

Biopolymers for Emulsion Breaking – CASE STUDIES

Maximize Oil Recovery | Minimize Solids & Sludge | Removal Metals | Improve Profitability

BioBreak® Emulsion Breakers & Metal Removal Technology

NX Chemical designs and manufactures raw materials and advanced formulations for the Oil & Gas, Water, and Energy industries. Advances in biopolymer testing by the R&D laboratories NX Chemical have led to the creation of a new chemical product line called BioBreak®.

The BioBreak® Biopolymer Technology product line are reverse emulsions breakers, water clarifiers and flocculants (all water-based products) and include the following:

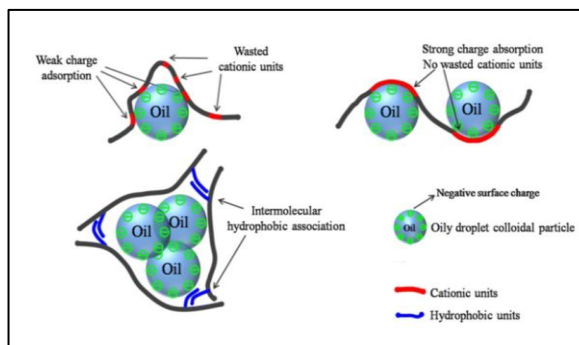
- NX OilFloc REB-30 (Primary Treatment of Oil-Water Separation)
- NX WaterFloc REB-36 (Oil-Water Separation Secondary Treatment)
- NX WaterFloc REB-37 (Oil-Water Separation Secondary Treatment & Metals Flocculation)

The BioBreak® Biopolymer Technology has proven to deliver excellent results for oil-water separation, dewatering, and clarification of produced water in both onshore and offshore operations. In addition to soluble metals removal in produced water or flowback water.

Unique Characteristics and Main Benefits:

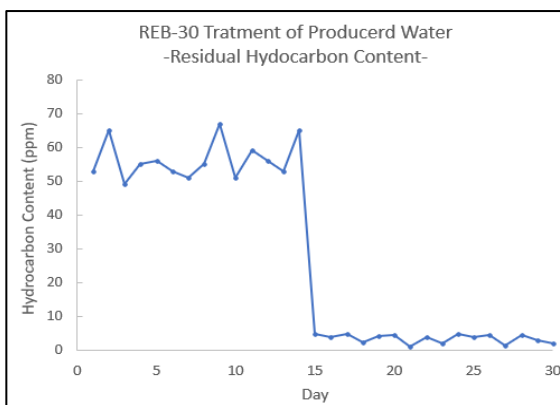
- BioBreak® biopolymers act as reverse emulsion breakers, providing excellent clarification and separation of produced water with high hydrocarbon content.
- Superior performance compared to conventional flocculants of the same use.
- Prevents environmental impact by delivering produced water free of oil and grease.
- Easy handling and simple dosage using existing chemical injection systems.
- Best cost-benefit ratio for treating and clarifying produced water.
- 100% compatible with other NX Chemical emulsion breakers.
- Acts as a flotation aid and does not contain metal-based salts, thus avoiding the formation of sludge or scale deposits.
- BioBreak® biopolymers do not contain heavy metals in their formulation, helping to prevent emulsion stabilization when the separated crude is reprocessed.

The oil coalescing process destabilizes negatively charged colloids by neutralizing charges and using opposite (+) charged biopolymers, avoiding electrostatic repulsion of the oil colloids. The reactions of BioBreak® Biopolymers with emulsions from formation water, process water, or produced water with high oil contents are illustrated in image to the right. The application of BioBreak® Biopolymer Technology has shown excellent results in Oil & Gas and other industries such as water, mining, chemicals and petrochemicals.

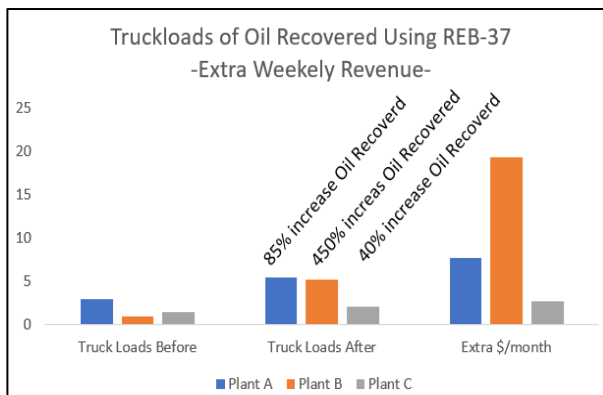


Case 1: Oil Carryover Minimization in Produced Water

Produced water with an average of 50 ppm dispersed hydrocarbons (oil) at the outlet of primary separators was treated using NX Chemical BioBreak® REB-30. Using a dosage below 8 ppm, BioBreak® REB-30 enhanced the separation across separators, reducing residual oil concentration to <5 ppm within minutes. The treatment enabled stable interfaces and avoided oil carryover. The plot shows the change in residual oil in water measured at the outlet of the separators.



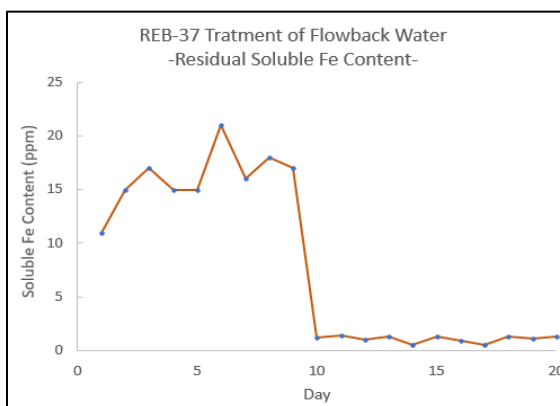
Case 2: Oil Recovery in Salt Water Disposal (SWD) Plants



Oily water sent to SWD plants contained significant levels of hydrocarbons. Using NX Chemical BioBreak® REB-37 at <10 ppm enabled the recovery of significantly more oil, resulting in larger plant revenues and lower injection well impacts (plugging). The plot below shows the increase in oil recovered (40% to 450%) using BioBreak® REB-37 and the corresponding revenue increase per week (\$3K to \$8K) per plant.

Case 3: Soluble Iron Removal in Flowback Water

Flowback water from fracking operations containing 15 ppm of dissolved iron was treated with NX Chemical BioBreak® REB-37. Using dosages between 10–15 ppm of REB-37 iron concentration was reduced to nearly 1 ppm. The plot shows soluble iron concentrations before and after treatment with REB-37, indicating a significant reduction of soluble iron, and enabling the reuse of flowback water for subsequent fracking operations.



For more information on the BioBreak® Biopolymer Technology, contact NX Chemical.