

Process Water Reuse Made Possible through Electro Pure Technology (EPT)

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The impact of polluted water is a critical environmental issue for industries around the world. As tailing ponds from the oil and gas industry gain more and more attention in the media, and as industries face increasingly high costs for disposal, it is apparent there is a growing need for scaled, decentralized water treatment solutions, particularly if there are reuse options.

GEE recently developed the Electro-Pure™ Technology (EPT), a vacuum-enhanced electrocoagulation process that will allow on site treatment of polluted water for reuse. The key principle at the basis of the EPT technology is electrocoagulation. Electrocoagulation has been in existence for over 100 years, however has never become a reliable, commercial technology. The system applies direct current (DC) through select electrodes to create an electrical field in the contaminated wastewater.

Contaminated ions and colloids are mainly held in solution by electrical charges. The electrical field destabilizes the contaminants within the wastewater causing chemical reactions and precipitation or coalescence of colloids within the wastewater. The contaminants can then be removed by flotation using a skimming mechanism or settling on the bottom where they can be removed.

The application of vacuum enhances the ability of the technology to treat the wastewater. By reducing the atmospheric pressure within the treatment cell, the interstitial tension is reduced, allowing for release of the contaminants bound to the water molecule. The coagulative ability of the waste stream is increased resulting in high removal rates of the contaminants of concern.

GEE has completed bench scale testing on a variety of wastewaters from different industries including the oil and gas, various manufacturing industries, brewing industry, environmental industry and the mining industry. Through the development of unique multi plate geometries, as well as the development of a proprietary treatment train, this process has the potential to remove up to 99% of contaminants.

Some of the contaminants that have been treated include:

Bacteria	>99%
Chlorinated hydrocarbons	>98%
Hydrocarbons (F1-F4)	85-99%
Iron	92%
Manganese	94%
Aluminum.	99%
Barium	87%
Arsenic	87%
Lead.	98%
Titanium	99%
Zinc	95%
Molybdenum	70%
Copper	91%
Cobalt.	84%
Herbicide	>99%

Bench Scale testing has proven that the Electro-Pure Technology is a viable treatment option for contaminated water. The technology can be used as an individual treatment option or as part of a treatment train depending on the contaminant of concern. It is economically viable when compared to other treatment technologies and should be considered when looking for wastewater treatment options.

Sean Frisky

Sean Frisky started GEE in 1998 because while an employee at an oil refinery (a job he worked at while attending university), he saw firsthand how most equipment spent more time broken than running. He asked his employer if he could work on a broken Multi-Phase Extraction system. To Sean, the fix was designing a new system. The result: an MPE with 300 per cent fewer parts, a 99.9 per cent runtime (a standard Sean's company maintains today on all equipment)...and the start of GEE. Today, GEE is a multi-million-dollar business that employs 35 people and serves customers in Canada, USA, Australia and parts of Europe and the Middle East. During his career, Sean has designed and commercialized more than 30 new products. Companies such as Cameco and Shell rely on his expertise in remediation. His latest accomplishment has been developing and designing a new water treatment system—Electro-Pure Technology—a system that can efficiently and economically treat frac water, produced water and mining wastewater.