

# Nitrate Removal with MIEX® Treatment



## Nitrate Removal

Technologies to remove nitrate are increasingly being sought after as rising demand and scarce water supplies are forcing many utilities to consider water sources previously ignored due to the presence of nitrate.

Sources of nitrate include fertilizers from agricultural activities and discharges from wastewater plants and septic sewage systems. When these inputs make their way into water supplies, nitrate levels can increase making it necessary to install treatment to stay within the EPA limit of 10 mg/L (as N).

As nitrate is classified as an acute toxin, any exceedance of the EPA limit is considered a violation, so even where systems only have nitrate levels at or above 10 mg/L for a short period each year, treatment must be installed to allow the water source to continue to be used.

Traditionally, the only feasible treatment options available for removing nitrate from drinking water supplies were conventional ion exchange and reverse osmosis. Both of these options generate a significant amount of waste that can be difficult and expensive to dispose of.

## The MIEX® Solution

The MIEX® Technology is an advanced magnetic ion exchange process that can be applied to remove nitrate from water supplies. The continuous resin regeneration utilized in the process allows for significant waste reductions over conventional ion exchange treatment and eliminates the occurrence of chromatographic peaking.

### This alternative delivers the following benefits over traditional nitrate removal practices:

- Lowest waste volumes of any nitrate removal technology (see Table 1).
- No risk of chromatographic peaking (nitrate dumping).
- MIEX® Resin can tolerate low free chlorine residuals to prevent bacterial growth without the risk of NDMA formation.
- Co-removal of other anions of concern such as TOC and arsenic.

Table 1: Waste Volumes for Nitrate Removal Technologies

Treatment Alternative	Waste Volume	
	gal/MG	% Throughput
MIEX®Proces	1,000 - 3,000	0.1 - 0.3
Packed Bed Ion Exchange	5,000 - 20,000	0.5 - 2
Reverse Osmosis	100,000 - 200,000	10 -20

## MIEX® Treatment Systems

Pressurized nitrate removal systems are available as packaged units up to 2 MGD and custom-designed systems for all capacities over 2 MGD. Gravity-flow systems are also available if it is not necessary to operate the process under pressure.

Figure 1: Pressurized MIEX® Treatment System



With the lowest waste production of any nitrate removal technology (approximately 0.1-0.3% of throughput), these systems provide an environmentally friendly solution to the increasing need for nitrate removal.

Feasibility studies can be conducted on water sources to determine the optimum performance of the MIEX® Process and appropriate system design parameters.



MIEX® DOC Resin is certified by the NSF for use in drinking water systems under the provisions of the ANSI/NSF Standard 61: Drinking Water Components - Health Effects.