Customer Profile

The Placer (Granny Smith) Sunrise Dam open cut gold mine is located near Laverton, WA. (Fig 1.) Mining of the Sunrise orebody began in 1995 and is currently mining in fresh volcanics and banded iron formations. For maximum profitability the development of the pit requires strict wall control blasting techniques to ensure the walls are both safe and cut to design angle. Presplitting is carried out in both transitional (Fig 2) and fresh rock (Fig 4), with trim blasting employed to further reduce the damage to the walls. Brownzewing Gold Mine, Western Australia.

Mining Issues

The design wall angles vary around the pit from to 85 degrees. Berms are 8m wide and are planned at 20m vertical intervals and along the ramps. Production mining is conducted by excavators in backhoe configuration working on 2m flitches after blasting on 5m benches. Presplit blasts are carried out in advance of trim blasting. The 115mm diameter holes are drilled over two benches (10m), with the top bench drilled at the design wall angle and the bottom bench drilled 5 degrees steeper to allow for drill mast access. A range of charging techniques have been used depending on blasthole diameter and rock type. Holes are charged with Powershear™. A single Tamrock 1100C 'Gator' rig is fully utilised for the presplit drilling. The harder rock means increasing metres and consumables costs.

The Situation

The falling gold price has added impetus to ongoing cost reduction programmes. Orica Explosives personnel worked with the Placer (Granny Smith) blasting team to evaluate options to provide high quality walls at lower operating costs. Presplitting with a range of hole diameters and explosives decoupling ratios, and spacing have been evaluated to establish the lowest cost of mining. The 38mm diameter Powershear™ was recommended to reduce costs. Trials were carried out in different sections of the mine to gauge the effectiveness of the explosives in the different geological zones and benchmarked against 29mm Powershear™ in the bench above. The measures of success included surface expression along the presplit line, the smoothness of the resultant face, cling on the presplit surface, and the halfbarrel factor.

The Results

The composite photo in Figure 4 shows that great results can be achieved at a lower mining cost. Cost Savings up to 18% (relative to current practice) have been realised with the expanded presplit spacing as shown in the following table.

<table>
<thead>
<tr>
<th>Item Costs*</th>
<th>29mm @ 1.5m</th>
<th>38mm @ 1.5m</th>
<th>38mm @ 2m</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drilling</td>
<td>77</td>
<td>64</td>
<td>57.5</td>
</tr>
<tr>
<td>Blasting</td>
<td>23</td>
<td>27</td>
<td>24.5</td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
<td>91</td>
<td>82</td>
</tr>
<tr>
<td>% Saving</td>
<td>0</td>
<td>9</td>
<td>18</td>
</tr>
</tbody>
</table>

Acknowledgments

Orica Mining Services wishes to acknowledge the staff at Placer (Granny Smith) for the support, input and permission to publish this Case Study.

Figure 1: Placer Granny Smith Sunrise Dam
Case Study
Cost Reduction in Wall Control Blasting
Presplitting with 38mm Powershear™

Figure 2: Presplits in transitional material

Figure 4: Comparing results of increased spacing and different Powershear™ diameter