

# MINING

Water management is emerging as the pre-eminent sustainability issue within the Global Energy and Mining Resource Industries. With water being the most important resource in all mining and quarrying developments and operations; it can be used and abused.

## Main Concerns

Miners often work in dry, remote areas, where environmental issues make water sourcing, use and disposal particularly problematic. With hard rock mines in particular using water in all steps of the mining process, from drinking water production, cooling equipment, separating waste from valuable minerals to controlling dust, working with such large volumes of water presents a variety of risks.

Mining water treatment applications include potable water treatment for mine sites, process water treatment, product recovery, recycle water treatment systems, residuals management and a variety of other treatment technologies.

In order to comply with regulations and ensure that the quality of water leaving mine sites is not adversely affecting water users downstream, mining companies develop water management plans to minimize the potential for water contamination, and to prevent the release of polluted water into the environment. Surrounding surface and groundwater quality is monitored, and a number of treatment processes can be used to ensure mine water meets regulatory standards prior to being discharged.

Awareness of environmental impacts and concern for the environment has increased in recent decades, resulting in more stringent environmental regulations worldwide and a corresponding response from the international mining industry.

Environmentally responsible practices, especially relating to water, have become central to the viability and acceptance of a modern mining operation. Water management strategies are used to minimize the environmental impact of mining operations, and are now at the heart of mine development, operation, and restoration activities. Increasingly, companies exceed regulatory compliance in order to provide clean water to surrounding communities.

DMI-65 is an extremely powerful silica sand based catalytic action water filtration media that is designed for the removal of Iron and Manganese without the use of potassium permanganate through an Advanced Oxidation Process.

Incorporation of a DMI-65 based filtration system in the water management strategy will:

- ✓ **Reduce iron and manganese contamination in drinking water to well below health authority standards**
- ✓ **Materially reduce the symptoms of iron and manganese fouling**
- ✓ **Remove impurities to control deposition, carryover, and corrosion in the boiler systems**
- ✓ **Prevent the clogging of water feed systems**
- ✓ **Reduce iron and manganese contamination in waste to well below regulatory limits to allow reuse or discharge into the environment**

**dmi65**®



## How DMI-65® Works?

DMI-65 is infused technology and not just a surface coating technology, unlike other catalytic water filtration media, which removes the chance of any chemical leaching into the water stream.

In order to begin the process of oxidation of the iron (and manganese) in solution DMI-65 is designed to operate in the presence of chlorine or other oxidant. In this process the oxidant removes electrons and is consumed in the process. The operator needs to ensure that there is a 0.1 – 0.3 ppm free chlorine residual in the effluent water. Chlorine, fed as sodium hypochlorite or bleach (12.5% NaOCl), is the preferred oxidant since it is relatively inexpensive, readily available around the world and it is effective. It also performs the vast majority of any disinfectant process.

Unlike ion exchange resins where higher regenerant dosages will increase the ion exchange capacity, NaOCl residuals or concentrations higher than required to oxidize the Fe and Mn do not increase the oxidative properties of the media.

## Certification

**DMI-65® is Tested and Certified Under Industry Standards: NSF / ANSI 61 Drinking Water System Components by the Water Quality Association of USA Gold Seal Program covering safety and health effects for drinking water components.**

**Compliant : Drinking Water Inspectorate safe to use according to: Reg. 31(4)(a) of water supply (Water Quality) regulations 2010 for UK, England and Wales.**

**DMI-65 has also been tested by many other water treatment authorities and laboratories.**

**DMI-65 is manufactured in Australia.**



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## Advantages of using DMI-65® in Mining

### Membrane Protection

The efficient removal of dissolved iron to almost undetectable levels as low as 0.005 PPM materially reduces the incidence of iron fouling which therefore reduces the need for membrane replacement and keeps the treatment system working at its optimal levels. Membranes are expensive, as is the time cost to replace them and the production downtime.

### Reduced Costs

The total cost of the iron and manganese removal water filtration system is significantly less than alternative solutions, the effectiveness, but relative simplicity, of DMI-65 based systems reduces the upfront capital expenditure on plant complexity as well as the ongoing operational expenditure in chemicals, power and backwash waste water recovery.

### High Flow Rates

The infused technology of DMI-65 promotes the highest oxidation rate of any catalytic filtration media. This permits a significantly higher water flow rate to achieve the same level of iron and manganese removal. DMI-65 can operate at linear filtration velocities up to twice that of conventional media with a corresponding reduction in capital equipment costs.

### Regeneration Not Required

The media operates with a continuous injection of sodium hypochlorite at low residual levels (0.1 to 0.3 ppm) which eliminates the need for Potassium Permanganate.

### High Load Capacity

Because of the increased surface area due to the micro-porous structure of the matrix material, the DMI-65 also has higher iron and manganese load capacity which can extend the duration of filter runs and the time between backwashing, thereby reducing downtime, operating expense and wastage.

### Wide Operating Environment

Stable and satisfactory performance at pH 5.8 to 8.6 and a maximum operating temperature of 113° F (45°C) reduces the need for investment to alter the operating environment.

### Regulatory Compliance

Demand for clean and reliable drinking water expands at rates far greater than available surface water sources. New municipal drinking water sources are increasingly from ground water which most commonly has Iron and manganese contamination levels well above designated acceptable levels. DMI-65 efficiently removes dissolved iron to the almost undetectable levels as low as 0.005 PPM and manganese to 0.001 PPM to achieve compliance in virtually all jurisdictions.

### Long Life

DMI-65 is not consumed in the process, providing considerable advantages over other processes or media. The media does not display a decaying capacity to do its catalytic work. Over a 5 to 10 year period, through many backwashing operations of the bed to remove retained solids, an attrition loss of the media occurs by contact between particles and mechanical abrasion.







## Case History

Mulga Downs, Western Australia

### Fortescue Metals Group Limited - Cloudbreak Mine Site

Fortescue Metals's Group's Cloudbreak mine site has won national recognition and awards with the Australian Water Association for their advanced groundwater management scheme.

With a capacity of 25 gigalitres of water recharged each year the Cloudbreak Managed Aquifer Recharge Scheme is one of the largest and complex managed aquifer recharge schemes in Australia.

The scheme, first established in 2008, is an innovative approach to mitigating environmental impacts related to surface discharge and dewatering drawdown while also conserving water resources for future mine water supply.

Iron and manganese removal plays an important role in the management of the water treatment system at the Cloudbreak Mine site. The Water Treatment plant uses DMI-65 for treating ground water elevated levels of iron and manganese to meet Australian Drinking Water Standards as an alternative to costly reverse osmosis (RO) processes.

Fortescue Water Supervisor Mark Botica said "The DMI-65 media used in this treatment plant consistently reduces iron and manganese to ultra low levels. After filtration through the DMI-65, manganese levels went from 0.939 mg/L to 0.02mg/L when mixed with our other potable water supply."

The Scheme to date has been so successful that it was awarded the National award for Infrastructure Project Innovation at the Ozwater11 conference and also won the Western Australian Water Infrastructure Innovation Award in 2010.






## Applications & Industries We Serve

- ✓ Drinking Water Treatment
- ✓ Reverse Osmosis
- ✓ Arsenic Removal
- ✓ Mining Industry
- ✓ Industrial Applications
- ✓ Irrigation Systems
- ✓ Landscape Reticulation
- ✓ Cooling Towers & Boilers
- ✓ Environmental Dewatering
- ✓ Food & Beverage

## Why DMI-65®?

-  **Expertise & Experience**  
Years of industry experience, we offer knowledgeable & professional services
-  **Customer-Centric Approach**  
We put YOU first, offering solutions tailored to your specific needs.
-  **Highest Quality**  
We're committed to providing the highest quality in everything we do.
-  **Competitive Pricing**  
Our rates are competitive giving you the best value for your money.
-  **Reputation**  
We have built trust, professionalism and exceptional service within the community.
-  **Innovative Solutions**  
Our cutting-edge technology is efficient and meets modern demands.

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