



# Low Headroom at Waterval

## Boosting Production

The Anglo Platinum Group of South Africa, the world's leading platinum producer, has launched an ambitious plan to boost its annual output by 75% from 2.2 million ounces to 3.5 million ounces by the year 2006. This tough target would be a daunting prospect for most mining companies. However, Anglo Platinum, which accounts for more than half of the 72% of the platinum contributed by South Africa to world supplies, is in no doubt that it will be able to reach the goal. The reason is two-fold: firstly, the company has extensive experience of low seam operations; and secondly, and just as important, Anglo Platinum has now acquired a complete equipment package from Atlas Copco that meets all of its drilling, rock bolting and hauling needs at its Waterval mine.

## Thin Seam, High Output

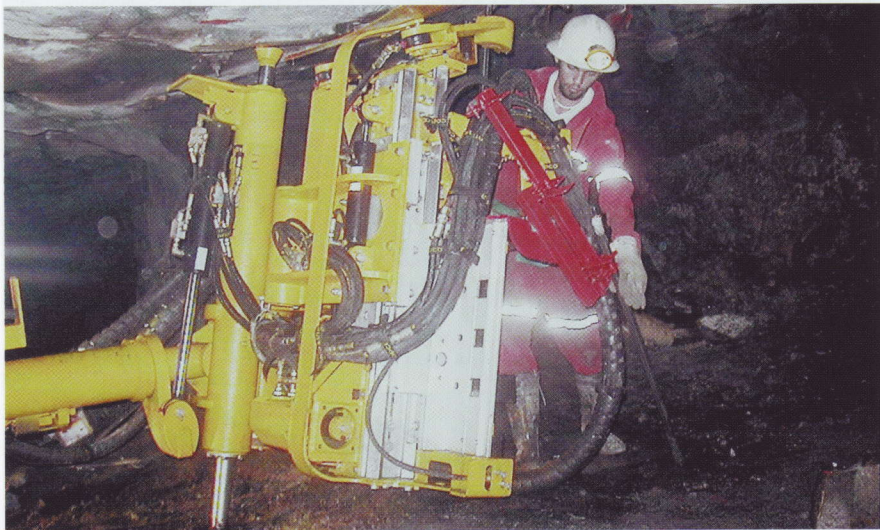
Waterval Mine is near Rustenburg, about 150 km north-west of Johannesburg. It is one of Anglo Platinum's newest mines, and will be making its contribution to the group's target by excavating 3.2 million t/year in an ore-body just 0.6 m-thick and on a decline of nine degrees.

Despite the low seam and restricted mining space, Anglo Platinum was convinced that it could tackle the task successfully, and opted for the room and pillar method with ramp access, together with mechanized equipment.

The mine design meant that the rooms would be extremely confined, with a height of 1.8–2.0 m. This, in turn, meant that headings would have to be as low as possible, and the equipment extremely compact.

Anglo Platinum also insisted that quantum improvements be made at the mine in three priority areas: safety, production and productivity, in that order.

Potential suppliers were assessed by Waterval engineers. Atlas Copco



Compact Boltec SL bolting rig in operation.

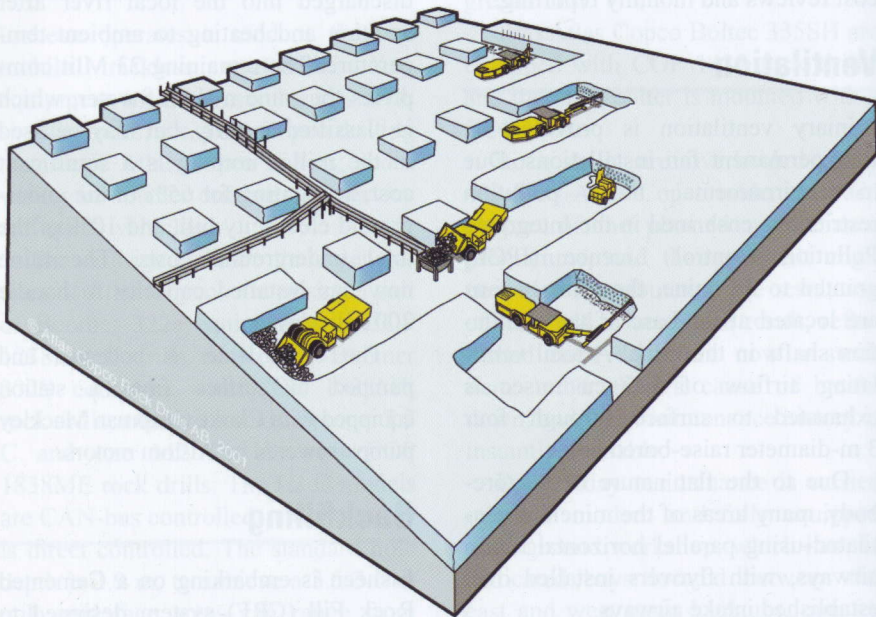
was the only company able to provide a total solution around the three key mining tools needed: drillrig, bolting rig and LHD unit. These needed to be low profile, compact and technically advanced, specially designed for low seam work and exacting environments. In addition, Atlas Copco agreed to act as a cooperation partner in all aspects of the rock excavation process, providing operator

training, spare parts supply, and service and maintenance.

## Suitable Package

The equipment trio comprises the Rocket Boomer S1 L drillrig, the Boltec SL bolting rig, and the ST600LP loader from Atlas Copco Wagner. The units have been progressively delivered to Waterval, and there

*The room and pillar layout at the Waterval Mine comprises 12 sections with 12 m-wide panels and 6 x 6 m pillars. The roof height varies between 1.8 and 2.0 m.*







Atlas Copco Wagner Scooptram ST600LP in the stopes.

are now 15 of the Rocket Boomer rigs, six of the Boltec units and 23 of the Scooptram ST600LPs at the site.

The mine is still in the build-up phase, and the full infrastructure is not yet in place, according to the management, but the results to date bode well for the future.

The Rocket Boomer S1 L has well-proven, heavy duty Atlas Copco components such as the COP 1838 rock drill, BUT 28 boom, and BMH 2837 feed.

The Boltec SL is a high production, semi-mechanized rock bolting rig with an electrical remote control system. Apart from standard rockbolt installation, it is also equipped to perform longhole drilling for anchor and cable bolting. The Boltec SL uses the same carrier as the Rocket Boomer S1 L, bringing advantages of commonality.

The Scooptram ST600LP, also known as the Ratel, is a compact LHD with a height of around 1.5 m. It has a 6 t tramping capacity, and is equipped with a special bucket for low height work. It is powered by a clean burning 136 kW Deutz diesel engine.

The equipment complement for each mining section is one Rocket Boomer, one Boltec, and two Wagner Ratels.

## Production Layout

The layout at Waterval is divided into 12 sections with nine panels, or stopes. Each panel averages 12 m-wide x 1.8 m-high, with pillars of approximately 6 m x 6 m. The drillers work three 8 h shifts/day, six days/week, and their target per section is 23,000 t/month. That translates to 200 t per panel, or two panels per shift.

Some 68–74 x 3.4 m-long holes are required in each panel, taking around 2.5 h to drill. Three 77 mm holes form the cut, and the main round is drilled using Secoroc model – 27 R32 43–45 mm bits.

Ramps from the surface provide the access for men, machines and supplies, and also accommodate conveyor belts for transporting the ore out of the mine. The mine expects each Rocket Boomer rig to yield around 200,000 t/year.

1.6 m-long Swellex bolts have been on trial at the mine, using the standard bolting pattern of 1.5 m x 1.2–1.5 m. By using Swellex, the mine expects the current rate of installation of resin bolts to be improved by some 30% from the standard six minutes. The Boltec SL is equipped with Secoroc Magnum SR28 Tapered Speedrods and 28 mm model – 56–67 bits for resin bolts, with 38 mm model – 27–67 for Swellex installation. The tramping height of the Boltec SL is just 1.30 m, with ground clearance of 0.26 m. It is equipped with a COP 1028HB rock drill, and can insert a Swellex bolt of length up to 1.6 m in roof height of 1.8 m.

## Priorities

To ensure high availability of the equipment, Anglo Platinum and Atlas Copco have entered into full-service contracts that provide for 24 h service and maintenance. It makes good business sense for the mine to have a service contract manned by specialists with the technical know-how and skills for optimal maintenance.

Loading from the different rooms is a crucial part of the operation, and the specially designed E-O-D (Eject-O-Dump) 6 t-capacity bucket on the new Scooptram ST600LP makes low height work easy. Using the E-O-D bucket, the rock is pushed out by a push plate onto feeders that transfer it to the conveyor system for transportation to the surface. At present, the LHDs drive up to the surface for maintenance and for fuel, but a refuelling station will be installed underground.

In this operation, Anglo Platinum gives top priority to dilution and utilization. The amount of rock waste must be kept to an absolute minimum, and the fact that this can be achieved with mechanized equipment in such a low, flat seam is seen by many as a breakthrough.

In addition, with so many available faces in close proximity to each other in the room and pillar layout, utilization is a key factor for maintaining a high level of productivity and efficiency. The required utilization for the drillrigs ranges from 50%–75% and availability is expected to be about 90%. ■

Rocket Boomer S1 L drilling in low headroom.

