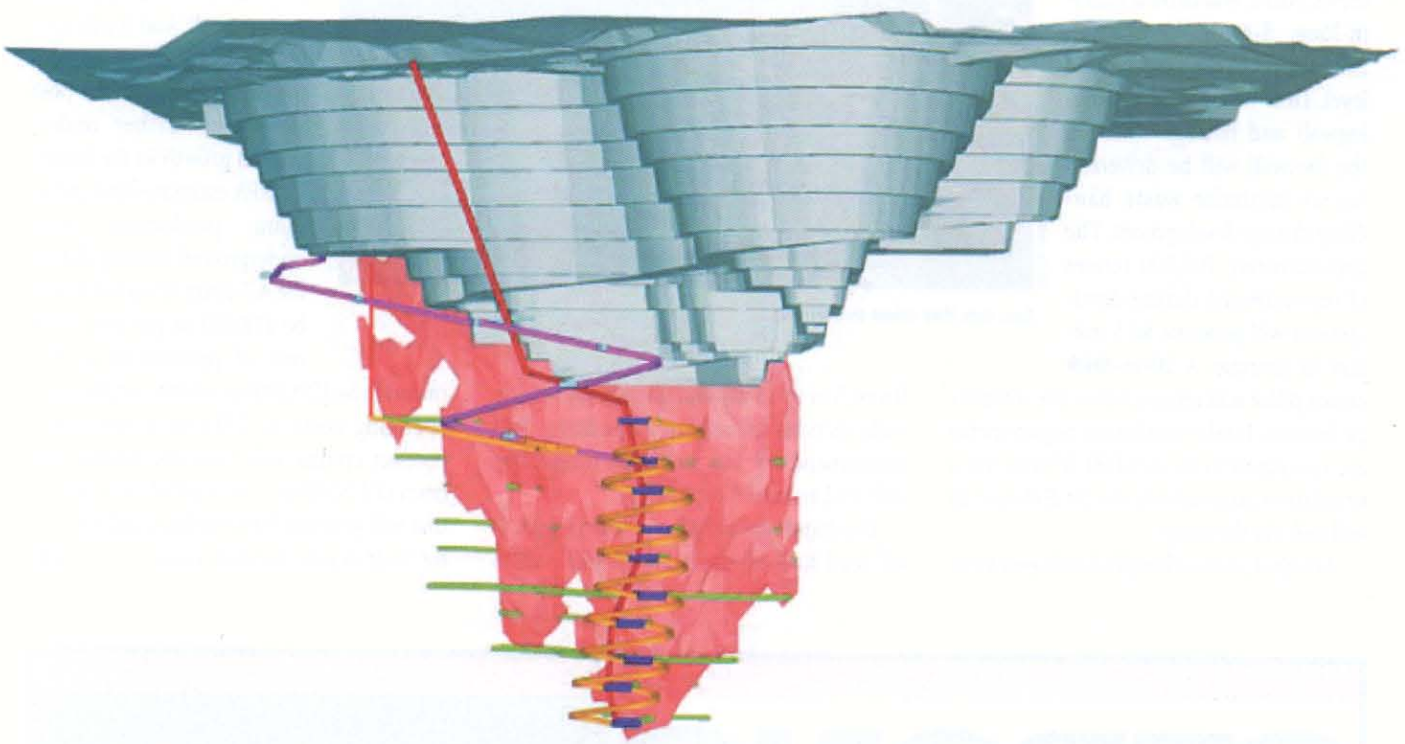
Simple success

North American Palladium goes underground at Lac des Iles



NORTH AMERICAN PALLADIUM

by Marilyn Scales

As the only primary palladium mine on the continent prepares to go underground, owner **North American Palladium Ltd.** (NAPL) of Toronto has laid out a simple plan: Rely on tried-and-true technology, optimize head grades in the mill, and keep operating costs down. It is a plan that will successfully put a new 2,000-tonnes/day mine into commercial production by 2006.

The Lac des Iles mine, 85 km northwest of Thunder Bay, Ont., became the only North American palladium producer in December 1993 after NAPL acquired the property from **Madeleine Mines** and completed development of the Roby pit. In June 2001, a new 15,000-tonnes/day mill was commissioned to replace the original plant (see *CMJ* August 2001). The Roby pit has been expanded in phases until it reached 17,200 tonnes/day ore and 22,600 tonnes/day waste during 2003.

With solid success behind it, NAPL knows the key to continued growth is to go underground. Last year's exploration drilling program from the pit outlined mineralization in the Main High Grade zone, an extension of the Roby pit Main zone. The probable reserves total 3.54 million tonnes with an average grade of 6.62 g/t Pd, 0.40 g/t Pt, 0.34 g/t Au, 0.07% Cu and 0.08% Ni. There are also 4.5 million tonnes of indicated resources.

The ramp access and longhole stoping chosen for the underground mine is a proven method for competent rock. (*See above,* a 3D view of the underground mine, looking east.) "It doesn't get any simpler than this," NAPL president André Douchane told *CMJ*. "We have excellent rock stability and no water. And longholing is simple, too."

Exploration drilling and experience in the pit where walls are 55° proves that the ground is "very structurally sound," he added.

Development Details

The technical report prepared earlier this year by **Roscoe Postle Associates** (RPA) outlines the project details. Construction will begin with collaring the portal in the pit wall at the end of May 2004. Using its own crews, NAPL will drive a 1,255-m-long, 5-m by 6-m ramp from the pit to the first haulage level. Drill levels in the hangingwall and haulage drifts in the footwall will be driven in ore to minimize waste handling during development. The approximately 100,000 tonnes of ore recovered during development will generate $6.5 million in revenue. A 20-m-thick crown pillar will remain below the ultimate pit bottom. Intake ventilation requirements are estimated to be 425,000 ft^3/min via a ventilation raise outside the pit. Exhaust air will exit via the ramp.

Longhole retreat longitudinal open stoping has been chosen because it is highly productive. The mining block interval, stope height, and sill pillar height will vary with ore thickness. A 70-m interval from floor to floor has been selected. Stopes will be excavated the full width of the orebody (from 5 m to 35 m) and divided into 15-m-wide sections to facilitate sequencing. RPA recommends a top hammer production drill and emulsion explosives.

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Lac des Iles mine overview

Ore handling includes mucking with 8-yd^3 load-haul-dumpers, which will eventually be remote-controlled. The LHDs will load 60-tonne trucks for the trip up the ramp and an additional 3.5-km haul to the crusher stockpile.

Douchane estimates capital costs and contingencies will be about $40 million. For its investment, NAPL will gain a high grade ore source for blending with pit ore to raise head grades in the mill, which will operate at 16,500 tonnes/day. The company will add 80 more employees to its payroll. And it will have the opportunity to explore the Offset zone with the possibility of further underground growth in the future.

RPA estimates that palladium production from underground mining during the 4.7 years of mine life will be 118,000 oz per year. Total cost of production is estimated to be US$200/oz, which includes unit operating costs of US$152/oz net of by-product credits and mine-life capital unit costs of US$48/oz.... very good for a project that will generate $90.3 million and pay for itself in less than two years. CMJ