

Case History

Customer - ConocoPhillips

Location - Judy Platform

Treated - Produced water (Oil in Water)

Trial Period - 26 Days



Background & Client Scope

The ConocoPhillips Judy platform in the north sea is a production platform which produces on average 11MBD of liquids and 74 MMCFD of natural gas. Liquid hydrocarbons are pumped to Teeside through the Norpipe system, natural gas is fed through the Central Area Transmission System and produced water is treated on site and discharged over board.

With tightening OSPAR legislation on discharge water quality, the operator found that their produced water treatment was now falling short on the recommended oil in water (OIW) limits.

Greenthreads' AquaPurge® system was recommended for use in a produced water treatment trial on the Judy platform. The aim of the trial was to evaluate the effectiveness of the AquaPurge® system in reducing the levels of oil in a portion of the produced water stream to below the legal requirements, the trial would also look at the effects of a period of over production on the AquaPurge® unit and whether it could handle the treatment required for the extra flow to be kept within OSPAR limits.

Results—Oil In Water

During the 26 day trial 248 sets of water samples were taken at both the inlet and outlet of the AquaPurge® system. The trial involved a single pass of the test fluid through the system. The samples taken were analysed using spectrophotometry to calculate the concentration of oil in water (OIW).

The first graph to the right shows the difference in OIW concentration between the inlet and outlet samples over the 26 day trial. Multiple inlet and outlet samples were taken each day and a daily average was calculated and plotted to create the graph shown.

It is clearly visible from the graph that the AquaPurge® system worked effectively in removing OIW. The AquaPurge® unit managed to reduce the OIW concentration from above the OSPAR discharge limit to below this limit throughout the entire trial. This successful testing proved the AquaPurge® system could indeed keep the produced water quality on the Judy platform within legislative discharge regulations.

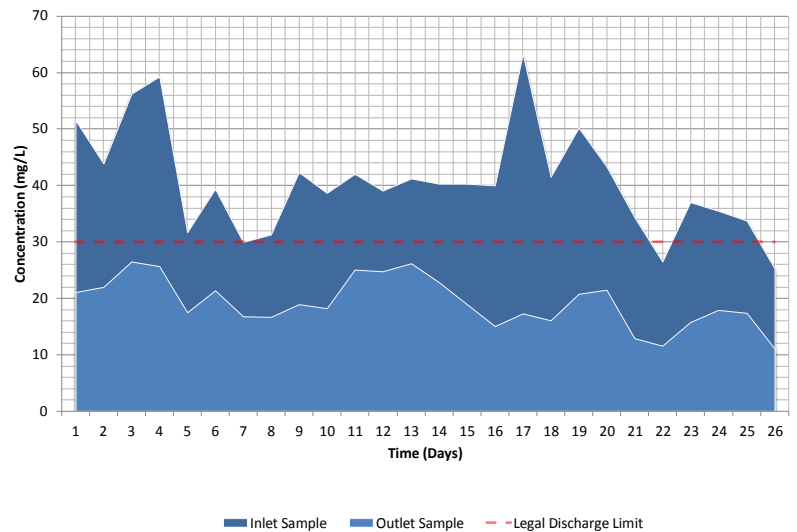
The maximum percentage reduction of a single set of samples during the trial of the AquaPurge® unit was an impressive 85.4%. All testing took place using only a single pass AquaPurge® process, by utilising Greenthreads Reverse Recirculation technology the treatment can be improved further if required.

Other Results—Increased Flow Rate

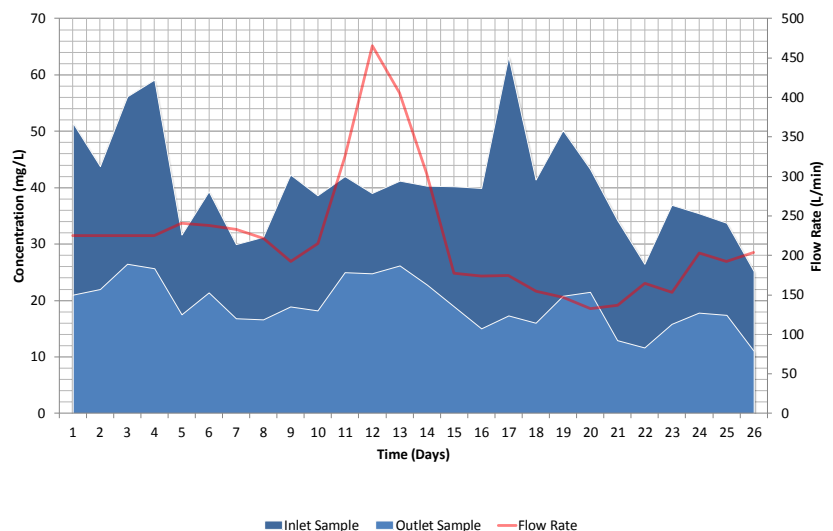
The second graph to the right shows the difference in OIW concentrations of each set of samples from the inlet and outlet of the system against the average flow rate through the AquaPurge® unit. Testing was carried out at 220L/min (~2000bpd) for the majority of the trial. However the throughput was ramped up to between 400-600L/min for 3.5 days to test the effects on the system when the treatment dose remained constant and the flow rates increased. As expected with a single pass system the efficiency of the process was reduced by around 20% however the system was still treating the produced water efficiently enough to ensure the discharge concentrations were kept below the 30ppm limit for oil in water.

The AquaPurge® system is based on an Advanced Oxidation Process (AOP). This Oxidation process treats almost all organic pollutants, oxidising them to H₂O and CO₂.

CoP Judy Trial - OIW Concentration vs. Time



CoP Judy Trial - OIW Concentration vs. Time



AquaPurge®

Greenthread water management solutions enable operators to exceed the increasingly challenging legislative limits ensuring compliance to global environmental standards and demands.

Greenthreads' patented AquaPurge® System is based on an Advanced Oxidation Process. AOP is essentially a natural process using Ozone (created from dry air) and UV to break down hydrocarbons and other organic substances to their component parts of carbon dioxide and water. The process breaks molecular bonds reducing complex molecules to simpler ones; resulting in zero waste stream.

AquaPurge® will treat

- 🔹 Hydrocarbons in water
- 🔹 Organic fluids miscible in water such as methanol
- 🔹 BTEX and other toxic compounds
- 🔹 Hydrogen Sulphide and associated bacteria
- 🔹 Hydrocarbon concentration in wet sands
- 🔹 Hydrocarbons in fluids contaminated with solids



AquaPurge® units

- 🔹 AP15000-S-FA-II
- 🔹 AP5000-S-SA-III
- 🔹 AP1500-S-SA-II

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