Case Study: Onsite Testing with Hach's Frac Kit Reduces Analysis Time, Improves Cost Savings

Introduction

The rising costs associated with supplying water to fracing sites over the past 10 years increasingly strains drilling companies. One method to mitigate spending on water is to recycle flowback and produced water for frac fluid. Companies like Colorado's Concord Energy Holdings, LLC offer services to test and treat flowback, produced, and source water for companies to ensure it is chemically sound for reuse in drilling and completions. Often, this requires sending water samples to a third party lab for analysis, but with results taking days to return, over-treating water is the only way to ensure frac fluid is stable.

For Concord Energy, this simply wasn't efficient enough. To receive results faster, the company leveraged Hach's Hydraulic Fracturing Water Analysis Kit and trained its own operators to perform field tests. This resulted in faster testing, optimized coagulant doses and chemistries, and generally more efficient water treatment operations. Efficiencies from onsite testing created savings that are passed on to operators.

Figure 1: Examples of Produced water (left), flowback (middle), and a side-by-side comparison of recovered oil (right)

Business Profile

Operating since 2002, Concord Energy offers marketing, midstream, transportation, water treatment and transfer, solids management, and well services to its oil and gas customers. At this particular site, Concord provided treatment for 7,000 barrels per day, generating $180,000 in revenue from recovered oil. To mitigate the need for source water, Concord offers recycling and water reuse services to keep production companies focused on drilling and completions while Concord provides treated water ready for frac fluid development.

Figure 2: Concord Energy onsite treatment skid

Business Challenge

Without analysis on produced or flowback waters, any company offering water recycling services runs the risk of spoiling tanks by inaccurately treating frac water. This creates major cost issues and downtime. "If you fail spec, it affects your reputation and requires you to spend more in chemicals and man hours," says Ryan Hutcherson, Manager of Engineering & Technology at Concord Energy. "If you don't get it right the first time or if you discover issues too late, you may not have capacity to re-treat."

Table 1: Frac Water Parameter Requirements

Iron	10 mg/L
Sulfates	300 – 500 mg/L
Hardness	300 – 500 mg/L
Aluminum	1 – 5 mg/L
Turbidity	10 NTU; 25 max

Companies that offer water reuse services often use third-party labs to test water samples so the right coagulant chemistries and doses are used during water treatment. Because it relied on a third-party lab, Concord Energy had to wait days for results—delaying water treatment and leaving Concord no option but to use more chemicals than necessary to ensure water quality met specifications. "Delayed water analysis resulted in increased chemical consumption and over-treatment of water," says Hutcherson. "Chemicals are one of our biggest expenses; they can pose logistical hurdles and may require special trucks."

Solution

As a company focusing on providing reliable support services to exploration companies, Concord Energy seeks solutions to lower water treatment costs and provide recycled water faster to better serve its customers and stand out among its competitors. When asked what kind of solution the company needs, Hutcherson replied: "Quick, accurate water quality analysis onsite and possibly in real time." To do this, the company turned to Hach's Hydraulic Fracturing Water Analysis Kit.

Figure 3: Frac water testing

Hach's Frac Kits offer on-site testing materials for oil and gas, including source and produced water, frac fluid, flowback, treated water, drilling fluids, and recovered oil. The kit tests for the following parameters: pH, conductivity, Ba, Fe, Cl^-, SO_4, BARTs, hardness, and alkalinity.

Focusing on Al, Fe, SO_4, pH, TDS, hardness, and Cl^- parameters, Concord Energy uses the kit to perform onsite tests for produced water, flowback, and recovered oil. "We were able to obtain data in minutes versus days," says Hutcherson. The company primarily tests water quality in the field, with tests taking about 5-30 minutes per tank.

Figure 4: Water quality analysis using Hach's Frac Kit

After Concord compared its analysis with a third-party lab, it found that its own measurements were a close match. Concord Energy gained the confidence to prescribe chemical treatments based solely on testing with Hach's Hydraulic Fracturing Water Analysis Kit, giving the company the added benefits of optimized and economical coagulant dosing. This reduced overhead costs, improving its bottom line.

When asked how onsite water testing affects operations, Hutcherson replied:

> *"Cost savings can be obtained by limiting chemical usage. Onsite testing ensures that the water is being treated effectively, so you don't have to over treat or re-treat the water, costing both time and money. We saved between 15%and 30% per barrel on chemicals when using real-time, onsite testing."*

Conclusion

- The Hach Frac Kit allowed Concord Energy to rely on its own frac water testing and analysis, effectively cutting out third-party lab analysis. This led to improved coagulant dosing, better process control, and significant savings.
- With faster analysis turnaround that used to take days, Concord Energy better serves its customers and offers faster, more accurate water treatment than competitors.

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