

Drilling Performance Improvements in the Powder River Basin using Logan Xciter Vibration Tool

OVERVIEW

25 horizontal wells drilled in the Powder River Basin by one operator on 3 different rigs. Study of ROP in curve and lateral hole sections of both Parkman and Turner formation wells. Data from BHA reports using the Logan Xciter.

The Parkman formation lies about 6,900 to 7,500 ft. below the surface and the Turner formation has a depth closer to 9,000 to 9,800 ft.

XCITER DESCRIPTON AND BENEFITS

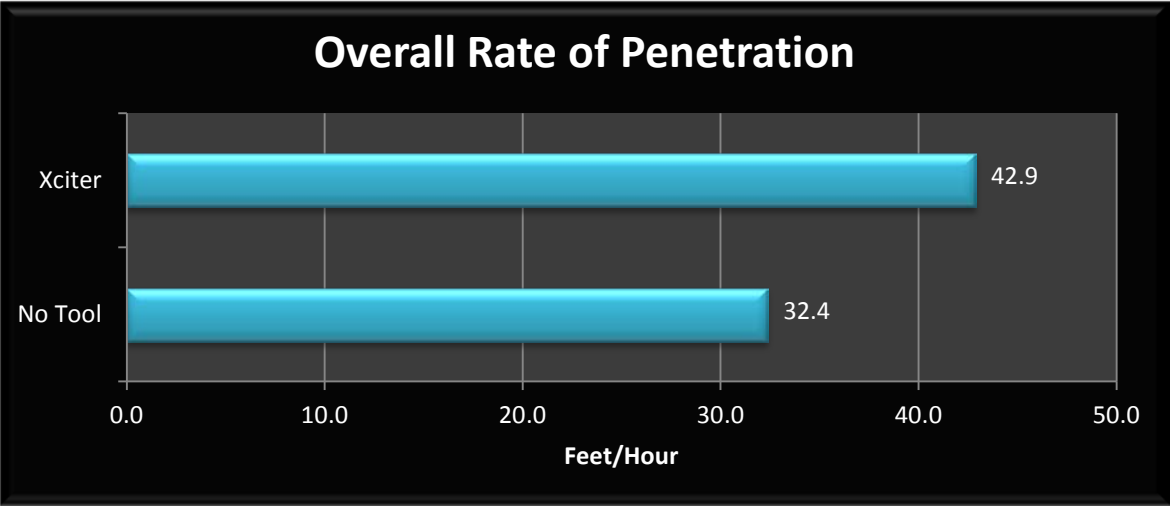
Logan's proprietary Xciter Extended Reach Vibration Tool enhances horizontal drilling effectiveness by introducing a variable frequency into the drill string that is designed to mitigate the effects of wellbore friction. The Xciter tool has proven to be especially effective in the drilling of horizontal wells in unconventional oil and gas plays in North America. Since the fall of 2004, Logan Xtend has participated in over 5,000 successful drilling projects in Canada, United States and the Caribbean.

- The Xciter is a vibration tool that is positioned down with the BHA and is MWD, LWD and EM safe
- Increases ROP while sliding; Reduces downhole friction
- Low constant pressure drop (around 150psi) allows for dual tools to be run
- Effective control of Weight on Bit results in improved tool face control and extended bit life
- Overall increase in performance from spud to TD and then to casing running time
- Reduces stick-slip, differential sticking and pipe buckling

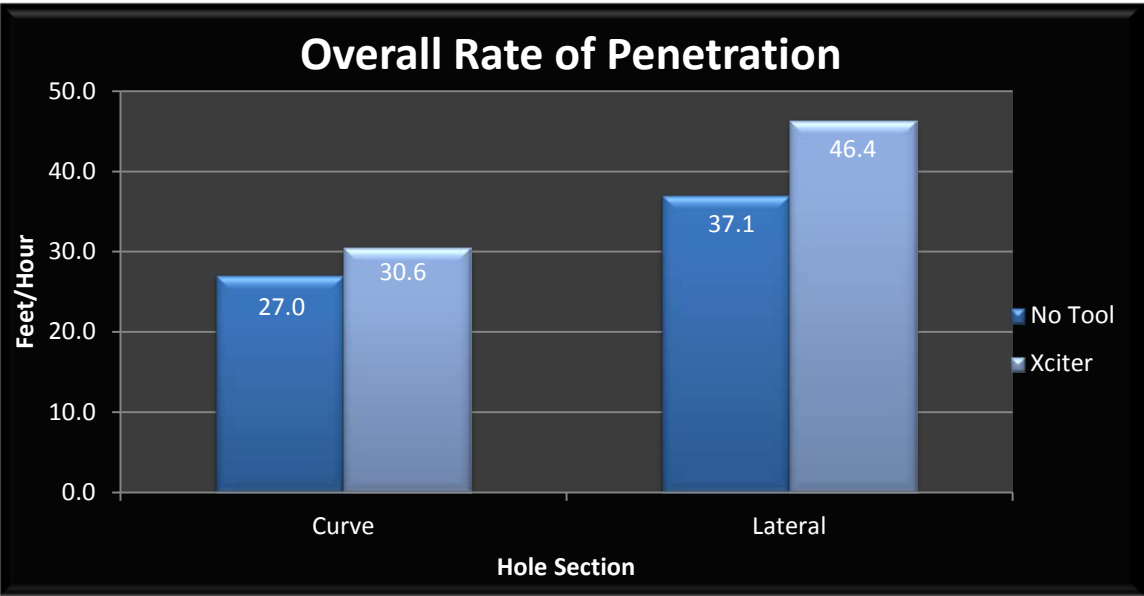
COMPARISON STUDY OF DRILLING PERFORMANCE BETWEEN BHAS WITHOUT FRICTION REDUCTION (VIBRATION) TOOL AND BHAS WITH THE LOGAN XCITER TOOL

Data summary

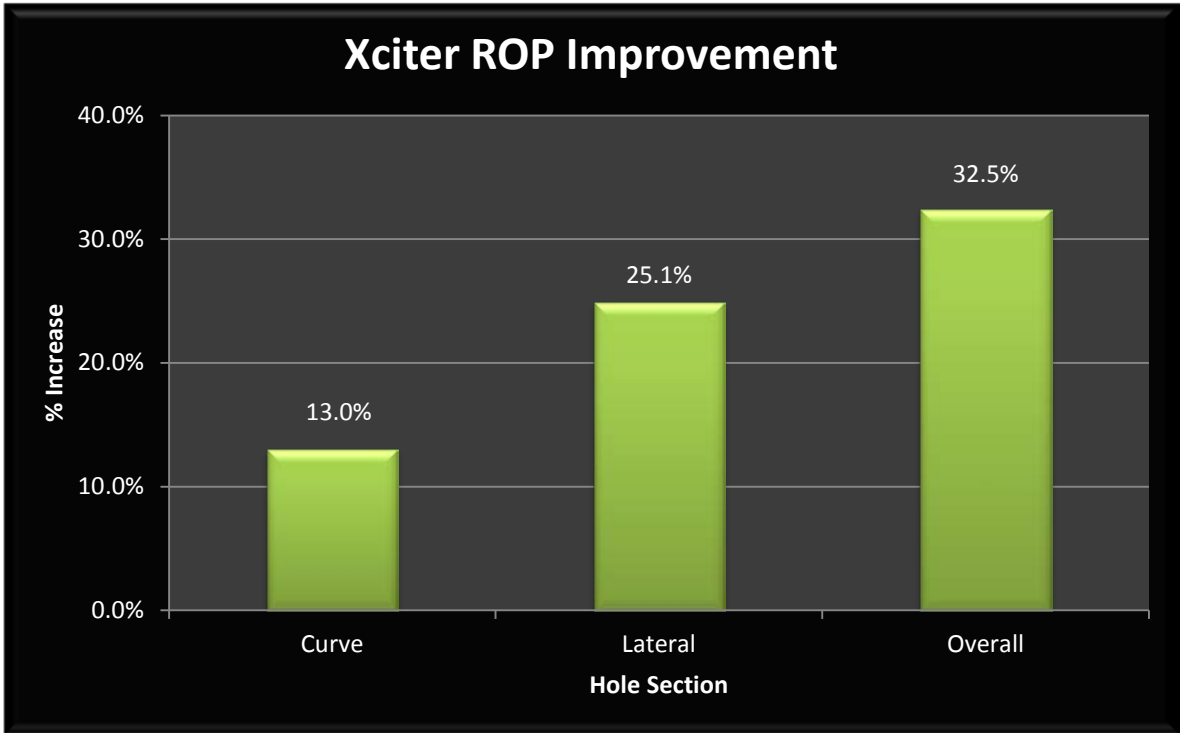
Wells	25
Rigs	3
Curves	12
Laterals	13
Total Footage	53,980
Curve Footage	11,744
Lateral Footage	42,236
Formations	Parkman & Turner
Parkman Wells	12 (5 curves, 7 laterals)
Turner Wells	13 (7 curves, 6 laterals)



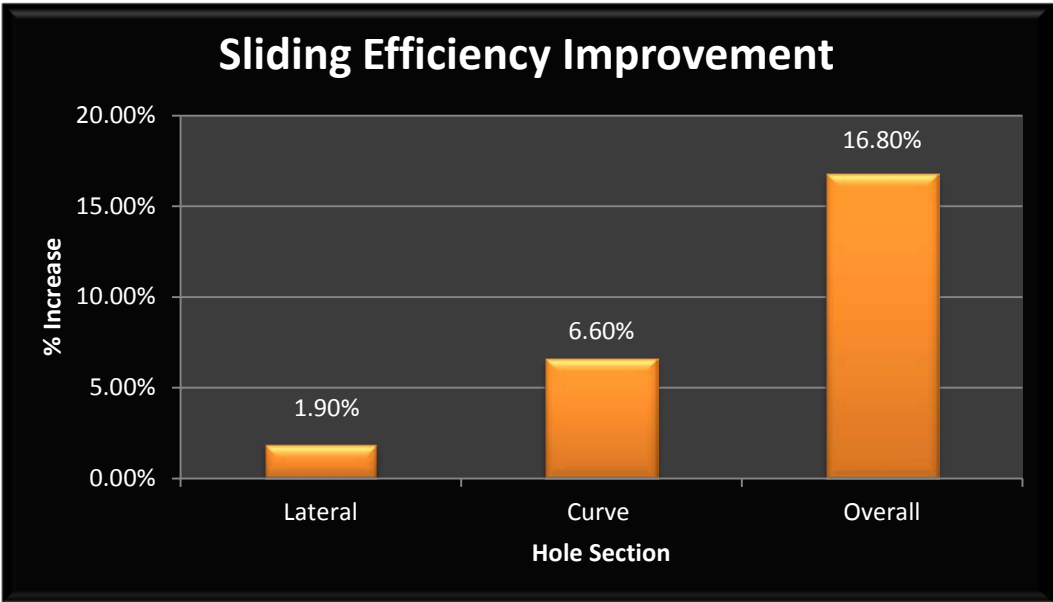
Xciter delivered significant improvement in overall ROP of 10.5 ft./hr. (all wells, curve and lateral sections)



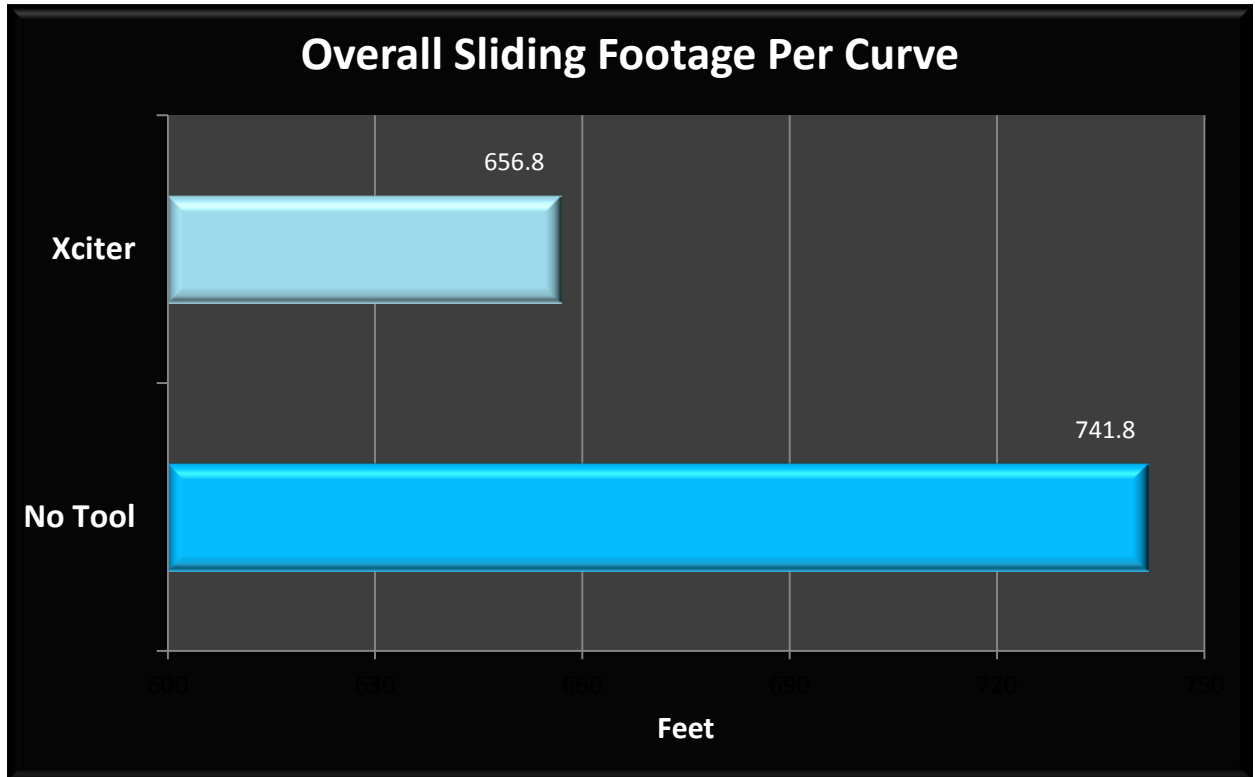
Xciter performance gains in curve sections and lateral sections of 3.6 ft./hr. and 9.3 ft./hr.



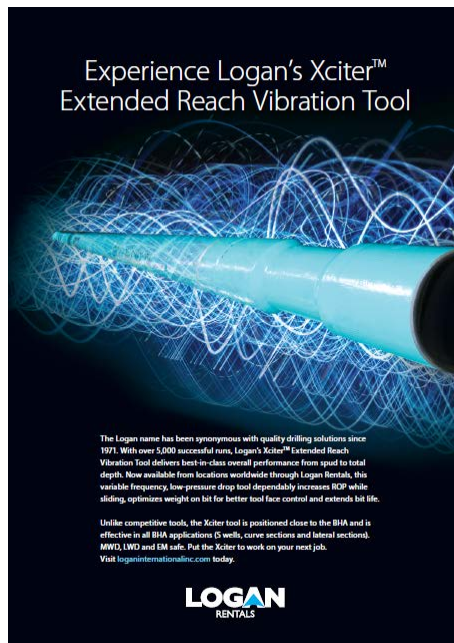
Xciter performance gains as a percentage of improvement over runs with no friction reduction tool



Review of sliding efficiency delivered by the Xciter tool as measured by the percentage of sliding footage per hole section. The ability to orient quicker and hold tool faces more accurately, allows more productive sliding, producing more consistent and predictable build rates = reduced sliding footage per section



Xciter improves sliding performance and allows more consistent build rates, resulting in less sliding footage per curve section



http://www.loganinternationalinc.com/logan_rental_tools_xciter.html