PROPOSED MINING RIGHT OVER A PORTION OF PORTION 3 OF THE FARM THE ORCHARDS NO 223, ALBANY MAGISTERIAL DISTRICT, EASTERN CAPE PROVINCE

STORM WATER MANAGEMENT PLAN

DEPARTMENTAL REFERENCE NUMBER:

EC 30/5/1/2/2/10069 MR

APRIL 2024

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1. INTRODUCTION

Grahamstown Brick (Pty) Ltd t/a Makana Brick (hereafter referred to as Makana Brick) held a mining permit with reference number EC 30/5/1/3/2/10397 MP over 4.95 ha of Portion 3 of the farm The Orchards No 233 in the Makhanda area. The mining permit allowed the mining of Ball Clay, Clay (General), Gravel and Kaolin from the approved area. This permit lapsed on 22 July 2023 and can no longer be renewed as the first, second and third renewals were already granted.

Subsequently, the Applicant, Makhanda Mining (Pty) Ltd, applied for environmental authorisation, and a mining right to win ball clay, clay (general), gravel, kaolin, and aggregate from 43.4688 ha of the above mentioned property.

Upon commencement, the proposed project will trigger listed activities in terms of the National Environmental Management Act, 1998 (Act 107 of 1998) and the Environmental Impact Assessment Regulations 2014 (as amended) and therefore requires an environmental impact assessment (EIA). Greenmined Environmental (Pty) Ltd ("Greenmined") is the consultants responsible for the mining right and environmental authorisation application. Considering this, the Storm Water Management Plan was accordingly drafted to propose methods for removing, reducing, or retarding run-off flows, and prevent targeted storm water run-off constituents, pollutants, and contaminants from reaching receiving waters.

2. OBJECTIVE OF STORM-WATER MANAGEMENT

The objective to proper storm water management is to:

- Prevent the contamination of clean runoff,
- Contain dirty water, dispose, or treat it in an environmental responsible manner,
- Prevent soil erosion because of increased runoff from the mining area, and
- Prevent the loss of stockpiled topsoil to be used during the rehabilitation phase.

This Storm Water Management Plan must be seen as a dynamic document that must biennially be reviewed and adjusted to the site specific conditions experienced at the proposed mine.

3. PROJECT DESCRIPTION

As mentioned earlier, an application for a mining right to win ball clay, clay (general), gravel, kaolin, and aggregate from the above mentioned property was lodged with the DMRE.

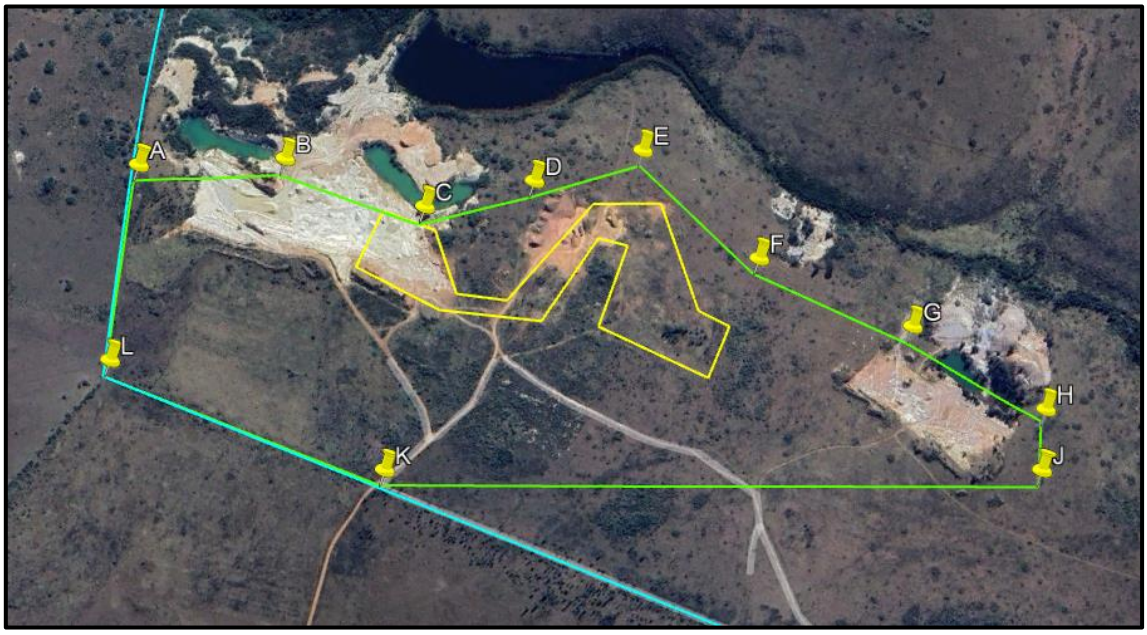

Figure 1: Satellite view showing the location of the proposed mining area (green polygon) in relation to the surrounding landscape where the yellow polygon indicates the old Makana Brick mining permit area, and the blue lines show the boundary of Portion 3 of The Orchards No 233. (Image obtained from Google Earth).

The Applicant intends to extract the clay from the mining area using opencast methods. A bulldozer, loader and tipper trucks will be used to win the clay and transport it to the Makana Brick Factory where it will be delivered to the factory and stockpiled until used for clay bricks. The Applicant also intends to sell the unwanted overburden removed from the clay mining area as aggregate. If needed, the aggregate will be processed at a mobile crushing and screening plant to reduce it to various sized stockpiles, from where it will be transported to clients via trucks and trailers. All activities will be contained within the approved boundaries of the site.

The proposed project will therefore entail the following:

- Introduction of mining equipment, stripping, and stockpiling of topsoil and overburden;
- Excavation of the mining area;
- Screening and processing of aggregates (when needed);
- Stockpile of mined minerals until it is transported to Makana Brick, alternatively collected by clients;
- Slope, landscape, and rehabilitate the affected areas upon closure of the mine.

The proposed processing infrastructure will be of temporary and mobile nature, and only an ablution hut needs to be placed to allow the proposed project. The Applicant will make use of the existing roads, no electricity is needed as the crusher plant (when needed) will be powered with generators, and water will be obtained from Makana Brick and transported to site.

Mining will be >100 m from the adjacent Botha's River and associated dams and the project therefore does not trigger regulated activities in terms of the National Water Act, 1998.

4. SITE CHARACTERISTICS

Climate:

Makhanda experiences its highest temperatures during the summer months (December – February) with peaks of up to 27°C; thereafter the mercury drops to lows of 13°C during July/August. According to Clima-Data.org the average rainfall of the Makhanda area is 590 mm/year. The prevailing wind direction of the Makhanda region is in a north to south-westerly, direction with an average wind speed of ±10 knots (±18.52 km/h).

Topography:

The topography of the greater study area is highly undulating, and the area has elevations ranging between ±534 – ±663 mamsl. The study area is generally described as level plains with some relief, varying to open high hills or ridges (SES, 2017).

The proposed mining area is situated on a fairly flat slope with a gradient decreasing from south to north, towards the Botha's River and very slight upslope from west to east. Further north the topography rises more prominently from Botha's Ridge and further south are more defined ridges and valleys. The proposed mining area extends across three mined areas, to the west is the mining area of the landowner Mr Moss, and to the east the old mining permit areas of Makana Brick and Collingham Mining.

The proposed mine is situated on an area with an average slope of 3.9% (-4.8%), and a max slope of 25.4% (-42.0%) over 1.6 km as presented in the following image.

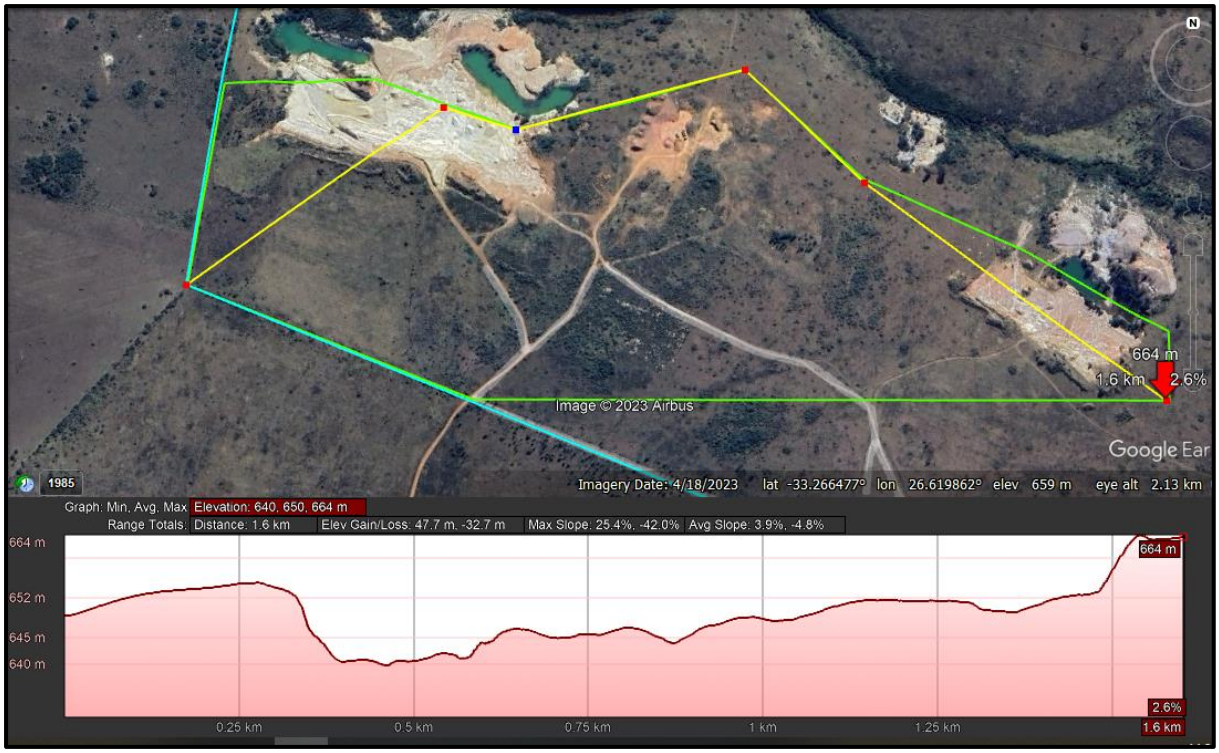

Figure 2: Elevation profile of the proposed mining area (image obtained from Google Earth).

Hydrology:

The study area is situated in the Fish sub-water management area that forms part of the Fish to Tsitsikama Water Management Area (ID 16). According to the National Freshwater Ecosystem Priority Areas (NFEPA) map as presented by SANBI, the study area falls within a NFEPA in terms of wetlands and/or rivers. The proposed mining footprint does not extend into any strategic water management area.

The study area falls within the Botha's River catchment area and this small river is more than 100 m away from the mine boundary. The Botha's River is a tributary of the Great Fish River and feeds two large man-made dams, which together with several smaller dams and numerous seasonal pans provide important water sources to animals (SES, 2017). The 2017 EMPR of Makana Brick notes that the Botha's River ecological status is classified as AB condition, which is considered intact and able to contribute towards river ecosystem biodiversity targets. SES reported in 2017 that an assessment of the Botha's River revealed three man-made dams/weirs within 2.5 km from each other, alien vegetation along the riverbanks and cultivation lands on the riverbanks. The AB classification for the river might be applicable to the lower reaches of the river, but not for the upper reach.

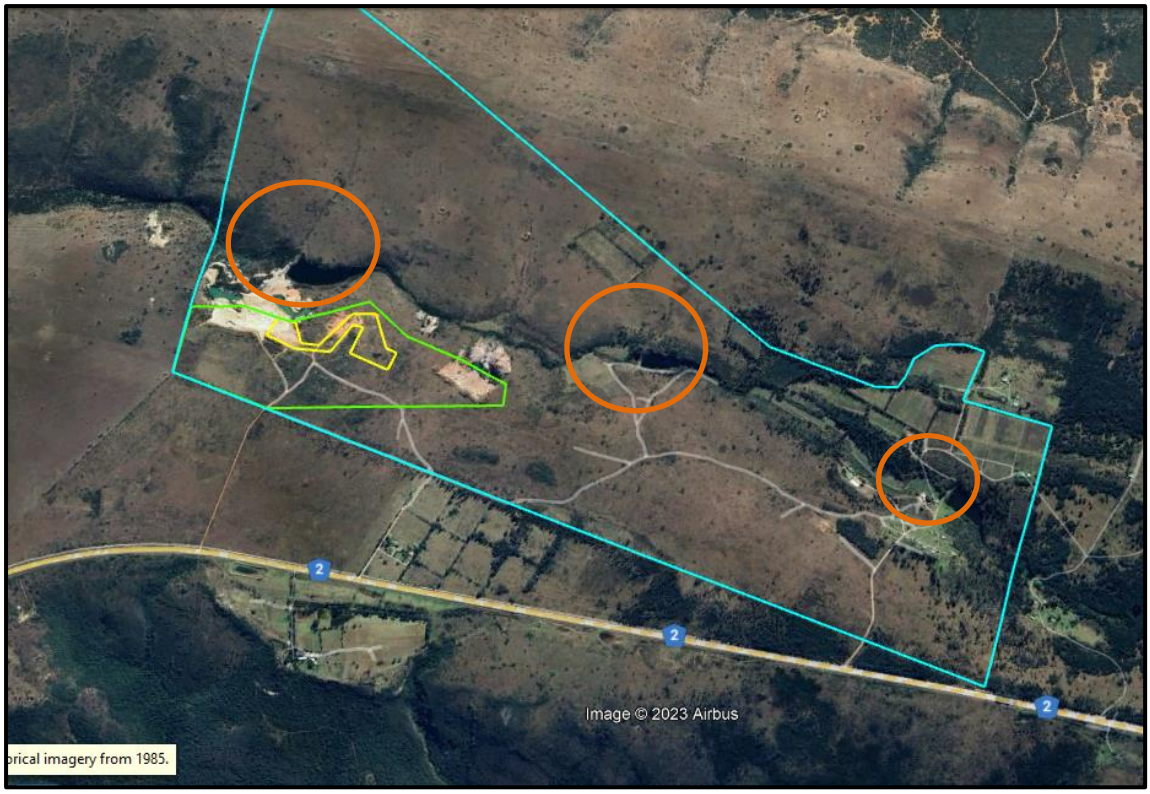

Figure 3: Satellite view of the Botha's River where the orange circles show the man-made dams/weirs. The green polygon shows the mining right application area, the yellow polygon indicates the mining permit area, and the blue polygon shows the farm boundary (image obtained from Google Earth).

The Albany Coast south and east of Grahamstown (Makhanda) has an elevated borehole concentration, with most boreholes situated in the fractured Witteberg Aquifer, and to a lesser degree, within the primary intergranular Algoa Aquifer and coastal dune belt. Groundwater is under-utilized in the Albany Coastal sub-area. Groundwater depth also varies in this area between 70 -120 m (SES, 2017).

Mining will not alter the drainage patterns. During the operational phase, there is always the risk that water quality can be affected through an increase in suspended and dissolved solids since cay material could potentially release a high sediment load during sheet wash. However, water from the quarry will accumulate in the existing retention ponds and this water will not drain into the surroundings. The Botha's River will not be impacted by mining since the mine boundary is more than 100 m away from the stream bank. The farm already has three retention ponds (following figure) along the northern boundary of the proposed mining footprint where runoff water can be directed to. The retention ponds trap silt loaded storm water whereafter the water can be used for irrigation by the MR Holder and/or landowner. It will be the responsibility of the MR Holder to constantly monitor the capacity of the retention ponds to prevent run-off water spilling into the environment. The retention ponds will remain post mining to be used by the landowner.

Figure 4: Satellite view of the retention ponds along the northern boundary of the proposed mining footprint (green polygon) (image obtained from Google Earth).

5. EROSION RISK

The removal of vegetation and disturbance of soil, makes an area vulnerable to erosion. Erosion occurs as flowing or falling water picks up particles of soil, gravel, stone, or rock. A lack of roots within soil makes it easier for it to be lifted by water. Vegetation also serves to slow the speed of water, and a lack of vegetation means that falling rain and flowing run-off has more energy to pick up greater volumes and sizes of particles. Bare soil therefore is prone to be washed away and bare areas facilitate erosion downstream.

At the proposed mining area downslope erosion, during the operational phase, can be caused by run-off accumulation from the mining excavation. Water running from denuded areas contains higher sediment loads, and therefore, channelled run-off from active or un-rehabilitated mine areas must be slowed and controlled. By planning the layout and position of the excavation with a sufficient erosion and rehabilitation plan in place the potential for erosion to occur can be maintained to an absolute minimum and localised, avoiding such impact to the surrounding areas.

6. STORM WATER MANAGEMENT

In order to adequately manage the storm water at the mining area, the following mitigation measures must be implemented for the duration of the site establishment-, operational- and decommissioning phases:

» Mining must be conducted only in accordance with the Best Practice Guideline for small scale mining that relates to storm water management, erosion and sediment control and waste management, developed by the Department of Water and Sanitation (DWS), and any other conditions which that Department may impose:
  - Clean water (e.g. rainwater) must be kept clean and be routed to a natural watercourse by a system separate from the dirty water system. Prevent clean water from running or spilling into dirty water systems.
  - Dirty water must be collected and contained in a system separate from the clean water system.
  - Dirty water must be prevented from spilling or seeping into clean water systems.
  - The storm water management plan must apply for the entire life cycle of the mine and over different hydrological cycles (rainfall patterns).

» The applicant must ensure that land clearing is minimised in areas with a bigger slope to limit the amount of runoff from the site to prevent erosion. It is recommended that the land clearing be done during dry seasons to avoid water runoff into the watercourse thus affecting the water quality.

» Areas cleared of vegetation must weekly be monitored, after larger rainfall events, to determine where erosion may initiate. These areas must be reinstated by modifying the soil micro-topography and revegetation or implementing soil erosion control efforts accordingly.

» Drainage must be controlled to ensure that runoff from the mining area does not culminate in off-site pollution, flooding or result in any damage to properties downstream or any storm water discharge points.

» Erosion control measures must be put in place to minimise erosion along the proposed mining areas. Extra precautions must be taken in areas where the soils are deemed highly erodible. These measures could include the use of sandbags, hessian sheets, bidim, retention or replacement of vegetation.

» Necessary precautions must be taken to ensure that floodwaters are diverted around the processing/stockpile- and excavation areas by means of berms.

» Stockpiling of soil or any other materials during the operational phase must not be allowed on or near steep slopes, near a watercourse or water body. This is to prevent pollution or the impediment of surface run-off. The Applicant must control and establish suitable mitigation measures to prevent the erosion of stockpiles.

- Where possible, storm water (and road-surface run-off) must be redirected towards the surrounding vegetated areas to increase groundwater infiltration, thereby providing sufficient soil moisture to support the vegetation cover (ensure that this water is slowed down, not channelized and spread out across the surface in order to prevent this water flow from causing erosion – where erosion signs are present prompt actions and measures should be taken to rehabilitate these areas and prevent erosion from occurring in these areas in the future).

- Silt traps must be used where there is a danger of topsoil or material stockpiles eroding and entering the river and other sensitive areas.

- If and where possible, rehabilitation of disturbed areas should be done concurrently with the mining activities to avoid erosion of bare soil. To reduce runoff, reinstated soil must be vegetated as soon as possible to restore soil properties. If erosion occurs on the slopes, it should be curbed by infill material obtained from the active mining area.

- No activities may take place, without the necessary authorisation from the DWS, within a horizontal distance of 100 m from any watercourse or estuary or within a 500 m radius from a delineated boundary of any wetland or pan. The 100 m between the river and the mine must be treated as a no-go area and all employees must be educated accordingly.

- Roads and other disturbed areas within the project area must be regularly monitored for erosion and problem areas must receive follow-up monitoring to assess the success of the remediation.

- Any erosion problems within the mining area because of the mining activities observed must be rectified immediately (within 48 hours) and monitored thereafter to ensure that it does not re-occur.

- If there is any channelled run-off from active or un-rehabilitated mine areas it must be slowed down by installing temporary sediment traps, such as small sandbag impoundments. These impounding structures must still allow all water to return to the natural river channels and may not be used to capture additional water for agricultural purposed.

- Mining activities must be reduced after large rainfall events when the soils are wet. No driving off of designated hardened roads may occur immediately following large rainfall events until soils have dried out and the risk of bogging down has decreased.

» All bare areas, due to mining, must be revegetated as soon as possible with a cover crop to bind the soil and limit erosion potential.

» Site management must implement good housekeeping practices and prevent leakage of hydrocarbons or other chemicals, and strictly prohibit littering of any kind.

» The storm water management plan must be reviewed biennially and adjusted to reflect the specific site conditions relating to storm water control.

7. REHABILITATION

Rehabiliation of the mining area must be in accordance with the closure objectives and actions listed in the EMPR and Closure Plan of the mine. In the medium term, rehabilitation will entail the continuous reinstatement of mined areas, and the management of weeds and invasive plant species. In the long term, rehabilitation will involve the reinstatement of the stockpiling/processing area by removing the stockpiled material and site infrastructure/equipment and landscaping the disturbed footprints. The MR holder will further be responsible for the seeding of all rehabilitated areas. The right holder will also comply with the minimum closure objectives as prescribed by DMRE and listed in the Closure Plan (attached as Appendix L to the Environmental Impact Assessment Report).

8. SIGNATURE OF AUTHOR

NAME	SIGNATURE	DATE
Christine Fouche		28 March 2024