

# Z-XM™ PERCHLORATE TREATMENT SYSTEM

## TECHNICAL MEMO

### Z-XM™ PERCHLORATE TREATMENT SYSTEM

CONFIGURATION: PES, SKID SYSTEM OR FABRICATED  
FLOW RANGE: 10 GPM OR GREATER

#### Drinking Water Limits

EPA MCL: NONE, EPA REPORTING LIMIT: 4 µG/L  
STATE HEALTH GUIDANCE: CALIFORNIA,  
TEXAS 4 µG/L, ARIZONA 14 µG/L,  
MASSACHUSETTS 2 µG/L, NEW YORK 5 µG/L,  
NEW MEXICO 1 µG/L, NEVADA 18 µG/L

EPA ANALYTICAL METHOD: EPA 353.2, 354.1 OR 300.0

#### Z-XM™ Features:

- Media is NSF Standard 61 certified for use in drinking water applications.
- Can be incorporated into a blended water treatment system.
- Concentrates and removes other anion contaminants such as arsenic, uranium, and selenium.
- WRT service components: System maintenance, media replacement and incineration of spent media brines.



#### Application:

WRT's perchlorate removal system consists of utilizing a non-regenerable ion exchange media, which after exhaustion is disposed of via incineration (preferred) or suitable landfill disposal. Currently the media, trade named Z-XM™ is a perchlorate selective synthetic ion exchange flow-through packed bed downflow media. The media is a specialized strong base anion exchange resin of styrene-divinylbenzene base structure. The media is contained in a screened pressure vessel wherein untreated water is pumped through the vessel for the service period. Following the recommended service interval measured in bed volume (BV) throughput or based on treated water discharge sampling, the spent media is removed or exchanged and disposed of via incineration (change of title is completed). The media is replaced with fresh media and the system is put back into service.

Spent perchlorate Z-XM™ media is disposed of via incineration. The media is RCRA TCLP compliant following removal from service. The spent perchlorate Z-XM™ media is dewatered, mixed with aqueous absorbent and packaged within a disposal container and then transported for disposal.





## WRT Perchlorate Removal Outline

- Configuration: Down flow packed bed contained within screened pressure vessels.
- Service duration: Dependent upon perchlorate and sulfate concentration. Typically greater than 1.0 million gal/cu.ft. in most cases depending upon perchlorate starting concentration.
- Resin Capacity 12.0 to 14 Kgrs/cu.ft anion exchange capacity and up to 5,000 mg perchlorate/Kg media
- Typical Service Flow Rates: 0.5 to 12 gpm/cu. ft. and 6.0 to 10.0 gpm per sq.ft.
- Backwash Flow Rates: 1.0 to 1.5 gpm per sq.ft. (approximately every 3 to 6 months continuous service)
- Operating Bed Depth: minimum 30 to 36 inches (prefer 36 inches)
- System Configuration: Can run single bed with regular effluent monitoring or two bed (lead – lag) with less monitoring and prearranged changeout frequency.
  
- Perchlorate concentration range: Up to 500 µg/L.
- Regeneration chemicals required: None
- Pretreatment required: Prefiltration to less than 5 NTU TSS and may require additional pretreatment steps if other organics or uranium is present in the feed.
  
- Operator requirements: Daily monitoring of service vessels and automated controls. Periodic sampling of discharge water for perchlorate break-through.
- System operating effectiveness: Potentially reduced perchlorate capacity in waters containing high silica, high monovalent anions, and organics.
  
- System Limitations: Nitrate concentration greater than 50 mg/L and TOC greater than 10 mg/L.
- Residuals disposal: Spent media removed by WRT for final disposal. Incineration is recommended and preferred.

Water quality data required in order to evaluate application:

- For budget cost estimate and evaluation: TDS, TSS (NTU), alkalinity, nitrate, pH, sulfate, hardness, TOC, iron and silica.

## Pilot Study Information

- Pilot testing on-site at well source using portable or trailer mounted pilot equipment.
- Unit includes 2-column filter unit, 6-inch diameter sized for 1.5 gpm.
- Typical duration: 5 days using on-site analytical testing. Third party analytical sampling can be provided.
- Pilot study description details and template available on the Marketing “Forms” folder.
- Pilot study equipment is currently available for installation.
- See Pilot Study Analytical Cost Estimate bulletin.

## Perchlorate Media Details

- Perchlorate selective monovalent ion preferential strong base anion exchange resin.
- Supplied in chloride form.
  - Density: 42 lbs./cu. ft.
  - NSF Std. 61 certified.
- Can operate well in the presence of high sulfate concentrations to 80% of anion load with minimal effect on nitrate capacity. Capacity is between 2.0 to 2.8 lbs/cu. ft. perchlorate ion.
- Very high throughput capacity of greater than 1.0 MM gals/cu.ft. with perchlorate levels less than 10 µg/L feed concentration.
- Operating parameters:
  - Service Flow rate: general guide - 6 to 10 gpm/cu. ft.
  - Minimum bed depth: 32 inches, recommended bed depth: 36 inches.