MYCELX
A Whole New Dimension in Oil-Free Water

CASE STUDY

Heavy Oil Production

CUSTOMER: Major Oil and Gas Company

LOCATION: Southern Europe

Application

Removal of oil in produced water from heavy oil formation

FLOW RATE: 90m3/hr (13,000bpd)

OBJECTIVE OF THE TREATMENT
Remove oil and suspended solids from produced water to less than 10 ppm to enable produced water to be re-injected.

DATA

Inlet:	Oil & grease 100 to 2500 ppm; TSS: 50 – 800 ppm
Outlet:	Oil & Grease below 10 ppm; TSS: Below 10 ppm
Temperature:	60°C
Pressure:	Operating Pressure 75 psi

Challenge

A major oil company with operations in southeastern Europe was generating 15,000 bpd of produced water from its heavy oil production facility. The API of the oil was 5 – 9 and the produced water was approximately 60°C with appreciable concentrations of diluents that emulsified the oil. The oil had very high concentrations of asphaltenes and Diesel Range Organics (DRO) with solid concentrations fluctuating from 50 to 800 ppm.

The oil and grease concentrations, as well as the degree of emulsion, fluctuated greatly during production. The presence of asphaltenes rendered conventional oil removal technologies less efficient. The presence of high salinity required the material of construction to be stainless steel 316 or higher to withstand the corrosive nature of the water. The water treatment discharge requirement was less than 10 ppm of oil and grease for reinjection, recycle and reuse.

SOLUTION

MYCELX provided a complete, robust solution that included primary, secondary and tertiary oil removal systems to remove inlet oil of 2500 ppm to less than 10 ppm. The primary MYCELX solution is an Oil Water Separator (OWS) which is custom designed to coalesce and recover a wide range of heavy oil droplets from 100-2500 ppm. The secondary MYCELX solution is a RE-GEN (back-washable) system which is designed to treat heavy oil in dispersed and emulsified form up to 1000 ppm and solids up to 800 ppm. The tertiary MYCELX solution is a polishing system with a gradient filter approach to remove the trace contamination of oil to less than 10 ppm.

The system included automatic controls to respond to fluctuations in flow rates and pressure drop. Due to the corrosive nature of the water, a sacrificial Anodic Protection (AP) was utilized to prevent corrosion of the system.

MYCELX systems are designed per ASME, NACE and ABSA requirements on the pressure vessels, instrumentation and skids.

IMPACT

- Inlet to the MYCELX complete oil removal system varied between 100 ppm – 2500 ppm of oil
- Consistent removal to less than the customer specified level of 10 ppm
- Oil recovery from the produced water was up to 98% from the primary and secondary oil removal systems
- MYCELX system effectively removed oil from the produced water in free, dispersed and emulsified phases
- Consistent performance on large fluctuations of asphaltenes and diesel range organics
- Removed Total Suspended Solids (TSS) to less than 10 ppm
- Easy operation and maintenance for the complete oil removal system