

# **CHLORINE DIOXIDE**

**TECHNOLOGY & TREATMENT**



**AEGIS**  
*Chemical Solutions*

*Leading the industry in conditioning  
oilfield water through innovative,  
environmentally friendly,  
Chlorine Dioxide treatments.*



## Chlorine Dioxide (ClO<sub>2</sub>)

- "Green" Biocide
- Rapid reaction
- Does not react with Hydrocarbons
- Effective across broad pH
- Effective at treating Bio Film
- Selective oxidant with 2.5 times the oxidative capacity of conventional alternatives

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## ClO<sub>2</sub> Advantages

- Selective oxidant with low corrosion profile
- Does not form colloidal sulfur
- Effective biocide over broad set of conditions
- Kills all bacteria, removes biomass
- Improves oil recovery
- Improves SWD skim oil quality by removing sulfides
- Controls H<sub>2</sub>S in tank headspace
- Improves well production / injection rates by removing well bore contamination
- Reduces corrosion by removing H<sub>2</sub>S / FeS

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## APPLICATIONS

### Frac Water Pre Treatment

- Rapid reaction and documentation of frac water cleanliness before introduction to blender
- Eradicates active and inactive microbes and spores
- Useful over a wide variety of frac water. (Fresh, Produced, and Blended)
- Aegis process will not disturb FR or gels

### Water Reclamation

- Rapid reaction with the bulk of the undesirable matter in water
- Able to tune reaction to a wide range of water quality
- Increased oil skim
- Eradicates H<sub>2</sub>S and Microbes
- Oxidizes Iron Sulfide and dissolved iron

### Tank Batteries and SWD

- Rapid reaction with the bulk of the undesirable matter in water
- Increased Skim
- Oxidizes Iron Sulfide and dissolved iron
- Remove odor, H<sub>2</sub>S
- System health increased due to removal of harmful elements

## Exceptional Mobility

Aegis' mobile capabilities for oilfield application of ClO<sub>2</sub> provides flexibility in logistics as well as size of assignment. Large or small, the technology comes to the field ready to perform.



Compact trailer units easily responds to smaller assignments



More demanding projects may require the increased capacity of a larger unit



Large volume mobile unit for "Frac on the Fly" or other large applications

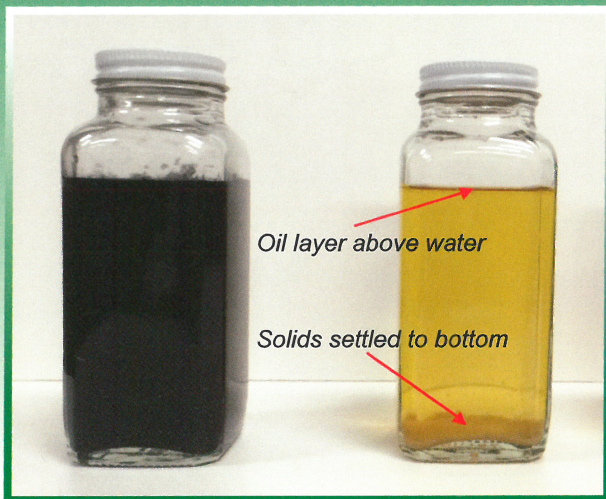


## Potential For Recovery

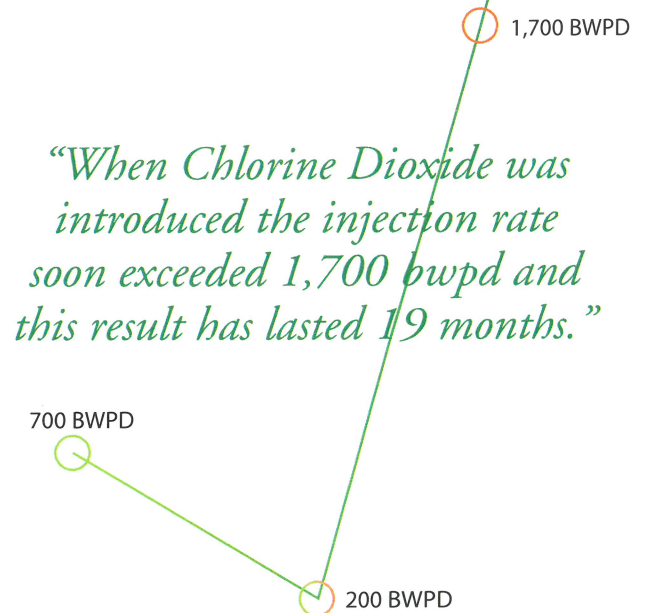
Within the dynamics of the Aegis process lies the valuable principle of separation. Under the right conditions in oil laden waste water the potential exist to separate and recover significant amounts of oil. Each treatment situation must be evaluated individually, but under the right circumstances upwards of 20% to 30% of the wastewater could be recoverable oil. When treating large volumes of water, substantial accumulations of this valuable by-product could result.

ORIGINAL FIELD SAMPLE

TREATED FIELD SAMPLE



Lab samples show potential oil reclamation from treated waste water



## Field Case Study

A Texas based oil and gas company operated a gas processing facility in which 700 bbls/day of water produced at the facility was pumped to a disposal well that was continually plugging and required periodic acidizing to restore the injection rate to 700 bwpd. The acid treatment lasted two months or less before the rate fell below 200 bwpd. When Chlorine Dioxide was introduced, the injection rate soon exceeded 1,700 bwpd and this result lasted 19 months with continuous  $\text{ClO}_2$  injections.

## OILFIELD CHLORINE DIOXIDE

Chlorine dioxide has been useful in various applications in the oilfield. While the chemistry has long been understood, the adaptation to proper oilfield use has been an evolution over the past several decades. With the increased pressure on oilfield companies to properly manage both water in and water out of the oil and gas operations, chlorine dioxide application is increasing because of its efficiency and environmentally positive profile. Aegis' methods of delivering chlorine dioxide in salt water disposal systems (SWD), water floods, water for hydraulic fracturing, and treatment of tank batteries have demonstrated the value of chlorine dioxide in the separation of entrained oil, and the elimination of bacteria, iron sulfides, and  $\text{H}_2\text{S}$ . Important advances in the process and methods of delivery allow for economically feasible use of high purity chlorine dioxide where it was once cost prohibitive. At Aegis we have been able to alleviate issues faced historically in the oilfield, resulting in a more efficient process with dependable and predictable results.



## Critical Water Management Issues Involving Fracking

In today's world of constant environmental concerns the oil and gas industry is increasingly looking for better ways to manage water as a precious resource in the day to day activities associated with hydraulic fracturing throughout North America. The overall quality of the water used in the fracking applications and disposal of this water is a major concern. The chemist and engineers at Aegis Chemical Solutions have done extensive research that show Chlorine Dioxide ( $\text{ClO}_2$ ) can effectively treat oilfield water with impressive results. Based upon extensive field testing Aegis is now engineering and building Chlorine Dioxide generating systems to meet specific job site applications in a variety of sizes. From a small mobile trailer unit, to a stationary  $\text{ClO}_2$  generating installation, the Aegis  $\text{ClO}_2$  treatment system is breathing new life into industrial wastewater treatment.

The Aegis team of water treatment specialists work closely with each of their clients to ensure accurate communications and to impart in-depth knowledge and understanding of the job at hand. This level of dedicated communication and education allows the customer to more realistically gauge anticipated results and affords them the valuable option of eliminating several reagents in favor of the cleaner, more efficient Chlorine Dioxide treatment process. Find out more about how the Aegis  $\text{ClO}_2$  treatment system can work for you. Call Aegis Chemical Solutions today or visit [aegischemical.com](http://aegischemical.com)



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