



1.0 FIELD LOGS – FIELD ENGINEER_AB

1.1 Platinum Mines

1.1.1 Field Log 1

Date: 02-03-2015

Mining House A

Mine/ Shaft – N/A

Working Place 1

- Underground training centre – Stope.
- Observed barring in stope and in development.
- Barring was completed correctly and to standard in stope.
- Development barring was not done correctly:
- Visual examination for vent pipe area was not completed but participant sounded the HW as well.
- Distance of personnel from the hazard when sounding was a problem .i.e. he was too close to the hazard.
- Researchers were given an explanation about standing on drill carriage to bar in certain areas in development.

1.1.2 Field Log 2

Date: 03-03-2015

Mining House A

Mine/ Shaft 1

Working Place 1

- Observed mechanised section – (breast panels).
- Took pictures of mechanical barring with rock drill machine - The operator is in a safer position and drills into loose rocks to assist/ allow them to fall out.

1.1.3 Field Log 3

Date: 04-03-2015

Mining House A

Mine/ Shaft 1

Working Place 2

- Mining method is Hybrid (Breast Panel).
- Researchers sat and observed meeting at waiting place.
- RDOs and other crew members left early into the stope to continue with EE despite us asking to accompany them.
- When researchers got to the face, it was being drilled already.
- It is unlikely that entry exam and barring was done thoroughly. Possibly it was rushed as the crew was rushing to prepare to blast. Smooth HW also is a reason for the lack of examination, sounding and barring.



Figure 1: Smooth HW conditions

1.1.4 Field Log 4

Date: 05-03-2015

Mining House A

Mine/ Shaft 1

Working Place 3

- Accompanying persons: (MO, Safety Superintendent and Miner)
- Mining method is Hybrid and the Panel being visited was a breast panel.
- Observed safety representative and RDO barring. Miner was at next panel.
- It was very interesting and pleasing to note that the crew does value their safety and inspects and bars the HW well.

Concerns are:

- Due to the joint orientation, leverage can mostly be gained into the joint /fracture from the down-dip side.
- This forces/ urges people to bar from the down dip side.
- Observed the wrong position being taken multiple times. Individuals were told to stand as far to the side as possible as they could, out of the way from where they thought the rock would fall.
- Sounding the HW does not seem to be as effective as one would think. Even loose HW may produce a slightly solid sound, as was observed.



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- Another concern is that even by visual examination, researchers could identify areas that could be barred that had been missed. These areas were highlighted.
- The final concern is the positioning of the gaskets. Pictures were taken to illustrate the problem. Sometimes the pinch bar is not held where the gasket is placed (hands are not placed behind gaskets).



Figure 2: Barrer's hands not positioned behind/ in gasket

- Miner showed no willingness to allow people to speak to researchers.
- HW condition-Highly jointed and badly fractured at parts. Roof bolts do not seem to be that effective - at least quarter of them installed throughout the panel protrude >15-20 cm
- A lot of rock seems to be barred down immediately surrounding each roof bolt.
- Non-Barring related notes:
- Concern noted about the roof bolts used and lack of resin in holes .Crew indicated the change to a new roof bolt where no resin is required. New roof bolts are end-anchored only.
- One grout pack missing approx. 5-6m from the face, at the bottom of the panel.

1.1.5 Field Log 5

Date: 06-03-2015

Mining House A

Mine/ Shaft 4

Working Place 1 – Mined by contractors

Accompanying persons: (Mine Manager, MO and Miner)

No pictures were allowed to be taken in-stope.

Old area being mined previously +/- 4 years ago by the mining company and not contractors.



Poor HW conditions.

Joint directions unfavourable.

Barring was observed being completed from the down dip position.

Personnel took the researcher's presence as an opportunity to vent their frustrations. In general, it appeared that barring and mining is done well with most tasks being completed to standard. Production targets were being reached consistently so personnel grievances revolved mainly around remuneration.

Feedback from Miner:

"Bring back incentives to reward those people doing a good job and to inspire those who aren't doing a good job.

- Remuneration is insufficient especially for RDOs-R186 per day.
- People get complacent about the safety because of other stresses, financial etc."
- **Purported deficiencies at training centre:**
- "Only 1 in 10 facilitators may be effective.
- Sometimes I know more than them but I can't stop the class.
- It's like a holiday when people have to go there because most leave by 10am.
- Time flies and things get rushed through."

1.1.6 Field Log 6

Date: 10-03-2015

Mining House A

Mine/ Shaft – 3

Working Place 1

- Shift Supervisor/ Shift Boss did not even enter the working place. Researchers were accompanied to the waiting place and were escorted into the winze by the miner.
- Shift Sup. Was negative and did not allow researchers to talk to mining personnel. He was of the opinion that things cannot be improved that much, especially barring.
- 2.2m winze – Researchers did not go down with the shift and thus did not observe entry examination taking place. However, visual examination and the presence of barred rocks showed that barring was done at the face area.



Figure 3: Barred winze

1.1.7 Field Log 7

Date: 11-03-2015

Mining House A

Mine/ Shaft – 3

Working Place 2

- Observation showed that EEE was not done properly.
- RDO was drilling the face even though the last line of support was +/- 5m from the face - Approximately two blasts. Measuring on Monday meant that the RDO's wanted to push advance.
- One roof bolt was installed and nets were properly tensioned "so that work can continue".

General observations – Mining House A

- Gaskets not easily available (Contractors shaft) and new pinch bars are not obtained very often.
- Positioning in development ends is a problem due to height and it is suspected that the loco is used at times to bar.
- According to the questionnaires, most rules are known but understanding is not demonstrated.
- Positioning down-dip is a problem and installing support from an unsafe position also appears to be a common occurrence.
- Pressure from supervisors to blast and to enter unsafe areas is sometimes apparent.
- Have witnessed midshift barring at two places. This was a positive observation.
- Warning people doesn't seem to take place until a rolling rock happens. This is definitely the wrong practice.



- People sounded the HW in-stope but often did not acknowledge the sound that resulted.

1.1.8 Field Log 8

Date: 17-03-2015

Mining House – B

Mine/ Shaft – 9

Working Place – 1

- Visited underground training centre.



Figure 4: Good HW condition in training centre

- Observed barring practice by a person who was undergoing training to be an assessor of barring.
- He recited the 13 rules of barring and then proceeded to make safe.
- Interviews were completed.
- Knowledge and skills were clearly observed by most people interviewed at the training centre.

1.1.9 Field Log 9

Date: 18-03-2015

Mining House B

Mine/ Shaft 9

Working Place 2

- Observed EE and barring.
- Sounding/ Testing occurs but with not much attention being paid to the sound being heard.
- Barring observations:



- Not placing the hand behind gasket at times.
- Barring of face/sidewall sometimes not done.
- Pinch bar ends were not sharp.
- Positioning was on the down dip side a lot of times.
- Personnel understood the barring concept but did not recall the rules in order – leading to researchers wondering whether the barring act is completed in the correct sequence.
- Non-barring related observations:
- Protruding and suspended rocks (from roof bolts) were barred down after being painted/ highlighted.
- Missing support was noted - instructions were given, including not opening up into the HW too much and no RIH be left.

1.1.10 Field Log 10

Date: 18-03-2015 Night Shift

Mining House -B

Mine/ Shaft – 9

Working Place – 3

- Accompanied by SCO.
- Very basic EE was observed. Only sounding of HW occurred. No rocks were actually barred down. Not much attention was being paid to hearing the sound when sounding.



Figure 5: Condition of XC



- Researcher had to request that the hose/ water be fetched to adequately wash the area which had been blasted.

1.1.11 Field Log 11

Date: 19-03-2015

Mining House B

Mine/ Shaft – 9

Working Place – 4

- Breast panel
- Stope- 1.6m
- Barring was completed to standard.

1.1.12 Field Log 12

Date: 20-03-2015

Mining House B

Mine/ Shaft – 9

Working Place – 5

- Accompanied by miner and shift supervisor.
- EE was not done thoroughly.
- Persons barring were not completing barring according to the rules, and in a sporadic disorderly routine.
- RIH observed that could have been completely barred out.
- No gasket was observed on a pinch bar used by the safety rep. when barring.
- The wrong position was being taken numerous times.
- No buddy barring –people were available but did not assist to bar.
- Even when the HW sounded but a hollow sound was not heard, the rocks could still be barred out.

1.1.13 Field Log 13

Date: 24-03-2015

Mining House B

Mine/ Shaft – 6

Working Place – 1

- Reef being mined is Merensky (881m below surface). Stopping width is between 1.4m to 1.6m.
- Hanging Wall is Pyroxenite and is very jointed and blocky.



Figure 6: Blocky Pyroxenite Hanging wall

- Support in the panel is to standard.
- Many members of the crew assist in barring. Half inspects the face area whilst the others do the back area - 7 to 8 people were barring at the same time.
- People entered but did not wash/ water down immediately. The team went back to wash and start at TW from 5m back.
- All people stood on the updip side.
- Many pinch bars were available in the panel and gaskets were fitted on all of them (The type that covers your hand).
- Chats with the miner revealed a fear to answer questions, as he believed many workers cannot recall all the rules of barring.
- Observations of chatter/ eavesdropping on conversations show led to the realisation that barring or EE is not always diligently complete. One new team member indicated that he has never seen mid-shift barring. He feels that this needs to be implemented still.
- Pinch bars used appear sharp, as they seem to be exchanged regularly.
- Lacks:
- Proper washing/ watering down.
- Looking back to search the HW every 2m.



- **Rock engineering department at the mine had the following views:**
- General observation of SCO's are that of poor barring and people rushing whilst working in the panel. Between 60-80% of barring is completed properly.
- Basic cause of injuries is approximately 50% due to poor barring.
- Barring is only done best when supervisors are present.
- Panels and crews without injury get complacent so they don't bar.
- Non-compliance to the 11 steps of barring occurs especially by not looking back.
- Suggestions by SCO's to improve barring:
- Address behavioural problems rather than the procedure.

1.1.14 Field Log 14

Date: 25-03-2015

Mining House B

Mine/ Shaft – 6

Working Place – 3

- Cross cut height is approximately 2.9m with support used being mostly 3m long tensioned cables.
- Many geological features are present in the tunnel:
- Fault Shear Zone
- Dykes
- Prominent Joint Sets creating Brows
- Additional support installed in all these areas.
- Team completed a thorough Entry examination and barring process with all aspects of the standard being completed.
- The use of gaskets and placing hands behind gaskets was stressed.



APPENDIX C

Field and Photo Log



Figure 7: XC Sidewall and HW condition



Figure 8: Support density due to faults and dykes



1.1.15 Field Log 15

Date: 26-03-2015

Mining House B

Mine/ Shaft – 6

Working Place – 4

- Reef is Merensky with HW being Pyroxenite.
- Stopping width varies between 1.4m high to 1.6m high.
- Researchers were accompanied by the Safety Superintendent and the Miner.
- Entry examination and barring was completed from the Secondary waiting place to the face.
- Watering down in a sequential manner and the hose moved steadily forward together with the crew.
- Two teams barred – one in the back area, and one at the face area.
- Most of the time was spent barring the HW and the team chose not to concentrate on the face. The researcher was told that the face will be barred during face preparation and the team should leave face barring for that time only.
- The suggestion was made that even though the HW conditions were very blocky, the entire panel should be attempted to be barred. Even visual examination by all the team members would have assisted in identifying hazardous conditions.
- Many people did not place their hands under the gasket when barring.
- S/Sup advised that some gaskets get too loose and move up and down pinch bars too easily. An “orange-coloured” gasket was recommended as a preferred type.
- S/ Sup indicated that he would do many PTO's on barring after observing the lack of knowledge from most people.
- Non-barring related observations:
 - Crush Pillars appear to be scaling/ have loose slabs against them. S/Sup indicated that they do not bar pillars.
 - The remote release tool for Camloks was observed in panel.
 - Poor ground and HW conditions were observed.
 - Grout packs at the top of the panel was not installed to the HW.
 - Support in panel is Tensioned Cables and Grout Packs. Personnel unsure about the consistency of grout that needs to be pumped. They asked for recommendations regarding the ratio of water to grout – and the quantity to be pumped per hole.

1.1.16 Field Log 16

Date: 27-03-2015

Mining House B

Mine/ Shaft – 6

Working Place – 5

- Accompanied by Miner and S/Sup.
- XC height 3m - First in Pyroxenite and then Norite just before the UG2 intersection.



Figure 9: Jointing in Sidewall of Pyroxenite

- Ground condition has deteriorated close to the Reef intersection but support is installed to standard – TC's 1m apart.
- Early entry examination and barring was done thoroughly and to standard. Once or twice, the individual forgot to place his hand behind the gasket. He was reminded of this.
- Sidewalls were barred.
- Watering down and testing /sounding was done thoroughly.
- Safe declaration book was signed after completion.
- Team supervisor talked and encouraged and reminded people about what to do (Comp A by miner appointed).
- One 1.8m long steel pinch bar had a bent tip and was old.
- Production personnel advised of a preferred orange gaskets that looks like a glove almost.
- 5m remote release slings were available at the working place store as well as plenty 3m aluminium pinch bars.
- Faults and other geological features were clearly demarcated (with yellow paint).



Figure 10: Fault demarcation - Note the fissure flow through anchor - not grouted well

- Evidence of barring being done daily can be seen from the good condition of XC.
- Buddy barring clearly works at the development area.

1.1.17 Field Log 17

Date: 31-03-2015

Mining House B

Mine/ Shaft – 5

Working Place- 4

- Accompanied by miner and strata control officer to the underground training centre.
- Observed barring during EE by training centre crew.
- Washing down and barring was done in sequential steps.
- Visual examination was done vigilantly.
- Pinch bar quality was poor. Three were rusted and were not sharp as they should be.
- Observed barring of large block (held loosely in place by bolt. Many tries were required to eventually bar the rock down).
- Gaskets were not moved into the correct position at all times.



- Buddy barring very evident.
- **OBSERVATIONS OF BARRING TRAINING ASSESSMENT IN THE TRAINING CENTRE:**
- Awaited Barring and R-Strata Practical Assessment by Assessor.
- MQA standard for barring is used MnHG338.
- MQA demonstrate on understanding at the identification of and dealing rock strata conditions.(MnHG578)
- Training is also done on the Mining House's 11 steps.
- "Revising the rules to make it simpler might help" – was a comment made by the assessor.
- Most concerning was the practical assessment portion:
- Trainer/ Assessor did not complete this section properly. Observations showed the candidate did not even bar and was passed.
- The entire training centre is well barred. Thus, had the practical been completed, there would have been very few areas where the candidate could be properly assessed. No area appeared challenging enough to assess a candidate properly.

1.1.18 Field Log 18

Date: 09-04-2015

Mining House B

Mine/ Shaft – 5

Working Place- 1

- Accompanied by shift boss, miner and strata control officer.
- Observed EEE and especially barring with a small crew of approximately 5 people.



Figure 11: Barring of pillar sides

- Good HW conditions.



Figure 12: Relatively smooth HW

- PS - loading panels less examined than drilling or supporting panels.
- Watering was not done at the start, only later on close to the drilled face.
- No specific route or system was followed.
- Wrong positioning was taken a few times i.e. on the down dip side.
- People don't know the Golden rules well even though understanding is shown.
- **Other Observations:**
- Flexibolts / 3m TC's are installed in permanent excavations.
- 1.6m long Resin Bolts are installed elsewhere. Standard is 1.2m apart strike ,1.5m apart dip
- Very dense patterns are installed i.e. 1m x 1m apart
- Incorrect angle of installation witnessed sporadically.
- Hazardous features appear to not be identified unless a rock engineer is present.
- Literacy levels are high with Fanakalo not being favoured at all.
- Senior management mentioned that the previous use of scalers caused extensive damage to HW.
- Shift boss indicated he has never seen scalers in use underground –only at the training centre.
- Very high excavations such as Belt Drives (+/- 5m high) observed. Longest pinch bars that were available were 3m long.
- People stand on equipment to bar when necessary.
- Once TSL is sprayed, no further barring is usually done.



1.1.19 Field Log 19

Date: 09-04-2015 Nightshift

Mining House B

Mine/ Shaft –5

Working Place - 2

- Accompanied by miner and strata control officer.



Figure 13: Great concept of warning lights at waiting place

- Observed EE in 3 panels.



Figure 14: Barring at conveyor belt area



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- First panel was comprehensively inspected, however the second was not thoroughly completed due to the presence of "stof". Miner indicated they would declare panel safe for machinery, then clean and then bar.



Figure 15: HW condition

- Watering down was done but the person washed from the second split right to the face and then returned under HW that was not inspected. This was pointed out to mining personnel.
- Visual examination is done but some areas are not assessed adequately.
- Buddy barring evident.
- Use of the light was excellent, though questionnaire respondents indicate it is not always used and that EE is not usually done thoroughly on night shift.



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Figure 16: Use of entry examination light



Figure 17: Fully illuminated pillar

- Hand placement behind gasket is good.



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- Knowledge of the eleven rules is lacking by this crew.
- No defined route/process is followed, people walk easily into un-examined areas.



Figure 18: Multiple barriers

1.1.20 Field Log 20

Date: 10-04-2015

Mining House B

Mine/ Shaft –5

Working Place - 3

■ Stratigraphy

HW	Pyroxenite
Reef	UG2
FW	Norite



Figure 19: HW Pyroxenite

- Accompanied by strata control officer.
- Blocky HW conditions.
- Miner had already entered with his people when the researcher got to the waiting place.
- He had declared many of his panels “loading panels”. Thus he did not do EE in them.
- He suggested completing panel 1 while I observed; after loading a small amount of “stof”.
- Excuses were given for not barring/ not doing EE or watering down. All poor and incorrect ways of thinking showed. E.g. reason for not watering down was that small rocks would be dislodged. Laziness was apparent.
- Observed personnel barring at the face before it was examined.
- Miner began washing from the second split and too far into the panel and he was aggressive at times.
- **When barring began:**
- It was done from the wrong side often.
- Miner was positioned in front of the barrer i.e. closer to the face and even caused an obstruction at times.



Figure 20: Proximity of miner to barrer (on the right)

- A second pinch bar was not available.
- Miner indicated that he was available to assist if a buddy was needed.
- Panel was not declared safe as the miner decided to declare it a loading panel.

1.1.21 Field Log 21

Date: 14-04-2015

Mining House B

Mine/ Shaft – 8

Working Place - 1

- Accompanied by strata control officer.
- The reef is Merensky with HW Pyroxenite.
- Arrangements were not definite about which panel to visit. Crew had water pipes to fix before proceeding into the panel.
- Scepticism about having a visitor in the panel led to a late start. Crew tried to dissuade the visit by indicating the need to crawl through the gully entrance due to accumulations of ore.
- Lekoba stick was used properly.



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- EE was completed thoroughly (perhaps due to visitor presence) but the length of time spent barring (2hrs) showed that barring had not been completed thoroughly during the previous shifts.

1.1.22 Field Log 22

Date: 15-04-2015

Mining House B

Mine/ Shaft – 8

Working Place - 2

- Reef being mined is UG2 with HW Pyroxenite.
- Accompanied by SCO.
- Awaited the fixing of a water pipe in the centre gully before EE began.
- The entire crew participated in the barring survey together. The crew was responsive and enthusiastic but I was not convinced that barring is done daily and to standard by this crew.
- Barring was completed to standard.



Figure 21: Barring in strike gully



1.1.23 Field Log 23

Date: 16-04-2015

Mining House B

Mine/ Shaft – 8

Working Place - 3

- Accompanied by the miner to this haulage.
- End was not blasted by the previous shift, thus the team did not water down. This was understandable as there was no dust to allay and the HW features were clearly visible.
- Development is done in FW Norite (FW to the UG2).
- HW sounds hollow throughout the sounding process. Special instruction by RME was given to install cable anchors. Temporarily wire mesh has been installed against the HW.
- The gasket was not always positioned correctly on the pinch bar.
- A fibreglass pinch bar of 3m length was observed. It is heavier than aluminium and lighter than steel.
- Lack of barring of the sidewalls.
- Thin slabs of the rocks were dislodged from the HW (pictures were taken as well as videos).
- Barring started from the vent pipe. Miner also tested for gases.
- Ground conditions appears to be fairly good. Fault observed approximately 10m from face.
- The tunnel height is 3.2m.



Figure 22: Incorrect positioning directly under the rock being barred, and note the position of the gasket

- **Other observations:**



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- Miner indicate that he struggles for equipment and thus does not get call. He blasts typically 20m, but his call is 40m.

1.1.24 Field Log 24

Date: 20-04-2015

Mining House C

Mine/ Shaft – UG Training Centre

Working Place- 1



Figure 23: Inadequate barring training where trainees 'demonstrate' barring in a shotcreted area rather than actually barring

- Observed training centre crew conducting barring training in-stope and in development. EE was completed to standard in-stope, but the development training was lacking i.e. there was no proper area to practice.
- Interview conducted with entire crew at the waiting place and surveys completed.



1.1.25 Field Log 25

Date: 21-04-2015

Mining House C

Mine/ Shaft - 10

Working Place – 1

- Accompanied by two strata control officers.
- Panel 1100m below surface - Miner arrived late.
- Washing of the gully started late.
- No gaskets were used initially and officials asked the crew why. Then team members collected them.
- Miner rushed people along this point.
- 3-4 people were barring at intervals down dip along the panel face.

1.1.26 Field Log 26

Date: 22-04-2015

Mining House C

Mine/ Shaft –11

Working Place- 1

- Accompanied by SRE.
- Pictures were not taken due to a misfire at the face.
- No barring was done.
- It is evident that barring was done thoroughly the previous shift.
- It was not observed how many pinch bars were present at this end.
- ICL Chromite stringers in Norite. Immediate FW to UG1.
- Good HW conditions were observed.
- Crew appears to be quite aware of their own safety and the need to bar.

1.1.27 Field Log 27

Date: 23-04-2015

Mining House C

Mine/ Shaft –11

Working Place- 2

Accompanied by SRE – Barring was completed to standard.



1.2 Gold Mines

1.2.1 Field Log 1

Date: 06-05-2015

Mining House D

Mine/ Shaft 1

Working Place 1

- Precursory Notes to the visit:
- The MOSH EE process was piloted at this Mining House.
- Team captains or shaft managers were keen to allow the visits to take place.
- They were keen to find out whether we could advise on either one barring process or be able to tell them if MOSH does happen.
- As TL's and miners were not present at the waiting place, other crew members could not enter the panels to do EE.
- I was accompanied by the health and safety representative and the safety officer, but the safety officer remained at the waiting area.
- Notes made from geology report at waiting place:
- Panels mine a single carbon leader (SBCL) reef – well mineralised and packed.
- Six faults previously intersected panel resulting in RIH.
- Geologist recommended not to leave RIH in the middle of panel.
- Hanging wall consists of friable quartzite (WAF) with RIH, intensely fractured with weak bedding planes.
- Many minor faults present.
- No support standard displayed at waiting area.
- Baby props, PSE's, Hydra bolts with nets, 1.1m X 1.1 m (and double) timber packs are used.
- Preconditioning is recommended for this area, 2.4m long holes - 3m apart.
- Normal production holes 0.9m long.
- Seismic event recorded here last month with no injuries.
- No night shift recommended by RME.
- Observations in the panel (Noted that the panel is a special area due to geological complexity):
- TW and gullies are (choked with stof) confined for travel, due to excessive accumulations of ore.
- Miner and TL were paraded by rock mechanics and thus arrived quite late to the panel. In the interim, I started conducting a survey with the entire crew at the waiting place. However, this was not completed as the miner and TL eventually arrived.
- MOSH EE was not completed to standard.
- No barring and/ or washing down took place at stick side.
- Crew did not all enter from behind the second line of support. They did not begin barring at the top of the panel and rather dispersed all over.



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- Installation of Camlok jacks proceeded without barring thoroughly first.
- There was evidence of barring not being done from the previous blast. The hanging wall was extremely fractured and could be barred a lot still.
- Condition of pinch bars were poor, especially with regards to gaskets sliding easily down the bars and pinch bar ends being blunt. Wear and tear leads to this. Researcher was told new gaskets are not easily available.
- The crew concentrated on face preparation rather than barring the hanging wall.
- The miner indicated he has many challenges:



Figure 24: Confinement in-stope due to accumulations of ore

- Insufficient tramming to get 'stof' out due to a German box being used in the area.
- Accumulation of ore increase temperatures in-stope.
- All access ways are confined.
- Not enough labourers in crew to install support.
- Many sockets evident on face.



Figure 25: Multiple sockets on the face

- No preconditioning holes drilled contributing to poorly fractured HW conditions.



Figure 26: Poor HW condition



1.2.2 Field Log 2

Date: 07-05-2015

Mining House D

Mine/ Shaft 1

Working Place 2

- Very poor ground conditions observed. Highly faulted area with dykes contributing to extremely fractured HW conditions.



Figure 27: HW in tunnel

- MOSH EE was completed well with the following observations:
- Watering down.
- Visual inspection as well as sounding.
- Pinch bars in good condition.
- Gaskets used and hands were placed behind.
- Sidewalls were less inspected than the HW and this was concerning as there was an overhanging (LHS) sidewall.



Figure 28: Barring in the development end

- Other non-barring related observations:
- This end exists as FW development was required for a bypass due to a FOG occurring in an alternate X/C.
- Geology and rock mechanics to visit – updated reports required at waiting place.
- 1m X 1m grouted tendons installed at area.
- Secondary support to follow anchors and WML.
- Support used in rocprops and timber packs.
- Backfill to follow soon.
- New panel was starting – correctly on ledging limits, packs installed 1m from face.
- Observed rats UG at tertiary stations area.

1.2.3 Field Log 3

Date: 11-05-2015

Mining House D

Mine/ Shaft 2

Working Place 1

- The reef being mined is the Carbon Leader with the HW and FW being Quartzite. The Stopping width is 1.2m.



Figure 29: Fractured HW Quartzite

- Researcher was accompanied by the Safety Officer and the Production Supervisor.
- The following are perceptions given by officials on the way to the panel and whilst not barring related may give insight to some social aspects prevalent at this mine:
- “Women are not taken that seriously still. I have had my Managers ticket for two years but I still have not been made an MO. The criteria though is that I need call for six months consistently, but this is difficult as seniors and crews can at times dictate and hinder your progress with sabotage.”
- ‘Discipline at the shaft is poor. People shove each other in the cage and rush to get out. We recently had two injuries due to a stampede.’
- “People get trained a lot and get constantly motivated but working well, and to standard does not last long. They get complacent quickly and start taking shortcuts if not injured.”
- Barring observations during EE included the following:
 - A new panel was being mined.
 - The Miner was consistently coaching in Fanakalo instead of allowing the researcher to observe. He appeared to want to give a good impression that EE was always completed well but it was clear that workers did not do EE as per standard as they were at times confused by his instructions.
 - Watering down took place from the top of the panel up until the bottom with no sequence being followed i.e. watering down then barring in 2-3m intervals.
 - People concentrated on dressing/ barring the face rather than also barring the HW above themselves.



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Field and Photo Log

- Gaskets were not observed on some pinch bars.
- People were positioned too close to where rocks would fall when barred i.e. they were confined and down dip (no escape routes were identified).



Figure 30: Positioning of barrer

- Miner appeared un-interested in correcting wrong practices. The Production Supervisor also seemed uninterested in the feedback being given to him.
- Knowledge of barring steps and rules is poor. Some people show understanding but they were few in comparison to those not interested in barring correctly.
- Ultimately it could be seen that MOSH EE was not being done consistently by this crew.

1.2.4 Field Log 4

Date: 12-05-2015

Mining House D

Mine/ Shaft 3

Working Place 1

- Paddocks were visited where the HW comprises Alberton Lava and the FW is Quartzite. A Top cut was being mined with the gully being blasted through backfill.
- Discussion with the Safety Officers at waiting area:
- View on barring - For this shaft they do 'bar' and have a FOG campaign that creates the awareness of barring. Now, everyone does MOSH rather than previously just the TL and miner.
- Habits and shortcuts lead to MOSH not being done well.



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Field and Photo Log

- People are fearful when interviewed by visitors and even management - "They don't want to get in trouble".
- "Accident investigations are sometimes not authentic due to people skewing the investigation so that culpability is changed".
- Not following the correct steps of barring often leads to accidents - Complacency leads to accidents.
- Taking shortcuts is often done due to employees wanting to finish early:
- Supervisors need to talk daily – 'coaching' e.g. Wednesday (supervisor go down early to do MOSH) - Human behaviour dictates that we do well when supervisors are present.
- Discussion with RME at the waiting place:
- Standards are perfect.
- Interventions complicate things.
- Barring is simple let's not complicate it and confuse people.



Figure 31: Top cut of Paddock area

- Observations on barring in the PADDOCK:
- Very high SW - 5 to 6 m in lower areas.
- Areas of the gully/ entrance and TW extend to beyond 10m high. 5.5m cable anchors and 2.3m long roof-bolt are used, as well as backfill.
- Barring was done well, but coaching addressed some minor issues.
- Buddy barring was good.



APPENDIX C

Field and Photo Log

- Positioning at all times was not good.
- Watering down and barring did not take place in the best sequenced manner.
- Gaskets being loose and incorrect positioning of gaskets are a problem as a gasket was observed almost falling off the pinch bar.



Figure 32: Incorrect Position of Gasket

- Pinch bars used were new and sharp.
- Barring of backfill is hazardous as it is friable and causes mud in-stope when exposed to water. It was observed that the barrers took cognisance of these considerations.



Figure 33: Exposed Backfill bags and poor HW condition

1.2.5 Field Log 5

Date: 13-05-2015

Mining House D

Mine/ Shaft 3

Working Place 1

- Crew entered without a miner (as the miner was paraded) and EE was not conducted. People were already working at the face.
- When the miner did conduct EE when he arrived, the following was observed:
- Visual examination was done from XC breakaway but more focus was placed on HW rather than including the sidewalls as well.



Figure 34: Sidewall and Hanging Wall condition

- Watering down was incorrectly done, as the person proceeded right to the face to water down and then came back.
- Pinchbar condition was poor – blunt at ends and even bent a little.
- Buddy barring is done quite successfully.
- Positioning of people barring close to other was a concern. They were coached to leave a little space in between.

1.2.6 Field Log 6

Date: 18-05-2015

Mining House D

Mine/ Shaft 8

Working Place 1

- Accompanied by Production Supervisor and Golder Social Researcher.
- SW 1.5m
- Panel face length 19m.
- Mining – VCR
- Hanging wall – WAF – ‘Shark teeth formation’ description was made of the shape of the HW.
- EE with barring completed and to standard:



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- Gaskets and pinch bars were in good condition and used well.
- Watering down was not done in a good sequence.
- Correct positioning was a challenge due to the nature of barring in a raise or gully.
- Very blocky HW and not all areas were visually examined or sounded i.e. there were areas that were observed that could still be barred.



Figure 35: Fractured WAF hanging wall

- Small FOG over winch in back area caused one person in our team to be afraid. She left to the waiting area accompanied by a helpful crew member. This showed that not all areas had been inspected previously and that the FOG hazard in the panel was high.
- Crew members indicated that because barring can be done for a long time in such a highly fractured HW, they bar down only what they have learnt might fall during the current shift. This skill/ judgement ability has taken a lot of time and experience working at this stope.



1.2.7 Field Log 7

Date: 19-05-2015

Mining House D

Mine/ Shaft 9

Working Place 1

- Accompanied by Production Supervisor.
- SW 1.6m
- Mining VCR with hanging wall lava being competent.
- No watering down during barring.
- No gaskets were observed on any pinch bars in-stope. Crew indicated a problem with the gasket being loose. Production supervisor indicated he will find better replacements from the material store.
- Crew appeared very scared to talk to the researcher –attempts were made to put the crew at ease and questionnaires were completed only with personnel who volunteered.
- It was indicated that there are 7 Pinch bars in-stope. All were in good condition but none had gaskets.

1.2.8 Field Log 8

Date: 20-05-2015

Mining House D

Mine/ Shaft 10

Working Place 1

- Accompanied by Miner and Production Supervisor, as well as STS personnel.
- SW 1.5m
- Mining VCR
- HW – Alberton Lava – fairly fractured → abutment panel with Stickside.
- MOSH EE was poorly done:
- No initial watering down and it was observed that watering down could not have been done during previous shifts
- Gaskets poor as they slide off Pinch bars.
- Barring was not done thoroughly as there was rushing to prep for the VP visit.

1.2.9 Field Log 9

Date: 20-05-2015

Mining House D

Mine/ Shaft 11

Working Place 1

- Accompanied by production supervisor and a full time health and safety representative.
- FW opening up –rock appears to be Quartzite at parts and unpayable reef at parts.
- Barring knowledge and execution was poor.



APPENDIX C

Field and Photo Log

- No watering down took place at the start of entry examination.
- Hands were not placed behind gaskets on multiple instances.
- Visual examination of sidewalls did not take place previously and the condition of SW's poor due to slabbing.
- Positioning was also a problem at times.

1.2.10 Field Log 10

Date: 17-06-2015

Mining House E

Mine/ Shaft 15

Working Place 1

- No notes made – Barring knowledge of rules was good but entry examination was not completed to standard.
- Accompanied by Miner.

1.2.11 Field Log 11

Date: 18-06-2015

Mining House E

Mine/ Shaft 15

Working Place 2

- Accompanied by Miner, Golder Engineer and SCO.
- Panel was mining through a dyke with the dyke forming the HW as well.



Figure 36: Steeply dipping joints and stress induced fracturing in the HW

- Barrage was not completed to standard at the panel.

1.3 Coal Mines

1.3.1 Field Log 1

Date: 20-07-2015

Mining House F

Mine/ Shaft 1

Working Place 1

- Accompanied by Safety Superintendent and Miner.
- Crew had already began EE and were withdrawn to restart (not at my request).
- Sounding and barring was completed diligently by the crew.
- At a portion that had a drumming sound that could not be barred down, the roof was marked in red. A decision was taken to install additional roof bolts in the area.
- The correct length pinch bar and sounding stick was used all times, they were in good condition with fixed gaskets.
- Crew was thorough with barring and sounding (possibly due to visitor and safety personnel presence).



1.3.2 Field Log 2

Date: 21-07-2015

Mining House F

Mine/ Shaft 1

Working Place 2

- Poor roof conditions in the section.
- Accompanied by safety officer and MO.
- Observing barring and sounding during EE.
- Observed dyke intersection area where a FOG (16m³) occurred.
- There was purported to be an area of burnt coal (could not be observed).
- In a roadway where the seam was closing, poor ground was observed and extensive barring was needed.
- MO suggested that the rock mechanic should visit.
- Crew was thorough with barring and sounding.

1.3.3 Field Log 3

Date: 23-07-2015

Mining House F

Mine/ Shaft 2

Working Place 1

- Accompanied by a PIT, Shift boss and a geologist.
- Did not observe barring and sounding during EE. Crew was requested to demonstrate how it is done.
- Relatively good roof conditions observed through section but a few brows can be seen in the section.
- Poor housekeeping and uneven floor contributes to poor pillar cutting in the section.
- Water is abundant in the section and leads to pumping needs.
- Barring and sounding was not completed as per STD during EE.
- No evidence of sounding marks on the roof and ribs.
- Production pressure was observed – crew appeared stressed and were rushing through tasks.

1.3.4 Field Log 4

Date: 24-07-2015

Mining House F

Mine/ Shaft 2

Working Place 2

- Accompanied by PIT and a Miner.
- Observed barring and sounding during the shift.
- It is likely that the procedure would not have been completed if I wasn't there. The crew appeared to be reluctant to complete EE or to sound at all.



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- Three people eventually started to sound and bar using a Combination stick and a conventional set comprising a sounding stick and pinch bar.
- Many areas at the edges of pillars were barred. Visual inspection was good, but there was little evidence of sounding marks from prior shifts.
- Ribs look scaled adequately.
- Roof conditions appear good to fair in certain roadways. Minor guttering.



Figure 37: Pinch Bar and Sounding Stick



Figure 38: More barring equipment in section



1.3.5 Field Log 5

Date: 28-07-2015

Mining House F

Mine/ Shaft 3

Working Place 1

- Accompanied by the shift boss.
- Observed sounding and barring with very poor roof conditions due to the presence of many dykes.



Figure 39: Poor Roof conditions



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Field and Photo Log



Figure 40: Barring pillar corners

- Barring was done well and thoroughly.



Figure 41: Areas of the roof where barring was completed



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Field and Photo Log



Figure 42: Buddy barring in action

- Sides of pillars are supported with roof bolts in special areas.
- Strips and anchors used at intersection points.
- Contractor and employees undergo the same training.
- Evidence of previous sounding due to marks observed on the roof.
- Stories about cat (nicknamed Mr. Mine Captain) and an owl living underground were told by the shift boss. Footprints or paw prints were seen but no picture was taken.



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Field and Photo Log



Figure 43: Large FOG in old area in the section. Picture taken to show the laminated nature of Shale and Coal in the roof



Figure 44: Another view of the large FOG



1.3.6 Field Log 6

Date: 29-07-2015

Mining House F

Mine/ Shaft 3

Working Place 2

- Accompanied by the shift boss.
- Better roof condition were observed in this section than working area 1 due to there being less geological complexity in this section, most notably, less dykes.
- Barring and sounding was not done thoroughly.
- People did not want to assist with barring and sounding.
- Sticksides appear to be scaling at parts, especially the corners (pictures were taken).

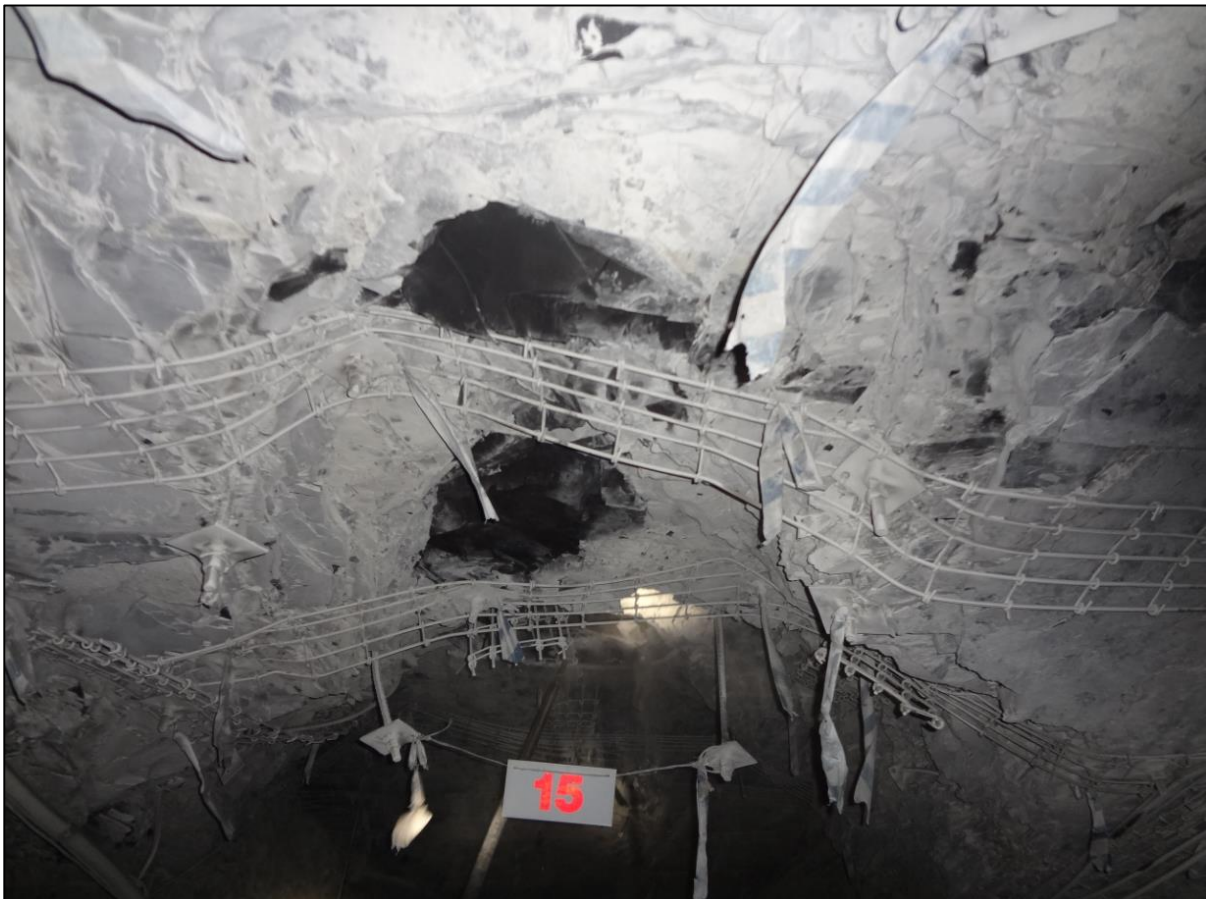


Figure 45: Roof in the outbye section

1.3.7 Field Log 7

Date: 12-08-2015

Mining House G

Mine/ Shaft 4

Working Place 1

- Accompanied by Rock Engineer and Golder Social Scientist.



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Field and Photo Log

- Crew attempted barring during entry examination together and followed a logical sequence through the section leaving operators at their machines along the way.
- Visual examination could have been improved.
- Some crew members did not involve themselves at all in inspection and just stood back observing others.
- Barring and sounding of all areas was not thoroughly done.
- Roof conditions were good and it is suggested that perhaps this crew was starting to get complacent about sounding and barring thoroughly.



Figure 46: Good Roof conditions and good pillar cutting

- Conventional steel pinch bars and wooden sounding sticks were used. Gaskets were fixed.



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Field and Photo Log



Figure 47: Coal Barring Equipment



Figure 48: Equipment made more visible with the addition of reflective tape on pinch bars and sounding sticks



1.3.8 Field Log 8

Date: 18-08-2015

Mining House G

Mine/ Shaft 5

Working Place 1

- 4 Seam section. Coal in roof as well.
- No questionnaires were completed, as there was a drive to get producing. Hence, no crew members were allowed to chat.
- Barring was completed to standard but only a single crew member sounded the section. The person carrying the pinch bar lagged far behind the sounder.
- No intrinsically safe camera was available that could be taken underground.

1.3.9 Field Log 9

Date: 19-05-2015

Mining House G

Mine/ Shaft 5

Working Place 2

- 4 Seam Section. No faults, dykes or poor roof conditions were observed in the section.
- Barring was completed fairly well. The only criticism being that sounding of the roof was completed with large gaps where the roof could have been hollow. The frequency of sounding could have been improved.
- No intrinsically safe camera was available that could be taken underground.

1.3.10 Field Log 10

Date: 20-08-2015

Mining House G

Mine/ Shaft 6

Working Place 1

- Accompanied by shift boss.
- Barring was completed to standard.
- Condition of equipment was good. Pinch bars were sharp and different lengths were available.
- Frequency of sounding as well as buddy barring was carried out properly.

1.3.11 Field Log 11

Date: 21-08-2015

Mining House G

Mine/ Shaft 7

Working Place 1

- Accompanied by Rock Engineer and STS personnel.



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Field and Photo Log

- Roof strata highly laminated with a thick in-seam parting being observed. Seam 1.39m thick from floor up to parting. Face was mining in an area with burnt coal and a predicted zone of poor roof conditions was noted on a plan.



Figure 49: In-seam parting



Figure 50: Roof laminations

- Waiting Place meeting was held and crew proceeded to complete entry examination together.
- A Combination Fibreglass pinch bar and sounding stick was used.
- Roadways were extremely high at parts i.e. higher than could be reached with 4.5m pinch bars. The barrer thus strained to reach rocks that could be barred down. No attempt was made to fetch a longer pinch bar. It is suggested that perhaps a longer pinch bar was not available in the section.
- Barring and sounding was done in too sporadic a manner. Thus, many areas remained that would still require barring in future shifts.



Figure 51: Size of rocks barred down

- Visual examination was poor – the section was dark and cap lamps did little to illuminate very high areas.

1.3.12 Field Log 12

Date: 26-08-2015

Mining House H

Mine/ Shaft 9

Working Place 1



Figure 52: Decline/ Portal entrance

- Only three crew members were present to assist with barring, but it was completed to standard.



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Field and Photo Log

- Due to the installation of wire mesh against the roof in most roadways, there was not a great deal of roof to sound and bar.
- Personnel sometimes sounded the roof where wire mesh/ nets were installed.



Figure 53: Barring being completed



Figure 54: Good Pillar conditions and nets tensioned against the roof



Figure 55: Smooth roof conditions with installed nets

1.3.13 Field Log 13

Date: 28-08-2015

Mining House I

Mine/ Shaft 10

Working Place 1

- Observed mechanical barring with the Fermel Scaler.



Figure 56: Outbye area



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Field and Photo Log



Figure 57: Scaling in rib sides

- The effectiveness of barring with the scaling machine is dependent on the skill of the operator. At times the operator was barring excessively into pillars and the roof.



Figure 58: Scaling into roof by operator - Top RHS of picture



2.0 FIELD LOGS - FIELD ENGINEER_VK

2.1 Platinum Mines

2.1.1 Field Log 1

Date: 02-03-2015

Mining House A

Mine/ Shaft – N/A

Working Place – N/A

- Accompanying persons: Training Personnel
- Visit to UG Training Centre.
- Barring training – 1 day demonstration and second day assessment.
- Observed barring the training stope. Demonstration was done according to the mine standard.
- Demonstration of barring at the flat development end, high excavation (greater than 3m) was not ideal. The pinch bar was not always kept at a safe angle, potential for loose rocks to fall on the barrer.
- Some sections of the training centre are still under development.
- Smooth hanging wall conditions, discontinuity planes parallel to the hanging wall. Fissure flows observed, high flow rate.
- Previously, each miner was supposedly issued with a telescopic aluminium pinch bar that could extend to 1.8m.

2.1.2 Field Log 2

Date: 03-03-2015

Mining House A

Mine/ Shaft 1

Working Place 1

- Barring observed to standard.
- Barring supposedly done with machinery if the hanging wall conditions are poor.



Figure 59: Good HW conditions

- Mechanised Mining.

2.1.3 Field Log 3

Date: 04-03-2015

Mining House A

Mine/ Shaft 1

Working Place 2

- Hybrid Mining.
- Barrage observed in the stope. Barrage of the face carried out to mine standard.
- Interviews carried out in the stope, very noisy, difficulty with hearing personnel.



Figure 60: Large Brow supported with Grout Packs



2.1.4 Field Log 4

Date: 05-03-2015

Mining House A

Mine/ Shaft 1

Working Place 3

- Observed barring in the stope.
- Barring done to standard for the most part. However, no warning of people down-dip.
- Barring, then watering down, then barring again.
- Large rocks were barred down.

2.1.5 Field Log 5

Date: 06-03-2015

Mining House A

Mine/ Shaft 4

Working Place 1

- Pillar mining.
- Barring carried out very well. Mid-shift barring also occurs frequently.
- Production pressure is evident. Long hours. Not enough pinch bars in the areas however barring still carried out diligently.
- Pinch bar conditions are okay. Pinch bars along the haulage roughly every 50m.

2.1.6 Field Log 6

Date: 10-03-2015

Mining House A

Mine/ Shaft 2

Working Place 1

- Observed barring in the stope.
- Positioning is a concern as sometimes the down-dip position is taken. Warning people doesn't take place prior to barring, only when there are rocks rolling down does the warning of people down-dip happen.
- Pinch bar condition is good.
- Sounding of the hanging wall doesn't seem to be practiced much.
- Behaviour seems to be a problem. The following is a quote from a crew member: "The UG environment changes the mind-set. People don't want to stay underground. They are in a hurry to finish their work, sometimes they don't concentrate and this can maybe cause the accidents to happen." "In some places, the crew members leave without the miners consent. Clock cards containers are broken into."



2.1.7 Field Log 7

Date: 11-03-2015

Mining House A

Mine/ Shaft 2

Working Place 2

- Observed barring at the development end.
- Barring of the travelling way as the crew spotted loose rocks.
- Gaskets aren't as easily available.
- "Historically, people would stand on the loco and bar higher areas" – This is not safe.
- Afrikaans and fanakalo seems to be the most spoken languages.

2.1.8 Field Log 8

Date: 12-03-2015

Mining House B

Mine/ Shaft – N/A

Working Place – N/A

- UG Training Centre visit
- Well equipped. Many learning aids.
- Good spread of theory and practical.

2.1.9 Field Log 9

Date: 13-03-2015

Mining House B

Mine/ Shaft – N/A

Working Place – N/A

- Training Centre visit – Mock-ups
- Well equipped. Many learning aids.
- FOG Simulations. Role playing etc.

2.1.10 Field Log 10

Date: 17-03-2015

Mining House B

Mine/ Shaft 9

Working Place 1

- Underground Training Centre visit.
- Hanging wall conditions: Blocky, closely spaced joints, calcite infill, vertical jointing in pyroxenite.
- Accompanying Persons: Training personnel
- Barring observed in UG training centre by trainees.
- Barring carried out well. All rules and procedures followed to standard.



- Pinch bar condition was good.
- Training centre well equipped.
- Interviews with trainers and trainees.



Figure 61: Pinch bars in haulage



2.1.11 Field Log 11

Date: 18-03-2015

Mining House B

Mine/ Shaft 9

Working Place 2

- Accompanying person: Shift Supervisor
- Observed barring in the stope. Observers sitting/standing too close to the barrer.



Figure 62: Watering down prior to barring

- Long meetings and discussions at the waiting place.
- Failed support observed in the panel, it was reported to the shift boss.
- Observed reef in hanging wall. More barring was needed in places.
- Blunt pinch bars in the panel. Safety rep to exchange these.
- Interviews with people in the stope. People know what's required of them but don't always feel safe.



APPENDIX C

Field and Photo Log



Figure 63: Crew involvement and participation



Figure 64: Blunt, old pinch bars



2.1.12 Field Log 12

Date: 19-03-2015

Mining House B

Mine/ Shaft 9

Working Place 3

- Observed barring during entry examination.
- Positioning whilst barring wasn't always good. Pinch bars were blunt but were still used.



Figure 65: Incorrect stance- positioning and footing. Kneeling would have been preferred to sitting

- More barring needs to take place. Some areas still needed barring.



Figure 66: Blocky Pyroxenite HW



- Short pinch bar used to bar the gully from the stope. Not safe with a short pinch bar.
- Warning of people down-dip was not done prior to barring.
- Barring by most people done to standard.

2.1.13 Field Log 13

Date: 20-03-2015

Mining House B

Mine/ Shaft 9

Working Place 4

- When arrived in the panel, the miner was standing down-dip a crew member was barring further up the panel – Miner was informed to move to a safer position.
- Person barring alone, asked for assistance but didn't receive any help from the crew members. He spent most time barring reef from the hanging wall. He stopped barring not when it was safe but when he got tired. Net installed after. He asked repeatedly for help but didn't receive any assistance from his crew.
- When barring failed, it appeared that nets are installed.
- Reef thinly bedded.
- Material handing needs to be addressed. People throw around pinch bars without warning people.
- Sounding the rock seems to replace visual observation of open fractures.



Figure 67: Good Pyroxenite HW conditions

- Blunt pinch bars are used.



- Interviews indicate that the rules are understood and known but aren't practiced.

2.1.14 Field Log 14

Date: 24-03-2015

Mining House B

Mine/ Shaft 6

Working Place 1

- Accompanying person: Strata control officer
- Barrage observed along the travelling way. No warning of persons down dip. People have no consideration for the barring rules. Some bystanders too close to barrer.
- Observed barring in the stope. Barring through the net in places.
- When barrers look back they tend to bar behind them from the down-dip position.
- Hanging wall, blocky.



Figure 68: Blocky HW conditions

- At times the pinch bar angle isn't correct leading to personnel not being at a safe distance.



2.1.15 Field Log 15

Date: 25-03-2015

Mining House B

Mine/ Shaft 6

Working Place 2

- Barring observed at the flat development end.
- Barring carried out to standard.
- Interviews with workers underground were completed.



Figure 69: Dyke in Sidewall

2.1.16 Field Log 16

Date: 26-03-2015

Mining House B

Mine/ Shaft 6

Working Place 3

- Merensky reef mined.
- Observed barring in the stope.
- Identified many areas to be barred and the crew diligently barred claiming “a fresh set of eyes is always good”. Large rock blocks were barred down.
- Some of the pinch bars were blunt but was still used; personnel struggled with the blunt pinch bar.
- Multiple people were barring simultaneously moving down dip. Mostly efficient.
- Sometimes observers were a little too close to the barrers.



- Feedback was given to the team regarding their barring practices.
- People appear to have a good understanding of barring and practice the rules for the most part.
- Pillar robbing in some places. Grout packs being installed for additional support.
- Water (Ground water and through mining) present in this area. This needed to be assessed.
- Nets installed in secondary waiting place.
- Crew commented on the long travelling time being the reason for the apparent hurry that people appear to be in.

2.1.17 Field Log 17

Date: 27-03-2015

Mining House B

Mine/ Shaft 6

Working Place 4

- Observed barring in steeply dipping panel. Entry examination began from the travelling way to the stope.
- People were aware of the barring rules and provided reasons as to why the rules don't apply in this particular environment. Positioning is not conventional in this environment due to the dipping strata and open fracture exposure orientation.
- Incorrect pinch bar length was used to bar the hanging wall in the gully. This was corrected when pointed out.
- People seem to have understood safe positioning when barring.
- UG2 being mined. Hanging wall is smooth, discontinuity sets parallel to the hanging wall.



Figure 70: Smooth HW

- Observed places where reef was in the hanging wall.



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Field and Photo Log

- Large rock blocks were barred down (1.2m x 0.7 x 0.3m) was barred down and fell alongside the scraper. Three people were needed to bar this down.
- One person took the wrong position, used the incorrect length pinch bar and didn't place his hands behind the pinch bar and attempted to bar. The shift boss stopped him and coached him.
- Orange gaskets are sometimes used. This is preferred because it is lighter and easier to get onto the pinch bar.



Figure 71: Orange gaskets on pinch bars

- Some observers stand too close to the barrer.
- Pinch bars were in good condition.

2.1.18 Field Log 18

Date: 09-04-2015

Mining House B

Mine/ Shaft 5

Working Place 1

- Accompanying person: Strata Control Officer and Miner
- Mechanised Mining. Bord and pillar method.
- Observed early examination. Miner does EE alone. Barring isn't carried out often. Rules of barring are remembered and most people understand how barring is to be carried out.



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Field and Photo Log

- Barrer positioning was not always good. No watering down prior to barring.
- Blocky conditions. Persistent closely spaced discontinuity sets perpendicular to the hanging wall cross-cutting the set oriented parallel to the hanging wall. Macro scale discontinuity shape is wavy resulting in variable block sizes.



Figure 72: Blocky HW conditions



Figure 73: Barring blocky hanging wall



APPENDIX C

Field and Photo Log

- Not much time is usually spent barring.
- No buddy barring was observed.
- Large area to be barred by one person.
- Incorrect pinch bar length was sometimes used.

2.1.19 Field Log 19

Date: 09-04-2015

Mining House B

Mine/ Shaft 5

Working Place 2

- Night shift.
- Not much barring carried out.
- Some interviews carried out.

2.1.20 Field Log 20

Date: 10-04-2015

Mining House B

Mine/ Shaft – NA

Working Place – NA

- Visit to the training centre.
- Observed training activities.
- Interviews with training personnel.
- Training facilities are good. Focus on understanding. Good spread of theoretical and practical approaches.

2.1.21 Field Log 21

Date: 20-04-2015

Mining House C

Mine/ Shaft - NA

Working Place - NA

- Visit to UG training centre.
- Group discussion on barring. Group consists of mostly men and a single lady. Age group 31-40 years. Group was very responsive. People share their experience freely. Historical accounts of barring incidents were provided.
- According to the historical accounts of barring accidents: causes include incorrect positions, no use of gaskets, incorrect pinch bar size and holding the pinch bar too close to one's body whilst barring.
- Observed barring. Barring carried out to standard. Although there were occasions where the barrers hands were not behind the gasket.
- Knowledge of barring rules was generally good.
- "Without barring there is no safety, we bar to be safe".



2.1.22 Field Log 22

Date: 21-04-2015

Mining House C

Mine/ Shaft 10

Working Place 1

- Accompanying persons: Strata Control officer and Miner
- Stress fracturing observed in the side walls.
- Very blocky conditions. Retreat Mining. Merensky Mined. Soft discontinuity infill.
- Observed barring in the travelling and the stope during entry examination.
- Good to see frequent barring of the side walls however positioning was not always good and the length of pinch bar was incorrect, that is, too short.
- Hanging wall in the travelling way needs to be barred more, very blocky conditions.
- Gaskets were not always used when barring. Only shorter length pinch bars were used despite the need for a longer pinch bar in some instances.
- Barring in the panel was a little unconventional. Multiple barring with barrers positioned along the length of the panel in a down-dip direction (Buddy barring). This isn't favourable nor is it safe as there should not be any persons situated down-dip. The sequencing has been misinterpreted. Feedback was given to the miner and the crew.
- Barring took place for a minimum of 20 minutes. Teams split up and work in different sections of the panel simultaneously.
- Entry examination was carried out to standard.

2.1.23 Field Log 23

Date: 22-04-2015

Mining House C

Mine/ Shaft 11

Working Place 1

- No barring was observed. Walked over 6km to either development end (E and W haulage faces) however it appears that we missed the entry examination.
- Interviews with multiple people underground regarding barring practices.
- Accompanying person: Rock Engineer

2.1.24 Field Log 24

Date: 23-04-2015

Mining House C

Mine/ Shaft 11

Working Place 2

- Accompanying person: Rock Engineer
- Gully is very steep.
- Observed barring in the stope and ASG.



Figure 74: Barring in-stope

- Sidewall was mostly barred in the ASG.
- Stopping height reduced to 0.5 to 0.9m as it has not been cleaned.
- Support units have been damaged by the blast. These have been reported.
- Buddy barring of the entire panel from the top to the bottom. No splitting of the panel into sections.
- Barring carried out well and the barring rules were demonstrated.
- Barring for at least 30 minutes. Barring is tiring.
- Most places were barred, blocky conditions.

2.2 Gold Mines

2.2.1 Field Log 1

Date: 05-05-2015

Mining House D

Mine/ Shaft – N/A

Working Place – N/A

- Health and Safety site induction



- Data collection of training materials, barring accident reports on surface.

2.2.2 Field Log 2

Date: 06-05-2015

Mining House D

Mine/ Shaft 1

Working Place 1

- Accompanying persons: Safety Supervisor and Miner
- Only some of the crew members were at the waiting place. Most of the crew is already in the panel before the entry examination was carried out.
- Steep raise, 2m high mat packs undermined.
- Miner does not appear to be able to effectively lead his crew, not many of the miners instructions were followed nor acknowledged (more than 14 people).
- Crew appears to be in a hurry to start working.
- Two teams were supposedly carrying out the entry examination in the stope at the bottom and the top of the panel.
- Installation of jacks along the face before barring has commenced, jacks installed below smaller loose rocks that could have been barred down.
- Safety officer intervened once this was pointed out and asked the miner to instruct his crew numerous times but he wasn't unfortunately able to.
- No velocity tests and temperature tests were carried out. Stope was incredibly hot.
- Barring observed in the stope.
- The crew occasionally barred the hanging wall but mostly barred the face.
- Barring was carried out without any gaskets. This was pointed out however it seemed to have been a pointless exercise as the gaskets that he used could not be secured on the pinch bar. The gaskets moved around so much that it eventually flew off the pinch bar.
- Barred from the correct position however he did not warn people that were further down-dip.
- They only barred the face; the travelling way has not been barred in a long time.
- Most people don't follow the rules.
- Team has not been trained properly but appear willing to learn.
- Team needs more guidance and supervision.

2.2.3 Field Log 3

Date: 07-05-2015

Mining House D

Mine/ Shaft 1

Working Place 2

- Barring observed in the development flat end.
- A complete entry examination was not completed.



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- Watering down of the complete area to be barred which involved the person moving through most of the area that isn't safe to water down. He did not sequentially water down.
- High excavation is 3.5m.
- Accompanying person: Safety supervisor
- Miner didn't acknowledge that barring should be carried out between support units even though loose rock was visible.



Figure 75: Jointing in Sidewall

- Only safety reps carried out barring. This is apparently their job and the other crew members would not bar. Crew members do not like spending lots of time barring, only the safety reps would bar.
- The crew was not pleased with me asking the safety rep to bar unsafe areas because they felt I was wasting their time.
- Observed good barring practice from the safety reps.
- Barring is difficult practice in these very high development ends.



Figure 76: Barring in high excavations

- Barring with the long pinch bar does result in shorter people losing their secure footing more often. Footing is a definitely a concern as the barrer can easily fall in the unsafe area.
- Interview with the crew member that completed barring.
- Incomplete questionnaire with the team leader that works at the box hole. Barring in the box hole is carried out from the top to the bottom. Guy enters with a harness attached. Visibility is poor and very wet conditions. He also bars alone which again is a safety concern. General rules for barring doesn't consider this situation.

2.2.4 Field Log 4

Date: 08-05-2015

Mining House D

Mine/ Shaft 2

Working Place 1

- Travelling time was considerably long. Entry examination supposedly already took place and the crew member was barring for demonstration purposes.
- Quartzite in hanging wall. Main reef being mined. Three major discontinuity sets identified, mostly widely spaced, not blocky. Hanging wall is relatively smooth, with a few joints and some blast damage.
- Observed barring in the winze, confined area.
- Barring mostly carried out to standard. However, a longer pinch bar was used in this confined area and it was difficult to manoeuvre and posed a hazard for bystanders.



2.2.5 Field Log 5

Date: 11-05-2015

Mining House D

Mine/ Shaft 2

Working Place 2

- Stoping height 1.5m or less.
- Accompanying person: Safety Rep
- Depth is estimated to be 3.1km below surface.
- Temporary support is installed prior to barring. Supposedly, barring was carried out prior to installation of support however there were areas that were barred after the fact.
- New miner allocated to this crew.
- Barring without gaskets, gaskets are apparently not generally used. Gaskets are not readily available.
- Pinch bar held unconventionally, like a spear for the most part. Crowbar/ Bent end of the pinch bar not used for the most part.
- No warning of people down-dip prior to barring.
- Travelling way needs to be barred more frequently.
- High volume of failed material/ FOGs/ Barred rock in the haulages that need to be addressed.

2.2.6 Field Log 6

Date: 12-05-2015

Mining House D

Mine/ Shaft 5

Working Place 1

- Entry examination carried out to standard.
- Barring took place from the waiting place until the face of the development end.
- Depth estimated to be 823m.
- Barring positioning was good, especially when barring the sidewalls.
- Most of the crew members were spotters while barring.
- Buddy barring also observed.
- Large rocks were barred down.
- Gaskets were not used for the most part as they were not available.
- Constant sounding of the rock since there were no visible fractures.



2.2.7 Field Log 7

Date: 13-05-2015

Mining House D

Mine/ Shaft 5

Working Place 2

- Smooth hanging wall conditions with a few joints sets. Persistent vertical joint sets observed in the hanging wall. Brows observed.
- Travelling way needs to be inspected. Brows along travelling way. Loose rock occasionally observed in the travelling way. Some confined entry points into the top of the panel.
- Barring carried out in the panel, mostly of the face and occasionally of the hanging wall. Barring mostly done to standard however they occasionally did not warn people down-dip prior to barring.
- Pinch bar condition not always good.

2.2.8 Field Log 8

Date: 14-05-2015

Mining House D

Mine/ Shaft 6

Working Place 1

- Accompanying person: Safety Supervisor and Shift Boss
- Walked 6km to the workplace. Locomotives were not available as the loco drivers were still held up on surface.
- Observed barring at the development end. High excavation (4.2 – 4.5m).
- Pinch bar lengths of 3m and 4m were used.
- Early Entry Examination was carried out very well and to standard.
- Barrers positioning were mostly good. The observers/bystanders were a little too close to the barrer at times.
- This crew carries out barring regularly.
- Hanging wall conditions, very blocky, highly fractured, close joints. Actively seismic area. Heard strain bursts.

2.2.9 Field Log 9

Date: 15-05-2015

Mining House D

Mine/ Shaft 7

Working Place 1

- Accompanying person: Safety Supervisor
- Travel by loco and a 5km walk to the workplace.
- Early entry examination was done well.
- Observed barring from the waiting place. Good display of sounding, positioning, warning people etc. Sometimes the observers were a little too close to the barrer.



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- Some barring was done in the travelling way; however it's still inadequate given the unfavourable joint orientations.
- Hanging wall is very blocky, closely spaced near vertical discontinuities with cross-cutting sets with varying shapes (wavy, some planar) and spacing forming the very blocky conditions.



Figure 77: Gully HW condition



Figure 78: Steeply dipping joints in HW



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- Additional supported required where support units have failed. Substantial water in the gully.
- Barring appears to be completed frequently during the shift.
- Observed barring at the face. Barring carried out well and to standard. Good understanding of the barring rules based on explanations provided.

2.2.10 Field Log 10

Date: 18-05-2015

Mining House D

Mine/ Shaft 8

Working Place 1

- Observed barring during entry examination.
- Not much barring was done and when it was, it was done so poorly. Barring observed in the travelling way.
- Pinch bar wasn't always at a safe angle away from the barrer, observers were too close, sometimes barring from the down-dip position instead of the side. No watering down.
- Support failure, mesh and lacing.
- Box hole barring: Shakes the chain from a safe position to dislodge any loose rocks. Climbs up from one-side of the box hole. Barring from top to the bottom.



Figure 79: TW entrance



2.2.11 Field Log 11

Date: 19-05-2015

Mining House D

Mine/ Shaft - NA

Working Place - NA

- General discussion with class of roughly 21 people about barring. Rules are adequate to carry out barring safely. Most are comfortable to complete barring after the training they receive.
- According to the class, barring accidents occur due to complacency (i.e. people get used to their environment and dangers).
- Classroom contains props. Mock-ups standard.



Figure 80: development Mock Up

- Interview with various students and training personnel.
- Employees receive a certification of competency to carry out their respective jobs.
- Five step process: Registering, Training, Assessment, Moderation, and Certification.
- New employees are inducted. Training in the classroom and then mock-up demonstrations, on the job training, assessment on the job and moderation then certification.
- Barring rules taught in the classroom. Practical demonstration at mock-ups. After a month on the job training, the student will be assessed. If found competent, certification would be issued, if not then the



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student will be re-trained and will undergo the process until deemed competent. "We don't give up on our people. We keep training them until they get it right".

- Assessments are carried out underground. Assessors can also be changed if requested. UG instructors train people in the environment that they are working in. The ground conditions are different in many of the places so this is why the instructors go underground to train people.
- If there is an accident/incident, the UG instructors are dispatched to train people whilst working.
- Classroom teaching for theory, mock-ups for practical demonstrations, mostly on the job training with UG coaching from trainers.
- UG instructors job to prepare the trainee for his assessment and skill competency.
- Assessors emphasise understanding and the assessors are assessed by moderators.
- Refresher training is carried out annually when personnel have returned from leave.

2.2.12 Field Log 12

Date: 20-05-2015

Mining House D

Mine/ Shaft 10

Working Place 1

- Pillar Mining. Mining Ventersdorp. Mining up-dip.
- Accompanying person: Shift boss
- Observed entry examination done to standard. Barring carried out to standard with participation from the entire crew.
- Panel has not been cleaned. Rolling reef.
- Hanging wall conditions – mostly smooth with a discontinuities. Some places can be blocky.
- Some concerns include positioning at times. Some of the pinch bars appear to be old and blunt.



Figure 81: Barring a blocky area

2.2.13 Field Log 13

Date: 21-05-2015

Mining House D

Mine/ Shaft 13

Working Place 1

- Site induction completed.
- Visit to the training centre mock ups.
- Training centre still under development.

2.2.14 Field Log 14

Date: 22-05-2015

Mining House D

Mine/ Shaft 12

Working Place 1

- Accompanying person: Miner and Shift boss
- Observed barring in the stope. Barring mostly done to standard. People appear to be complacent, didn't seem to identify the loose rocks by visual means.
- Hanging wall looks smooth however has discontinuities that is parallel to the hanging with soft infill. Cross-cutting discontinuity sets that have variable spacing forming blocks in the hanging wall.



Figure 82: Laminated HW (Quartzite)

2.3 Coal Mines

2.3.1 Field Log 1

Date: 28-08-2015

Mining House I

Mine/ Shaft 10

Working Place 1

- Mechanised mine.
- Observed mechanical barring.
- The effectiveness of barring with the scaling machine is dependent on the skill of the operator. At times the operator would be barring the pillar.

3.0 FIELD LOGS - FIELD ENGINEER_JM

3.1 Platinum Mines

3.1.1 Field Log 1

Date: 03-03-2015

Mining House A

Mine/ Shaft – 1

Working Place – 1

- Accompanying Person: Mine Overseer and Miner
- Observed barring demonstration at the development end and stope area.
- Some of the crew members were at the waiting place. Most of the crew have already entered their working area.



- Observed barring demonstration as the crew have already done the early entry examination.
- Mechanised mining area - Observed support i.e. hydrabolt installation at working panel.

3.1.2 Field Log 2

Date: 04-03-2015

Mining House A

Mine/ Shaft – 1

Working Place – 2

- Accompanying person : Shift supervisor
- Entry Examination completed from secondary waiting place into the stope area.
- Overall Comment: Barring and early entry examination was completed to standard.
- Hybrid mining section.....The crew commented about poor sound testing during barring due noise caused by heavy machinery.

3.1.3 Field Log 3

Date: 05-03-2015

Mining House A

Mine/ Shaft – 1

Working Place – 3

- Accompanying person: Shift Supervisor.
- Entry examination was not completed to standard.
- Observed inconsistent and inaccurate assessment along the travelling way and working panel.
- No velocity tests and temperature tests were carried out as the crew member enters stope area.
- Less barring practice was carried out the low risk panels.
- Team Leader was given pressure to blast at the end of the shift by the shift boss.

3.1.4 Field Log 4

Date: 06-03-2015

Mining House A

Mine/ Shaft – 4

Working Place – 1

- Accompanying Person: Shift Supervisor and Miner
- Contractor Shaft and mining out pillars.
- Entry examination was not completed to standard
- Observed less barring practice and crew did not water down during entry examination.
- Team walk long distances to the working place and exhaustion/fatigue affects them during barring down process as it is a laborious exercise.
- The team understand the benefit of barring, they use team effort, are disciplined and have a better than average understanding of identifying dangerous geological features.



3.1.5 Field Log 5

Date: 10-03-2015

Mining House A

Mine/ Shaft – 3

Working Place – 1

- Accompanying Person: Shift Supervisor and Miner
- Entry examination was completed from the secondary waiting place.
- Exhaustion/Fatigue affects the crew members due to walking long distance to the working panel.
- The crew members understand the benefit of barring and follow miner's instruction.
- The crew members walk long distance to the working place and travelling way needs to be barred more frequently
- Velocity and temperature tests were carried out as the crew member enter panel.
- Overall Comments: Barring/EE was completed to standard.

3.1.6 Field Log 6

Date: 10-03-2015

Mining House A

Mine/ Shaft – 3

Working Place – 2

- Accompanying Person: Shift Supervisor
- Observed entry examination from the secondary waiting place.
- Barring practice is not strictly controlled and team lack team efforts or discipline.
- Barring without gaskets and gaskets are apparently not generally used.
- Deviations from standard include incorrect positioning during barring.
- Overall comments: Barring received little attention at the panels that are categorized as having good hanging wall conditions.

3.1.7 Field Log 7

Date: 17-03-2015

Mining House B

Mine/ Shaft – 9

Working Place – 1

- Accompanying persons: Shift Supervisor and Rock Engineer
- EE completed from secondary waiting place into the stope area.
- Barring was carried out to standard. However, an incorrect length pinch bar was used in this stoping area.
- Observed less assessment of the hanging wall and sidewall along the travelling way.



Figure 83: Smooth HW condition

- There were no camlok releasing tools at the stope area.
- Overall Comment: Barrage/EE was completed to standard.

3.1.8 Field Log 8

Date: 18-03-2015

Mining House B

Mine/ Shaft – 9

Working Place – 2

- Accompanying person: Shift Supervisor



Figure 84: Jointed HW condition

- EE completed from secondary waiting place into the stope area.
- Barring practice is strictly controlled and correct length pinch bar was used effectively to dislodge the rock from the hangingwall.
- Personnel were not able to bar down unstable rock at the safe distance.
- General Comments: Barring is physically demanding, which can lead to poor concentration, improper completion of the tasks, and accidents.
- Overall Comment: Barring/EE was completed to standard.

3.1.9 Field Log 9

Date: 19-03-2015

Mining House B

Mine/ Shaft – 9

Working Place – 3

- Accompanying person: Shift Supervisor and Team Leader
- General observations.....EE completed from secondary waiting place into working panel.
- The crew members seemed to have a better understanding on barring procedure than a lot of other teams observed at Mining House B.
- Crew appears to be in a hurry to start working and perform a quick assessment of the hanging wall along the travelling way.
- Deviations from standard includedbarring down with gasket been at the incorrect position on the pinch bar.



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- Both steel pinch bar and lightweight aluminium pinch bar where available.
- Overall Comment: Barring/EE was completed to standard.

3.1.10 Field Log 10

Date: 20-03-2015

Mining House B

Mine/ Shaft – 9

Working Place – 4

- Accompanying person: Shift Supervisor
- General observations.....EE completed from secondary waiting place into working panel
- The crew occasionally barred the hanging wall but mostly barred the face.
- Deviations from standard included not warning people down-dip prior to barring.
- Overall Comment: Barring/EE was completed to standard.

3.1.11 Field Log 11

Date: 24-03-2015

Mining House B

Mine/ Shaft – 6

Working Place – 1

- Accompanying person: Shift Supervisor
- EE completed from waiting place into working panel.
- Barring mostly carried out to standard. However, incorrect length pinch bar was used in this confined area.
- Team walk long distance to the working place and fatigue affects them during barring down process.
- Barring down process is physically tiring as it is laborious exercise.



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Figure 85: Barring in-stope



Figure 86: Orange coloured glove-like gasket

■ Overall Comment: Barring/EE was completed fairly well.



3.1.12 Field Log 12

Date: 25-03-2015

Mining House B

Mine/ Shaft – 6

Working Place – 2

- Accompanying person: Shift Supervisor
- General observations.....EE completed from waiting place into working panel
- Barring was carried out to standard mostly under various geological conditions.
- General comment: Different geological features bring challenges to the crew members during barring down process and support installation.
- Overall Comment: Barring/EE was completed to standard

3.1.13 Field Log 13

Date: 26-03-2015

Mining House B

Mine/ Shaft – 6

Working Place – 3

- Accompanying person: Shift Supervisor
- General observations.....EE completed from waiting place into working panel
- General comments: Workers walk for long distance to waiting places and this contribute to the ineffective barring down processes at times.
- Barring was carried out mostly to standard.
- Deviations from standard included barring down with gasket being at the incorrect position on the pinch bar.
- The weight of the steel pinch bar, different geological features, warm and humid panels makes it difficult for the barrer to continue barring for prolonged periods.
- Mine captain closed down this panel due to unsafe working conditions.

3.1.14 Field Log 14

Date: 27-03-2015

Mining House B

Mine/ Shaft – 6

Working Place – 4

- Accompanying person: Shift Supervisor
- General observations.....EE completed from waiting place into working panel
- Deviations from standard includedcrew member did not water down prior barring.
- Observed good barring in the stope area and bar down significant amount of rocks.
- The miner is expected to blast on every shift and this put pressure and haste on the team during EE.



3.1.15 Field Log 15

Date: 09-04-2015

Mining House B

Mine/ Shaft – 5

Working Place – 1

- Accompanying person: Shift Supervisor
- General observations..... EE completed from waiting place into working panel
- Miner demarcated potentially unsafe blasted panels to warn others.
- Barring was carried out to standard.
- Barring practice receive little attention during night shifts
- Observed less barring down process around the differ panels due to pressure from the superior and many area of responsibilities given to the miner.
- The miner is given responsibility to declare safe 3 -5 working panels.

3.1.16 Field Log 16

Date: 10-04-2015

Mining House B

Mine/ Shaft – 5

Working Place – 2

- Accompanying person: Shift Supervisor
- General observations..... EE completed from waiting place into working panel
- Barring mostly carried out to standard. However, incorrect length pinch bar was used in this confined area.
- Observed less barring on the hanging wall and sidewall along the travelling way.

3.1.17 Field Log 17

Date: 13-04-2015

Mining House B

Mine/ Shaft – 5

Working Place – 3

- Accompanying person: Strata Control Officer
- General observations.....EE completed from secondary waiting place.
- Deviations from standard included.....incorrect positioning.

3.1.18 Field Log 18

Date: 14-04-2015

Mining House B

Mine/ Shaft – 8

Working Place – 1

- Accompanying person: Strata Control Officer



- General observations.....EE completed from secondary waiting place.
- The crew member uses the Lekoba stick as a lead for better barring practice.
- Observed team effort and discipline during barring down process.
- Overall Comment: Barring / EE was completed to standard.

3.1.19 Field Log 19

Date: 15-04-2015

Mining House B

Mine/ Shaft – 8

Working Place – 2

- Accompanying person: Shift Supervisor
- General observation: Entry examination was not completed to standard
- No velocity and temperature tests were carried out.
- There was no pinch bar at the panel.
- Barring practice is not strictly controlled and team lack team efforts or discipline.
- Overall comments: Barring/EE receive little attention on the Panel.

3.1.20 Field Log 20

Date: 16-04-2015

Mining House B

Mine/ Shaft – 8

Working Place – 3

- Accompanying persons: Shift Supervisor and Miner
- General Comments: Only some of the crew members were at the waiting place. Most of the crew was already in the panel before on arrival.
- Conducted questionnaire with the team leader and he seemed to have a good understanding of proper barring procedures.

3.1.21 Field Log 21

Date: 20-04-2015

Mining House C

Mine/ Shaft – 10

Working Place – 1

- Accompanying persons: Training Manager
- Entry examination was not completed to standard
- Observed good barring practice at gully and stope.
- Rock mass in the gully was extensively jointed, and this condition extended to the toe of the panel.
- General comments: The crew understand barring practice and different size of pinch bar were used different working areas. All the barring was done manually, using the 1.2m pinch bar in the stope and 1.8m pinch bar at the gully area.



- The barring practice in the stope was difficult and it was not possible for the miner to remove all hazards.
- Timber Packs were used as primary stope support and stoping height was 0.9m.
- The team commented on barring down as stressful and labour intensive activity.

3.1.22 Field Log 22

Date: 21-04-2015

Mining House C

Mine/ Shaft – 10

Working Place – 2

- Accompanying person: Strata Control Officer
- Observed good barring at the stope.
- Pinch bars of different sizes where available in the panel.
- The miner declared the working panel safe without team and barring down receive little attention in the centre gully.
- Each Team member has his own pinch bar and bar down separately around the working panel.
- Deviations from standard included incorrect positioning and barring down without gaskets on pinch bars.
- Overall Comment: Barring / EE was completed to standard

3.1.23 Field Log 23

Date: 22-04-2015

Mining House C

Mine/ Shaft – 11

Working Place – 1

- Accompanying person: Strata Control Officer
- Barring receive a lot of attention and the crew followed the miner's instructions.
- Observed good barring down practice and accurate visual assessment along the travelling way.
- Deviations from standard included barring down without a gasket.
- A 3m aluminium pinch bar was used and the miner emphasis proper barring procedure to maximise safety.
- Overall Comment: Barring/EE was completed to standard

3.1.24 Field Log 24

Date: 23-04-2015

Mining House C

Mine/ Shaft – 11

Working Place – 2

- Accompanying person: Strata Control Officer
- General observation..... Entry examination was completed to standard



- Observed good barring practice in the stope and less barring practice was carried out along the centre gully.
- Overall Comment: Barring/EE was completed to standard

3.2 Gold Mines

3.2.1 Field Log 1

Date: 06-05-2015

Mining House D

Mine/ Shaft – 1

Working Place – 1

- Observed barring at travelling way and stope.
- The Team seems to understand the benefit of making safe or barring before entering the working area.
- During early entry examination the team entered the panel and install temporary support then bar down which lead to sub-standard barring.
- The significant amount of rock where barred down at the face and it was noted that a good condition hangingwall received little barring.



Figure 87: Barring at the face



Figure 88: Watering down at the face

3.2.2 Field Log 2

Date: 07-05-2015

Mining House D

Mine/ Shaft – 1

Working Place – 2

- The team have already completed their early entry examination on our arrival and we did find or see any pinch bar around their working place.
- Team seems to understand the benefit of barring but it was noted that barring is not strictly controlled or it is actually given a little attention on the areas that have good hangingwall and sidewall conditions.

3.2.3 Field Log 3

Date: 08-05-2015

Mining House D

Mine/ Shaft – 2

Working Place – 1

- The Team entered the working place without a Miner or Team leader declaring it safe. Observed barring down demonstration by the Miner and he seems to understand the benefit of barring.



Figure 89: Barring in stope. No gasket on pinch bar



Figure 90: Good Quartzite HW conditions in the back area

- Barring is often rushed and carried out inefficiently due to the fact that production can only commence after the area has being declared safe and crew need to finish their task as soon as possible.



3.2.4 Field Log 4

Date: 11-05-2015

Mining House D

Mine/ Shaft – 2

Working Place – 2

- The panel was not clean and crew stop at last line of support for visual inspection around the stoping area.
- I didn't observe any barring as the panel was full of stope and their daily task was to clean and sweep the stoping area.

3.2.5 Field Log 5

Date: 12-05-2015

Mining House D

Mine/ Shaft – 4

Working Place – 1

- Observed barring at the stoping area and crew started hangingwall inspection from the waiting place into the working area.
- The crew seems to understand the benefit of barring but they do bar in a sub-standard manner.
- They do pass the last line of support, water down the face and hanging wall, install temporary support and bar down the panel. Observed lack of team effort or discipline.



Figure 91: Poor housekeeping in gully area

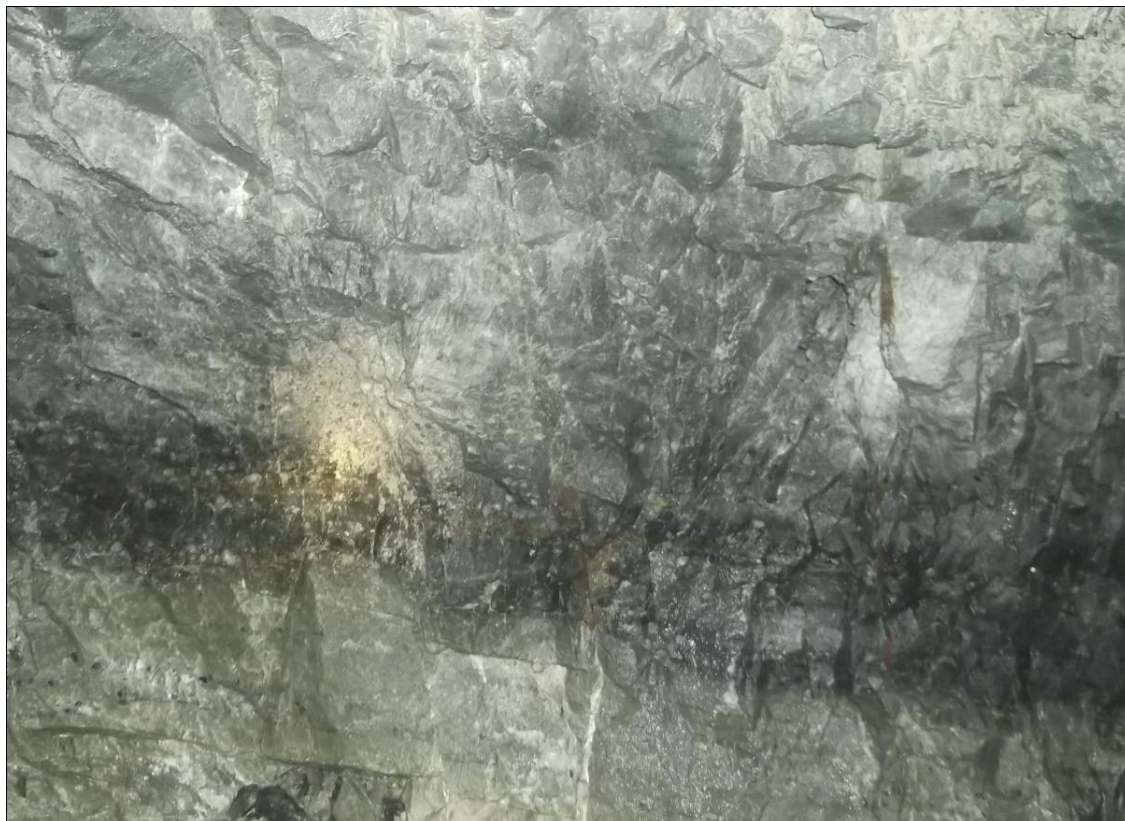


Figure 92: VCR face showing blocky Quartzite in HW

3.2.6 Field Log 6

Date: 13-05-2015

Mining House D

Mine/ Shaft – 4

Working Place – 1

- Observed barring at the stoping area and it seems that barring is not carried out or it just receive little attention.
- There is a lack of team effort or discipline and the crew follow sub-standard during early entry examination.
- They water down the face and hangingwall from last line of support and enter the panel to install temporary support then bar down the potentially dangerous rocks.

3.2.7 Field Log 7

Date: 14-05-2015

Mining House D

Mine/ Shaft –6

Working Place – 1

- It was noted the Miner carrying out the early entry examination are often under a lot pressure to complete the process and declare the area safe in order for operation to begin.
- The night shift completed their work without a proper ventilation in their working area, they were using a gas pipe to ventilate their working place.



- On our arrival we waited for the night shift team to complete their task and due to insufficient ventilation the miner declared the working area unsafe.
- I didn't observe any barring due to poor ventilation or high temperature condition around the working place.

3.2.8 Field Log 8

Date: 15-05-2015

Mining House D

Mine/ Shaft 7

Working Place 1

- Observed proper early entry examination and crew seems have better understanding on barring procedure.
- The significant amounts of rock were barred down along the sidewall and the hangingwall.
- There is available pinch bar at the waiting place and barring was done along the travelling way.

3.2.9 Field Log 9

Date: 18-05-2015

Mining House D

Mine/ Shaft 8

Working Place 1

- Observed a full early entry examination.
- The crew seems to understand the benefit of barring and starting barring along the travelling into the working place.
- The team uses a small hose to water down the hangingwall on and bigger hose to water down the face.
- Different size pinch bars where available at the working place.

3.2.10 Field Log 10

Date: 19-05-2015

Mining House D

Mine/ Shaft 9

Working Place 1

- The team have already completed their early entry examination on our arrival
- Available pinch bars at their working without gasket.



Figure 93: Old, rusted and blunt pinch bars without gaskets

- Team seems to understand the benefit of barring and commented that the gaskets supplied does not fit properly on the pinch bars.



Figure 94: Lava HW with excessive accumulations of ore in-stope

3.2.11 Field Log 11

Date: 20-05-2015

Mining House D

Mine/ Shaft 10

Working Place 1

- Observed barring along the centre gully into the working place, team effort and discipline.
- Crew presented a good knowledge about hazards identification and understanding of barring procedure.

3.2.12 Field Log 12

Date: 22-05-2015

Mining House D

Mine/ Shaft 11

Working Place 1

- Mechanised section. Team perform manual barring along the sidewall and uses a mechanised scaling to bar down high hanging wall condition.
- The crew shows team effort and discipline and seems to understand the benefit of barring down.



- Miner commented that mechanical scaling create new loose fragments and on many occasions. Manual/ conventional barring has been necessary after mechanical barring to reach an acceptable safety standard.



Figure 95: Mechanical Scaler

3.2.13 Field Log 13

Date: 22-05-2015

Mining House E

Mine/ Shaft 15

Working Place 1

- The mine captain didn't arrange with the miner about our planned visit to the working place.
- The team at the working place was not expecting visitors and had already completed their early entry examination on our arrival.
- It appears that barring receive little attention and there was no a single pinch bar at their working place.
- The team seems to understand the benefit of making safe or barring before entering the working area.



3.2.14 Field Log 14

Date: 22-05-2015

Mining House E

Mine/ Shaft 15

Working Place 2

- Observed barring at the stoping area and it appears that barring practice receive little attention.
- The team bar down only potentially dangerous rocks.
- There is a lack of discipline and some team member do not participate during early entry examination.

3.2.15 Field Log 15

Date: 22-05-2015

Mining House E

Mine/ Shaft 15

Working Place 3

- Mechanised section.
- I did not get to observe any barring but the shift boss explained as to how they conduct their early entry examination procedure.
- After blasting/post blasting the crew uses loader bucket to scale sidewalls.
- During support installation, the operator uses the rock drill jumbos to scale the high areas.
- The barrier stand inside the utility vehicle and perform manual barring using a correct size pinch bar.
- The mechanical scaling create new loose fragments and on many occasions manual barring is necessary after mechanical barring to reach an acceptable safety standard.

3.2.16 Field Log 12

Date: 22-05-2015

Mining House E

Mine/ Shaft 16

Working Place 1

- Observed barring in stope area and it appear that barring practice receive little attention due to good hanging wall conditions.
- The team uses high pressure water (water jet) to water down loose rocks on the sidewall and hanging wall and it assist with preliminary barring and dust suppression.
- The team followed sub-standards as they have entered the last area of support near the face, water down with water jet and install support.
- They carried out little barring down of potentially loose rocks.



APPENDIX C

Field and Photo Log

3.2.17 Field Log 12

Date: 22-05-2015

Mining House E

Mine/ Shaft 16

Working Place 2

- Observed barring at the development end and crew started hanging wall inspection from the waiting place into the working area.
- The crew seems to understand the benefit of barring.
- Observed team effort or discipline and uses long aluminium pinch bar to bar down potentially unstable rock.