ALTA 2023 27
30 April - 6 May | Perth, Australia

THE DIVERSITY OF ReCYN TECHNOLOGY

Malcolm Roy Paterson

PT GreenGold Technology, Indonesia

Presenter and Corresponding Author

Malcolm Roy Paterson

ABSTRACT

GreenGold Technology (GGT) was formed in 2017 to commercialise ReCYN Technology, a process to recycle cyanide from gold plant tailings (ReCYN I) and recover metal from metal cyanide complexes for sale (ReCYN II). Both these objectives can result in a net revenue instead of the high cost of destructive detoxification methods. Clean-up of plant tailings with the ReCYN process also involved scavenging residual solubilised gold escaping the carbon circuit (ReCYN III).

The commercialisation has now reached the five-year milestone and is still not considered a proven technology, despite having three operational plants and two in the construction phase. One reason is the diversity of applications for which the technology is suitable, with each case requiring a customised solution. The "one size fits all" approach with carbon plants does not apply to ReCYN Technology.

GGT has completed over forty ReCYN plant studies, many with comprehensive testwork programmes and sometimes site testing. The result has been a different design for each case. This diverse applicability of ReCYN Technology has extended the commercialisation progress. Other impacts of design outcomes are determined by mine life, location, plant size, solution chemistry, reagent costs, existing detoxification costs, environmental requirements and economics.

The ReCYN process uses a macro reticular, anionic, strong base, polystyrene bead resin that is non-selective for the adsorption of most cyanide complexes. Activated carbon is more selective and therefore has a more straightforward process. The non-selective nature of the resin and specialist resin elution and recovery circuits gives the ReCYN process its unique diversity and advantage.

The range of applications includes the following:

1. Circuits that require high cyanide levels, such as silver-gold ores and concentrate leach circuits,
2. High cyanide soluble copper ores,
3. Favourable economics to replace detox,
4. Reducing the build-up of cyanide-consuming metals in recycled process water,
5. Removing contaminants deleterious to flotation efficiency,
6. Merrill-Crowe circuits to recover and recycle cyanide and zinc,
7. Removal of high iron and thiocyanate levels in tailings,
8. Gold scavenging from CIL circuit losses,
9. Increasing Reserves through the economic treatment of high copper-gold ores,
10. The recovery of PGE cyanide complexes,
11. Lowering the carbon footprint by reducing new cyanide purchases by 50%.

Each of the above examples has been the subject of studies conducted by GGT for specific projects, either operating or study phase. This Paper describes each application to demonstrate the diversity of the ReCYN process.

Three previous ALTA papers (2017, 2019, 2020) have described ReCYN I, ReCYN II and ReCYN III, including chemistry and flowsheet information.

Keywords: ReCYN, cyanide, gold, copper, resin, carbon, detoxify, recovery, economic and environmental.