evocra

CASE STUDY:

OCRA reduces reagent consumption and meets environmental discharge goals

2011

ACID MINE DRAINAGE

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PROJECT
Gold resource exploration pit

DATE
2011

MATERIAL
Acid Mine Drainage

DESIGN
Av. 30.5kL/day, Peak 62kL/day

PRINCIPAL
Tasmanian west coast polymetallic mine

LOCATION
TAS, Australia

SCOPE
Design a water treatment plant to treat acid mine drainage (AMD) to a zero environmental harm release standard for sensitive alpine receptors

About

Evocra works with international tier 1 engineering firms to provide turn key water treatment plants to solve Acid Mine Drainage (AMD) issues.

Evocra's new generation technology, OCRA, offers a superior treatment solution of AMD at existing mining operations and at abandoned mine sites. Working with our Tier 1 engineering partners with global reach, we have the capability to design and commission the ORCA process either into existing treatment plants or installed as a standalone treatment system.

RESULTS

All of the sites zero environmental harm discharge limits were met, even during extraordinary peak flow rain events, up to 160kL/day, which is >250% of peak design flow.

CONTAMINANT (mg/L)	AVERAGE DELIVERY WATER	AVERAGE TREATED WATER	PERCENT REMOVAL
Arsenic	12.8000	0.4130	96.77%
Cadmium	0.0890	0.0020	97.75%
Copper	3.3500	0.0750	97.76%
Iron	26.5200	1.7490	93.40%
Lead	6.3900	0.0540	99.15%
Manganese	40.4500	2.0310	94.98%
Mercury	0.0355	0.0004	98.96%
Zinc	2.8950	0.0610	97.89%

Issue

AMD has been a pollutant of concern since metal mining began. AMD was recognised 4,000 years ago and managed with simple lime addition, a practise that still continues today. These traditional methods rely upon pH manipulation, creating hydroxide metal precipitates. Traditional methods leave tailings facilities with reactive hydroxide precipitation compounds that can be reversed resulting in ongoing and ever increased remediation costs.

The OCRA process removes contaminants three ways, by either:

1. decomposing them (e.g. cyanide),
2. absorbing metals into insoluble reagents, and
3. separating metals as precipitates for resource harvesting.

OCRA removes contaminants from the fluid phase and away from re solubilisation pathways, producing positive intergenerational remediation outcomes.

TECHNOLOGY

OCRA utilises ozone in an ozofractionation column to directly oxidise contaminants in the AMD stream. Organic compounds are degraded to simple inorganic compounds, while metals form metal oxides that can be floated or precipitated as minerals or captured by reagents.

PROCESS

An OCRA plant designed for AMD utilises OzoFractionation columns either in a single or multi-stage arrangement to remove suspended solids, metal, hydrocarbon and other organic contaminants. Dependent upon the influent quality the OCRA process can extract valuable mineral oxides as a supplementary income.

APPLICATION

OCRA implementation at this polymetallic mine demonstrated the processes advantages over conventional AMD treatment methods, which include:

- Comparable direct capital costs;
- Reduced indirect (storage facilities) capital costs;
- Reduced operating footprint;
- Reduced overall operating costs;
- Lower energy consumption and costs;
- Lower reagent consumption and costs;
- Increased production rates;
- Reduced post-treatment sludge management costs;
- Broader spectrum contaminant treatment; and
- High standard of treated water quality.