



# BARBERTON MINES PRESENTATION

FEBRUARY 2016



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# OVERVIEW OF PRESENTATION

- Overview of Barberton Gold Mines
- Safety
- Current mining methods
- Further exploration potential
- Photographs





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OVERVIEW OF  
BARBERTON GOLD MINES



## OVERVIEW OF BARBERTON MINES ('BML')

- Mining started in 1886 at Sheba Mines – oldest operating mine
- Currently BML has three operations i.e. Sheba, New Consort and Fairview
- About 24 000 ore tons per month at about 11g/t are treated
- Tailings Retreatment Plant (90,000t/m)
- Combined gold production per month is 290kg
- Each operation has a treatment plant with a centralised BIOX<sup>®</sup> plant
- BML is the largest employer in the Barberton area
- NUM is the representative union



# LOCALITY OF BML

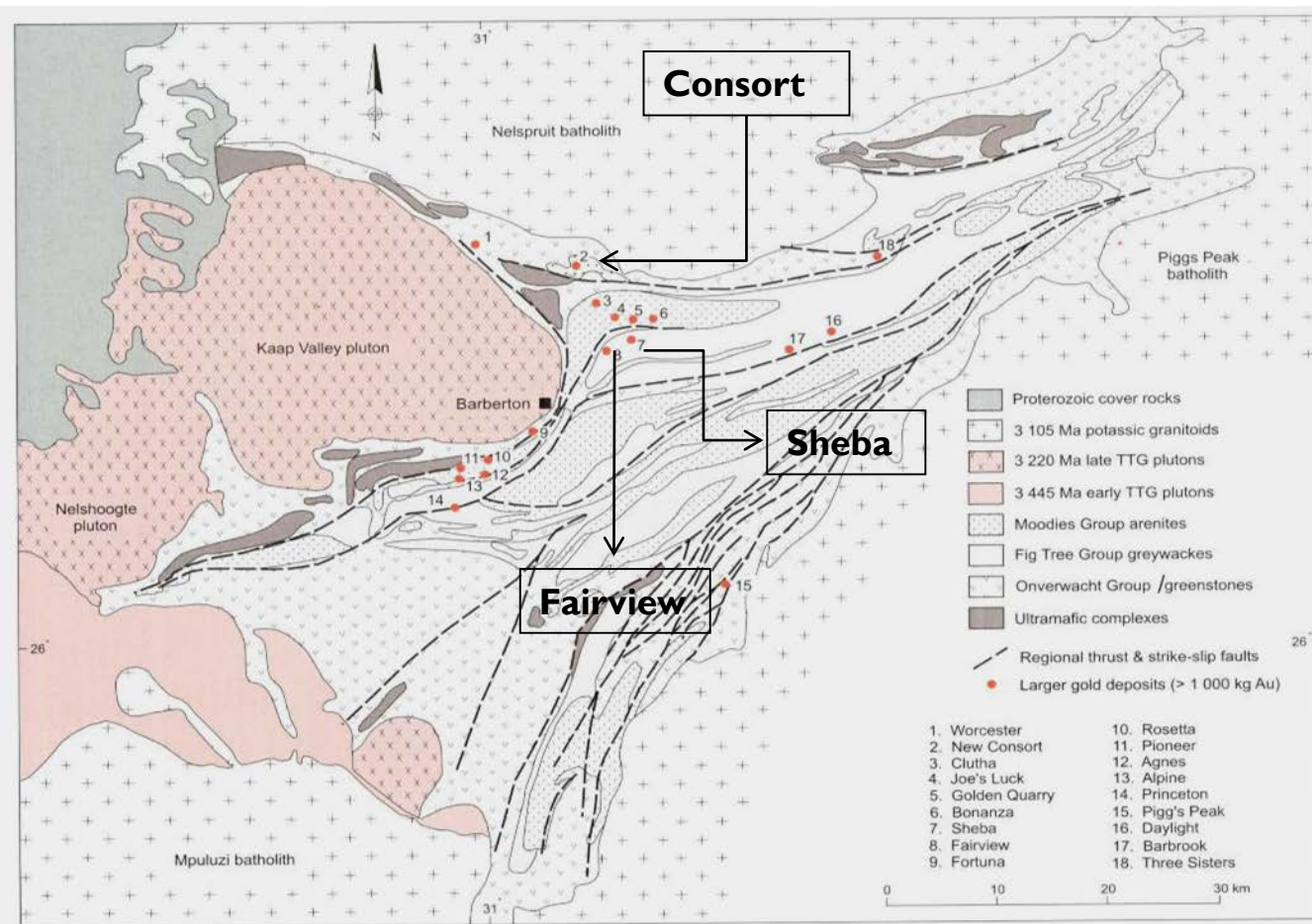


Fig. 2 – Simplified geology of the Barberton Greenstone Belt.

# TOTAL EMPLOYEES / CONTRACTORS

BML Employees		
Mining	919	49.0%
Mining Capital	159	8.49%
Engineering & Cap	299	15.97%
Plants	229	12.22%
HR & Training/Medical	122	6.51%
Technical	80	4.28%
Admin	41	2.18%
Security	24	1.28%
<b>Total</b>	<b>1,873</b>	<b>100.00%</b>
Contractors		
M&R,VTN	257	
Security	124	
Others	131	
<b>Total</b>	<b>512</b>	
<b>Grand Total</b>	<b>2385</b>	

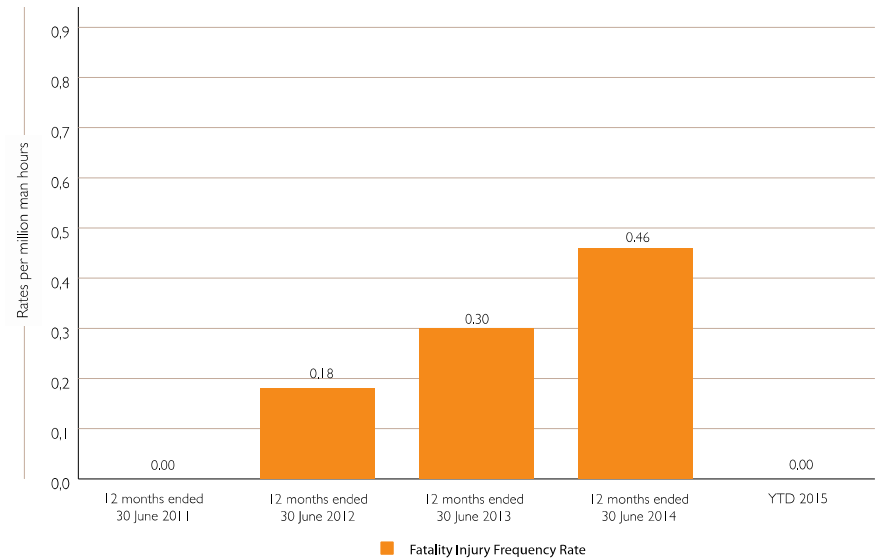
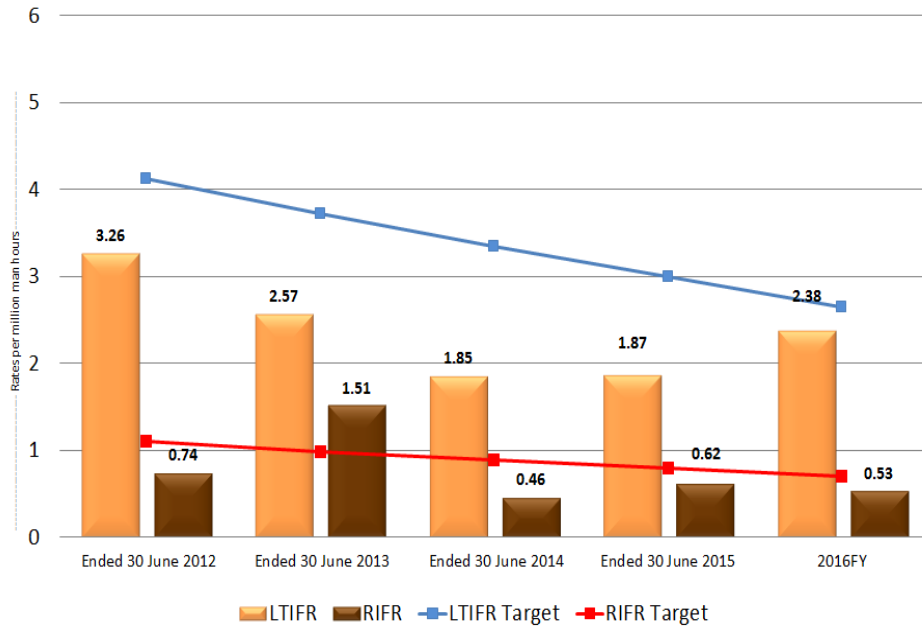


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SAFETY  
PERFORMANCE

# SAFETY PERFORMANCE

- An excellent safety record in terms of Lost Time Injury Frequency Rate (LTIFR) and Reportable Injury Frequency Rate (RIFR)
- Tragic loss of life at Fairview Mine on 23 April 2015





# SHEC

- Focus – Zero Tolerance
- Establishment of an Effective Safety Culture
- Objective
  - ❖ Safety should become second nature
  - ❖ Involvement of all employees
  - ❖ Honesty & Sincerity – care for our employees
- Safety Action Plan



## SHEC (CONTINUED)

- Foundation – Health

- ❖ Pillars

- ❖ Supervision

- ❖ Discipline

- ❖ Communication

- ❖ Systems

- Tri Partite – Effective involvement of Employer, Employees and DMR





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## CURRENT MINING METHODS



## CURRENT MINING METHODS

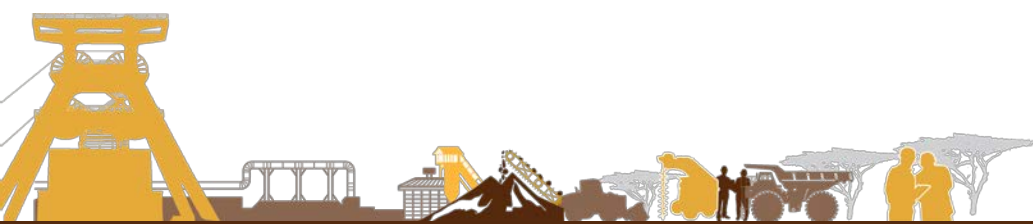
- **Mechanised Mining** – Cut and fill (90%)
  - ❖ Breast & Updip
- **Open Stopping** – Conventional Mining (10%)
- **Shrinkage Mining** (0%)



# CURRENT MINING METHOD

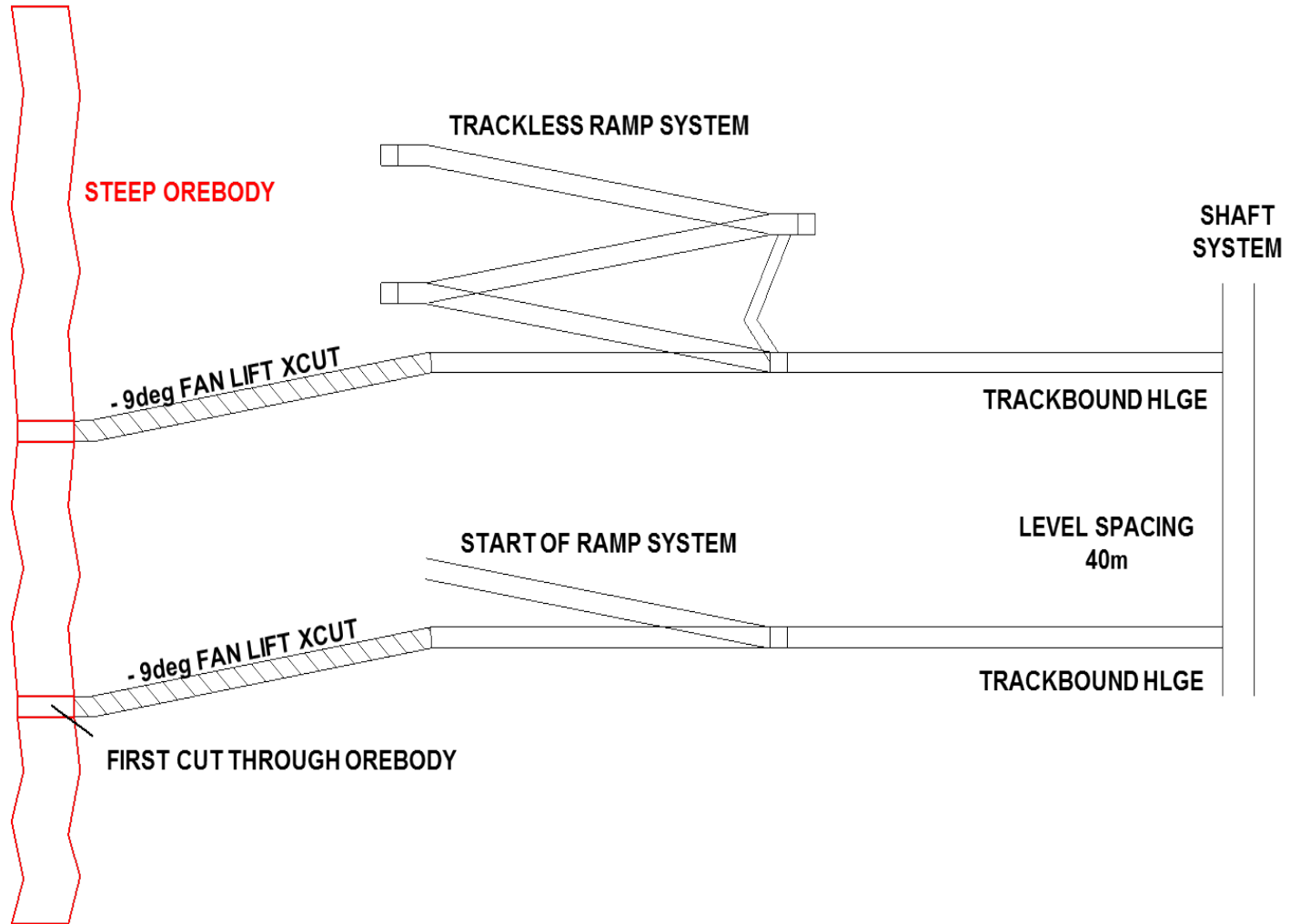
- **Mechanised Mining – Cut and fill (90%)**

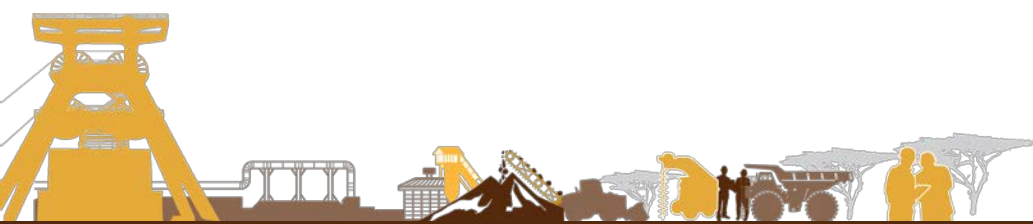
- ❖ Waste from infrastructure development is hauled back into stope for fill  
(Ramp system and Access cross cut which is then fan lifted)
- ❖ 55% of reef tons removed equates to waste tonnage requirement for waste fill  
(Development meters required)
- ❖ Mining sequence
  - Blasting stope face and support
  - Loading reef
  - Waste filling
  - Compacting
  - Cement capping



# CURRENT MINING METHOD

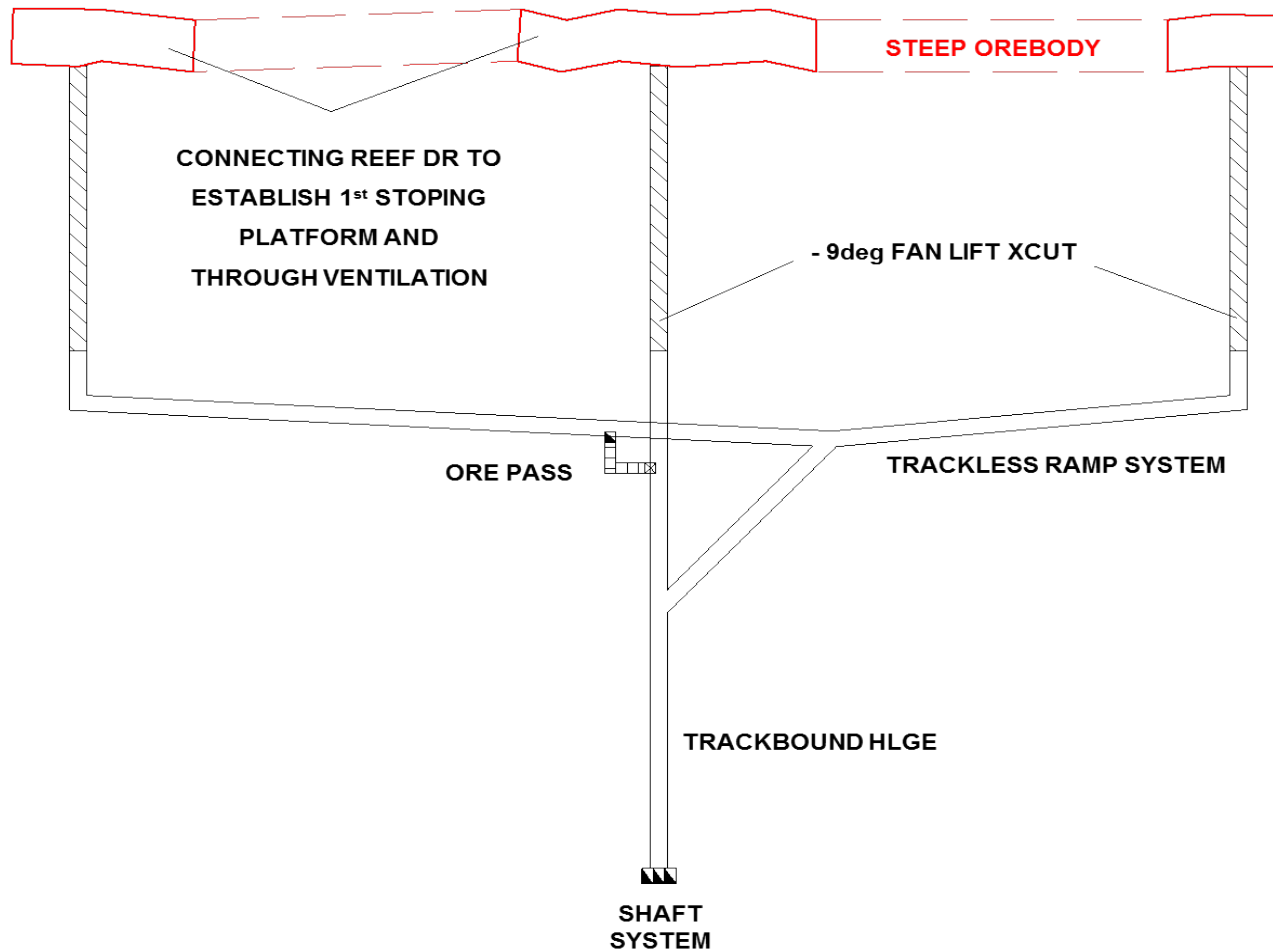
Simplified section view of stoping/mining layout

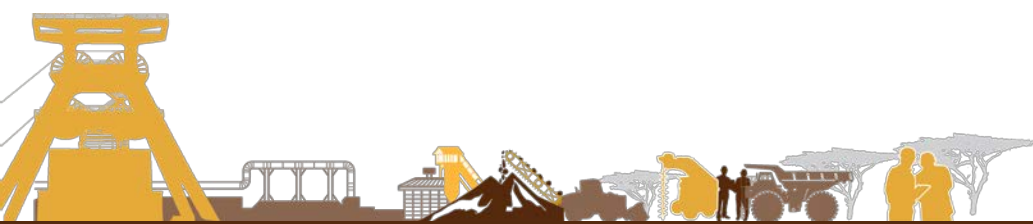




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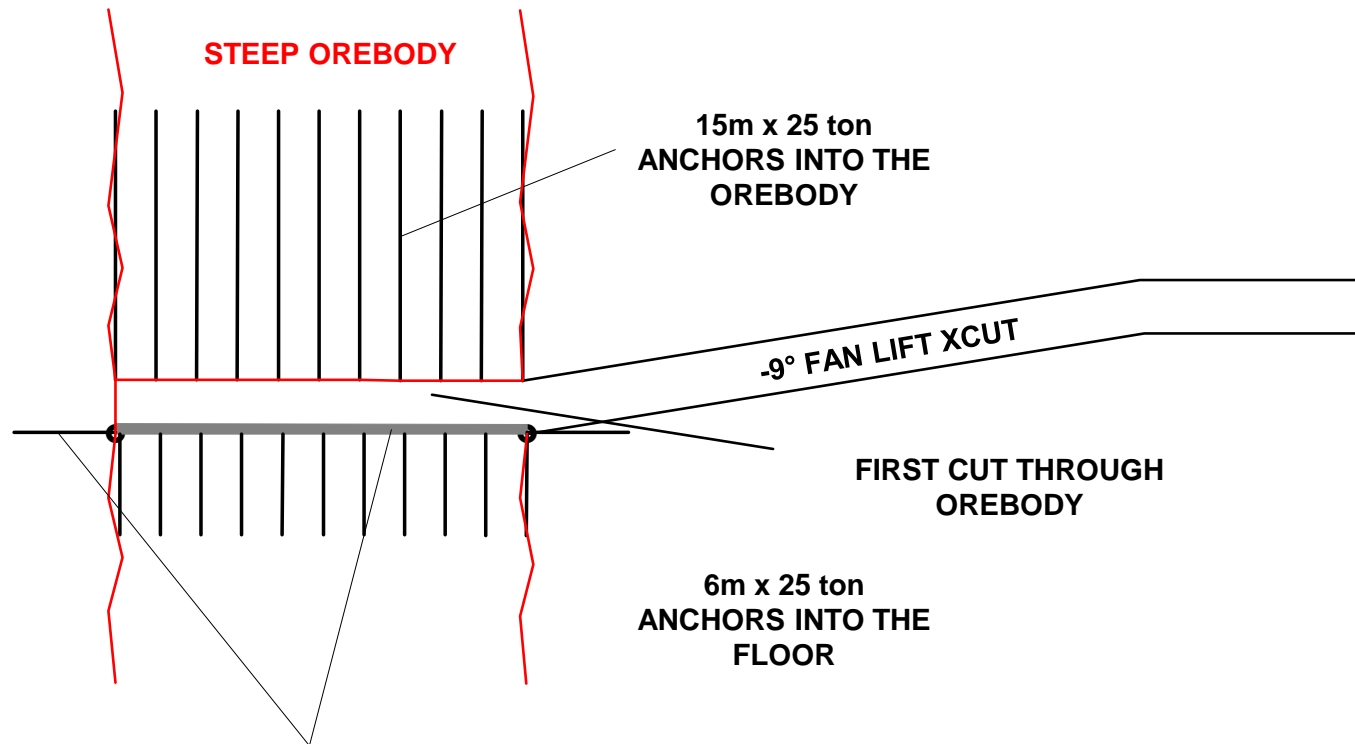
Simplified plan view of stoping/mining layout



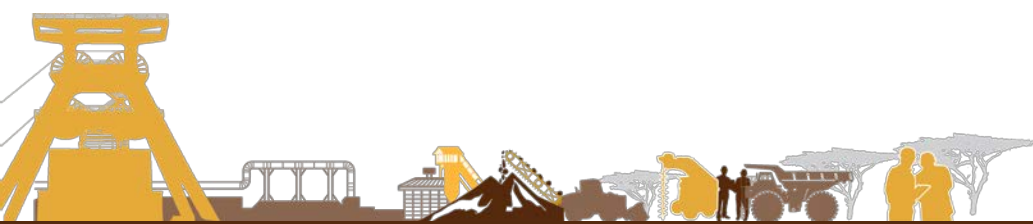


# CURRENT MINING METHOD

Close up simplified section of reef intersection

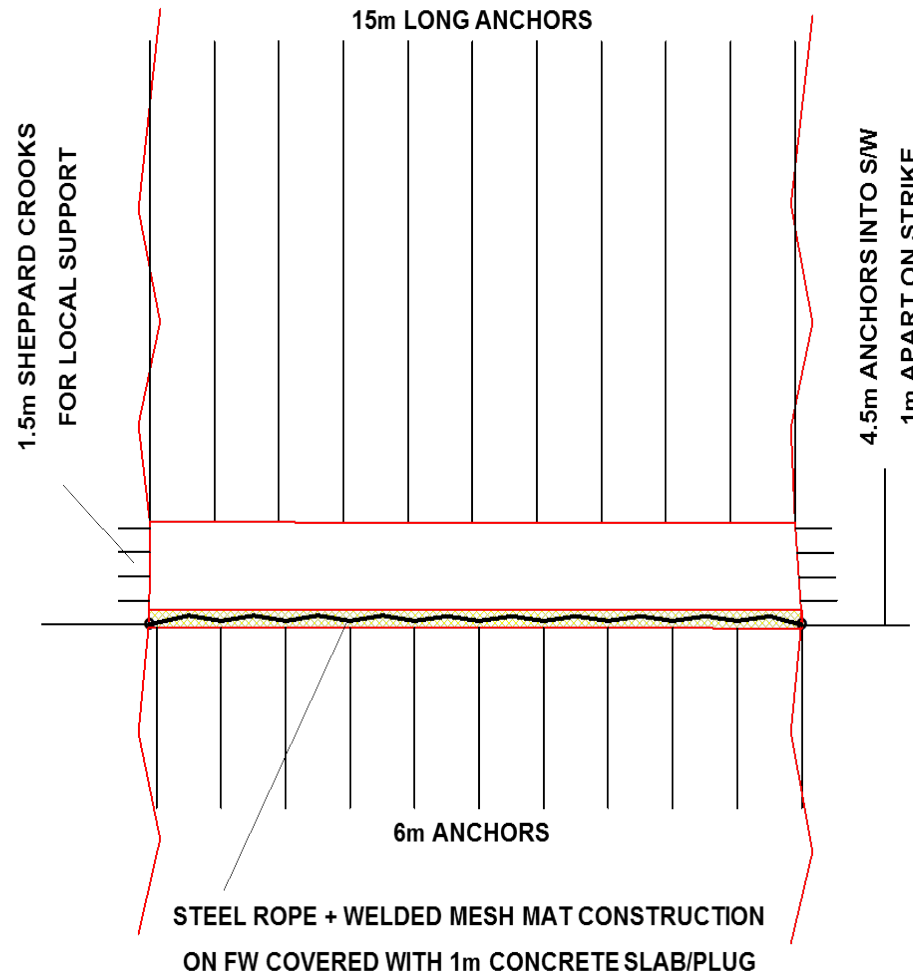


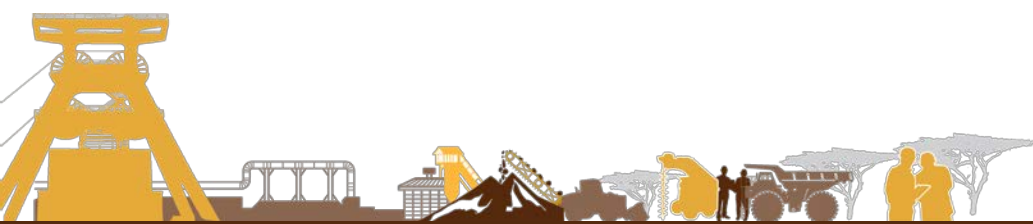
4.5m ANCHORS INTO SIDEWALL AND A  
CONCRETE PLUG WITH HOIST ROPE AND  
WELDED MESH



# CURRENT MINING METHOD

Close up section of floor support in 1<sup>st</sup> cut

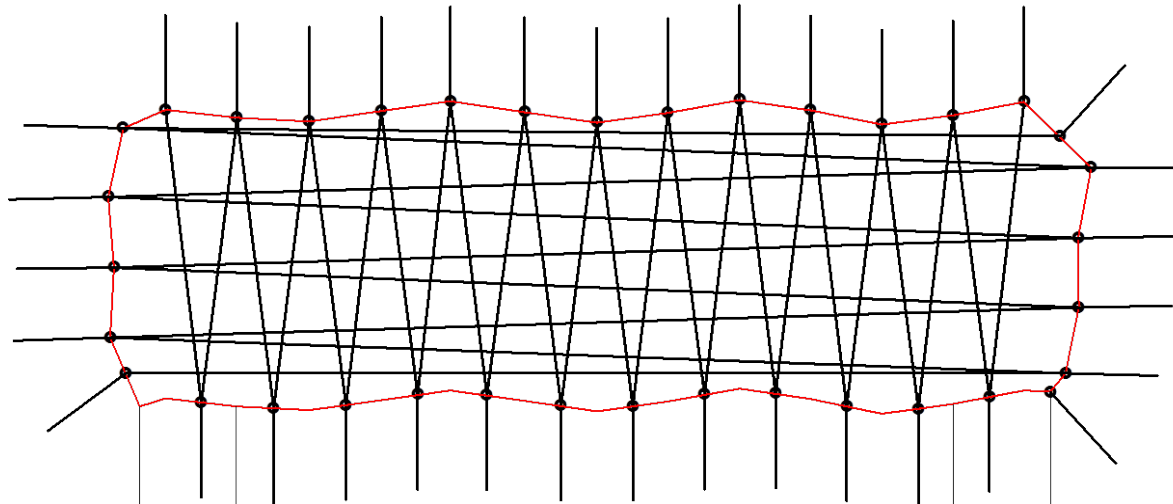




# CURRENT MINING METHOD

## Close up plan view of floor support in 1<sup>st</sup> cut

4.5m ANCHORS INTO SWALL OF THE STOPE WITH STEEL  
LOOPS OR BRACKETS THROUGH WHICH ROPE IS THREADED



16 – 20mm STEEL ROPE WEAVED THROUGH ALL THE  
“LOOPS” AND THEN COVERED WITH WELDED  
DIAMOND MESH AND A 1m CONCRETE SLAB ON TOP  
OF THIS

FAN LIFT XCUT

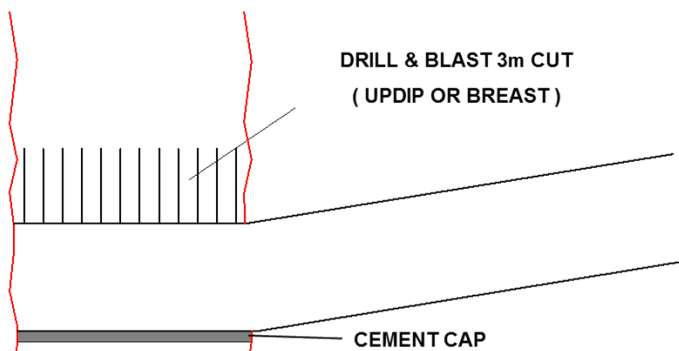
FAN LIFT XCUT



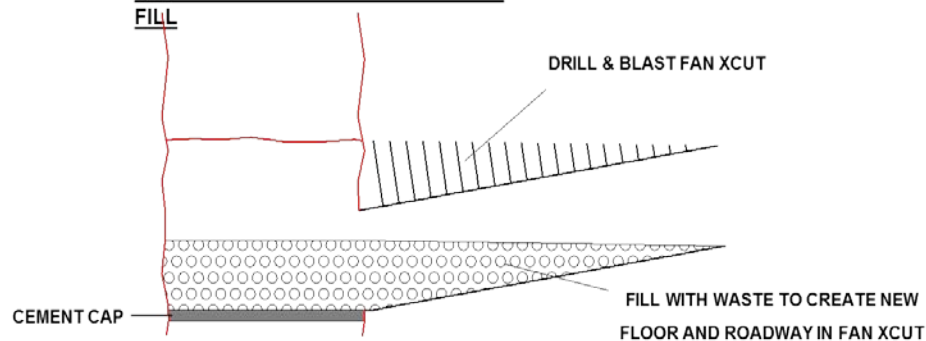
# CURRENT MINING METHOD

## Stoping cycles

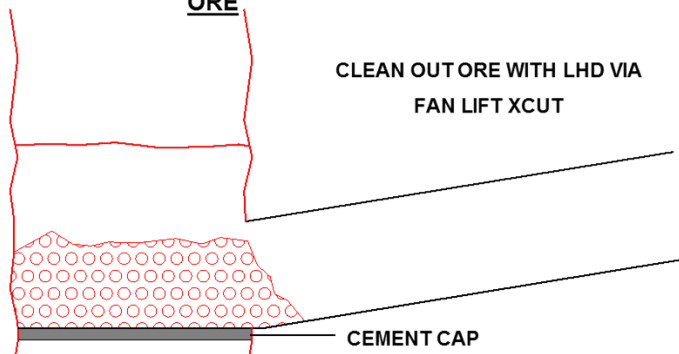
### 1. DRILL & BLAST REEF



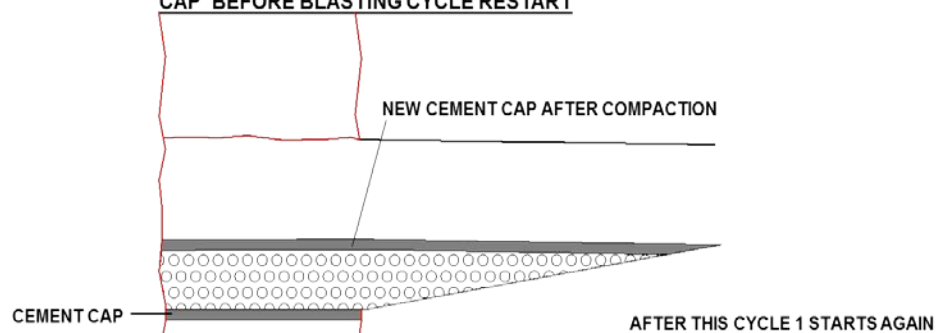
### 3. DRILL & BLAST FAN XCUT + WASTE FILL

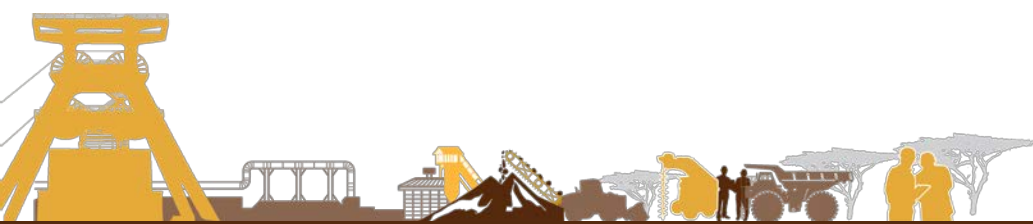


### 2. CLEANING – REMOVE BROKEN ORE



### 4. COMPACT WASTE & CREATE NEW CEMENT CAP BEFORE BLASTING CYCLE RESTART

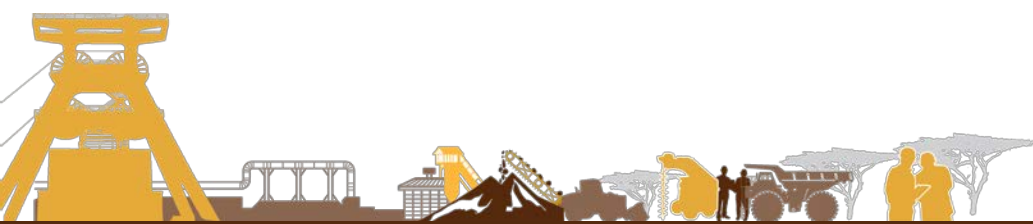




# CURRENT MINING METHOD

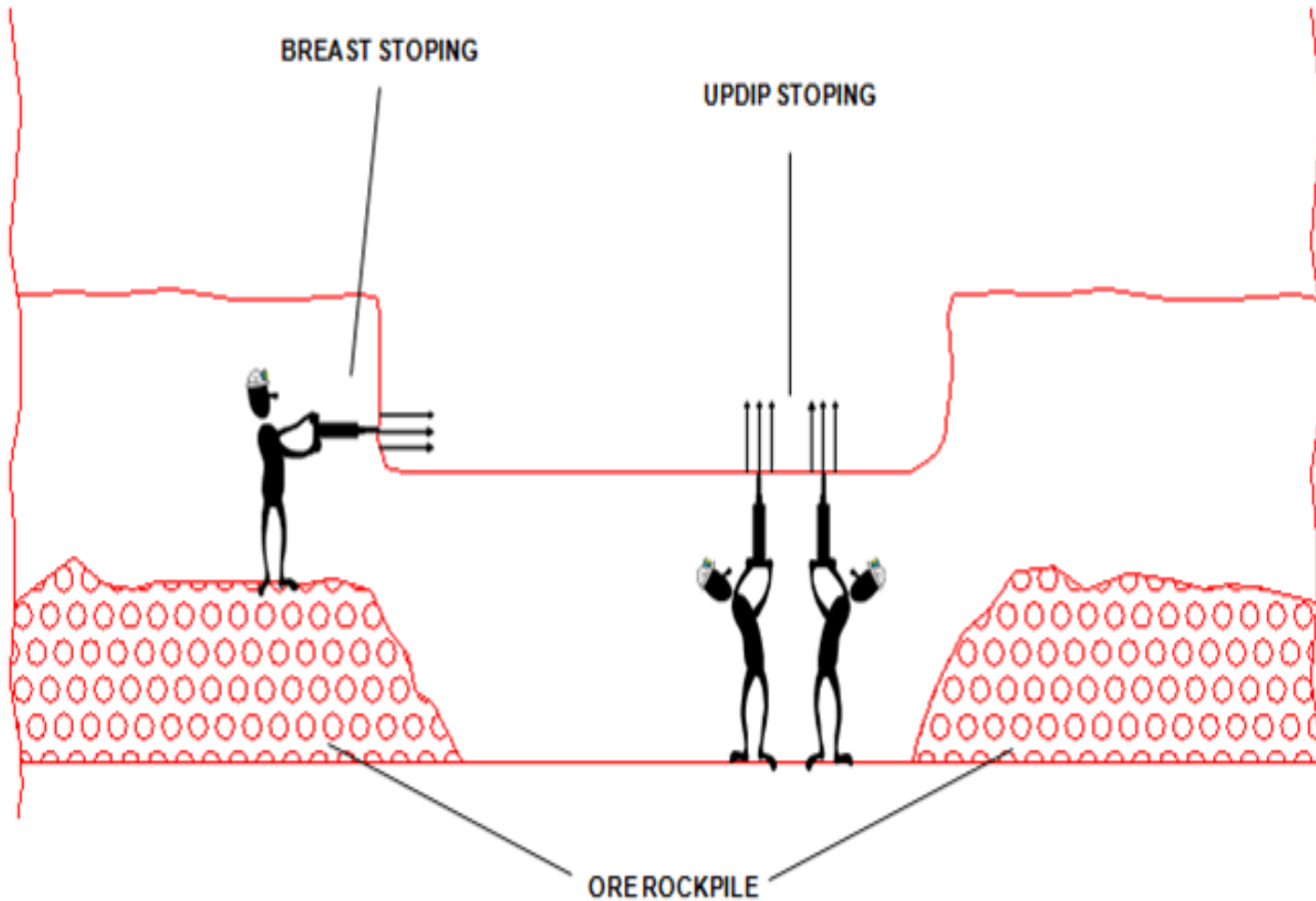
Close up section of floor support in 1<sup>st</sup> cut





# CURRENT MINING METHOD

Section along strike of stope showing Breast mining & Updip mining



# FALL OF GROUND MEASURES

- **Mechanised Mining – Cut and fill (90%)**

- ❖ Back areas are filled with waste therefore overall stability of the stopes is good
- ❖ At Fairview, mining is at about 1800m below surface and no seismic related activities have been noted
- ❖ Only the current stope face area is exposed – reducing FOG risk
- ❖ No back areas - this assists with ventilation conditions and reduces fire risk
- ❖ Both sidewalls are supported with sheppard crook roofbolts
- ❖ In stopes wider than 4m, the stope face (hanging wall) is supported by 40t, 15m long pre-stressed anchors



## FAIRVIEW SECTION

- **The MRC is the second richest orebody in the world**
- **Current life of orebody is 26 years which exceeds the BML life of mine**
- **There is potential for MRC to continue at depth**

# FAIRVIEW

## The top 10 highest grade underground gold operations

Mine	Country	Major Owner	Au grade, g/t	Ore Reserves, 000' tonnes*	Contained Au, 000' ozt
Fire Creek	United States	Klondex Mines	44.1	170	172
Macassa (South Mine)	Canada	Kirkland Lake Gold	22.2	1330	950
Kedrovka	Russia	Zapadnaya Gold	22	380	269
Turquoise Ridge	United States	Barrick Gold	16.9	10932	5943
Toguracl	Indonesia	Newcrest Mining	16	1000	514
Orcopampa	Peru	Buenaventura	15.8	630	321
Dvoynoye	Russia	Kinross Gold	15	2137	1028
Pinson	United States	Atna Resources	13.8	353	157
Midas	United States	Klondex Mines	12.9	220	92
Pimenton	Chile	Cerro Grande	11.1	138	49

\*Ore reserves are Proven + Probable, except Kedrovka, where A + B categories calculated.

# FAIRVIEW

The top 10 highest grade underground gold operations (What the table should look like in reality)

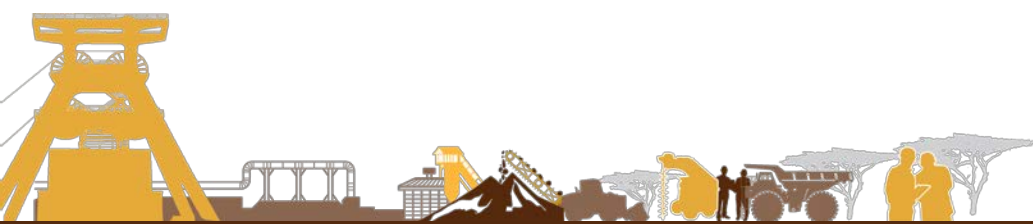
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<b>MRC</b>	<b>South Africa</b>	<b>Pan African Resources</b>	<b>32.0</b>	<b>848</b>	<b>871</b>
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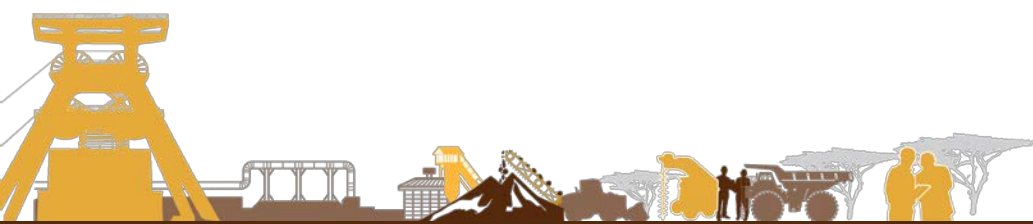
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PHOTOGRAPHS



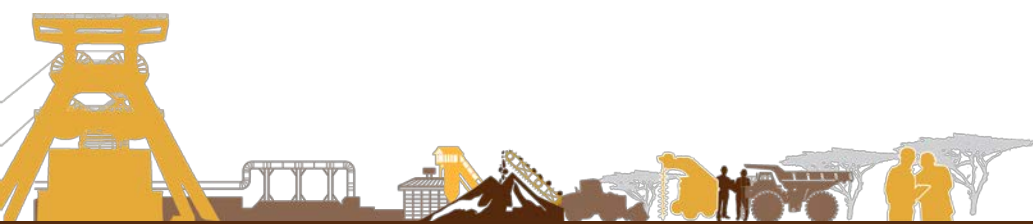
# START OF THE GOLDEN QUARRY - SHEBA





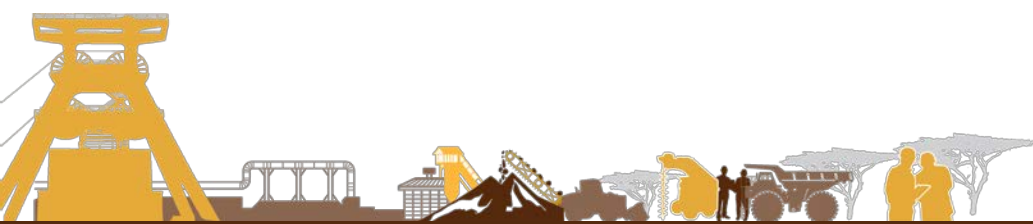
# EDWIN BRAY ADIT IN PROGRESS





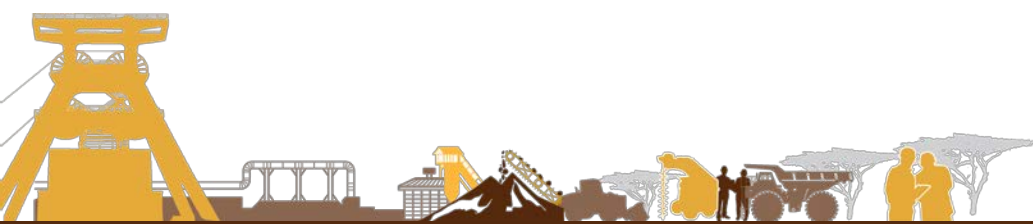
# EDWIN BRAY ADIT (STILL IN USE)





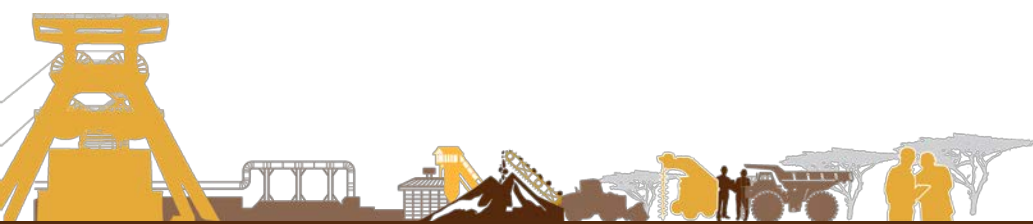
# FAIRVIEW MAIN ADIT





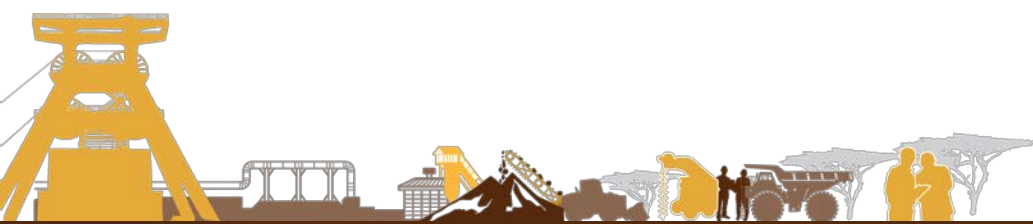
# NEW CONSORT – I LEVEL





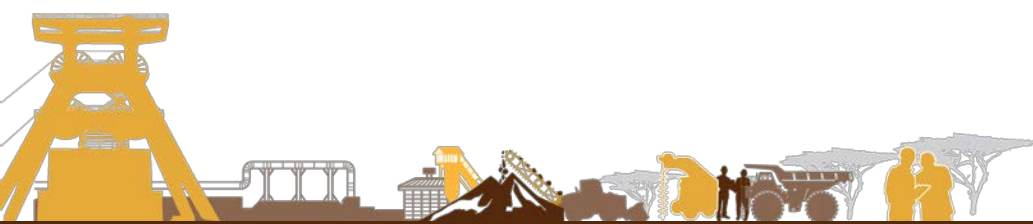
# NEW CONSORT – MAIN ADIT (+-60 YRS OLD)





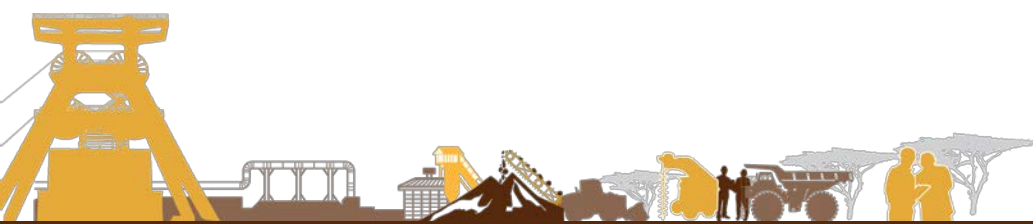
# SHEBA MINE - ZK VERTICAL SHAFT





# BIOX<sup>®</sup> PLANT





# BARBERTON TAILINGS RETREATMENT PLANT – ‘BTRP’





THANK YOU

