

# CASE HISTORY

*A deeper look into how Gradiant Energy Services' Engineering Team provided a tactical solution to a tough oilfield problem*

## SUCCESS SNAPSHOT

### BENEFITS OF SCE™

- Designed to handle varying water quality
- Specific chemistry plan
- Patented chemical dosages developed through algorithm
- Clarifier to manage solids control
- Consistent effluent water quality
- Manned system
- Focused HSE program and award winning record
- Modular 15,000 bpd and 30,000 bpd systems

### BACKGROUND & CHALLENGES

- Able to meet wide range of influent water
- Ensured effluent water quality matched the desired quality standards
- Able to engineer solutions for unique problems

### GES SOLUTION & RESULTS

- Analyzed produced water and suggested GES's SCE™ technology
- Engineered solution to resolve O&G challenges
- Currently processed over 3.2MM bbls of water using solution
- Minimal solids generated through innovative chemical program; reducing costs for the client
- Continued joint partnership and expansion of program

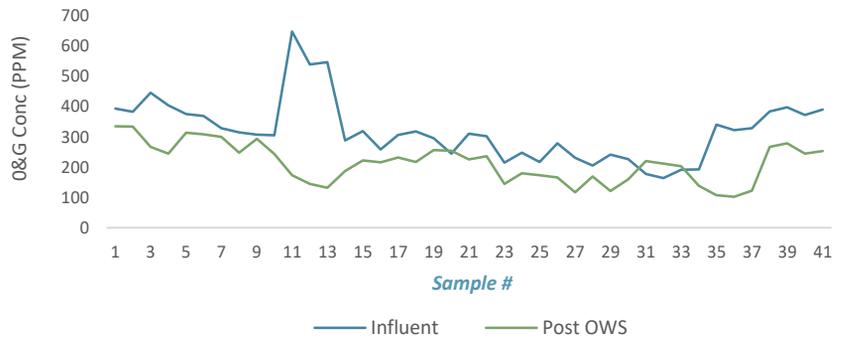
### WHILE WORKING IN THE DELAWARE BASIN, AN UNFORSEEN PROBLEM

**AROSE.** Gradiant Energy Services (GES) began to see high readings at one of its Selective Chemical Extraction (SCE™) plants. With the plant consistently showing Oil and Grease influent produced water readings four-to-five times higher than anticipated, Gradiant knew a sophisticated solution would be required. Working in conjunction with the client, GES was able to create the needed solution, and in doing so, solved the oil and grease issue in a manner that was cost effective, met stringent produced water specifications, and provided a new standard for oilfield-engineering.

### THE CHALLENGE

A GES client in Lea County, New Mexico relies on GES' Selective Chemical Extraction (SCE™) technology to recycle 10,000 bpd. Initially, O&G influent concentrations were expected to range between 30-50 ppm, but after several weeks of processing water, the concentrations of O&G were much higher, consistently averaging above 200 ppm and sometimes reaching levels as high as 650 ppm. While some of the O&G was free oil that could be easily skimmed with a separator, much was emulsified oil that could not be physically removed. It became clear GES needed to develop an engineering solution.

### O&G REMOVAL PROCESS PERFORMANCE (FIGURE 1)



### THE SOLUTION

GES' technical support team developed a plan to better understand and fix the problem. First, they began collecting and analyzing large volumes of influent water samples prior to processing by the Oil Water Separator (OWS) and post processing of the OWS (FIGURE 1). The client key performance indicators (KPI's) required no traces of O&G, but the data quickly confirmed that the current configuration fell far short of this standard. Further analyzing the samples, the team discovered the majority of O&G was emulsified in solution. Based on these findings, the client and GES' technical support team devised a solution to inject a non-emulsifying agent prior to the water reaching GES' plant. By doing this, and allowing the water some residence time, the O&G separated from the water, making it easy to mechanically remove. As a result, GES removed the O&G, meeting the set KPI's, and provided it back to the client for sale (FIGURE 2). The joint engineered solution highlights GES' commitment to working with partners to provide beneficial solutions.

### O&G CONTROL PROCESS PERFORMANCE (FIGURE 2)

