geoconvention
Virtual Event
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CSPG • CSEG • CWLS • GAC • MAC • IAH

Session: Geophysical Applications to Influence Business Decisions and/or Optimize Capital Efficiency

Abstract

Briefly describe your Company:

Starbird Enterprises, a GeoScience Consulting company, provides strategic advice, geoscience interpretation, risk mitigation, and training

Briefly describe your role at the Company:

I am the President and Principal Geoscience Consultant for Starbird Enterprises, specializing in integrated geophysical applications and training

List and describe THREE or more ways you/your company is using geophysics to influence business decisions and/or optimize capital efficiency:

1) **Drill Hazard Avoidance 1** - Shallow producing/depleted reservoirs in the project area
    a. Business problem: Mitigate risk of lost circulation while drilling due to depleted reservoirs
    b. Workflow: All project area producing wells were evaluated for total production, and current reservoir pressure. Depleted reservoirs were identified using PostSTM and PreSTM AVO compliant reservoir characterization 3Ds. Reservoir characterization inversion attributes were used to identify zones that may cause lost circulation. Advised client to move some well pad locations due to underlying risk of encountering a depleted reservoir.
    c. Innovation: Recognizing that depleted reservoirs in the project area may cause significant lost circulation risk while drilling
    d. Impact: Client did not have a lost circulation problem that could have cost them $1-2 MM

2) **Drill Hazard Avoidance 2** – Paleo Karst and Wabamun Karst in project areas
    a. Business problem: Mitigate risk of lost circulation by identifying, pre-drill, due to karst terrain and sink holes
    b. Workflow: The project area was assessed for karst topography and sink holes using available 2D and 3D data, geological well logs, and well “Tour” reports. Karst trends and sink holes were further evaluated using reservoir characterization inversion attributes to identify the

horizontal and vertical extend and type of fill. Advised client to move some well pad locations due to underlying risk of encountering a karsted carbonate reservoir

c. Innovation: Talking to the drilling engineer about some of the client's recent wells. He informed me that they had lost circulation problems on a pad of 2 wells that already cost the company over $500,000. We were planning to spud the next two wells on that same pad. 3D and 2D data were used to identify the karst holes
d. Impact: Recommended the company move the surface location of the next two drills to avoid the shallow sink holes. Saved the client $ 500,000 - $2 MM.

3) Water flooded fairways identified in legacy oil pool

a. Business problem: "Five spot" water flood not effective: Mitigate risk and maximize profitability in a legacy water flooded reservoir by evaluating existing property assets and recommending next steps.
b. Workflow: The client's property/reservoir was reviewed for its geological setting, pay thickness, produced and injected volumes. Seismic attribute mapping using PostSTM and PreSTM AVO compliant reservoir characterization 3Ds were interpreted. Waterflood fairways were identified using seismic attributes. Recommended conversion of some existing down dip producers to injectors and identified potential new drills in under swept areas
c. Innovation: Using seismic attributes to identify water flood azimuthal fairways. Then using microseismic data outside the immediate project area to support the concept. Future 4D seismic applications will now aid in mapping water flood fairway changes.
d. Impact: Increased longevity and profitability of the legacy oil property.