

CASE STUDY

ULTRASONIC COMPLETION LOGGING ON 19-WELL PROJECT IN THE BAKKEN SHALE PROVES VALUE OF ENHANCED CASING EVALUTION BY ELIMINATING NEED FOR FRAC STRING

► TECHNOLOGY

- Ultrasonic cement evaluation (UCE)
- Ultrasonic pipe evaluation (UPE)

► APPLICATION

- Cement bond logging
- Casing inspection
- Thickness determination

► LOCATION

- Bakken Shale

INDUSTRY CHALLENGE + OBJECTIVE

An operator in the Bakken Shale had a total of 19 wells across five pads which were drilled earlier in the year and pending completion. The operator needed to understand the quality of the cement and thickness of the casing simultaneously to ensure they could proceed with completing the 19 DUCs properly. It was imperative to obtain high-quality data quickly, as costly delays to completions and fracturing operations would push the project beyond AFE. In addition, the operator hoped that the information would provide insight into whether additional completion hardware was required.

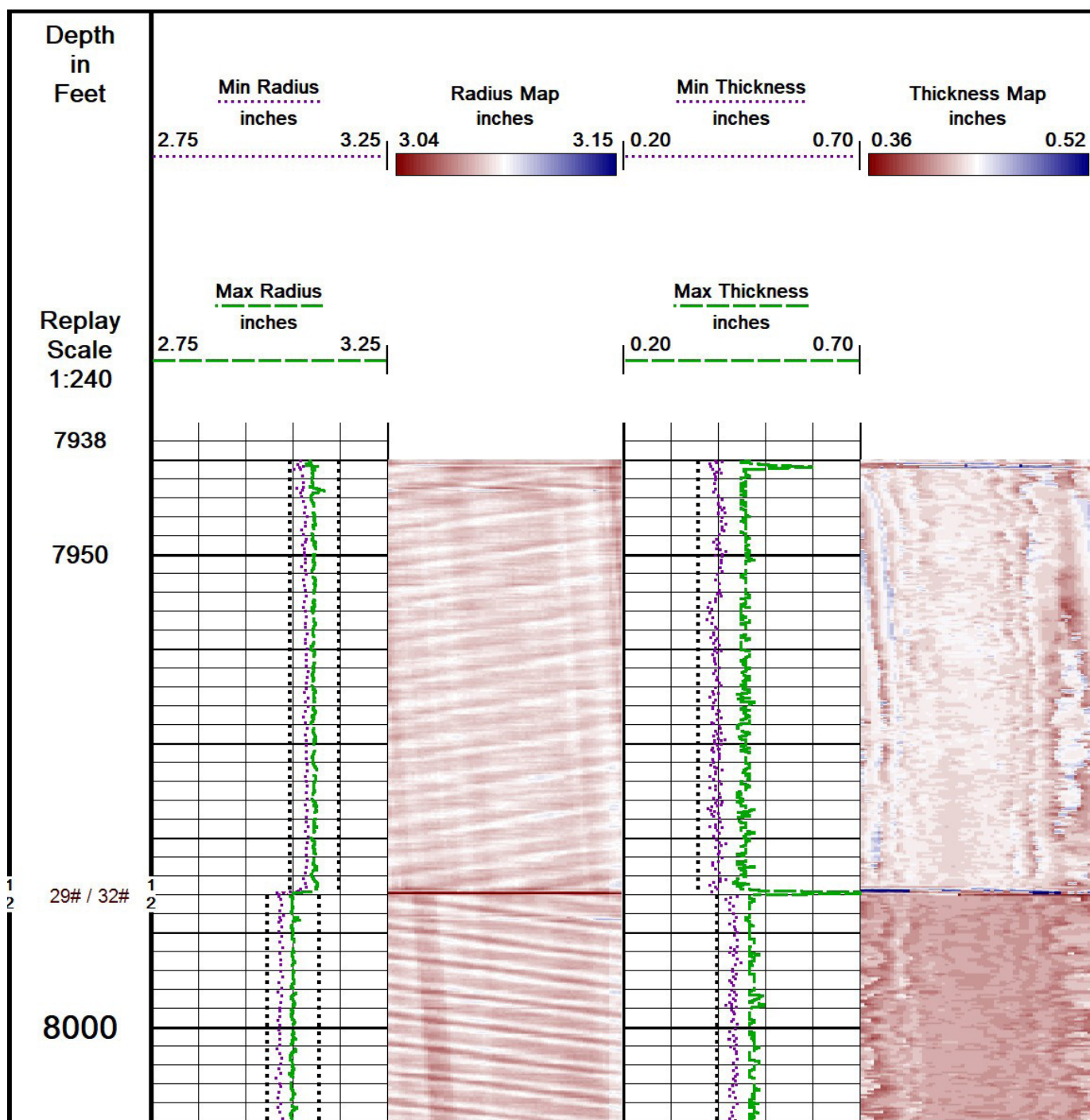
TECHNOLOGY + SERVICE SOLUTION

- UCE and UPE are both ultrasonic logs. The tools send an ultrasonic pressure pulse that makes the casing vibrate at a certain frequency, with the resonating casing frequency depending on the thickness of the casing and the material behind it. The resulting waveforms are analyzed to deliver information on casing thickness, burst pressure analysis and cement bond quality.
- Our new ultrasonic services, which include UCE and UPE, were deployed to log the 19 wells and return a full casing and cement integrity analysis. This analysis provided a clear depiction of the health and viability of future operations on all 19 wells.
- The scope of work included running a gauge ring and junk basket to clean out the well, running the UCE and UPE logs, generating a summary report for review of pipe conditions, setting a top-mount plug, and having a third-party pressure testing company pressure up well and hold for approximately 20 minutes before having us pull the plug back out.

RESULTS + VALUE DELIVERED

- We successfully generated high-quality log data, which was reviewed prior to pressure testing to ensure adequate integrity of the 7-in. casing. The results of the successful pressure test allowed frac strings to be eliminated and completion to be done directly in the 7-in. casing. This process saved significant cost by foregoing the frac string along with the mobilization and operational cost of a workover rig. All the processed reports were sent to the North Dakota Industrial commission (NDIC) to support this expedited completion process.
- Our logging specialist provided clear communication with both the onsite supervisors and managers in Denver to ensure all processes were being followed and the proper solutions and downhole conditions reported.
- At the conclusion of each well, we provided the operator with a [comprehensive zonal isolation and casing report](#), which served as the report card summary to give the well the necessary verification to proceed with the pressure testing.
- Based on market analysis and due diligence negotiating favorable rates, we were able to extend extremely competitive pricing to the operator in line with their need to fall in line with their AFE.

CASE STUDY



This ultrasonic pipe evaluation log from the project shows the weight change of the 7-in. casing, which reflects the thickness on the log.