CaseID: 1666

mineral resources
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REPUBLIC OF SOUTH AFRICA

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Reference: EC30/5/1/2/3/2/1(0251)EM
Date: 22 September 2011

South African Heritage Resources Agency
P.O. Box 4637
CAPE TOWN
8000

Sir / Madam

CONSULTATION IN TERMS OF SECTION 40 OF THE MPRDA OF 2002: AGGREGATE MINING ON UNREGISTERED STATE LAND INGQUZA HILL LOCAL MUNICIPALITY, DISTRICT OF QAUKENI, EASTERN CAPE

1. Attached herewith, a copy of the EMP received from Pondoland Quarries Cc.

2. Any written comments or requirements your department may have in this regard can be forwarded to this office no later than **8 November 2011.** Failure to do so, will lead to the assumption that your department has no objection(s) or comments with regard to the said documents. Comments may be submitted at your earliest convenience in order to reduce the turnaround time for the application process.

3. Consultation in this regard has also been initiated with other relevant State Departments.

4. Please use the reference number (EC) 30/5/1/2/3/2/1(0251) EM in all future correspondence.

5. Your co-operation is appreciated.

Sincerely,

MGrobler
REGIONAL MANAGER

EASTERN CAPE

SA HERITAGE RESOURCES AGENCY
RECEIVED
5 - OCT 2011

Report

Environmental Management Programme Report in terms of the Mineral and Petroleum Resources Development Act, 2002 and the National Environmental Management Act, 1998 (and its subsidiary Acts)
Pondoland Quarries cc
DME Reference: EC30/5/1/2/2/0251MR

August 2011

(Reference: L011001)

(For submission & review)

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Quality Assurance			
Project Name: ***Pondoland Quarries Environmental Studies***		**Project Number:** **L011002**	
	Responsible person	**Date**	**Sign**
Document compilation	Leonie Berjak	August 2011	
Document review	Digby Gold	August 2011	

Executive Summary

Pondoland Quarries cc (Pondoland Quarries) has made an application to the Department of Mineral Resources (DMR) for a mining right (reference EC30/5/1/2/2/0251MR) to quarry aggregate on part of the Nkunzimbini community area of the Qaukeni-Lusi Traditional Authority within Ward 21 of the Ngquza Hill Local Municipality of the OR Tambo District Municipality, Eastern Cape Province. The proposed mining area is approximately 7 ha in extent and is located approximately 10 km west Lusikisiki off the R61, within an area that has previously been quarried.

One of the requirements in the application process is the undertaking of environmental investigations that include the drafting of an Environmental Scoping Report (ESR) which is used to identify the specialist studies required for an the Environmental Impact Assessment (EIA) and the subsequent drafting of an Environmental Management Programme (EMP). The EIA and EMP will be compiled in terms of, and in compliance with, the Mineral and Petroleum Resources Development Act, 2002 as amended (MPRDA), the National Environmental Management Act, 1998 as amended (NEMA) and the National Water Act, 1998 as amended (NWA).

This EIA / EMP has been compiled for submission to the Eastern Cape Regional Manager of the DMR and describes the methodology applied to the environmental process, a description of the proposed project, project alternatives, a brief description of the current state of the environment, the consultation process, an environmental impact assessment for the proposed mining and an environmental management plan to mitigate these impacts. The process, timeframes and document content will follow that laid out in the Mineral and Petroleum Resources Development Regulations; however as the area under this mining right application is within an area that has previously been quarried, environmental studies have previously been undertaken and this EMPR is therefore based on these studies.

The proposed opencast mining method is traditional opencast truck and shovel technique, with surface rehabilitation only on closure. Approximately 500,000 tons of aggregate is available for mining and it is expected that the life of mine will be approximately 25 years at a full production rate of 20,000 tons per annum. Crushing of the mined aggregate as required by market will occur on site. The crushed product is collected and / or delivered to the local market, specifically the Lusikisiki construction market.

There is existing infrastructure on the site that includes:

- A site office complex for mine personnel – including an office and workshop;
- A diesel storage tank;
- A crusher plant with temporary stockpiles; and
- A designated block making area.

Additional infrastructure required includes:

- Stormwater-pollution control dams; and
- Stormwater-pollution control trenches and berms.

Based on scoping of the pre-mining environment, the potential impacts identified as requiring additional investigation during the EIA / EMP phase include those on surface water (hydrological) and air quality. The environmental consequences of the proposed project, both positive and negative, are addressed in this report, along with the requirements to prevent or minimise environmental degradation whilst promoting socio-economic upliftment. The process has been conducted in an open and transparent manner to ensure that all aspects and issues of concern are taken into account.

Significant impacts highlighted as requiring careful mitigation include:

- Habitat degradation due to the removal of terrestrial vegetation and poor handling of soils;
- Surface water quantity and pollution;
- Habitat and atmospheric degradation due to high levels of particulates in the air; and
- Reduction in employment opportunities and economic decline at closure.

The identified impacts can be reduced to a level of acceptable risk through the implementation of sound and feasible management measures. The main closure objective is to mine in such a way as to limit impacts on the topography, biodiversity, hydrology, air quality and aesthetics of the area by:

- Restricting the sphere of influence through the limiting the disturbed area to that which is necessary only;
- Controlling erosion and possible surface water pollution through the implementation of suitable erosion and storm water control measures;
- Controlling nuisances, such as fugitive dust and noise, at the source;
- Managing soils appropriately during stripping, handling and stockpiling to protect against erosion, compaction and contamination;
- Effective implementation of the Environmental Awareness Programme.

The closure cost estimate to cover the current environmental liability in the event of premature closure amounts to **R 80,300 (ex VAT)**.

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List of Abbreviations

DMR	Department of Mineral Resources
DWAF	Department of Water Affairs and Forestry
EIA	Environmental Impact Assessment
EMP	Environmental Management Programme
EMPR	Environmental Management Programme Report
ESR	Environmental Scoping Report
I&APs	Interested and Affected Parties
LM	Local Municipality
MPRDA	Mineral and Petroleum Resources Development Act, 2002
PPE	Personal protective equipment
PPP	Public Participation Process

1. INTRODUCTION

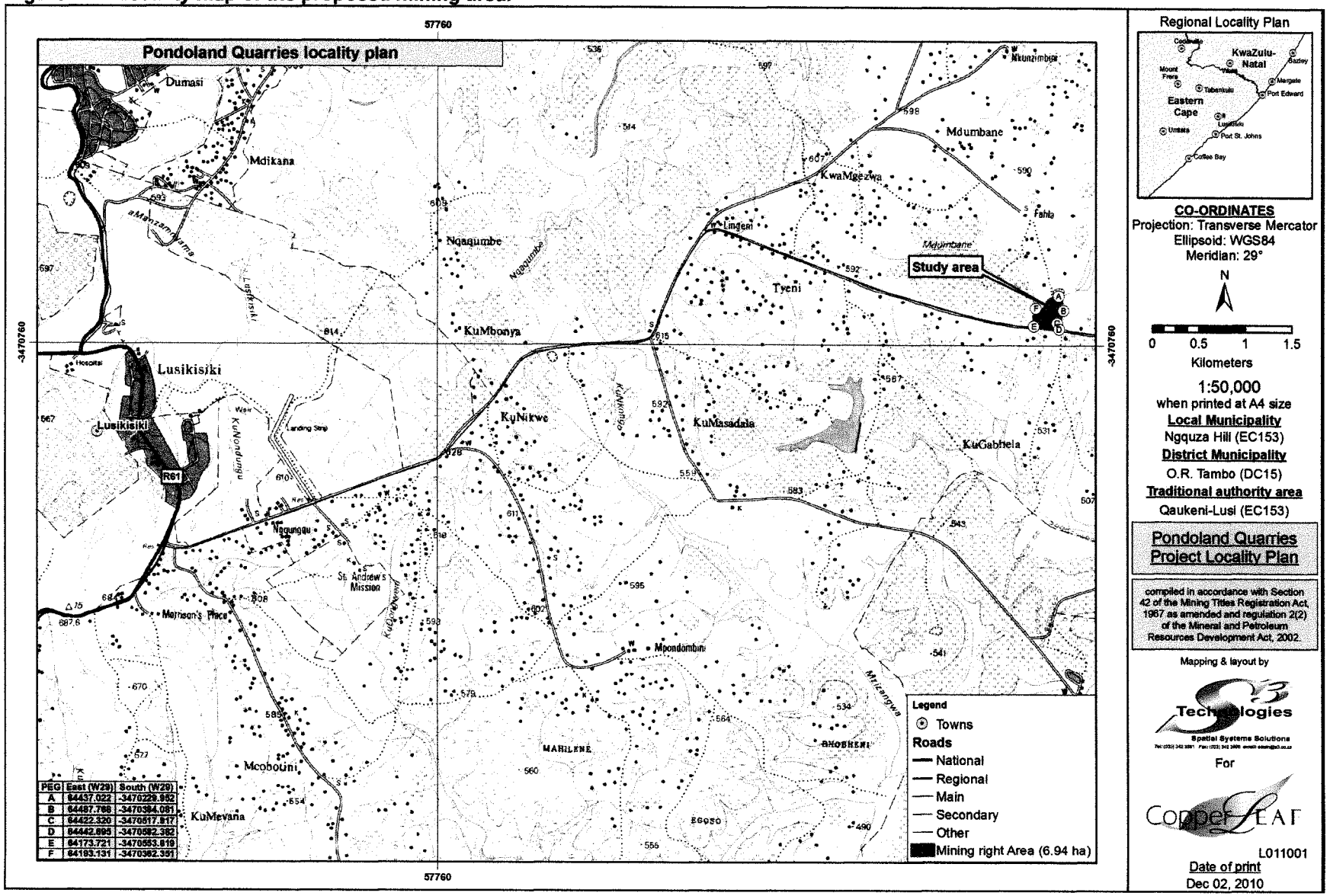
Pondoland Quarries cc (Pondoland Quarries) has made an application to the Department of Mineral Resources (DMR) for a mining right to quarry aggregate on part of the Nkunzimbini community area of the Qaukeni-Lusi Traditional Authority within Ward 21 of the Ngquza Hill Local Municipality of the OR Tambo District Municipality, Eastern Cape Province. The proposed mining area is approximately 7 ha in extent and is located approximately 10 km west Lusikisiki off the R61 (Figure 1.1), within an area that has previously been quarried.

The application was submitted to the DMR in the Eastern Cape and an acknowledgement of this application and requirements to proceed was received under reference EC30/5/1/2/2/0251MR from the DMR on the 16th March 2011. One of the requirements is the undertaking of environmental investigations that included the drafting of an Environmental Scoping Report (ESR), which is used to identify the specialist studies required for an the Environmental Impact Assessment (EIA), and the subsequent drafting of the Environmental Management Programme (EMP) in terms of the Mineral and Petroleum Resources Development Act, 2002 (MPRDA).

In order to comply with the requirements of sections 22(4), 39(1) and regulations 50 to 52 of the MPRDA, this document is presented as the impact assessment and proposed mitigation measures stage in the environmental investigation process. This Environmental Management Programme Report (EMPR) has been compiled for submission to the Regional Manager of the DMR, Eastern Cape and describes the methodology applied to the environmental process, a background to the proposed project, project alternatives, a brief description of the current state of the environment, the consultation process, the EIA for the proposed project, and an EMP on how impacts will be avoided, mitigated and/or managed.

As the area under this mining right application is within an area that has previously been quarried, environmental studies have previously been undertaken. This EMPR is therefore based on the *Environmental Management Programme Report for the Pondoland Quarry, near Lusikisiki in Eastern Cape* compiled by Terratest in April 2003. This report has been reworked, with additional specialist studies to comply with the MPRDA.

Figure 1.1: Locality map of the proposed mining area.



2. METHODOLOGY OF THE ENVIRONMENTAL PROCESS

In accordance with the MPRDA, an EIA needs to be undertaken and an EMP compiled and approved by the DMR before mining can commence. CopperLeaf Consulting has been appointed as an independent consultant to undertake and co-ordinate the EIA process and any associated specialist environmental investigations for the proposed project. CopperLeaf Consulting will act in an advisory capacity for the relevant Public Participation Process (PPP). The process to be followed is based on that described in the MPRDA.

The Mineral and Petroleum Resources Development Regulations provide the process, timeframes and content of the documents required for the establishment of a new mine (Figure 2.1). The purpose of the process is to ensure that environmental and social impacts and factors are taken into account at each stage of project development, and to ensure that all relevant parties are adequately consulted. In terms of the timeframes, this project is currently within the EMPR review stage.

Figure 2.1: Timeframes for Mining Right Application Process

Mining Right Application					Approval		
Lodge application	Acceptance of application letter	Submit Scoping Report	Authorities review	Submit EMPR	Authorities review	Minister review	MR approved
0 days	14 days	30 days	30 days	120 days	60 days	60 days	30 days
4-Dec-10	16-Mar-11	15-April-11	15-May-11	12-Sept-11	11-Nov-11	10-Jan-12	10-Feb-12

An EIA is a decision-making tool utilised in assessing the environment. It addresses the effect of development on the existing socio-economic and biophysical environmental conditions. The EIA process typically comprises two phases:

- ***Environmental Scoping Phase*** which involves investigation of the current status of the receiving environment by means of desktop studies and reconnaissance, reviews proposed project activities, highlights the environmental sensitivity of the proposed site, identifies preliminary project issues and possible alternatives, and identifies information gaps that guide the nature and extent of the specialist investigations required for the EIA; and
- ***Environmental Impact Assessment Phase*** where detailed specialist investigations are undertaken to determine and assess the nature and extent of possible impacts of the proposed development. This information is used to highlight appropriate mitigation measures for each significant impact, and provide an implementation programme with environmental objectives and goals on how the identified impacts will be avoided, mitigated and/or managed (***EMP***). An approved EMP is a legally binding document and is a legal requirement of the MPRDA for all mines, existing or new, prior to initiating mining operations.

The process engages Interested and Affected Parties (I&APs) through advertisement and notification of the project and communicates key project issues identified by the proponent, consultants, authorities and the public. Public involvement, through notification and consultation with I&APs, is a key component in the environmental process and comments obtained from the authorities and I&APs are / will be addressed in this document.

2.1 Legislative objectives

The environmental process and assessment of the proposed project will comply with, and take cognisance of, the following legislation:

- Constitution of the Republic of South Africa, 1996;
- Minerals and Petroleum Resources Development Act, 2002 (Act 28 of 2002);
- National Environmental Management Act, 1998 (Act 107 of 1998);
  - National Environmental Management: Biodiversity Act, 2004 (Act 10 of 2004);
  - National Environmental Management: Air Quality Act, 2004 (Act 39 of 2004);
  - National Environmental Management: Waste Act, 2008 (Act 59 of 2008);
- National Water Act, 1998 (Act 36 of 1998);
- National Heritage Resources Act, 1999 (Act 25 of 1999);
- Environment Conservation Act, 1989 (Act 73 of 1989);
- Conservation of Agricultural Resources Act, 1983 (Act 43 of 1983);
- Mine Health and Safety Act, 1996 (Act 29 of 1996); and
- Hazardous Substances Act, 1973 (Act 15 of 1973).

2.2 Environmental Scoping Phase

The initial phase of the environmental process reviews the project in relation to the receiving environment to determine the potential impacts that each may have on the other, and to highlight the studies required to facilitate an effective environmental assessment. The environmental scoping phase methodology is based on the Regulations under the MPRDA, and the objectives are to:

- Identify I&APs, communicate the project details, provide opportunities for comment, and to incorporate concerns and views of I&APs;
- Identify relevant Regulatory Authorities and other institutions and inform them of the project to enable them to express their concerns and issues;
- Identify issues associated with the proposed mining operation that are most likely to affect the biophysical and socio-economic aspects of the surrounding environment;

- Conduct a review of the applicable environmental legislation; and
- Determine and document aspects of the project that require further investigation.

The Environmental Scoping Phase has been completed. No comments were received relating to this document.

The submitted ESR highlighted the following specialist studies to be incorporated into the EIA:

- A ***hydrological assessment*** to establish a baseline in terms of quality and quantity with a water balance for the mining operation to determine the impacts during and after mining.
- An ***air quality assessment*** of the pre-mining environment.

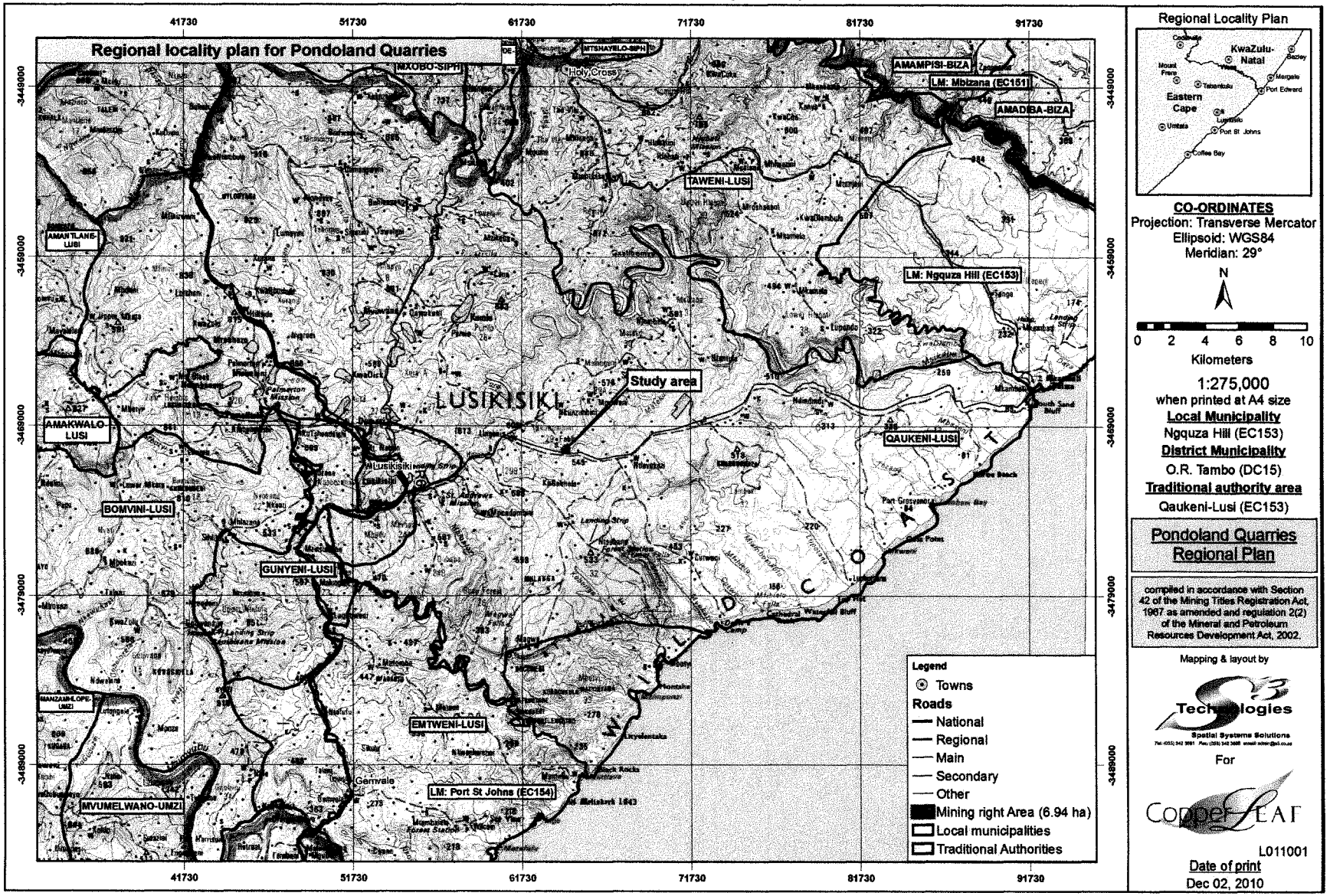
2.3 Environmental Impact Assessment, Management Plan and Reporting Phase

The specialist studies highlighted in Section 2.2 above have been incorporated into this EMPR that includes the EIA and EMP for the proposed mining area. The structure of the report is as follows:

- Section 1 – Introduction that provides a brief background to the project
- Section 2 – Methodology followed in the environmental process to complete this report
- Section 3 – Project description that provides information on the proposed mining operation
- Section 4 – Project alternatives that include those alternatives considered for the land.
- Section 5 – Description of pre-mining environment that incorporates information from the specialist studies.
- Section 6 – Consultation process
- Section 7 – Environmental impact assessment for the proposed mining area that includes both individual activity / aspect impacts and cumulative impacts and incorporates information from the specialist studies.
- Section 8 – Environmental management plan that provides mitigation measures for the environmental impacts determine in Section 7 to avoid, mitigate and / or manage the negative impacts. This includes an environmental monitoring programme, maintenance and emergency procedures, environmental awareness, rehabilitation plan and overall financial provision for the proposed mining operation.
- Section 9 – Identification of knowledge gaps and how these should be addressed
- Section 10 – Conclusion

The EMPR must be submitted to the Regional Manager of the DMR for consideration and approval ***prior*** to the proposed activity being undertaken.

Figure 3.1: Proposed mine area within a regional setting (Traditional Authority areas).



3.3.1 Mining method

Mining takes place in an opencast quarry. Tillite material is blasted and then transported to the two stage crushing plant for processing and stockpiling. Crushing of the mined aggregate is from 75 mm to dust as required by market. The final products are transported to their points of sale. The crushed product is collected and / or delivered to the local market, specifically the Lusikisiki construction market.

3.3.2 Mining Phases

The operational sequence will be broken down into the following three phases:

- **Construction** – As the quarry has previously been mined no site preparation is required and there is no construction requirement. However, should soils need to be removed to expose the tillite these will be stripped and stockpiled to create a visual berm during operations. The construction of stormwater - pollution control measures will be required (dam, berms and trenches).

- **Operation** - Mining Process
  - Mining will continue from the existing 10 m high rock face through a benching process (sloped at a gradient of 1:2 for safety) towards the northwest and southeast with the final depth of the quarry dependent on demand and reserves.
  - The aggregate will be mined by traditional opencast truck and shovel technique.
  - This technique utilises excavators and off-road trucks.
  - The drilling and blasting is carried out by certified approved external subcontractors (numbering five) who come out to site three times a year to prepare the aggregate for removal. A zone 500 m around the proposed operation could be affected by blasting. There are structures within this zone to the south and east of the proposed site. Blasting will be conducted by registered specialists, and the size, timing, and frequency will be regulated to reduce the potential for rock debris and fly-rock. Surrounding landowners within the potential sphere of influence will be notified of blasting schedules.

- **Closure and rehabilitation** - The closure process will commence once all the aggregate has been depleted and or the mine is no longer viable in terms of market and production. This following sequence of events will be completed within 6 months of the mining activity having been completed:
  - Contouring mined area with final stage benches appropriately constructed for safety.
  - Removal and rehabilitation of the haul road.
  - Remove all infrastructure such as diesel tanks, toilets etc.
  - Fencing off the entire mining area.

3.4 Infrastructure

There is existing infrastructure on the site as indicated in Figure 3.2 which includes:

- A site office complex for mine personnel – including a prefabricated office, workshop, meter room and stores; however no storage of explosives will take place on site;
- A diesel storage tank (5,000 litres);
- A two-stage crusher plant; and
- A designated block making area.

Electricity is supplied by Eskom. No further infrastructure apart from the following is proposed (see Terratest, 2003):

- A stormwater-pollution control dam in the northeast corner of the area (approximately 300 m^3); and
- stormwater-pollution control trenches and berms to divert surface runoff from the site of operations into the dam and protect the Mdumbane River.

The pollution control and stormwater management infrastructure will be designed to comply with GN704 in terms of the National Water Act, 1998, namely:

- clean water diversion facilities for the 1:50 year storm event will be constructed upstream of the potential pollution source/s, and
- dirty water diversion facilities for the 1:50 year storm event will be constructed downstream of the potential pollution source/s.

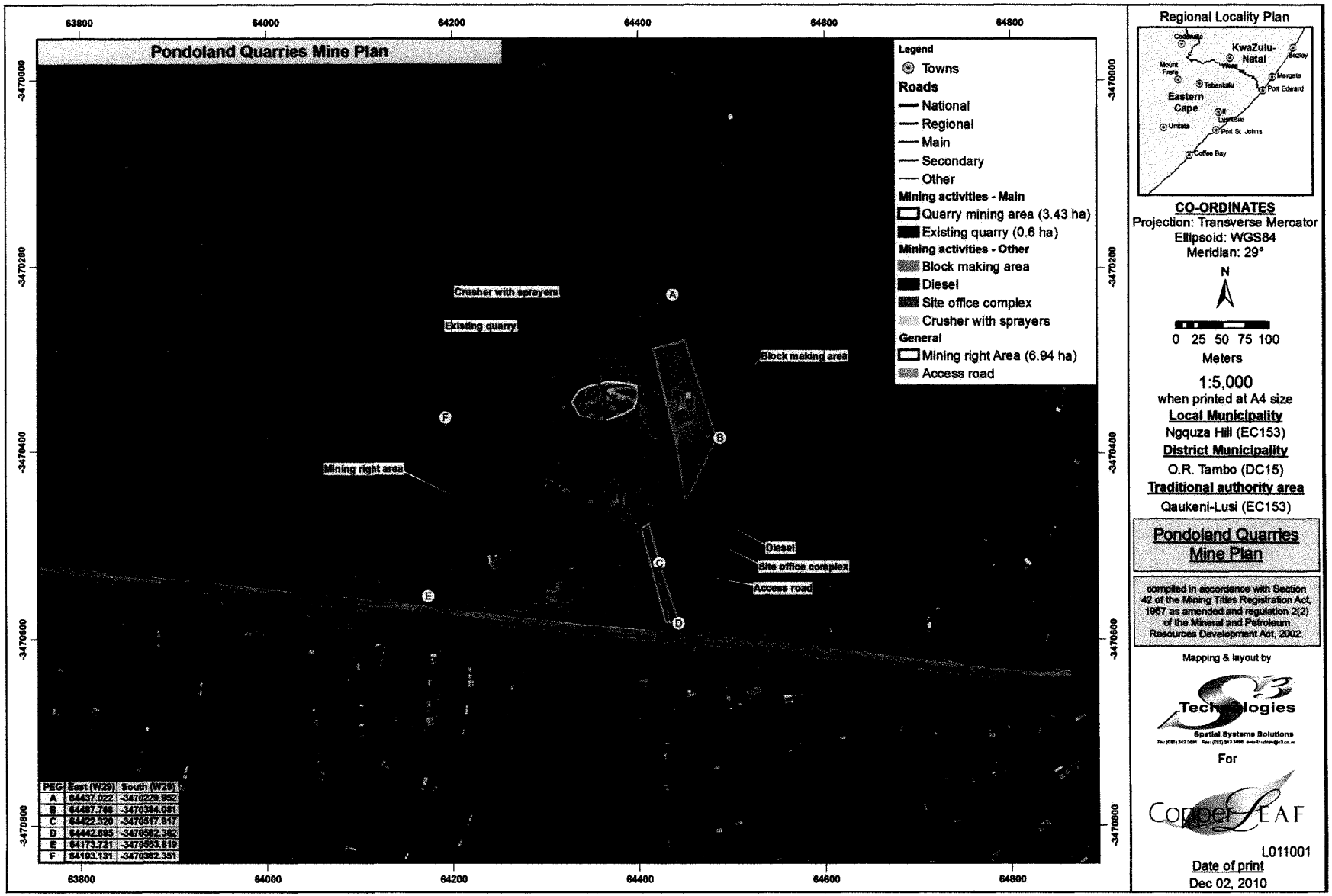
3.5 Transport and mine access

Access to the site is off the R61 which connects Flagstaff and Lusikisiki. The exact transport route for hauling the aggregate from the mine to the target market is dependent upon the client but as the aggregate is primarily for the construction industry within Lusikisiki the aggregate will be trucked on the R61 towards Lusikisiki as required. The low levels of production proposed in combination with the fact that the quarry is located on the site of an existing operation means that traffic levels are unlikely to increase significantly such that mitigation measures would be required.

3.6 Water usage

Very little potable water is required for the mining operation site offices and this will be transported to site by tankers. Water is also required for dust suppressing, crushing operations and for the block manufacturing that occurs on site (approximately 12,000 litres per day). Water from the stormwater-pollution control dam will be used for dust suppression around the operations as well as the operations themselves. Any make-up water required is likely to be extracted from the Mdumbane River (although this is unlikely if effective stormwater and pollution control measures are put in place - see Section 5.7).

Figure 3.2: Mine plan of the Pondoland Quarries mining area.



Based on the type and placement of the mining and infrastructure, the following have been highlighted as potential water uses requiring a water use licence in terms of the NWA:

- Section 21a – taking water from a water resource – abstraction (Form DW760)
  - taking water from a borehole (groundwater) and / or surface water resource
- Section 21g – Disposing of waste in a manner which may detrimentally impact on the water resource (Form DW767)
  - stormwater-pollution control (including return water and evaporation) dam/s
  - use of groundwater from stormwater-pollution control dam for dust suppression
- Section 21j – Removal of underground water for a safe mining environment and placing it in the storm-water pollution control dam for reuse for dust suppression (Form DW805)

3.7 Waste management

Any residual quarry material will be used for block-making on site; therefore no mine residue will be left as waste.

Very little domestic and industrial waste is expected to be produced on site. All domestic waste generated will be collected in drums and removed at regular intervals to the nearest registered waste disposal site.

Diesel fuel will be bulk delivered (approximately every 10 weeks) and stored in a 5000 litre tank surrounded by spillage bunds. Fuel and oil spills will be handled in accordance with approved procedures. All industrial waste such as oil, diesel and grease, will be collected in 210 litre drums at designated collection points that have been underlain by impervious materials to ensure that any spills are contained. The drums will either be collected by an appointed contractor for recycling or taken to a licensed disposal facility.

Sanitation is provided through septic tanks.

3.8 Site closure

Rehabilitation of all mine related roads and infrastructure is planned. Owing to the nature of aggregate mining, the surface elevation will be lower than the original levels; however contouring of the site to ensure correct drainage of the area so as not to detrimentally impact on the surface water environment post-mining will be undertaken.

4. PROJECT ALTERNATIVES

4.1 Alternative mining method and processing

Mining has previously taken place on the site of the application. The outcome of the mining feasibility study considered opencast mining of the aggregate as the only feasible and environmentally acceptable process. The alternative to the existing stationary crusher would be a mobile crusher to allow the crushing plant to be moved if required. A mobile crusher could result in the increase in surface area disturbance, unless used within the pit area.

4.2 Land use options

This section briefly discusses the most relevant land use options.

4.2.1 Grazing / Cultivated Land

The area is under the Qaukeni-Lusi Traditional Authority (Figure 3.1). The current land-use in the surrounding area is largely rural with subsistence agriculture, primarily livestock (cattle and goats). None of the proposed opencast mining area is currently under cultivation or agriculture as it is fenced off as a quarry site. The continuation of current farming activities into the previously quarried area would effectively support a 'no-go option' (see Section 4.5). As the proposed mining area is relatively small, has been previously mined, is not currently used for agricultural purposes, and once mining is complete and rehabilitation has taken place it is intended to return the land to rural / agriculture; agricultural use is not considered a valid project alternative.

4.2.2 Tourism

The area is primarily rural / agricultural land and not a pristine landscape devoid of human intervention. No existing tourism facilities are available in the immediate project area. It is concluded that the opportunity for tourism development in the proposed mining area is very low and not feasible as an alternative land use development.

4.2.3 Residential

The nearest town to the proposed mining operation is Lusikisiki. As the proposed mining area falls under Traditional Authority, the rural residential dwellings tend to be in clusters and scattered across the

area. Although there are dwellings south and east of the proposed mining area, no major residential development is currently taking place or planned within the proposed mining operations.

4.3 Alternative transport routes, power and water supply

The current proposed power (see Section 3.4) and water supply (see Section 3.6) are considered to be the most economically viable options based on the size and duration of the operation, and will have the least negative environmental impact on the area. The transportation route to truck the aggregate to market is dependent on the market being supplied (primarily Lusikisiki construction industry). Based on the volumes of aggregate proposed per month it is likely that there will be a maximum of three to five trucks leaving the mine per day and using existing roads to haul the aggregate to market.

4.4 Benefits of the project

The proposed project will result in the following benefits for the surrounding community:

- **Product status and market**: a mining operation with a sustainable life of mine of approximately 25 years will produce aggregate for the local construction industry. The production and sale of aggregate ensure development opportunities within the project region.
- **Employment opportunities (labour force)**: The estimated labour force for mining at full production will be 15 people, 14 of which will be from the local community (as per the Social and Labour Plan submitted to the DMR). A block making facility as an off shoot of the mining process will employ an additional 30 local people which could assist in reducing the relatively high unemployment rate in the area (see Section 5.15). No houses will be erected on site.
- **Regional socio-economic benefit (multiplier effect)**: The average household size within the area is 5 persons (see Section 5.15). Based on the proposed labour force to be employed, a total of 75 persons will be supported by the mine and a further 150 persons will be supported by the block making facility.
- **Economic inputs into the area**: expenditure on construction and operation of the mine will lead to positive economic impacts as they would constitute an injection of capital into the local and regional economy resulting in increased commercial activity.

4.5 The 'no project' option

There were no environmental impacts identified that are considered to be of such a nature that they cannot be mitigated and may be considered as fatal to the environment. The 'no-go' alternative in this instance would entail no mining in the proposed area. As the site has been previously mined there is an existing void, and it is fenced from the surrounding land use. The proposed mining area is relatively small and the 'no-go' option would not have a positive impact on the natural or social environment.

5. DESCRIPTION OF ENVIRONMENTAL SETTING

This section presents the existing environmental setting of the proposed mining area aspect by aspect and then summarises the overall pre-mining environment in the final subsection (section 5.16). The description of the pre-mining environment, ideally involves a consultation process with interested and affected parties as discussed in Section 6. The consultation process for the mining right application under discussion tried to involve the public and government bodies to assist with this background to the environmental setting. However this section is primarily a reworking of the '*Environmental Management Programme (EMP) Report for the Pondoland Quarry, near Lusikisiki in Eastern Cape*' compiled for the quarry by Terratest in April 2003. No comments on this information as provided in the ESR were received.

5.1 Topography

The topography is characterised by gently to moderately sloping hills, with surrounding grazing lands. The quarry and processing area will be situated in a small, northeast facing slope with elevations across the site ranging from about 560 m in the south to 500 m in the north (Figure 5.1). Slopes in the proposed mining area typically average 1:8.

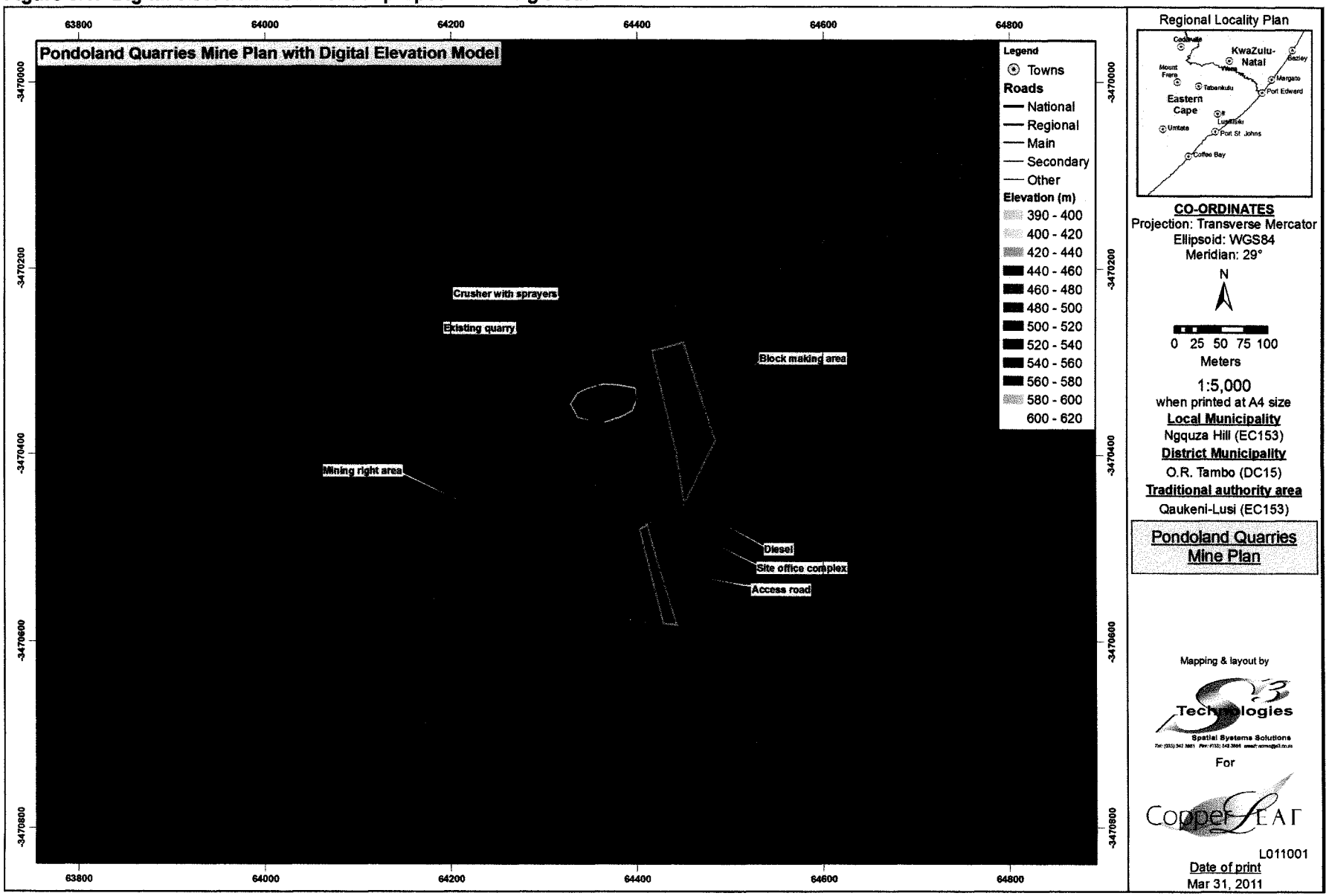
5.2 Regional geology

The underlying geology is depicted on the 1:250 000 Geological Sheet 3028 Umtata. The geology within the proposed mining area comprises rocks of the Dwyka Formation, Ecca Group and Karoo Sequence throughout the area. According to Terratest (2003) there are no dykes, sills or faults evident in the vicinity of the quarry.

5.3 Soils

Onsite the soils are generally colluvial in nature and comprise mainly of clays and gravels with abundant boulders (Terratest, 2003). The AGIS soils plan indicate the area as being primarily undifferentiated humic soils, with the WRB classification for the site as Umbrihumic Ferralsols (FR-huu). The soils in this area are derived from the Karoo Supergroup sediments (including the Dwyka Tillite) and intrusive dolerites. In general the soils are acidic, leached and heavy, with only a shallow covering within the proposed mining area.

Figure 5.1: Digital elevation model of the proposed mining area.



DMR Reference: EC30/5/1/2/2/0249MR

Figure 5.2: Soils within the proposed mining area (AGIS).

DMR Reference: EC30/5/1/2/2/0249MR

5.4.3 Wind

The pre-dominant wind direction is north-easterly to easterly in summer and south-westerly and westerly in winter. Winds are generally moderate to gentle with highest speeds during August / September at the end of the winter period when rainfall is low which will influence the dispersion and dilution of pollutants / dust in the area (Table 5.3, extracted from Terratest, 2003).

Table 5.3: Wind run data at Kokstad (km/day)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	TOTAL
71.0	71.7	64.7	65.9	69.7	74.2	76.7	91.4	84.9	83.3	79.2	76.3	**75.8**

5.4.4 Evaporation

The potential mean annual evaporation (A-pan) is 1,600 to 1,800 mm per annum, ranging from approximately 242 mm in January to 91 mm in June (Schulze & Maharaj, 2006).

5.4.5 Extreme weather conditions

The region is exposed to cold winters when nightly temperatures can drop to freezing. Mist / fog are prevalent during the colder months, while intense short duration thunderstorms occur in the summer months (Table 5.4).

Table 5.4: Extreme weather conditions at Kokstad

Month	Average number of days per month with:		
	Thunder	Hail	Fog
Jan	9.2	0.8	1.7
Feb	6.0	0.3	1.7
Mar	6.4	0.3	2.5
Apr	2.4	0.2	3.3
May	0.8	0.1	3.0
June	0.1	0.0	1.5
July	0.2	0.0	3.8
Aug	0.3	0.0	3.1
Sep	2.1	0.1	2.5
Oct	5.0	0.4	0.9
Nov	5.7	0.6	0.9
Dec	6.8	0.6	1.0
Total per year	**45**	**3**	**26**

5.5 Land use and land capability

The site is situated within a rural / agricultural environment. Land capability is a function of slope, soil type and depth and climatic conditions and determines the best use for the land. The proposed mine is

5.4 Climate

The regional climate is characterised by hot summers and cold winters. Apart from rainfall data, there is no other weather data available for Lusikisiki; therefore all other climate information was taken from the weather station records at Kokstad.

5.4.1 Rainfall

Rainfall occurs mostly in the form of thunderstorms during summer months (October to March) and in connection with cold fronts moving in from the south-west. The mean annual rainfall at Lusikisiki is 998 mm with the highest mean monthly rainfall occurring during March (Table 5.1). The rainfall intensities at Kokstad (Table 5.1) indicate that the highest monthly rainfall occurred in February in 1985, with December to March experiencing monthly maximums above 200 mm.

Table 5.1: Mean monthly rainfall at Lusikisiki and maximum monthly rainfall at Kokstad (mm)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	TOTAL
Lusikisiki (mean)	114.7	124.8	135.3	58.4	47.6	30.3	35.4	35.6	66.6	106.5	128.3	114.6	**998.1**
Kokstad (max)	216	252	236	189	80	100	63	54	89	131	162	233	**1010**
(year)	1976	1985	1976	1978	1966	1965	1967	1970	1980	1977	1963	1975	

5.4.2 Temperature

The mean monthly maximum and minimum temperatures for the region range from 0.1℃ to 26℃ as presented in Table 5.2. Temperature affects the formation, action and interaction of pollutants by impacting the rate of chemical reactions (often in combination with relative humidity). In addition, surface temperature inversions which are strongest during the winter months may impact air quality.

Table 5.2: Mean monthly minimum and maximum temperatures at Kokstad

Month	Mean Min (°C)	Mean Max (°C)
Jan	13.4	26.0
Feb	13.0	25.5
Mar	11.5	24.7
Apr	7.7	22.1
May	3.7	19.6
June	0.1	17.6
July	0.1	18.1
Aug	2.3	19.6
Sep	6.1	21.7
Oct	8.4	22.7
Nov	10.3	23.6
Dec	12.2	25.3

situated on an old quarry with the pre-mining land use probably grazing as the soil cover is low. There is no on site evidence of land misuse (Terratest, 2003). The surrounding area is primarily grazing with minor cropping in the lower lying areas (Figure 5.2). Settlements occur immediately southwest and southeast of the site (across the road approximately 100 m from the proposed mine boundary); with additional settlements to the east approximately 200 m from the site.

5.6 Biodiversity – flora and fauna

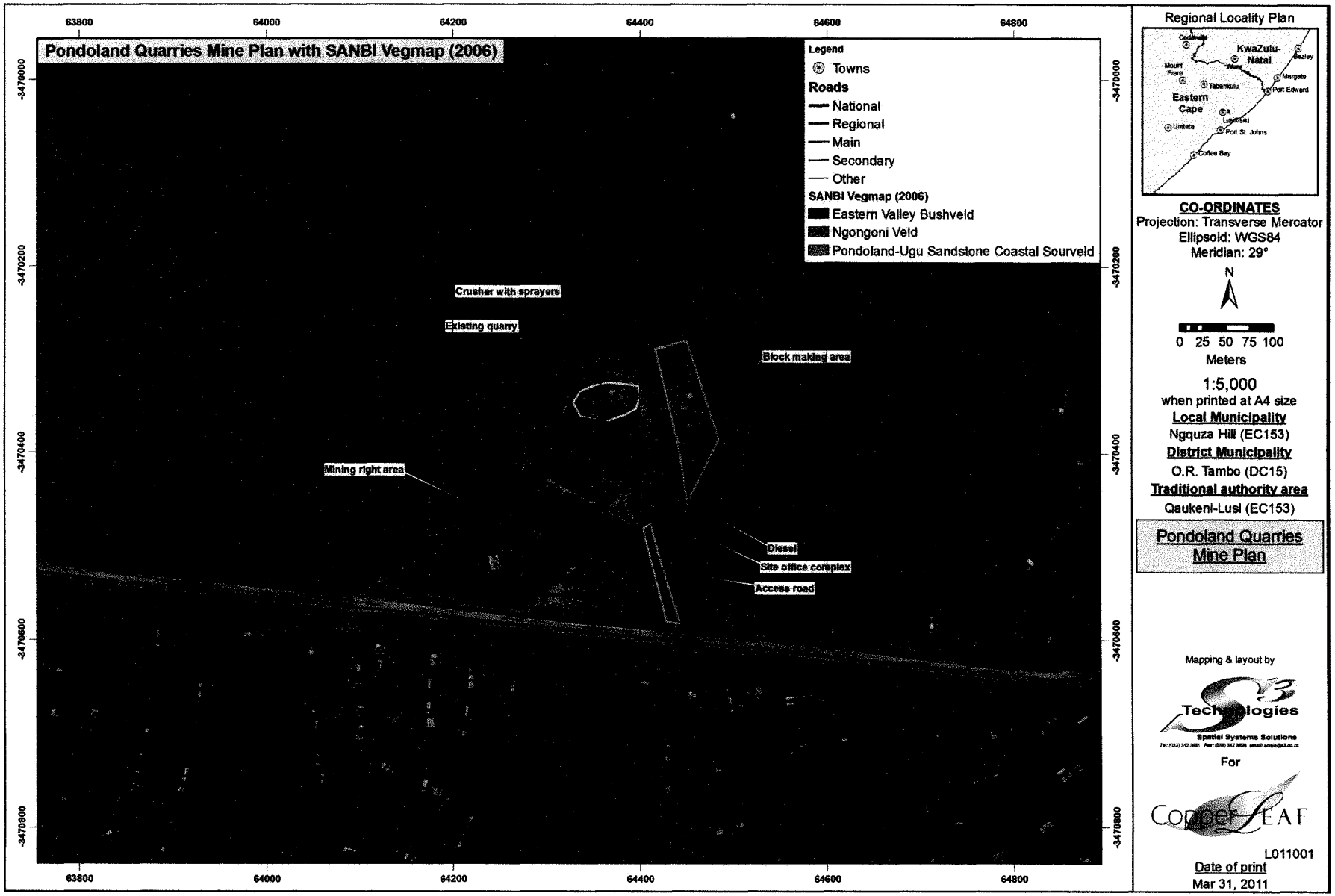
As it is not the listing of individual plant and animals species that is environmentally important but the interaction of these species in terms of biodiversity, the normal categories of vegetation (flora) and animal life (fauna) have been combined to determine overall ecological state of the proposed mining area. This will ensure management of the biological environment as a whole to minimise any impact on biodiversity of the site.

The proposed mining area is situated within the Ngongoni Veld (SVs4) of the Savanna Biome (SA Vegetation and Acocks, 1998). This sub-escarpment savanna vegetation type is listed within the 2009 threatened terrestrial ecosystems with less than 1% of the targeted 25% being protected in the Ophathe and Vernon Crookes Nature Reserves. Only 61 ha of the original 1,000,000+ ha is naturally remaining, with 39% of the overall vegetation type being transformed through cultivation, plantations and urban development (SANBI website). The Lusikisiki area however is known to have species of special concern.

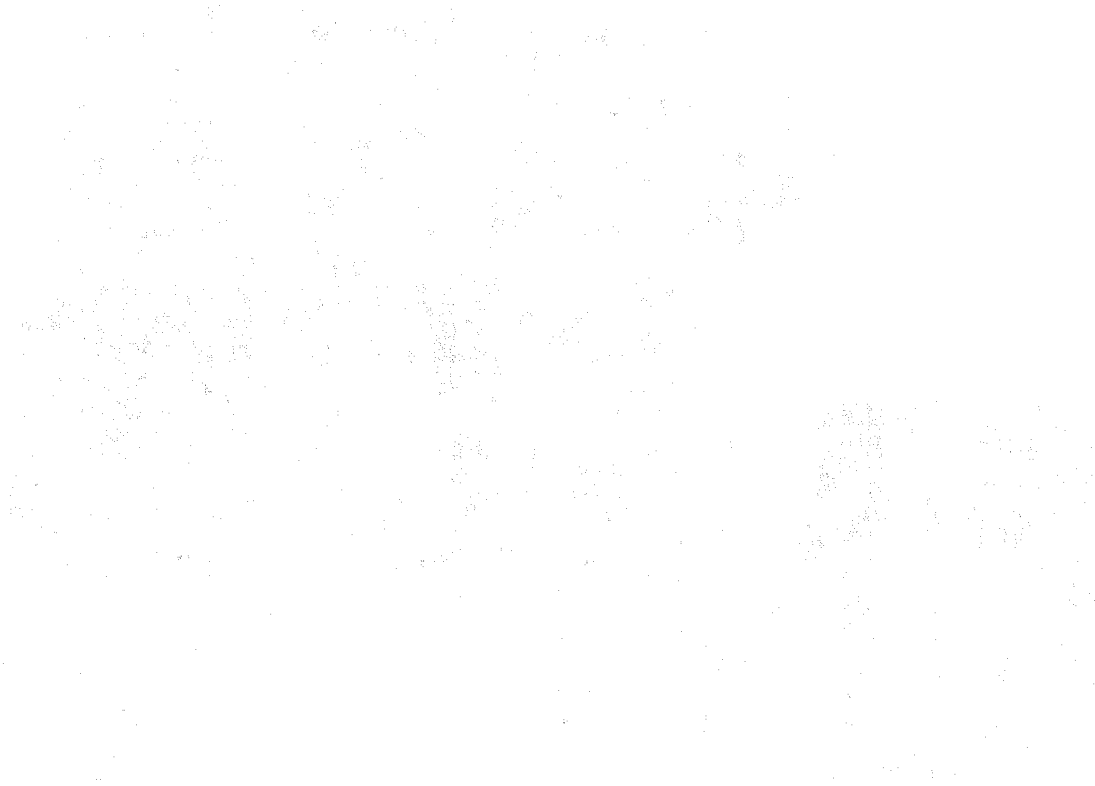
This vegetation type comprises dense, tall grassland that has low species diversity and is dominated by unpalatable, wiry Ngongoni grass (*Aristida junciformis*). Other graminoids include *Bothriochloa insculpta, Erogrostis curvula, Hyparrhenia hirta, Panicum maximum, Paspalum scrobiculatum, Sporobolus africanus, S. pyramidalis* and *Themeda triandra*, with low shrubs of *Agathisanthermum bojeri, Euryops laxus*, and *Gnidia anthylloides* (Munica and Rutherford, 2006).

On site the veld is well mixed with no dominant species. It is scarcely grazed but where it is grazed it seems to be dominated by *Aristida junciformis* (Terratest, 2003). No endangered or rare flora or faunal species noted during the site survey by Terratest (2003). In addition, no invader flora species were noted on the mining site; however Eucalypthus trees have been planted around the offices for shade. It was noted by Terratest (2003) that as the site has been operated as a mine it is doubtful that any mammals live on the site with the exception of some rodents, birds and possibly reptiles.

Figure 5.3: Vegetation type within the proposed mining area (SANBI).



DMR Reference: EC30/5/1/2/2/0249MR



5.7 Surface water

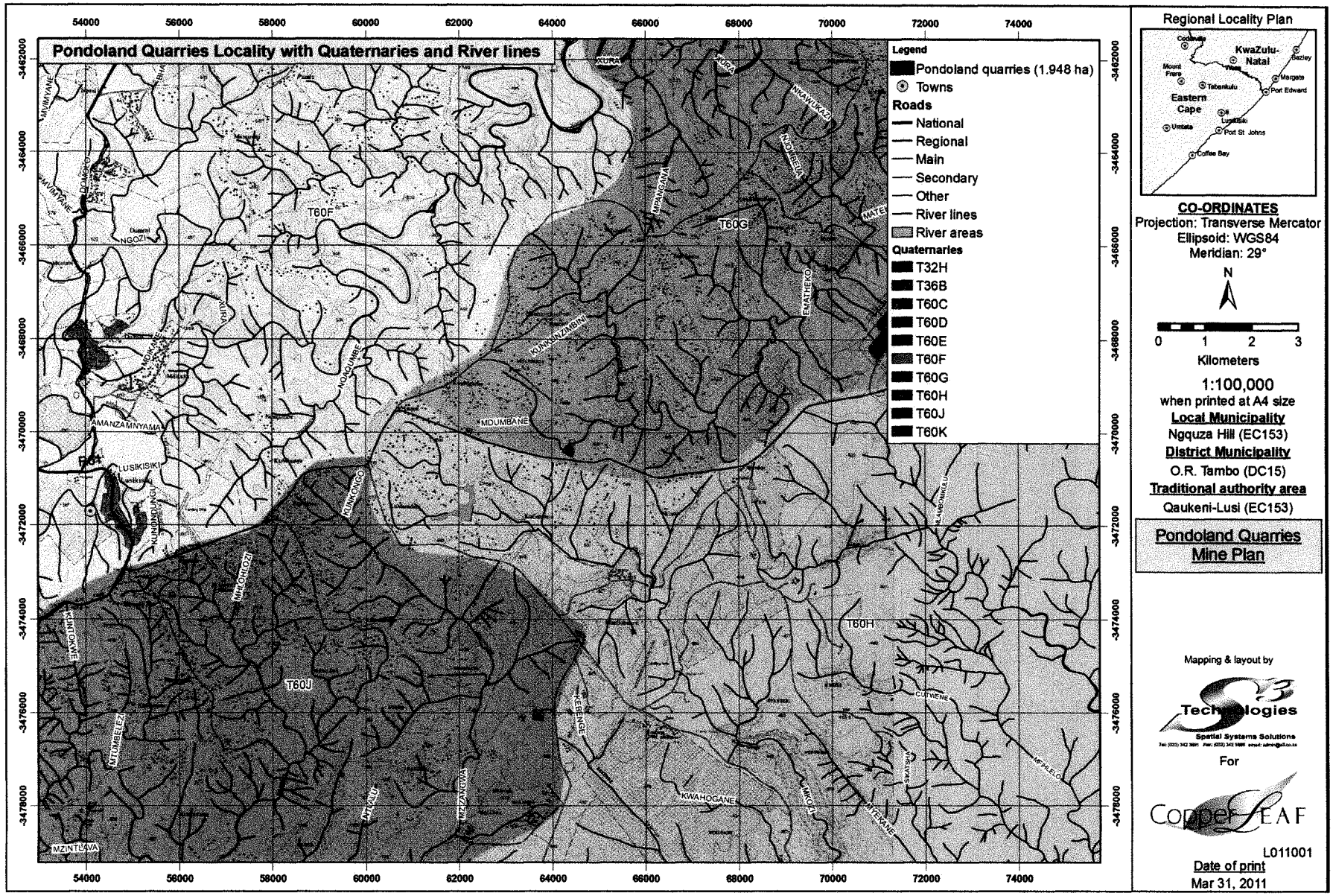
The proposed mining area is situated within upper reaches of the T60G quaternary of the Mzimvubu to Keiskamma Water Management Area (Pondoland Key Area; Figure 5.4). No surface water resources traverse the site; however the northern boundary is marked by the perennial Mdumbane River (Figure 5.5). This river sources west of the proposed mining area and flows eastwards into the Msikaba River, which flows through the Mkambatini Game Reserve (a highly sensitive ecological area) and ultimately drains into the Indian Ocean. DWAF (2004) indicates that the Pondoland Key Area has rivers and estuaries of high conservation value. A specialist study was undertaken by S3 Technologies to assess the flood levels and flow within the proposed mining area. This report is provided in Appendix B and summarised in this section.

5.7.1 Mean annual runoff

The naturalised mean annual runoff for the Pondoland Key Area is 796 million m^3/a, with the ecological reserve requirement of 148 million m^3/a (DWAF, 2005). The high ecological reserve requirement affects the volumes available for consumptive use. Water use within this Key Area is very limited with the largest user being the rural sector that use run-of-river yield (DWAF, 2005). The water requirement within this area is 4 million m^3/a (DWAF, 2003). However, despite the high MAR volumes, a lack of storage means that only 1 million m^3/a surplus water is available (DWAF, 2005). According to the Terratest (2003) on site study the mean annual runoff from the site is 20-50 mm.

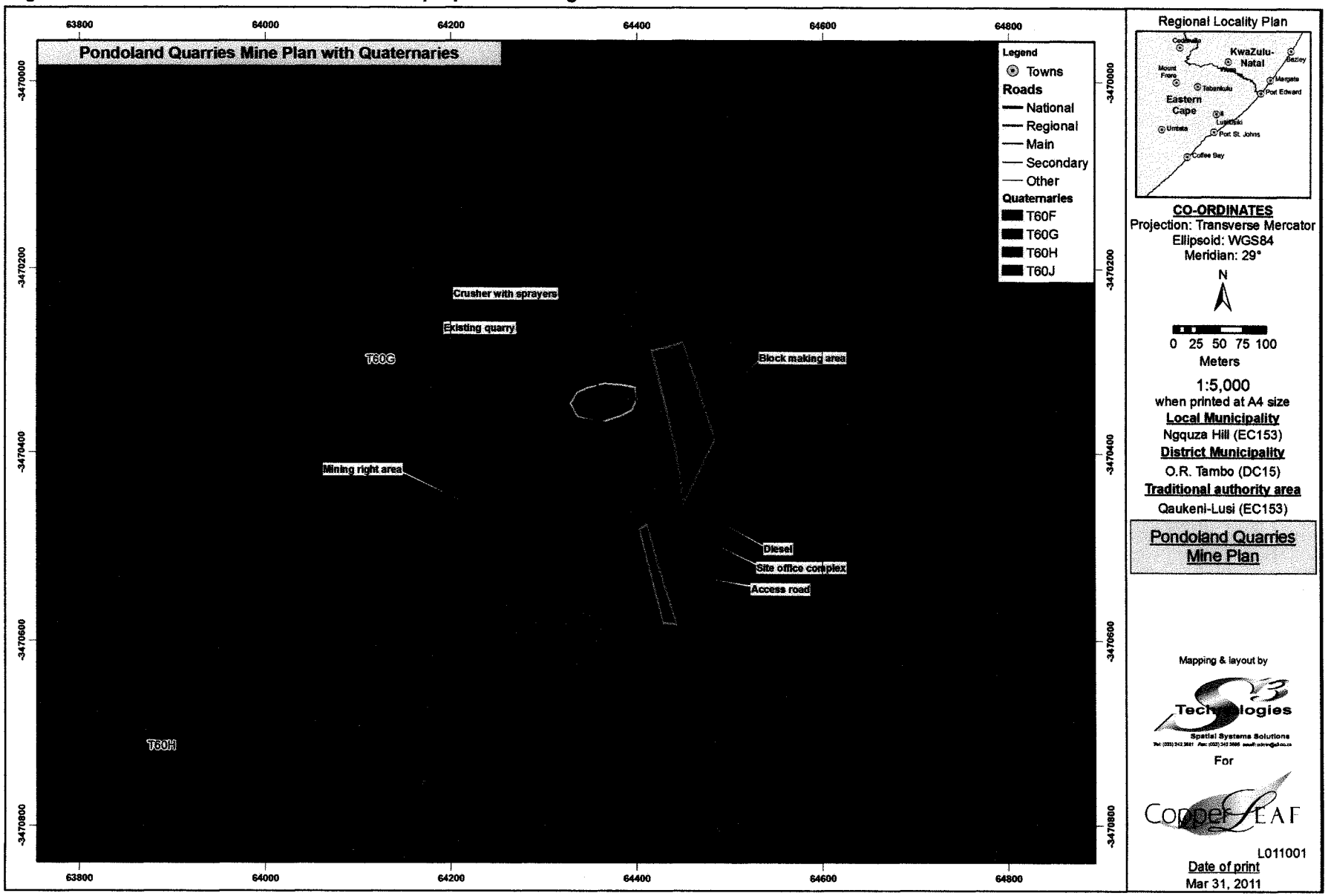
The 2 year point rainfall volume over the mining area is approximately 1.3 Ml, with a maximum rainfall of 119 mm over 24 hours up to 203 mm over 7 days every two years (see Appendix B). Based on the average monthly rainfall (Lusikisiki station) there is the potential for approximately 34,000 m^3 annual runoff volume (based on 100% runoff) over the existing quarry and mining area. Within the unmined area infiltration will take place and this volume will reduce; however over time the mining of the quarry will result in this full volume being accumulated within the quarry depression. Initially the model predicts a runoff coefficient of 35%; therefore the annual runoff volume over the unmined area will be approximately 9,876 m^3. In the developed areas of the mining area such as the office, crusher, block making area and roads, the runoff coefficient is estimated to be 0.7 (70% of rainfall). Therefore, within these areas the annual runoff volume is approximately 7,029 m^3. Separating the runoff from the quarry activities (dirty water) from the river (clean water) to ensure that there is no contamination of the water resource from increased sediment load (erosion of exposed surfaces) will allow for the capturing of this water from these areas for use in the block-making industry. Based on the available information it is likely that annually approximately 27,412 m^3 can be captured for use. This volume will not contribute to the river flow. It is estimated that annually approximately 3,168 m^3 is required for use by the mine and block-making activities, with a further 7,920 m3 for dust suppression; therefore effective capture of water from the quarry area should be able to supply the operations.

Figure 5.4: Surface water catchments within the region of the proposed mining area.



DMR Reference: EC30/5/1/2/2/0249MR

Figure 5.5: Surface water catchments for the proposed mining area.



DMR Reference: EC30/5/1/2/2/0249MR

5.7.2 Flood peaks and volumes

Two significant streams feed the flowline that passes north of the quarry site (Figure 5.6). Along the boundary of the quarry adjacent to the river, fairly steep banks surrounding the flowlines with well formed channels that will contain the floods and prevent widespread flooding even though some flood depths (for the 1:100 year flood) will be 4 m at the deepest points of the river channels with an average of 2 m to 3 m (see Appendix B). There is no positive indication that floods up to and including the 100-year event will inundate the quarry (Figure 5.7). Accumulations directly into the quarry areas during normal annual rainfall events are likely to be of greater importance in the planning and running of the mine.

5.7.3 River diversion

No river diversions are planned for the proposed mining activities.

5.7.4 Water quality

Two water samples were taken for analysis upstream and downstream of the proposed mining area for baseline determination. The general water quality in the area appears to be good and well within the range for drinking water chemical standards (SABS 241), apart from the high turbidity (see Appendix C). The separation and prevention of runoff from the mining area from entering and potentially silting the river needs to be put in place.

5.8 Groundwater

The quarry site is assumed to lie within the surface water run-off zone, as the soil cover is very shallow on top of the tillite rock. There are no boreholes or springs on the site and depth to the water table has not been established (Terratest, 2003). In general the sandstones that outcrop within the Pondoland tertiary catchments (T60) have limited water bearing capacity (DWAF, 2005). However the Msikaba sandstone Formation within the T60G quaternary gives good borehole yields and the associated high rainfall ensures good aquifer recharge. In has been estimated that the unexploited groundwater availability within the Pondoland Key Area is 36 million m^3/a (DWAF, 2005). In addition, in zone of fracturing such as faults or adjacent dolerite intrusions, secondary aquifers will be developed. Ground water will not be used on the site for the proposed mine and associated activities.

Figure 5.6: Surface water sub-catchments that supply flow to the proposed mining area.

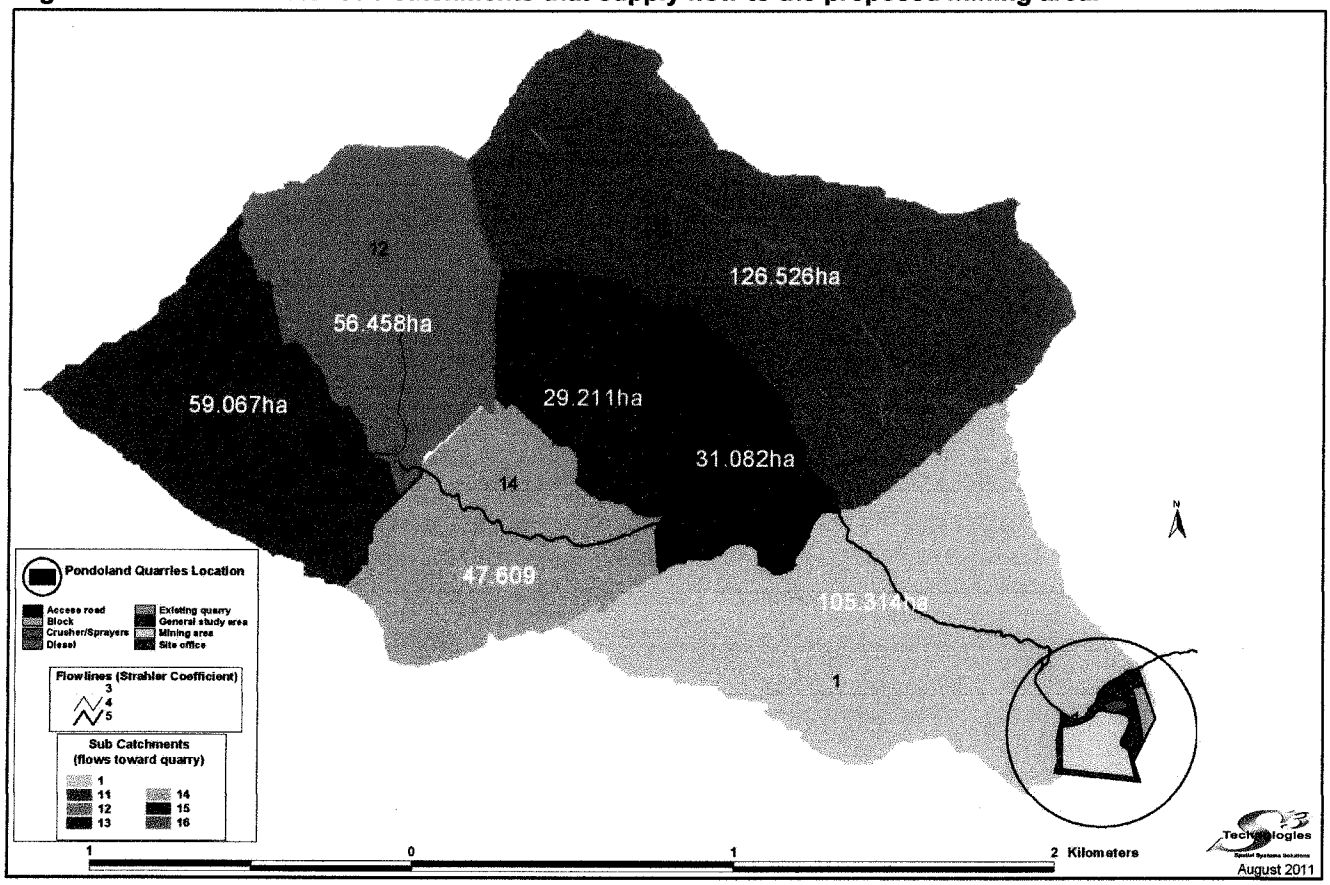
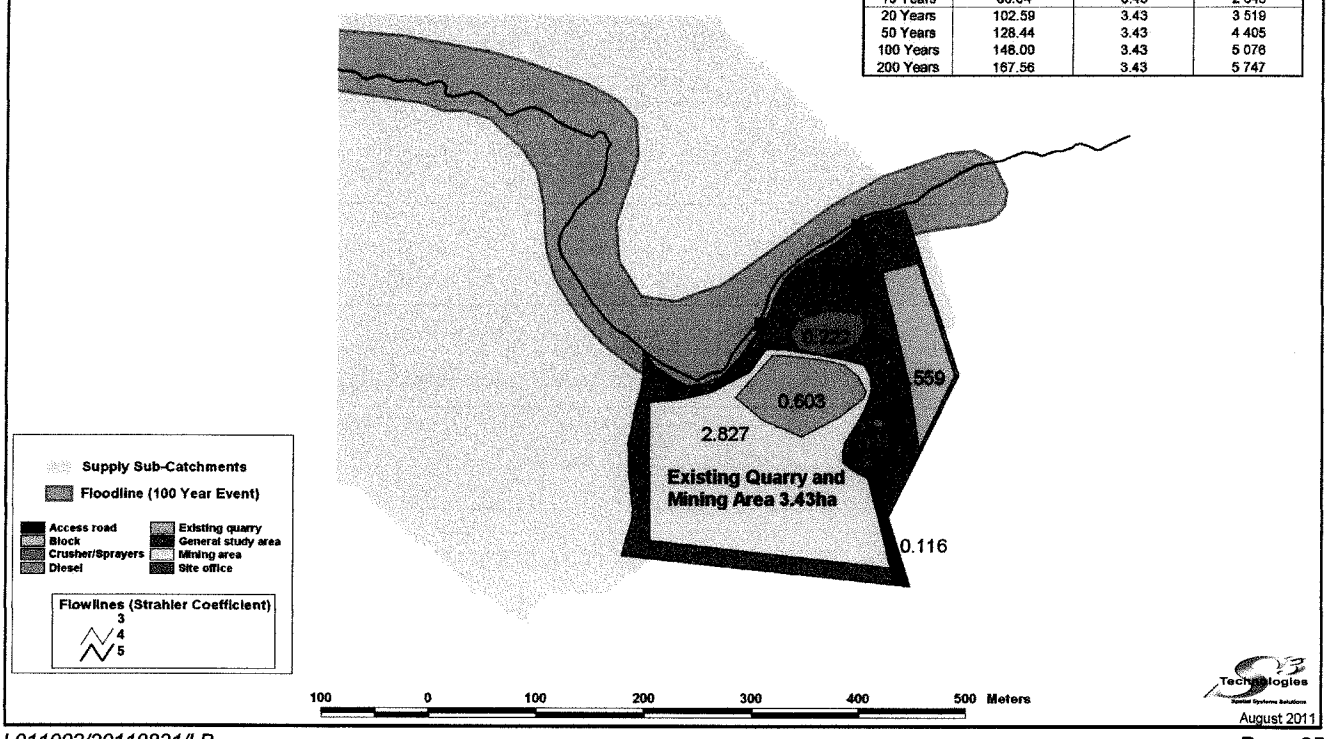


Figure 5.7: Surface water flood levels for a 1:100 year event for the proposed mining area.

Flood Event	Point Rainfall mm	Mining Area ha	Fall Volume m³
2 Years	37.63	3.43	1 290
5 Years	63.48	3.43	2 177
10 Years	83.04	3.43	2 848
20 Years	102.59	3.43	3 519
50 Years	128.44	3.43	4 405
100 Years	148.00	3.43	5 076
200 Years	167.56	3.43	5 747



5.9 Air quality

The quarry site is located in a rural area, where the air quality is generally good (Terratest, 2003). The existing potential sources of air pollution within the region of the proposed mine include:

- Vehicle tailpipe emissions (southern road - hydrocarbons such as benzene, CO, NO_2,, $S0_2$ and particulates);
- Domestic fuel burning (CO, NO_2,, $S0_2$, particulates and polycyclic aromatic hydrocarbons); and
- Agricultural activities and biomass burning (surrounding farmlands and gravel roads - CH_4, CO, NO_2, and fugitive dust).

The potential sources of air pollution from the quarry / mining activity include:

- Vehicle tailpipe emissions (from the use of machinery for excavation and haulage);
- Vehicle movement over exposed surfaces on site;
- Blasting activities (sporadic event every four months);
- Moving and crushing of the rock to the appropriate sizes for the market;
- Stockpiling of the crushed stone (exposed surface, depending on size fraction); and
- Soil stockpiles, including berms for stormwater control (entrainment of dust from exposed surfaces).

It is evident that air pollution within the quarry area is primarily from dust generation relating to vehicle and wind movement over exposed surfaces, with minor additional chemical input through vehicle emissions. However, this dust generating potential (particulate matter) is generally low. Particulate matter is classified as a criteria pollutant, with a National ambient air quality standard having being established for PM10 (particulate matter with an aerodynamic diameter less than 10 µm). Particulates may have potential health effects, impact vegetation or simply be a nuisance issue.

A specialist study of the ambient and personal dust levels is in progress (see Appendix C). Four dust buckets have been erected over the site, as well as the use of personal dust monitoring equipment over the quarry area. Laboratory analysis of the ambient and personal dust levels is still in progress; however volumes collected appeared to be low and monitoring is on-going.

Based on rainfall data for the region (see Section 5.4.1) the removal of pollutants in the atmosphere through wet deposition occurs mainly in summer. Relative humidity is also highest in the summer months and any chemical transformations which require water vapour will be performed most efficiently in the summer months. The maximum wind speed over the area occurs between August and October from the southwest to west and is generally moderate (5 m/s), with an average annual wind speed of approximately 1 m/s (see Section 5.4.3).

Based on the topography, wind directions and speed the closest settlements south and west of the quarry area may be impacted during the summer months (low probability), especially as mining progresses towards the southern boundary. It must however be noted that gravel roads (source of dust) lies between the quarry site and these settlements which are also upslope from the quarry with gentle breezes and high rainfall during this period resulting in low dust entrainment and migration potential (dust suppression). During winter, stronger moderate winds from the southwest-west with low rainfall will result in entrainment of dust downslope of the quarry if dust suppression is not conducted. The closest settlement to the northeast-east of the quarry site is approximately 400 m away and should not be adversely affected by a change in air quality during the winter months as a result of quarry activities if appropriate dust suppression is undertaken.

5.10 Noise

The rural area is generally a very tranquil one with noise levels well within acceptable limits (Terratest, 2003). Existing noise sources in the vicinity of the proposed mining area include vehicles accessing the area and noise levels generally associated with farming activities. In terms of the proposed mining, apart from the crushing and vehicle noise levels that will occur during daylight hours only, blasting will only occur three times a year. Noise attenuation occurs exponentially with distance; therefore although the activities have the potential to contribute to the ambient noise levels of the region, none of these sources will produce noise levels in excess of the maximum allowable health limit. Employees operating machinery will be provided with correct personal protective equipment (PPE) and it is recommended that surrounding communities are made aware of the blasting schedule.

5.11 Sites of archaeological or cultural interest

There are no known sites of archaeological or cultural interest in the vicinity of the quarry site.

5.12 Sensitive landscapes

There are no sensitive landscapes under statutory protection within the proposed mining area; and there are no wetlands on the site. No streams or rivers are present on site, but the northern boundary is delineated by the Mdumbane River.

5.13 Visual aspects

The quarry site is situated on the north-west facing slope of a hill, which in turn is shielded by the hill on the other side of the Mdumbane River. The site is therefore generally hidden from the surrounding areas by the topography. There are however a few neighbours who have a view towards the quarry.

5.14 Transport, traffic and safety

In terms of the mining operation, there is unlikely to be an increase in traffic on the surrounding road network owing to the low volumes of quarry. In addition, the transport routes will be on existing black-top and gravel surfaces with regulated speed limits and factors of safety.

5.15 Socio-economic

The proposed area of operation is situated on a portion of the Qaukeni-Lusi Traditional Authority area within Ward 21 of the Ngquza Hill Local Municipality in OR Tambo District (Eastern Cape Province) (see Figure 1.1), with the potential labour sending area of Lusikisiki.

The key socio-economic factors for the local municipal area are as follows[1]:

- Total population = 255,354
  - 55% are female
  - 99.4% are HDSAs
- Total households = 50375
  - The average household size is five
- Education
  - 40% of persons over 20 years have no schooling
  - 68.5% of persons over 20 years have primary education or lower
  - <1% of persons over 20 years have any tertiary education
- Employment
  - 48.4% of the total population are considered economically active (15 to 65 years)
  - Only 11.7% of this sector are employed with the main employment sector indicated as services (28.3%), followed by private households (16.3%) and retails / trade (12.1%). Mining / quarrying constitutes only 2.4% of the employment.
  - 22.4 % are considered to be unemployed
  - 7.4% choose not to work
  - 37% are students, homemakers or pensioners/retired
- Household income
  - 43.3% of the households have no income
  - 89.2% of the households have less than R19,200 per annum (R1,600 pm)
  - 94.6% of households have less than R38,400 per annum (R3,200 pm)

[1] Information sourced from the national 2001 census as updated, Statistics SA – www.statssa.gov.za.

It is evident from this information that the area has a large number of people who are dependent on others with low levels of education and income. The economic sectors are limited to service type provision, and this is compounded by the fact that very few people have any buying power. The area is in need of sustainable employment opportunities and service delivery.

5.16 Summary of the environmental setting

The proposed mining area is situated on part of the Nkunzimbini community area of the Qaukeni-Lusi Traditional Authority within Ward 21 of the Ngquza Hill Local Municipality of the OR Tambo District Municipality, Eastern Cape Province. The area is characterised by gently to moderately sloping hills, with surrounding grazing lands (minor cropping in the lower lying areas as soils cover is low) within a rural / agricultural environment. Settlements occur southwest, southeast and east of the site. The quarry and processing area is on a small, northeast facing slope with elevations across the site ranging from about 560 m in the south to 500 m in the north. The area is therefore mostly transformed habitat (agriculture / settlement) with low ecological sensitivity.

Moderate annual summer rainfall is experienced (998 mm) with high annual potential evaporation resulting in a net monthly deficit throughout the year. There are no water resources on the proposed mining area; however natural surface drainage is to the northeast to the Mdumbane River which creates the northern boundary of the proposed mining area. This is within the upper reaches of the Mzimvubu to Keiskamma Water Management Area (T60G quaternary). There is no indication that the calculated 1:100-year flood event will affect the mining area, with natural runoff from normal annual rainfall events being potentially more important in planning.

The predominant winds in the area are from the east-northeast (summer) and southwest-west (winter), with dust fallout and noise generation from mining activities having little impact on the surrounding communities. However, in terms of best practice monthly monitoring of dust fallout and notification of blasting schedule is recommended.

Based on the above it is evident that there are very few environmental features within the area of the proposed mining operation that require protection, remediation, management or avoidance measures. These features are as follows:

- Soils – management of any excavated soils to maintain viability;
- Air quality – management of dust generation; and
- Surface water – protection and management measures to prevent potential pollution of the Mdumbane River

6. CONSULTATION PROCESS

Public participation is an important tool in the decision-making process. Consulting the interested or affected public is the only meaningful way through which account of locally relevant conditions can be taken, rather than imposing a socially and environmentally insensitive design onto an environment. This section documents the process followed with respect to consultation with I&APs and Regulatory Authorities (see Sections 2 and 3 for the environmental process and objectives). As the proposed mining area is an existing quarry, consultation with the public has previously occurred. Consultation in association with both past activities as well as the mining right application in process has been included in this section.

6.1 Interested and affected parties

6.1.1 Regulatory Authorities

The following Regulatory Authorities were identified during the initial environmental assessment process undertaken by Terratest (2003):

- Department of Mineral Resources: Mineral Development (DMR)
- Department of Water Affairs and Forestry (DWAF)
- Department of Environmental Affairs and Tourism
- Department of Land Affairs
- Department of Agriculture: Directorate Resource Conservation
- Department of Local Government and Housing
- Department of Economic Affairs Environment and Tourism
- Department of Public Works
- The Project Steering Committee from the Lusikisiki area

In terms of the Terratest Report (2003), liaison with the various departments is assumed to be undertaken by the DMR.

6.1.2 Landowners & other interested and affected parties

An initial list of potential I&APs was created from a desktop study of the immediate surrounding landowners (see Section 3.2). Contact with the headman of the Qaukeni-Lusi Traditional Authority within the area of the proposed mine has already taken place through personal contact. Most of the other I&APs will be engaged with during the information phases. No specific recent comments relating to the environment or potential impacts of mining have been made by I&APs to date.

6.2 Information phases

6.2.1 Advertising

In terms of the Terratest Report (2003), legal notices informing the public of the proposed project and inviting them to register as I&APs and comment on the project were placed in the Daily Dispatch on the 13 March 2003 in English and Xhosa. No I&APs registered during this process, however enquiries were made with regards to employment opportunities within the quarry business (e.g. plant hire owners offering their services). These were directed to the quarry owner for further discussions.

To update the I&APs in line with this recent mining right application, site notices have been placed on the boundary of the proposed mining area, and a legal notice informing the public of the proposed project, inviting them to register as I&APs and informing them in the Daily Dispatch of the availability for public comment of the ESR on the 4th February 2011 and the EMPR on the 2nd September. See Appendix A for the samples of the content of the legal notice and the proof of site notice. No I&APs have registered to date, however one comment has been received from the headman in the area relating to local labour opportunities (see Appendix A).

6.2.2 Site visit

A site visit was held on the 14th April 2003, with the management and the staff of the quarry and some 100 local residents (Terratest, 2003). Their main concerns were with regards to the job advertising and the selection of staff. As jobs are scarce in the area, it was decided that the temporary staff be employed on a rotation basis so that everyone gets employment, even if temporarily. The permanent staff would be selected by the management of the Pondoland Quarry, after wide advertising through the area headman and leaflets in the local shops.

To update the I&APs in line with this EMPR a site meeting will be held on the 7th September 2011. Any comments received will be addressed and provided to the DMR.

6.2.3 Availability of the ESR

The ESR was made available for comments by the public from 4th February 2011 to 14th March 2011. I&APs were invited to review and comment on the ESR in writing. No comments were received with regard to the ESR.

6.2.4 Availability of the EIA / EMP

The EMPR has been made available for comments by the public from the 2nd September 2011 to the 3rd October 2011. I&APs have been invited to review and comment on the EMPR in writing. Any comments received will be addressed and provided to the DMR.

7. ENVIRONMENT IMPACT ASSESSMENT

This section follows the requirements of the MPRDA and identifies the main mining activities and assesses the potential impacts of each of these activities as well as the cumulative impacts based on the environmental setting provided in Section 5. The assessment of environmental impacts of mining on the environment, as well as the environment on mining, ideally involves a consultation process with interested and affected parties as discussed in Section 6. However no feedback from the I&APs has been registered therefore much of the assessment has been reformatted from the Terratest Report (2003) with input from the specialists studies undertaken as highlighted in Section 5.

7.1 Mining phases and activities

When assessing environmental impacts, the proposed project needs to be viewed holistically, incorporating all phases of development from establishment to eventual closure. Therefore, to mitigate potential negative impacts and identify any potential fatal flaws that may render the project environmentally unacceptable, the environmental assessment addresses all phases related to the establishment of the proposed mine as discussed in Section 3, namely:

- Construction;
- Operation;
- Decommissioning and closure; as well as
- Post-closure (residual impacts).

7.1.1 Construction

As most of the infrastructure is already in existence, the construction phase for the following activities will be undertaken over a relatively short period:

- Creation of stockpile areas
    - The construction of the stockpile areas includes topsoil, sub-soil and product. Topsoil will be stripped from the construction of the stormwater and pollution control measures and quarry areas and stockpiled on an on-going basis for the life of the mining operation. The topsoil and subsoil stockpiles will be located separately from the temporary product stockpiles.
- Construction of stormwater and pollution control measures
    - Development of berms and cut-off trenches (to separate clean water from the environment surrounding the operating area from dirty water within the operating area). Berms will be constructed along the back face of the quarry to divert stormwater away from the quarry face and also along the contours at the toe of the quarry to intercept any polluted run-off. Topsoil will be removed and stockpiled and the berms will be constructed using subsoil taken from

construction of the trenches. If there is insufficient material then topsoil will be used; and

- Development of a pollution control dam (settling pond) between the quarry and the Mdumbane River to capture the water from pit dewatering and dirty water and prevent any polluted water from entering the river. This water will be re-used for dust suppression within the operating area and block-making.

7.1.2 Operation

The following activities will be undertaken during the mining process:

- Access and on-site haul road
  - The existing access and on-site haul road will be maintained at all times to allow for continuous access by trucks;
- Opencast operations including mining, blasting and contribution to the various stockpiles
  - The method of mining is discussed under Section 3.3.
- Two-stage crusher plant and block-making facility
  - Crushing of the rock to sizes for the target market;
  - Using the discard (fines) from the crusher to produce blocks for the construction industry
- A site office complex for mine personnel with workshop and diesel storage tank
  - Storage of waste - waste management is discussed under Section 3.7
  - Storage of a hazardous substance (diesel) in bunded area

7.1.3 Decommissioning and closure

The decommissioning and closure phases will comprise the following activities that could lead to potential impacts:

- Closure of the quarry
  - All loose rock will be cleared of benches and floor and will be removed to the quarry floor area;
- Removal of surface infrastructure – office complex, crusher plant, maintenance area and roads
  - This process will commence once the infrastructure is no longer required for other closure activities. This will include:
    - Removal and rehabilitation of the access road;
    - Dismantle and remove all infrastructures such as office units, diesel tanks, toilets, crusher plant, block-making area, etc. The fencing and gate will be left in place for safety reasons;

- Once the site has been cleaned, the removal of stormwater control measures (berms, trenches and settling dam) through the backfill of the trenches and pollution control dam with berm and stockpiled material; and

- Rehabilitation
  - Exposed surfaces will be reshaped and scarified (where applicable).
  - The topsoil will be evenly spread across the disturbed areas.
  - Topsoil areas shall be vegetated with suitable grass species.

7.1.4 Post Closure Phase

The mine will be required to apply for a Closure Certificate according to Section 43 of the MPRDA. Section 43 (1) of the MPRDA states clearly that "The holder of a ... mining right ... remains responsible for any environmental liability, pollution or ecological degradation, and the management thereof, until the Minister has issued a closure certificate to the holder concerned." It is therefore assumed that all environmental impacts will be successfully addressed and managed through implementing the management measures as stated in Section 8 of this report.

Owing to the nature of the mining activity the area is unable to be returned to pre-mining land use or surface drainage conditions. Therefore rehabilitation is limited to contouring and re-vegetating exposed areas related to the infrastructure. Nevertheless, the main closure objective is to mine in such a way as to limit impacts on the topography, biodiversity, hydrology and aesthetics of the area by:

- Restricting the sphere of influence through the creation of suitable buffers and limiting the disturbed area to that which is necessary only;
- Controlling erosion through the implementation of suitable erosion and storm water control measures;
- Controlling nuisances, such as fugitive dust and noise, at the source;
- Managing soils appropriately during stripping, handling and stockpiling to protect against erosion, compaction and contamination;
- Effective implementation of the Environmental Awareness Programme.

There will however be residual environmental impacts on:

- Surface runoff: increased run-off from the quarry area as a result of a change in topography and a decrease in the infiltration potential, however no pollutants will be generated. The impact is considered to be probable, of low significance, long term, of low intensity and of site extent.
- Visual aspects: exposed rock will be visible. The impact is considered to be definite, of low significance, permanent, of low intensity and local extent.

- Stability: the rock face will be checked regularly for stability, and loose rock will be cleared when necessary. The impact is considered to be improbable, of low significance, long term, of low intensity and site extent.
- Regional socio-economic structure: the proposed operation will provide employment for the life of the mine only; therefore some residual effects on the local economy will be felt for some time after the mine has closed.

The potential environmental impacts associated with the proposed activities and the biophysical environment, have been identified and will be investigated further detail during the EIA/EMP phase as per the specialist studies highlighted in Section 8. These potential impacts are listed in Table 7.1.

Table 7.1: Main mining activities and the potential impacts for the Pondoland Quarries

Activity	Environmental aspect – potential impact	Phase of mining
Access & on-site roads	• Soil contamination and loss of viability through: o spillage of oils and grease	Operation & closure
	• Surface water contamination through: o wet suppression of exposed surfaces leading to soil erosion	Operation & closure
	• Dust generation (particulate emissions) through: o wind erosion of exposed surfaces o vehicle entrainment on the roads o tailpipe emissions from vehicles	Operation & closure
	• Noise generation through: o movement of heavy vehicles	Operation & closure
Subsoil and topsoil stockpiles	• Soil contamination and loss of viability (land capability) through: o incorrect stripping during construction of the stockpile area o incorrect placement (not separating) of soil during stockpiling o spillage of oils and grease by vehicles during operations	Construction and operation
	• Loss of biodiversity through: o Removal of vegetation (habitat)	Construction
	• Dust generation (particulate emissions) through: o wind erosion of exposed surfaces o materials handling o tailpipe emissions from vehicles	Construction, operation & closure
	• Noise generation through: o movement of heavy vehicles	Construction and closure
Site office complex with diesel store	• Soil contamination and loss of viability (land capability) through: o spillage of oils and grease by vehicles during operations o incorrect storage of domestic or industrial waste o concentrated run-off as a result of demolition activities	Operation & closure Operation Closure

Activity	Environmental aspect – potential impact	Phase of mining
	• Surface water contamination through: o incorrect storage of domestic or industrial waste o concentrated run-off as a result of demolition activities	Operation Closure
	• Dust generation (particulate emissions) through: o wind erosion of exposed surfaces o vehicle entrainment within the area surfaces o tailpipe emissions from vehicles	Operation and closure
	• Noise generation through: o movement of vehicles	Operation & closure
[redacted]		
Crusher & block-making, including product stockpile	• Soil contamination and loss of viability (land capability) through: o spillage of oils and grease by vehicles during operations	Operation
	• Surface water contamination through: o Erosion of exposed surfaces	Operation & closure
	• Dust generation (particulate emissions) through: o wind erosion of exposed surfaces o materials handling o tailpipe emissions from vehicles	Operation & closure
	• Noise generation through: o movement of heavy vehicles o crusher plant operation	Operation

Activity	Environmental aspect – potential impact	Phase of mining
Stormwater and pollution control measures (trenches, berms & pollution control dam)	• Soil contamination and loss of viability (land capability) through: o incorrect stripping during construction of the trenches, berms and pollution control dam o mixing of topsoil and subsoil during the construction of the berms o spillage of oils and grease by vehicles during operations	Construction
	• Surface alter contamination through: o alteration of surface water run-off o spillage of oils and grease by vehicles during operations	Construction & operation Construction
	• Dust generation (particulate emissions) through: o wind erosion of exposed surfaces o material handling o tailpipe emissions from vehicles	Construction, operation &closure Construction Construction
	• Noise generation through: o movement of heavy vehicles	Construction

7.2 Environmental impact assessment process

To ensure comparable results, the assessment of potential impacts is addressed in a standard manner using a clearly defined numerical rating scale to determine the significance of the potential impacts as a result of the proposed project (Table 7.2). Each impact identified is assessed in terms of probability (likelihood of occurring), extent (spatial scale), intensity (severity) and duration (temporal scale) and the sum of the numerical values defines the significance. Although impacts may be positive or negative, only the negative impacts that require mitigation measures area addressed in this section.

The EIA per mining activity rates the impact for each relevant environmental aspect per mining activity as required by the DMR. The activities (and sub-activities) are assessed according to the different phase of the mining process. Assessment of the environmental impacts is provided in Tables 7.3 to 7.9 per activity as follows:

- Table 7.3: Access and on-site haul roads
- Table 7.4: Stockpile area – topsoil and subsoil
- Table 7.5: Site office complex – office complex with maintenance, security and diesel store
- Table 7.6: Quarry – mining, including blasting
- Table 7.7: Crusher & block-making, including product stockpile
- Table 7.8: Stormwater and pollution control measures (trenches, berms, and pollution control dam)

For all tables under this section the following abbreviations are used for the various categories:

- P - probability
- E - extent
- D - duration
- I - intensity
- S – significance

Table 7.2: Numerical rating scale to determine environmental impact significance

Category	Category	Rating	Description
Probability	Improbable	0	Less than 40% sure of a particular fact or the likelihood of that impact occurring.
	Possible	1	40% to 70% sure of a particular fact or the likelihood of that impact occurring.
	Probable	2	70% to 90% sure of a particular fact or the likelihood of that impact occurring.
	Definite	3	More than 90% sure of a particular fact or the likelihood of that impact occurring.
Extent	Site	1	Immediate project site
	Local	2	Up to 5km form the project site
	Regional	3	20km radius from the project site (beyond the borders of the immediate area)
	Provincial	4	Provincial
	National	5	South Africa
	International	6	Neighbouring countries/overseas
Duration	Very short-term	1	Less than 1 year
	Short-term	2	1 to 5 years
	Medium-term	3	5 to 10 years
	Long-term	4	10 to 15 years
	Very long-term	5	Greater then 15 years
	Permanent	6	Permanent
Intensity	Very low	0	Where the impact affects the environment in such a way that natural, cultural and social functions area not affected
	Low	1	Where the impact affects the environment in such a way that natural, cultural and social functions are only marginally affected
	Medium	2	Where the affected environment is altered but natural, cultural and social functions and processes continue albeit in a modified way
	High	3	Where natural, cultural and social functions or processes are altered to the extent that it will temporarily cease
	Very high	4	Where natural, cultural and social functions or processes are altered to the extent that it will permanently cease
Significance		2 to 4	Low
		5 to 7	Low to moderate
		8 to 10	Moderate
		11 to 13	Moderate to High
			High
			Very high

Table 7.3: Impact assessment of the access and on-site haul roads							
Potential impact	**Activity description**	**P**	**E**	**D**	**I**	**S**	**Management measure**
Soil contamination and loss of viability	Spillage of oils, grease, diesel, etc. could lead to the contamination of soil resources and the subsequent loss of soil viability.	0	1	5	1	**7**	A waste management plan must be put in place that takes account of the following: • Oils, grease, diesel and other chemicals will be stored in the prescribed manned and within bounded areas. • The prescribed procedure for minor spillage and rehabilitation. • The prescribed procedure and contact for major spillage. An incident reporting and remediation log must be kept on site. All vehicles and equipment must be serviced regularly and the logs kept on-site.
Surface water contamination	During operation, the increase in the exposed area combined with wet suppression for dust control increases the potential for soil erosion and subsequent water resource contamination.	1	1	5	1	**8**	Surface water runoff within the operational area must be contained by the trenches and pollution dam – daily checks by the designated responsible party must be logged.
Dust generation affecting air quality	Potential sources of particulate emissions include wind erosion of exposed surfaces, vehicle entrainment on the roads, and tailpipe emissions from haul vehicles.	2	2	5	1	**10**	Fugitive dust suppression techniques to reduce emissions include: • Vehicle speed restrictions - signage and enforcement; • Regular vehicle maintenance – logs kept on-site • Daily surface treatment such as wet suppression (70%) Establish a dust fallout monitoring programme with at least four dust fallout buckets around the proposed mining operations.
Noise generation	Noise will be generated by the movement of heavy earth moving machinery.	3	2	5	0	**10**	Regular vehicle maintenance – logs kept on-site. Limit vehicle movements to what is necessary by demarcating and fencing off zones.

Table 7.4: Impact assessment of the stockpile area – topsoil and subsoil							
Potential impact	**Activity description**	**P**	**E**	**D**	**I**	**S**	**Management measure**
Soil contamination and loss of viability	The construction of the stockpile area will require that the topsoil is removed and stockpiled for rehabilitation on closure. If this stripping does not take place, or is done incorrectly such as allowing mixing of the soils, it could lead to contamination and therefore loss of soil viability.	1	1	1	2	**5**	A log and plan of soil stripping and placement must be kept up to date. This must take account that: • Structural integrity is maintained if stripping occurs during winter • Topsoil is considered be to a depth of 300 mm • Topsoil and subsoil must be stockpiled separately
	The placement and separation of the topsoil and subsoil within the stockpile area. If separation of the material types does not take place, or is done incorrectly such as allowing mixing of the soils, it could lead to contamination and therefore loss of soil viability.	1	1	5	2	**9**	A log and plan of soil placement must be kept up to date. This must take account that: • Topsoil is considered be to a depth of 300 mm • Topsoil and subsoil must be stockpiled separately • Stockpiles must not exceed a height of 1.5m
	Spillage of oils, grease, diesel, etc. could lead to the contamination of soil resources and the subsequent loss of soil viability.	0	1	1	2	**4**	A waste management plan must be put in place that takes account of the following: • Oils, grease, diesel and other chemicals will be stored in the prescribed manned and within bounded areas. • The prescribed procedure for minor spillage and rehabilitation. • The prescribed procedure and contact for major spillage. An incident reporting and remediation log must be kept on site. All vehicles and equipment must be serviced regularly and the logs kept on-site.
Loss of biodiversity	Removal of vegetation (habitat) for construction of the stockpile areas and the establishment of alien invasive species on disturbed surfaces	1	1	1	1	**4**	Ensure area of disturbance is as small as possible. Should alien invasive species occur then these should be sprayed with Garlon (or suitable equivalent) and monitored.
Dust generation affecting air quality	Potential sources of particulate emissions include clearing of vegetation, levelling area, materials handling operations, wind erosion exposed surfaces, vehicle entrainment on site, and tailpipe emissions from vehicles.	2	1	2	2	**7**	Fugitive dust suppression techniques to reduce emissions include: • Reduce exposed surfaces through covering or vegetation • Regular vehicle maintenance – logs kept on-site • Daily surface treatment such as wet suppression (70%) • Self vegetation of long-term stockpiles and if this has not happened after the first wet season then seeding may be required.
Noise generation	Noise will be generated by the movement of heavy earth moving machinery.	3	1	1	1	**6**	Regular vehicle maintenance – logs kept on-site. Limit vehicle movements to what is necessary by demarcating and fencing off zones.

Table 7.5: Impact assessment of the site office complex – office complex with maintenance, security and diesel store							
Potential impact	**Activity description**	**P**	**E**	**D**	**I**	**S**	**Management measure**
Soil contamination and loss of viability	Spillage of oils, grease, diesel, etc. could lead to the contamination of soil resources and the subsequent loss of soil viability.	1	1	5	2	**9**	A waste management plan must be put in place that takes account of the following: • Oils, grease, diesel and other chemicals will be stored in the prescribed manned and within bounded areas. • The prescribed procedure for minor spillage and rehabilitation. • The prescribed procedure and contact for major spillage. An incident reporting and remediation log must be kept on site. All vehicles and equipment must be serviced regularly and the logs kept on-site.
	Temporary storage of domestic or industrial waste and diesel (possible spillage / incorrect storage)	1	1	5	1	**8**	A waste management plan must be put in place that takes account of the following: • Oils, grease, diesel and other chemicals will be stored in the prescribed manned and within bunded areas (maintenance area). • Domestic waste collection in marked bins in a designated area (maintenance / office area). • Collection of waste by a recognised contractor for disposal at a registered facility off-site
	Concentrated runoff as a result of the demolition activities during closure could lead to erosion, which will reduce the fertility of the soils and the subsequent establishment of flora.	0	1	1	2	**4**	All clean and dirty water infrastructures will be maintained up until completion of demolition and rehabilitation activities.
Surface water contamination	Temporary storage of domestic and industrial waste and diesel (possible spillage / incorrect storage)	0	1	5	1	**7**	A waste management plan must be put in place that takes account of the following: • Oils, grease, diesel and other chemicals will be stored in the prescribed manned and within bounded areas (maintenance area). • Domestic waste collection in marked bins in a designated area (maintenance / office area). • Collection of waste by a recognised contractor for disposal at a registered facility off-site
	Concentrated runoff as a result of the demolition activities during closure could lead to erosion, which may result in contamination of the water resources.	0	1	1	2	**4**	All clean and dirty water infrastructures will be maintained up until completion of demolition and rehabilitation activities.
Dust generation affecting air quality	Potential sources of particulate emissions include wind erosion exposed surfaces, vehicle entrainment on the site, and tailpipe emissions from vehicles.	1	1	5	0	**7**	Fugitive dust suppression techniques to reduce emissions include: • Reduce exposed surfaces through covering or vegetation • Regular vehicle maintenance – logs kept on-site • Daily surface treatment such as wet suppression (70%)
Noise generation	Noise will be generated by the movement of vehicles.	0	1	5	0	**6**	Regular vehicle maintenance – logs kept on-site. Limit vehicle movements to what is necessary by demarcating and fencing off zones.

Table 7.6: Impact assessment of the quarry - mining including blasting

Potential impact	Activity description	P	E	D	I	S	Management measure
Soil contamination and loss of viability	The preparation of mining area will require that any soil is removed and stockpiled for rehabilitation on closure. If this stripping does not take place, or is done incorrectly such as allowing mixing of the soils, it could lead to contamination and therefore loss of soil viability.	1	1	5	1	9	A log and plan of soil stripping and placement must be kept up to date. This must take account that: • Structural integrity is maintained if stripping occurs during winter • Topsoil is considered be to a depth of 300 mm • Topsoil, subsoil and overburden must be stockpiled separately
	Spillage of oils, grease, diesel, etc. could lead to the contamination of soil resources and the subsequent loss thereof.	1	1	5	1	8	• A waste management plan must be put in place (see previous tables) • An incident reporting and remediation log must be kept on site. • All vehicles and equipment must be serviced regularly and the logs kept on-site.
Loss of biodiversity	Removal of vegetation (habitat) for the preparation of the mining / quarry area and the establishment of alien invasive species on exposed surfaces.	3	1	6	1	11	Ensure area of disturbance is as small as possible. Should alien invasive species occur then these should be sprayed with Garlon (or suitable equivalent) and monitored.
Surface water quantity and contamination	Change in natural runoff volumes as a result of topographic and infiltration changes	2	1	6	2	11	Ensure area of disturbance is as small as possible with contouring, replacement of soil and vegetation where possible during rehabilitation
	Concentrated runoff over exposed surfaces as a result of topographic and infiltration changes associated with quarrying could lead to erosion, which may result in contamination of the water resources	1	1	5	1	8	Minimising the extent of exposed surfaces with the concurrent construction of stormwater and pollution control facilities during operations. Quarterly monitoring of the river upstream and downstream of the quarry.
	Particulate and chemical matter from blasting could contaminate the surface water	1	1	5	1	8	
Dust generation affecting air quality	Potential sources of particulate emissions include clearing of vegetation, drilling and blasting, wind erosion of exposed surfaces, vehicle entrainment within pit surfaces, and tailpipe emissions from vehicles.	2	1	5	1	9	Fugitive dust suppression techniques to reduce emissions include: • Regular vehicle maintenance – logs kept on-site • Daily surface treatment such as wet suppression (70%) Establish a dust fallout monitoring programme with at least four dust fallout buckets around the proposed mining operations.
Noise generation	Noise will be generated from drilling and blasting as well as by the movement of heavy earth moving machinery during operations. In addition, fly-rock from blasting activities may occur.	3	2	5	1	11	• The blasting schedule (times and frequency) must be published onsite and distributed to surrounding land users. A log of any correspondence must be kept on-site. • A suitably competent person must be assigned as responsible party to ensure that the correct design procedures are followed. The air blast and vibration must be monitored (logged) and controlled to ensure that health and safety of employees and people around the area are not affected (Regulations under the Mines Health and Safety Act). • Houses within 500 m of the quarry should be evacuated dusting blasting periods. • Regular vehicle maintenance – logs kept on-site. • Limit vehicle movements to what is necessary by demarcating and fencing off zones.

Table 7.7: Impact assessment of the crusher and block-making, including the product stockpile							
Potential impact	**Activity description**	**P**	**E**	**D**	**I**	**S**	**Management measure**
Soil contamination and loss of viability	Spillage of oils, grease, diesel, etc. could lead to the contamination of soil resources and the subsequent loss thereof.	2	1	5	1	**9**	A waste management plan must be put in place that takes account of the following: • Oils, grease, diesel and other chemicals will be stored in the prescribed manned and within bunded areas. • The prescribed procedure for minor spillage and rehabilitation. • The prescribed procedure and contact for major spillage. An incident reporting and remediation log must be kept on site. All vehicles and equipment must be serviced regularly and the logs kept on-site.
Surface water quantity and contamination	Concentrated runoff over exposed surfaces could lead to erosion, which may result in contamination of the water resources	1	1	5	1	**8**	• Minimising the extent of exposed surfaces with the concurrent construction of stormwater and pollution control facilities during operations. • Quarterly monitoring of the river upstream and downstream of the quarry site.
Dust generation affecting air quality	Potential sources of particulate emissions include wind erosion of exposed surfaces, materials handling and tailpipe emissions from vehicles.	2	2	5	1	**10**	Fugitive dust suppression techniques to reduce emissions include: • Regular vehicle maintenance – logs kept on-site • Daily dust suppression using sprayers within the crusher plant and surface treatment of exposed surfaces using wet suppression (70%) Establish a dust fallout monitoring programme with at least four dust fallout buckets around the proposed mining operations.
Noise generation	Noise will be generated from the movement of heavy vehicles and the crusher operations.	3	2	5	1	**11**	• Regular maintenance of the plant with the installation of mufflers where necessary. Supply employees with appropriate PPE. • Regular vehicle maintenance – logs kept on-site. • Limit vehicle movements to what is necessary by demarcating and fencing off zones.

Table 7.8: Impact assessment of the stormwater and pollution control measures (trenches, berms and pollution control dam)							
Potential impact	**Activity description**	**P**	**E**	**D**	**I**	**S**	**Management measure**
Soil contamination and loss of viability	The construction of the trenches, berms and pollution control dam will require that the topsoil is removed and either stockpiled for rehabilitation on closure or used to top-dress the berms. If this stripping does not take place, or is done incorrectly such as allowing mixing of the soils, it could lead to contamination and therefore loss of soil viability.	1	1	1	2	**6**	A log and plan of soil stripping and placement must be kept up to date. This must take account that: • Structural integrity is maintained if stripping occurs during winter • Topsoil is considered be to a depth of 300 mm • Topsoil and subsoil must be stockpiled separately
	Mixing of topsoil and subsoil during construction of the berms	1	1	1	2	**5**	Mine manager must be present during construction and must sign off the process followed. Soil to a depth of 300 mm is considered topsoil and a log of the excavation and construction must be kept.
	Spillage of oils, grease, diesel, etc. could lead to the contamination of soil resources and the subsequent loss of soil viability.	0	1	1	2	**4**	A waste management plan must be put in place (see previous tables) An incident reporting and remediation log must be kept on site. All vehicles and equipment must be serviced regularly and the logs kept on-site.
Surface and groundwater contamination	Surface run-off will be altered through the creation of various clean water diversion berms, dirty water cut-off trenches and the pollution control dam, which will be established as part of the water management system around the mining area. Incorrect construction or ineffective maintenance could lead to pollution from the mixing of dirty and clean water.	3	1	5	1	**10**	• Engineer must be present during construction to ensure compliance with the design with a signed-off log of the phases of construction • Slope stability, aided by self succession of vegetation without being obstructive • Maintenance of the stormwater / pollution control structures with logged daily checks by the designated responsible party. • Pollution control dam to be cleaned out prior to backfilling to remove any potential chemicals collected from blasting activities
	Spillage of oils, grease, diesel, etc. could lead to the contamination of the water resources.	0	1	1	2	**4**	A waste management plan must be put in place (see previous tables) An incident reporting and remediation log must be kept on site. All vehicles and equipment must be serviced regularly and the logs kept on-site.
Dust generation affecting air quality	Potential sources of particulate emissions include wind erosion of exposed surfaces, materials handling, and tailpipe emissions from vehicles.	2	2	5	1	**10**	Fugitive dust suppression techniques to reduce emissions include: • Limit exposed surfaces • Surface treatment such as wet suppression (70%) • Natural succession of vegetation or seeding on berms
Noise generation	Noise will be generated by the movement of heavy earth moving machinery.	3	1	1	0	**5**	Regular vehicle maintenance – logs kept on-site. Limit vehicle movements to what is necessary by demarcating and fencing off zones.

8. ENVIRONMENTAL MANAGEMENT PLAN (IMPACT MITIGATION)

An environmental management plan (EMP) is aimed at providing management measures to reduce or mitigate the environmental impacts highlighted in the EIA section of the EMPR (Section 7). This section of the EMPR is designed as a practical stand alone section that can be implemented by mine management. Management strategies are based on the BATNEEC principle (Best Available Technology Not Exceeding Excessive Cost). Wherever possible, management strategies will be incorporated into the mine systems to avoid, or appropriately manage, impacts from the outset.

Once approval of the EMPR has been obtained from the DMR, in terms of the MPRDA, the EMP becomes legally binding on the applicant. Mines are expected to continually update their EMPRs and these updates need to be added in the form of amendments to the EMPR. Monitoring of the EMP is undertaken on an ongoing basis and performance assessments (audits) are undertaken every two years to determine the continued appropriateness and adequacy for the EMP. Reports on the findings of the audits must be submitted to the DMR, other government departments involved in the approval of the EMP and other I&APs on written request.

8.1 Objective and goals

The overall objectives are to minimise operational impacts and rehabilitate the areas disturbed by infrastructure as close as possible to pre-mining conditions, ensure that the site is made safe, blend the quarried area into the natural environment as far as possible, and to control erosion and pollution emanating from the proposed mining activities (Table 8.1). However, owing to the nature of quarrying and the limited soil cover, pre-mining land use will not be attainable on closure with rehabilitation to wilderness status.

8.2 Management measures

This section provides the mitigation and management measures of the impacts highlighted in the EIA during construction, operation, decommissioning and closure phases of the proposed mining operation. The management measures, including frequency and financial quantum, have been dealt with per mining activity and are provided in Tables 8.2 to 8.8 as follows:

- Table 8.2: Access and on-site haul roads
- Table 8.3: Stockpile area – topsoil and subsoil
- Table 8.4: Site office complex – office complex with maintenance, security and diesel store

- Table 8.5: Quarry – mining, including blasting
- Table 8.6: Crusher & block-making, including product stockpile
- Table 8.7: Stormwater and pollution control measures (trenches, berms, and pollution control dam)

Table 8.1: Environmental objectives related to aspect

Aspect	Objectives
Topography	• To mitigate topographic impacts created during the operational phase as far as possible through correct benching and factors of safety
Geology	• To limit the impact on the mining area by limiting the size of the area disturbed by mining and ensuring proper stockpiling of soils for use during rehabilitation
Soils	• To mitigate long-term soil contamination impacts • To maintain the viability of the soils for future rehabilitation purposes • To ameliorate altered physical and chemical properties of soils caused by stripping, handling and stockpiling • To install and maintain long-term erosion control structures using natural vegetation and stand-alone methods • To ensure proper and effective dust monitoring measures are put in place • To prevent the possible contamination of soils along the roads, and around the mining operational area
Land capability & use	• To reduce the area that is to be disturbed, and contain the impacts on the natural habitat caused by the mechanised equipment
Biodiversity	• To reduce the impact on the natural biodiversity in the area by limiting mining activities to the designated areas • To control weed/alien plant invasion • Encourage self vegetation to control erosion • To ensure proper rehabilitation and natural succession occurs so that the natural habitats can be restored in certain areas
Hydrology	• To ensure the most effective water management of the mining site
Noise	• To ensure blasting events are guided by the Mines Health and Safety Act • To ensure that the blasting events are controlled and monitored • To reduce the impact of mining noise on the overall environment, and within the proposed mining area in particular
Visual	• To limit the visual impact of the mining activities to the road-users and local residence of the area
Socio-economic	• To limit the socio-economic impacts as a result of cessation of the mining activities
Maintenance	• To monitor and manage post-closure impacts until closure is obtained
Infrastructure	• To ensure that the components are properly disposed of
Waste	• To collect and dispose of all waste at a permitted disposal site

Table 8.2: Management measures for the access and on-site haul roads

Potential impact	Activity description	S	Management measure	Frequency	Annual management cost	Final rehabilitation cost
Soil contamination and loss of viability	Spillage of oils, grease, diesel, etc. could lead to the contamination of soil resources and the subsequent loss of soil viability.	**7**	A waste management plan must be put in place that takes account of the following: • Oils, grease, diesel and other chemicals will be stored in the prescribed manned and within bounded areas. • The prescribed procedure for minor spillage and rehabilitation. • The prescribed procedure and contact for major spillage. An incident reporting and remediation log must be kept on site. All vehicles and equipment must be serviced regularly and the logs kept on-site.	Daily site check and updating of incident reporting log plan updates	R50,000	NA
Surface water contamination	During operation, the increase in the exposed area combined with wet suppression for dust control increases the potential for soil erosion and subsequent water resource contamination.	**8**	Surface water runoff within the operational area must be contained by the trenches and pollution dam – daily checks by the designated responsible party must be logged.	Daily site check and updating of incident reporting	R60,000	NA
Dust generation affecting air quality	Potential sources of particulate emissions include wind erosion of exposed surfaces, vehicle entrainment on the roads, and tailpipe emissions from haul vehicles.	**10**	Fugitive dust suppression techniques to reduce emissions include: • Vehicle speed restrictions - signage and enforcement; • Regular vehicle maintenance – logs kept on-site • Daily surface treatment such as wet suppression (70%) Establish a dust fallout monitoring programme with at least four dust fallout buckets around the proposed mining operations.	Daily wet suppression throughout operation and closure	R 50,000	NA
Noise generation	Noise will be generated by the movement of heavy earth moving machinery.	**10**	Regular vehicle maintenance – logs kept on-site. Limit vehicle movements to what is necessary by demarcating and fencing off zones.	Ad hoc spot checks by responsible party	NA	NA

Table 8.3: Management measures for the stockpile area – topsoil and subsoil						
Potential impact	**Activity description**	**S**	**Management measure**	**Frequency**	**Annual management cost**	**Final rehabilitation cost**
Soil contamination and loss of viability	The construction of the stockpile area will require that the topsoil is removed and stockpiled for rehabilitation on closure. If this stripping does not take place, or is done incorrectly such as allowing mixing of the soils, it could lead to contamination and therefore loss of soil viability.	5	A log and plan of soil stripping and placement must be kept up to date. This must take account that: • Structural integrity is maintained if stripping occurs during winter • Topsoil is considered be to a depth of 300 mm • Topsoil and subsoil must be stockpiled separately	Daily log with monthly plan updates throughout construction	R10,000	R20,000
	The placement and separation of the topsoil and subsoil within the stockpile area. If separation of the material types does not take place, or is done incorrectly such as allowing mixing of the soils, it could lead to contamination and therefore loss of soil viability.	9	A log and plan of soil placement must be kept up to date. This must take account that: • Topsoil is considered be to a depth of 300 mm • Topsoil and subsoil must be stockpiled separately • Stockpiles must not exceed a height of 1.5m	Daily log with monthly plan updates throughout construction	No additional cost	NA
	Spillage of oils, grease, diesel, etc. could lead to the contamination of soil resources and the subsequent loss of soil viability.	4	A waste management plan must be put in place that takes account of the following: • Oils, grease, diesel and other chemicals will be stored in the prescribed manned and within bounded areas. • The prescribed procedure for minor spillage and rehabilitation. • The prescribed procedure and contact for major spillage. An incident reporting and remediation log must be kept on site. All vehicles and equipment must be serviced regularly and the logs kept on-site.	Daily site check and updating of incident reporting log plan updates	No additional cost	NA
Loss of biodiversity	Removal of vegetation (habitat) for construction of the stockpile areas and the establishment of alien invasive species on disturbed surfaces	4	Ensure area of disturbance is as small as possible. Should alien invasive species occur then these should be sprayed with Garlon (or suitable equivalent) and monitored.	Six monthly internal status monitoring	R10,000	R20,000
Dust generation affecting air quality	Potential sources of particulate emissions include clearing of vegetation, levelling area, materials handling operations, wind erosion exposed surfaces, vehicle entrainment on site, and tailpipe emissions from vehicles.	7	Fugitive dust suppression techniques to reduce emissions include: • Reduce exposed surfaces through covering or vegetation • Regular vehicle maintenance – logs kept on-site • Daily surface treatment such as wet suppression (70%) • Self vegetation of long-term stockpiles and if this has not happened after the first wet season then seeding may be required.	Daily wet suppression throughout construction, operation and closure	No additional cost	NA
Noise generation	Noise will be generated by the movement of heavy earth moving machinery.	6	Regular vehicle maintenance – logs kept on-site. Limit vehicle movements to what is necessary by demarcating and fencing off zones.	Ad hoc spot checks by responsible party	NA	NA

Table 8.4: Management measures for the site office complex – office complex with maintenance, security and diesel store						
Potential impact	**Activity description**	**S**	**Management measure**	**Frequency**	**Annual management cost**	**Final rehabilitation cost**
Soil contamination and loss of viability	Spillage of oils, grease, diesel, etc. could lead to the contamination of soil resources and the subsequent loss of soil viability.	9	A waste management plan must be put in place that takes account of the following: • Oils, grease, diesel and other chemicals will be stored in the prescribed manned and within bounded areas. • The prescribed procedure for minor spillage and rehabilitation. • The prescribed procedure and contact for major spillage. An incident reporting and remediation log must be kept on site. All vehicles and equipment must be serviced regularly and the logs kept on-site.	Daily site check and updating of incident reporting log plan updates	No additional cost	NA
	Temporary storage of domestic or industrial waste and diesel (possible spillage / incorrect storage)	8	A waste management plan must be put in place that takes account of the following: • Oils, grease, diesel and other chemicals will be stored in the prescribed manned and within bunded areas (maintenance area). • Domestic waste collection in marked bins in a designated area (maintenance / office area). • Collection of waste by a recognised contractor for disposal at a registered facility off-site	Daily site check	No additional cost	NA
	Concentrated runoff as a result of the demolition activities during closure could lead to erosion, which will reduce the fertility of the soils and the subsequent establishment of flora.	4	All clean and dirty water infrastructures will be maintained up until completion of demolition and rehabilitation activities.	NA	NA	R25,000
Surface water contamination	Temporary storage of domestic and industrial waste and diesel (possible spillage / incorrect storage)	7	A waste management plan must be put in place that takes account of the following: • Oils, grease, diesel and other chemicals will be stored in the prescribed manned and within bounded areas (maintenance area). • Domestic waste collection in marked bins in a designated area (maintenance / office area). • Collection of waste by a recognised contractor for disposal at a registered facility off-site	Daily site check and updating of incident reporting log plan updates	No additional cost	NA
	Concentrated runoff as a result of the demolition activities during closure could lead to erosion, which may result in contamination of the water resources.	4	All clean and dirty water infrastructures will be maintained up until completion of demolition and rehabilitation activities.	NA	NA	No additional cost
Dust generation affecting air quality	Potential sources of particulate emissions include wind erosion exposed surfaces, vehicle entrainment on the site, and tailpipe emissions from vehicles.	7	Fugitive dust suppression techniques to reduce emissions include: • Reduce exposed surfaces through covering or vegetation • Regular vehicle maintenance – logs kept on-site • Daily surface treatment such as wet suppression (70%)	Daily wet suppression throughout operation and closure	No additional cost	NA
Noise generation	Noise will be generated by the movement of vehicles.	6	Regular vehicle maintenance – logs kept on-site. Limit vehicle movements to what is necessary by fencing off zones.	Ad hoc spot checks	NA	NA

Table 8.5: Management measures for the quarry - mining including blasting

Potential impact	Activity description	S	Management measure	Frequency	Annual management cost	Final rehabilitation cost
Soil contamination and loss of viability	The preparation of mining area will require that any soil is removed and stockpiled for rehabilitation on closure. If this stripping does not take place, or is done incorrectly such as allowing mixing of the soils, it could lead to contamination and therefore loss of soil viability.	9	A log and plan of soil stripping and placement must be kept up to date. This must take account that: • Structural integrity is maintained if stripping occurs during winter • Topsoil is considered be to a depth of 300 mm • Topsoil, subsoil and overburden must be stockpiled separately	Daily log with monthly plan updates throughout operation	No additional cost	No additional cost
	Spillage of oils, grease, diesel, etc. could lead to the contamination of soil resources and the subsequent loss thereof.	8	• A waste management plan must be put in place (see previous tables) • An incident reporting and remediation log must be kept on site. • All vehicles and equipment must be serviced regularly and the logs kept on-site.	Daily site check and updating of incident reporting log plan updates	No additional cost	NA
Loss of biodiversity	Removal of vegetation (habitat) for the preparation of the mining / quarry area and the establishment of alien invasive species on exposed surfaces.	11	Ensure area of disturbance is as small as possible. Should alien invasive species occur then these should be sprayed with Garlon (or suitable equivalent) and monitored.	Six monthly internal status monitoring	No additional cost	NA
Surface water quantity and contamination	Change in natural runoff volumes as a result of topographic and infiltration changes	8	• Minimising the extent of exposed surfaces with the concurrent construction of stormwater and pollution control facilities during operations. • Quarterly monitoring of the river upstream and downstream of the quarry.	Quarterly	R10,000	NA
	Concentrated runoff over exposed surfaces as a result of topographic and infiltration changes associated with quarrying could lead to erosion, which may result in contamination of the water resources	8				
Dust generation affecting air quality	Potential sources of particulate emissions include clearing of vegetation, drilling and blasting, wind erosion of exposed surfaces, vehicle entrainment within pit surfaces, and tailpipe emissions from vehicles.	9	Fugitive dust suppression techniques to reduce emissions include: • Regular vehicle maintenance – logs kept on-site • Daily surface treatment such as wet suppression (70%) Establish a dust fallout monitoring programme with at least four dust fallout buckets around the proposed mining operations.	Daily wet suppression throughout operation and closure	No additional cost	NA
Noise generation	Noise will be generated from drilling and blasting as well as by the movement of heavy earth moving machinery during operations. In addition, fly-rock from blasting activities may occur.	11	• The blasting schedule (times and frequency) must be published onsite and distributed to surrounding land users. A log of any correspondence must be kept on-site. • A suitably competent person must be assigned as responsible party to ensure that the correct design procedures are followed. The air blast and vibration must be monitored (logged) and controlled to ensure that health and safety of employees and people around the area are not affected (Regulations under the Mines Health and Safety Act). • Houses within 500 m of the quarry should be evacuated dusting blasting periods. • Regular vehicle maintenance – logs kept on-site. • Limit vehicle movements to what is necessary by demarcating and fencing off zones.	As required throughout operation and closure	No additional cost	NA

Table 8.6: Management measures for the crusher and block-making, including the product stockpile

Potential impact	Activity description	S	Management measure	Frequency	Annual management cost	Final rehabilitation cost
Soil contamination and loss of viability	Spillage of oils, grease, diesel, etc. could lead to the contamination of soil resources and the subsequent loss thereof.	9	A waste management plan must be put in place that takes account of the following: • Oils, grease, diesel and other chemicals will be stored in the prescribed manned and within bunded areas. • The prescribed procedure for minor spillage and rehabilitation. • The prescribed procedure and contact for major spillage. An incident reporting and remediation log must be kept on site. All vehicles and equipment must be serviced regularly and the logs kept on-site.	Daily site check and updating of incident reporting log plan updates	No additional cost	NA
Surface water quantity and contamination	Concentrated runoff over exposed surfaces could lead to erosion, which may result in contamination of the water resources	8	• Minimising the extent of exposed surfaces with the concurrent construction of stormwater and pollution control facilities during operations. • Quarterly monitoring of the river upstream and downstream of the quarry site.	Quarterly	No additional cost	NA
Dust generation affecting air quality	Potential sources of particulate emissions include wind erosion of exposed surfaces, materials handling and tailpipe emissions from vehicles.	10	Fugitive dust suppression techniques to reduce emissions include: • Regular vehicle maintenance – logs kept on-site • Daily dust suppression using sprayers within the crusher plant and surface treatment of exposed surfaces using wet suppression (70%) Establish a dust fallout monitoring programme with at least four dust fallout buckets around the proposed mining operations.	Daily wet suppression	No additional cost	NA
Noise generation	Noise will be generated from the movement of heavy vehicles and the crusher operations.	11	• Regular maintenance of the plant with the installation of mufflers where necessary. Supply employees with appropriate PPE. • Regular vehicle maintenance – logs kept on-site. • Limit vehicle movements to what is necessary by demarcating and fencing off zones.	Ad hoc spot checks by responsible party	NA	NA

Table 8.7: Management measures for the stormwater and pollution control measures (trenches, berms and pollution control dam)						
Potential impact	**Activity description**	**S**	**Management measure**	**Frequency**	**Annual management cost**	**Final rehabilitation cost**
Soil contamination and loss of viability	The construction of the trenches, berms and pollution control dam will require that the topsoil is removed and either stockpiled for rehabilitation on closure or used to top-dress the berms. If this stripping does not take place, or is done incorrectly such as allowing mixing of the soils, it could lead to contamination and therefore loss of soil viability.	**6**	A log and plan of soil stripping and placement must be kept up to date. This must take account that: • Structural integrity is maintained if stripping occurs during winter • Topsoil is considered be to a depth of 300 mm • Topsoil and subsoil must be stockpiled separately	Daily log with monthly plan updates throughout construction	NA	NA
	Mixing of topsoil and subsoil during construction of the berms	**5**	Mine manager must be present during construction and must sign off the process followed. Soil to a depth of 300 mm is considered topsoil and a log of the excavation and construction must be kept.	Daily check during construction	NA	NA
	Spillage of oils, grease, diesel, etc. could lead to the contamination of soil resources and the subsequent loss of soil viability.	**4**	A waste management plan must be put in place (see previous tables) An incident reporting and remediation log must be kept on site. All vehicles and equipment must be serviced regularly and the logs kept on-site.	Daily site check and updating of incident reporting log plan updates	No additional cost	NA
Surface and groundwater contamination	Surface run-off will be altered through the creation of various clean water diversion berms, dirty water cut-off trenches and the pollution control dam, which will be established as part of the water management system around the mining area. Incorrect construction or ineffective maintenance could lead to pollution from the mixing of dirty and clean water.	**10**	• Engineer must be present during construction to ensure compliance with the design with a signed-off log of the phases of construction • Slope stability, aided by self succession of vegetation without being obstructive • Maintenance of the stormwater / pollution control structures with logged daily checks by the designated responsible party. • Pollution control dam to be cleaned out prior to backfilling to remove any potential chemicals collected from blasting activities	Daily site check	NA	R15,300
	Spillage of oils, grease, diesel, etc. could lead to the contamination of the water resources.	**4**	A waste management plan must be put in place (see previous tables) An incident reporting and remediation log must be kept on site. All vehicles and equipment must be serviced regularly and the logs kept on-site.	Daily site check and updating of incident reporting log plan updates	No additional cost	NA
Dust generation affecting air quality	Potential sources of particulate emissions include wind erosion of exposed surfaces, materials handling, and tailpipe emissions from vehicles.	**10**	Fugitive dust suppression techniques to reduce emissions include: • Limit exposed surfaces • Surface treatment such as wet suppression (70%) • Natural succession of vegetation or seeding on berms	Daily wet suppression	No additional cost	NA
Noise generation	Noise will be generated by the movement of heavy earth moving machinery.	**5**	Regular vehicle maintenance – logs kept on-site. Limit vehicle movements to what is necessary by demarcating and fencing off zones.	Ad hoc spot checks by responsible party	NA	NA

8.3 Environmental monitoring programme

On-going monitoring of the physical environment (surface water and air quality) will continue throughout the life of mine as per the monitoring programmes below.

8.3.1 Hydrology

Surface water quality will be monitored quarterly at localities PQSW1 and PQSW2 upstream and downstream of the site (Figure 8.1). These samples will be submitted to a laboratory for an abbreviated standard chemical analysis. An annual monitoring and trend report will be compiled.

8.3.2 Air Quality

Dust will continue to be measured and reported on throughout the life of mine at the four dust bucket localities PQD1 to PQD4 (Figure 8.1).

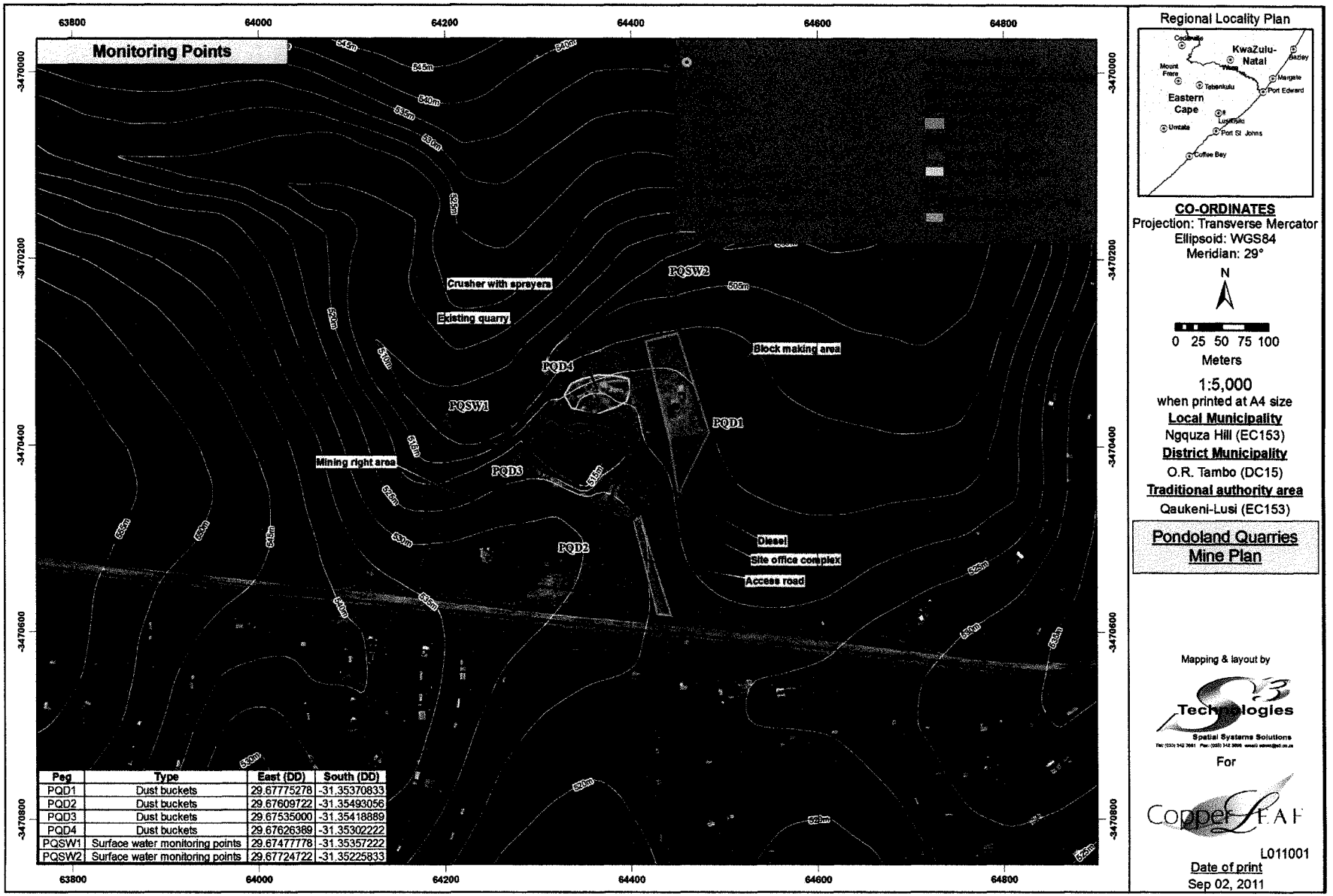
8.3.3 Performance Assessment

The MRPDA requires that the holder of a mining right undertake an assessment of performance against the requirements of its EMP and submit such report to the DMR. Performance assessments will be undertaken in accordance with Regulation 55 of the Mineral and Petroleum Resources Development Regulations and will include:

- Continuous monitoring of performance against the EMP provisions;
- Updating of all procedures (emergency, environmental awareness, rehabilitation strategies etc.) where necessary;
- Updating the financial provision (method and quantum) annually as part of the internal performance assessment audit;
- Submitting a performance assessment report to the DMR every two years; and
- Effective management all environmental information required by the various government departments such that this readily available for submission when required.

Review and monitoring of the commitments made in the EMP will continue throughout the life of mine. Mine management will conduct daily review of compliance which will be checked and reviewed on-site monthly by senior management. Any non-compliance will be noted and mitigation measures actioned, reported on and addressed. An annual on-site internal audit will be conducted. The audit report will cover all aspects investigated, and provide suggestions and recommendations, advise on any mitigation measures which need to be implemented, and any amendments to the existing programme that will improve the levels of commitment. Should more specialist inputs be required then these will be assessed and implemented as the need arises.

Figure 8.1: Pondoland Quarries monitoring points.



8.4 Environmental awareness programme

The successful implementation of the Environmental Management Programme is dependent on training and awareness of all mining personnel.

8.4.1 Induction

All full time staff and contractors are required to attend an induction session. Employees are inducted when they start at the mine and when they return from leave. Any contractor, who works on the mine for a period of 24 hours or more, is required to undergo induction. Environmental issues and aspects relating to the operation, including environmental impacts and mitigation measures, will be discussed, explained and communicated in these sessions. Induction sessions will be modified according to the skill and education level of attendees, so that a suitable understanding of environmental issues and pollution is obtained.

The basic content of the induction programme for full time employees will include the following aspects:

- Topsoil management;
- Water Control;
- Dust Control;
- Waste Management;
- Pollution Control;
- Trespassing, and
- Hygiene.

8.4.2 In-house and on the job training

In-house training sessions will be held with relevant employees to allow for participation in determining environmental issues and concerns that relating to their specific occupation. Education with regard to environmental incident reporting will be detailed at these sessions.

On the job training is an essential tool in environmental awareness as employees will be given details of the expected environmental issues and concerns specifically related to their occupation. Employees will be trained on how to respond if an environmental problem or source of environmental pollution arises. The training will be on-going, and all new employees will be provided with the same standard of training as existing employees.

8.4.3 Environmental communication strategy

Management shall establish and maintain procedures for the internal communication between the various levels and functions of the organisation, as well as receiving, documenting and responding to relevant communication from external interested and affected parties. The following communication channels and media may be used to communicate environmental issues within the project area:

- The Mine Manager communicates information to senior management on environmental issues and the information is noted;
- Daily pre-shift environmental and safety meetings.
- 'Environmental issues' should be a recurring agenda item on the weekly planning meetings;
- Establishment of an internal incident reporting structure - employees are required to report any and all environmentally related problems, incidents and pollution, so that the appropriate mitigation action can be implemented timeously.

The following communication channels and media may be used to communicate environmental issues with individuals from outside the project area:

- A site register must be kept of all concerns and comments of external parties, with associated actions referenced; and
- Establishment of an incident reporting structure.

8.5 Maintenance and emergency procedures

An effective, comprehensive, well-considered and tested environmental emergency preparedness and response plan has the potential to save lives, prevent unnecessary damage to the company and other property and to manage environmental risk in the event of a large chemical spill, oil spill, fuel spill or explosives spill. The Mineral and Petroleum Resources Regulation requires the mine to implement procedures for environmentally related emergencies and remediation.

Environmental emergencies occur over the short-term and require immediate response. A mine, as part of its management tools, should have an Emergency Response Plan that is available on-site and disseminated to all employees and contractors. The plan should contain a list of procedures, evacuation routes and emergency contact numbers. In the event of an emergency, this plan should be consulted. It is advisable that the mine tests the emergency response plan in order to identify any areas for improvement. If the emergency has the potential to affect surrounding communities, they should be alerted via alarm signals or contacted in person.

Communication is vital in an emergency, therefore communication devices such as mobile phones, two-way radio's, pagers or telephones, must be placed around the mine. A checklist of emergency response units must be consulted and the relevant units notified. The checklist includes:

- Fire department;
- Police;
- Emergency health services such as ambulances, paramedic teams, poisons centres;
- Hospitals, both local and further a field, for specialist care;
- Public health authorities;
- Environmental agencies, especially those responsible for air, water and waste issues;
- Other industrial facilities in the vicinity with emergency response facilities;
- Public works and highways departments, port and airport authorities; and
- Public information authorities and media organisations.

8.6 Rehabilitation plan and financial provision

8.6.1 Rehabilitation objective

Once mining is complete the rehabilitation objective is to return the infrastructure area as near as possible to the pre-mining state, with the quarry (owing to the nature of rock removal and minimal soil cover) to a classified wilderness status.

8.6.2 Financial provision

The financial provision for the environmental rehabilitation and closure of any mine and its associated mining operations forms an integral part of the MPRDA (Sections 41(1), 41(2), 41(3) and 45). The DMR guidelines require a 'clean closure' cost assessment, meaning that the mine infrastructure has no salvage value.

Using the DMR guidelines, with the following criteria:

- Master rates as supplied by the 2005 guideline;
- Multiplication factor related to a Class C mine (quarry) in an area of medium sensitivity (largely disturbed rural area);
- The 'quick' calculation rate of R50,000 per hectare;
- The current area of disturbance of 1.606 ha;

The quantum of the financial provision to ensure rehabilitation is **R 80,300**.

The quantum is subject to an annual review and revision. The mine is required to ensure full financial cover for the current liability at any point in the life of the mine. Pecuniary provision must be made for the shortfall between any existing fund balance and the premature closure or current environmental rehabilitation liability.

8.7 Undertaking

An undertaking of agreement to the management strategies as proposed in the EMP as well as an undertaking of approval of the EMP is provided below:

I, _____ the undersigned and duly authorised thereto by **Pondoland Quarries cc**, have studied and understand the contents of this Environmental Management Programme (EMP) and duly undertake to adhere to the conditions as set out therein, unless specifically or otherwise agreed to.

Signed at _____ on this day _____of 2011

_____

Signature of authorised representative

I, _____ the undersigned and duly authorised thereto by **Department of Mineral Resources** have studied and approved the contents of this Environmental Management Programme (EMP).

Signed at _____ on this day _____of 2011

_____

Signature of Director: Mineral Development

9. REFERENCES AND BIBLIOGRAPHY

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APPENDIX A:
LEGAL AND SITE NOTICES

LEGALS LEGALS LEGALS LEGALS LEGALS LEGALS LEGALS LEGALS LEGALS LEGALS LEGALS LEGALS

NOTICE OF SALE IN EXECUTION

In the Magistrate's Court for the District of East London held at East London (Case No. 37485/2004)

In the matter between: HELENA COURT BODY CORPORATE (Execution Creditor) and SIPHO ONDALA (Identity No. 610208 5803 084) (Execution Debtor)

In Execution of a Judgment of the Magistrate's Court, East London, in the above matter, a Sale will be held on Friday, 18 February 2011 at 10:00 am at the Sheriff's Warehouse, 31 Church Street, East London, of the undermentioned property of the Execution Debtor:

Description: Unit consisting of Sectional Title Unit no. 12 in the scheme known as SS Helena Court, Scheme No. 85/25/1985; and an undivided share in the common property apportioned thereto, situated at 79 Caxton Street, Quigney, East London, in the Local Municipality of Buffalo City.

Held by virtue of Deed of Transfer No. ST954/1997

In Extent: 79.0000 square metres

Better known as: Flat 12 Helena Court, 79 Caxton Street, Quigney, East London

The following information relating to the unit is furnished but not guaranteed in any way.

Consists of 2 Bedrooms, Kitchen, Lounge, Bathroom/Toilet.

CONDITIONS OF SALE:

1. The Sale shall be subject to the terms and conditions of the Magistrate's Courts Act and the rules made thereunder.

2. The purchaser shall pay a deposit of TEN PER CENT (10%) of the purchase price and the auctioneer's commission in cash immediately after the sale and the balance against transfer to be secured by a bank or building society guarantee, to be furnished to the Plaintiff's Attorneys within 10 (TEN) days after the date of sale, to be approved by the Plaintiff's Attorneys.

3. Transfer shall be effected by the Attorneys for the Plaintiff and the purchaser shall pay all transfer dues, including transfer duty, current and/or arrear levies/rates and/or Value Added Tax and other necessary charges to effect transfer upon request by the Sale Attorneys.

4. The full Conditions of Sale will be read out at the time of the sale and may be inspected at the Sheriff's Office, 1 Lowent Oxford Street, East London, prior to the date of sale.

Dated at East London this 14th day of January 2011.

NIEUWOUDT-DU PLESSIS ATTORNEYS
Execution Creditor's Attorneys
45 Darlington Road, Berea, East London
Ref: Mrs Du Plessis/HEL2/0030

NOTICE OF SALE IN EXECUTION

In the High Court of South Africa (East London Circuit Local Division) (Case No. EL 499/10; ECD 999/10).

In the matter between: NEDBANK LTD (Plaintiff) and LUYANDA DUKE BODI (1st Defendant), NONTUTHUZELO HAZEL BODI (2nd Defendant).

In Execution of a Judgment of the High Court of South Africa (East London Circuit Local Division) in this suit, a sale will be held by the Sheriff of the High Court, at 43 Frame Park, Phillip Frame Road, Chiselhurst, East London, on 18th February 2011 at 10:00 of the undermentioned property of the Defendants on the Conditions of Sale to be read out by the auctioneer at the time of the sale:

PROPERTY DESCRIPTION:
Erf 53848 East London, Buffalo City Local Municipality, Division of East London, Province of the Eastern Cape.
In Extent: 350 Square Metres.
Held by Deed of Transfer No. T5078/2006.
Commonly known as: 43 Fingerlin Road, Wilsonia, East London.
Whilst nothing is guaranteed, it is understood that the property is a: Vacant Plot.
TERMS:
The sale is without reserve. Deposit of 10% and Sheriff's charges of 6% on the proceeds of the sale, which shall be paid by the purchaser up to a price of R30 000,00 and thereafter 3,5% up to a maximum of R8 750,00 subject to a minimum of R440,00 plus VAT on Sheriff's charges on the date of sale, the balance against the transfer to be secured by a bank guaranteed, to be approved of by the Plaintiff's Attorneys, to be furnished to the Sheriff within 21 days from the date of the sale.
The Conditions of Sale will be read out prior to the sale and may be inspected at the offices of the Sheriff of the High Court at Unit 43, Frame Park, Phillip Frame Road, Chiselhurst, East London.
Dated at East London on this 14th day of January 2011.
BATE CHUBB & DICKSON INC.
Plaintiff's Attorneys
Suite 3, Nonvia House, 34 Western Avenue, Vincent, East London.
Ref: Mr J. Chambers/Benita/W73946

NOTICE OF SALE IN EXECUTION

In the High Court of South Africa (East London Circuit Local Division) (Case No. EL 631/10; ECD 1331/10).

In the matter between: NEDBANK LTD (Plaintiff) and ENOCK MPUMELELO ZONO (Defendant).

In Execution of a Judgment of the High Court of South Africa (East London Circuit Local Division) in this suit, a sale will be held by the Sheriff of the High Court at 43 Frame Park, Phillip Frame Road, Chiselhurst, East London, on 18th February 2011 at 10:00 of the undermentioned property of the Defendant on the Conditions of Sale to be read out by the auctioneer at the time of the sale:

PROPERTY DESCRIPTION:
Erf 26850 (a portion of Erf 16450) East London, Buffalo City Local Municipality, Division of East London, Province of the Eastern Cape.
In Extent: 307 Square Metres.
Held by Deed of Transfer No. T3240/2006.
Commonly known as: 12 Longfellow Street, Quigney, East London.
Whilst nothing is guaranteed, it is understood that the property is a conventional dwelling comprising of: 5 x Bedrooms, Kitchen, Lounge and Diningroom, Bathroom and Toilet, 4 x Rooms and bathroom and toilet, Empty swimming pool.
TERMS:
The sale is without reserve. Deposit of 10% and Sheriff's charges of 6% on the proceeds of the sale, which shall be paid by the purchaser up to a price of R30 000,00 and thereafter 3,5% up to a maximum of R8 750,00 subject to a minimum of R440,00 plus VAT on Sheriff's charges on the date of sale, the balance against the transfer to be secured by a bank guaranteed, to be approved of by the Plaintiff's Attorneys, to be furnished to the Sheriff within 21 days from the date of the sale.
The Conditions of Sale will be read out prior to the sale and may be inspected at the offices of the Sheriff of the High Court at Unit 43, Frame Park, Phillip Frame Road, Chiselhurst, East London.
Dated at East London on this 14th day of January 2011.
BATE CHUBB & DICKSON INC.
Plaintiff's Attorneys
Suite 3, Nonvia House, 34 Western Avenue, Vincent, East London.
Ref: Mr J. Chambers/Benita/W73311

NOTICE OF SALE IN EXECUTION

In the High Court of South Africa (Eastern Cape, Bhisho) (Case No. 157/10).

In the matter between: NEDBANK LTD (Plaintiff) and SIPHOKAZI NYATELA (Defendant).

In Execution of a Judgment of the High Court of South Africa (Eastern Cape Division) in this suit, a sale will be held by the Sheriff of the High Court at the Magistrate's Court, Mdantsane, on 23rd February 2011 at 10:00 of the undermentioned property of the Defendant on the Conditions of Sale to be read out by the auctioneer at the time of the sale:

PROPERTY DESCRIPTION:
Erf 2713 Mdantsane Unit 6, Buffalo City Local Municipality, Division of East London, Province of the Eastern Cape.
In Extent: 300 Square Metres.
Held by Deed of Transfer No. T2567/2007.
Commonly known as: 2713 (Unit 6) Zone 12, Mdantsane.
Whilst nothing is guaranteed, it is understood that the property is a conventional dwelling.
TERMS:
The sale is without reserve. Deposit of 10% and Sheriff's charges of 6% on the proceeds of the sale, which shall be paid by the purchaser up to a price of R30 000,00 and thereafter 3,5% up to a maximum of R8 750,00 subject to a minimum of R440,00 plus VAT on Sheriff's charges on the date of sale, the balance against the transfer to be secured by a bank guaranteed, to be approved of by the Plaintiff's Attorneys, to be furnished to the Sheriff within 21 days from the date of the sale.
The Conditions of Sale will be read out prior to the sale and may be inspected at the offices of the Sheriff of the High Court at 20 Fleming Street, Schornville, King William's Town.
Dated at East London on this 14th day of January 2011.
BATE CHUBB & DICKSON INC.
Plaintiff's Attorneys
Suite 3, Nonvia House, 34 Western Avenue, Vincent, East London.
Ref: Mr J. Chambers/Benita/W73316

O.R. TAMBO DISTRICT MUNICIPALITY
TENDER NOTICE AND INVITATION TO TENDER

Tenders are hereby invited from suitably qualified and experienced contractors with CIDB for the supply, delivery and installation of concrete precast VIP toilets structures on the following projects.

Project Number	Name and Description	CIDB grading	No. of Toilets	Local Municipality
MIS 194818	Construction of VIP toilets in Nyandeni Ward 20	5CE/GB PE or 6CE/GP or higher	1 775	Nyandeni
MIS 195782	Construction of VIP toilets in Nyandeni Ward 2	6CE/GB PE or 7CE/GP or higher	3 250	Nyandeni
MIS 193657	Construction of VIP toilets in Ingquza Hill Ward 23	6CE/GB PE or 7CE/GP or higher	5 219	Ingquza Hill
MIS 193771	Construction of VIP toilets in Ingquza Hill Ward 21 & 24	6CED/GB PE or 7CE/GP or higher	2 436	Ingquza Hill
MIS 193954	Construction of VIP toilets in Mhlontlo Ward 11	5CE/GB PE or 6CE/GP or higher	1 462	Mhlontlo
MIS 193892	Construction of VIP toilets in KSD Ward 15	6CE/GB PE or 7CE/GP or higher	3 307	KSD
MIS 193913	Construction of VIP toilets in KDS Ward 16	6CE/GB PE or 7CE/GP or higher	2 896	KSD
MIS 196474	Construction of VIP toilets in KSD Ward 19	5CE/GB PE or 6CE/GP or higher	2 183	KSD
MIS 180945 D	Construction of VIP toilets in PSJ Ward 12 D 7CE/GP or higher	6CE/GB PE or	3 132	PSJ
MIS 172582 E	Construction of VIP toilets in KSD Ward 21 E	6CE/GB PE or 7CE/GP or higher	2 753	KSD

A compulsory clarification meeting with representatives of the client will take place at 11:00 on Tuesday, 8th February 2011 at O.R. Tambo District Municipality offices, Technical Boardroom. Bid documents shall be available from Tuesday, 8th February 2011 and may be collected between 08:00 and 16:00 at O.R. Tambo Water and Sanitation Revenue Offices in Sutherland Street (next to Shell Garage and City Centre Complex) upon the payment of non-refundable deposit of R1 000,00 per document.

Completed tenders in black ink, in a sealed envelope clearly marked as **"Project Number and description"** must be placed in the tender box, Ground Floor, O.R. Tambo District Municipality Building, Nelson Mandela Drive, Myezo Park, Umthatha, Eastern Cape, not later than 12:00 on Friday, 18th February 2011 and will be opened in public.

Invalid or non-submission of the following documents will render the tender disqualified:

- An original Tax Clearance Certificates.
- Certified copies of Company documents issued by register of Companies.
- Certified copies of IDs of Members or directors.
- Proof of registration with CIDB.
- Audited Annual Financial Statements in respect of service providers that are required by law to prepare their financial statements for auditing.
- JV agreement where applicable.

Tenders may only be submitted on tender documentation issued.

No late, faxed, e-mailed or other form of tender will be accepted.

Enq: Mr S.F. Khoza, 047 501 6400 during office hours: Monday to Friday 07:30-13:00 and 13:30-16:30.

Tenders will be evaluated in terms of the Supply Chain Management policy of the O.R. Tambo District Municipality and the lowest tender will not necessarily be accepted and the right to accept the whole or part of any tender or not to consider any tender not suitably endorsed is fully reserved by the O.R. Tambo District Municipality. A 90/10 point system shall apply where 90 points is for the price and 10 points is for equity.

A.M.M. Ncube - Acting Municipal Manager
O.R. Tambo District Municipality

BUFFALO CITY MUNICIPALITY
TENDERS

CONTRACT NO.	DESCRIPTION OF CONTRACT
90	Supply and Delivery of Desktop Computers and Printers for three years
Compulsory Information session	Thursday, 17 February 2011 at 11h00
Non-attendance of the Information Session will be an automatic disqualification to any Prospective Bidders	2nd Floor Boardroom, Room 212, Munifin Building, 29 Oxford Street, East London
	RSVP: Deon Martin at 043 705 3221
Evaluation Criteria: 80/10 as per PPPFA	Price = 90 HDI = 10
HI = BEE Compliance, Z = Gender, Y = Youth, I = Locality, I = SMME, I = Disability	
All Enquiries: Mr D Martin - 043 705 3890 / deonmartin@buffalocity.gov.za	

CONTRACT NO. AND DESCRIPTION	COMPULSORY BRIEFING SESSION
BCC/CDD/085/11/40/2010 Reconstruction of 888 Storm Damaged houses	Friday, 11 February 2011 at 10h00 5th Floor Boardroom Town Planning and Engineering Building, 26 Oxford Street East London
Evaluation Criteria: 80/10	Price = 90 HDI = 10
All Enquiries: Ms. S. Magqae - 043 705 2306	

Potential bidders are urged to submit the following attachments when submitting, failing to do so could lead to disqualification

- Valid Tax Clearance Certificate
- CK Document/Registration Certificate
- Copy of Identity Documents
- Company Profile
- Municipal Debt Clearance Certificate/ Lease of Agreement

Tender documents may be obtained from the Contracts Management Department, Municipal Stores, 80 Phillip Frame Road Chiselhurst (P.O Box 626), East London on payment of **R200.00 for Contract No. 90** and payment of **R300.00 for Contract No. BCC/CDD/085/11/40/2010.**

Additional copies for contract no. 90 may be obtained on payment of R350.00 which will not be refunded.

SUBMISSION OF TENDERS:

Tenders documents must be submitted **before 12:00 on Friday, 04 March 2011.**

Tenders may be submitted by hand or by post. Faxed, e-mailed, unsigned or incomplete tenders will not be accepted.

1. By hand: ***One original copy*** sealed tenders endorsed on the envelope with the Bidder's name and address and the contract number must be deposited in the formal tender box at Municipal Stores, 80 Philip Frame Road Chiselhurst, East London or the Town Secretary's Department, Civic Centre Independence Avenue Bhisho

2. By post: To reach the Municipal Manager P.O. Box 626, East London 5200 in sufficient time for it to be placed in the Tender Box before the closing time. It must be expressly understood that the Council disclaims any responsibility for seeing that bids sent by post or delivered in other way to the Council are lodged in the tender box.

OPENING OF TENDERS:

Tenders will be opened in public at **14:00 on Friday, 04 March 2011,** at Ground Floor Boardroom, Municipal Stores, 80 Philip Frame Road Chiselhurst, East London.

Standard tender conditions will apply. Council reserves the right not to accept the only or lowest or any tender at all, or to accept the whole or part of any tender. The invitation and award of tenders is subject to the Council's Procurement Policy on tenders. The Council gives preference to previously disadvantaged contractors as set out in the procurement formula in the tender documents. Canvassing of Councillors or Municipal Officials shall disqualify a tender.

The Council reserves the right to extend the tender period by a notice in the press. **(6549)**

CONTRACT NO.	DESCRIPTION OF CONTRACT
2906	Buffalo City Tourism Business and Attractions Audit and Database Development
Evaluation Criteria: 80/10	Price = 90 HDI = 10
All Enquiries: Ms P Mbomvu - 043 705 1162	

CONTRACT NO. AND DESCRIPTION	COMPULSORY BRIEFING SESSION
BCC/DDP/B/1140/2011 Alterations and Additions to the Ginsberg Clinic	Tuesday, 08 February 2011 at 10h00 Ginsberg Clinic, Barunna Street Ginsberg King Williams Town
Evaluation Criteria: 80/10	Price = 90 HDI = 10
CIDB GRADING -	3 GB3 or 3GBPE or Higher
All Enquiries: Mr L. Jafta - 043 705 2529	

Potential bidders are urged to submit the following attachments when submitting, failing to do so could lead to disqualification

- Valid Tax Clearance Certificate
- CK Document/Registration Certificate
- Copy of Identity Documents
- Company Profile
- Municipal Debt Clearance Certificate/ Lease of Agreement
- CIDB Certificate *ramy for Contract no* BCC-2DP/B/1142/2011)

Tender documents may be obtained from the Contracts Management Department Municipal Stores, 80 Philip Frame Road Chiselhurst (P.O. Box 626) East London on payment of **R200.00 for Contract no. 2906** and payment of **R100 for Contract No. BCC/DDP/B/1142/2011**

SUBMISSION OF TENDERS:

Tenders documents for **Contract No. 2906** must be submitted **before 12:00 on Friday, 18 February 2011.**

Tenders documents for **Contract no. BCC/DDP/B/1142/2011** must be submitted **before 12:00 on Friday, 25 February 2011.**

Tenders may be submitted by hand or by post. Faxed e-mailed, unsigned or incomplete tenders will not be accepted.

1. By hand: One original copy sealed tenders endorsed on the envelope with the Bidder's name and address and the contract number must be deposited in the formal tender box at Municipal Stores, 80 Philip Frame Road Chiselhurst, East London or the Town Secretary's Department, Civic Centre, Independence Avenue, Bhisho

2. By post: To reach the Municipal Manager, P.O. Box 626, East London 5200 in sufficient time for it to be placed in the Tender Box before the closing time. It must be expressly understood that the Council disclaims any responsibility for seeing that bids sent by post or delivered in other way to the Council are lodged in the tender box

OPENING OF TENDERS:

- Tenders for **contract no. 2906** will be opened in public at 14:00 on **Friday, 18 February 2011,** at Ground Floor Boardroom, Municipal Stores, 80 Philip Frame Road, Chiselhurst, East London
- Tenders **for contract no. BCC/DDP/B/1142/2011** will be opened in public at 14:00 on **Friday, 25 February 2011,** at Ground Floor Boardroom, Municipal Stores, 80 Philip Frame Road Chiselhurst, East London

Standard tender conditions will apply. Council reserves the right not to accept the only or lowest or any tender at all, or to accept the whole or part of any tender. The invitation and award of tenders is subject to the Council's Procurement Policy on tenders. The Council gives preference to previously disadvantaged contractors as set out in the procurement formula in the tender documents. Canvassing of Councillors or Municipal Officials shall disqualify a tender.

The Council reserves the right to extend the tender period by a notice in the press. **(6548)**

UMasipala Wase Nkonkobe Municipality of Nkonkobe

OFFICE OF THE MUNICIPAL MANAGER

CALL FOR THE PUBLIC COMMENTS: ANNUAL REPORT 2009/10

Mr Khanyisile Christian Manell, the Municipal Manager, as duly instructed by the Speaker of Nkonkobe Municipality (Cllr JH Ndlebe),hereby gives notice that, in terms of section 127 (5)(a)(i)(ii) of the Municipal Finance Management Act, No 56 of 2003, the Nkonkobe Municipality is calling for public comments on the 2009/2010 Annual Report. Copies of the Annual Report are available at all administrative units of the Nkonkobe Municipality. These are: Alice, Fort Beaufort, Middledrift, Hogsback and Seymour as well as Town Libraries.

The last day for submission of comments is Friday, 25 February 2011 at 13:00, at all the above mentioned areas.

ISIMEMO SOLUVO KULURITU LONKE: INGXELO YONYAKA 2009/2010

uMnu. Khanyisile Christian Manell, Umphathiki Masipala njengoko eyalelwe nguSomlomo kaMasipala u(Ceba u-JH Ndlebe), uyazisa ngokwaGqindelo 127(5)(a)(i)(ii)omthetho wophatho nochithomali kooMasipala, Act 56 of 2003, ukuba umasipala waseNkonkobe umema ulumtu ngokubanzi ukuba luthiomle kwingxelo yonyaka ka 2009/2010. Amacwecwe alengxelo yoyaka oyafumaneka kuzo zonke ii-ofisi zaloomasipala, eziziziofisi eDikeni, eXesi, eHogsback naseMpofu kuquka nemathala eencwadi aseziidolophini.

Usuku lokugqibela lokufakwa kwezizimvo ngulweshlanu, umhla we 25 kweyoMdumbe 2011, ngentsimbi yokugala, kuzo zonke ezindawo sele zikhankanyiwe ngenentla.

KC MANELI
MUNICIPAL MANAGER

DIOCESAN SCHOOL FOR GIRLS, GRAHAMSTOWN

Tenders are hereby invited for the proposed alterations and additions to The Diocesan School for Girls in Grahamstown

(Contract Period: March to November 2011)

Interested MBA Registered Builders must please contact the Quantity Surveyors, Messrs KWMH:QS, with all their details via **Fax: 041 585 8046** or **e-mail: kwmhqsgse@mweb.co.za** to reserve Construction Bills of Quantities - non-refundable payment of R300,00 cash.

KWMH Quantity Surveyors
Contact: Mr Peter May
4 Lawrence Street,
Central, Port Elizabeth, 6001
Tel. 041 585 8374

Province of the EASTERN CAPE
ECONOMIC DEVELOPMENT AND ENVIRONMENTAL AFFAIRS

INVITATION TO INTERESTED PARTIES TO NOMINATE CANDIDATES FOR CONSIDERATION FOR APPOINTMENT ON THE EASTERN CAPE GAMBLING AND BETTING BOARD

With reference to the advert placed in the Daily Dispatch dated 17 January 2011, in the above regard.

All applications/nominees to the new ECGBB Board are required to complete an LA 2 form.

This form must be returned with any and all supporting documentation required by no later than 16:00 on Friday the 11th of February 2011.

Incomplete forms or applications without the accompanying duly completed forms will result in the applications not being considered.

LA2 forms and enquiries may be requested from:
Andiswa: 082 552 6660
Email: andiswakamba@yahoo.com

NOTICE OF SALE IN EXECUTION

In the Magistrate's Court for the District of King William's Town held at King William's Town (Case No. 2480/10).

In the matter between: EASTERN CAPE RURAL FINANCE CORPORATION "ECRFC" t.a. UMABA FINANCE (Execution Creditor) and PHANDISWA SULULU (1st Execution Debtor), TEMBISA ROBOTSHI (2nd Execution Debtor).

In pursuance of a Judgment of the above Honourable Court and a Writ of Execution dated 11th November 2010, the following property will be sold on 23rd February 2011 at the Magistrate's Offices, Mdantsane at 10:00 or as soon as the matter may be called.

Erf: Erf 4535, Mdantsane Unit 5, East London Road, Buffalo City Municipality, Province of the Eastern Cape.
Extent: Measuring 326,0000 Square Metres.
Description: Dwelling.
Held by: Bond No. B7646/2005.
CONDITIONS OF SALE

1. The sale shall be subject to the terms and conditions of the Magistrate's Court Act and the rules made thereunder.

2. The purchaser shall pay a deposit of 10% (TEN PERCENT) of the purchase price and the Auctioneers Commission in cash immediately after the sale and the balance against transfer to be secured by a Bank or Building Society Guarantee to be furnished to the Plaintiff's Attorneys within TEN (10) days after the date of the sale, to be approved by the Plaintiff's Attorneys.

3. Transfer shall be effected by the Attorneys for the Plaintiff and the purchaser shall pay all dues including transfer duty, current and/or arrears levies/rates and/or Value Added Tax and other necessary charges to effect transfer upon request by the Sale Attorneys.

4. The full conditions of sale will be read out at the time of the sale and may be inspected at the Sheriff's Office, 20 Flemming Close, Schornville, King William's Town, prior to the date of Sale.

Dated at King William's Town on this 11th day of January 2011.

SMITH TABATA INCORPORATED
Plaintiff's Attorneys
126 Alexandra Road, King William's Town, 5600
14U002013BN

Pondoland Quarries cc

This business has submitted an application for a Mining Right Application to quarry within Ward 21 of Ngquza Hill Local Municipality, approximately 10km west of Lusikisiki off the R61.

A copy of the Environmental Scoping Report is available on site at the Municipal offices, Lusikisiki.

Any interested and/or affected parties may submit their names, contact details and interest in the matter to P.O. Box 1236, Ourban 3600, fax to (031) 7017440 or on site at the quarry by no later than 14th March 2011.

BUFFALO CITY MUNICIPALITY

LAND USE PLANNING ORDINANCE NO. 15 OF 1985, REMOVAL OF RESTRICTIONS, ACT 84 OF 1967

It is hereby notified in terms of the abovementioned Ordinance/Act that the under mentioned applicationsa has been received and is open for inspection at Room 4145, 4th Floor, Department of Housing and Local Government and Traditional Affairs, Eastern Cape Regional Office, Tyamzashe Building, Civic Square, Bisho and at the Town Planning Enquiry Counter First Floor, City Engineering Centre, 26 Oxford Street, East London on weekdays from 08:00 to 13:00.

Any objections, with full reasons therefore, must be lodged in writing with the Municipal Manager P.O Box 134, East London not later than **7 March 2011,** quoting the above Act and the objector's erf number.

Nature of Application

Removal of title conditions C (d) (f) and (g) applicable to Erf 10442, East London in order to extend the buildings on the property.

Applicants

S.P. Mulligan Family Trust **(6548)**

C M K

Site notice content:

PONDOLAND QUARRIES CC

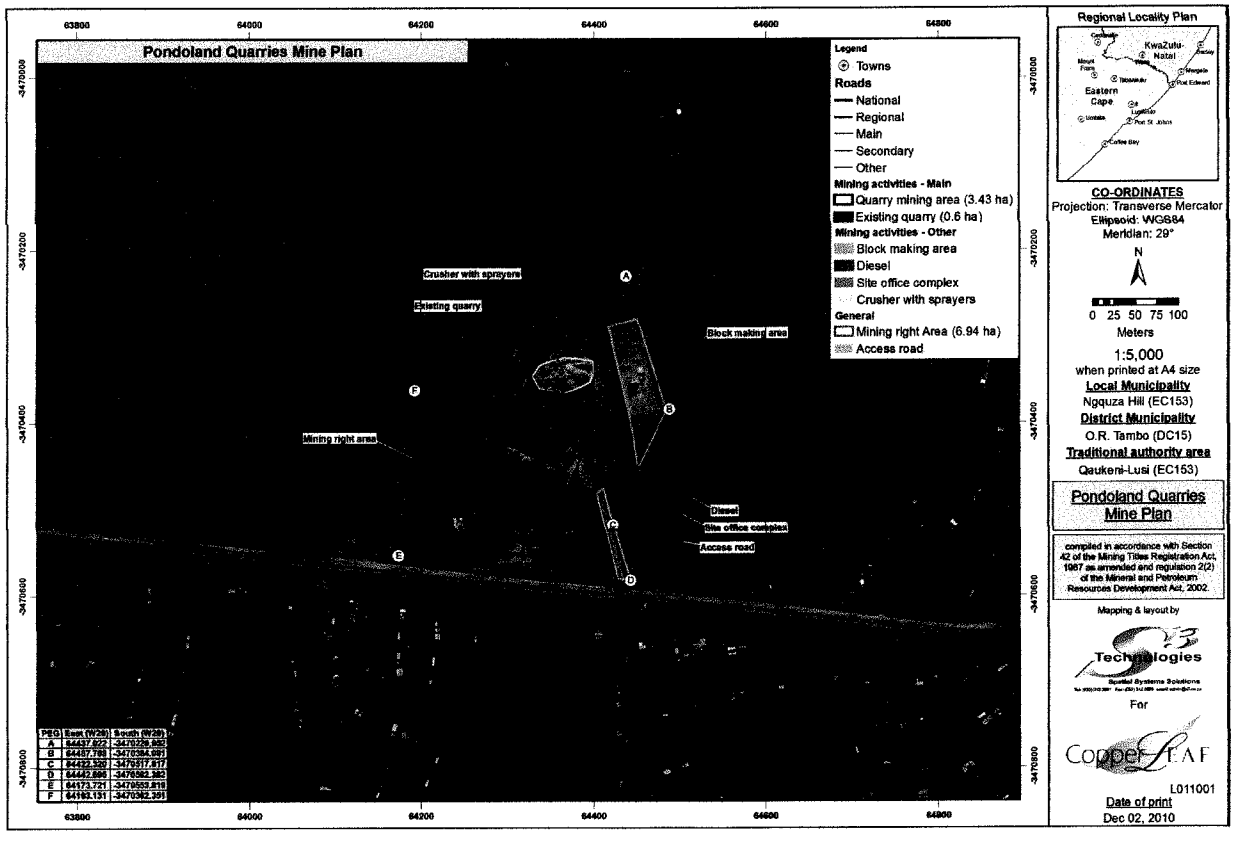
MINING RIGHT APPLICATION ON PART OF THE NKUNZIMBINI COMMUNITY AREA OF THE QAUKENI-LUSI TRADITIONAL AUTHORITY NEAR LUSIKISIKI

Pondoland Quarries cc has submitted a Mining Right Application (MRA) to quarry aggregate on the above mentioned area within Ward 21 of the Ngquza Hill Local Municipality of the OR Tambo District Municipality, Eastern Cape Province. The proposed mining area covers approximately 7 ha and is located approximately 10 km west Lusikisiki off the R61, within an area that has previously been quarried.

As part of the approval process for the MRA, a Scoping Report and Environmental Management Programme Report (EMPR) compiled in terms of the Mineral and Petroleum Resources Development Act, 2002 are to be submitted to the Department of Mineral Resources. Listed activities in terms of the National Environmental Management Act, 1998 and a Water Use License Application for the water uses associated with the proposed quarrying will also be addressed.

As part of the approval process an environmental assessment of the area is required. This notice serves to inform all interested and/or affected parties that the Environmental Scoping Report is available for review onsite at the quarry offices and the Lusikisiki Municipal Offices. To ensure that you are identified as an interested and/or affected party please submit your name, contact information and interest in the matter to the contact person. Should you have any queries, comments and/or concerns regarding the proposed project, please inform us either telephonically or in writing through the contact details provided. All comments on this document must be received by the 14th March 2011.

The contact details are: Pondoland Quarries, PO Box 1238 Pinetown 3600. Tel: 031 717 9770. Contact person: James Arthur. Email james@creightonproducts.co.za.



DME Reference: MP30/5/1/2/2/352MR

Proof of site notice location:

Headman letter:

Nkunzimbini A/A29
P O Box 29
Lusikisiki 4820
07-06-2000

Mhlekazi Ozithobileyo

Ndibhala le ncwadi ndicela ukuba siyifumane into ebuyithe tha apha Komfuluter entumelani sithi ilima sebenzisa abantu ematyeni akukho nto siyithethayo kuthi mna ndiyinkosi yalali.

Ukuba kukho isikhalazo siyo sithetha apha kuwe inkosi ngawe tyala?

NKUNZIMBINI A/A 29A
P.O BOX 29
LUSIKISIKI 4820
DATE: 07-06-2000
SIGN ....
HEADMAN

APPENDIX B:
FLOOD LEVEL AND FLOW ASSESSMENT REPORT

APPENDIX C:
WATER QUALITY RESULTS

APPENDIX D:
BASELINE AIR QUALITY ASSESSMENT

Laboratory analysis for the ambient and personal dust sampling is still outstanding and will be incorporated once received. Dust monitoring will be established as an on-going programme.

Report on Floodline Assessment:
Study Area: Pondoland Quarry Site
Ngquza Hill Municipality (EC153)
Eastern Cape Province

Management Summary

The findings of this investigation is that there are two significant streams that feed the flowline that passes to the North/West of the quarry site. All reasonable flowlines have had floodlines calculated. Floodline determinations are based on the calculations of the 100 (and 50) year flood event. **Along the boundary of the quarry adjacent to the river, fairly steep banks surrounding the flowlines will contain the floods and prevent widespread flooding during evaluated events. Floodlines are shown to be confined to river bed surrounds where well formed channels will, in general, contain flows even though some flood depths will be 4m at the deepest points of the river channels with an average of 2-3m.** There is no positive indication that floods up to and including the 100-year event will inundate the quarry. **If the quarry and infrastructure is constructed in the location of the present layout diagram supplied, then it is extremely unlikely to be affected by floods eminating from river flow.**

A floodline analysis is a requirement of the planning application. **However, accumulations directly into the quarry areas during normal annual rainfall events are likely to be of greater importance in the planning and running of the mine.** These are presented later in the report.

General

The study area is located 10km East of the town of Lusikisiki (see Map 1). It is entirely situated within the DWA designated quaternary catchments T60G (see Map 2). The T60# quaternaries make up the T60 tertiary catchment with the flowlines needing to be analysed all eminating from the watershed to the West of the study area. All of the rivers in the study area have sources on the watershed between T60G and T60F/H. The greatest length of river affecting the study area is just over 3km. There are no major dams or inland waters along the reaches of these flowlines, and any dams within the catchment system have no influence on the study area. As such, the possibilities of flooding are generally limited because the maximum distance traversed by the flowlines within the study area from the watershed is only 3-4km, but in most cases less. Thus accumulations will be accordingly limited.

- In the centre a coordinate: 29° 40.8' East, 31° 21.6' South
- Mean Annual Rainfall: 1200mm (approx) and MAP (Mean Annual Precipitation) 1250mm (approx)
- **Vegetation - (SANBI):** (see appendix A for explanations[1])

  Ngongoni Veld

- **Vegetation - (Acocks)**

  Ngongoni Veld

- **National Landcover in assessed close to study area: (CSIR Designated)**

  Cultivated temporary – semi commercial/subsistence dryland
  Urban / built-up land: residential

- **Landform**

  TV: High gradient valleys

- **Dominant Soils: (WRB classification)**

  PL: Gleyic Planosols
  FR: Umbrihumic Ferrasols

- **Lithology**

  SC1: Conglomerate, breccia

The utility programmes, developed by Pretoria University Department of Civil and Biosystems Engineering, and used at S3 Technologies, embeds statistics for many rainfall stations with numerous years of continuous daily recordings in the country. The most suitable stations to use for flow determinations for the entire study area are Lusikisiki (station number 0154142 with 109 years of monthly rainfall recordings) and Ntsubane (Forestry; station number 0154354 with 107 years of monthly rainfall recordings) with MAP (Mean Annual Precipitation) of 1057mm and 1504mm respectively. The locations of the rainfall stations are shown on Map 1. The programme suite also allows designed input for a location not serviced via the embedded rain station data. To assist, Pretoria University has supplied subscribers to their package with 'Design Rainfall Depths at Selected Stations in South Africa', a document that covers 2000 stations. Slopes in the study area from the watershed to the study area are generally gradual with some 40% better than 1: 20 (flat and fairly flat), 47% between 1: 20 and 1: 5 (hilly) and less than 13% worse than 1: 5 (steep). As the study area falls close (just over 3km at the furtherst place) to the watershed of the quaternary sub-catchment (T60G) no external flows need to be taken into account in the floodline determination. The rainfall stations at Lusikisiki and Ntsubane are ideally situated. Being contained close to the study area, and on a similar elevation plain the figures (taken in combination) are reasonably indicative of the expected rainfall patterns.

Designer data for the flood return period for the maximum rainfall for Lusikisiki: Latitude 31° 22', Longitude 29° 35' and Altitude of 580m is as follows:

Days on which thunder was heard	= 28 days/year
Mean annual precipitation	= 1057 mm

[1] See conservation status and targets in the appendix A. In areas of high conservation status, negotiation with statutory bodies is normally required before infrastructural developments can be approved.

Return Period (years) for the Lusikisi Station

Duration	2	5	10	20	50	100	200
1 day	83	125	159	197	255	306	364
2 days	114	169	213	261	332	394	464
3 days	128	191	239	291	368	433	506
7 days	152	222	276	336	426	504	592

figures in the table in millimeters

e.g. every 100 years a one day fall of 306mm can be expected.

Designer data for the flood return period for the maximum rainfall for Ntsubane: Latitude 31° 24', Longitude 29° 42' and Altitude of 500m is as follows:

Days on which thunder was heard = 28 days/year
Mean annual precipitation = 1504 mm

Return Period (years) for the Ntsubane Station

Duration	2	5	10	20	50	100	200
1 day	119	177	224	278	361	435	519
2 days	155	240	312	394	523	639	772
3 days	171	264	341	429	565	686	826
7 days	203	303	383	471	604	718	845

figures in the table in millimeters

e.g. every 100 years a one day fall of 435mm can be expected.

Every 100 years, the entire T60G quaternary would be expected to have a one hour duration fall with 200mm (8 inches) of rain.

Flood Determination in Upper Catchments.

As mentioned earlier, there is no influence on the study area from any upper catchment (see Map 2).

Flood Determination in the Study Area

The UPFLOOD/DETFLOOD program suite developed at the University of Pretoria was used throughout to determine the duration of the concentration and the peak flow flood volumes.

For these calculations, the 5m digital contour set from the SG (Chief Directorate for Surveys and Mapping) was used. The study area and contours needed for generating the DEM (Digital Elevation Model) were all located from this set. Aerial images (circa 2005), again from the SG, were used to assist the exercise. These images show good detail, in panchromatic (greyscale), with cultivated areas covering the bulk of the area above the quarry and dwellings to the West and South of the quarry (not of urban category with respect to the modeling routines) making up part of the infrastructure discernable. No wooded sections can be seen between the watershed and quarry. The study area was also converted into Google Earth compatible format for additional verification purposes.

For the study area the Lusikisiki and Ntsubane rainfall stations were used for determination of flows in the rivers and tributaries within the study area.

Because of the small size of the study area (i.e. from the watershed to the quarry) and the terrain in which it is located, the 100 year maximum flash flood over the area of influence (see map 1) is estimated (by the flood prediction model) to last up to one hour with falls of 150mm (6 inches). Every 100 years, the **entire T60G quaternary** would be expected to have a longer duration of fall, however falls below the quarry (on the Eastern side) have no effect on the quarry.

The 5m contour set, together with the aerial images, can be assessed to provide a reasonably accurate positioning of the significant river centerlines (Strahler > 3) and correspondingly, after analysis, the floodlines. The 5m set is adequate for purposes required in the prediction models. Accordingly, the main floodlines have been interpreted for the maximum flows predicted by the floodline model. The river surrounds normally pose the major flood hazard, but as the banks are (mostly) fairly steep, the inundation will, generally, be confined. The longer rivers beds with just over 3km runoff from the watershed, pose the greater (but not dire) threat. The floodlines of the minor streams (Strahler 3 and below) investigated within the study area will not produce a major flood even during the 100 year event. If the demarcated flood predicted areas (shown later in the report see maps 4 and 4a) of river centerlines are avoided, the quarry can be developed without fear of inundation from surface flooding due to rivers overtopping.

A (fine level) DEM (Digital Elevation Model) was derived for the study area, using the 5m contour set. Within the quaternary catchment (35,945ha) the fully contained catchment above the quarry (455ha) had to be broken up, as a finer level of determination is required for the analysis areas (map 3) in order that meaningful results could be calculated for each derived (and cumulative) part of the river configuration. The hydrological modeling component within the TNT MIPS package (MicroImages, Lincoln, Nebraska, USA) was used to establish the basins and flowlines within the study area using the DEM calculated from the 5m contours. Significant flowlines were selected. The Strahler coefficient, as returned by TNT-MIPS, exceeded or equaled four (>=4) or in some important cases three (see flowlines on map 3); for these stretches of flowline floodline calculations were predicted. The study area contains minor catchments (flowlines Strahler <=3) where flows converge (are directed) towards the higher level rivers. Seven separate (self contained, but interconnected) sub-catchments were identified within the study area, all contained some streams of Strahler coefficient greater than or equal to three (>= 3), but in general exceeding 3 (Strahler coefficient >=4) critical to be assessed for flooding potential as flows are quite significant.

Measurements needed for input to the floodline modeling were computed. These included max/min elevation within each sub-catchment (on the 10-85[2] basis as required by the model), length of significant flowlines (to and including Strahler >=4 flowlines) and various longest distances along flowlines and areas from the watershed to the position on the minor catchment being analysed (known as the crossection).

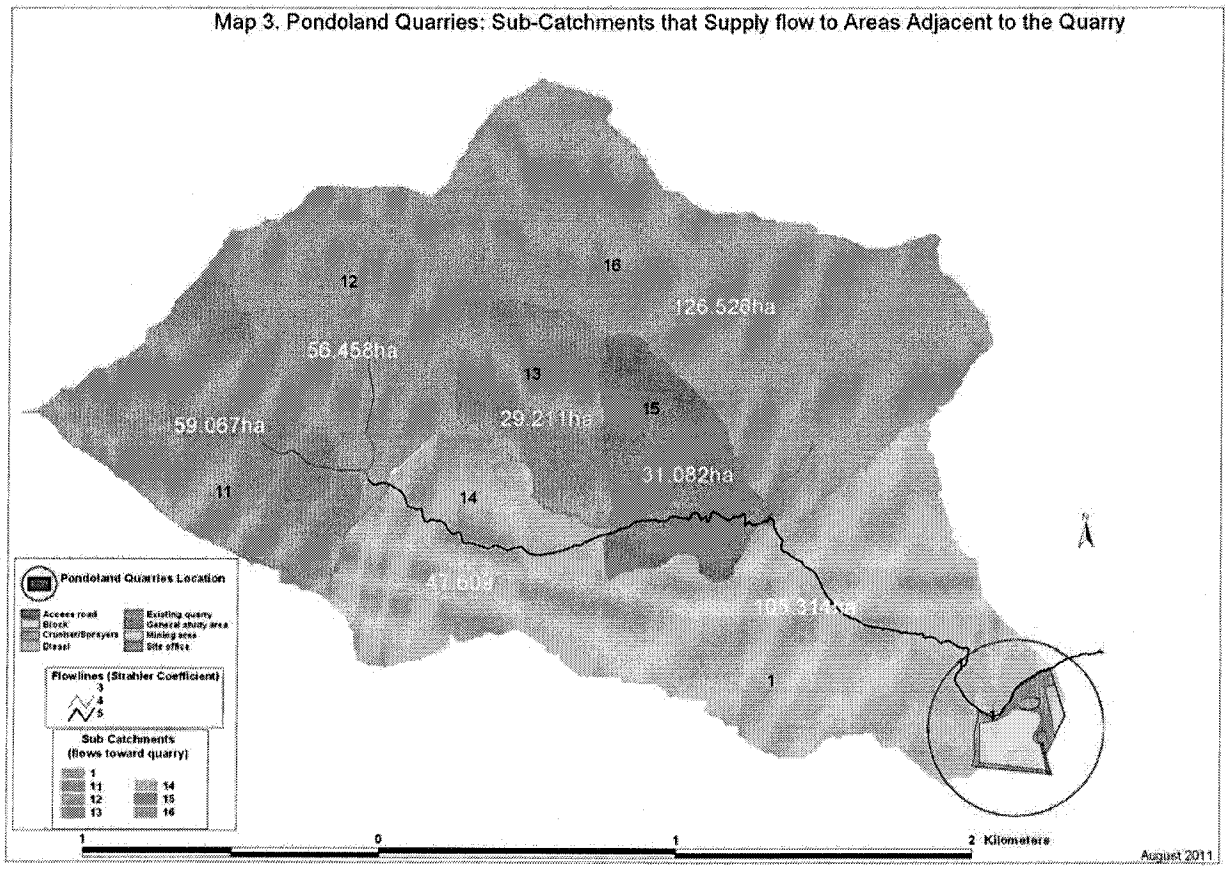
Flow Prediction Methods: Rational and Alternative Rational[3]

It is important to compute results with both methods as the true 100-year flood extent volume and peak rate is likely to be somewhere between the lesser and greater predictions. However, because of the 100 year event being in an area of significant thunderstorm activity, for safety, the flow from the 'Alternative Rational' method was used as this tends to be higher than the 'Rational Method' at such locations.

---

[2] The flow prediction model requires the drop in elevation from the commencement of the flowline up to the crossection. However, the height measurements need to be taken at 10% and 85% of the distance from source to measurement point (hence 10-85). The difference between these two elevations is the value fed into the model for flow determination.

[3] Please see the Appendix B for a fuller description of the differences in the methods.

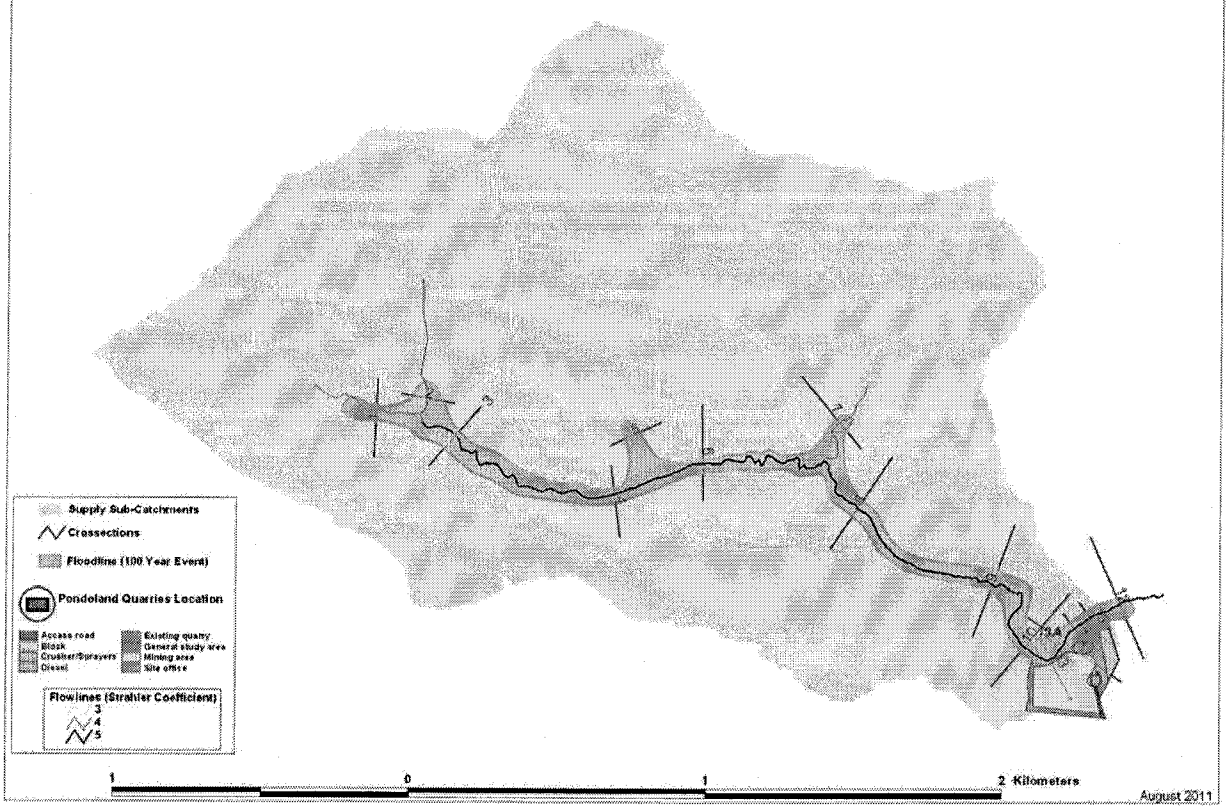


The Alternative Rational Method concentrates on areas (parts of the country) where thunder storms are prevalent and where maximum daily rainfall is likely to occur in a very short period (less than 6 hours, even possibly less than 1 hour) making flood volumes and rates of flow greater because of the flash flood phenomenon. The Rational Method measures the same inundation spread over daily (24 hour) periods.

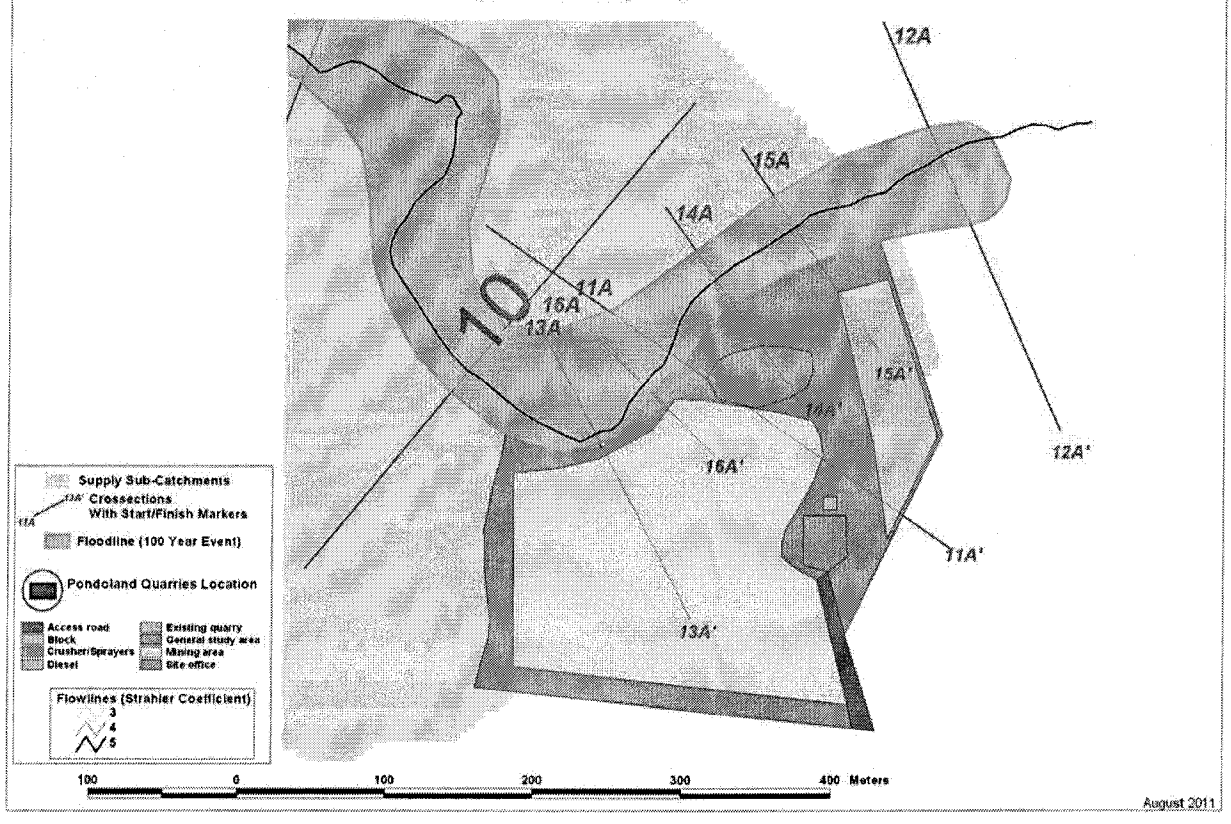
Cross-Sections (see Table 1 for full technical specifications) were inserted at points across the flowlines of the sub-catchments (see map 4 and Map 4a) over the whole study area so that the flows, at intersection points with flowlines, could be apportioned over river profiles. The reason for using crossections of this design was to be able to examine the extent to which the flood levels of the streams might inundate sub-catchments within the study area. Significant crossections at river frontage adjacent to the quarry site are depicted later in the report (an enhanced view of crosssection locations is shown in Map 4a).

ID	AREA above crossection	River Length to crossection	Height 10%	Height 85%	Height Diff	Lusikisiki 50 Year Flood	Lusikisiki 100 Year Flood	Ntsubane 50 Year Flood	Ntsubane 100 Year Flood	Floodwidth Lusikisiki 100 Year	Flooddepth Lusikisiki 100 Year	Floodwidth Ntsubane 100 Year	Flooddepth Ntsubane 100 Year
	km²	km	m	m	m	m	m³	m³	m³	m	m	m	m
1	0.59	0.64	586	570	16	20.51	24.87	26.97	32.71	42.42	0.64	52.42	0.83
2	0.56	0.68	589	572	17	18.11	21.97	23.82	28.90	52.11	0.51	54.59	0.60
3	1.15	0.90	585	568	17	32.02	38.84	42.12	51.08	49.89	0.97	54.88	1.16
4	1.63	1.59	585	556	29	35.71	43.32	46.97	56.97	42.34	1.57	47.32	1.92
5	0.29	0.41	570	548	22	13.09	15.88	17.22	20.88	37.43	0.70	47.41	1.10
6	1.92	1.91	585	550	35	40.26	48.84	52.96	64.23	34.99	2.03	37.48	2.23
7	1.27	1.80	586	544	42	30.88	37.45	40.61	49.26	47.26	0.87	49.75	1.10
8	3.50	2.69	581	534	47	61.89	75.07	81.40	98.73	57.19	1.54	62.16	1.97
9	4.33	3.28	580	523	57	71.99	87.31	94.68	114.84	54.96	2.16	62.45	2.63
10	4.44	3.61	579	520	59	68.92	83.59	90.64	109.94	54.76	2.01	57.24	2.23
11	4.55	3.79	579	517	62	68.79	83.43	90.47	109.73	56.77	2.10	61.71	2.56
12	4.55	4.02	579	515	64	66.10	80.17	86.93	105.44	62.29	2.14	69.77	2.49
13	4.55	3.85	0	0	63	67.00	82.00	88.00	107.00	72.33	1.34	77.32	1.89
14	4.55	3.90	0	0	63	67.00	82.00	88.00	107.00	37.37	3.57	42.35	4.11
15	4.55	3.95	0	0	63	67.00	82.00	88.00	107.00	47.43	2.08	52.43	2.62
16	4.55	3.95	0	0	63	67.00	82.00	88.00	107.00	62.40	1.49	67.39	1.91
													Table 1

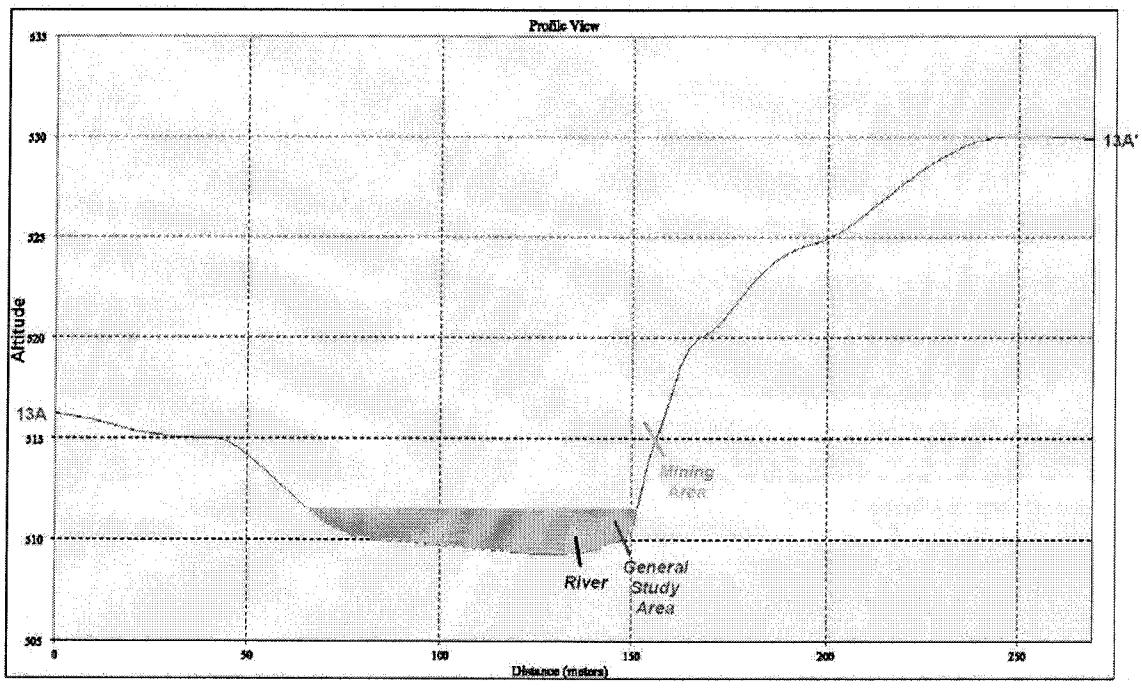
Map 4. Pondoland Quarries: Floodlines Determined for the 100 Year Event

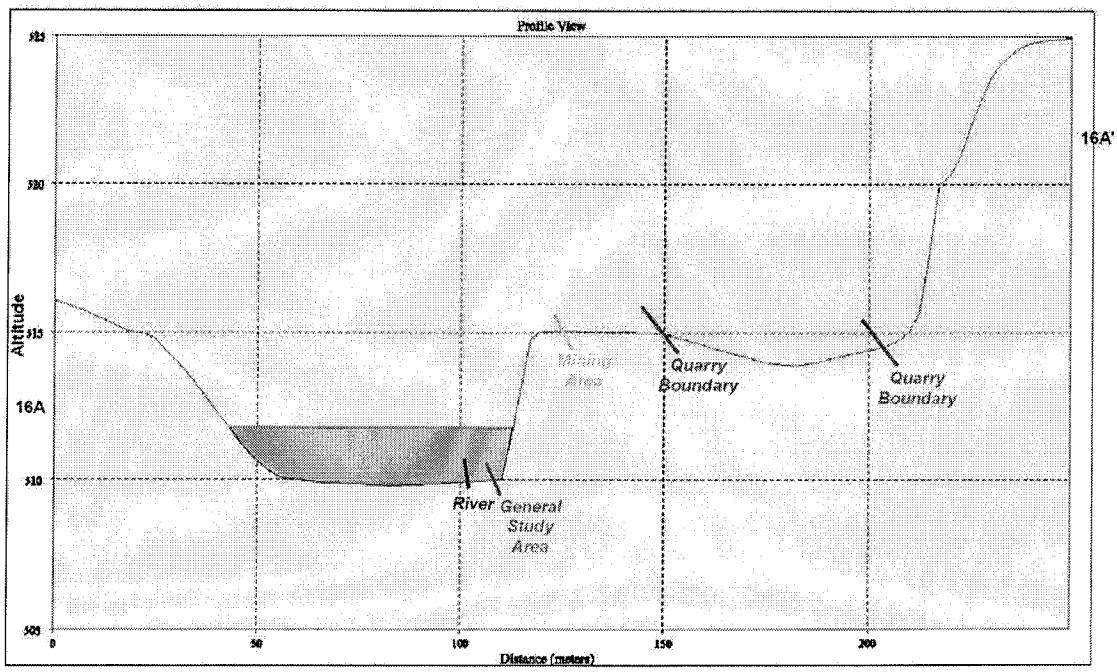


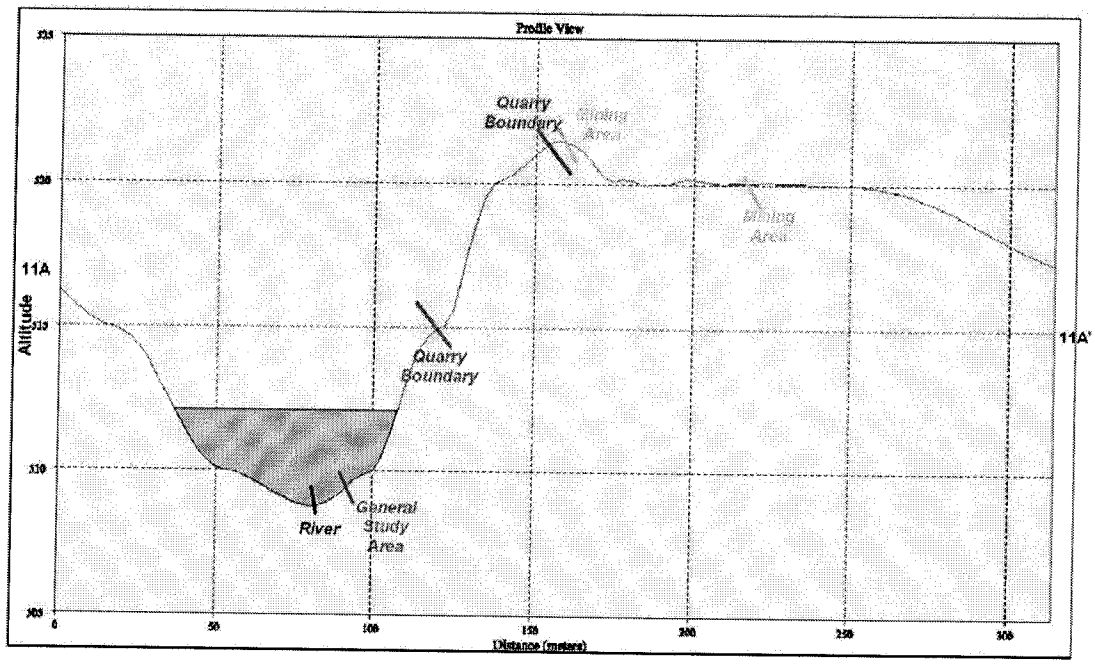
Map 4a. Pondoland Quarries: Floodlines Determined for the 100 Year Event
(Zoom at Quarry Site)

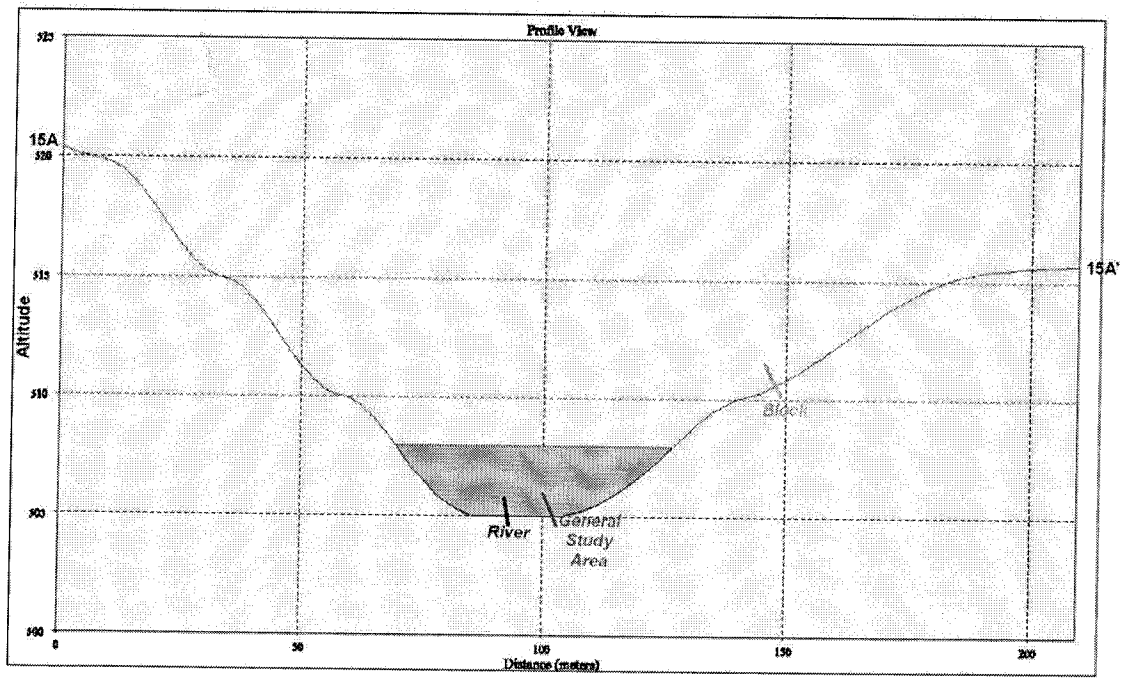


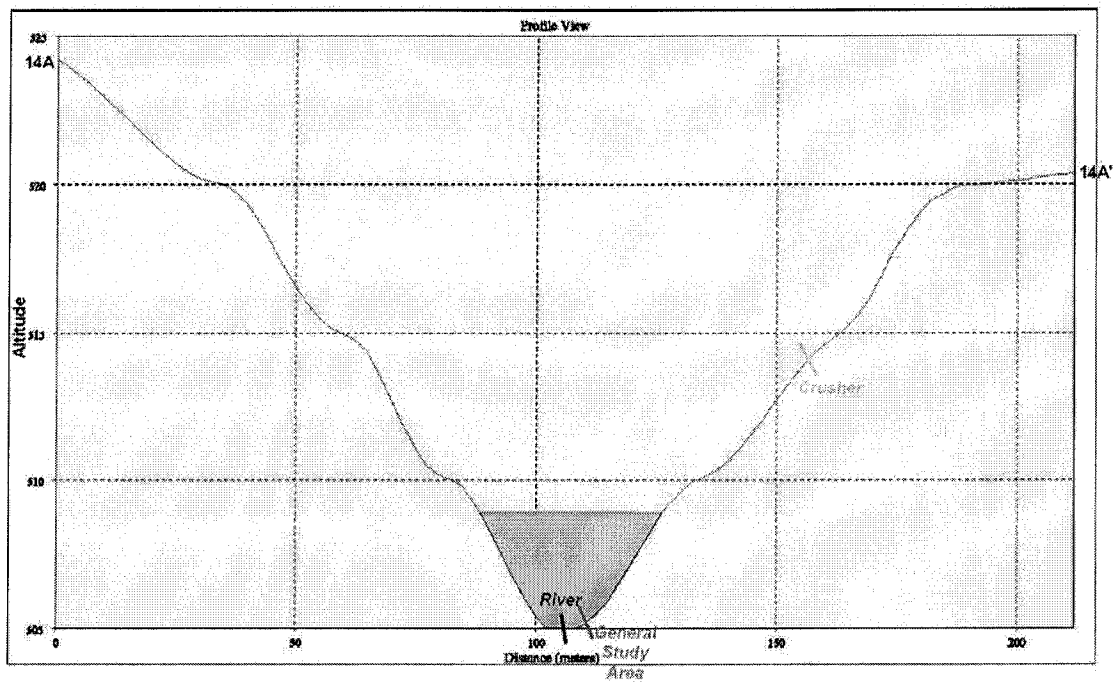
Each of the crossections 13, 16, 11, 14, 15 and 12 (in this order along the river frontage) are depicted below in start to finish view in altitudes (in metres). The flood containment is shown for the greatest 100-year flood prediction based on statistics based on statistics from the Ntsubane Rainfall Station. It is clear that none of the flood predictions indicate inundation from the river flowing into the mining areas of the quarry.

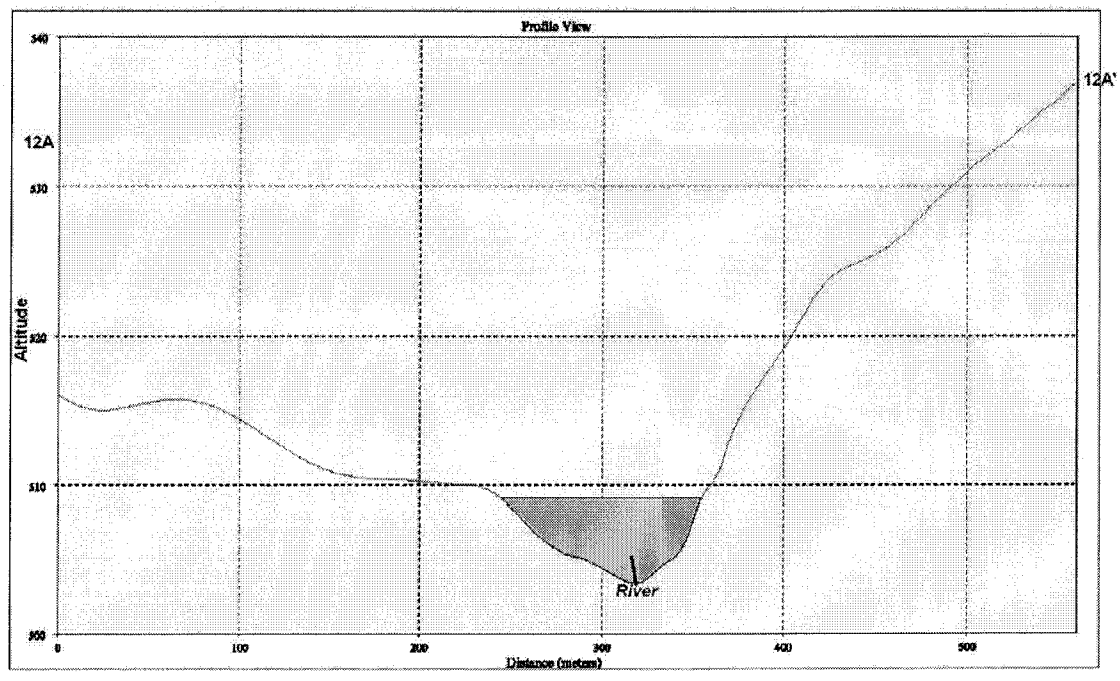





Profile View
Quarry Boundary
Existing Area
Existing Area
11A
Altitude
11A'
Quarry Boundary
River
General Study Area
Distance (meters)


Profile View
15A
Altitude
15A'
Block
River
General Study Area
Distance (meters)





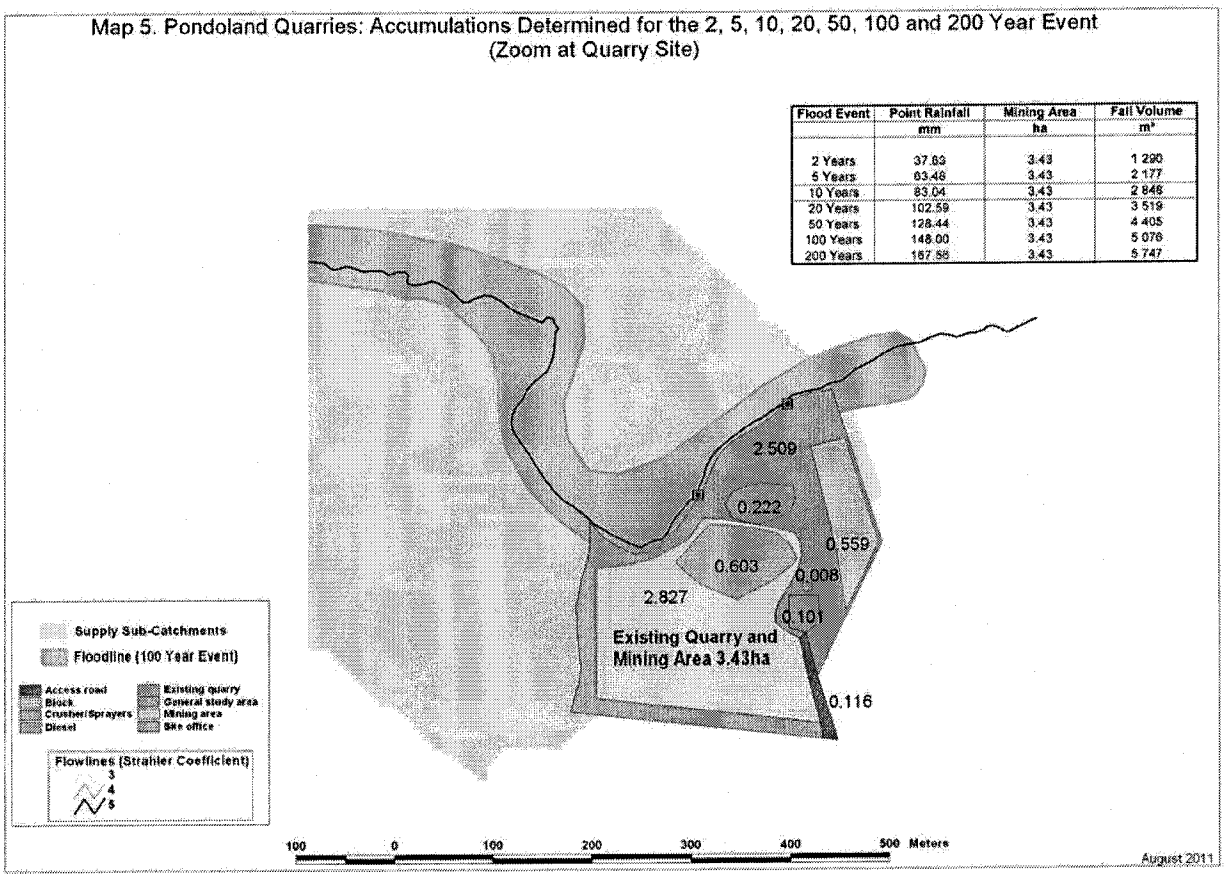
Flows will be limited in all minor catchments and will be only wide enough to cause limited flooding in narrow river channels. In Map 4a it will be noted that the 100 year floodline prediction (based on the higher figures from the Alternative Rational computations and using the rainfall model based on the Ntsubane Forestry Rainfall Station) covers limited ground. Channels are fairly deep and adequately formed and therefore flood waters will not spread widely over the surrounding land. In Map 4a the floodlines remain reasonably constant. Infrastructure to be created outside the floodlines shown in Map

4a should not be susceptible to flood events under investigation. The mining and existing quarry area as shown in Maps 4a consists of 3.43ha. In the mining and quarry area the possible 100 year flooding is not predicted to inundate the workings.

The table in Map 5 indicates the volumes of water likely to accumulate in the mining and quarry areas from the predicted maximum point rainfall (flash flood) during the 2, 5, 10, 20, 50, 100 and 200 year events. Table 2 shows the corresponding volumes likely to accumulate in the mining and quarry areas for the 1, 2, 3 and 7 day predicted rainfall maxima over those periods.

Map 5. Pondoland Quarries: Accumulations Determined for the 2, 5, 10, 20, 50, 100 and 200 Year Event (Zoom at Quarry Site)

Flood Event	Point Rainfall mm	Mining Area ha	Fall Volume m³
2 Years	37.83	3.43	1 298
5 Years	63.46	3.43	2 177
10 Years	83.04	3.43	2 848
20 Years	102.59	3.43	3 519
50 Years	128.44	3.43	4 405
100 Years	148.00	3.43	5 076
200 Years	167.55	3.43	5 747



It is evident from Map 5 and Table 2 that the 2 year point rainfall volume over the mining area is approx 1 300 m³, with a maximum rainfall of 119 mm over 24 hours up to 203 mm over 7 days every two years. Based on the average monthly rainfall (Lusikisiki station) there is the potential for approximately 34,000 m^3 runoff volume (based on 100% runoff) over the existing quarry and mining area (see Table 3). Within the unmined area infiltration will take place and this volume will reduce; however over time the mining of the quarry will result in this full volume being accumulated within the quarry depression. Initially the model predicts a runoff coefficient of 35%, therefore the annual runoff volume over the unmined area will be approximately 9 876 m^3. In the developed areas of the mining area such as the office, crusher, block making area and roads, the runoff coefficient is estimated to be 0.7 (70% of rainfall). Therefore, within these areas the annual runoff volume is approximately 7 029 m^3. Separating the runoff from the quarry activities (dirty water) from the river (clean water) to ensure that there is no contamination of the water resource from increased sediment load (erosion of exposed surfaces) will allow for the capturing of this water from these areas for use in the block-making industry. Based on the available information it is likely that approximately 27 412 m^3 can be captured for use. This volume will not contribute to the river flow.

Table 2: Point and rainfall maximum for flood return periods in the mining area

Flood Event	Point Rainfall	Mining Area	Fall Volume
	mm	ha	m³
2 Years	37.63	3.43	1 290
5 Years	63.48	3.43	2 177
10 Years	83.04	3.43	2 848
20 Years	102.59	3.43	3 519
50 Years	128.44	3.43	4 405
100 Years	148.00	3.43	5 076
200 Years	167.56	3.43	5 747

Flood Event	One Day	Mining Area	Fall Volume
	Maximum Rainfall	ha	m³
2 Years	119.00	3.43	4082
5 Years	177.00	3.43	6071
10 Years	224.00	3.43	7683
20 Years	278.00	3.43	9535
50 Years	361.00	3.43	12382
100 Years	435.00	3.43	14921
200 Years	519.00	3.43	17802

Flood Event	Two Day	Mining Area	Fall Volume
	Maximum Rainfall	ha	m³
2 Years	155.00	3.43	5317
5 Years	240.00	3.43	8232
10 Years	312.00	3.43	10702
20 Years	394.00	3.43	13514
50 Years	523.00	3.43	17939
100 Years	639.00	3.43	21918
200 Years	772.00	3.43	26480

Flood Event	Three Day	Mining Area	Fall Volume
	Maximum Rainfall	ha	m³
2 Years	171.00	3.43	5865
5 Years	264.00	3.43	9055
10 Years	341.00	3.43	11696
20 Years	429.00	3.43	14715
50 Years	565.00	3.43	19380
100 Years	686.00	3.43	23530
200 Years	826.00	3.43	28332

Flood Event	Seven Day	Mining Area	Fall Volume
	Maximum Rainfall	ha	m³
2 Years	203.00	3.43	6963
5 Years	303.00	3.43	10393
10 Years	383.00	3.43	13137
20 Years	471.00	3.43	16155
50 Years	604.00	3.43	20717
100 Years	718.00	3.43	24627
200 Years	845.00	3.43	28984

The 50 year flood event will vary only marginally from the 100 year event depicted in the floodlines on Map 4a and will not show up as being significantly different if mapped at the scale of these maps; i.e. that the idea these may pose lesser threats to the study area should be avoided. **Infrastructure should be created away from the demarcated floodlines of the 100year flood.**

Table 3: Potential monthly runoff volumes at 100%preciptation

Month	Ave mnth rainfall (mm)	Quarry (m3)	Mining area (m3)	Office & plant (m3)	Roads (m3)
Jan	114.7	691.64	3242.57	1020.83	133.05
Feb	124.8	752.54	3528.10	1110.72	144.77
Mar	135.3	815.86	3824.93	1204.17	156.95
Apr	58.4	352.15	1650.97	519.76	67.74
May	47.6	287.03	1345.65	423.64	55.22
Jun	30.3	182.71	856.58	269.67	35.15
Jul	35.4	213.46	1000.76	315.06	41.06
Aug	35.6	214.67	1006.41	316.84	41.30
Sep	66.6	401.60	1882.78	592.74	77.26
Oct	106.5	642.20	3010.76	947.85	123.54
Nov	128.3	773.65	3627.04	1141.87	148.83
Dec	114.6	691.04	3239.74	1019.94	132.94
	998.1	**6018.54**	**28216.29**	**8883.09**	**1157.80**

Discussion and Conclusions

The determination of floodlines is based on the best data available. In South-Africa, use is made of the 120 year base of daily recordings at designated rainstations. Coordinates for positions of stations are also recorded. Calculations of the one, two, three and seven day maximum falls over the period are made for each rainstation and maximum flows based on these totals. Statistics have been published and provided in digital form by Pretoria University of these daily rainfalls. When an exceptional rainfall event occurs, a statistical estimate is made of its return time period. What is predicted as the fifty and hundred year flood events, will vary around those timescale. The ultimate or all time maximum flood is suggested to occur with a frequency of ten thousand years. Estimates, of this volume and flow, predict a fall of more than three times the maximum for the hundred year event. However, maximum flow from a two hundred year flood is estimated to exceed by only some fifteen percent that from the one hundred year event while the ten year peak flow is about half the maximum of that from the hundred year quantity. Since records have been analysed over 120 years, the 200 and 10 000 year extents are a statistical extrapolation.

The synthesis is performed via putting together data in four different packages. On the hydrological side the University of Pretoria, under the leadership of Professor W J R Alexander of the Civil and Biosystems Engineering Department, developed the flow prediction models. Inputs to that model were computed in the Surface Modeling and Watershed Analysis components of the TNTmips package from MicroImages, Inc. Lincoln, Nebraska, USA. The third stage is a set of programs written by us at S3 Technologies that establishes the filling of a crossection, based upon predicted flows. S3 captures the base data needed for the modeling in-house via accepted and accurate mathematical procedures. All the mapping and tables are then completed in the Arc3# package from ESRI, Redlands, Ca. USA. Although every reasonable effort has been made to ensure that the results are correct, accurate and based on personal scientific experience, S3 Technologies (or the providers of the packages used by S3 Technologies) cannot accept liability or responsibility if the findings, which must be understood to be only an estimate, are later contradicted.

The 100 year floodline prediction is provided in Map 4a and based on the current mining / quarry layout plan, should not inundate the workings. The impact of the point rainfall and runoff from (within) the mining area is more likely to have an impact on the working area (Table 2).

Appendix A (SANBI Vegetation Descriptions)

(Extracts from: Mucina, L. & Rutherford, M. C. (eds) 2006. The vegetation of South Africa, Lesotho and Swaziland. Strelitzia 19. South African National Biodiversity Institute, Pretoria.)

SVs 4 Ngongoni Veld

Name of vegetation type Ngongoni Veld
Code as used in the Book - contains space SVs4
Conservation Target (percent of area) from NSBA 25%
Protected (percent of area) from NSBA 0.3%
Remaining (percent of area) from NSBA 61.5%
Description of conservation status from NSBA Vulnerable
Description of the Protection Status from NSBA Hardly protected
Area (sqkm) of the full extent of the Vegetation Type 10051.15
Name of the Biome Savanna Biome
Name of Group (only differs from Bioregion in Fynbos) Sub-Escarpment Savanna Bioregion
Name of Bioregion (only differs from Group in Fynbos) Sub-Escarpment Savanna Bioregion

Distribution
KwaZulu-Natal and Eastern Cape Provinces: From Melmoth in the north to near Libode in the former Transkei (including Eshowe, New Hanover, Camperdown, Eston, Richmond, Dumisa, Harding, Lusikisiki and the Libode area). Altitude 400–900 m.

Conservation
Vulnerable. Target 25%. Only less than 1% of the unit is statutorily conserved in the Ophathe and Vernon Crookes Nature Reserves. Some 39% has been transformed for cultivation, plantations and urban development.

Appendix B

Resume of Alternative Rational v Rational Methods for flow prediction.

Method (Comparison of Rational and Alternative Rational)

After more than a century since it was first proposed this universally applied method is the oldest of the calculation methods used in determining flow volumes. It depends on the simple linear relationship:

$Q_T = 0.278 C_\tau I_\tau A$

where C_τ is the runoff coefficient with a value between zero and one, I_τ, is the rainfall intensity averaged over the catchment in mm/h for the return period T and A is the area of the catchment in km^2. The factor 0.278 is the conversion factor for the units used.

The essence of the method is the estimation of the values of the rainfall intensity and the runoff coefficient.

Two alternative methods are given for the determination of effective catchment rainfall. The first is the HRU 1/72 method (revised in HRU 2/78) which is detailed in method above.

The alternative implementation is based on the recalibrated Hershfield equation for storm duration up to 6 hours, and the Department of Water Affairs' technical report TR 102 for durations from 1 to 7 days. In the program, the point precipitation for durations of 1, 2, 4, and 6 hours is determined using the Hershfield equation which requires values for the return period, duration, mean lightning ground flash density from Figure B3 and 2-year return period one day rainfall from TRl02 . Data for 1, 2, 3 and 7-day rainfall depths for a range of return periods are read from TR102. This information is then presented in the form of a table. Because two different methods are used to derive these values, the 6-hour value (or more rarely the 4-hour or 2-hour values) may be higher than the 24-hour value. lf the time of concentration is less than 24 hours and the Hershfield value is larger than the 24-hour value, then it is reduced to equal the 24-hour value. This assumption is realistic as the storm precipitation mechanisms are such that short duration rainfalls exceeding 4 hours are often close to the 24-hour value.

The program uses linear interpolation between the values derived above to estimate the point precipitation for the previously calculated time of concentration.

Results obtained when applying the commonly used methods for deriving the area reduction factor do not vary greatly. The method given in the alternative implementation is new and is based on the graphical relationship proposed by Alexander (1990), which in turn was based on that given in the UK Flood Studies Report. The equation is included in the program.

The estimation of the runoff coefficient is based on the Department of Water Affairs standard calculation sheet which itself was evolved from earlier proposals by Alexander, Kovacs and others. The relationships used are logical but their values are empirical and based largely on experience.

(Extracted from notes provided by Pretoria University Civil and Biosystems Engineering Department)