Produced Water Solutions

Heavy Oil Production

Introduction

Heavy oil production is becoming increasingly more viable around the world, especially in Canada, Western US, Venezuela, Oman and Europe. The very viscous oil in these regions contain high sulfur concentrations that require the addition of heat (thermal energy) and chemicals in the treatment process to break the emulsions in the produced water. Heavy oil production practices demand a high level of water purity to allow for the reinjection of the produced water into subsurface formations or for recycle and reuse.

Challenge

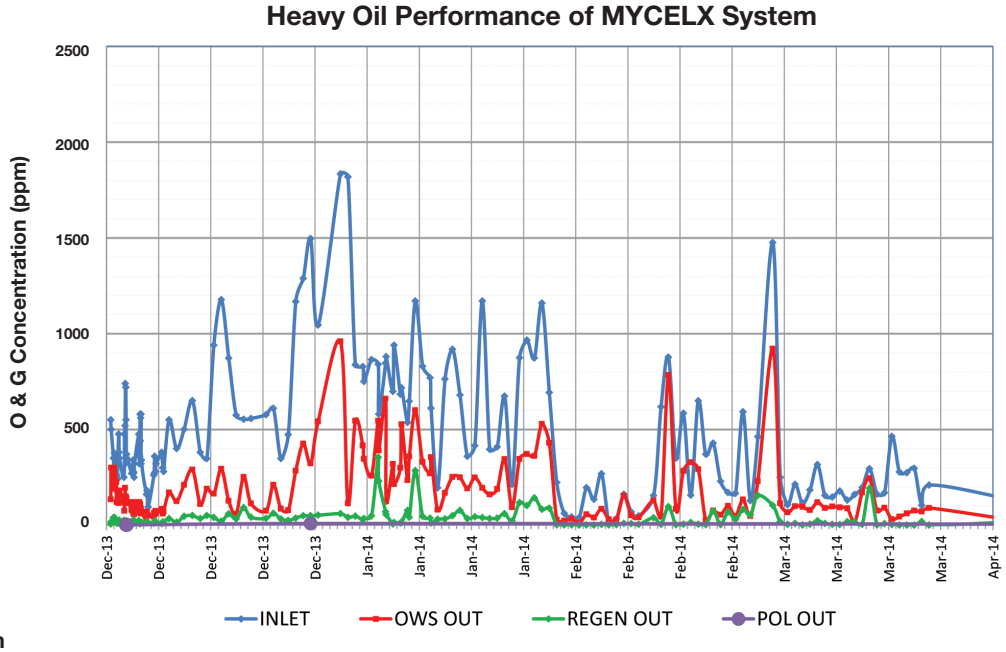
- Heavy oil production creates emulsified produced water; the degree of emulsion is a function of the oil components (percentage of diesel range organics, gasoline range organics and asphaltenes), presence of chemical additives and the parameters of the system (temperature and pressure).
- The presence of soluble lower chain organics and solvents, and the mixing of the reservoir fluids with diluent, create complex emulsions in the water.
- System specifications must address high temperature and high salinity issues.
- Reinjection, recycle and reuse often requires produced water to be treated to less than 10 ppm of oil and total suspended solids (TSS) in water.

MYCELX Technology and Solution

- The MYCELX solution for heavy oil produced water treatment is a complete oil removal system (primary, secondary and tertiary) that utilizes the patented MYCELX filtration media.
- The MYCELX filtration media is coated with a highly oleophilic polymer that attracts a wide range of oil and hydrocarbons.
- The primary treatment stage, the (MAS) MYCELX Advanced Separator, uses chemical affinity to enhance coalescence and increase oil recovery.
- The secondary stage, the MYCELX RE-GEN, is a back-washable media that uses chemical adsorption to remove oils, solids and oil coated solids.
- The tertiary treatment system, the MYCELX Polishers, uses cartridge filtration through a gradient approach to permanently remove oil and grease.

Performance

- Inlets of the system can vary from 100 to 1,500 ppm of oil in water and up to 500 ppm of total suspended solids (TSS). The discharge from the MYCELX system is less than 10 ppm for oil in water and TSS.
- The degree of emulsion can vary between mostly free oil to mostly emulsified oil with a higher concentration of heavily dispersed phase intermittently. MYCELX completely removes the free, dispersed and emulsified oils.
- Oil removal in the first two stages of the MAS and RE-GEN will be approximately 95- 97%. This oil is typically sent to the skim tank where it can be completely recovered.
- Polishers are used only when the RE-GEN outlet is above the required discharge limit. The discharge from the polisher is less than 10 ppm of oil under emulsified and dispersed conditions.



MYCELX
producedwatersolutions@mycelx.com