

Mining Method

1.6.5.1 Drilling

Drilling is conducted on a level surface with 60R and GD 120 drills. Drill holes are 251 mm in diameter and are drilled 12.5 m deep to secure 10 m benches in the pit. Water is added in the drill process to suppress dust generated.

1.6.5.2 Blasting

Drill holes are charged with 400 kg ANFO or HEF 100 emulsion in the areas where the holes are water logged. Each hole contains ANFO and a 400 grain Pentolite booster and detonator in the booster. The Pentolite booster is connected to the surface via a shock tube. The booster is approximately 3 m from the bottom of the hole and the last 5 m of the hole is tamped with drill chips. The blast is set off with a 1.2 m long safety fuse which burns for approximately 4 minutes.

Blasting takes place once a week in each pit.

1.6.5.3 Loading

Blasted material is loaded onto 170 t haul trucks with 2300 and 2100 P&H shovels. Rubber wheel CAT 992 loaders or a Liebherr Mechanical shovel are used to select ore in confined areas or where mixing has occurred or where the larger shovels can not separate the ore and the waste (selective mining).

1.6.5.4 Hauling

Ore is transported to the ore passes at Donkerpoort and Van der Bijl crusher via haul trucks. The waste is transported to the waste tips on the side of the mountains.



Trucks on Dust-A-Side haul road**Typical mining operations****Dumping waste rock on side of the mountain**

1.6.5.5 Roads

CAT m16 graders are used to grade the roads in the pit to secure an even surface for the haul trucks. All haul roads are sprayed with Dust-A-Side to ensure an even surface for transport of iron ore. These haul roads are approximately 26 m wide and has a total collective length of **x km.**

1.6.5.6 Dust suppression

Dust suppression in the pits is conducted by 100 t water bowsers which spray water on the haul roads. The rest of the haul roads are covered with Dust-A-Side to prevent dust generation.

1.6.5.7 Pit layout

Figure 9 and **Figure 10** depict the layout of a typical pit at Thabazimbi Mine. The figures provide for a side view and top view of the pit. The figures indicate the various sections of a typical pit as well as the cut-out view of the benches in the pit.

1.6.5.8 Ore flow

Figure 11 provides information regarding the flow of ore once it is deposited from the east and west pits into the different crushers. The diagram furthermore provides information regarding the plant activities and the final storage of the product prior to it being reclaimed and placed on a railway trucks destined for one of the Mittal Steel factories.

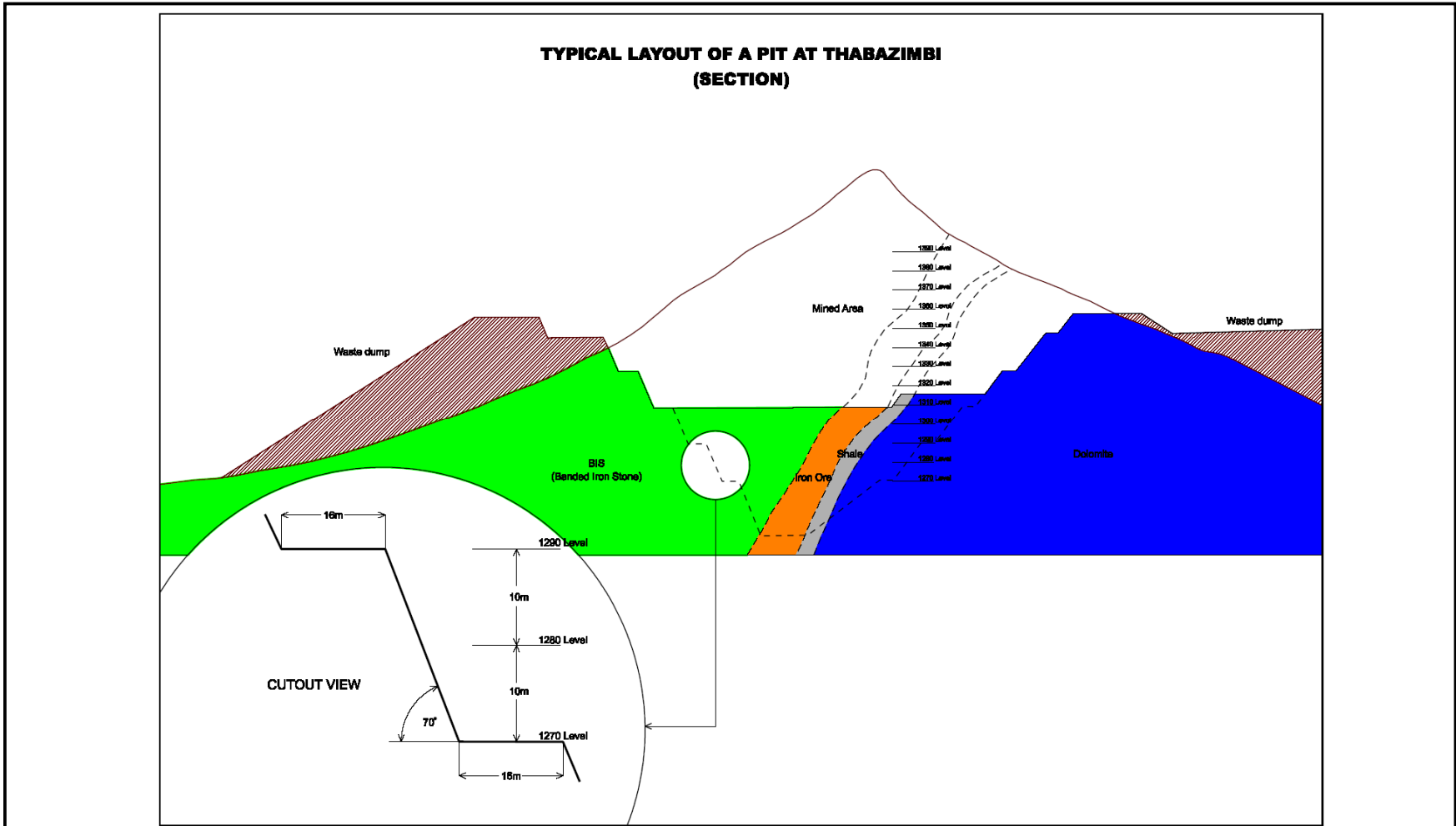


Figure 1: Side view of Pit Layout

KUMBA Iron Ore – Thabazimbi Mine

Project: Revised EMP

Ref nr: KIOTM-REMP/Fig11

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TYPICAL PIT AT THABAZIMBI IRON ORE MINE

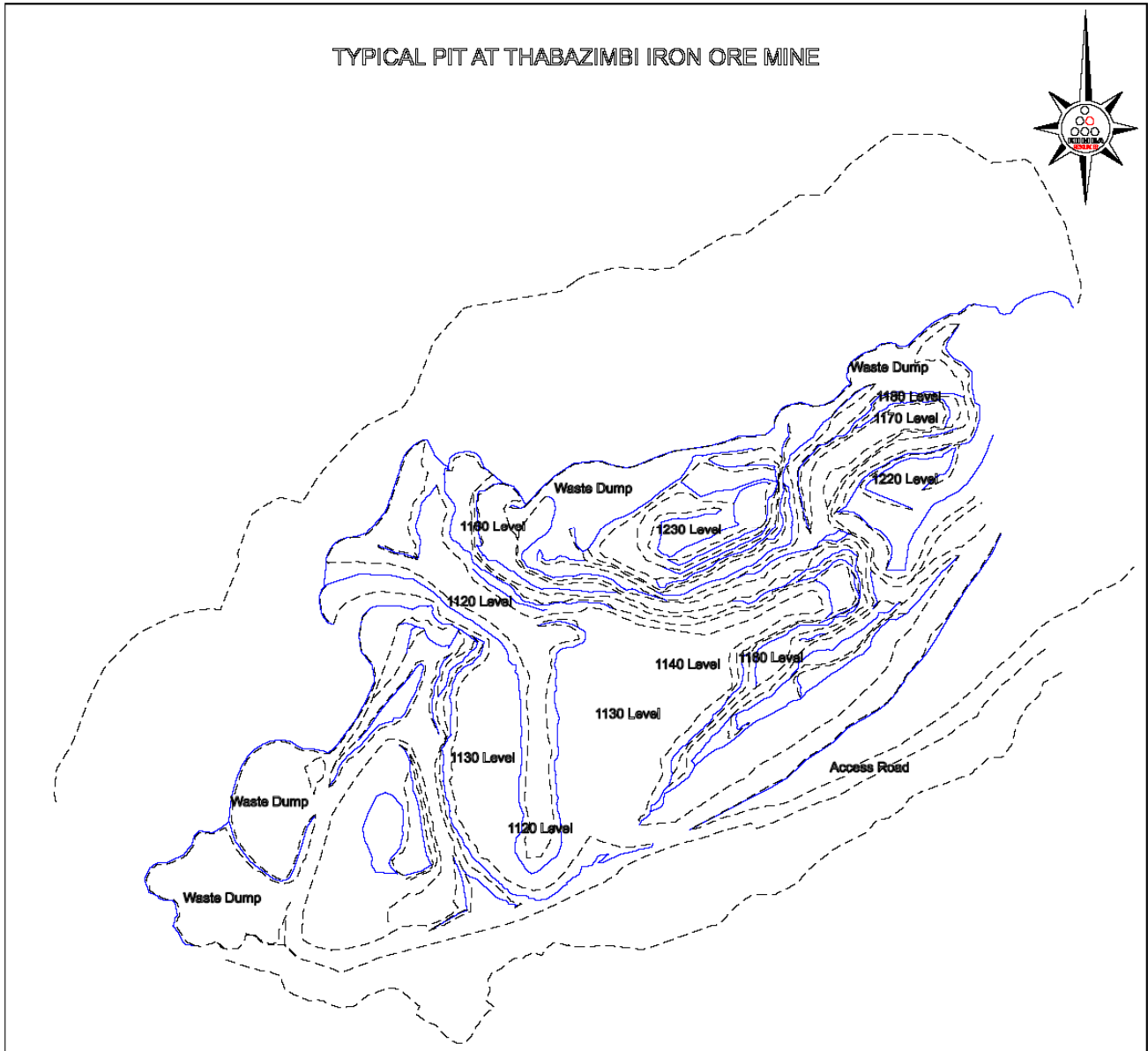


Figure 2: Top view of typical Pit

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SCHEMATIC DIAGRAM OF THE BENEFICATION PLANT

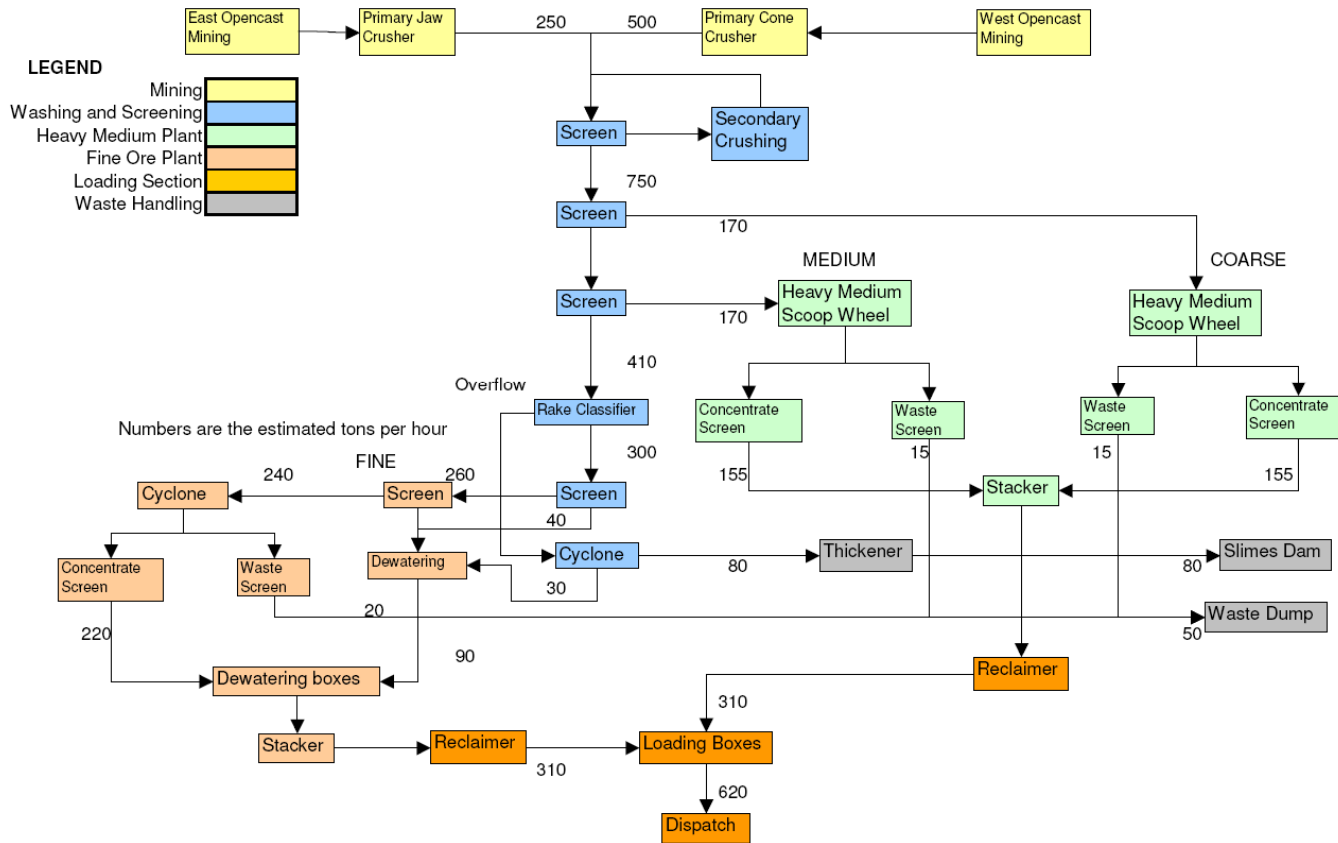


Figure 3: Ore Flow Diagram

KUMBA Iron Ore – Thabazimbi Mine

Project: Revised EMP

Ref nr: KIOTM-REMP/Fig1

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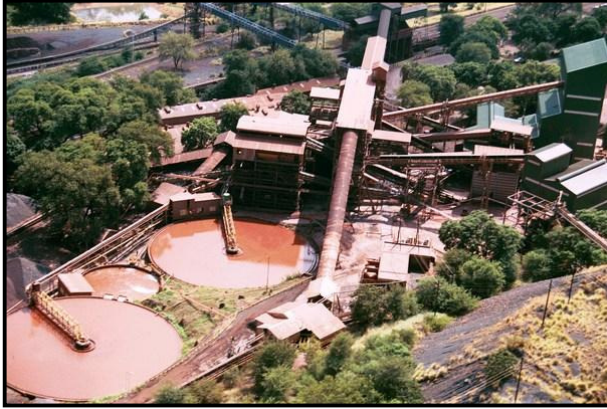
Donkerpoort



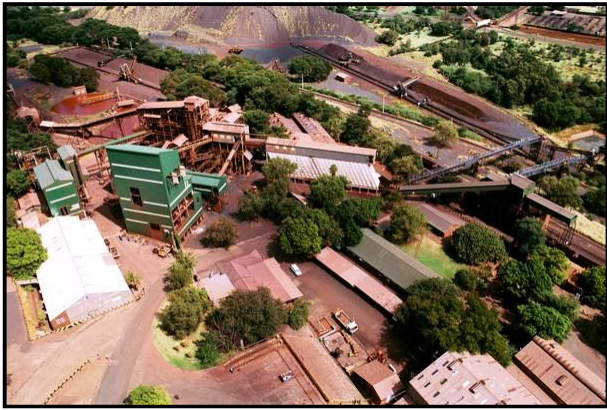
Buffelshoek



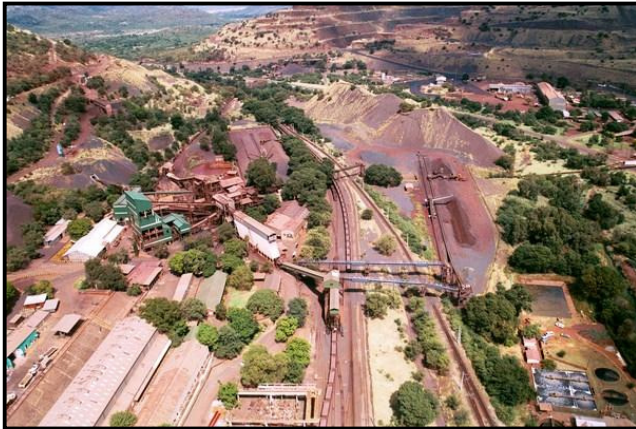
Donkerpoort West



Thickener dams



Plant



Ore beds and loading station

1.6.6 Planned Life of Mine (LoM)

The Life of Mine (hereafter referred to as LoM) Plan is revised on an annual basis. Pits and projects included in the LoM Plan include current workings as well as future ones that have proved to be feasible through optimisation. To support the determination of the LoM calculation and the conversion process, a Mining Works Programme has been developed. This document includes information regarding the

economics of the mining operation and the reasoning behind converting the existing right to the new order mining right (see Addendum 2).

The LoM is defined in terms of the SAMREC Code (i.e. geological confidence of 85 % and 70 % respectively) (see **Figure 12**). Exploration is an ongoing process and therefore the LoM will be updated and refined as more information becomes available.

Pits and projects currently included in the LoM plan are:

- Buffelshoek – West
- Donkerpoort – West
- Kwaggashoek – East
- Donkerpoort - West West
- Donkerpoort – Neck
- Bobbejaanwater
- Meyer mine
- Phoenix
- Current Stockpiles
- Kumba Pit
- Buffelshoek - East East

The proposed LoM (30 years) (see **Figure 13**) which includes Project Phoenix was made based on some assumptions. The assumptions used include the following:

- Current Thabazimbi LoM (2005, 2006, 2007 and 2008 @ 225 000 tonnes product / month) (2.7 million / year)
- Phoenix in production mid 2009
- Phoenix total yield @ 55 % Phoenix stripping ratio @ 1:3
- Ramp-up period 2009 and 2010
- Production @ 250 000 tonnes / month from 2011 until end of life (3 million / year)

Please Note: All resources and reserves included in 2004 Business Plan (A, B and C) included in LoM 2005 (Conversion).

MINING INFRASTRUCTURE

1.8.1 Haul roads

The Mine has an extensive network of haul roads which is used by the heavy vehicles to haul the raw material to the various primary crushers. The haul roads are all on average 26 m wide and have been covered with Dust-A-Side to prevent the generation of dust during travel on the roads. The haul road crosses the Crocodile River via a bridge (Kwai Bridge) which was constructed in the 1990's.

1.8.2 Explosive Magazine

The Explosives Magazine is used to store safety fuses, shock tubes, Splitex, Boosters, cordtex, dynagel, anfax and bulk anfax storage. This area is inspected on a frequent basis internally as well as externally by the SAPS. For safety reasons this area is kept clean of any vegetation and a fire break is kept alongside the fence to prevent any fires from entering the area and causing any unnecessary emergencies. This area has been cited as per the legal requirements to ensure safety of people.

1.8.3 Workshop Areas

1.8.3.1 *Van der Bijl Workshop*

This workshop is currently being used by contractors for the purpose of mining equipment maintenance (mechanical, electrical, vehicle). The workshop was used in the past as a vehicle workshop (utilised by contractors). Oil was stored in drums in this area in the past and a wash bay was used to wash vehicles. These structures have been demolished as part of the rehabilitation plan.

1.8.3.2 *Donkerpoort Workshops*

1.8.3.2.1 Haul Truck Workshop

The Haul Truck Workshop is used for maintenance of haul trucks.

1.8.3.2.2 CAT Workshop

This workshop is used for the maintenance on all CAT equipment.

1.8.3.2.3 Drill Workshop

This workshop is used for maintenance on all drill equipment.

1.8.3.2.4 Crusher Workshop

Crusher maintenance is managed from this workshop. This includes planning of maintenance in the crusher area as well as repair of equipment in the workshop.

1.8.3.2.5 Tyre Workshop'

The Tyre Workshop is responsible for the replacement of used and worn tyres. New tyres are stored in this area.

1.8.3.2.6 Filling Station

The Filling Station is used by all heavy vehicles for fuel tank filling. This area has been specifically equipped to handle heavy vehicles.

1.8.3.2.7 Vehicle Wash Bay

This wash bay is used for the cleaning and washing of all mining equipment and mining vehicles.

1.8.3.3 Engineering services

1.8.3.3.1 Central Workshop

The Central Workshop is responsible for general maintenance on the Mine.

1.8.3.3.2 Boiler Workshop

The Boiler Workshop is responsible for mechanical repairs on the site. This involves mainly cutting and welding activities.

1.8.3.3.3 Light Vehicle Workshop

The Light Vehicle Workshop is responsible for maintenance on all light vehicles used by the Mine.

1.8.3.3.4 Transport Workshop

The Transport Workshop is responsible for transport on the Mine for example the scheduling and ensuring that transport takes place.

1.8.3.3.5 Conveyor Workshop

The Conveyor Workshop is responsible for all maintenance to conveyor systems including replacement of belts.

1.8.3.3.6 Electrical Workshop

The Electrical Workshop is responsible for electrical maintenance on site.

1.8.3.3.7 Plant Workshop

The Plant Workshop is responsible for maintenance of the Plant. This includes the inner and outer sections.

1.8.3.3.8 Robbie's Electrical

Robbie's Electrical is responsible for amongst other the maintenance of some water and electrical services on the Mine.

1.8.3.3.9 Power and Water Supply Workshop

The Power and Water Supply Workshop is responsible for maintenance of electrical and water supply systems on the site. The Mine Workshop takes over where the responsibility of Robbie's Electrical stops. Furthermore the workshop is also responsible for the maintenance on locomotives used for shunting of the railway trucks.

1.8.4 Material Management (Stores)

1.8.4.1 Total (Filling Station)

The Total filling station is used for bulk storage of diesel (500 000 l), petrol (46 000 l) and oil drums. The station is used for the filling of light vehicles with fuel.

1.8.4.2 Fluden Tank

A bulk Fluden Tank (83 000 l) is used for the storage of Fluden which is used in the explosive process.

1.8.4.3 Material Management area

This area is used as a temporary store for all the material purchased for use on the site. Material is stored under roof and outside as required. The storage areas have been clearly demarcated and are managed to minimise potential impacts to the environment.

1.8.5 Beneficiation Plant

1.8.5.1 Plant Laboratory

The Plant Laboratory is used to test the quality of raw material, final product and the effectiveness of the processes in the Plant. Minimal chemicals are used in the laboratory and main focus is on crushing and screening of product samples.

1.8.5.2 Primary Crusher

Two primary crushers exist. The two crushers are the underground crusher at Donkerpoort and the crusher at Van der Bijl. Both these crushers feed the stockpile which in turn feeds the secondary crusher.

1.8.5.3 Secondary Crusher

The secondary crusher receives material from the stockpile and crushes material which has been sieved out. This material is then fed into the Washing and Screening Plant.

1.8.5.4 Washing and Screening

This Plant is used for the washing and screening of material into the acceptable sizes.

1.8.5.5 Cyclone

In the cyclone the water from the washing and screening process is removed and the material is cycloned into final sizes.

1.8.5.6 Stacking and Reclaiming

At the stacker the material is placed on the fines bed or the coarse ore bed. From here the materials is reclaimed and sent to the loading station.

1.8.5.7 Loading Station and Rail Despatch

At the loading station the material is loaded onto the rail trucks and transported via the rail system to Newcastle or Van der Bijl Park.

1.8.6 Administration and Supporting Offices

1.8.6.1 Training Department

The Training Department is responsible for all the compulsory training such as induction prior to commencement of work, drivers training, etc.

1.8.6.2 SHE Offices

The Safety and Sustainability Department supports the mining operations from these offices.

1.8.6.3 Administration and Finance

All administration and financing activities are managed from these offices. These offices are mainly situated in town.

1.8.6.4 Mmehane

The office is being used by external parties for amongst other things schooling, geology, housing etc.

1.8.7 Slimes dams

Four slimes dam facilities have been utilised on site. Two facilities are old and have not been used for many years. The other two facilities are currently used. Pumping is alternated depending on the tempo and volume pumped.

A Scoping Report has been submitted in which an additional slimes dam facility has been proposed. The facility will probably be used for slimes disposal from 2015 onwards.

1.8.8 Waste Rock Dumps

Waste rock dumps have been constructed on the sides of all the open pit areas. The waste rock dumps have been constructed and are rehabilitated in line with the rehabilitation schedule. Waste rock removed from the open pit areas is directly deposited on the waste rock dumps.

Kumba Waste Rock Dump

1.8.9 Discard Dump

A historical discard dump and an active discard dump are present on the site. The historical dump is being worked away and the material is used for road construction. A river diversion was built when the dump was constructed. The active discard dump is used for disposal of discard from the Plant. This material is also used for the construction of roads where required.

1.8.10 Meyer Mine Stockpile Area

Road transport of material to the furnaces at Newcastle and Van der Bijl takes place from the Meyer Mine stockpile areas. Vehicles are loaded at the stockpile area.

(Scoping Report: Kry detail by Salome – Detail)

1.8.11 Adits

Various adits exist where access was gained to the underground mine workings. These adits have been sealed to limit access by external parties. Access has been left open via controlled gates where required.

1.8.12 Rosond

The drill contractor uses a small area for administration purposes.

1.8.13 Power supply

Power is supplied to the mine via Eskom power lines which include:

- A 132KV line from Lephalale (Ellisras) to the substation
- The power is distributed on the Mine from the 11KV and 22KV lines. The power is transformed to the required power levels where required in the pits or Plant e.g. 6.6KV, 3.3KV.

Addendum 1 has been included to indicate the layout of the mining (require new layout) area specifically focusing on the surface infrastructure and placement of pit areas.

1.8.14 Water supply

Thabazimbi Mine makes use of various boreholes on site that supply water to the Mine and supplement the water required by the Town. Thabazimbi Mine is furthermore connected to the Magalies Water Scheme Pipeline which receives water from the Vaalkop Dam. The town receives water for potable use from Vaalkop Dam.

1.8.15 Rail transport

Beneficiated iron ore, is transported to Mittal Steel operations at Vanderbijlpark and Newcastle via a railway line. (what about road transport) The railway line is operated by South African Railway Services. A separate siding has been constructed to provide facilities for the loading of the beneficiated iron ore.

1.8.16 Clinic

A clinic is present on site to provide primary health care and to assist with occupational health related issues.

1.8.17 Bridge connecting Donkerpoort and Van der Bijl