January 2017

# DRAFT SCOPING REPORT
# Thornridge Farm Quarry on Portion 55 of Farm Uitkomst & Doornrug No. 852
# eThekwini Municipality
# Cato Ridge Quarry (Pty) Ltd
# KZN 30/5/1/3/2/10497MP

Prepared by


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**This report was prepared by EnviroPro Environmental Consulting in terms of Appendix 1 to GNR 982**

*2 (1) (a) details of (i) the EAP who prepared the report; and (ii) the expertise of the EAP. Please see Appendix A for EAP Declaration and full Curriculum Vitae;*

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| | | |
|---|---|---|
| Tertiary Education: | BSc (Hons) | Zoology |
| | MSc | By thesis in estuarine fish ecology. |
| Work Experience: | 2001 – 2002 | MSc formed part of EIA for National Ports Authority |
| | 2003 – 2010 | Senior Manager for KSEMS cc. |
| | 2010 – Present | Managing Member of EnviroPro Environmental Consulting |

**Iain Jourdan Bsc (Hons)**

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| Tertiary Education: | BSc (Hons) | Geographical Science |
| Work Experience: | 2006 – 2007 | Environmental Manager service for Inhlanhla Civils (Pty) Ltd |
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| Tertiary Education: | BSc (Hons) | Botany & Ecophysiology |
| | MPhil | Marine & Environmental Law |
| Work Experience: | 2012 | Environmental Control Officer for EIMS on the Transnet NMPP |
| | 2012 – 2014 | Consultant at KSEMS cc |
| | 2014 – Present | Consultants at EnviroPro Environmental Consulting |

## Executive Summary

Cato Ridge Quarry (Pty) Ltd have applied for a Mining Permit to mine stone from Thornridge Farm in the eThekwini Municipality. The mine area is 4.99 hectares in extent and includes all stockpile areas, offices, parking etc. Controlled blasts will loosen material to create benches in the quarry with the material being screened and crushed on site. The material will be stored in stockpiles, collected by top-loaders and distributed to consumers. A number of environmental and social factors were taken into consideration by the EAP to determine the preferred quarry site however the alternate sites for the quarry which were originally considered as well as alternative access routes to the site are discussed further in the Scoping Report.

The operation of the mine requires a Mining Permit in terms of section 27 of the Mineral and Petroleum Resources Development Act (No. 28 of 2002) and will result in the cumulative clearance of more than 1 hectare of indigenous vegetation. The upgrading of the access road will result in more than 5m$^3$ of material being excavated / deposited into drainage lines. A Scoping Report and Environmental Impact Assessment are therefore in process in terms of section 28 of the National Environmental Management Act (107 of 1998 as amended).

A Final Scoping Report will be submitted to the Department of Mineral Resources (DMR) for approval prior to the release of a Draft Environmental Impact Report (EIR), which will be available to registered Interested and Affected Parties for further comment. The EIR will contain all specialist reports that have been commissioned with more detailed mitigation measures provided for the impacts identified.

The following key impacts and mitigation measures have been identified in the Scoping Report and will be expanded on in the EIR. Areas where specialist input will be required are identified in blue italics:

- **Risk of collapse of the mining face:** A *Mine Works Programme* is currently being prepared which will detail the mining operation, including details on the height and width of the proposed benches to ensure there is no collapse of the mine face. The *Geotechnical Investigation* will also provide recommendations to prevent a collapse.
- **Increase in heavy truck traffic in the area:** The nature of the activity will result in a localised increase in haulage truck traffic once vehicles exit Thornridge Farm. Two route alternatives are considered along Allsop road and underneath the railway line before vehicles merge onto the R103. The preferred route is for vehicles to head east and avoid the small residential area immediately adjacent to Allsop Road. A *Traffic Impact Assessment* will be carried out to determine the most feasible access route.
- **Generation of flyrock, noise and dust as a result of blasting:** Mitigation is generally applied when mining comes to within 100m of any structure and whenever the ground vibration is likely to cause damage to the structure. The *Blasting Plan* will however determine Peak Particle Velocities (PPV) at varying distance intervals from the quarry so that potential impacts on nearby structures can be determined. Perimeter monitoring of dust will be conducted to monitor dust levels to ensure they remain within legislated limits and dust control mitigation measures will be put in place. The operation of the quarry will generate noise although the distance to the nearest residential household (>600m) is expected to reduce this impact. Where necessary, noise mitigation measures can be implemented.
- **Visual impact:** The preferred mine site is located on the south facing side of the hill, away from the surrounding residential households. The quarry will be visible to the industries to the east and south (>800m). The visual impact on these areas is therefore deemed negligible.
- **Loss of indigenous vegetation:** This impact cannot be avoided as the entire permitted mine area, will ultimately be cleared of vegetation. A *Vegetation Assessment* has been conducted to confirm the quality of the vegetation associated with the mining area and identify the presence of any threatened, protected or valuable flora species.
- **Poor stormwater management increasing the risk of erosion and risk to water quality in nearby watercourses:** A *Stormwater Management Programme* will be attached to the EIR. *Wetland and Aquatic Assessments* will determine any potential impacts on nearby watercourses and the catchment at large, however appropriate stormwater management should prevent such impacts from occurring. Clean run off from surrounding slopes will be prevented from entering the quarry by strategically placing berms around the perimeter of the site. Any runoff from the quarry areas itself and especially areas where blasting takes place will be directed into a sump at the lowest point of the site and will not be permitted to leave the site.
- **Cumulative impact on the biodiversity due to the loss of vegetation and the impact on fauna:** The *Vegetation Assessment* and consultation with KZN Wildlife will provide further insight into this cumulative impact on biodiversity.

Initial mitigation measures for these impacts have been included in the Impacts Table in section 7.0 of the Scoping Report but will be addressed further and in more detail by the relevant specialists in various reports to be submitted with the Draft EIR (indicated in section 8.1 of the Scoping Report).

# Contents



# Appendices

# Section 1: Scope of Work and Location of Activity

## 1.1 Project Title

Thornridge Farm Quarry located within the eThekwini Municipality.

## 1.2 Aim of the Scoping Report

As per Appendix 2 of the Environmental Impact Assessment Regulations[1], the objective of the scoping process is to, "*through a consultative process-*

1) *Identify the relevant policies and legislation relevant to the activity;*
2) *Motivate the need and desirability of the proposed activity, including the need and desirability of the activity in the context of the preferred location;*
3) *Identify and confirm the preferred activity and technology alternative through an impact and risk assessment and ranking process;*
4) *Identify and confirm the preferred site, through a detailed site selection process, which includes an impact and risk assessment process inclusive of cumulative impacts and a ranking process of all the identified alternatives focusing on the geographical, physical, biological, social, economic, and cultural aspects of the environment;*
5) *Identify the key issues to be addressed in the assessment phase;*
6) *Agree on the level of assessment to be undertaken, including the methodology to be applied, the expertise required as well as the extent of further consultation to be undertaken to determine the impacts and risks the activity will impose on the preferred site through the life of the activity, including the nature, significance, consequence, extent, duration and probability of the impacts to inform the location of the development footprint within the preferred site; and*
7) *Identify suitable measures to avoid, manage or mitigate identified impacts and to determine the extent of the residual risks that need to be managed and monitored*."

The Scoping Report therefore aims to provide registered Interested and Affected Parties (I & APs) with sufficient information to gain an understanding of the project and the preferred site alternative so that they can provide meaningful input for further investigation in the Environmental Impact Report (EIR). Opportunity to provide comments on the Scoping Report will be provided and meetings held on request if needed to clarify or discuss aspects of the application. The EIR will be produced after the final Scoping Report has been accepted by the DMR, and will provide more detail on the mining process, addressing concerns raised during the "Scoping Phase" and will include specialist input on impacts identified by the independent Environmental Assessment Practitioner (EAP; see section 7.0 of the Scoping Report for the impacts section).

All registered I & APs will be given a legislated 30 day comment period to comment on the Draft Scoping Report and then later on the Draft EIR, before reports are submitted to the Department of Mineral Resources (DMR)[2]. Comments are to be submitted to the EnviroPro Consultant whose details are provided below.

## 1.3 Applicant and Independent Consultant Details

| ITEM | APPLICANT CONTACT DETAILS |
|---|---|
| Name | Cato Ridge Quarry (Pty) Ltd |
| Tel no | 032 947 1746 |
| E-mail address | dpillay@waldene.com |
| Postal address | PO Box 608, Umhlali, 4390 |

| ITEM | CONSULTANT CONTACT DETAILS |
|---|---|
| Name | EnviroPro / Stephanie Denison & Josette Oberholzer |
| Tel no | 031 765 2942 |
| Fax no: | 086 549 0342 |
| Cellular no | 082 929 4662 |
| E-mail address | steph@enviropro.co.za |
| Postal address | P.O Box 1391 Kloof 3640 |

[1] Environmental Impact Assessment Regulations published on the 04th December 2014 in Government Gazette No. 38282 notice R982.

[2] "Timeframes" are outlined in Chapter 2 of the 2014 EIA Regulations.

### 1.4 A Description of the Activities to Be Undertaken Including Associated Structure and Infrastructure As per Section 2 (d) (ii)

Cato Ridge Quarry (Pty) Ltd have applied for a Mining Permit in terms of section 27 of the Mineral and Petroleum Resources Development Act (No. 28 of 2002), to mine stone on a privately owned portion of land in Ward 1 of the eThekwini Municipality. Circle Irrigation cc own Portion 55 of Farm Uitkomst & Doornrug 852, where the mining will take place (proof of landowner is provided in Appendix D). An existing dirt road on the property will be used to access the quarry. The road crosses the head of four drainage lines. There is stormwater infrastructure in place at the crossings however these may need to be upgraded once heavy vehicles begin using the road. The necessity and details of the upgrading will be confirmed in the EIR.

The entire property is 198 hectares in extent. The mining area, including all stockpile areas, offices, parking etc. will ultimately measure a total area of 4.99 hectares.

**Construction**

There will be very little activity associated with the construction phase apart from establishing a site office and setting up the screening plant and crusher in the demarcated areas. There are currently two alternative existing access routes to the proposed Thornridge Quarry. These are discussed in more detail in section 2.0 of the Scoping Report. Regardless of which access alternative is preferred, no additional roads will need to be constructed to gain access to the quarry. Access to the mine area will be restricted and controlled during operation. The applicant will commence with removing material using excavators on approval of this application.

**Operation**

Mining will be carried out in phases so that only portions of the 4.99 hectare site will be cleared at any one time. In the long term, the activity will result in the clearance of more than 1 hectare of indigenous vegetation from the property, triggering an Environmental Impact Assessment (EIA).

Blasting will be required either weekly or bi monthly to soften material so that it can be removed by excavator. A Blasting Plan will be attached to the EIR, providing further information on the proposed blasting process. A stone crusher and screening plant will also be used on the site. The crusher will be used to reduce the size of larger stones to a finer grade. This will increase the range of consumers depending on the size of stone provided by the quarry (i.e. larger stones required for french drains or landscaping compared to the crushed smaller stones used for the construction of roads). The blasting, crushing and screening of material on site will qualify as primary processing of the mined material and therefore a Scoping/EIA process applies (see section below).

A Mine Works Plans is currently being prepared which will describe the mining methodology in detail and will be attached to the EIR. The mining operation can, however, be summarised as follows:

- The permitted area to be mined will be demarcated.
- The engineer will establish access for the plant and plan out the excavation approach.
- A topsoil storage site will be established for storage of topsoil removed during the initial clearing. This will be retained for use in rehabilitation at a later stage.
- Overburden will be cleared using an excavator and soft material cut back.
- Controlled blasts will loosened material to create benches (minimum of 30m wide and ideal bench height of 10-12m, to be confirmed in the Mine Works Plan).
- Blasting to be conducted during day light hours only, while trucks may operate 18 hours a day, depending on demand, Monday to Saturdays.
- A Blasting Plan will be submitted as part of the EIR, which will provide more detail on the frequency and intensity of the blasting required.
- Material will be transported to the crushing and screening plant on site for processing.
- Material collected by top-loaders and distributed to consumers.
- All activity will be monitored and managed by a site foreman and flag men will be placed to ensure safe operation of the earth moving equipment in and out of the quarry.

This process will be confirmed and described in more detail in the Mine Works Plan, to be attached to the EIR. The location of the various activities in the mine area will be included in the EIR.

**Rehabilitation/ Decommissioning**

On decommissioning of the quarry, the processing equipment and offices will need to be removed, internal access roads ripped and rehabilitated. The quarry will need to be rehabilitated by shaping slopes and ensuring that there is no loose material or areas where slippage could occur. Topsoil will be re-laid over exposed areas and indigenous grassland species re-introduced.

Before the quarry is legally abandoned, the DMR requirements of long-term drainage, environmental and public access issues will be adequately considered and controlled. Adequate geotechnical data is normally available at the time of a quarry closure to address all long-term geotechnical concerns regarding the abandonment of the mine. By making geotechnical engineering input to the quarry planning and design process an integral part of the mining operation, improvements can be made to quarry safety, productivity, economic efficiency as well as closing concerns when abandoning the mine.

A number of environmental impacts may remain after a site has been mined as the area may be vulnerable to erosion. Stormwater flow must be managed by placing diversion berms and ditches at the top of the slope which will act to divert and slow water flow down the slope. The ditch and berms will be vegetated. Even with rehabilitation, an excavated area will remain on the hillside. The visual aspect of this will be mitigated as far as possible through shaping, re-vegetation and screening with vegetation. Rehabilitation measures will be further guided by specialist findings in the EIR.

On closure, the aim of the rehabilitation will be to reduce visual and safety impacts and to control risk of erosion and slippage. The following key points must be followed to ensure appropriate closure. These will be included in the Environmental Management Programme (EMP) attached to the EIR.

- Rehabilitation will occur as soon as practically possible on completion of mining, following the cessation of the work in a specific section.
- No more than one month will pass between cessation of mining and rehabilitation.
- Any infrastructure erected for mining will be demolished and removed.
- All equipment, concrete footings, fencing, etc. will be removed from site.
- All waste will be removed from site and disposed of at an approved landfill.
- Soil contaminated with oil, grease, fuel may not be disposed of in the excavation but will be disposed at a permitted landfill.
- The floor of the quarry will be left level and ripped to allow re growth of vegetation. Topsoil removed at the beginning of the process can be used to cover this area.
- Before placing topsoil, all visible weeds will be removed.
- The topsoil will be spread evenly over the prepared surface to a depth of 75 to 150mm on slopes of 1:3 or steeper.
- Topsoil placement will occur in a phased manner, concurrent with the phased operation of the quarry. Topsoil will be placed in the same area from which it was stripped.
- Where amounts are inadequate to cover the entire area, slopes will receive priority treatment.
- Site access will be blocked to ensure that other operators or opportunists do not re-visit closed areas and continue to remove material.
- Re-vegetated areas will be protected until vegetation has become established. No vehicles or equipment will be allowed access to areas that have been vegetated.
- Any erosion channels that develop after re-vegetation will be backfilled and consolidated and the areas restored to a proper stable condition. The erosion will not be allowed to develop on a large scale before effecting repairs and all erosion damage should be repaired as soon as possible.
- Any large rocks uncovered by the mining activity must be placed in the pit and covered with overburden material and topsoil.
- The site will not be used further once it has been closed. The area will be shaped and re vegetated to ensure that it does not pose a safety or erosion and environmental hazard.

### 1.5 All Listed and Specific Activities to Be Triggered and Being Applied For as Per Section 2 (d) (i)

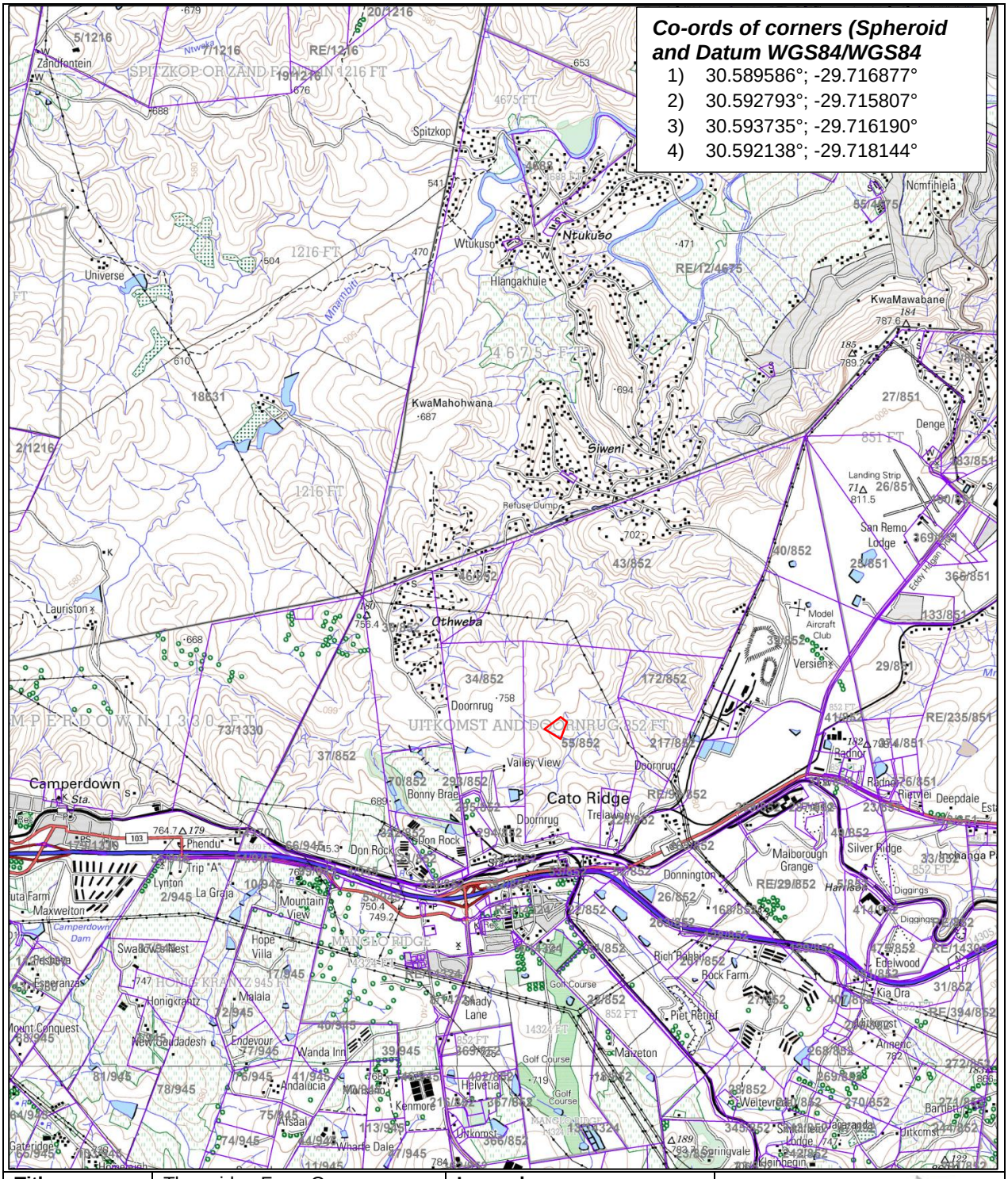
| GNR | Activity Number | Activity as per the legislation | Activity as it applies to the proposal |
|---|---|---|---|
| GNR 983 Listing Notice 1; 04th December 2014 | 21 | *Any activity including the operation of that activity which requires a mining permit in terms of s27 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002), including associated infrastructure, structures and earthworks directly related to the extraction of a mineral resource, including activities for which an exemption has been issued in terms of section 106 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002).* | A Mining Permit application was submitted to the Department of Mineral Resources and accepted on the 23rd November 2016. Due to the restriction on public participation between the 15th December and 05th January, DMR granted an extension to submit the Final Scoping Report before the 17th February 2017. |

| | | | |
|---|---|---|---|
| GNR 983 Listing Notice 1; 04th December 2014 | 27 | *The clearance of an area of 1 hectares or more, but less than 20 hectares of indigenous vegetation, except where such clearance of indigenous vegetation is required for-*<br>*(i) the undertaking of a linear activity; or*<br>*(ii) maintenance purposes undertaken in accordance with a maintenance management plan.* | The mining activities will require the clearance of more than 1 hectare of indigenous vegetation. The entire quarry area, including parking, stockpiling and crushing plant, is 4.99 hectares. |
| GNR 983 Listing Notice 1; 04th December 2014 | 19 | *The infilling or depositing of any material of more than 5m³ into, or the excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 5 m³ from-*<br>*(i) a watercourse*<br>*But excluding where such infilling, depositing , dredging, excavation, removal or moving-*<br>*(a) will occur behind a development setback;*<br>*(b) is for maintenance purposes undertaken in accordance with a maintenance management plan; or*<br>*(c) falls within the ambit of activity 21 in this Notice, in which case that activity applies.* | There is existing access to the quarry however the dirt road crosses four drainage lines. The crossings may need to be upgraded once heavy vehicles are travelling along the roads. Cumulatively, this will result in more than 5m³ of material being deposited / removed from the watercourses. |
| GNR 984 Listing Notice 2; 04th December 2014 | 21 | *Any activity including the operation of that activity associated with the primary processing of a mineral resource including winning, reduction, extraction, classifying, concentrating, crushing, screening and washing but excluding the smelting, beneficiation, refining, calcining or gasification of the mineral resource in which case activity 6 in this Notice applies.* | Blasting, crushing and screening of rock material will take place on site. These activities are considered "primary processing of the raw material". |

### 1.6 Location Of Activity As Per Section 2 (b)(i)-(iii)

| | | |
|---|---|---|
| **District Municipality** | eThekwini Municipality. | |
| **Local Municipality** | eThekwini Municipality. | |
| **Ward** | 1 | |
| **Area / Town / Village** | Cato Ridge | |
| **Co-ordinates:** | **Latitude** | **Longitude** |
| Quarry Corner 1 | 29°43'0.75"S | 30°35'22.52"E |
| Quarry Corner 2 | 29°42'56.90"S | 30°35'34.05"E |
| Quarry Corner 3 | 29°42'58.27"S | 30°35'37.49"E |
| Quarry Corner 4 | 29°43'5.31"S | 30°35'31.71"E |
| **Property Description:** | **Parent Farm:** | **Farm Portion:** |
| | Uitkomst & Doornrug 852 | Portion 55 |
| **21 Digit Surveyor General's numbers:** | N0FT00000000085200055 | |

**Figure 1: 1 in 50 000 Locality Map Showing Proposed Quarry on Portion 405 of Vaalkop and Dadelfontein 885, Msunduzi Local Municipality, Umgungundlovu District Municipality, KwaZulu Natal. Applicant: Cato Ridge Quarry (Pty) Ltd. Property boundary in purple; Proposed Mining Area Shown in Red Measuring 4.99ha.**




| | | | |
|---|---|---|---|
| **Title** | Thornridge Farm Quarry | **Legend** | |
| **Co-ordinates** | 29°43'41.56"S ; 30°35'33.97"E | | Watercourses |
| **Scale** | 1:50 000 | | Properties |
| **Topographical Sheet No.** | 2930DA | | Quarry site |
| **Drawing No.** | Thornridge Farm Quarry #01 | | 20m Contour |
| **Date Prepared** | 06th January 2017 | | Rural Settlements |
| **Prepared By** | Stephanie Denison | | Urban Areas |

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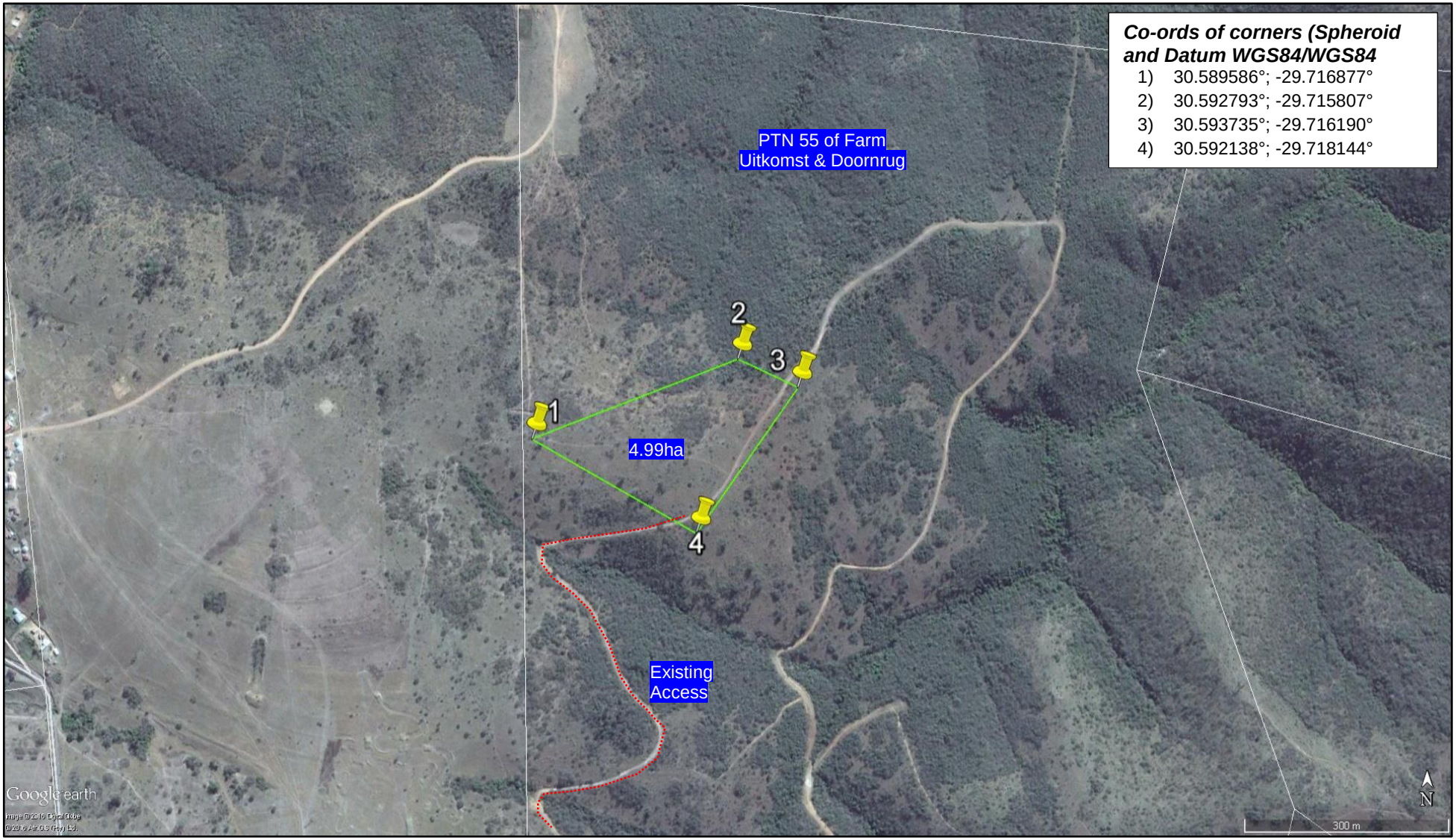
**Figure 2: Aerial Photograph Showing Permitted Area (4.99ha) in the eThekwini Municipality; KZN; Portion 55 of Uitkomst & Doornrug 852. Applicant: Cato Ridge Quarry (Pty) Ltd. Property boundary in white; Proposed Mining Area Shown in green. Two alternate access options are indicated in red (source: Google Earth Pro, 2017).**



## Section 2: Alternatives as Per Section 2 (h) (i) and 2 (i) (i)

### 2.1 Description of Process Followed to Reach Proposed Preferred Activity, Site and Location within the Site as Per Section 2 (h) (i)

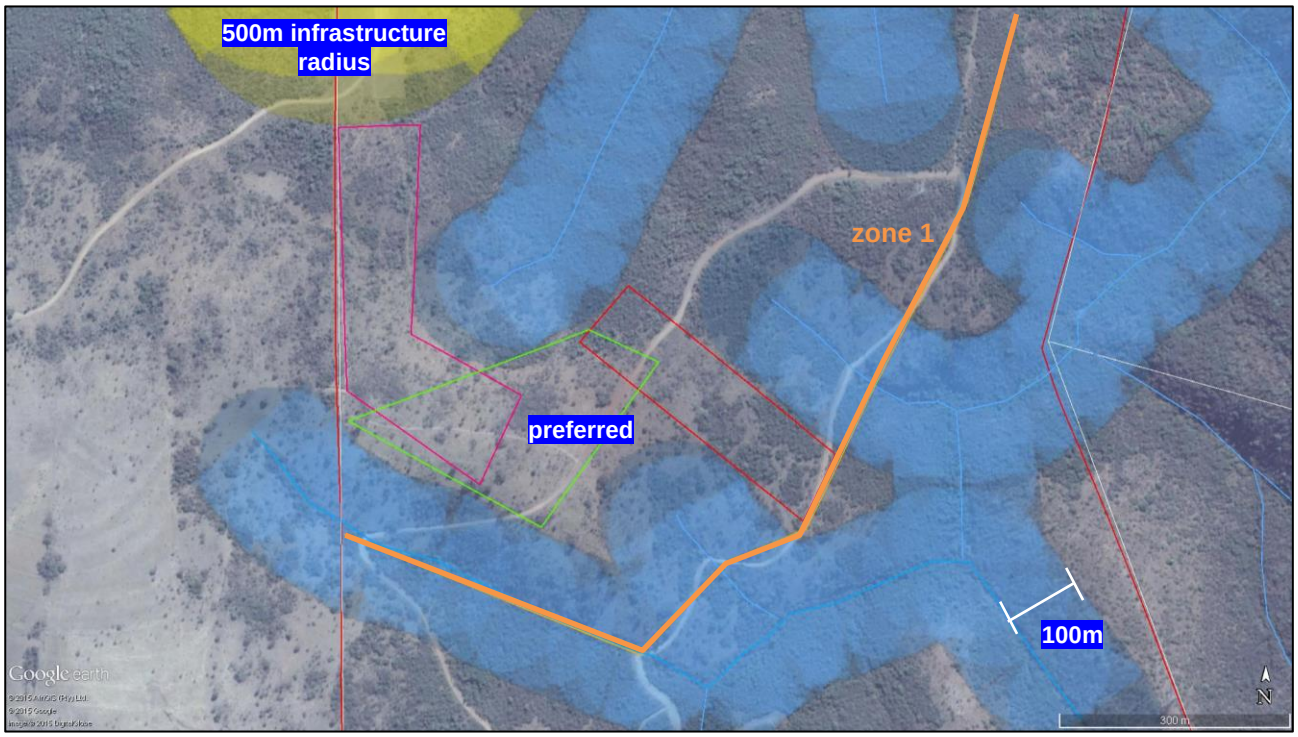
**Site Alternatives**

Circle Irrigation cc purchased this property after determining that it had mining potential. Initial investigations indicated that a number of factors, including availability of material, made it feasible to commence a mining operation on site. The proposal is therefore ultimately to clear and mine a 4.99 hectare portion of land to operate a commercial quarry. An application for a mining permit at the co-ordinates provided in section 1.5 has been submitted, acknowledged and accepted by the Department of Mineral Resources (DMR). Based on geotechnical investigations, which confirmed the location of the desired stone, as well as restrictions imposed by infrastructure and sensitive environmental areas across and adjacent to the property, a preferred layout alternative on the property was formulated by the applicant with input from the EAP.

Initial geological investigations indicated an eastward-northeastward trending spur dominating the northern portion of the property (i.e. "zone 1" shown by the orange line in Figure 3 below). This portion of the property was regarded by geologists as the best area on the property to mine the desired tillite[3] material. The watercourses in and adjacent to zone 1 were plotted by the EAP. As per Government Notice 704, mining is not permitted within 100m of a watercourse. Therefore a 100m buffer was placed on the watercourses to advise the preferred mining area (see blue shading in Figure 3).

One of the requirements for the quarry was to have access to the existing farm road so that no new roads would need to be developed unnecessarily. By a process of elimination, three alternative mining areas were identified and are marked in Figure 3. All three alternate mine areas are located more than 500m from the nearest residential household (yellow in Figure 3). After input from the vegetation specialist, the most degraded vegetation was found in the centre alternative site, which became the preferred alternative (green in Figure 3). Therefore no further site alternatives will be investigated. Photographs of the proposed quarry site are provided below in Figure 4.

**Figure 3: Proposed Layout Alternatives for the Thornridge Farm Quarry on Uitkomst & Doornrug 852. Layout Alternative 1 (preferred) is outlined in green with the other two alternate sites shown in pink & red. Geological Zone 1 is indicated in orange with watercourses and associated 100m buffers shown in blue (source: Google Earth Pro, 2017).**



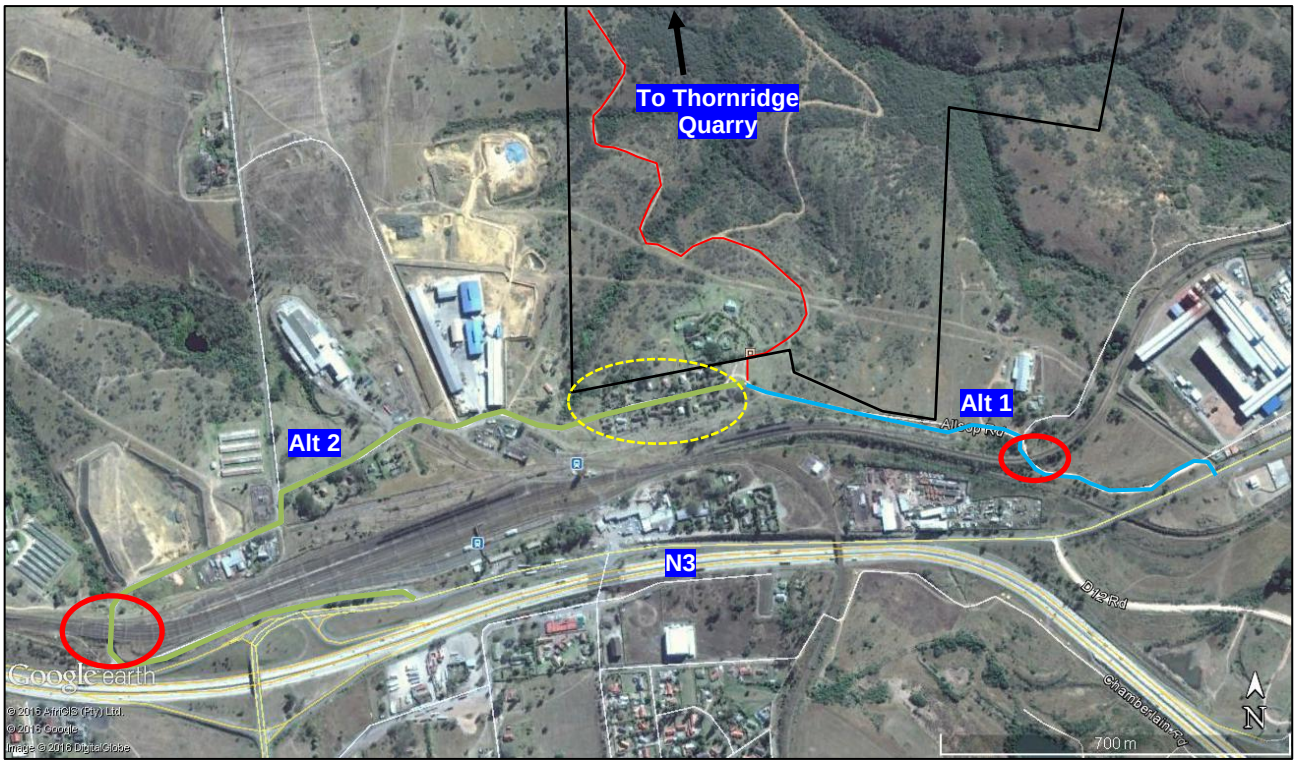

[3] "Tillite" is a sedimentary rock consisting of consolidated masses of unweathered blocks and glacial till in a rock matrix. The matrix is dark gray to greenish black in colour and consists of angular quartz and feldspar grains and rock fragments in a very fine-grained paste (https://global.britannica.com/science/tillite).

**Figure 4: (a) Photograph taken in a northerly direction showing the view from the existing farm houses looking onto the proposed mine area, outlined in black; and (b) Photograph taken from the quarry area facing uphill in a north-easterly direction looking at the proposed quarry area from the access road (facing north).**


## Access Alternatives

There are two access alternatives that are currently being assessed. Mining and construction vehicles will travel from the quarry, through Portion 55 of Uitkomst & Doornrug 852 and onto Allsop Road (red in Figure 5). Vehicles can either turn east, underneath the railway line and onto the R103 (alternative 1; preferred) or west, through a small residential area and underneath the railway line onto the R103 (alternative 2). The two alternatives are illustrated in the Figure and compared briefly below. The alternatives will be discussed in more detail in the EIR.

**Figure 5: Google Earth image showing the access alternatives to the Thornridge Quarry. The preferred alternative 1 is drawn in blue with the alternate access route drawn in green. The residential area is circled in yellow (source: Google Earth Pro, 2017).**




Comment from the municipality and Department of Transport is required on the preferred access alternative onto the R103 however Access Alternative 1 (blue in Figure 5) is currently the preferred access route. The route onto the R103 is significantly shorter that Alternative 2 (green in Figure 5; 1 km compared to 2.2km). Trucks could avoid the residential area (circled in yellow above) by using the preferred alternative route. Both routes pass underneath the Assmang Spur rail line (circled in red in the above figure). The underpass for Alternative 1 is a single lane wide and alternative 2 is a double lane wide. Alternative 1 is a dirt road with

Alternative 2 being an existing asphalt road. The requirements from a traffic perspective will be determined during the next phase of the assessment.

**Technology Alternatives**
In terms of the mining method proposed, overburden will be cleared using an excavator and soft material will be cut back. Work benches (minimum of 30m wide and ideal bench height of 10-12m, to be confirmed in the Mine Works Plan) will be cut into the mining area and material will be removed using controlled blasts. The loosened material will be removed using excavators and transported to the crushing and screening plant area. This is the standard methodology used to mine hard stone material and is therefore the only feasible technology alternative considered throughout the EIA process.

An alternative method would be to crush and screen the material at an offsite location. The applicant would need to provide and retain proof at the mine that the site processing the material further is permitted to do so. It therefore does not make logistical sense to transport truckloads of material before it is screened and then crushed at an alternative site. The Works Manager will have more control over the processing process, which will be discussed further in the EIR, if it is carried out at the site. There is an opportunity to ensure that best practice measures are carried out during the processing (as per the Environmental Management Programme, to be attached to the EIR).

**The No Go Alternative**
No mine will be established on the property and the land will remain as it is. No impacts associated with mining will occur but neither will any of the positive economic benefits associated with employment or a locally available source of material.

## Section 3: Site Description and Surrounding Land Use as per section 2 (h) (iv)

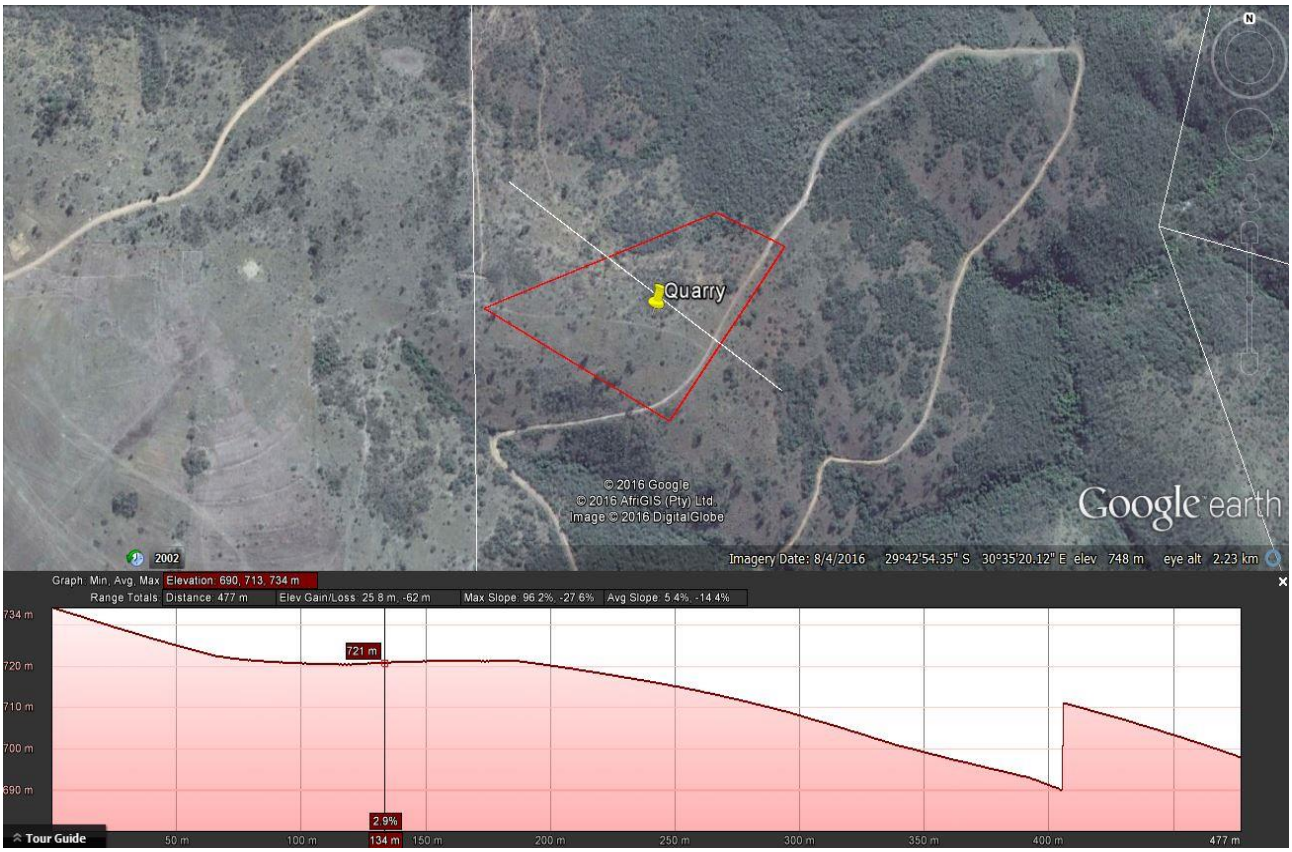
The information provided below is based on a desktop assessment of the site. A number of specialist reports have been commissioned to further investigate potentially environmental sensitive areas associated with the site. The findings of these reports will be discussed in the EIR.

### 3.1 Geographical, Physical Characteristics of the Site and Surrounding Land Uses

The property is located at an elevation of approximately 740m above mean sea level. An elevation profile of the hill, which is to be mined, is provided in Figure 6. The south facing side of the hill will be mined. Photographs taken of the proposed Thornridge Quarry showing the surrounding topography are included in Figure 7. The N3 Highway is located directly south of the quarry and easily accessed via the R103. The quarry itself is surrounded by vacant land with the nearest infrastructure located 620m north, where there is a small cluster of rural houses. There is a rural town 770m west of the quarry with the nearest industrial site 800m south-west of the quarry. Assmang Manganese is located 1.3km east of the quarry, across the valley. Surrounding land uses have been illustrated in Figure 9. There are no servitudes or services associated with the quarry site itself. There is a powerline 420m north-east of the quarry.

*The Geotechnical Investigation will be submitted with the Draft EIR. The Geotechnical Investigation will provide more information on the underlying geology as well as relevant surrounding land uses.*

**Figure 6: Elevation profile of the hill where the Thornridge Farm Quarry is to be located (source: Google Earth Pro, 2017).**




The entire property has been included in the Durban Metropolitan Open Space System (DMOSS; Figure 9). It covers a wide range of open space types (grassland, water, forests etc.) and physically links these open spaces to allow for flow of genetic material, energy, water and nutrients[4]. The open space also provides a link connecting rivers and catchments to the coast, maintaining biodiversity in the eThekwini area. DMOSS has been incorporated into the eThekwini town planning schemes as a control area / overlay. eThekwini Environmental Planning and Climate Protection Department (EPCPD) will need to be consulted to form an agreement for the conservation / management of the remainder of the site, should this portion be relaxed.

[4] D'MOSS boundaries and D'MOSS GIS (http://www.durban.gov.za/City_Services/development_planning_management/environmental_planning_climate_protection/Durban_Open_Space/Pages/D%E2%80%99MOSS-boundaries-and-D'MOSS-GIS.aspx). Accessed on 11/01/2017.

**Figure 7: Photographs showing the topography and characteristics of the Thornridge Quarry site (a) Photograph taken facing north up the slope of the proposed quarry site, and (b) Photograph taken from the centre of the site facing south-east towards the existing access road across the property.**


**Figure 8: Aerial photograph showing the location of the Thornridge Quarry in red and the surrounding land uses. The powerlines are indicated with a yellow line (source: Google Earth Pro, 2017).**

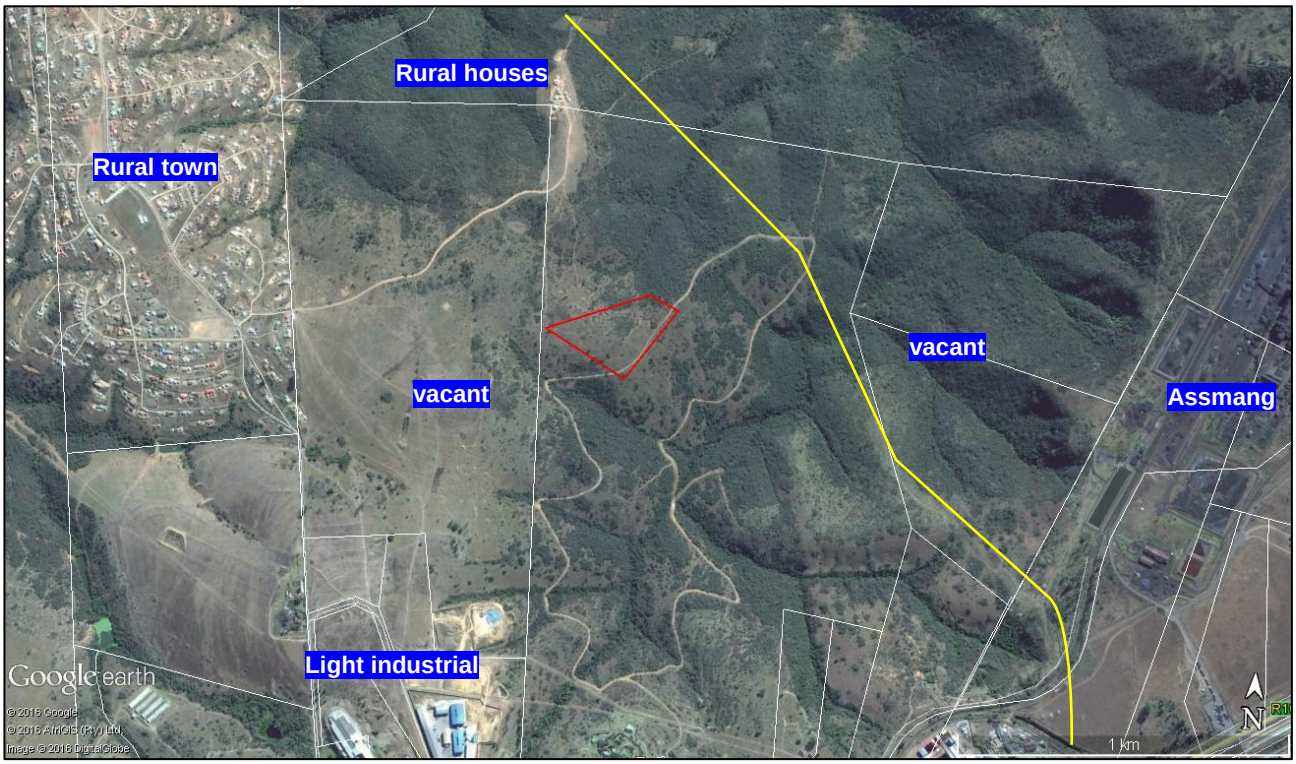
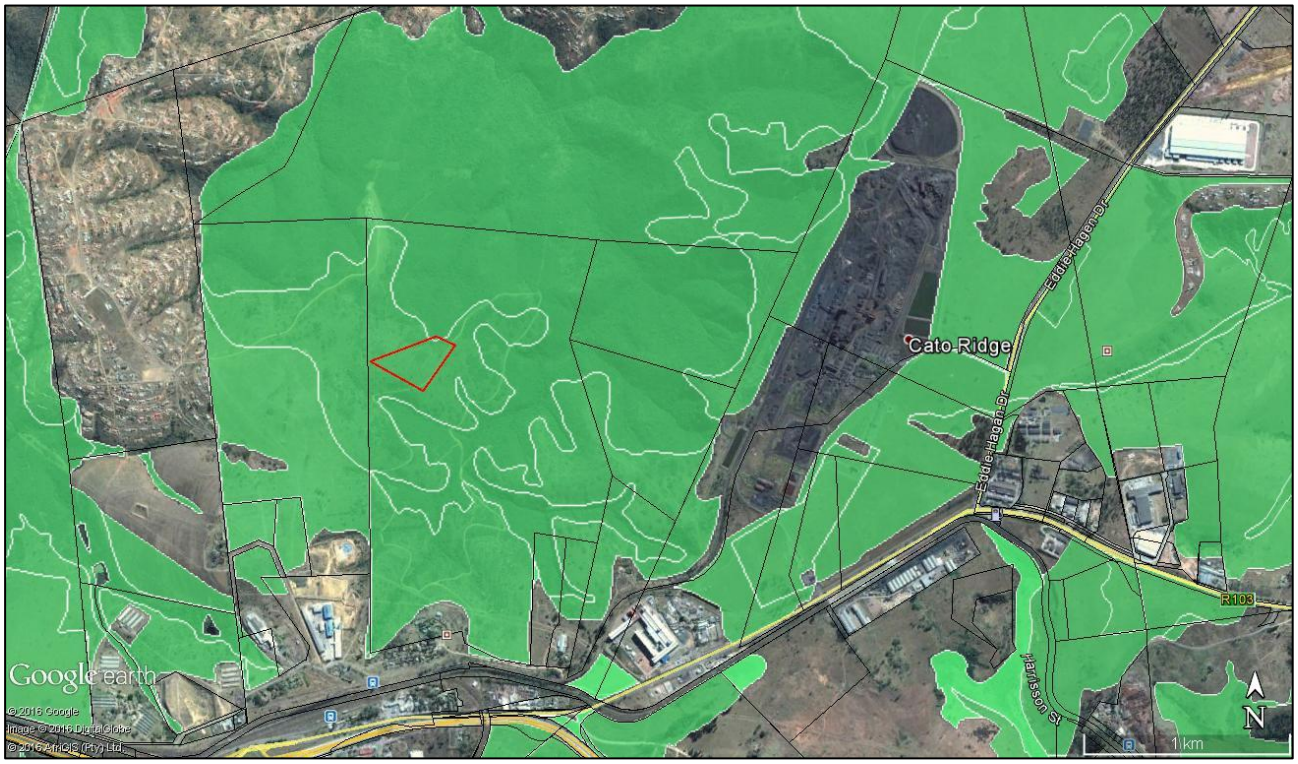


**Figure 9: Aerial image showing Portion 55 of Uitkomst & Doornrug 820 and the DMOSS overlay shaded in green (source: Google Earth Pro with eThekwini GIS overlay, 2017).**




### 3.2 Surface Water

The quarry falls within the U20J Quaternary Drainage Region within the Mvoti to Umzimkulu Water Management Area. There are a number of drainage lines on the property, which drain down the sides of the steep hills into a valley. A tributary of the Mshwati Stream flows in a northerly direction out the property towards the main channel of the Mshwati River. The drainage lines and tributary associated with Portion 55 of Uitkomst and Doornrug No. 852 are shown in dark blue in Figure 10 below.

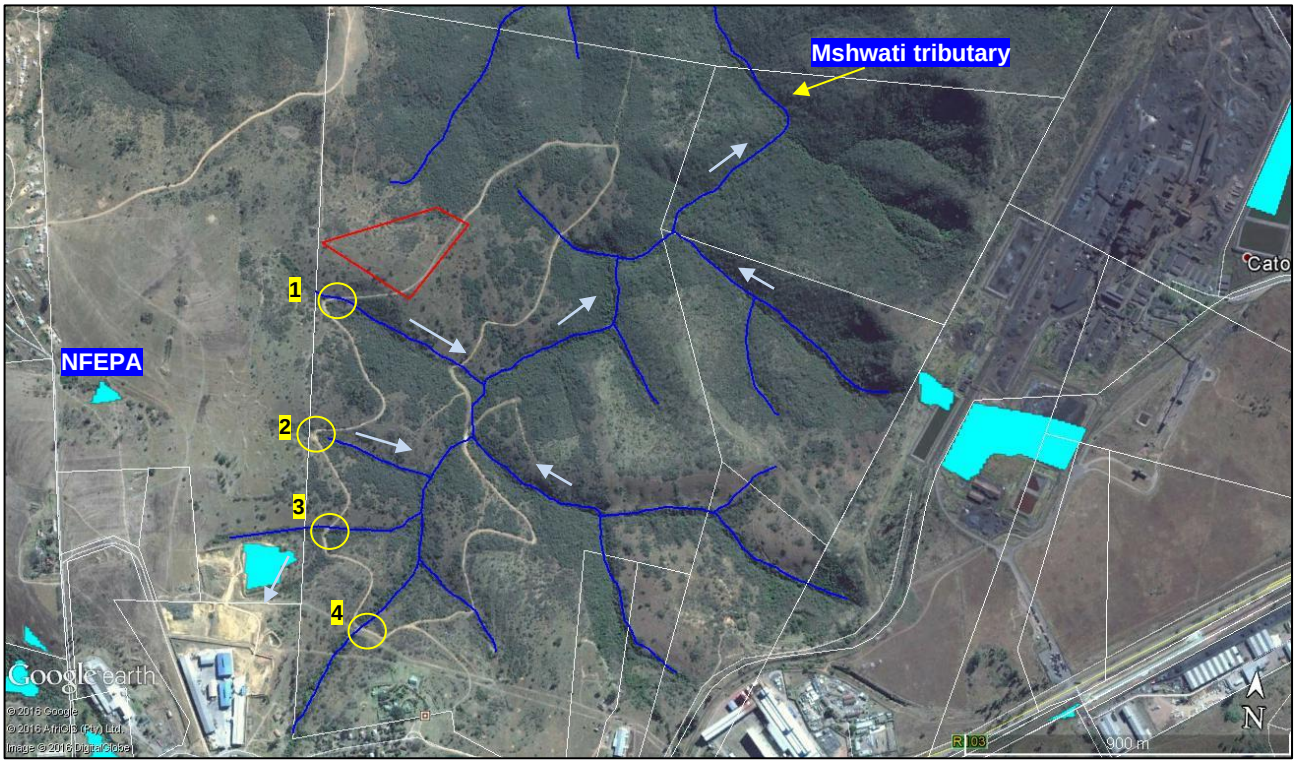
The National Freshwater Ecosystem Priority Areas (NFEPA) database shows four wetland systems adjacent to the property (shaded in light in the Figure below). Apart from the area shaded in blue 740m south-west of the quarry, all other wetland systems are artificial ponds / dams. The NFEPA wetland is upstream of the proposed mine area and far enough away from the mining area not to be impacted on during the operation of the quarry. There are wetland areas associated with the drainage lines and tributary on site. Accordingly, a wetland specialist has been appointed to determine the extent, health, functionality and potential impacts on these wetland systems.

As general good practice, all clean surface water runoff from surrounding slopes will be diverted away from the mining area. Potentially contaminated run off from the mine area itself will be diverted into an onsite sump and will not be permitted to discharge to the surrounding environment or any drainage lines. The extent and dimensions of the sump will be determined and included in the EIR and Water Use Authorisation. Water collected in the sump will be treated as potentially contaminated and will only be used for dust suppression within the mine area that is protected by the berms and drains back to the sump. Dirt access road will also require dust suppression however water will be brought offsite for dust suppression outside of the mine area.

The existing access road crosses four drainage lines (circled in yellow in Figure 9). The infrastructure currently in place at these crossings may need to be replaced / formalised once heavy vehicles begin utilising the road. The necessity of upgrading the structures as well as details of the upgrade will be confirmed and included in the EIR.

*A wetland and aquatic assessment has been commissioned to delineate all watercourses and wetlands within 500m of the mine area and to assess risk to the catchment as a result of mining in this location. A Water Use Authorisation from DWS will also be applied for. The specialist is to recommend mitigation measures to prevent any impacts from occurring during the operation of the mine. A Stormwater Management Programme will be attached to the EIR.*

**Figure 10: Desktop study showing the watercourses and National Freshwater Priority Areas associated with Portion 55 Uitkomst & Doornrug 852. The watercourse crossings are labelled 1 – 4 in yellow with drainage direction indicated by the grey arrows (source: Google Earth Pro with NFEPA database overlay).**




### 3.3 Fauna and Flora

The upper portion of the property where the mining will take place is currently not zoned. The site is currently vacant and is therefore in a relatively undisturbed state apart from occasional cattle grazing. According to the South African Biodiversity Institute's (SANBI) Geographical Information System (GIS) overlay, the site falls outside any of the threatened ecosystems mapped by SANBI. The National Vegetation Map shows that the property is comprised of Ngongoni Veld, KZN Hinterland Thornveld and Eastern Valley Bushveld (Figure 11)[5]. The quarry itself falls within the KZN Hinterland Thornveld. Photographs showing the current condition of the vegetation on the property are provided in Figure 12.

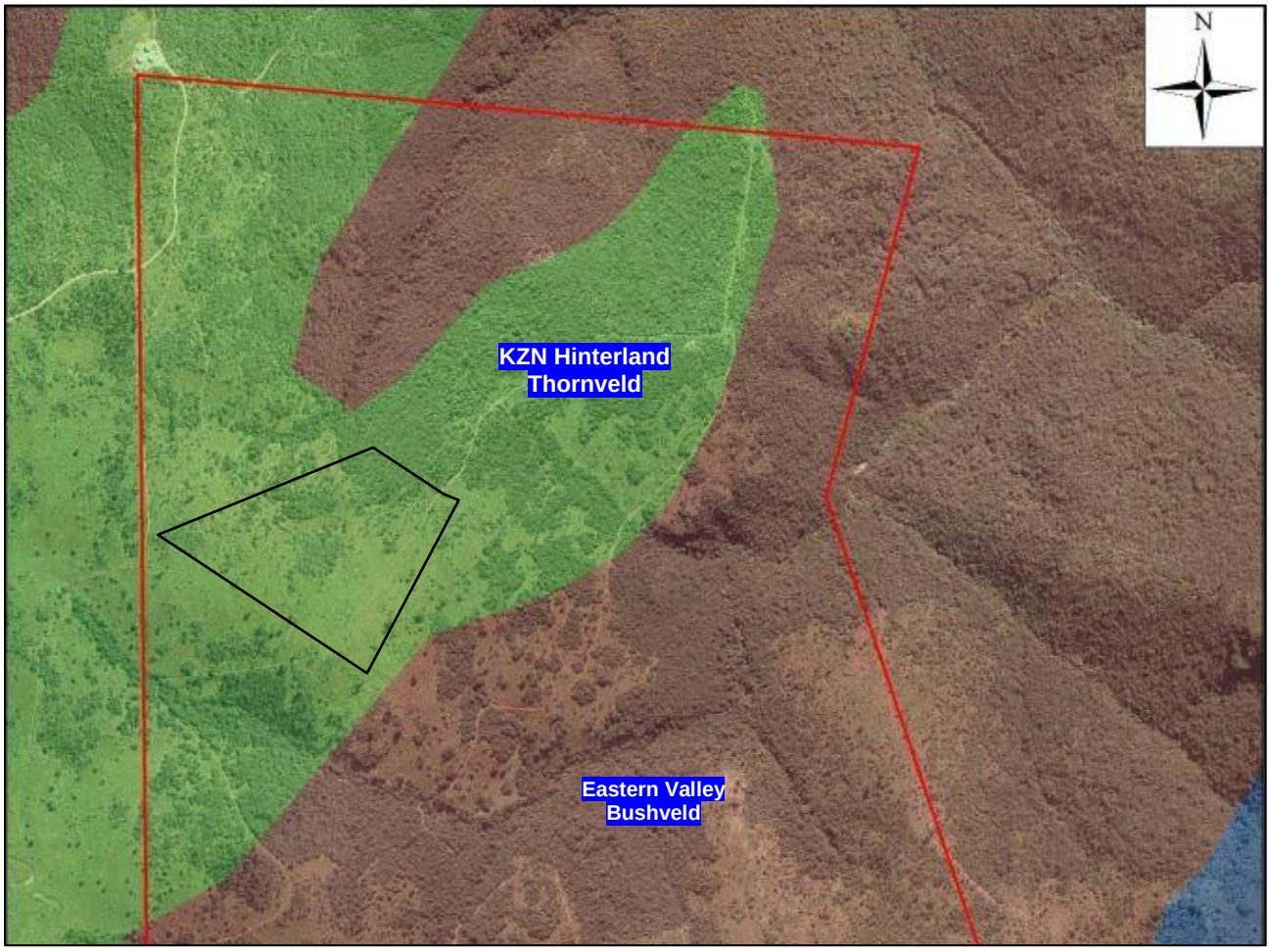
Mucina & Rutherford (2011) described the characteristics of the vegetation type as follows:

- Occurs in scattered patches above Eastern Valley Bushveld, in a relatively small area of south-central KwaZulu-Natal, between 450–900 m asl.
- Open thornveld dominated by Acacia species on undulating plains found on upper margins of river valleys.
- The climate is typically summer rainfall with MAP about 750mm.
- 2% of the unit is statutorily conserved in the Spioenkop, Weenen, Ntinini, Wagendrift, Moor Park and Tugela Drift Nature Reserves.
- More than 16% has been transformed for cultivation and urban sprawl as well as building of dams.

The operation of the proposed Thornridge Quarry will result in the clearance of 4.99 hectares of indigenous vegetation. The vegetation specialist has assessed the property with specific attention to the preferred mine area. Any important / red data species identified, will be relocated or re-planted as per specialist's input. The report will be attached as part of the EIR.

[5] Mucina, L. & Rutherford, M.C. (eds). Reprint 2011. The vegetation of South Africa, Lesotho and Swaziland. *Strelitzia* 19. South African National Biodiversity Institute, Pretoria.

**Figure 11: Aerial image of the National Vegetation Map with the KZN Hinterland Thornveld vegetation type shaded in green and the surrounding Eastern Valley Bushveld shaded in red (source: Mucina & Rutherford, 2011).**

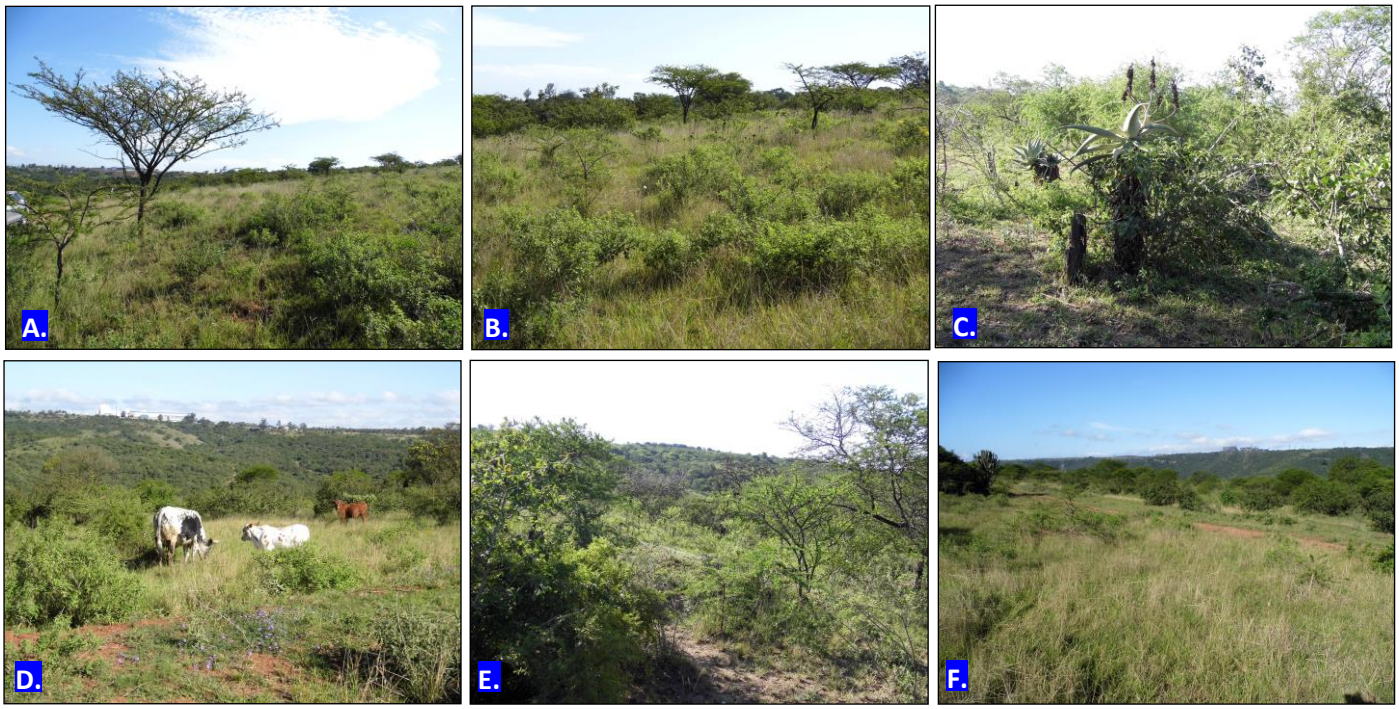



Apart from grazing cattle, there was no other fauna seen on the site during the time of the site visit. Due to the rural, undisturbed nature of the property, it is likely that there will be a number of small mammal and antelope species residing and foraging on the property. According to the Ezemvelo KZN Wildlife Minset Map, there is the potential for 8 threatened species of Millipede, 2 threatened Molluscs species and a grasshopper species to found in the study area.

- *Spinotarsus maritzburgenis* (Millipede)
- Patinatius bidentatus simulator (Millipede)
- *Spinotarsus destructus* (Millipede)
- *Doratogonus falcatus* (Millipede)
- *Gnomeskelus spectabilis* (Millipede)
- *Gnomeskelus tuberosus urbanus* (Millipede)
- *Gulella separata* (Mollusca)
- *Gulella euthymia* (Mollusca)
- *Camaricoproctus planidens* (Millipede)
- *Spinotarsus glomeratus* (Millipede)
- *Odontomelus eshowe* (Grasshopper)

*A Vegetation Assessment will provide input on the species found within the proposed mine area to determine what species will be removed. A species list will be included (indigenous and alien species). Recommendations and mitigation measures are to be provided by the specialist with particular reference to the rehabilitation and landscaping of the mine on decommissioning / closure. KZN Wildlife will be consulted to determine whether a Faunal Assessment will be required for the study area.*

**Figure 12: Photographs showing the general condition of the vegetation on the proposed Thornridge Quarry site (a) Photograph along the eastern boundary of the mine area; (b) Mix of shrubs and *Acacia* species in the centre of the quarry site; (c) Outcrop of Aloe species in the northern corner; (d) Cattle grazing in the centre of the site; (e) Thicker vegetation near the crest of the hill (western boundary); and (f) open grassland area with the access road visible in the background of the photograph.**




### 3.4 Heritage and Cultural Aspects

During the initial site visits, no archaeologically/ cultural significant resources were identified in the proposed mine area however this is to be confirmed by a heritage specialist.

*A Heritage Impact Assessment will determine the impact of the mine on the site and surrounding outlook. The heritage specialist will also identify any graves or other features of cultural/architectural significance.*

### 3.5 Socio-Economic Environment

The area is rural in nature with the property being undeveloped. There are however plans in place to develop the southern portion of the property, near the Thornridge Farm House, into platforms for light industrial purposes. The N3 is easily accessible off Allsop Road and the R103 in Cato Ridge. Thornridge Farm is surrounded by a mixture of light and heavy industry to the south and east with rural open land to the north and west. The nearest residential house is 620m north of the quarry site. Due to the close proximity of the N3, it is anticipated that light industry / mixed-use developments will be on the increase in this area in the future, in anticipation of the N3 “development corridor”. Please refer to Figure 8 above showing surrounding land-uses.

# Section 4: Policy and Legislative Context

## 4.1 Identification of all Legislation, Policies, Plans, Guidelines, Spatial Tools, Municipal Development Planning Frameworks and Instruments As Per Section 3(e)(i) and Compliance of Proposed Activity with Legislation and Policy 2 (e)

| Legislation | Compliance of Activity |
|---|---|
| National Environmental Management Act 1998 | The National Environmental Management Act (Act 107 of 1998) (NEMA) is South Africa's overarching environmental legislation. It includes a set of principles that govern environmental management and against which all Environmental Management Programmes (EMPrs) and actions are measured. These principles include and relate to sustainable development, protection of the natural environment, waste minimisation, public consultation, the right to an environment that is not harmful to one's health or wellbeing, and a general duty of care.<br>The Environmental Impact Assessment (EIA) Regulations, 2014: GN R.982, R.983, and R.985 under Section 24 of the NEMA define the activities that require Environmental Authorisation and the processes to be followed to assess environmental impacts and obtain Environmental Authorisation.<br>Environmental authorisation is required for the proposed mining activity including the processing of the raw material on site. Therefore this application is in line with the requirements of NEMA. |
| National Water Act 1998 | Provides for fundamental reform of the law relating to water resources in a water scarce country. Section 21 of the National Water Act (NWA) lists certain water uses requiring a Water Use License from the Department of Water and Sanitation (DWS).<br>A Water Use Authorisation (WUA) will be required for the mining activities. The WUA application is running concurrently with the EIA process. The following water uses have been identified:<br>s21(a) – abstraction of water from the sump for dust suppression;<br>s21(g) – stockpile areas, sump and dust suppression<br>s21(c) & (i) - wetland specialist to confirm the potential impact on wetland within 500m of the site |
| National Waste Management Act 2008 | Reforms the law regulating waste management to prevent pollution and ecological degradation.<br>Section 19 allows the Minister to publish a list of activities, which require a Waste Management License. The most recent list is published in Government Gazette 37083 Notice No. 921 dated 29 November 2013. The proposal will not trigger a Waste Management Activity. |
| Environmental Conservation Act 1996 | Makes provisions for the application of general environmental principles for the protection of ecological processes, promotion of sustainable development and the protection of the environment. This Act has mostly been repealed by NEMA. |
| National Environmental Management Biodiversity Act 2004 | To provide the framework, norms, and standards for the conservation, sustainable use and equitable benefit-sharing of South Africa's biological resources. Section 52 allows for the publication of a list of threatened ecosystems in need of protection. The list was published in Government Gazette No. 34809 Notice No. 1002 dated 9 December 2011.<br>This site is not located within an endangered ecosystem type and therefore does not require environmental authorisation for this aspect. |
| National Heritage Resources Act 25 of 1999 | For the protection of South African Heritage to nurture and conserve communities legacy. A Heritage Impact Assessment has been commissioned to comment on and identify any features of cultural or architectural significance. |
| **Municipal Planning Framework **** | |
| eThekwini Municipality Spatial Development Framework 2016/2017 (SDF) | The intention of the Thornridge Quarry is to supply material for future developments and service delivery within the Cato Ridge area and beyond. Cato Ridge has been identified in the SDF as one of the industrial expansion and potential dry port areas in the Municipality that can respond to the increasing demand for industrial land in eThekwini Municipality. By |

| | |
|---|---|
| | improving the infrastructure in the Cato Ridge area and upgrading the N3 the area can be unlocked for industrial and logistic development. According to the SDF, the development of Cato Ridge will also serve as a stimulus to unlocking the potential of the surrounding areas of Mpumalanga and Hammersdale. Traffic issues, particularly the limited accessibility off the N3 to vast portions of land, was identified as one of the key challenges in the Cato Ridge Area. The quarry will supply the Cato Ridge area with a legal supply of good quality construction material for future development and road infrastructure upgrading. |
| Cato Ridge Local Area Plan & Precinct Plans (May 2012; LAP) | The document prepared by Graham Muller Associates Consortium provides a development vision for the Cato Ridge area. According to the Conceptual LAP, the proposed quarry is located in an area with "steep topography" which is "environmentally sensitive". The Cato Ridge Industrial Precinct Land Use Management Plan shows the property falling in Public Open Space / Conservation. The conservation of the remainder of the property is to be discussed with the municipality and addressed in the EIR. |

** Further investigations will be carried out during the next phase of the assessment with input from the relevant authorities, I & APs as well as the conservation organisations in the local area.

## Section 5: Motivation, Need and Desirability

### 5.1 Need and Desirability as Per Section 2 (f)

Following the World Summit on Sustainable Development in 2002, the Department of Minerals Resources initiated a programme to guide the mining and minerals sector to achieve "sustainable development"[6]. The Sustainable Development through Mining Programme (SDM) was therefore developed by the DMR. This EIA process aims to implement this Programme by ensuring that the planning and operational phases of the Thornridge Quarry fall in line with sustainable development principles listed in Chapter 1 of NEMA. The EIA process guides the applicant in contributing to sustainable development thereby achieving one of the goals of the SDM Programme.

The eThekwini Municipality SDF and Cato Ridge LAP identify the existing local road network as limited and consists of mainly priority intersections. The envisioned increase of new developments in the area would lead to the need for widening of the roads and upgrades to intersections. One of the proposed upgrades to for the R103 to become two lanes in both directions. The area where the proposed Thornridge Quarry is well located with easy access onto the R103 and will therefore have the potential to supply road and construction material to the immediate area increasing the development potential. The close proximity of the N3 highway provides an ideal access network to surrounding areas and the anticipated "development corridor" associated with this busy route. The municipal framework acknowledges the potential for an increase in the construction of light industry / mixed-use developments in the immediate area.

The material mined will be used in the construction industry, which is an important contributor to municipal and provincial development and growth. Apart from supplying good quality material to the construction market, the mine will create job opportunities (skilled and unskilled) benefiting the local economy. This is in line with the National Development Plan (2011), which introduces the long-term vision for the future development of South Africa by identifying the need to activate rural economies through the stimulation of small-scale agriculture, tourism as well as mining investments.

### 5.2 Motivation for Preferred Site, Activity and Technology Alternative as Per Section 2 (h) (x) and (xi)

The site was selected for a Mining Permit on inspection of the underlying geology of the property and taking into account environmental sensitivities. There are therefore no site alternatives. A number of environmental and social factors were taken into consideration by the EAP to determine the preferred quarry site alternative (shown in green in Figure 3 above). This site will be assessed in more detail in the EIR as the preferred alternative due to the existing access road, distance from the nearest watercourse and nearby households.

Two access route alternatives are being assessed at this stage of the process, subject to input from the relevant authorities (municipality and DoT). The preferred alternative is for vehicles accessing the mine to leave Thornridge Farm and head east along Allsop Road, underneath the railway line and onto the R103, without passing through the nearby residential area where the houses are constructed very close to the road.

[6] Sustainable development can be defined as "development that meets the needs of the present generation without compromising the ability of future generations to meet their needs".

Children and domestic animals were also frequently observed in the main road within this small community. The road underneath the railway line is a single lane compared to the double land passing underneath the railway using the alternate route, to the west of Thornridge Farm.

Due to the nature of the material available at the Thornridge Quarry, there are no feasible technology alternatives. The technology / mining methodology is considered preferable as there is no excessive water use associated with the process. The only water used for the mining process will be that needed for dust suppression and water used by staff for drinking etc. Run off from the mined area will be collected in the sump and will be re-used in the mine are for dust suppression. Additional water may be needed for dust suppression and this will either be obtained from a municipal source or trucked in. The water source will be confirmed in the EIR and assessed under the water use authorisation process.

## Section 6: Public Participation as per Section 2 (h) (ii) & (iii) and 2 (i) (vi) & (vii)

As per Section 2 (h) (ii) and (iii), below is the details of the public participation process followed to date and a summary of the issues raised by interested and affected parties. Copies of supporting documents and inputs have been included in Appendices B - F.

### 6.1. Notification of Interested and Affected Parties

1) *fixing a noticeboard at a place conspicuous to and accessible by the public at the boundary, on the fence or along the corridor of-*
   - i. *the site where the activity to which the application or proposed application relates is or is to be undertaken; and*
   - ii. *any alternative site;*

A noticeboard was placed at the entrance to Thornridge Farm, where the proposed Thornridge Quarry will be located (English noticeboard). An additional noticeboard was placed in the nearby residential community to the south of the property (isiZulu noticeboard). Should access alternative 2 be used, the vehicles will travel through this residential area. Noticeboards were erected on the 13th December 2016. The noticeboard detailed the applicant's proposed plan to mine 4.99 hectare of the site, subject to a Scoping/EIA process. See Appendix B for proof of placement of the noticeboards.

2) *giving written notice, in any of the manners provided for in section 47D of the Act, to-*
   - i. *the occupiers of the site and, if the proponent or applicant is not the owner or person in control of the site on which the activity is to be undertaken, the owner or person in control of the site where the activity is or is to be undertaken or to any alternative site where the activity is to be undertaken;*
   - ii. *the municipal councillor of the ward in which the site or alternative site is situated and any organisation of ratepayers that represent the community in the area;*
   - iii. *the municipality which has jurisdiction in the area;*
   - iv. *any organ of state having jurisdiction in respect of any aspect of the activity, and;*
   - v. *any other party as required by the competent authority;*

Apart from the landowner, Circle Irrigation cc, there are no other occupiers on the property. The landowner is one of the directors of Cato Ridge Quarry (Pty) Ltd, who are applying for the Mining Permit. An official email of notification was sent to Circle Irrigation (see Appendix D). Ward Councilor Mkhize was notified of the application on the 09th January 2017 (see Appendix D for proof of notification). It is anticipated that a meeting will be held with the ward councilor during the next phase of the assessment. Representatives of eThekwini Municipality were notified by email. A number of stakeholders and authorities were also tracked down electronically and information has been provided to them via email on the 13th December 2016 (see Appendix D for proof).

All relevant authorities have therefore been notified of the application and have been provided with copies of the Draft Scoping Report (SR). The Draft SR will be circulated for a legislated 30 day comment period (16th January 2017 – 14th February 2017). All comments received within the comment period will be included in Appendix F of the Final SR. The Draft EIR will be circulated for comment, once DMR approves the Final SR.

i. *owners, persons in control of, and occupiers of land adjacent to the site where the activity is or is to be undertaken or to any alternative site where the activity is to be undertaken;*

A map showing the properties directly adjacent to Portion 55 of Farm Uitkomst and Doornrug No. 852 has been provided in Appendix D. Notification emails were sent on the 13th and 15th December 2017 and 09th January 2017. Please see Appendix D for proof of notification.

*3) placing an advertisement in-*
*i. one local newspaper; or*
*ii. any official Gazette that is published specifically for the purpose of providing public notice of applications or other submissions made in terms of these Regulations;*
*4) placing an advertisement in at least one provincial newspaper or national newspaper, if the activity has or may have an impact that extends beyond the boundaries of the metropolitan or district municipality in which it is or will be undertaken: Provided that this paragraph need not be complied with if an advertisement has been placed in an official Gazette referred to in paragraph (c)(ii);and*

The project has been advertised in the Mercury (English) and Isolezwe (isiZulu). The adverts were published on the 13th and 14th December 2016 respectively. The adverts detail the proposed Thornridge Quarry, Scoping/EIA process and provide contact details for EnviroPro should anyone wish to register as I & AP. Proof of adverts is provided in Appendix C.

### 6.2. Registered Interested and Affected Parties

*42. A proponent or applicant must ensure the opening and maintenance of a register of interested and affected parties and submit such a register to the competent authority, which register must contain the names, contact details and addresses of-*
*(a) all persons who, as a consequence of the public participation process conducted in respect of that application, have submitted written comments or attended meetings with the proponent, applicant or EAP;*
*(b) all persons who have requested the proponent or applicant, in writing, for their names to be placed on the register; and*
*(c) all organs of state which have jurisdiction in respect of the activity to which the application relates.*

The contact details of all I & APs that have registered have been provided in the Registered I & AP list in Appendix E.

### 6.3. Comments

Comments of interested and affected parties to be recorded in reports and plans.

*1) The applicant must ensure that the comments of interested and affected parties are recorded in reports and plans and that such written comments, including responses to such comments and records of meetings, are attached to the reports and plans that are submitted to the competent authority in terms of these Regulations.*
*2) Where a person desires but is unable to access written comments as contemplated in subregulation (1) due to-*
*i. a lack of skills to read or write;*
*ii. disability; or*
*iii. any other disadvantage;*
*iv. reasonable alternative methods of recording comments must be provided for.*

All comments received from I & APs to date have been recorded in the comments and response table. The original comments provided have been provided together with the comments and response table. See Appendix F for the Comments and Response Table and all comments received to date.

## Section 7: Preliminary Impact Assessment as Per Section 2 (h) (v) - (ix)

### 7.1 Methodology to Determine and Rank Nature, Significance and Consequences of Impacts Associated With all Alternative as Per Section 2 (h) (vi) and 2 (i) (v)

Impacts are assessed qualitatively and quantitatively, looking at the duration / frequency of the activity and likely impacts associated with that activity during construction, operation and closure. If the activity happens frequently, the risk of the associated impact occurring is much higher than if the activity happens less frequently. The geographical extent of the impact is assessed i.e. will the impact be restricted to the point of occurrence or will have it have a local or regional effect. Impacts are also reviewed looking at severity levels and consequences should the impact occur i.e. will the severity be low, medium or high and then probability of the impact occurring is taken into account.

Whether or not the impact can be mitigated and the extent to which it can be avoided, managed, mitigated or reversed is assessed i.e. the probability of occurrence after mitigation has been applied. This also takes into account likelihood of human error based on construction and operational auditing experience i.e. even though spills can be completely mitigated against and prevented, there is always a small chance that spills will still occur (residual risk). Based on all of these factors, the impact is then rated to determine its significance. For example an impact can have a regional affect with severe environmental implications, however the probability of it occurring is very low and the implementation of the proposed mitigation measures means that the ultimate rating is medium or low.

Please see below a description of the scoring. The full impact scoring tables detailing how the significance rating was calculated can be found in Appendix G, as per section 2 (h) (ix).

**Table 1: Explanation of the scoring of the impacts identified in EIA**

| Scoring of Impacts | |
|---|---|
| Duration / Frequency of activity likely to cause impact | 0 = No impact<br>1 = short term / once off<br>2 = medium term / during operation<br>3 = long term / permanent |
| Geographical Extent | 0 = No impact<br>1 = point of impact / restricted to site<br>2 = local / surrounding area<br>3 = regional |
| Severity (level of damage caused) if impact were to occur | 0 = No impact<br>1 = minor<br>3 = medium<br>5 = major |
| Probability of impact without mitigation | 1 - 5 = low.<br>6 -10 = medium.<br>11 -14 = high. |
| Significance before application of Mitigation Measures | A score of between 1and 5 is rated as low.<br>A score of between 6 and 10 is rated as medium.<br>A score of between 11 and 14 is rated as high. |
| Will activity cause irreplaceable loss of resources? | 10 = Yes<br>0 = No |
| Mitigation measures | 0 = No impact<br>- 5 = can be fully mitigated<br>- 3 = can be partially mitigated<br>-1 = unable to be mitigated |
| Probability of impact after mitigation | 0 = No impact<br>1 = Low<br>2 = Medium<br>3 = High |
| Significance after application of Mitigation Measures | A score of between 1and 5 is rated as low.<br>A score of between 6 and 10 is rated as medium.<br>A score of between 11 and 14 is rated as high. |

Some of the impacts in the table below will be expanded on in the EIR once more information is available from the various specialist studies. Impacts scoring a higher significance in the Scoping Report, will receive more attention in the EIR. The impacts identified below are therefore not the complete list, as there may be more impacts identified in the specialist reports and through the public participation process. Please note that

scoring and assessment of impacts as well as discussion of mitigations below are **preliminary** and that a more detailed assessment will be provided in the EIR.

### 7.2 Preferred Site and Layout Alternative

See Appendix G for the full impacts scoring matrix, which assesses the impacts based on the above scoring system. The below impacts relates to the preferred site layout and access route (i.e. east on Allsop Road).

**Table 2: Impacts and mitigation measures associated with the *preferred* layout & access route**

| Nature and Consequences of impact | Significance rating of impacts[7]: | Proposed mitigation and Extent to which impact can be reversed / avoided, managed or mitigated: | Significance rating of impacts after mitigation: |
|---|---|---|---|
| **Construction** | | | |
| Since construction will result in the very little activity occurring on the site (establishment of site office, setting up screening and crushing plants in demarcated areas), no construction related impacts have been identified. There is also existing access to the mine site. | | | |
| **Operation** | | | |
| 1. There is a risk of collapse of the mining face if the angle of removal is not correctly planned and managed. This could lead to slippage and collapse of the slope causing damage to the surrounding environment as well as posing a risk to onsite workers. | 10 (med) | If the appropriate mining technique is not used and slippage occurs, it could potentially have a significant impact in terms of risk to the workers on site, on-going instability issues and on-going erosion. The risk of this impact occurring is relatively low, provided proper mining techniques are used and the angle of removal is appropriately planned, implemented and monitored. A *Mine Works Programme* is currently being prepared which will detail the height and width of the proposed benches to ensure there is no collapse of the mine face. The *Geotechnical Investigation* will also provide recommendations to prevent a collapse.<br>Factors to be taken into consideration during the planning phase:<br>• The slope face must not be heavily undercut as this could lead to collapse of the slope.<br>• The employment of bench mining so restricting possible failures to bench level events.<br>• The use of core drilling results in modelling the rock body is a key consideration in planning and development of the quarry.<br>• Mining activity needs to take into account the final shape of the excavated area so as to reduce the risk of potential collapse and shifting.<br>• Undercutting of the slope and creation of over-steep slopes must not be permitted. After a blast these soft areas, which are prone to back break, are excavated to a point where competent material is reached. No loose material is left in the face. | 5 (low) |

[7] See Appendix H for more details.

| Nature and Consequences of impact | Significance rating of impacts[7]: | Proposed mitigation and Extent to which impact can be reversed / avoided, managed or mitigated: | Significance rating of impacts after mitigation: |
|---|---|---|---|
| | | • The slope angle and stability must be regularly evaluated by the resident engineer and adjustments made to the area and angle of excavation as needed.<br>• The maintenance of proper drainage away from the workings. | |
| 2. Generation of emissions from vehicles. | 7 (med) | All construction vehicles will be fitted with the appropriate silencers and exhausts. Emissions generated from these vehicles is not expected to significantly affect the workers on site or neighbouring households.<br>This impact can be managed and mitigated. | 3 (low) |
| 3. Increase in heavy truck traffic as trucks enter and leave the farm, which will impact on the existing road network and traffic along these roads. | 9 (med) | The nature of the activity will result in a localised increase in haulage truck traffic onto Allsop Road towards the R103 and N3. The preferred access route, travelling east out of Thornridge Farm, will ensure that vehicles do not drive through the small residential area but have direct access onto the R103, which joins the N3. Vehicles will not travel on any private / residential roads and therefore the increase in traffic along Allsop Road should not significantly affect the local community and businesses. Further input into the traffic requirements will be included in the EIR once feedback is given from the relevant authorities and the *Traffic Impact Assessment*. | 7 (med) |
| 4. Generation of flyrock as a result of blasting. | 8 (med) | Mitigation is generally applied when mining comes to within 100m of any structure and whenever the ground vibration is likely to cause damage to the structure. The *Blasting Plan* will confirm the location of any nearby structures that may require further protection during blasting.<br>The *Blasting Plan* will determine Peak Particle Velocities (PPV) at varying distance intervals from the quarry so that potential impacts on nearby structures can be determined, this will also provide necessary information to adjust timing and size of blasts to minimise potential impacts.<br>Blasting generates short duration events that are noticeable only by communities and individuals living in the immediate environment. A number of mitigation measures will be recommended in the *Blasting Plan* to be included in the EIR.<br>The blasting is however to be carried out by a suitably qualified Contractor.<br>An assessment of ground conditions and desired fragmentation is to be done on each blast and blasting strategies and | 4 (low) |

| Nature and Consequences of impact | Significance rating of impacts[7]: | Proposed mitigation and Extent to which impact can be reversed / avoided, managed or mitigated: | Significance rating of impacts after mitigation: |
|---|---|---|---|
| | | techniques are tailored to deliver the desired outcomes. For example:<br>• The use of "shake up" blasts in the soft areas. The blasts have a wider drill pattern and are undercharged.<br>• The use of bottom and mid hole boosters on high benches >15m.<br>• The weathered zones and solution channels often have to be blasted using packaged explosive emulsion due to the clay and sometimes wet conditions.<br>Ground vibration from blasting operations will be monitored after each blast by means of a PPV (Peak Particle Velocity) meter. Recordings will be kept of each blast in the Blast Analysis Sheet and filed in the Site Supervisor's office. This information, including further mitigation measures will be provided in the *Blasting Plan* however due to the isolated nature of the quarry, flyrock is not anticipated to impact any neighbouring properties. | |
| 5. Leaving the Thornridge Quarry un-rehabilitated. | 11 (high) | If the quarry is not rehabilitated upon completion of the operation, the quarried area will create an on-going safety risk (especially children and animals who may fall off the cliff edges or be hurt by unstable collapsing rock faces). It will also continue to have a visual impact on the landscape and there may be further slippage of unshaped slopes and erosion of soil above unstable slopes. A Rehabilitation Plan (annual and closure) will be included in the EMPr, attached to the EIR. This Rehabilitation will be as per the "*Regulations pertaining to the Financial Provision for Prospecting, Exploration, Mining or Production Operations*". Rehabilitation measures include the following:<br>• The quarry must be rehabilitated after closure to prevent these impacts from occurring.<br>• Rehabilitation should occur as soon as practically possible on completion of work, following the cessation of the work in a specific section.<br>• Infrastructure erected for mining must be demolished and removed.<br>• All equipment, concrete footings, fencing, etc. must be removed from site.<br>• All waste must be removed from site and disposed of at an approved landfill.<br>• Soil contaminated with oil, grease, fuel | 6 (med) |

| Nature and Consequences of impact | Significance rating of impacts[7]: | Proposed mitigation and Extent to which impact can be reversed / avoided, managed or mitigated: | Significance rating of impacts after mitigation: |
|---|---|---|---|
| | | may not be disposed of in the excavation and must be disposed at a permitted landfill.<br>• The floor of the quarry must be ripped (if possible) to allow re-growth of vegetation and topsoil removed at the beginning of the process can be used to cover this area.<br>• The requisite permanent drainage works and erosion protection measures should be set in place[8].<br>• Before placing topsoil, all visible weeds must be removed.<br>• The stockpiled topsoil to be spread evenly over the prepared surface on slopes of 1:3 or steeper.<br>• Topsoil placement shall occur in a phased manner, concurrent with the phased operation of the quarry. Topsoil should be placed in the same area from which it was stripped.<br>• Where amounts are inadequate to cover the entire area, more gentle slopes are to receive priority treatment.<br>• Ensure that other operators or opportunists do not re-visit closed areas and continue to remove material.<br>• Re-vegetated areas should be protected until vegetation has become established.<br>• No vehicles or equipment should access areas that have been vegetated.<br>• Any erosion channels that develop after re-vegetation should be backfilled and consolidated and the areas restored to a proper stable condition. The erosion should not be allowed to develop on a large scale before effecting repairs and all erosion damage should be repaired as soon as possible.<br>Provided these measures are implemented the quarried area can be rehabilitated and long-term impacts avoided. Please refer to section 8.3 of the Scoping Report detailing the financial provisions which are to be set aside for the rehabilitation phase. | |
| 6. Petrochemical spills from mining operational machinery. | 7 (med) | All mining equipment and vehicles are to be retained in the permitted mine area, which will be rehabilitated on closure. All spills must however be contained, placed in the hazardous waste removal containment area and removed off site to | 3 (low) |

[8] Aggregates And Sand Produces Of South Africa; The Issue Of Borrow Pits Being Used In The Aggregate And Sand Industry.

| Nature and Consequences of impact | Significance rating of impacts[7]: | Proposed mitigation and Extent to which impact can be reversed / avoided, managed or mitigated: | Significance rating of impacts after mitigation: |
|---|---|---|---|
| | | be disposed of at a licensed hazardous waste landfill site. Adequate spill kits and containers for spilled and contaminated material to be on standby on site. If a spill occurs, stop the source, contain it, clean up in accordance with MSDSs and notify relevant authorities. | |
| 7. Inadequate waste management on site. | 6 (med) | The project will see an increase in workers on site and therefore an increase in waste in the area.<br>• Littering will not be permitted in the study area;<br>• Designated waste storage areas with appropriate waste receptacles must be set up in the site camp;<br>• Waste will be removed from site and disposed of at a registered waste disposal site.<br>• No dumping is permitted. | 4 (low) |
| 8. Encroachment of alien vegetation into disturbed areas and surrounding vegetation during operation of the mine. | 8 (med) | The *Vegetation Assessment* will confirm the extent of alien invasion on the property however there is likely to be limited alien vegetation in the surrounding grassland. Alien vegetation establishment is to be tightly controlled to ensure that there is no encroachment into the surrounding natural environment. Measures to control alien encroachment will be carried out during the lifespan of the quarry.<br>This impact can be managed and mitigated. | 4 (low) |
| 9. Insufficient number of toilet facilities on site resulting in the contamination of the environment. | 7 (med) | Workers on site will require an appropriate number of toilet facilities on site.<br>• Appropriate and sufficient toilet facilities (1 toilet per 15 employees) must be provided by the applicant;<br>• All toilet facilities must be checked on a daily basis;<br>• All toilet facilities must be emptied and cleaned on a weekly basis.<br>• A registered waste removal contractor must remove effluent waste from site or effluent waste must be disposed of at a permitted Waste Water Treatment Site.<br>• Should a septic tank be required, this is to be included in the Water use Authorisation application to be submitted to DWS.<br>This impact can be managed and mitigated. | 3 (low) |
| 10. Cumulative impact on biodiversity due to further loss of vegetation and the impact on fauna. | 10 (med) | From the desktop study, the site does not fall within a critically endangered or endangered ecosystem however the state of the vegetation will be confirmed in the *Vegetation Assessment*. The EAP is to liaise with KZN Wildlife to determine | To be determined in specialist study. |

| Nature and Consequences of impact | Significance rating of impacts[7]: | Proposed mitigation and Extent to which impact can be reversed / avoided, managed or mitigated: | Significance rating of impacts after mitigation: |
|---|---|---|---|
| | | whether a *Faunal Assessment* will be required for the study area. After correspondence with KZN Wildlife, further insight into the cumulative impact on biodiversity will be available and discussed in the EIR.<br>Once mining operations are complete, topsoil must be used to cover the floor of the quarry and indigenous vegetation re-planted in the disturbed area. After effective rehabilitation fauna should move back into the disturbed area. | |
| 11. Suitability of operation with respect to surrounding land use i.e. visual impact, and impact on sense of place. | 9 (med) | The portion of land ear marked for mining is currently vacant. Due to the surrounding topography, no nearby residential households look directly onto the hill which will be mined. The quarry will be visible to Assmang, across the valley as well as some light industrial businesses to the south of the site. The visual impact is therefore negligible. No infrastructure or services running through this property will be impacted by the mining operations. The mine is ideally located in close proximity to the N3 highway where it is anticipated that development, in particular light industry, will be increasing in the future (Cato Ridge LAP, 2012).<br>Once the quarry is closed, rehabilitation of the area will take place to ensure that the excavations blend into the surrounding environment. | 7 (med) |
| 12. Positive impacts for the community include potential for local employment. | 0 (no impact) | This is a positive impact however it is to be noted that local labour must be sought, where possible, for the mining of this site. Residence near the entrance to Thornridge Farm have expressed interest in the mining operations during the notification phase. | 0 (no impact) |
| 13. Loss of indigenous vegetation within the KZN Hinterland Thornveld. There will be clearing of up to 4.99 hectares of indigenous vegetation as the mining area is expanded. | 10 (med) | This impact cannot be avoided as the entire permitted mine area, will ultimately be cleared of vegetation. The *Vegetation Assessment* will confirm the quality of the vegetation associated with the mining area and identify the presence of any threatened, protected or valuable flora species. Feedback from the vegetation specialist was received when determining the preferred quarry site alternative. The specialist categorised the vegetation in the quarry footprint as “degraded” compared to the surrounding natural thornveld. Further recommendations are to be provided by the specialist during the EIR phase. The significance of the vegetation clearing can only then be determined.<br>Vegetation is only to be cleared from within the authorised Thornridge Quarry | To be determined in specialist study. |

| Nature and Consequences of impact | Significance rating of impacts[7]: | Proposed mitigation and Extent to which impact can be reversed / avoided, managed or mitigated: | Significance rating of impacts after mitigation: |
|---|---|---|---|
| | | footprint. Scattered indigenous *Acacia* and Aloe species were identified during the site visit. Very little alien vegetation was noted.<br>It is to be noted that the vegetation type is represented in the surrounding area and will not cause the isolation of any important vegetation or wetland areas. Once mining is completed, the site will be rehabilitated back to its former state and the vegetation type will be re-introduced. Further recommendations from the vegetation specialist will be provided.<br>When vegetation clearing takes place, the contractor is to stockpile the topsoil separately in a designated area, where it can be used again during rehabilitation. | |
| 14. Noise generation during operation of plant equipment (crushing, screening and blasting) and trucks which may impact on staff and nearby residents. | 9 (med) | The nearest cluster of households are located approximately 620m north of the quarry. Due to the distance from the site, and the topography, the noise from machinery (front end loaders, excavators, screener and crusher) and trucks should not cause a nuisance to the nearby residents. Regardless, all vehicles will be fitted with standard silencers and will be maintained regularly to prevent undue noise. The noise from machinery, trucks and loading of stone will be on-going during operation and can't be completely mitigated against but can be minimised.<br>Noise from blasting will however be further addressed in the *Mine Works Plan* and *Blasting Plan*. Typically, blasting is intermittent and at maximum capacity will only occur once a week. Blasting will only occur during daylight hours. | 7 (med) |
| 15. Dust generation during excavations and on the farm access roads impacting on the air quality. | 9 (med) | The area of impact is expected to be relatively low. The existing dirt road does not pass through any populated areas (i.e. only through the vacant farm) however dust control is still required to prevent excessive dust from settling on the adjacent vegetation. Dust will require management and the applicant must comply with the National Dust Regulations (Government Notice R827, 2013) with regards to dust levels produced on site. Perimeter monitoring of dust will be conducted to monitor dust levels to ensure they remain within legislated limits.<br>Vehicle speeds must be reduced to 40kms within the quarry area and a water cart / water truck must be in operation to ensure dust is controlled. Machines to be fitted with dust suppression equipment and localised water spraying with the addition of wetting agents will also reduce dust from specific activities and equipment. If | 5 (low) |

| Nature and Consequences of impact | Significance rating of impacts[7]: | Proposed mitigation and Extent to which impact can be reversed / avoided, managed or mitigated: | Significance rating of impacts after mitigation: |
|---|---|---|---|
| | | legislated dust levels are exceeded, shielding of this equipment (use of hoods or enclosing within shade cloth barriers) as well as placement of equipment so that it is sheltered from prevailing winds will be implemented to assist in managing dust. The material being transported off site in the back of the trucks must be covered.<br>Dust generation will be primarily managed through application of water but is an impact associated with on-going operation of a quarry and even with mitigation, some dust will still be released. | |
| 16. Abstraction of water from the tributary of the uMshwati River negatively impacting downstream water users and instream fauna/flora. | 8 (med) | The property is located in Quaternary Catchment U20J which is currently closed to "stream flow reduction activities" (i.e. large scale irrigation and commercial agriculture)[9]. The volume of water to be abstracted is to be confirmed with the applicant and discussed with DWS at a pre-application meeting however it is likely that dust suppression along the dirt access road will require a maximum of 6m$^3$/day. The abstraction of this water from the watercourse is unlikely to significantly impact on the instream water quantity for downstream users and aquatic environment (to be further discussed and monitored in the WUA application). | 6 (med) |
| 17. Poor stormwater management during operation and after closure leading to erosion of the site and adjacent road. | 9 (med) | Provision must be made to control stormwater runoff, especially down the slope of the mine face. Stormwater Management during operation of the mine will be discussed in detail in the Water Use Authorisation (WUA) however the following measures will be taken to management runoff in and around the mine area:<br>• Strategic placement of diversion berms and ditches around the mine area to divert clean water away from the mine and prevent potentially contaminated run off from leaving the mine area.<br>• The ditches and berm area must be vegetated.<br>• Temporary stormwater protection measures must be established before operational activities commence.<br>• Install appropriate erosion barriers (berms or diversion ditches, sandbags) and other sediment control structures (grates or grids, geofabric) in order to prevent substances from entering exposed drains or channels.<br>• Identify steeper areas where erosion is more likely to occur and ensure | 5 (low) |

[9] Umgeni Water Masterplan for the Mooi/Mgeni Region; 2012 (http://www.umgeni.co.za/projects/infra-structuremasterplans/docs/2012/vol1/IMP_2012_Vol1_Part4d.pdf) Accessed on 12th January 2017.

| Nature and Consequences of impact | Significance rating of impacts[7]: | Proposed mitigation and Extent to which impact can be reversed / avoided, managed or mitigated: | Significance rating of impacts after mitigation: |
|---|---|---|---|
| | | adequate protection of these slopes through planting of vegetation, placement of berms or use of hessian material. Regularly check and clean material from behind erosion barriers.<br>• A sump is to be created at the lowpoint of the quarry to capture runoff from within the mine area. This water will be abstracted for dust suppression but only within the mine area. The sump may need to move as the mining area changes and moves.<br>The aim of the stormwater management is to ensure that clean water running off surrounding slopes does not enter the mine area and "dirty" water from within the mine area does not leave the mine area. This will also be assessed as part of the WUA submitted to DWS. A *Stormwater Management Programme* will be attached to the EIR. A *desktop Geohydrological Assessment* will provide input on any potential impacts to groundwater. | |
| 18. Risk to water quality on nearby watercourses and wetlands as a result of mining activities. | 7 (med) | Drainage off the mine area will flow in a south-easterly direction towards the nearest drainage line (>100m) and into the tributary of the Mshwati River at the bottom of the valley. The *Aquatic Assessment* will assess the risk to the nearby watercourses and the catchment, however the primary aim of the stormwater management plan will be to prevent run off from leaving the quarry at all.<br>The *Wetland Assessment* will also identify any wetlands within 500m / downstream of the quarry area to ensure that there is no loss of wetland / impacts to nearby wetlands.<br>In terms of mitigation, slopes that fall towards the quarry workings will be identified and berms provided to deflect run off from entering quarry operations, thereby reducing the risk of contamination. Drainage from the quarry area and especially areas where blasting takes place will be directed into a sump. This water will then either be re used on site i.e. for dust suppression which means it will drain back into the sump. Only clean water will be used for dust suppression outside the mine area i.e. on the access roads. Sediment and potentially contaminated run off is not permitted to enter the natural watercourses in the area. A *Desktop Geohydrological Assessment* will provide input on potential impacts to groundwater. | 3 (low) |
| 19. Upgrading of the road infrastructure | | Deposition of eroded material into the | |

| Nature and Consequences of impact | Significance rating of impacts[7]: | Proposed mitigation and Extent to which impact can be reversed / avoided, managed or mitigated: | Significance rating of impacts after mitigation: |
|---|---|---|---|
| where it crosses the four drainage lines negatively impacting the watercourses. | 6 (med) | drainage lines during excavations, mechanical damage to the banks and the loss of riparian vegetation were identified as potential impacts to the watercourses during the road upgrade. The existing infrastructure at the crossings will be assessed and drawings of the required upgrades will be included in the EIR. During the upgrading of the crossings, construction will be monitored by the independent Environmental control Officer with no heavy vehicles permitted to work in the drainage line itself. The upgrading of infrastructure is to take place during the dry season when it is less likely for the non-perennial drainage lines to be flowing. Any damage can therefore be rehabilitated prior to the rainy season. Apart from clearing the alien vegetation, no further riparian vegetation should be cleared during the construction as the existing footprint should be maintained. | 2 (low) |
| 20. Impact on existing services i.e. power lines. | 9 (med) | All existing services and infrastructure on the property have been identified and will not be impacted by the mining operations. Any infrastructure that is unintentionally removed must be replaced and any damage caused from the mining operations must be repaired.<br>This impact can be avoided. | 4 (low) |
| 21. Loss of a portion of DMOSS resulting in fragmentation of the open space system and potential conservation area within the Cato Ridge Area. | 11 (high) | The loss of 5 hectares of the DMOSS is to be discussed with eThekwini EPCPD during this next phase of the EIA. The proposed quarry has been positioned more than 100m from any watercourses to ensure the Mshwati catchment is not impacted by the mining activities, The loss of open space in this area cannot, however, be fully mitigated. There is the potential for the remainder of the property to be formally declared as a conservation area. Since Thornridge Farm is privately owned, the declaration of a conservation area across the remainder of the property will ensure that this valley will not be disturbed in the future. Conservation and Management Plans are currently under discussion with the applicant. A clearer vision for future development / conservation of the property will be discussed and presented in the EIR. | 9 (med) |

### 7.3 Preferred Site and Layout Alternative

See Appendix G for the full impacts scoring matrix, which assesses the impacts based on the scoring system described in section 7.1. The below impacts relates to the alternative access route (i.e. west on Allsop Road).

**Table 3: Impacts and mitigation measures associated with the *alternative* layout**

| Nature and Consequences of impact | Significance rating of impacts[10]: | Proposed mitigation and Extent to which impact can be reversed / avoided, managed or mitigated: | Significance rating of impacts after mitigation: |
|---|---|---|---|
| **Construction** | | | |
| As per the above table, construction will result in the very little activity occurring on the site and therefore no construction related impacts have been identified. | | | |
| **Operation** | | | |
| Operational impacts 1 and 2 remain the same as the preferred access alternative. | - | Mitigation measures for operational impacts 1 and 2 remain the same as the preferred alternative. | - |
| 1. Increase in heavy truck traffic as trucks enter and leave the farm, which will impact on the existing road network and traffic along these roads. | 9 (med) | The nature of the activity will result in a localised increase in haulage truck traffic onto Allsop Road towards the R103 and N3. The alternate access route, travelling west out of Thornridge Farm, passes through a small residential area where the houses are close to the main road. During notification children and domestic animals were frequently observed in the main road within this small community. Vehicles will also drive past a number of light industrial businesses where the number of heavy vehicles is much greater compared to the preferred route. The pass underneath the railway line is however double the width of the preferred access option. Further input into the traffic requirements will be included in the EIR once feedback is given from the relevant authorities. | 9 (med) |
| 2. Operational impacts 4 – 21 remain the same as the preferred access alternative. | - | Mitigation measures for operational impacts 4 - 21 remain the same as the preferred alternative. | - |

## Section 8: Plan of Study for Undertaking the EIA

### 8.1 Description of Aspects to be Assessed in the EIA, including Specialist Input, and Proposed Tasks to be Undertaken as Part of the EIA as Per Section 2 (i) (ii), (iii) and (viii)

No fatal flaws or red flags have been identified in the Scoping Report however all identified impacts will be further investigation and assessed in the EIA phase of the project. Additional impacts may be added to the Impacts Table on receipt of the various specialist reports.

#### 8.1.1 Specialist Assessments

The following specialist reports are underway and will be included in the EIR:

##### *8.1.1.1* ***Blasting Plan***

Cato Ridge Quarry (Pty) Ltd will provide the blasting methodology and detail management measures to be undertaken during the operation of the Thornridge Quarry. The Blasting Plan will determine Peak Particle Velocities (PPV) at varying distance intervals from the quarry so that potential impacts on nearby structures can be determined, this will also provide necessary information to adjust timing and size of blasts to

[10] See Appendix H for more details.

minimise potential impacts. The Blasting Plan will ensure that the blasting is managed to minimise adverse impacts on the surrounding infrastructure and environment. It will also provide clear definitions of the roles and responsibilities for employees and contractors working at the Thornridge Quarry.

#### *8.1.1.2* ***Fauna Assessment***

KZN Wildlife will be consulted to determine whether a Faunal Assessment will be required for the study area and the requirements for the faunal assessment.

#### *8.1.1.3* ***Geotechnical and Desktop Geohydrological Investigation***

GeoZone GeoServices are the independent geotechnical engineers which will be preparing a detailed Geotechnical Investigation for the property showing the underlying Geology. On site tests have been carried out and the results of the laboratory tests will be presented. Material suitability will be discussed and possible quarry constraints. Recommendations to prevent collapse of the mine face as well as other general recommendations for mine safety will be provided by the engineer. Geomeasure will prepare the desktop geohydrological report wherein they will collect and review available information and carry out a qualitative preliminary risk assessment and review. The report will include a hydrocensus, indicating boreholes within 5km of the site and an indication of risk to groundwater as a result of the operation.

#### *8.1.1.4* ***Heritage Impact Assessment***

Active Heritage will undertake a Heritage Impact Assessment for the proposed development in terms of the KwaZulu Heritage Act No. 10 of 1997. The specialist will review existing databases and literature relevant to the site and document coordinates of any heritage features. The Heritage Impact Assessment is not limited to archaeological artefacts, historical buildings and graves but includes intangible and invisible resources such as places, oral traditions and rituals. In the KwaZulu-Natal Heritage Act 1997 a heritage resource is defined any place or object of cultural significance i.e. of aesthetic, architectural, historical, scientific, social, spiritual, linguistic or technological value or significance.

#### *8.1.1.5* ***Mine Works Programme***

Cato Ridge Quarry (Pty) Ltd will prepare the proposed mine works programme identifying the methodology / technique for mining the mineral at the Thornridge Quarry. Maps showing the mine design and schematic mining schedule will be provide. The Mine Works Programme includes details of infrastructure required on the site (office, access road, water source etc.).

#### *8.1.1.6* ***Stormwater Management Programme***

Cato Ridge Quarry (Pty) Ltd will include a detailed, site specific Stormwater Management Programme in the Mine Works Programme. The Stormwater Management Programme will include measures to ensuring that only clean water enters the surrounding environment. The Stormwater management Plan should include calculations to ensure that the site can be sufficiently managed during a flood event. Dimensions of the proposed sump which is to be created in the centre to capture runoff from within the mine area (to be used for onsite dust suppression) will be included.

#### *8.1.1.7* ***Traffic Impact Assessment***

An assessment of the current state of the local road network. By calculating the expected trip generation rate of the Thornridge Quarry, recommendations on the best access route will be provided and whether any upgrades are required to ensure that there is no strain on the local road network.

#### *8.1.1.8* ***Vegetation Assessment***

David Styles has undertaken a detailed study of the property to ascertain the composition and importance of the vegetation associated with the mine area. The assessment will include a full reconnaissance of the property to map the vegetation communities followed by plot based fieldwork. A report including a species list and relevant GIS work and mapping will be provided. The report is to fulfil the DMR and Ezemvelo KZN Wildlife standards. Comment is to be provided on the local biodiversity.

#### *8.1.1.9* **Wetland and Aquatic Assessment**

The Biodiversity Company have carried out a study which will include a wetland assessment (where applicable) and an aquatic assessment of local rivers and streams affected by the project, in order to ensure that all legislative requirements are fulfilled. In accordance with DWS, a radius of 500m around the project area has been assessed for the presence of wetland systems. The following will be included in the reports:

**Aquatic assessment**

1. Description of site;
2. Show the extent of the riparian habitat;

3. Determine the Present Ecological State of the watercourses;
4. Determine the Ecological importance and sensitivity (EIS) of the watercourses;
5. Assess impact of proposal on watercourse / biota etc.;
6. Provide mitigation measures to reduce / prevent impact; and
8. Provide monitoring program if required.

**Wetlands**
1. Confirm and show on map a 500m radius around the site and indicate the location of wetlands within 500m of the site.
2. Provide the following for each and every wetland
    a. Delineate boundary
    b. PES
    c. EIS
    d. EI
4. Assess impact of proposal on the 4 wetland drivers
5. Complete wetland risk matrix as required by DWS
6. Provide mitigation measures to reduce / prevent impact
8. Provide monitoring program if required.

**Scope of Work Wetland Assessment**
**Wetland delineation**
The wetland areas will be delineated in accordance with the DWAF (2005) guidelines. The outer edge of the wetland areas will be identified by considering the following four specific indicators:

- The Terrain Unit Indicator helps to identify those parts of the landscape where wetlands are more likely to occur.
- The Soil Form Indicator identifies the soil forms, as defined by the Soil Classification Working Group (1991), which are associated with prolonged and frequent saturation.
- The Soil Wetness Indicator identifies the morphological "signatures" developed in the soil profile as a result of prolonged and frequent saturation.
- The Vegetation Indicator identifies hydrophilic vegetation associated with frequently saturated soils.

**Riparian delineation**
The riparian areas will be delineated in accordance with the DWAF (2005) guidelines. The riparian areas will be identified by considering the following specific indicators:

- Are associated with a watercourse.
- Contain distinctively different plant species than adjacent areas; and contain species similar to adjacent areas but exhibiting more vigorous or robust growth forms.
- May have alluvial soils.

**WET-EcoServices**
WET-EcoServices will be implemented to assess the goods and services that the individual wetlands provide. The identified wetland areas will be characterised into hydro-geomorphic wetland types based primarily on interpretation of aerial photographs. Individual wetlands will then be assessed at a desktop assessment level (Level 1) and ground-truthed (Level 2).

**WET-Health**
WET-Health will be implemented to assess the health or integrity of the wetlands in order to measure the deviation of wetland structure and function from the wetland's natural reference condition. This technique will assess hydrological, geomorphological and vegetation health in three separate modules.

**Scope of Work Aquatic Assessment**
The ecological classification (EcoClassification) of the systems will require the determination and categorisation of the Present Ecological State (PES; health or integrity) of individual biophysical attributes, and then comparing these findings to the natural or close to natural reference conditions, as well as previous biomonitoring projects (where possible). These biophysical attributes refer to the drivers and biological responses of an aquatic ecosystem. The acquired data can be used to establish spatial and temporal trends of the biotic integrity of the aquatic systems. As per the requirements of the WULs, the biophysical attributes that will be included for the study are the following:
The abiotic driver assessment:

- *In situ* water quality (DWAF standards for aquatic ecology).
- The Invertebrate Habitat Assessment System (IHAS).
- The Intermediate Habitat Integrity Assessment (IHIA).

The biotic response indicator assessment:

- South African Scoring System ver 5 (SASS 5).
- The Average Score Per Taxon (ASPT).
- Macroinvertabrate Response Assessment Index (MIRAI).
- Fish Response Assessment Index (FRAI).

### 8.1.2 Other Proposed Tasks

Mitigation measures and recommendations made by the specialists will be included in a site specific Environmental Management Programme (EMPr), to be complied during the next phase of the EIA. The EIA phase aims to adequately assess and address all the environmental impacts which have been identified throughout the EIA, to provide DMR with sufficient information to make an informed decision regarding the proposed mining application.

Consultation will continue with eThekwini Municipality, the Ward Councillor, DWS, KZN Wildlife and other authorities listed in the I & AP Register (Appendix E). Any other I & APs identified during the EIA phase will be included in the I & AP register and sufficient time provided to the I & APs to comment on the EIA reports. Consultation with authorities and I & APs is therefore a continuous process that takes place until completion of the environmental investigations.

Table 5 below provides the plan of study for the remainder of the EIA according to legislated timelines provided in the Environmental Impact Assessment Regulations, 2014 published on the 04th December 2014 in Government Gazette No. 38282 Notice No. R.982.

**Table 4: Plan of Study for the EIA process for the Thornridge Quarry**

| Date | Description |
|---|---|
| 23rd November 2016 | DMR Acceptance of Mining Application received |
| 28th November 2016 | Extension request to submit Scoping Report in New Year approved by DMR |
| 16th January 2017 | Release of Draft Scoping Report to I & APs for comment |
| 14th February 2017 | End 30 day comment period |
| 17th February 2017 | Submission of Final Scoping Report to DMR. Final Scoping Report to include any comments received from I & APs. |
| 03rd April 2017 | Deadline for DMR to accept or reject Scoping Report (within 43 days of receipt of Scoping Report). |
| ~ 26th June 2017 | Provided that the Scoping Report is accepted, the EIR will be released for I & AP comment (106 days from receipt of acceptance of Scoping Report). EIR to include all specialist studies listed above and updated impacts table. |
| ~ 26th July 2017 | End 30 day comment period |
| ~ 31st July 2017 | Submission of Final EIR to DMR (within 106 days of acceptance of Scoping Report). |
| ~ 17th November 2017 | Deadline for DMR to accept or reject EIR (within 107 days of receipt of the EIR). |

## 8.2 Methodology for Assessment of Environmental Aspects as Per Section 2 (i) (iv), (v) and (ix)

The impacts identified in the Impacts Table (section 7.0 above) as well as additional impacts raised in the specialist reports will be discussed in further detail in the EIR. The same methodology described in section 7.1 above for rating impacts identified in the Scoping Report, will be used to assess the environmental aspects in the EIR however the ratings will be more accurate with input from the specialists.

The duration / frequency of the activity and likely impacts associated with that activity during construction, operation and closure will be rated. The geographical extent of the impact will be assessed as well as the severity levels and consequences should the impact occur. Probability of the impact occurring will be taken into account. Whether or not the impact can be mitigated and the extent to which it can be avoided, managed, mitigated or reversed is assessed i.e. the probability of occurrence after mitigation has been applied. Based on all of these factors, the impact is then rated to determine its significance. Table 1 above

explains the scoring system that will be used in the EIR to rate the significance of the impacts before and after mitigation.

### 8.3 Financial Provisions

Financial provision is required for rehabilitation of the site once mining is complete. The applicant is responsible for and must ensure that the site has been rehabilitated in full before leaving the site. This financial provision depends on the size and state of the cleared area requiring rehabilitation. The following tables, extracted from the DMR standard rehabilitation guideline[11], provide guidance on rehabilitation fees applicable for mines based on sensitivity and area affected. A more comprehensive break down of the annual and closure rehabilitation costs will be provided in the EIR according to the "*Regulations pertaining to the Financial Provision for Prospecting, Exploration, Mining or Production Operations*". The tables below are based on a desktop assessment and will change in the EIR depending on input from the Mine Works Programme. The highlighted items are applicable to the site in question.

**Table 5: DMR sensitivity ratings for mines**

| Sensitivity | Sensitivity criteria | | |
|---|---|---|---|
| | **Biophysical** | **Social** | **Economic** |
| **Low** | • Largely disturbed from natural state.<br>• Limited natural fauna and flora remains.<br>• Exotic plant species evident.<br>• Unplanned development.<br>• Water resources disturbed and impaired. | • The local communities are not within sighting distance of the mining operation.<br>• Lightly inhabited area (rural). | • The area is insensitive to development.<br>• The area is not a major source of income to the local communities. |
| **Medium** | • Mix of natural and exotic fauna and flora.<br>• Development is a mix of disturbed and undisturbed areas, within an overall planned framework.<br>• Water resources are well controlled. | • The local communities are in the proximity of the mining operation (within sighting distance).<br>• Peri-urban area with density aligned with a development framework.<br>• Area developed with an established infrastructure. | • The area has a balanced economic development where a degree of income for the local communities is derived from the area.<br>• The economic activity could be influenced by indiscriminate development. |
| **High** | • Largely in natural state.<br>• Vibrant fauna and flora, with species diversity and abundance matching the nature of the area.<br>• Well planned development.<br>• Area forms part of an overall ecological regime of conservation value.<br>• Water resources emulate their original state. | • The local communities are in close proximity of the mining operation (on the boundary of the mine).<br>• Densely inhabited area (urban/dense settlements).<br>• Developed and well-established communities | • The local communities derive the bulk of their income directly from the area.<br>• The area is sensitive to development that could compromise the existing economic activity. |

**Table 6: Rates (per Ha) to determine financial provision.**

| | Environmental Sensitivity of mine area | | |
|---|---|---|---|
| | **Low** | **Medium** | **High** |
| **Rate per hectare to determine the quantum (rands)** | 20 000.00 | 50 000.00 | 60 000.00 |

[11] DMR Financial Provision Guideline, 2005.

| | |
|---|---|
| **Minimum amount** | R10 000.00 |

As per Tables 5 and 6 above, the sensitivity of the site is medium and therefore, according to the standard DMR guideline for determining financial provision for a site of 4.99 ha in a 'medium sensitivity' area, this would amount to approximately R249 500.

The DMR standard rehabilitation guideline[12] has been used in conjunction with the costing spreadsheet below. As per Table 7 below, the rehabilitation cost for rehabilitating this site measuring 4.99 ha is R186 000. An average between the two amounts is therefore an estimated closure rehabilitation fee of R217 750 (to be confirmed after finer calculations at the next phase of the assessment).

**Table 7: Anticipated rehabilitation costs for the Thornridge Quarry**

| **Rehabilitation cost estimate** | | | | |
|---|---|---|---|---|
| Description | UNIT | QTY | RATE | Amount R |
| **LANDSCAPING AND PLANTING** | | | | |
| Trimming | $m^2$ | 5000 | 4 | R20 000 |
| **Preparing areas for grassing** | | | | |
| Topsoiling within the quarry area | $m^3$ | 5000 | 15 | R75 000 |
| **GRASSING** | | | | |
| Hydroseeding | ha | 4 | 15000 | R60 000 |
| **LABOUR** | | | | |
| Unskilled labour | Hour | 100 | 20 | R2 000 |
| Semi-Skilled | Hour | 80 | 30 | R2 400 |
| Skilled | Hour | 100 | 60 | R6 000 |
| **PLANT WORK** | | | | |
| Tracked excavator (Bell HD 820 or similar) | Hour | 20 | 300 | R6 000 |
| Tracked Loader Backhoe (CAT 428 or similar) | Hour | 20 | 220 | R4 400 |
| Tip Truck ($10m^3$) | Hour | 20 | 225 | R4 500 |
| Water Tanker (10 000 litre) | Hour | 30 | 190 | R5 700 |
| **Total** | | | | **R186 000** |

### 8.4 Conclusion

The intent of this Scoping Report has been to provide a background to the proposal and a description of the site and activities so that I & APs and authorities can provide preliminary feedback on the proposal for further investigation in the EIR. All information provided should be considered introductory subject to further investigation and confirmation as per the plan of study for EIA. The public participation process should be seen as ongoing and I & APs will continue to be given opportunities to review and comment on all information pertaining to the proposal. At this stage, no fatal flaws have been identified and therefore the EAP concludes that the project continue to the next stage of the EIA process.

[12] DMR Financial Provision Guideline, 2005.

## Appendix A: EAP Declaration and Curriculum Vitae

**Appendix B: Proof of Placement of Notice Board**

## Appendix C: Adverts

## Appendix D: Proof of Notification

- LO
- Adjacent LO
- Authorities and I & APs

## Appendix E: Registered I &Aps

## Appendix F: Comments and Response Table and Comments Received

**Appendix G: Impacts Scoring Matrix**