

BUSHMANLAND GYPSUM MINE EXTENSION

BACKGROUND INFORMATION DOCUMENT (BID):

MINING RIGHT APPLICATION

on

**Farm Dikpens 182 Portions 2 and 4
situated in the District of Calvinia
(Northern Cape Province)**

November 2011
Report #: 2639/BID/R1

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1 Purpose of document:

The aim of this document is to serve as background to allow informed public participation / comment in a recently lodged mining right application. This document is the first step in a public participation process which will continue for the next 8-12 months.

The Mining Right application has been made in terms of Section 22 of the Mineral and Petroleum Resources Development Act 28 of 2002 (MPRDA). A mining right is restricted by law to a lifespan of 30 years and this application is for a period of 20 years.

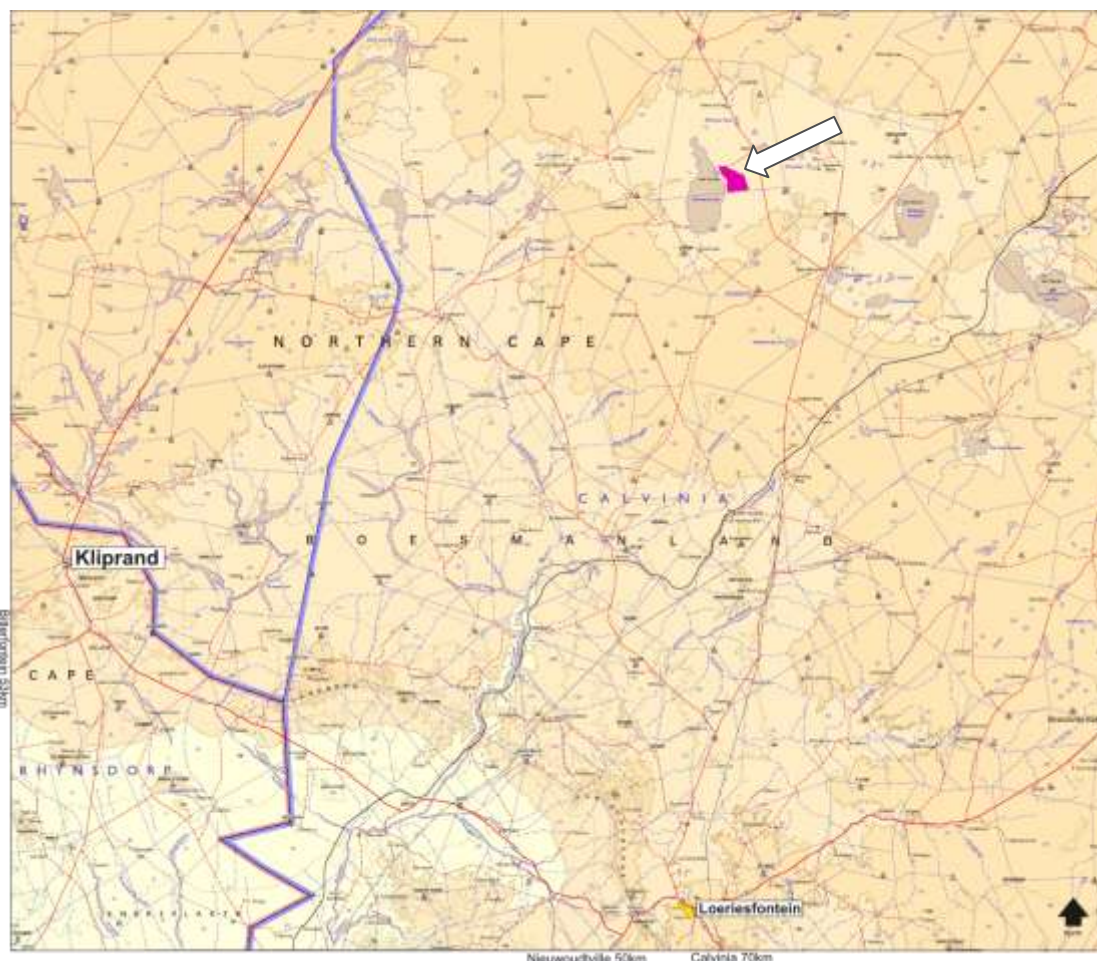


Figure 1: Locality Plan

2 Structure of this document:

The remainder of this document consists of the following sections:

- General information regarding the application process with specific reference to where public participation takes place in the process.
- Brief project description
- Brief description of existing environment, anticipated impacts and impact attenuation (reduction) measures.

- Specific requests of I&AP's
- Way forward and Request to register as I&AP

3 Mining Right Application Process:

The process to be followed by an applicant for a Mining Right is legislated in terms of the MPRDA.

1. The first step in the process is the lodging of the application by the applicant. The actual lodging is conducted without consultation so that the applicant's rights as first applicant are protected.
2. Within 14 days¹ the DMR either accepts the application and instruct the applicant to continue with the process, or rejects the application. This application has been lodged and the process continues as follows:
 - a. The applicant prepares a (BID) Background Information Documentation (this document) which accompanies all written and personal communication. This document is initially sent to all identified I&AP's which include the landowner, surrounding landowners, Land Claims Commissioner, Ward Councillor/Committee, Ratepayers Associations (if applicable), Municipality and Provincial department responsible for environment.
 - b. Broader public participation will also take place and this takes the form of at the very least a newspaper advert in the local publication. A notice can also be placed at the entrance to the affected farm or application area.
 - c. The initial contact with the Interested and Affected Parties (I&APs) serves to notify & consult with the landowner/legal occupier and other affected parties. Furthermore the applicant is to identify any additional I&AP's and to request I&APs to register as such (through newspaper advert for instance). This registration is important in that it ensures that those who register are kept informed of the status of the application and are provided with relevant documentation).
 - d. The Mineral & Petroleum Resources Development Act, Act 28 of 2002 (MPRDA) requires a separate scoping report for Mining right. This Information must reach the DMR within 30 days of the applicant being notified that the application has been accepted. As a result the timeframes are very tight initially and respondents are given 2 weeks to respond to this BID so that the responses can be included in the scoping report to be lodged at the DMR.
 - e. The scoping report is also circulated for comment and this includes circulation to all parties who registered as I&AP's as well as leaving a copy at the local public library. Calls are again made for persons /

¹ Note that all applications are now conducted electronically and the applicant has in some cases waited a little longer than the 14 day timeframe. All dates utilised in this document will be adjusted to reflect date of acceptance by the DMR and all registered I&AP's will be informed as such (Refer Part 7 for details on how to register as I&AP).

groups to register as I&AP's. At this stage respondents are given a longer period to provide comment (i.e. longer than the initial 2 weeks), given that the applicant has 5 months to compile the Environmental Management Programme (EMP).

- f. All comments are included in EMP.
- g. The DMR are responsible for distribution of the EMP to State Departments whom have 60 days to provide comment on the report to the DMR
- h. The standard practice is to provide all registered I&AP's with further opportunity to comment on the EMP during the State Department commenting period.
- i. The DMR assesses all comments and provides the applicant with their considered decision 60 days after receipt of all comments. (i.e. 120 days after EMP is lodged).

4 Brief Project Description

The application for mining right over a portion of land on 2 farms to mine Gypsum as an extension of an existing Gypsum mine run by the applicants on neighbouring farm.

4.1 General Mining Method and Site Layout Plan

(Refer Figure 2 overleaf).

The mining method that will be employed at this site is the tried and tested method (with some amendment) in use at the existing mine and consists of the following:

1. Bulldozer and self-elevating scrapers are used to remove the vegetation and approximately 50cm topsoil over an area of about 1ha.
2. Historically the topsoil was stockpiled (normally on the high side of the cleared area) in berms not exceeding 3m in height. This method is not acceptable as it leads to large areas remaining exposed for extensive periods as well as the potential for topsoil to become “inert” (i.e. loss of seedbank and nutrient leaching). Topsoil must be transported to previously mined out area as soon as possible and use in rehabilitation of that mined out area.
3. Actual mining of the Gypsite takes place using the Wirtgen continuous surface milling miner. The machine operates by cutting gypsite strips of 1.9m wide to a cutting depth of 0.2m.
4. The strips are between 200 and 600m long and mined in blocks 19m wide (i.e. 10 passes of the Wirtgen).
5. The Wirtgen cuts and crushes the Gypsum to 20mm (or less).
6. The Wirtgen leaves the Gypsum material in windrows along each cut. Such material is collected by self-elevating scrapers and taken to central stockpile, loaded on trucks and dispatched to market.

No electricity is required. No water is used in the process.

The following equipment all requires diesel fuel for operation on the site:

1. One Bulldozer
2. Up to 2 self-elevating scrapers
3. One Wirtgen Miner
4. Wheel loaders
5. Grader (maybe)
6. Transport / dispatch vehicles (operated by others)

The stores and materials required to operate these machines are already on site.

The applicant's main logistical facility site is an existing facility located on the adjacent property. That site has large supply of stores and workshop facilities. As a result no stores or workshop facility will be required at this site.

4.2 Mining Rate, Reserves and Lifespan

All gypsum mined will be sold. Production rate has been set at an initial 130 000 tons per annum escalating by 5% per annum, resulting in a lifespan of 20 years as per the table below.

The applicants have (and will continue to have) 2 markets for their product, all of which are regional (i.e. National) markets as follows:

1. Cement market: Gypsum sales directly to cement manufacturing by applicant sister company.
2. Construction materials manufacture (Ceiling boards, etc.): Also an "in-house" sale / transfer.

The reserve were measured based on prospecting results. The prospecting consisted of the digging / drilling of over 300 holes and sampling of materials in each hole. The reserves were then quantified by company geologist and only the areas of high grade (i.e. the red areas in Map 2 below) will be mined. The total surface area of such red areas is 162.3ha and the measured reserve measures 4 321 540tons. Given that this material has an S.G of 1.4tons/m³ that means that the reserve measures 3 086 814.3m³ and the reserve has an average mining depth of just under 2m.

Year	Tons mined in specific year	Remaining Tons
Total reserve		4 321 540 tons
1	130 000	4 191 540
2	136 500	4 055 040
3	143 325	3 911 715
4	150 491	3 761 224
5	158 016	3 603 208
6	165 917	3 437 291
7	174 212	3 263 079
8	182 923	3 080 156

Year	Tons mined in specific year	Remaining Tons
9	192 069	2 888 087
10	201 673	2 686 414
11	211 756	2 474 658
12	222 344	2 252 314
13	233 461	2 018 852
14	245 134	1 773 718
15	257 391	1 516 327
16	270 261	1 246 066
17	283 774	962 292
18	297 962	664 330
19	312 861	351 469
20	328 504	22 966

4.3 Hydrocarbon Management

At the time of writing this report, the author had not yet completed full assessment of existing hydrocarbon management policy at the existing mine to the south. Although it is not strictly speaking required as part of this application, the entire hydrocarbon management plan will be described in the upcoming scoping report. Such plan will include measures relating to the following aspects which will only occur on the existing site and will not occur on this extension application, such as:

- Domestic and industrial waste- separation, temporary storage and disposal
- Storage of fuel and lubricants
- Transport of fuel to site
- Oil traps
- Generator use

However in terms of the extension, the following impact attenuation measures will need to be put in place:

Refuelling in the veld:

In the event of refuelling being required away from the main fuel tank, then the staff must be supplied with suitable equipment to perform such task.

Emergency repairs in the veld:

In the event of a breakdown with repair being required in the field, the staff should be trained in use of drip trays and suitable funnels (not to drain oil into the sand) for filling and draining of lubricants and the staff shall be provided with such equipment to prevent oil contamination.

In addition:

- Used/replaced filters, hoses, belts, cloths, etc. are to be placed in a bin for return to the used oil and lubricant storage area which is to be constructed at the main logistical facility on the existing mine. Used filters are not to be buried at the site of repair (nor discarded in the excavation to be backfilled).
- In the event of soil contamination, the soils are to either be:

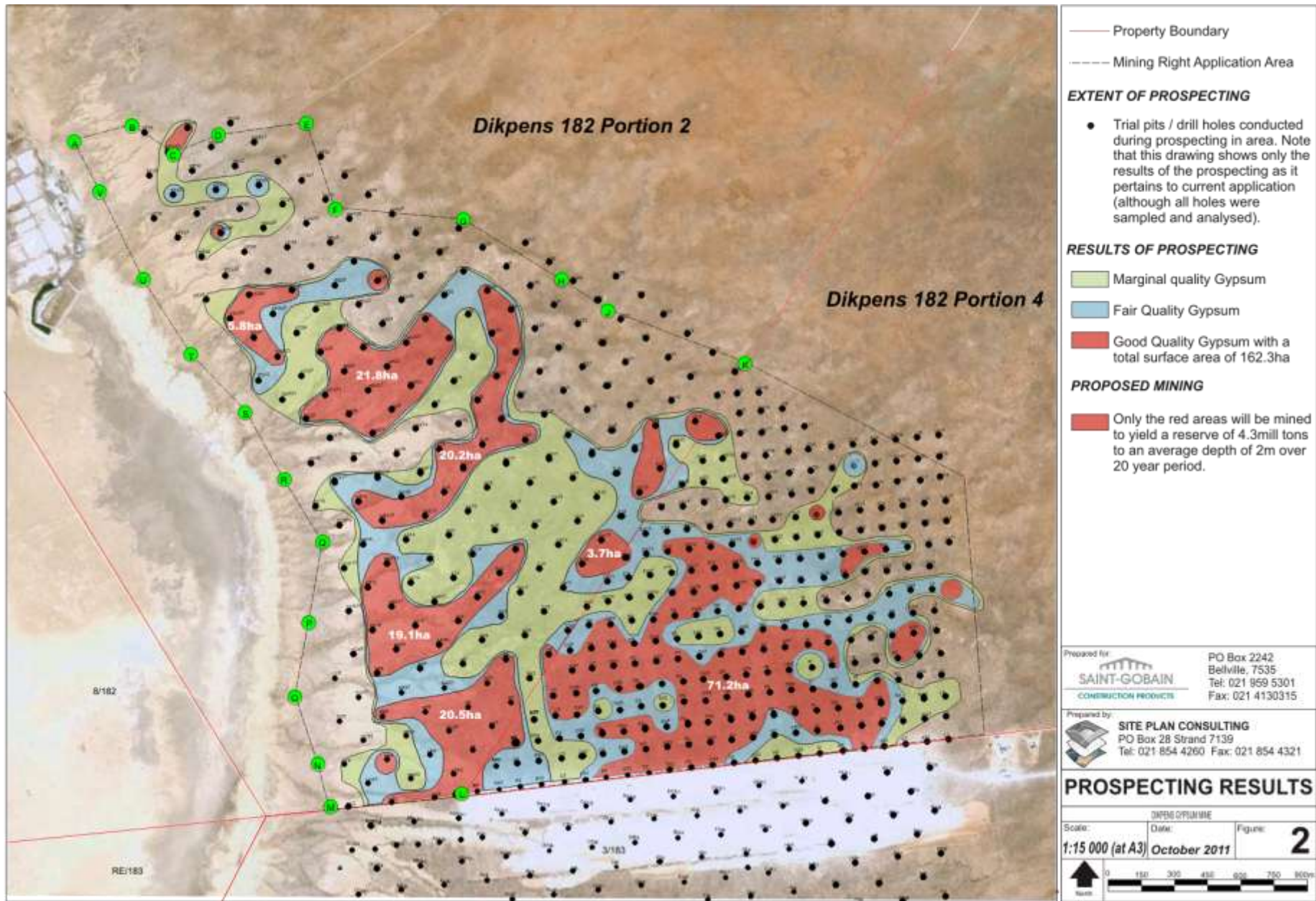
- treated in-situ with a suitable decontaminant such as the OT8 or Spillsorb range of products
- or removed in black bags along with at least 5cm of sand below the leaked lubricants.

All staff involved in mobile plant operation and maintenance is to be made aware of these oil and lubricant procedures. Staff will require instruction in the:

- Deleterious effects of oil / fuel on the environment
- Use of OT8 / Spillsorb products and the treatment of soil.

Other General Provisions

- All operators are to check their equipment for leaks and report such leaks on a daily basis.
- No used oils are to be used as dust suppressants on manoeuvring areas.
- All staff to be instructed to report oil spills immediately and be trained in fire fighting and the use of biodegradable solvents such as OT8 or Spillsorb or similar products in the clean-up operation



5 Brief description of existing environment, anticipated impacts and impact attenuation (reduction) measures

5.1 Defining the impact

The impact on each of the aspects is measured according to the following table of significance.

a) Significance (level)

Significance		Criteria
Negative	Significant	<ul style="list-style-type: none"> Recommended level always exceeded with associated widespread community action Disturbance to areas that are pristine, have conservation value, are important resource to humans and will be lost forever Complete loss of land capability Destruction of rare or endangered specimens May affect the viability of the project
	Moderate	<ul style="list-style-type: none"> Moderate measurable deterioration and discomfort Recommended level occasionally violated – still widespread complaints Partial loss of land capability Complete change in species variety or prevalence May be managed Is Insignificant if managed according to EMP provisions
	Insignificant/ Minor	<ul style="list-style-type: none"> Minor deterioration. Change not measurable Recommended level will rarely if ever be violated Sporadic community complaints Minor deterioration in land capability Minor changes in species variety or prevalence
Positive	Minor	<ul style="list-style-type: none"> Improvements in local socio-economics
	Significant	<ul style="list-style-type: none"> Major improvements in local socio-economics with some regional benefits

b) Duration

- Residual (post mining)
- Life of Mine
- Temporary

c) Probability

- Definite
- Possible
- Unlikely

5.2 Climate

The wind data for Pofadder below refers:

POFADDER WIND DIRECTION AND SPEED TABLES (1990)

DIRECTION FREQUENCY

	N	NE	E	SE	S	SW	W	NW
Jan	31	48	31	151	190	244	104	71
Feb	38	60	42	152	160	191	93	96
Mar	69	85	41	152	112	125	71	96
Apr	71	96	59	137	77	91	62	89
May	60	113	61	115	68	81	60	85
Jun	68	156	73	104	60	67	58	78
Jul	69	159	58	119	61	66	56	71
Aug	61	124	45	137	89	109	82	66
Sep	49	77	50	155	118	152	78	69
Oct	32	65	45	155	137	188	97	77
Nov	30	49	42	148	170	216	101	83
Dec	24	38	41	146	184	227	110	79

SPEED

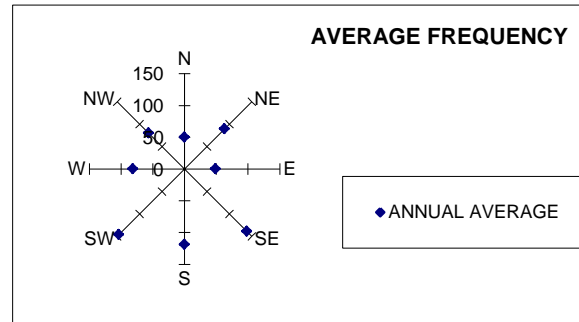
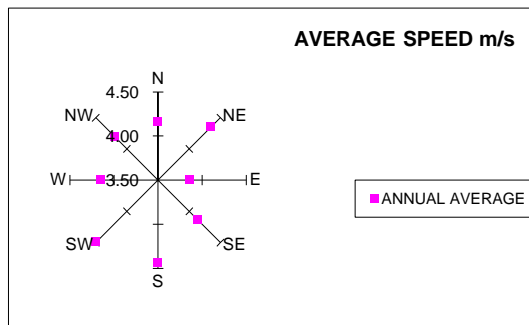
	N	NE	E	SE	S	SW	W	NW
Jan	3.4	4.3	4.4	4.7	5.3	4.7	3.8	3.9
Feb	3.7	3.9	3.6	4.4	4.8	4.4	3.5	4
Mar	4	3.8	3.6	4.1	4.2	4	3.7	4
Apr	4.2	4.3	3.7	3.6	3.7	4	3.9	4.1
May	4.1	4.4	3.2	3.4	3.5	4.5	4.7	4.2
Jun	4.3	4.5	3.3	3.1	3.9	4.5	4.2	4.4
Jul	4.4	4.3	3.3	3.3	3.7	4.2	4.3	4.4
Aug	4.8	4.9	3.4	3.8	4	4.2	4.7	4.4
Sep	4.3	4.6	4.2	4.3	4	4.5	4.2	4.4
Oct	4.3	4.7	4.2	4.7	5	5.2	4.3	4.3
Nov	4.5	4.5	5	5.1	5.5	4.9	4.2	4.1
Dec	3.9	4	4.4	5.2	5.6	4.9	4.3	4

DIRECTION FREQUENCY

	N	NE	E	SE	S	SW	W	NW
AVERAGE	50	89	49	139	119	146	81	80

SPEED

	N	NE	E	SE	S	SW	W	NW
AVERAGE	4.16	4.35	3.86	4.14	4.43	4.50	4.15	4.18



The wind data above is for Pofadder and is considered representative of the wind regime in the area. It shows that the predominant winds are from the SW and S. NE winds are also common. The implications on proposed prospecting activities of this wind regime are as follows:

- Prevailing wind direction is from the south and is especially strong in summer. This is also the “driest” period and dust generation will be highest. This must however be seen against the regional ambient dust levels which are in any event high under dry high wind conditions.
- Infrequent northeast winds (berg winds) also blow quite regularly. These winds are hot and dry and carry regionally generated dust.

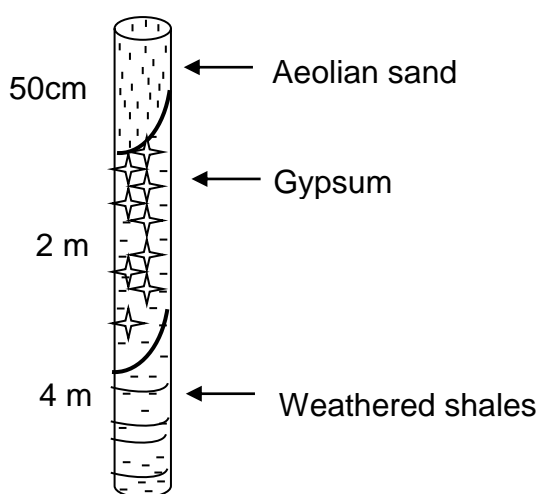
5.3 Surrounding Land Uses

The entire farm is used solely for small stock grazing. Surrounding land uses comprise:

- Grazing veld
- Two salt mines in Dwaggas Sout Pan to the W.
- The existing Bushmanland Mine to the south. This mine application is an extension to that existing mine.

5.4 Geology

5.4.1 Existing Situation



The deposit was formed as a procrete by leaching of the underlying sulphate bearing Eccca shales, comprising the country rock. Weathering of dolerites provided calcium. The calcium and sulphur, together with areas with restricted drainage (pans) and cyclical dry periods, generated the gypsum. The deposit of gypsum is made up of tiny crystals or small grains of gypsum.

The gypsum layer is mostly covered by a layer of reddish aeolian sand with minor shale fractions present in some areas. It varies in thickness from 0 to 50 cm. The gypsite layer varies in thickness from 50 cm to 3170 cm. The base of the ore body consists of weathered dark brown Eccca shale. The bedrock consists of shales of the Eccca Group of the Karoo Supergroup.

A full prospecting process was undertaken by the applicant. The process consisted of more than 300 holes either drilled by auger or dug as trial pits by small excavator. The material in the holes was sampled and the then graded on a 5 step range from high quality to no Gypsum content. The results are contained in figure on page 6 with only the red areas suited for mining.

The site is not a geo – site nor does it represent a geological unique occurrence.

5.4.2 Expected Impact of operation

<i>Impact generator</i>	<i>Spatial extent</i>	<i>Probability</i>	<i>Duration</i>	<i>Significance</i>	<i>Post-closure impact</i>
Mining of 4.3mill tons Gypsum	162ha to ±2m deep on average	Definite	Permanent	Insignificant	Insignificant

5.5 ***Topography***

5.5.1 Existing Environment

As is the case for all Gypsum deposits and is required for Gypsum development, the area is flat with only the very slightest grade towards the west (i.e. toward Konnes se Pan).

5.5.2 Impact of the operation

Impact on topography will arise through the mining and removal of Gypsum to an average depth of 2m. That means there will be an average surface level reduction of approximately 2m in the areas indicated in red on plan on page 6. In terms of topography, this impact is negligible but any impact on surface water flow and current drainage pattern is discussed under para 5.11.

<i>Impact generator</i>	<i>Spatial extent</i>	<i>Probability</i>	<i>Duration</i>	<i>Significance</i>	<i>Post-closure impact</i>
Mining of Gypsum to average 2m depth	162ha to ±2m deep on average	Definite	Permanent	Insignificant	Insignificant

5.5.3 Proposed attenuation measures

The following mitigation measures will be required to reduce / eliminate any impact on topography:

1. Fortunately the Wirtgen machine and the self-elevating scrapers work in such a way as to ensure a fairly level surface after mining and replacement of topsoil. So the resultant topography will closely mimic natural contours and not contain any heaps or residual “bumps”.
2. The side slopes of the 2m deep excavation must be sloped to no steeper than 1:3 and all sharp edges are to be rounded prior to topsoil replacement.

5.6 ***Visual Impact***

5.6.1 Existing Environment

The site is located on an exposed portion of land between DR2980 and the pan. The site is visible to sections of the public road (DR2980) as well as the salt mine access road. This road is seldom used and the distance from the road to the closest activity area is in excess of 1.5km from the DR2980.

The site is not visible to any residence in the area.

5.6.2 *Impact of the operation*

It is possible that visual impact may arise from the operations, but the impact will be minor and will be restricted to the distant visual impact of the equipment operating on site. The impact will be restricted to passing vehicles.

Full visual impact assessment will be conducted on specific site visit for this purpose during the course of compilation of the scoping report. Consideration of existing visual impact generated by existing mine will be incorporated into such impact assessment.

<i>Impact generator</i>	<i>Spatial extent</i>	<i>Probability</i>	<i>Duration</i>	<i>Significance</i>	<i>Post-closure impact</i>
Exposed mined out areas prior to rehabilitation	Say 40ha maximum at a time.	Definite	Temporary (until re-establishment of vegetation)	Insignificant	None

5.6.3 *Proposed attenuation measures*

The visual impact will be reduced through the following activities:

- Ensure that the principle of strip mining (with continuous rehabilitation) takes place. The proposal is that as soon as mining has been completed over an area that the topsoil from the area ahead of that (i.e. in area of topsoil clearing in preparation for mining) is used in the rehabilitation of the mined out area.

Should the detailed visual impact assessment as will be contained in the scoping report yield additional more serious impacts then these will be addressed in that document (but such case is unlikely).

5.7 *Soil*

Possibly the most important aspect of the proposed attenuation measures is the proper handling of topsoil. Without effective topsoil management, the disturbed areas will not be able to effectively revegetate, visual impact (if any) will remain and the agricultural capability of the land will not return and all impacts are thus multiplied.

5.7.1 *Existing Environment*

The topsoil depth is up to 50cm. It consists largely of sand of aeolian origin that has been bound by the vegetation cover on site. The topsoil (upper 50cm) is more or less the same material as the subsoil but does contain the seed bank and humous layer and must be preserved and used in the rehabilitation where disturbance takes place

5.7.2 *Impact of the operation*

The topsoil will be impacted upon when such topsoil is removed ahead of mining by self-elevating scraper to either:

1. Berm (on high side of development) to no higher than 2m, or
2. Immediately transported to mined out area and spread over such area for natural revegetation to take place.

It is once again stressed that proper topsoil handling is probably *the* most important factor in ensuring rehabilitation of the site and all attempts must be made to ensure that topsoil is replaced as soon as feasible.

<i>Impact generator</i>	<i>Spatial extent</i>	<i>Probability</i>	<i>Duration</i>	<i>Significance</i>	<i>Post-closure impact</i>
Topsoil removal ahead of mining	Over entire area to be mined (160ha).	Definite	Temporary (until re-spreading over mined out area)	Insignificant (provided re-topsoiling of mined out areas do take place)	None (provided re-topsoiling of mined out areas do take place) – Otherwise significant

5.7.3 Proposed attenuation measures

Topsoil handling in all cases must proceed as follows:

Less preferable method: If removing topsoil to temporary berms (no longer than 6 months):

1. Remove topsoil along with vegetation to full depth (± 50 cm) to berms/heaps alongside the affected area.
2. Such topsoil berms is to be limited to 2m in depth. Such height restriction is required to retain a viable seed bank in the disturbed topsoil.
3. Replace topsoil over affected areas to original depth when rehabilitating the site. Such replacement of topsoil must take place last i.e. in reverse order where applicable.

Most preferable method: Remove topsoil immediately to mined out and prepared area:

1. Remove topsoil along with vegetation to full depth (± 50 cm) to for loading and transport to mined out and leveled area.
2. Load haul and tip material onto mined out area in preparation for smoothing.
3. Smooth material with dozer or scraper.

In all cases, where topsoil has been replaced

1. Ensure that clay is not exposed on surface as this will not allow revegetation to take place
2. Lightly scarify the replaced topsoil to:
 - a. Assist in aeration of the soil
 - b. Assist in the capture of windblown seeds
3. Ensure no access to rehabilitating area (especially for stock grazing)

5.8 *Land Capability/ Agricultural Potential*

5.8.1 Existing Environment

The land is classified as non-arable, low potential grazing land in terms of the land capability rating contained in the *Agricultural Information System for South Africa (AGIS)* – see <http://www.agis.agric.za>.

The land has further been classified as wilderness area with subordinate grazing (given that the carrying capacity is in the order of 12ha/ssu). This classification is more restrictive than pure grazing classification. The total area mining right area is 725.74ha.

On site land capability is classified as per the table below:

<i>Land capability</i>	<i>Area</i>	<i>%</i>	<i>Notes</i>
Wilderness area	725.74ha	100%	The more restrictive wilderness rating has been applied even though the land is used for grazing.
Arable Land	0ha		
Grazing	0ha		
Wetland Area	0ha		
Existing Structures	0ha		
<i>Total</i>	<i>725.74ha</i>	<i>100%</i>	

The carrying capacity of the veld is reported to be 41ha / Animal Unit (http://www.agis.agric.za/aismap_atlas/AtlasViewer.jsp?MapService=agis_atlas2006&ProjectId=5&LId=0&OId=0&LayerIdVisList=none) - to be confirmed with landowner and surrounding farmers - but the aim of the rehabilitation programme is to restore the veld to its wilderness rating.

5.8.2 *Impact of the operation*

The proposed mining of the site will result in temporary unavailability of portions of the site as wilderness or grazing land from the moment topsoil is removed until revegetation of the site.

<i>Impact generator</i>	<i>Spatial extent</i>	<i>Probability</i>	<i>Duration</i>	<i>Significance</i>	<i>Post-closure impact</i>
Topsoil removal ahead of mining	Total unrehabilitated area – assuming no rehab takes place during life of mine then max = 160ha, however continuous rehabilitation is proposed and it is anticipated no more than 40ha will ever be unrehabilitated at any time	Definite	Temporary (until rehab of mined out area)	Insignificant (provided re-topsoiling of mined out areas do take place)	None (provided re-topsoiling of mined out areas do take place) – Otherwise significant very long term impact is most likely to result

5.8.3 *Proposed attenuation measures*

The attenuation of the impact on land capability is generally related to the impact and attenuation of soil. So, when topsoil is replaced, the return of the wilderness rating land capability generally follows shortly.

Attenuation measures to return the land capability mostly relate to replacement of topsoil after completion of activities using “freshest” topsoil possible. The process will be accelerated by a light scarification of the replaced topsoil to increase the aeration of the soil and assist in the potential capture of windblown seed.

Other measures include the following:

- Use of shade-cloth nets to stabilize topsoil may be contemplated if wind plays a part in prevention of full revegetation.
- Prevention of grazing until affected land unit has revegetated sufficiently so that grazing will not affect revegetation. This may require that the mined out

area is unavailable as grazing for several growing seasons. Access to stock can only be prevented through fencing and the landowner would have to be compensated for such losses.

5.9 Natural Vegetation

5.9.1 Existing Environment

A full botanical assessment was conducted by T Anderson in April of 1999. The study found the following – the full study will be included as Annexure in Scoping report:

- The site falls within the Nama Karoo Biome
- The vegetation type is Bushmanland Nama Karoo (Low and Rebelo 1996)
- Two vegetation types were mapped (i.e. the Open shrubland on deeper sands and the Dwarf shrubland on gypsum outcrops).
- “No botanically sensitive sites were found and there should be no severe effect on the vegetation type of the general area” was the recommendation for mining at the site.

5.9.2 Impact of the operation

The impact of the mining operation will be the temporary disturbance of the natural vegetation between the time that topsoil is removed and when the natural revegetation of the replaced topsoil takes place. The aim of the rehabilitation plan is to replace topsoil as soon as possible on mined out and prepared areas through a process of strip mining. In that way it is anticipated that the maximum exposed area at any time will be in the order of 40ha.

<i>Impact generator</i>	<i>Spatial extent</i>	<i>Probability</i>	<i>Duration</i>	<i>Significance</i>	<i>Post-closure impact</i>
Topsoil removal ahead of mining	Total unrehabilitated area – assuming no rehab takes place during life of mine then max = 160ha, however continuous rehabilitation is proposed and it is anticipated no more than 40ha will ever be unrehabilitated at any time	Definite	Temporary (until rehab of mined out area)	Insignificant (provided re-topsoiling of mined out areas do take place)	None (provided re-topsoiling of mined out areas do take place)

Note that the duration of impact will be determined by number of rainy seasons (as opposed to simply a measure of growing seasons).

5.9.3 Proposed attenuation measures

The following general principals apply:

1. Whenever topsoil is to be removed, always remove the vegetation with the topsoil. If topsoil is to be stockpiled for any length of time in a berm then such berm must be limited in height to 2m.
2. The 2m height restriction is an attempt to retain a viable seed bank in the topsoil.
3. The main aim however is to be the immediate replacement of topsoil (with vegetation content) over previously mined out and prepared area as part of continuous mining and rehabilitation programme (i.e. strip mining).

4. Replace topsoil after the activities have been completed and conduct a light scarification of the affected area. The scarification assists through creating a favourable microclimate (i.e. windblown seeds are trapped, water does not run-off too easily and the soil is aerated) – all aiding more effective revegetation.
5. No unnecessary access to the surrounding veld at any site must be permitted.
6. No fires are permitted. Gas/paraffin stoves are to be used for cooking.
7. No ad hoc campsites in the veld

5.10 *Animal Life*

5.10.1 *Existing Environment*

Vast expanses of low shrubland veld type vegetation provide a habitat suitable for species typical of the area. These include small buck, rodents (meerkat, mice, shrews etc), reptiles (snakes and tortoises) birds and insects. The large scale of the habitat type when compared to the extent of the proposed activities negate any significance of any impact in this regard.

A full faunal study was conducted during Feb of 2000 by Dr WRJ Dean. That report will be contained as Annexure to the Scoping report. The study found that there are no species listed in any category of conservation concern (Branch 1988), except for the 4 species of bird which are listed as indeterminate or endangered. They will not be impacted upon by the proposed mining.

5.10.2 *Impact of the operation*

<i>Impact generator</i>	<i>Spatial extent</i>	<i>Probability</i>	<i>Duration</i>	<i>Significance</i>	<i>Post-closure impact</i>
Topsoil removal ahead of mining	Total unrehabilitated area – assuming no rehab takes place during life of mine then max = 160ha, however continuous rehabilitation is proposed and it is anticipated no more than 40ha will ever be unrehabilitated at any time	Definite	Temporary (until rehab of mined out area)	Insignificant	None

5.10.3 *Proposed attenuation measures*

The animal life around the affected area will be chased away by the presence of such activities. There is a vast expanse of similar habitat type around the proposed activity area and it is unlikely that any impact on animal life will occur from the proposed activities.

5.11 *Surface Water*

5.11.1 *Existing Environment*

The area receives an erratic annual rainfall of between 50 and 200mm per year with most of the precipitation occurring during the summer thunderstorms. Evaporation rates far exceed precipitation and this situation generally results in saline (alkaline)

soils. The land is very flat and this topography coupled with the permeability of the soils results in negligible surface water flow.

Any surface water which does flow, flows toward Konnes se Pan located west of the proposed prospecting operation.

There are some low order drainage channels draining toward Konnes se Pan, but these will not be impact upon.

5.11.2 *Impact of the operation*

The mining of the site will result of the lowering of the surface by approximately 2m. It must be investigated whether this will have any impact on the contribution of drainage area (i.e. surface water recharge quantity) to Konnes se Pan. This will be determined through contour analysis.

<i>Impact generator</i>	<i>Spatial extent</i>	<i>Probability</i>	<i>Duration</i>	<i>Significance</i>	<i>Post-closure impact</i>
Lowering of topography by $\pm 2m$	max = 160ha – but extent can only be properly determined after analysis of contour survey	Unknown (but unlikely to be on any significance)	Unknown – to be assessed	Unknown – to be assessed	Unknown – to be assessed
Threat of oil / fuel pollution	Point impact	Unlikely	Temporary	Insignificant	None
Threat of siltation of surface water resources	Local basin	Very unlikely	Life of Mine	Insignificant	None

5.11.3 *Proposed attenuation measures*

- *Impact on drainage basin contribution to Konnes se Pan:*
The level of this impact will be properly assessed during the mining right application process. If any impact is determined then measures will be put in place to limit such impact.
- *Oil / Fuel pollution threat:*
The measures as described in Para 4.3 must be adhered to
- *Siltation of surface water resources:*
This is so unlikely to occur that no measures are proposed at this stage.

5.12 *Ground Water*

5.12.1 Existing Environment

No groundwater impact has occurred as a result of the adjacent mining over the past several years. However the following is known in respect of the groundwater regime in the area²:

- The groundwater occurrence is principally from fractured aquifer type
- The basement rock type is argillaceous in nature (shales/ mudstones)
- The median borehole yield is in the order of 0.1-0.5litres per second
- Groundwater quality is general quite poor with conductivity measurements between 70 and 300mS/m

Mr. Brian Dyason, Geotechnologist from the then Dept. of Water Affairs and Forestry provided the following information (1999):

15 boreholes drilled on the farms Konnes, Dikpens and Hoepel (to the west of Konnes pan) between 1955 and 1983 indicated the water table to be approximately 22 m deep. Most of these boreholes are not in use anymore. Two boreholes drilled on farm Konnes indicated the water table to be in the order of 21 m, close to the deposit. The depth of the water table in the vicinity of the adjacent farm Waterkuil, to the east of the mining area, is in the region of 17 metres. The 15 boreholes yield an average of 0.98 litres per second during blow tests. A borehole about 1 km from the planned mining area is used for livestock. The depth is estimated at 17 to 22 metres but the yield is not known. No ground water seepage is evident on the property.

During July 2003, Dr. Ricky Murray from the CSIR, Stellenbosch conducted an investigation on the occurrence of groundwater on the farm Konnes for Saint Gobain. Based on his findings, a borehole was drilled at position 30,12,056° S; 19,31,054° E during October 2003. The borehole was drilled to a depth of 30 metres and delivers about 1000 l/h. It was equipped with a solar pump and the water is used for ablution purposes only. Approximately 1 540 litres of potable water per month is brought in by container from Vanrhynsdorp.

5.12.2 Impact of the operation

No impact. Note that the existing mine's logistical facilities does use groundwater for ablutions. All potable water is trucked in.

5.12.3 Proposed attenuation measures

No impact.

² The following statistics have been sourced from 1:500 000 sheet 2916 of the Hydrogeological map series of RSA (with the exception of the groundwater depth which was obtained from personal communication with the landowner).

5.13 Air Quality

5.13.1 National Standards/Recommendations

Attention is drawn to paragraph 4.8.4 of the extract from SANS regarding recognition that certain enterprises need to operate within “band 3” by virtue of “the practical operation of the enterprise...” provided that the best available control technology is applied for the duration”.

“DUST FALL STANDARDS SANS 1929:2004

4.8 Dust Deposition

4.8.1 General

The four-band scale to be used in the evaluation of dust deposition is given in 4.8.2 and target, alert and action levels indicated in 4.8.3. Permissible margins of tolerance are outlines in 4.8.4 and exceptions noted in 4.8.5

4.8.2 Evaluation Criteria for Dust Deposition

Dust deposition rates shall be expressed in units of mg m² day⁻¹ over a 30-day averaging period. Dust deposition shall be evaluated against a four-band scale as presented in Table 9.

Table 9 – Four-band scale evaluation criteria for dust deposition

Band number	Band description label	DUSTFALL RATE (D) (mg /m ² /day ¹ 30-day average)	Comment
1	Residential	D < 600	Permissible for residential and light commercial.
2	Industrial	600 < D < 1 200	Permissible for heavy commercial and industrial.
3	Action	1 200 < D < 2 400	Requires investigation and remediation if two sequential months lie in this band, or more than three occur in a year.
4	Alert	2 400 < D	Immediate action and remediation required following the first exceedance. Incident report to be submitted to relevant authority.

4.8.3 Target, Action and Alert Thresholds are given in Table 10

Table 10 – Target, action and alert thresholds for dust deposition

Level	DUSTFALL RATE (D) (mg/ m ² /day ¹ 30-day average)	Averaging period	Permitted frequency of exceedances
Target	300	Annual	
Action residential	500	30 days	Three within any year, no two sequential months
Action industrial	1 200	30 days	Three within any year, no two sequential months.
Alert threshold	2 400	30 days	None. First exceedance requires remediation and compulsory report to authorities.

4.8.4 Margin of Tolerance

An enterprise may submit a request to the authorities to operate within Band 3 (ACTION Band), as specified in Table 9, for a limited period, providing that this is essential in terms of the practical operation of the enterprise (for example the final removal of a tailings deposit) and provided that the best available control technology is applied for the duration.

No margin of tolerance will be granted for operations that result in dustfall rates which fall within Band 4 (ALERT Band) as specified in Table 9.

4.8.5 Exceptions

Dustfalls that exceed the specified rates but that can be shown to be the result of some extreme weather or geological event shall be discounted for the purpose of enforcement and control. Such event might typically result in excessive dustfall rates across an entire metropolitan region, and not be localised to a particular operation. Natural seasonal variations, such as dry windy period during the Highveld spring will not be considered extreme events for this definition”

5.13.2 Existing Environment

The existing mining operation is continuously monitored for dust levels (both fallout and windblown dust) not only at the mine but also along the transport road to Loop 8 and at the rail loading station at Loop 8. Such monitoring commenced in June 2003.

There are 5 monitoring stations with 3 located along the transport route and at Loop 8 rail siding, 1 located within the mining area and subject to windblown dust from the mine. The last is located near to the mine but outside of the mining right area and out of possible impact from the mine. This station’s purpose is for control and serve’s to measure ambient levels. Note that both these last 2 sites also have a section of natural vegetation fenced off to prevent grazing and the impact of dust on the vegetation is continuously being assessed by independent botanical specialists.

The data presented in the studies so far shows the average fallout dust levels at the 2 relevant monitoring sites are as follows:

- Station 4: Free of mine impact measures on average 80mg/m²/day. This is the ambient level and is very low in dust (when compared to recommended maximum allowable limits).
- Station 5 (in the mine’s sphere of influence), average fallout dust has measured 200mg/m²/day. This is still well below the threshold where complaints should be the order of the day.

5.13.3 Impact of the operation

The proposed extension of the Bushmanland mine will not increase existing dust levels in any way but will prolong the lifespan of the activities in the area. Dust will continue to be generated by earthmoving activities and as a result of windblown dust generated off denuded areas.

5.13.4 Proposed attenuation measures

It is critical that for dust reduction to be maximised, that mined out areas be rehabilitated as soon as they are mined out and backfilled.

During early consultation with surrounding landowners, it appears as if dust is the major issue which needs additional control at the existing mine and any future extension.

5.14 Noise

5.14.1 Existing Environment

The ambient noise levels are very low and the only noise source at present is the occasional vehicle using the unsurfaced public roads and the heavy earthmoving equipment at the existing Bushmanland Gypsum Mine.

5.14.2 Impact of the operation

Noise levels will not exceed the current levels. Impact is negligible given the isolation of the site.

5.14.3 Proposed attenuation measures

No attenuation measures will be necessary given:

- The relatively small scale of the operation and
- The isolation of the site.

5.15 Socio-economic Situation

5.15.1 Existing Situation

The following socio-economic indicators have been sourced from the Community Profiles database of StatsSA as well as from the IDP for the ward 5 (being the ward which includes Loeriesfontein) In addition, data has been provided for the Hantam Local Municipality as well as the Namakwa District Municipality to allow for relevant comparison. Note that the data contained below is based on 2001 data and it is entirely possible that the stats may have changed since then, but in the absence of such stats, the 2001 census data has to form the basis for the Socio-Economic description.

The following excerpt from the IDP for the Hantam Municipality (2011/2012) states that social problems arising out of unemployment are the main issues that were raised by all towns during the public participation phase. In addition, the indicators show that the rural population is migrating to towns and the problem will be exacerbated.

"Die belangrikste probleem van die verskillende dorpe is weereens gemeenskaplik naamlik werkloosheid. Dit is by al die dorpe geïdentifiseer as die grootste probleem wat die hoogste prioriteit moet geniet. Die statistiese gegewens bevestig die probleem en ook dat uiters lae persoonlike en ook huishoudelike inkomste by die jong, ekonomiese aktiewe bevolking bestaan. Die bevolkingsprojeksies impliseer ook dat die landelike bevolking sal verklein en meer sal konsentreer in die stedelike gebiede. Dit sal die probleem verder vergroot en werksgeleenthede sal geskep moet word."

i. Gender Profile

	Ward 5		NC065: Hantam		DC06: NAMAKWA District Municipality	
Male	1 286	46.1%	9 527	48.1%	53 385	49.4%
Female	1 502	53.9%	10 291	51.9%	54 726	50.6%
Total	2 788	100.0%	19 818	100.0%	108 111	100.0%

The relatively large female percentage within ward 5 when compared to the other 2 figures indicates possibly that the men have left Ward 5 in search of work elsewhere or possibly the population age profile is skewed towards older age and the absolute numbers of men is less given that women have greater life expectancy than men.

ii. Population Profile

	Ward 5		NC065: Hantam		DC06: NAMAKWA District Municipality	
Black African	30	1.1%	285	1.4%	4 704	4.4%

	Ward 5		NC065: Hantam		DC06: NAMA KWA District Municipality	
Coloured	2 257	80.9%	16 447	83.0%	90 537	83.7%
Indian or Asian	-	0.0%	30	0.2%	129	0.1%
White	502	18.0%	3 057	15.4%	12 740	11.8%
Total	2 789	100.0%	19 819	100.0%	108 110	100.0%

iii. Economic Profile

The chief employment sectors in ward 5 are in the primary sector (i.e. Agriculture, hunting, forestry and fishing) and in the higher level Community, social and personal services.

	Ward 5		NC065: Hantam		DC06: NAMA KWA District Municipality	
Agriculture, hunting; forestry and fishing	164	10.3%	1 762	14.6%	6 881	9.9%
Mining and quarrying	3	0.2%	57	0.5%	5 531	7.9%
Manufacturing	15	0.9%	132	1.1%	955	1.4%
Electricity; gas and water supply	3	0.2%	18	0.1%	162	0.2%
Construction	55	3.4%	246	2.0%	1 220	1.7%
Wholesale and retail trade	109	6.8%	576	4.8%	3 646	5.2%
Transport; storage and communication	24	1.5%	111	0.9%	602	0.9%
Financial, insurance, real estate and business services	24	1.5%	196	1.6%	1 215	1.7%
Community, social and personal services	156	9.8%	828	6.9%	4 419	6.3%
Private Households	126	7.9%	664	5.5%	2 783	4.0%
Undetermined	48	3.0%	585	4.9%	1 888	2.7%
Not applicable	872	54.5%	6 880	57.1%	40 417	58.0%
Total	1 599	100.0%	12 055	100.0%	69 719	100.0%

The table is in respect of all persons between 15 and 60 and it is assumed that the 872 persons categorised under not applicable are unemployed or not able to work.

iv. Education Levels

Statistics for highest education level achieved are as follows:

	Ward 5	NC065: Hantam	DC06: NAMA KWA District Municipality

	Ward 5		NC065: Hantam		DC06: NAMA KWA District Municipality	
No schooling	543	19.5%	3 924	19.8%	11 519	10.7%
Some Primary	981	35.2%	5 863	29.6%	30 676	28.4%
Complete Primary	215	7.7%	1 512	7.6%	10 346	9.6%
Some Secondary	466	16.7%	4 022	20.3%	30 626	28.3%
Complete Secondary	319	11.4%	2 396	12.1%	14 024	13.0%
Tertiary	18	0.6%	198	1.0%	935	0.9%
Not applicable	247	8.9%	1 904	9.6%	9 984	9.2%
Total	2 789	100.0%	19 819	100.0%	108 110	100.0%

Statistics show a massive gap in the education levels at this ward 5 level when compared to the District Municipal level. This is certainly an issue that needs to be addressed.

v. Employment, Unemployment & Income Profile

The table below shows that any employment opportunities which do arise will be easily catered for in this situation.

	Ward 5		NC065: Hantam Local Municipality		DC06: NAMA KWA District Municipality	
Employed	727	45.4%	5176	42.9%	29301	42.0%
Unemployed	169	10.6%	1361	11.3%	11686	16.8%
Scholar or student	50	3.1%	1065	8.8%	5918	8.5%
Home-maker or housewife	202	12.6%	1683	14.0%	8879	12.7%
Pensioner or retired person/to old to work	66	4.1%	632	5.2%	3513	5.0%
Unable to work due to illness or disability	88	5.5%	591	4.9%	3219	4.6%
Seasonal worker not working presently	9	0.6%	162	1.3%	491	0.7%
Does not choose to work	151	9.4%	826	6.9%	2320	3.3%
Could not find work	138	8.6%	560	4.6%	4391	6.3%
Total	1600	100.0%	12056	100.0%	69718	100.0%

The table above shows that although unemployment is officially pegged at 10.6% for the ward, that does not include the 19% who do not choose to work or could

not find work. Note that the IDP states that the unemployment rate is just over 25%.

vi. Infrastructure: Housing

The following table describes the housing situation in 2001:

	Ward 5		NC065: Hantam		DC06: NAMA KWA District Municipality	
House or brick structure on a separate stand or yard	868	94.1%	4823	87.8%	23175	76.0%
Traditional dwelling/hut/structure made of traditional materials	9	1.0%	149	2.7%	1834	6.0%
Flat in block of flats	9	1.0%	51	0.9%	549	1.8%
Town/cluster/semi-detached house (simplex; duplex; triplex)	-	0.0%	168	3.1%	335	1.1%
House/flat/room in back yard	6	0.7%	73	1.3%	594	1.9%
Informal dwelling/shack in back yard	18	2.0%	77	1.4%	481	1.6%
Informal dwelling/shack NOT in back yard	3	0.3%	30	0.5%	471	1.5%
Room/flatlet not in back yard but on shared property	-	0.0%	21	0.4%	133	0.4%
Caravan or tent	3	0.3%	15	0.3%	231	0.8%
Private ship/boat	-	0.0%	3	0.1%	6	0.0%
Not applicable (living quarters is not housing unit)	6	0.7%	81	1.5%	2683	8.8%
Total	922	100.0%	5491	100.0%	30492	100.0%

Ward 5 does not appear to have a housing problem.

vii. Infrastructure: Water and Sanitation

The following table shows the population's access to water supply:

	Ward 5		NC065: Hantam		DC06: NAMA KWA District Municipality	
Piped water inside dwelling	277	30.0%	2 281	41.5%	15 204	49.9%
Piped water inside yard	530	57.4%	2 605	47.4%	11 427	37.5%
Piped water on community stand: distance < than 200m	53	5.7%	279	5.1%	1 663	5.5%
Piped water on community stand: distance > than 200m	48	5.2%	215	3.9%	1 032	3.4%
Borehole	-	0.0%	24	0.4%	257	0.8%

	Ward 5		NC065: Hantam		DC06: NAMA KWA District Municipality	
Spring	-	0.0%	28	0.5%	34	0.1%
Rain-water tank	-	0.0%	3	0.1%	166	0.5%
Dam/pool/stagnant water	-	0.0%	6	0.1%	82	0.3%
River/stream	-	0.0%	3	0.1%	171	0.6%
Water vendor	-	0.0%		0.0%	27	0.1%
Other	15	1.6%	48	0.9%	427	1.4%
	923	100.0%	5 492	100.0%	30 490	100.0%

Table above shows that there are 923 households in Ward 5. Given a population of 2 789 persons that leads to an average household size of only 3.0 persons. Note that 5% of households still have to travel distances greater than 200m to fetch water.

In terms of sanitation the following applies:

	Ward 5		NC065: Hantam		DC06: NAMA KWA District Municipality	
Flush toilet (connected to sewerage system)	311	33.7%	2 395	43.6%	16 214	53.2%
Flush toilet (with septic tank)	136	14.7%	913	16.6%	3 314	10.9%
Chemical toilet	3	0.3%	178	3.2%	587	1.9%
Pit latrine with ventilation (VIP)	34	3.7%	225	4.1%	1 461	4.8%
Pit latrine without ventilation	113	12.2%	303	5.5%	1 396	4.6%
Bucket latrine	266	28.8%	787	14.3%	4 690	15.4%
None	60	6.5%	691	12.6%	2 830	9.3%
Total	923	100%	5 492	100%	30 492	100.0%

The statistics show a huge backlog in this respect. Only 48% of households have flush toilets.

viii. Infrastructure: Electricity

Although housing seems to be well provided for in Ward 5, it is clear that some services still need to be supplied. Amongst them is electricity to about 20% of households.

	Ward 5		NC065: Hantam		DC06: NAMA KWA District Municipality	
Electricity	752	81.5%	4103	74.7%	23530	77.2%
Gas	-	0.0%	45	0.8%	120	0.4%
Paraffin	21	2.3%	92	1.7%	781	2.6%
Candles	120	13.0%	888	16.2%	5033	16.5%
Solar	21	2.3%	303	5.5%	677	2.2%
Other	9	1.0%	60	1.1%	351	1.2%
Total	923	100.0%	5491	100.0%	30492	100.0%

5.15.2 *Impacts*

Potential impacts arise as follows through the proposed activities:

Negative

- Potential impacts on farm integrity: Poaching, stock theft, stock loss (through roadkill or gates being left open), security, and road condition deterioration.
- Potential impacts on rural settlements: Raise false levels of expectancy, economic concerns if mine labour are paid more than farm labour, immigration of workers, drugs etc. Fortunately there is no nearby rural settlement which can be negatively affected and all job positions are already filled.

Positive

- Potential for infrastructure development and job creation through social and labour plan Local Economic Development initiatives
- Potential for employment opportunity – In this case, the extension will not provide any additional jobs but will provide additional time for those currently employed.

Social and Labour Plan

It must be noted that the potential for socio-economic upliftment as a result of this mining authorisation is large, given the time frame of the proposed activities and the fact that social and labour plan requirements will ensure:

1. Corporate social responsibility is enforced through implementation of LED project.
2. Skills development is enforced through ABET, tertiary level bursaries for staff and community members, school support, Learnerships and apprenticeship training for staff and community members, mentoring programme, special attention placed to increasing numbers of women in mining, and more
3. Procurement progression plan to ensure continuous supply of goods and services from local and BEE companies
4. Plan to manage the effects of downscaling or retrenchments (if applicable).

5.15.3 Attenuation measures

The following measures will be implemented to limit the negative impacts:

- All staff will be warned of the consequences (police referral and dismissal) for poaching and stock theft and conditions will be inserted into their employment contracts in this regard
- Stock security in terms of closure of gates, maintenance of water supply to watering troughs etc., will be discussed at weekly production/safety meetings
- Implementation of Social and Labour Plan Prescriptions

5.16 Heritage / Cultural Aspects

An Archaeological Impact Assessment was conducted by Dr David Morris (then of the Kimberley Museum) in 1996 on nearby farm Waterkuil 185 Remainder. The full report will be contained in Annexure to the future scoping report.

That study concluded by stating that there would be no impact as a result of the proposed mining operations in respect of Archaeological issues.

6 Specific requests of I&AP's

It is incumbent on the applicant to provide a report to the DMR in respect of the results of consultation. The DMR have prepared a template which must be filled in by the applicant. The template contains a standard level of reporting and in order to ensure full transparency and meet the requirements of the DMR, the following questions are specifically asked of you as Interested and Affected Party to consider:

1. Do you agree with the provided description of the status of existing biophysical environment (as described in para 5.2 to 5.14)?
2. Do you agree with the potential impacts on biophysical environment identified as a result of the proposed mining (as described in para 5.3 to 5.14)?
3. Do you agree with the provided description of the status of existing heritage /cultural environment (as described in para 5.16)?
4. Do you agree with the potential impacts on heritage / cultural aspects identified as a result of the proposed mining (as described in para 5.16)?
5. Do you agree with the provided description of the status of existing socio economic environment (as described in para 5.15)?
6. Do you agree with the potential impacts on socio-economic aspects identified as a result of the proposed mining (as described in para 5.15)?
7. Do you know of any land developments which may be impacted upon by the proposed project?
8. Do you know of any other parties which should specifically be consulted in respect of this project?

7 Way Forward & Registration as Interested and Affected Party

The application was lodged on 22 February 2012 and in terms of current legislation the Department of Mineral Resources (DMR) must accept the application within 14 days (if all documentation is in place). So that results in a timetable of deliverables to the DMR as follows:

1. Lodging of Scoping report including results of this preliminary consultation to the DMR on 7 April 2011
2. Lodging of EIA and EMPlan to the DMR by 7 September 2012
3. Lodging of final comments on EMPlan to DMR by 7 October 2012

In order for your comments to be included in the Scoping Report, you are hereby required to provide comments in writing by 2 April 2012 to the person at contact details below.

Furthermore, should you wish to be kept abreast of the application progress and be provided with opportunity to scrutinise relevant documentation, then you must register as Interested and Affected Party before 23 March 2012 to the following consultant contact details:

Site Plan Consulting
PO Box 28
Strand
7139

Email: craig@siteplan.co.za
Fax: 021 854 4321
Tel: 021 854 4260