The Value Case for Good drilling, charging and blasting

The Business Case

Costs
- Training
- Equipment

Additional Income
- Increased productivity

Indirect Influences

Financial Savings
- Reduced explosives
- Reduced drilling
- Reduced waste mined
- Reduced mineral loss

Thank you
The Value Case for Good Drilling, Charging and Blasting

Duncan Adams

13 November 2014
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Indirect Influences

The Business Case

Financial Savings
- Reduced explosives
- Reduced drilling
- Reduced waste mined
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Benefits:
- Increased productivity

Costs
- Training
- Equipment

THANK YOU
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The Business Case

Rands and Cents
Indirect Influences
The Value Case for Good drilling, charging and blasting
The Business Case

Rands and Cents
Costs

- Training
- Equipment
Additional Income

• Increased productivity
Financial Savings

- Reduced explosives
- Reduced drilling
- Reduced waste mined
- Reduced mineral loss
<table>
<thead>
<tr>
<th>Example of Benefits of good drilling and Blasting</th>
<th>Good</th>
<th>Bad</th>
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</thead>
<tbody>
<tr>
<td>Stope Panel Length (m)</td>
<td>30</td>
<td>30</td>
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<tr>
<td>Stoping width (m)</td>
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<td>1</td>
</tr>
<tr>
<td>Advance (m)</td>
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<tr>
<td>Rock Density (tons/m³)</td>
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<td>2.7</td>
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<tr>
<td>Grade (g/ton)</td>
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<tr>
<td>Grams to ounces</td>
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<tr>
<td>Mineral loss (%)</td>
<td>0.95</td>
<td>0.8</td>
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<tr>
<td>Non Fracturing the host rock</td>
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<tr>
<td>Dilution (%)</td>
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<tr>
<td>R/$ exchange Rate</td>
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<tr>
<td>Mineral price ($/ounce)</td>
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<tr>
<td>Income (R)</td>
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</tbody>
</table>
Indirect Influences
**People Factors**

- Employees feel safer
  - More competent hanging walls
  - Fewer pests
  - Fewer section 54s

- Less physical work
  - Pressure on face-time reduced

- Interpersonal relations improve
  - Less need for major interventions
  - Opportunities to give positive feedback

- Pride in the workplace and secure bonus payments
  - Better housekeeping
  - Sweepings up to date

- Completion of all required tasks in a shift
  - Reduction in short-cuts
People Factors
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Fracturing
- Better Footwall conditions
  - Reduced mineral loss
- Better Hangingwall conditions
  - Reduced support

Better Face Shape
- Easier cleaning
- Consistent face to support distance
- Reduced stress raising points
- Reduced face seismicity

Stopping Width Control
- Reduced waste
- Improved mine call factor
Ground Condition Factors
Fracturing

• Better Footwall conditions
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• Better Hangingwall conditions
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Stopping Width Control

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The Value Case for Good drilling, charging and blasting
- Training Costs
- New Equipment
- Equipment maintenance
- Outsourced service providers

Better Fragmentation of rock
- Cleaner faces
- Reduced waste
- Improved ventilation

Productivity improvement
- Higher face advance per week
- Increased overall productivity
- Better face control

Staff turnover decreases and absenteeism declines
- Less mining accidents
- Improved safety

Improved Health and safety
- No section 54s
- Lower hospitalization and medical costs
- Lower BHP levies
- Reduced insurance premiums

Improved stope conditions
- Unfractured hangingwall
- Smooth bolting
- Lower mining loss
- Less support required
- Less work for crew
- Training Costs
- New Equipment
- Equipment maintenance
- Outsourced service providers
 Improved Health and safety

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• Lower hospitalization and medical costs
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Improved stope conditions

- Unfractured hangingwall
- Smooth footwall
- Lower mineral loss
- Less support required
- Less work for crew
Staff turnover decreases and absenteeism declines

- Less at-risk workforce
- Bigger bonuses
- More productive face time
Productivity improvement

- Greater face advance per blast
- Increased monthly centares broken
- Greater mine profits
- Mine is sustainable
Better Fragmentation of rock

- Cleaning easier
- Transport improved
- Milling optimised
- Mineral loss reduced
Conclusions

- There is merit in improving drilling and blasting practice
- There are a critical few things that could bring about improvement
- Safety, particularly FoG safety, will be improved
- Improved drilling and blasting will contribute to sustainability of mines
THANK YOU