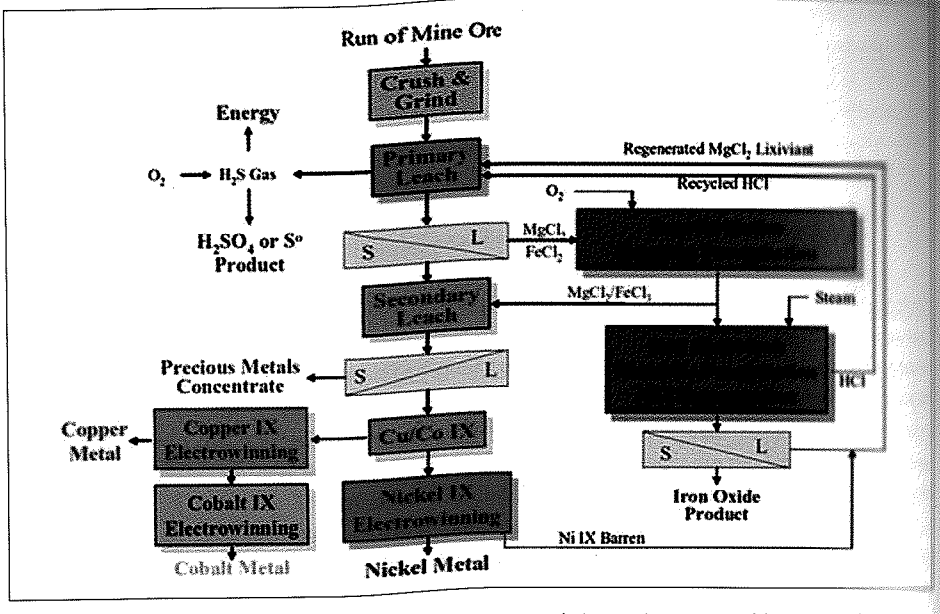

Preliminary flowsheet for Starfield Resources' Primary Leach Process. The company continues to do value engineering as it develops the pilot plant, therefore this flowsheet could change slightly. For example, at this juncture, the company is relatively sure that one stage of leaching will be sufficient

Tankhouse management

Also in Australia, the 6th Annual PACE Zenith Awards were held in Sydney in June and MIPAC took first prize for its CellView® wireless tankhouse management solution in the metals products category. MIPAC was also selected as a finalist in the mining, aggregates and cement category for its Advanced Control Strategies work with Xstrata Zinc Concentrator in Mount Isa.

CellView provides wireless condition monitoring for tankhouse management and was developed in response to a need for tools that enable a more efficient, safe and profitable refinery operation. CellView is a critical foundation for effective tankhouse management and enables customers to achieve optimum production, quality, safety and environmental standards. It combines the latest advances in wireless technology with an extremely robust design to increase the efficiency and profitability of electro-refining and winning operations.

MIPAC says CellView "significantly improves copper and other electrolytic process operations." It was developed in Xstrata's Townsville refinery and has been trialled in Europe.

"CellView allows operators to produce more cathode at a higher, more consistent quality without having to increase inputs." explains Tony Mathison, Product Manager, MIPAC. The first order was received, through Xstrata Technology, for a major new copper plant project with Kazzinc in Kazakhstan. CellView is also being trialled with one of Europe's largest copper producers and processers.

CellView provides continuous, real time monitoring of cell performance and enables increased production through early detection of process problems. MIPAC also reports that it "reduces maintenance and implementation costs, particularly compared to hard-wired systems [and] is at least 25% smaller than alternatives and therefore uses much less of the precious real estate in a tankhouse."

MIPAC's Copper Concentration Monitor is a rugged online process solution that automates the control of the copper stripping process, removing the need for manual chemical analysis during electro refining. Designed in cooperation with Copper Refineries Pty it continuously monitors copper concentration in electrolyte enabling:

- Constant levels within the tanks, reducing the chance of unsafe hydrogen gas production
- Minimal human intervention and integration with the wider plant control systems increasing efficiency, reducing operations costs and improving the quality of production.

Byproduct recovery

There is increasing industry interest in technologies to treat sulphur-rich residues from hydrometallurgical processes – with the aim of not only improving sustainable storage but also capturing sulphur, precious metals and other byproducts. Such residues result from hydrometallurgical processes commonly used in the production of copper, zinc and nickel. Typically they contain elemental sulphur, gypsum (from lime neutralisation), iron oxides, acid insoluble concentrate components, minor base metals and precious metals.

These residues currently require long-term storage. Because residue with a high elemental sulphur content is flammable, sub-aqueous storage in a low dissolved-oxygen environment has been one option, but a number of environmental bodies have questioned the long term desirability of this, arguing that the material is not inert.

Vale has expressed interest to AMIRA in a research program to explore improved treatment processes which would address both these sustainability issues and recovery of byproducts. Because of the widespread use of these hydrometallurgical processes, there would appear to be benefits in other companies joining the project.

Canadian and other North American researchers would play a key role, with