinquishment and/or transfer to third parties if feasible to implement.	
Delineation/ selection of area	To select suitable reclaimed areas for progressive closure	<ul style="list-style-type: none"> ■ Confirm that the area under consideration is suitably reclaimed; ■ Confirm the planned land use and alignment with regional developmental initiatives; ■ Confirm aligned with sustainable development initiatives; ■ Compile business plan to confirm feasibility in transferred to third party, especially if to be used for commercial farming; and ■ Compile progressive closure plan, obtain approval and implement.
Stakeholder engagement	To establish and maintain a stakeholder forum to maintain communication between the mine and	<ul style="list-style-type: none"> ● Establish a stakeholder forum for Namaqualand Mines initially based on the key

Topic	Objective	Measure
	surrounding landowners as well as other key stakeholders on the mine's closure related initiatives.	stakeholders(communities and landowners) consulted with closure planning; <ul style="list-style-type: none"> ■ Maintain the forum as required to provide input to at least the following: <ul style="list-style-type: none"> ■ Land use planning; ■ Sustainable development; ● Re-use of surface infrastructure; ● Mine closure planning; ● Leasing of property/land and the eventual purchase of mine property; ● Property values; and ● Augment the above stakeholder engagement with proactive contributions/interaction with the district municipality on IDP formulation and sustainable development planning.
Transfer of surface infrastructure and land.	To transfer surface infrastructure and/or land to contribute to the socio economic stability and sustainable development of the region.	<ul style="list-style-type: none"> ● Identify mine related surface infrastructure and or land becoming available as part of progressive closure that could be transferred to third parties; ● Ensure that sale of land and/or the transfer of surface infrastructure is preferably to parties who are empowered towards efficient farming, chosen land use practices as well as capable to utilise and maintain transferred infrastructure; ● In the event that the above could not be achieved, the fall-back situation would be the following: <ul style="list-style-type: none"> ● Disturbed areas would be reclaimed to grazing; and ● Where possible, key biodiversity areas would be re-instated.
Land management	To ensure that land management is continued in a manner which is appropriate and takes into account principles of sustainable development.	<ul style="list-style-type: none"> ● Ensure that sale of land is only granted to parties who are empowered towards efficient farming and/or chosen land use practices; ● Ensure integration with regional land use practices; ● Reclamation is continued towards ecological integrity; and ● Ensuring the area is safe for animals and humans.

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

All environmental damage, pollution and treatment of ecological degradation will be managed in line with the mine's existing EMP closure commitments and rehabilitation plans. The proposed

development of an asbestos site within the mining area would assist in reaching those goals with a lesser impact than transporting and disposal of the asbestos waste in another province.

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

The proposed development does not pose a risk for acid mine drainage. Very limited ground water is present in the area and the potential impacts on water quality have been considered to be very low due to the inert nature of the asbestos waste proposed to be disposed of at the site.

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

Not Applicable to this proposed development.

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

Not Applicable to this proposed development.

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

Not Applicable to this proposed development.

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

Not Applicable to this proposed development.

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

Not Applicable to this proposed development.

ix) Impacts to be mitigated in their respective phases

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

The proposed development of an asbestos waste disposal site is considered to be part of the ongoing mine rehabilitation planning and closure commitments for the Buffels Marine Mining Right. The proposed site where the development will be constructed, it authorised, is an existing open cast mine pit which had been mined to bedrock and would require rehabilitation in line with the approved EMPr and existing closure commitments of the mine. With the existing degraded environment and available mining infrastructure, e.g. roads and access routes, very limited additional impacts are associated with the proposed development.

It is considered that overall risk of the proposed development will be very low due to the transformed nature of the surrounding environment and lack of ground and surface water in the vicinity of the proposed development. Should additional controls other than those recommended by the specialists and the current closure commitments of the Buffels Marine Complex EMPr be recommended during the Public Participation Process, those will be addressed and incorporated in the Final Assessment Report.

e) Impact Management Outcomes

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

The proposed impact management outcomes are aimed to be in line with the existing Rehabilitation and Mine Closure Commitments as described in Section d)i above. These include the following:

1. Ensure vegetation establishment as soon as possible after clearing.
2. Limit dust impacts from traffic
3. Limit ecological impacts because of traffic
4. Prevent and manage soil contamination
5. Reduce noise impacts
6. Ensure safe removal of hazardous waste
7. Ensure safe and stable environments after demolition

f) Impact Management Actions

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

ACTIVITY	POTENTIAL IMPACT	MITIGATION TYPE	TIME PERIOD FOR IMPLEMENTATION	COMPLIANCE STANDARDS WITH
Site access/roads	Destruction and/or disturbance of on-site fauna, flora and sensitive areas	Loss of fauna, flora & sensitive habitat	Construction and Operation of the disposal site	<ul style="list-style-type: none"> • Section 2 of the National Environmental Management Act 107 of 1998 • The conditions of the Environmental Authorisation and approved Environmental Management Programme • Section 21 of the National Water Act 36 of 1998 • Heritage Resources Act 25 of 1999 • Mine Health and Safety Act 29 of 1996 • Occupational Health and Safety Act 85 of 1993 • National Environmental Management Act 107 of 1998 as it relates to any listed activities. • National Environmental Management Waste Act 59 of 2008 • Noise Regulation Standards for Rural Areas • National Environmental Management: Air Quality Act, 2004 Dust Regulation guidelines for rural Communities • Achieve rehabilitation objectives
	Potential destruction of heritage resources	Control through the clear delineation of the area.		
	Poor access control resulting in unauthorised people entering the site	Control through the limiting of the activities to the day time and the implementation of an open and transparent channel of communication.		
	Activities within the Kwaganab River flow course could result in disturbance to the natural geomorphology and safety hazards during rainy periods	Control through the clear delineation of the demolition area.		
	Rehabilitation of access roads	Mitigation through rehabilitation		
	Destruction or disturbance of onsite fauna / livestock / wildlife.	Control through the clear delineation of the area.		

ACTIVITY	POTENTIAL IMPACT	MITIGATION TYPE	TIME PERIOD FOR IMPLEMENTATION	COMPLIANCE WITH STANDARDS
Excavation of earth works / infrastructure	Water and soil pollution resulting from disposal of materials	Control through the clear delineation of the area. Control through the implementation of a soil management programme in terms of the correct topsoil removal, stockpiling and rehabilitation practices as discussed in the EMP. Control through the implementation of environmental induction and toolbox talks. Control through the implementation of the NWA GN704 water management principles.	Construction and Operation of the disposal site	<ul style="list-style-type: none"> • Section 2 of the National Environmental Management Act 107 of 1998 • The conditions of the Environmental Authorisation and approved Environmental Management Programme • Section 21 of the National Water Act 36 of 1998 • Mine Health and Safety Act 29 of 1996 • Occupational Health and Safety Act 85 of 1993 • National Environmental Management Act 107 of 1998 as it relates to any listed activities. • National Environmental Management Waste Act 59 of 2008
	Rehabilitation of excavations	Mitigation through rehabilitation		
Waste management	Potential water and soil pollution resulting from improper waste storage and management	Control through the clear delineation of the area. Control through the implementation of a soil management programme in terms of the correct topsoil removal, stockpiling and rehabilitation practices as discussed in the EMP. All asbestos waste that will be removed must be conducted by suitable qualified persons, wearing appropriate protective equipment and must be disposed of at a licensed	Construction and Operation of the disposal site	<ul style="list-style-type: none"> • Section 2 of the National Environmental Management Act 107 of 1998 • The conditions of the Environmental Authorisation and approved Environmental Management Programme • Section 21 of the National Water Act 36 of 1998 • Mine Health and Safety Act 29 of 1996 • Occupational Health and Safety Act 85 of 1993 • National Environmental Management Act 107 of 1998 as it relates to any listed activities.

ACTIVITY	POTENTIAL IMPACT	MITIGATION TYPE	TIME PERIOD FOR IMPLEMENTATION	COMPLIANCE WITH STANDARDS
		<p>hazardous landfill site, Alternative 1.</p> <p>The asbestos waste disposal site will be appropriately capped to cover asbestos waste to prevent possible emissions to air and water.</p> <p>All general waste that are generated must be free of any asbestos containing fibres and hazardous containing waste before it can be disposed of at a waste management facility licensed to accept such waste.</p>		<ul style="list-style-type: none"> • National Environmental Management Waste Act 59 of 2008
Re-Fuelling and maintenance	Potential water and soil pollution resulting from hydrocarbon spills and hazardous waste storage	<p>Control through the clear delineation of re-fuel and maintenance areas.</p> <p>Control through the implementation of a soil management programme in terms of the correct topsoil removal, stockpiling and rehabilitation practices as discussed in the EMP.</p> <p>Control through the implementation of environmental induction and toolbox talks.</p> <p>Control through the implementation of the NWA GN704 water management principles.</p>	Construction and Operation of the disposal site	<ul style="list-style-type: none"> • Section 2 of the National Environmental Management Act 107 of 1998 • The conditions of the Environmental Authorisation and approved Environmental Management Programme • Section 21 of the National Water Act 36 of 1998 • Mine Health and Safety Act 29 of 1996 • Occupational Health and Safety Act 85 of 1993 • National Environmental Management Act 107 of 1998 as it relates to any listed activities. • National Environmental Management Waste Act 59 of 2008

i) Financial Provision

(1) Determination of the amount of Financial Provision.

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

Please refer to Section d)i) above for the current closure objectives.

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

The Environmental Assessment Report and Environmental Management Plan are made available to registered stakeholders for review and comment. All comments will be recorded in the issues and response section and will be included into the final report. The existing closure plan has undergone a detailed environmental impact assessment and public participation process of its own and was shared during that process as well.

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

The existing closure and rehabilitation plan are included as an appendix to this application.

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

The rehabilitation plan has been developed on the basis that the rehabilitated areas are safe, stable, and non-polluting and are able to support an ecosystem similar to the surrounding natural environment or alternative business as described earlier in the document. Due to the nature of the activities, the impacts will be limited and of short duration. The overall closure objectives of the mine are achieved through this activity and the development of an asbestos disposal site on the mine is viewed as an integral part of the rehabilitation works.

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

		UNSCHEDULED
INFRASTRUCTURE AND RELATED ASPECTS		
1	Infrastructural aspects	11,492,215
2	Mining aspects	0
3	General surface reclamation	116,973,762
4	Water management	0
	Re-calculation For FRD Rate	5,243,270
	SUB-TOTAL 1 (Infrastructure and related aspects)	133,709,248
5	Post closure aspects	9,464,367
	SUB-TOTAL 2 (Post-closure aspects)	9,464,367
6	ADDITIONAL ALLOWANCES#	
6.1	Preliminary and general (6 percent)	8,022,555
6.2	Contingencies (10 percent)	13,370,925
6.3	Engineering & project management (0 percent)	0
6.4	Management/staff cost (10 percent)	0
	SUB-TOTAL3 (Additional allowances)	21,393,480
	GRAND TOTAL (Sub-total 1+2+3)	164,567,094

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

Namaqualand Mines provides for closure over the life-of-mine through the use of bank guaranteed cheques (Amended EMP for the Buffels Marine Right, 2012).

Bank guarantee 01: R 127 000 000.00 – 30 March 2011

Bank guarantee 02: R 60 100 000.00 – 07 March 2012

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

- a) **Monitoring of Impact Management Actions**
- b) **Monitoring and reporting frequency**
- c) **Responsible persons**
- d) **Time period for implementing impact management actions**
- e) **Mechanism for monitoring compliance**

Bi-annual performance assessment reporting takes place in terms of the MPRDA and will incorporate this EMP as part of that assessment process going forward.

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

Internal and external inspections will be conducted on a regular basis to confirm the compliance to this EMP. EMP performance results and quantum update from these inspections will be reported to the relevant regulator according to the prescribed manner annually.

h) Environmental Awareness Plan

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

All employees and subcontractor staff involved with the project will undergo Safety-Health-Environmental Induction that is updated on a regular basis to adhere to changes in compliance requirements. All employees involved with the operation of the proposed site will also undergo specific Asbestos work training and would have to have the specific certification to enable them to work at the facility.

A Safety-Health-Environmental (SHE) representative is appointed for the operation of the waste disposal site to assist in highlighting operational SHE issues while disposing of the waste.

The reporting hierarchy for operational performance is also used to ensure environmental communication and awareness. Competent and suitably registered contractors are appointed with supervisors that can translate SHE risks to foremen and operating staff.

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

De Beers Consolidated Mines Pty (Ltd) will aim to apply a risk management system where risks are identified and rated. Site inspections in terms of EMP compliance take place and will serve as training opportunities.

Emergency procedures of risks are practiced at least annually and improvements made to ensure emergency preparedness and response is adequate to address environmental incidents.

Recommendations and Incident reporting of events takes place during site inspections and are addressed to ensure continual improvement of the environmental management on site.

i) Specific information required by the Competent Authority
(Among others, Confirm that the financial provision will be reviewed annually).

Any additional information required by the Competent Authority will be included in the Final Environmental Impact Assessment Report and Environmental Management Program Report.

2) UNDERTAKING

The EAP herewith confirms

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

-END-



Appendix 1:

EAP Qualifications



Appendix 2:

EAP CV



Appendix 3:

Locality Maps



Appendix 4:

Layout Drawings



Appendix 5:

Public Participation Process

- 5A: Site Notice and Advertisement**
- 5B: Background Information Document (BID)**
- 5C: Report on Consultation**



Appendix 5A:

Site Notice and Advertisement



Appendix 5B:

Background Information Document



Appendix 5C:
Report on Consultation



Appendix 6:

Specialist Comments and Reports:

**Geo-Hydrology
Heritage
Ecology
Fresh Water
DEA Screening Report**



Appendix 7:

Other

7A: Impact Assessment Criteria

7B: Minutes from Pre-Application meeting with DEA



Appendix 7A:

Impact Assessment Criteria



Appendix 7B:

Minutes from Pre-Application meeting with DEA



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