

## **WHY GEO-NAVIGATE A HORIZONTAL WELL?**

### THE QUESTIONS:

- How will geo-navigating/geosteering a horizontal wellbore save drilling dollars?
- What can be learned from a horizontal wellbore about the geology in an area that we don't already know from vertical wells and seismic?
- Are there "sweet spots" we should target?
- How can Post Drill Analysis of horizontal Wellbores that have already been drilled improve the performance of new wells?
- How do we use the geologic interpretation of data from a horizontal well to improve completions?

### BENEFITS:

GEOSTEERING IS ABOUT MORE THAN JUST STAYING IN ZONE

#### **IT'S ABOUT SAVING DRILLING DOLLARS. How?**

- Landing the curve into the correct stratigraphic position the first time
- Drilling hazard avoidance! (i.e. slow drilling zones)
- Prevention of sidetracks due to incorrect targeting because of unexpected geologic hazards such as:
  - Faults cut in the build section
  - anomalous dips through the build section

### BENEFITS:

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#### **IT'S ABOUT UNDERSTANDING THE GEOLOGY. How?**

- The TSP Method shows you all the warts. Details that can be seen in no other way. (Small faults, anomalous dips, stratigraphic variation)
- Every area has its own unique characteristics that can be planned for if they are known
- Identifying Karsted and Faulted areas
- The only way to identify "sweet spots" in the formation is to know which section each well drilled

BENEFITS:

GEOSTEERING IS ABOUT MORE THAN JUST STAYING IN ZONE

**IT'S ABOUT UNDERSTANDING WELL PERFORMANCE:**

- Post Drill analysis of poor wells can reveal re-drill opportunities
- Post Drill analysis of excellent performers may identify “sweet spots” within the reservoir
- Analysis of the structure and stratigraphy will give the operator a better understanding of reservoir performance versus reservoir placement

BENEFITS:

GEOSTEERING IS ABOUT MORE THAN JUST STAYING IN ZONE

**IT'S ABOUT IMPROVING COMPLETIONS. How?**

- Avoid completion across faulted zones that may:
  - Create a pathway for water encroachment
  - Create a permeable zone that may reduce effectiveness of FRAC
- Proper placement of wellbore within the section will help in FRAC containment and keep the wellbore away from possible water sources