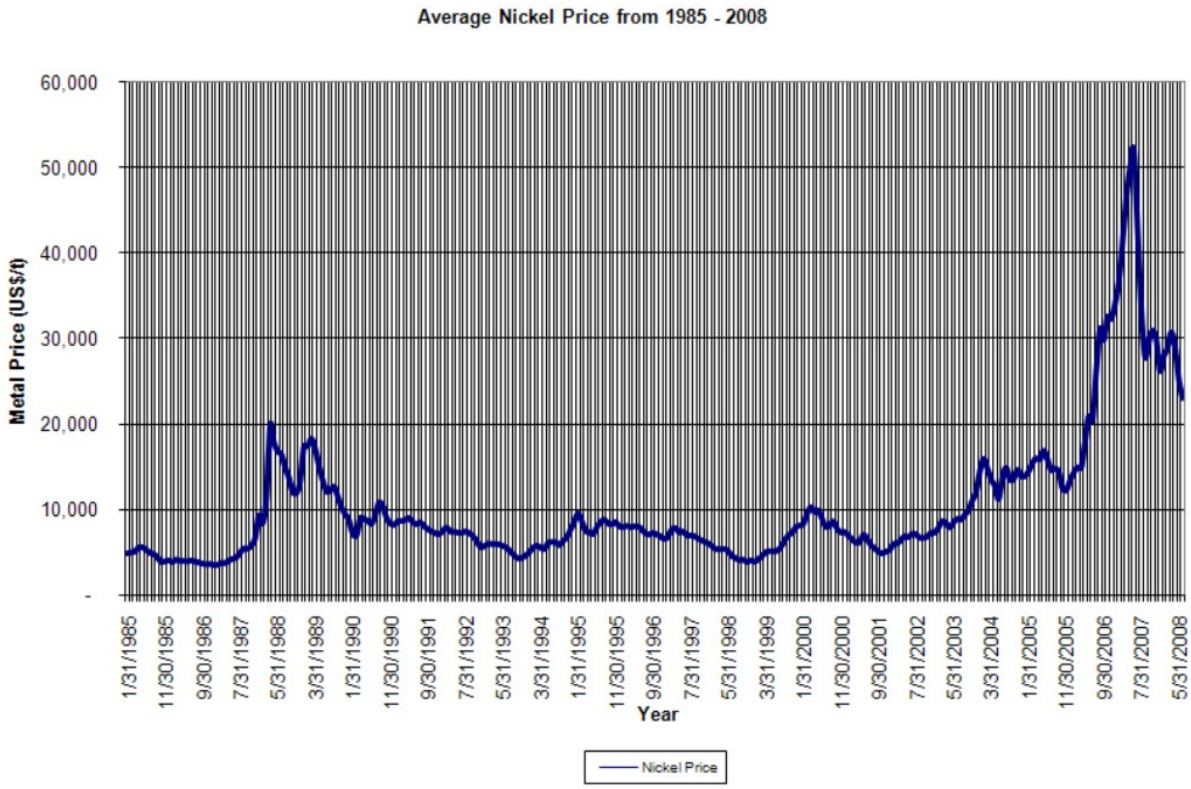
Fickle Nickel?

By Fiona Harper

There was a time when a ‘nickel’ was worth very little in monetary terms but with the, largely Asian driven, global demand for resources, Ni has become particularly valuable. Nickel is a primary ingredient in stainless steel, catalysts, batteries and the chemical industry and this strategic role was reflected in the massive increase in the Ni price between 2005 and 2007.



Exploration for Ni, spurred on by the price increase and future demand estimates, has seen a marked increase in activity, particularly in Africa. Economic Ni deposits occur principally as two types; magmatic sulphide deposits associated with mafic and ultramafic igneous rocks and as lateritic deposits associated with olivine-rich progenitors as a result of tropical weathering.

Magmatic Ni sulphide deposits occur essentially where there has been a protracted history of magmatic activity over suitable trap sites together with a source of sulphur in crustal rocks. The sulphur dissolves in the magma until the sulphur saturation point is reached at which juncture an immiscible iron sulphide liquid is developed. Cu, Ni and PGEs are partitioned very strongly into this immiscible liquid. **Disseminated** nickel sulphides are produced as a result of crystal fractionation in mafic/ultramafic intrusives with sulphur saturation occurring in the late fluids whilst **massive** Ni sulphide deposits occur as layered mafic/ultramafic complexes and in immiscible pods in komatitic lavas sequences.

Historically, most major nickel deposits have been discovered by the sampling of gossans during regional prospecting surveys. Current exploration has to be more sophisticated and aimed at uncovering deposits with no surface gossans or halos. Of primary importance is the understanding of the ore forming processes and structural controls as a tool for regional target selection.

Following regional target selection, geophysics can be used as a tool in Ni prospecting but adequate expertise is required for finding suitable techniques that are sufficiently diagnostic to identify sulphide deposits in country rocks that are commonly strongly magnetic and tectonised. Geochemistry expertise is similarly required to determine the pathfinder elements such Pt and Ir which would be concentrated during weathering.

Prospecting for Ni is a complicated and sophisticated process and the early 2008 down turn in the Ni price has surely caused exploration companies to re-examine their strategies. However, the world Ni market was 6600tonnes in deficit in the first half of 2008 and the global demand for Ni will remain strong. Those involved in Ni exploration have put their money on Ni not being fickle and if they ensure that they employ state of the art exploration strategies, they will surely be rewarded.

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