

# Electrocoagulation

Water Recovery and Reuse

## Mining Industry

### Industry Applications

Surface Mining: strip mining, open-pit mining, mountaintop removal, dredging, quarrying, placer mining \*\* Sub-surface Mining: drift mining, slope mining, shaft mining, hard rock mining, borehole mining \*\* Mining Reclamation Process (making land where a mine has been suitable for future use), mine closures.

#### Challenges

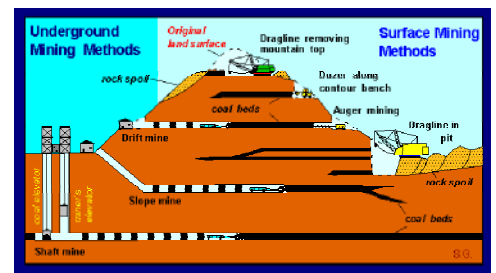
- The by-product water contains heavy metals, radioisotopes, and suspended clay.

#### Solution

##### Electrocoagulation:

- Is well suited for the removal of suspended clay particles; removes suspended solids (TSS) by 99.49%
- Removes heavy metals.
- Removes high-weight hydrocarbons.
- Removes radioisotopes.
- Allows water reuse.

Contaminant	Before mg/l	After mg/l	Removal Rate %* +
TSS (clay, coal, silt, etc.)	5,620	25	99.6
Silica	21.7	0.1	99+
Aluminum	224	0.69	99+
Arsenic	0.076	ND <0.0022	97
Iron	29.1	3.1	89
Cadmium	0.1252	ND <0.004	97
Chromium	139	ND <0.1	99+
Lead	0.59	0.0032	99+
Mercury	0.72	ND <0.0031	98
Zinc	221	0.14	99+
Radioisotope Contaminant	Before	After	Removal Rate %*
Americium-241	72 pCi/l	0.57 pCi/l	99+
Plutonium-239	29.85 pCi/l	.29 pCi/l	99+
Radium	1093 pCi/l	0.1	99+
Uranium	0.13 mg/l	0.0002	99+



\*These published test results are specific examples and were conducted by a qualified independent laboratory or government facility.

EC systems deliver five significant benefits to both hard rock and coal mining operations.

1. EC enables mining operations to remove suspended solids from tailing ponds, and can help these ponds become a source of water for beneficial use.
2. They remove suspended contaminants found in mine process water, including silt, clay and heavy metals. This facilitates the reuse of process water, reducing the demand on local fresh water sources.
3. Mines often face flooding issues with the operator having limited options to handle the contaminated flood waters. Because of the Powell EC system's very high removal rates of suspended solids, heavy metals and even radioactive isotopes, flooded mines can be brought back into operation while creating a body of harvestable water available for beneficial use.
4. EC systems can help address Acid Rock Drainage (ARD) issues, for both operational and non-working mines, removing heavy metals and bringing pH levels into the normal range. Please contact us for more information on this critical issue.

EC systems are skid mounted, have a small footprint and require little power or attention when operating. They are optimized for field operations.