



WATER TREATMENT

WATER TREATMENT



CETCO
OILFIELD
SERVICES
COMPANY



Water Treatment Applications

CETCO Oilfield Services provides water treatment services for all phases of oilfield production, from the well head to the refinery. Whether on a platform or in a tank farm, we can be found treating a variety of streams:

- Heating/Cooling Medium Treatment
- Deck Drainage
- Drill Cuttings
- Brine Filtration and Recycling
- Methanol Filtration
- Produced Water Treatment and Polishing
- Workover Fluids and Coiled Tubing Jobs
- Initial Well Flow Backs/Completions
- Decommissioning Wastewaters
- Pipeline Maintenance
- Well Stimulations and Acid Flow Backs



WATER TREATMENT

CrudeSorb® is packaged for quick media change outs – essential on temporary flow back applications or at remote locations.



Benefits of Using CETCO Water Treatment Services

- Ensure overboard compliance
- Reduce waste by onsite treatment, cutting logistics and 3rd party processing
- Maximize production by isolating specific well work activities
- Ensure maximum asset return by treating online
- Avoid costly shut downs

The CETCO Oilfield Services Process

CETCO Oilfield Services provides a unique and effective service to help customers manage unusual or temporary situations, such as off-spec discharges. Drawing on years of experience in water treatment, we have designed a rental fleet that meets a vast variety of flow rates, temperatures, and pressures. Our technical and service teams have extensive service and training and are often available at 24 hours notice. CETCO Oilfield Services Water Treatment Division specializes in the removal of hydrocarbons, solids, toxic materials, and other contaminants from oilfield wastewater streams produced during oil and gas operations, transportation, and storage.

CETCO's highly trained personnel optimize equipment and technologies to ensure our customers remain compliant with overboard water quality regulations while reducing waste disposal costs.

Patented Media Technology

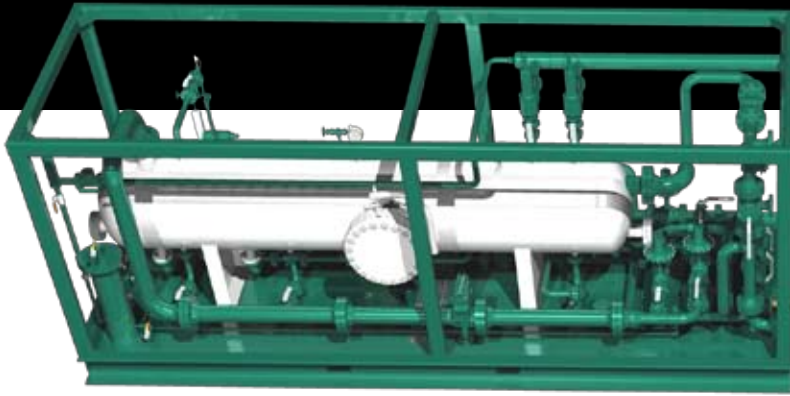
CETCO Oilfield Services utilizes different technologies based on our customers' requirements. We utilize the appropriate technology design to remove oil, solids, and toxic materials from wastewater based streams.

CrudeSorb®

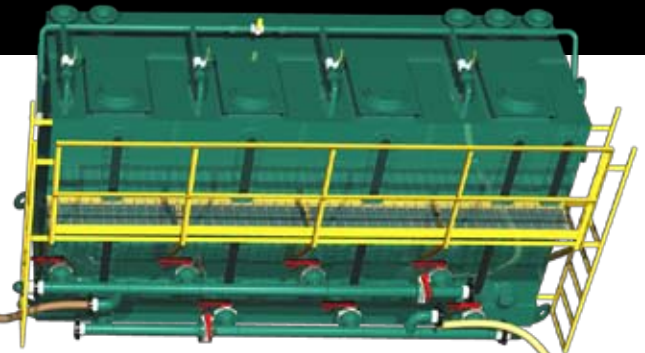
CrudeSorb is a proprietary adsorption media based on resin, polymer, and clay technology. It has been proven to be extremely efficient at removing oil, grease, and soluble organics from water.

CrudeSorb has been developed specifically for this purpose and is packaged in radial-flow, nonferrous canisters comprised of a cloth mesh and polycarbonate sealing caps at either end of the canister. Housing the CrudeSorb adsorption media in this way allows for quick media change outs – essential on temporary flow back applications or at remote locations.

HP Separator



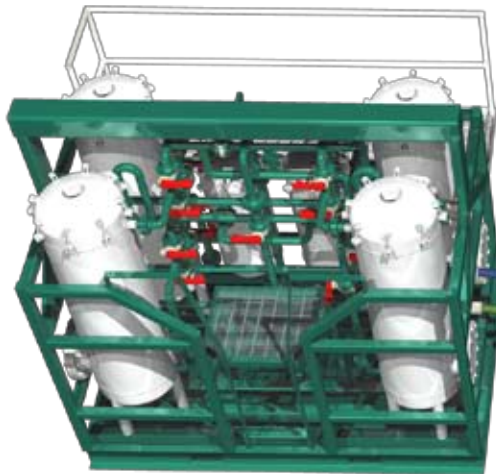
Weirbox



Pump Unit

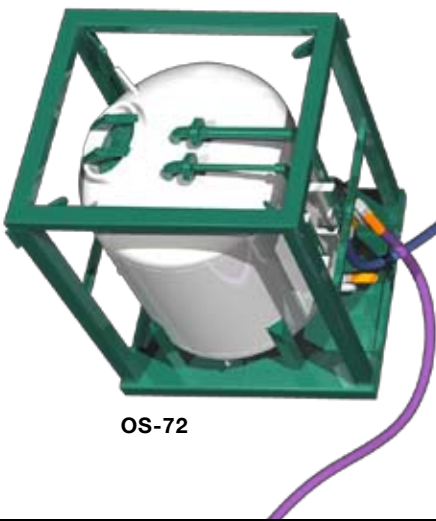


RFV 2000



Typical Process Flow Equipment Layout

OS-72



CRUDESORB®



Stage 1

First, fluids enter the CETCO 120 barrel separation tank (weirbox) where fluids can be chemically treated for emulsions, gels can be broken, or toxic materials can be neutralized. Oil is recovered and solids are isolated.

1

At each treatment stage our technology incrementally improves the water quality. This stepwise approach to processing provides assurances that the discharge specification is met or exceeded.

This conservative approach has also made CETCO Oilfield Services the most successful in online applications.



Stage 2

Fluids are then pumped through sock filters to remove solids and coalesce additional oil.

2



Stage 3

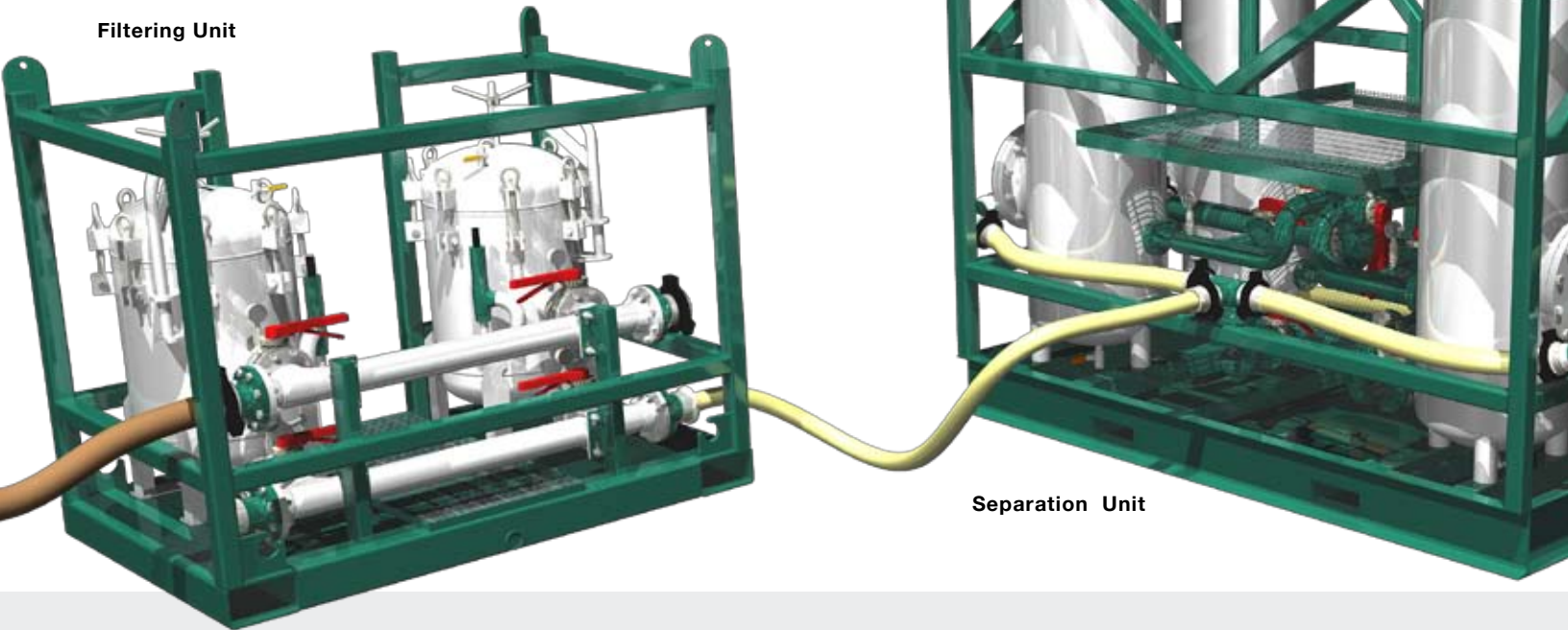
Water then flows through CETCO's patented CrudeSorb media in a specifically designed Radial Flow Vessel (RFV). Water flows through the canister fabric, media, and perforated core, and is routed downward through the stacked canister center cores through the CETCO patented vessel header. The fluids may be treated by a second vessel in series with additional CrudeSorb media, by a vessel with granulated activated carbon media, or routed overboard.



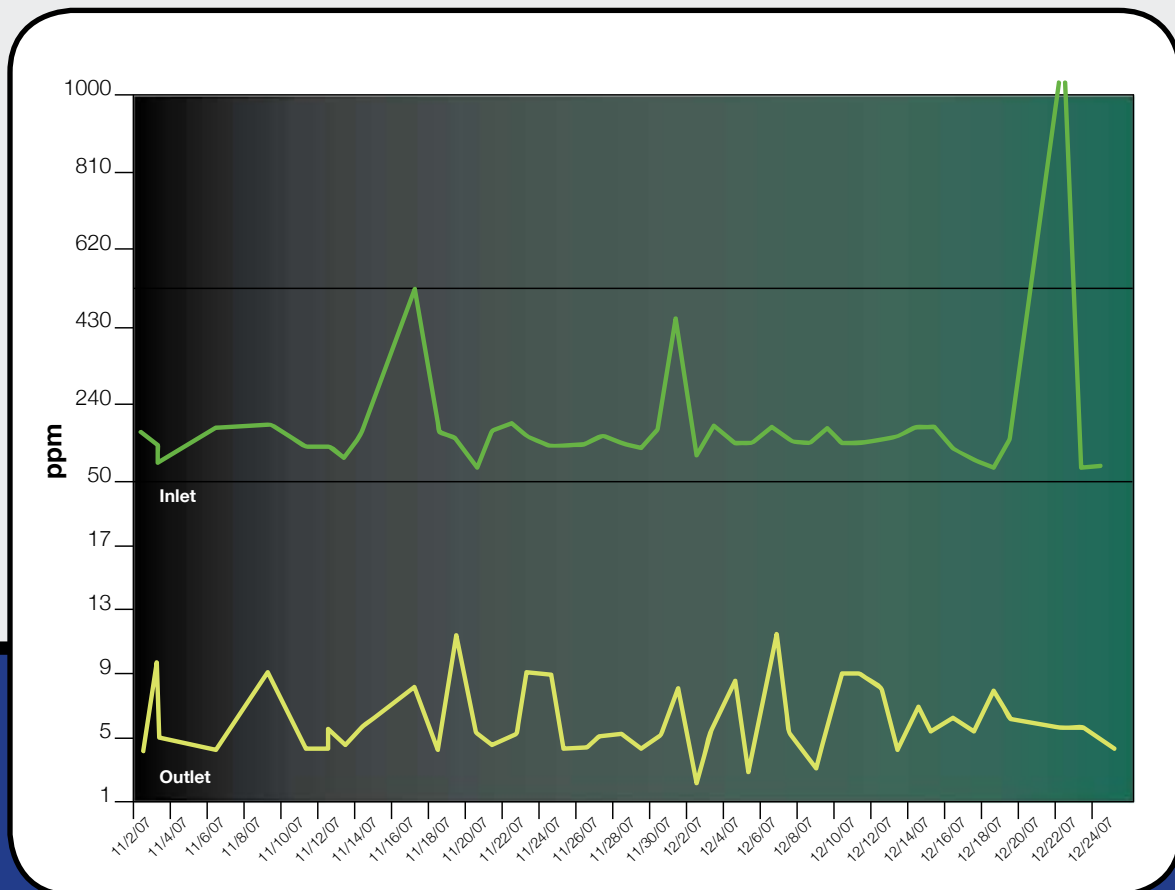
3 Stages of treatment

IMPLEMENTATION

Typical Hi-Flow™ Equipment Layout



Results from CETCO Oilfield Services Hi-Flow Process



FAST & SIMPLE

Hi-Flow Process Applications

- Permanent Produced Water Treatment and Polishing
- Diversion Skid
- System Upsets
- Increase Produced Water Handling Capacity

Hi-Flow Process Solutions

- Handles small to large volumes of liquid, from 1,000 BWPD to more than 40,000 BWPD
- Features a small footprint
- Performs well with large fluctuations in oil and grease inlets
- Ensures discharge compliance
- Allows flexibility – can be used on projects with short or long durations

Polishing Unit



Hi-Flow™ Process

CETCO Oilfield Services Hi-Flow Process can treat high rates of produced water, allowing the operator to return the produced water back into the environment in compliance with state and federal regulations. Our Hi-Flow Process gives you the flexibility you need in having one solution for many applications—the Hi-Flow process can handle small to large volumes of liquid, from 1,000 BWPD to more than 40,000 BWPD; it is not hindered by large fluctuations in oil and grease inlets; and it can be used on projects with short or long durations.

HI-FLOW™



Arsenic
74.922



CrudeSorb®MR Mercury Arsenic Removal Media

CrudeSorb MR is a new media material that can be packed in the canister similar to the CrudeSorb media. This new media is still based on organoclay technology but it has been heavily modified to enhance mercury and arsenic adsorption through both physical removal and chemical bonding. CrudeSorbMR is effective on all sources of mercury including the organic type of mercury, mercury element (zero valent), and mercury ions (both I and II valent). Additionally, CrudeSorbMR can also be as effective as the traditional CrudeSorb media to remove oil, grease, and other organic contaminant molecules when needed.

CRUDESORB®MR

CrudeSep®AF Produced Water Treatment System for high-efficiency removal of oil, gas, and solids



CrudeSep®AF Produced Water Treatment

CrudeSep AF is an unparalleled technology which separates oil, water, gas, and solids at variable flow ranges. Based on application of fluid dynamics, the CrudeSepAF is a novel technology which eliminates the dependency on gravitational separation prolific in traditional methods.

The inlet and outlet are located at the bottom of the vessel. The whole body of water is directed in a controlled vertical flow pattern towards a primary interface where droplets break out and accumulate. The return flow interacts with a series of specially engineered interfaces which encourage swirling eddies to form. These forced eddy currents propel the oil droplets towards additional gas interface surfaces for breakout and collection. Accumulated oil on these surfaces combines to form much larger oil droplets which join the main body of flow. These are now of a significantly larger size and interact with the initial interface at the top of the fluid column.

The vessel also works as a degassing unit as entrained gas will break out and be released with the separated oil particles. Solids and heavier particles will accumulate at the bottom of the vessel to be flushed out on an intermittent basis.

CRUDESEP®AF

CRUDESSEP®AF



SOLIDS REMOVAL

Skids are designed to be operated and maintained on-line.

Additional Services

Bulk Oil and Chemical Treatment

CETCO Oilfield Services can remove bulk oil through gravity and flotation technology. The process stream enters the 120 barrel separation (weirbox) or sparging tank comprised of four individual compartments. Each compartment has chemical injection, sparging, and oil separation capabilities. The tank provides a great deal of flexibility in breaking emulsions, segregating solids, and recovering oil. Any unexpected surges of oil, solids, and undesirable waste can be isolated and treated independently. Oily water is progressively cleaned from one compartment to the next.

Solids Removal

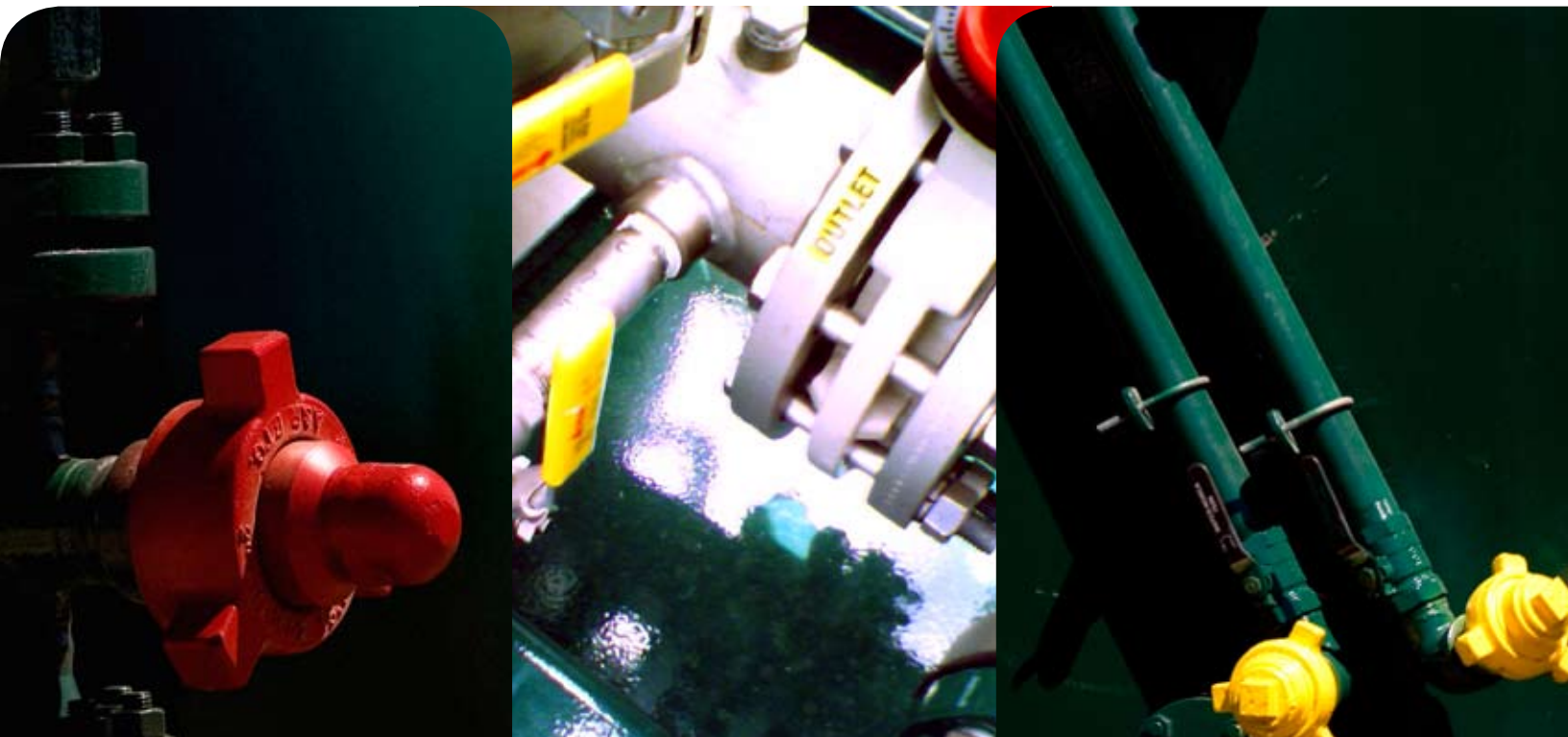
CETCO can provide various solids filter skids depending on the rate desired. The skids are designed to be operated and maintained on-line. Various micron sizes and fabrics are available for specific applications.

Rental Fleet

Our rental fleet includes sparging tanks, sock filter skids, bulk and canisterized media skids. We also supply all the necessary fittings, hoses, and safety equipment.

Complete Solutions Provider

Our turnkey approach to the treatment of oilfield wastewater streams places personnel and safety first. Consistent results produce environmentally compliant assets with increased oil recovery and ultimate production maximizing your return on investment.



WATER TREATMENT | PIPELINE | WELL TESTING | WASTEWATER | RENTALS | NITROGEN | REELED TUBING



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