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Single-Well SAGD Field Installation and Functionality Trials

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Thermal Enhanced Recovery Methods

**Conventional SAGD**
- Reduced Steam Pressure
  - Shallow depth, Caprock integrity, Outcrop proximity
- Geological Issues
  - Vertical perm, Shale barriers, Permeable lean zones

**Conventional CSS**
- Geological Issues
  - Bottom water, Caprock integrity, Top gas

**X-Drain Single-Well SAGD**
- Engineer around Geology
  - High permeable propped vertical planes
  - Operate in SAGD mode
- Target Formations – No Recovery Method
Shallow Test Well Objectives

Primary Objectives:
• Mechanical expansion of the casing to the fully locked-open position.
• Independent wing injection of 12/20 proppant without excessive head loss or sanding off.
• Pore-pressure relief for wing coalescence.
• Packer deflation and recirculation procedures to POOH.

Secondary Objectives:
• Imaging of injected geometry by active resistivity.
  • Quantify plane coalescence by hydraulic pulse interference tests.
  • Observe azimuthal alignment of vertical injected planes by surface excavations.
Active Resistivity Image
Surface Excavation
Single-Well SAGD

Operated in SAGD Mode
- no startup
- invariant of geology
- $\text{NPV}_{10} > 2x \text{ SAGD}$
- shallow or deep

Injector
Producer

Top Pay
Bottom Pay
Sump

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Produced Oil
Steam Injection
Wing Length
Lines of Symmetry
1/2 Well Spacing
Modeled Region
Conclusions

Test objectives achieved:

• Mechanical expansion of the casing to locked open position
• Independent wing injection of 12/20 proppant
• Enabled pore-pressure relief for wing coalescence,
• Quantified plane coalescence from hydraulic pulse interference tests
• Observed azimuth alignment by surface excavations

Single-Well SAGD

• If planes constructed thru’ full pay height, performance virtually unimpaired by geology
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