



EFC waste management solution for saline brines, especially in mining

Eutectic Freeze Crystallisation (EFC) offers a novel, sustainable method for the treatment of brines and concentrates that were previously regarded as difficult to treat. It is particularly suitable for those components of mine water waste streams, which are currently discharged into evaporation ponds.

The EFC technique operates by cooling the hypersaline brine to the eutectic temperature at which point both ice and pure salt will form simultaneously. Ice, being less dense than water will float, whilst the salt, being denser, will sink. The outcome is usable water and salts. The added advantages are therefore, a reduction in total water consumption and a potential additional revenue stream through the sale of salts.

Eutectic Freeze Crystallisation offers a sustainable treatment process to turn wastewater into a resource with multiple benefits, particularly in a water-scarce country such as South Africa.

Benefits

- Produces saleable products from the waste
- Reduces the cost of brine management. Decreases the long term liabilities and risk associated with brine management
- Contributes to water conservation
- Operation at lower temperature, is safe to operate and minimises corrosion
- Extends the life span of evaporation ponds
- Modular technology- can be scaled up based on process demand

Market

- Mining industry and metallurgical refiners
- Power generation industry
- Fuels and fine chemical production companies
- Textile companies
- Pharmaceutical manufacturers
- Agricultural industry

Keywords:

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Intellectual Property Rights:

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Business Plan

A business strategy has been developed, which entails using the EFC technology in the treatment of saline process waste streams generated by mines and large industries. Rather than following a traditional commercial route for this technology, that is, selling a plant to a client, an alternative strategy is proposed. This involves providing a waste treatment service to clients using the EFC technology to allow for optimisation and cost reduction in the client's waste management process. Therefore clients will only pay for waste treated.

The proposed business model involves a start-up company or commercial partner providing modular crystallisation units, which can treat 150 cubic meters brine waste per day. This plant (or plants) will be used to treat waste at an existing client's waste pond, that is, waste that they cannot treat any further cost effectively.

Ultimately the client will only pay for waste that is treated based on a service fee for tonnage of waste treated. This model eliminates capital expenditure risks and fits into current business processes where large organisations pay third party service providers to dispose of the hazardous waste. The aim is to treat the waste at a lower price than the current cost of disposal at a hazardous waste site.

Intellectual Property Status

Type	Region	Application No	Filing Date	Publication Number	Priority Date
Provisional	South Africa	2008/07293	22-Aug-08		22-Aug-08
PCT	PCT	PCT/IB2009/006612	21-Aug-09	W02010/020872	22-Aug-08
National Phase	Australia	2009283940	11-Feb-11		22-Aug-08
National Phase	Canada	2,732,629	17-Feb-11		22-Aug-08
National Phase	Europe	9807969.2	11-Feb-11	2321024	22-Aug-08
National Phase	Germany	2321024			22-Aug-08
National Phase	Netherlands	2321024			22-Aug-08
National Phase	South Africa	2011/01228	16-Feb-11		22-Aug-08

The inventors are Alison Lewis and Jeeten Nathoo.

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