

AquaWatcher Surface Sensor Replaces Manual Sampling with Continuous Salinity for 3-Month Flowback

Water salinity sensor installed inline with PhaseTester multiphase well testing equipment tracks changing water conductivity to ensure test accuracy, Midland Basin

CHALLENGE

Reduce exposure of personnel to well effluents during manual water sampling for measuring salinity while conducting a long-term flowback test.

SOLUTION

Install the AquaWater Surface* water salinity sensor in series with the PhaseTester* portable multiphase well testing equipment to continuously measure water conductivity for conversion to salinity as the NaCl equivalent.

RESULTS

- Increased the accuracy of the flow rate measurement for analyzing the flowback test by incorporating automated, continuous, high-accuracy salinity measurements.
- Decreased operating costs by eliminating manual sampling visits to the remote wellsite for the duration of the 3-month test.



The challenges with manual salinity monitoring

During long-duration flowbacks, the salinity of the water increases over time as the proportion of completion slickwater returned is reduced and more reservoir water is produced. The change in salinity cannot be assumed to be linear, but rather is logarithmic and depends on the surface return rates. As the salinity changes, the water properties change, which has conventionally required performing in situ reference sampling to maintain the accuracy of the flow rate measurement by the PhaseTester portable multiphase well testing equipment or Vx Spectra* surface multiphase flowmeter.

Especially for long-flowback well tests, an operator in the Midland Basin wanted a high-accuracy automated solution instead of requiring periodic manual water sampling and analysis at remote wellsites.

Automated inline salinity determination for multiphase flow

Schlumberger proposed installing the new AquaWatcher Surface water salinity sensor in series with PhaseTester equipment to add real-time salinity determination to the automated high-accuracy rate measurement of the produced fluid. The AquaWatcher Surface sensor uses the latest-generation microwave sensor technology to measure water conductivity with both high accuracy and high resolution in water-continuous multiphase flow and wet gas. The inclusion of continuous salinity measurements from the sensor would eliminate the need for manual sampling while improving the accuracy of the flow rate calculation, in turn optimizing the length of well cleanup and flowback.

Elimination of manual sampling to improve safety and reduce cost

The AquaWatcher Surface sensor was installed at the wellsite for a long-term flowback test. It reported continuous measurement of the water conductivity to the data acquisition computer, which calculated the salinity value as the NaCl equivalent. The real-time salinity was then used to automatically update the flowback water properties.

No longer were personnel required to visit the remote wellsite and manually measure and enter the salinity value. The accuracy of the flow rate measurements was improved for understanding the results of the flowback test while operating costs for site visits were significantly reduced.



The AquaWatcher Surface sensor is installed in series with PhaseTester equipment for salinity determination in real time.