



Ken Bartlett troubleshooting a flow control valve for the water addition to the Sag Mill.



Looking north at the Mill and Filter building facilities. In the blue tube is the conveyor belt that brings the ore from underground to the mill.

Down in the mine, workers bore precisely-spaced 14-foot blast holes in 17-foot-wide, 14 foot-tall faces or 'drifts' in the ore body, fill the holes with an explosive emulsion, then blast the rock loose. Low-slung diesel loaders scoop or 'muck out' the material into low riding 50-ton haul trucks that carry it to a 'grizzly table' where rocks are sorted for size and larger pieces are crushed. The material then drops into an ore pass some 100 feet tall and 20 feet wide, carved out of the stone. At the bottom a steel pan feeder meters the ore onto a conveyor that takes it to an ore bin on the surface. From there it goes to the processing plant, where the ore is crushed smaller and smaller in a series of mills, then processed further with water and cyanide. The goal: recover 92 percent of the gold. Employee safety is the top concern. The facility requires not just steel toe boots but metatarsal guards to prevent foot injuries.

Rigorous rules govern lockout/tagout procedures. Permits are required for confined entry situations and hot work. Safety is always on Maintenance Supervisor Kennedy's mind.

### Keep it simple

Ensuring that the mine's complex infrastructure runs smoothly falls to Kennedy, a 32-year mining industry veteran, and his crew of 11 electricians and instrumentation specialists. Together they manage and maintain 14 motor control centers and electrical rooms. Those facilities contain breakers and the transformers that step 15 kV supplies down to 480 volts to power motors. The powerful blowers that clear diesel exhaust and blast gases from the mine, the equipment that lifts, moves and pulverizes the ore and 200 pumps with up to 200 horsepower are all on Kennedy's maintenance list. It's a complex job, but he finds that Fluke digital multimeters help keep it simple.

"The Fluke meter's so versatile that one meter can do a lot of different things when you're troubleshooting," he said. "When you're looking at ohm capacity, when you're looking at grounding, you're looking at how much current is going through - just the whole gamut of electrical troubleshooting. It's our main troubleshooting tool."

Many of those 200 pumps use variable speed drives, Kennedy said, and the Fluke 87V enables technicians to filter out high-frequency noise and read the synthetic wave forms generated by the drives. The Fluke 179 and Fluke 117 are also on the job at Pogo Mine.

Kennedy uses Fluke meters to verify correct signals from the computerized controls of rock drilling machines, and to calibrate the density gauges used to measure the thickness of the slurry of ground rock and water produced in the gold extraction process.

"Gold bearing ore that's ground up has a specific gravity," he said. "That specific gravity correlates into density. When it's mixed with water, that gauge reads it. It tells you whether you need to add more water to make it a lighter density so it pumps easier, or decrease the water because it's too light. The Fluke meter reads the impedance at four to 20 milliamps to verify that the gauge is working correctly."