UNIQUE SOLUTIONS

Exterran has developed unique solutions for the most challenging water including handling produced back polymer, SAGD heavy oil, and frac flowback. With options of purchase, lease, or contract services, we can solve your water problems!

With over 20 years of produced water treatment experience, Exterran provides a full range of solutions for removing oil, contaminants, and suspended solids from produced water with primary, secondary, and tertiary treatment. Our unique service offerings allow us to understand water challenges and clean-up requirements through expertise in the field, lab studies, and equipment design. We help recover oil and reduce disposal cost whether shipping it offsite or reinjecting on location. Exterran solutions have been implemented at facilities worldwide throughout the Middle East, Asia, Europe, Africa, North America, and Latin America. Our clients range from top oil producers to water disposal companies, each interested in incorporating Exterran’s standard and customized products or retrofitting existing equipment.

STANDARD PRODUCTS FOR PRODUCED WATER DEOILING AND DESANDING

PRIMARY

Hydrocyclone Oil-Water Separation

- The P-KLONE™ uses centrifugal force to separate oil from water in less than two seconds with a turndown capacity of 50%. This is a well-proven method for taking water from the production separator with oil concentrations up to 5% and readying it for secondary treatments.

- EGFT™ (Enhanced Gas Flotation Tank) Handling marginal wells with up to 200,000 ppm OIW, the EGFT reduces CAPEX and OPEX costs by as much as 65% and decreases your footprint by replacing FWKO, CPI’s and IGF’s. Capacities range from 50,000 to 750,000 BWPD with achieved OIW outlets <20 ppm using MBF®.

- The Separon™ Deoiling Hydrocyclone has an advanced generation hydrocyclone geometry optimizing the critical balance between oil removal efficiency and capacity. The innovative liner geometry produces finer hydrocarbon separation at higher unit capacities, allowing fewer cyclone liners to be used for optimal performance and cost.

- Separon™ Desanding Hydrocyclones are the latest generation in hydrocyclone technology. The design consists of an involute inlet geometry which minimizes fluid turbulence and reduces inlet wear. Innovations in these models produces finer separation and increased throughput at lower pressure drops than conventional designs. This technology is designed to meet the harsh conditions of the upstream market.

- Separon™ Desanders effectively remove solids from liquids using centrifugal-action. Used in a wide range of onshore and offshore applications, units are designed with a two-to-one turndown ratio in most cases with flow rates from 100 bbl/d to 450,000 bbl/d per unit.

- Separon™ Solids Transport System is a compact fluidizing and solids transport solution. It allows for online solids fluidization and transport of solids which settle to the floor of vessels. A device with no moving parts, it uses a motive fluid which can be supplied from almost any source.

- Separon™ Wellhead Desander is an economic alternative for high-pressure environments. It is a complete solution that is compact, light and meets various API standards. This equipment is used in wellhead/wellstream and multiphase applications.
**SECONDARY**

**Applications for Microbubble Flotation (MBF<sup>®</sup>)**

- The RevoLift<sup>®</sup> HS IGF vessel is a high-volume MBF<sup>®</sup> system that targets oil separation outputs as low as <10ppm and trouble-free separation at rates up to 150,000 BWPD.

- The RevoLift<sup>®</sup> VS and RevoLift<sup>®</sup> VSL are portable and compact IGF units that utilize MBF<sup>®</sup> with target outlet oil concentrations <10ppm and flow rates up to 30,000 BWPD.

**TERTIARY**

**Black Walnut Shell Filtration**

- Sabian® Black Walnut Shell (BWS) Filters remove the smallest traces of oil and solids that remain in produced water after other treatments. The system removes OIW and TSS achieving a target water quality of <5ppm. Capacities range from 2,000 to 150,000 BWPD with a turndown capability of 45%.

- The Separon™ Sandwash System offers a unique sand cleaning system for treatment of oily solids from production, reducing oil on the solids to a level allowable for discharge without the use of chemicals. Sand cleaning can be used during sand jetting or when sand from production needs to be cleaned prior to overboarding, transport, reuse or disposal.
MICROBUBBLE FLOTATION (MBF®) TECHNOLOGY

MBF® technology helps attain cleaner water in the most challenging processes. With Exterran MBF®, oil is removed from produced water more efficiently and effectively. Unlike dissolved air flotation (DAF) systems that rely on solubility or typical induced gas flotation (IGF) technologies that use large bubbles, our technology introduces trillions of microscopic bubbles to the untreated water. Due to the increased surface area and contact time, microbubbles are superior in capturing the smallest of oil particles and bringing them to the surface for skimming. When properly applied, the most challenging waters can be treated efficiently. Exterran offers two methods of creating microbubbles:

- **Gas Liquid Reactor (GLR®)**, a pressure vessel that uses hydraulic flow, shear, pressure and impaction to create microbubbles of gas.
- **Onyx® Pump**, a unique multi-stage pump that creates microbubbles through hydraulic shear and pressure with no cavitation.

FIELD SERVICES

Our trained staff will visit your site to help evaluate your needs. Upon completing a Water Characterization Study, Exterran will offer a site specific technical review to identify which process improvements and water treatment solutions will best fit your requirements.

CFD and RETROFIT SERVICES

Make the most of new or existing equipment. Through Computational Fluid Dynamic (CFD) modeling (single or multiphase), Exterran can identify short-circuiting and problem areas then demonstrate how modifications can improve performance. Retrofitting existing equipment using Exterran’s patented designs and technologies can help dramatically lower CAPEX and OPEX.

LAB SERVICES

Exterran has the capability to run actual site samples through our lab to validate CFD models and qualify equipment performance. Our lab allows us to test variables such as highly sheared oils, high oil loading, varied retention times and chemical programs for conventional and unconventional applications to make sure sites are operating smoothly and efficiently.

Learn more at [Exterran.com/Water](http://Exterran.com/Water)
Contact: Water@Exterran.com

Exterran offers site specific water characterization studies to identify which process improvements and water treatment solutions will best fit your requirements.