Well Design and Execution for Data Acquisition in the Delaware Basin

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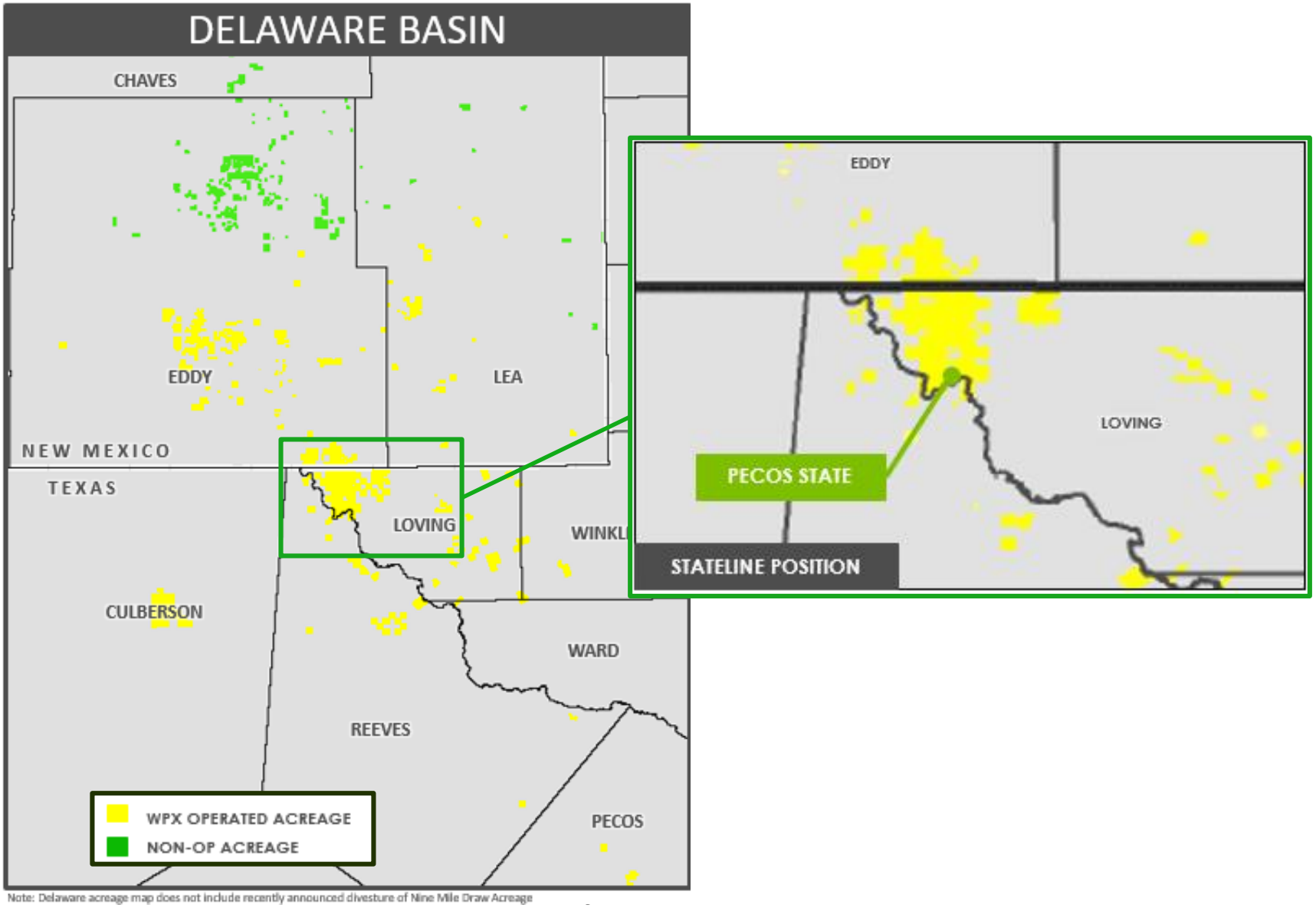
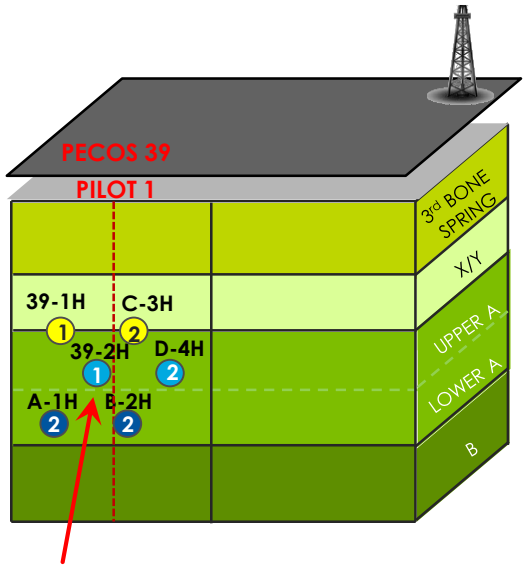
WPXENERGY®

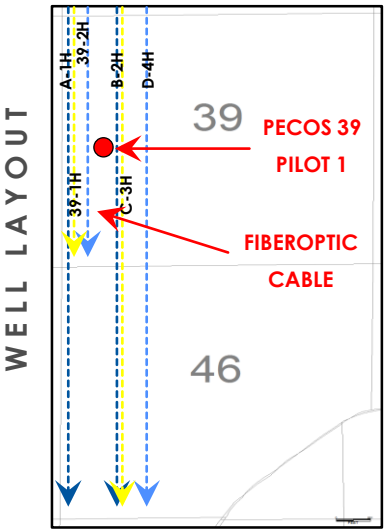
WPX Delaware Basin Overview

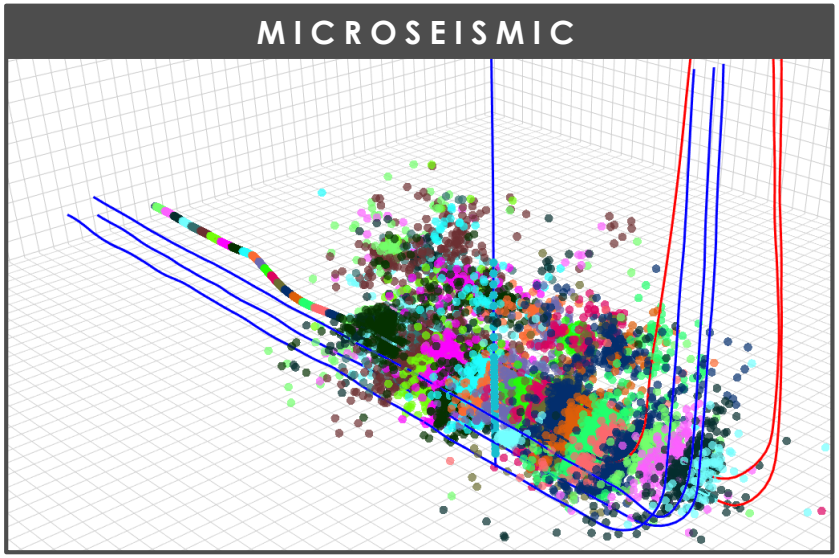


Note: Delaware acreage map does not include recently announced divesture of Nine Mile Draw Acreage

Real-Time Analytics Driving Well Design







PECOS STATE MONITORING PROJECT

PILOT/MONITOR WELL

- Contiguous 806' core running from 3rd Bone Spring through Wolfcamp B
- Equipped with Microseismic geophones, permanent external pressure & temperature gauges
- Strategically placed to monitor fracs during completion, overall well performance and depletion through life of the well

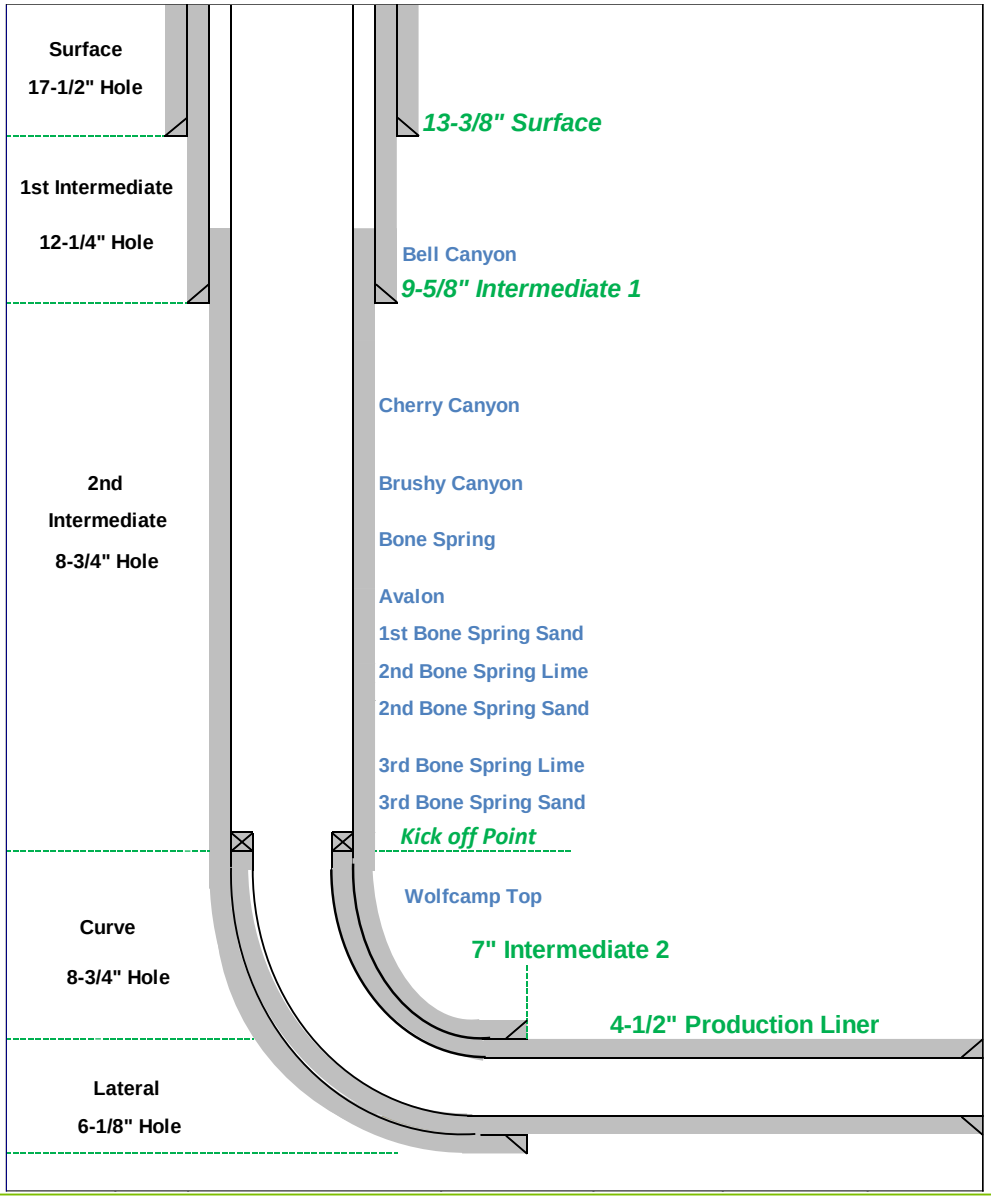
PERMANENT DAS-DTS FIBEROPTIC INSTALLATION

- Successfully installed in the Pecos State 39-2H well and completed all frac stages without damaging the fiber

BENEFITS

- Optimize well spacing and landing targets
- Improve completion design
- Develop best practices for choke and flow management
- Optimize artificial lift

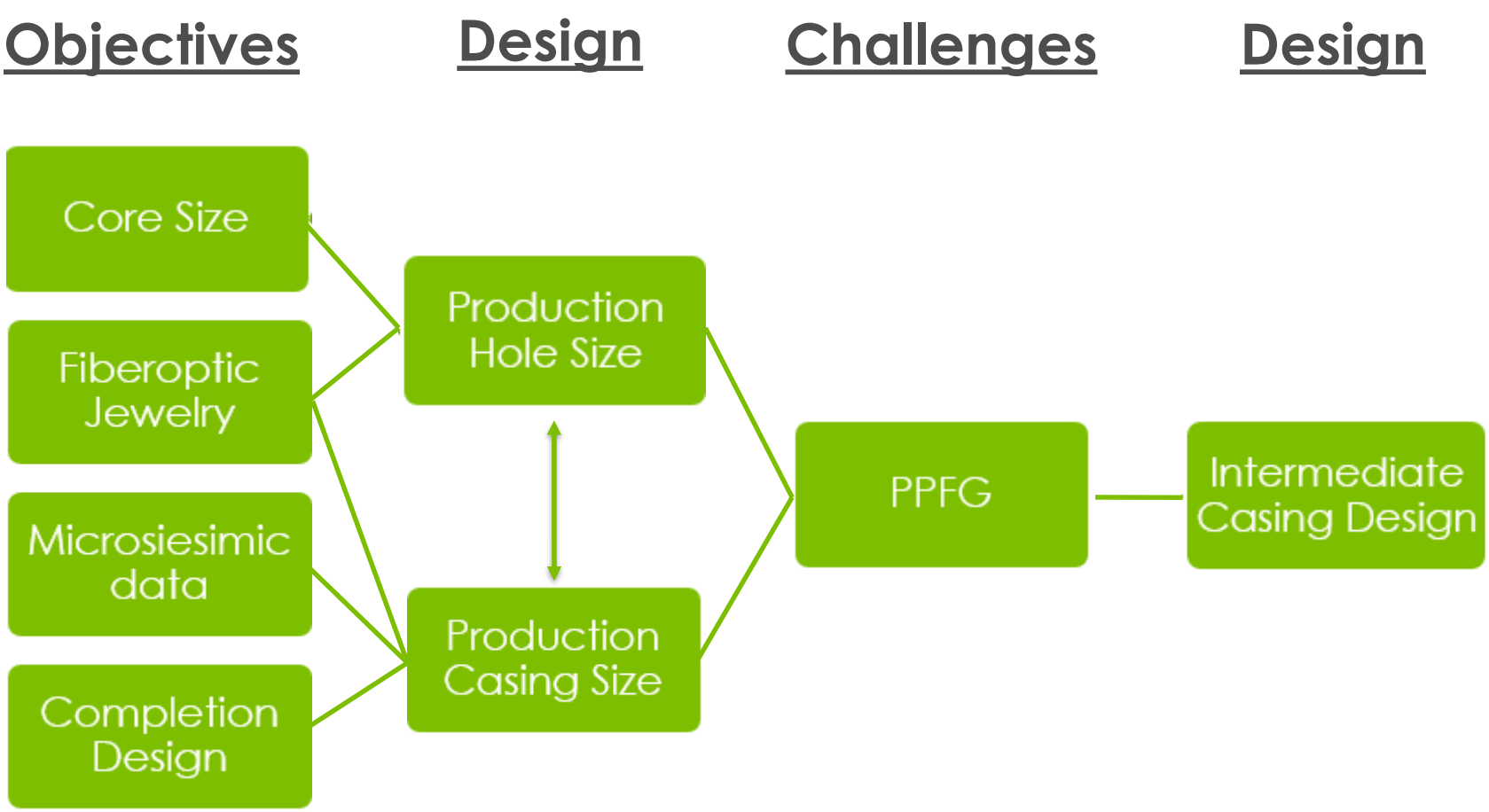
Development Well Design



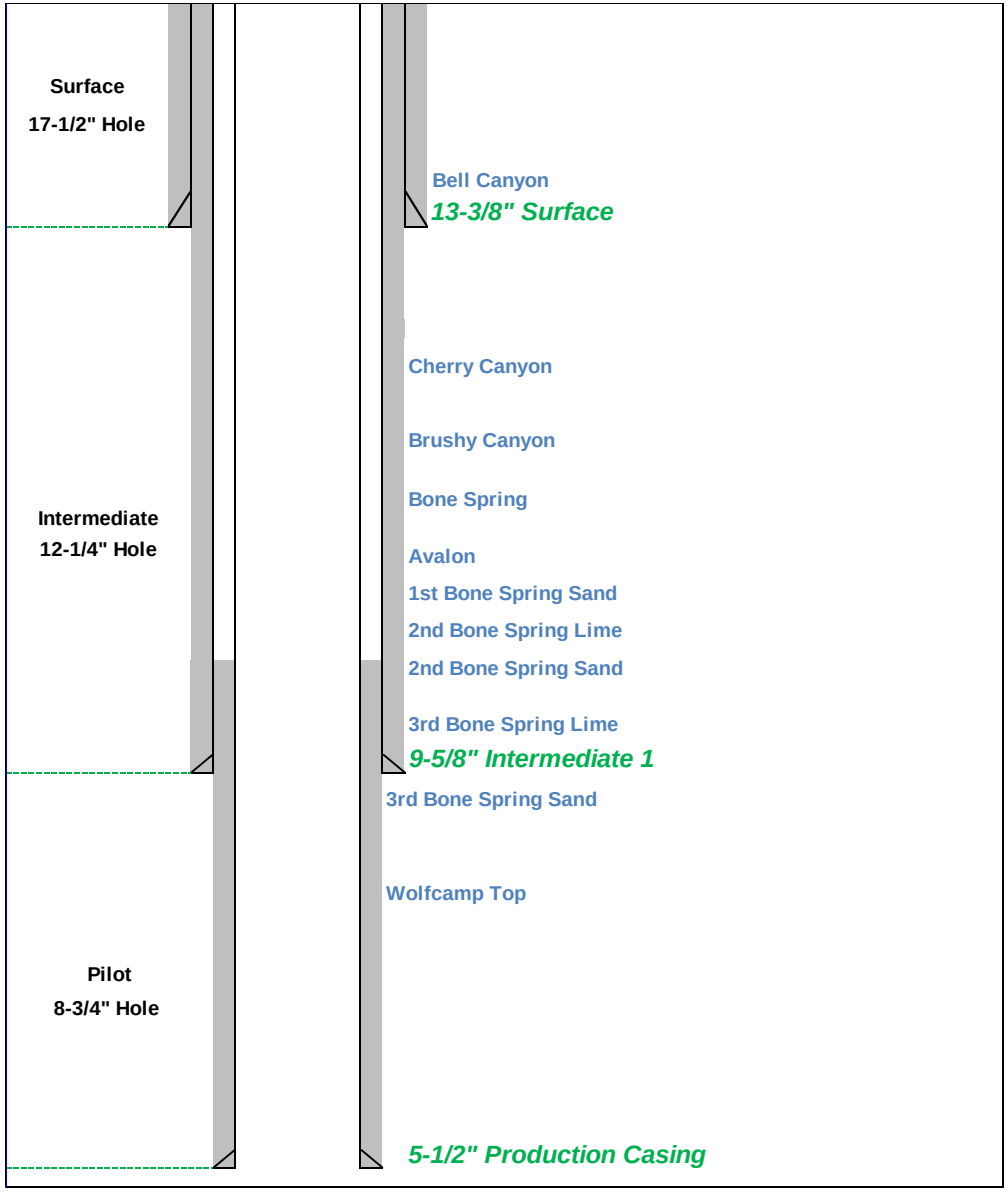
Delaware Basin 4 String Design

- 170 Wells Since Q1 2017
- 7” Casing Drives Design
  - Pore Pressure Ramp
  - Anhydrite
  - Brushy Canyon
- Completion Design Requirements
  - Rate
  - Pressure

Well Design – Bottom Up



Pilot Hole Well Design



Objective:

- 800-ft of contiguous 4"core
- Acquire openhole wireline logs
- 7 external pressure gauges
- Case and suspend well for vertical microseismic array

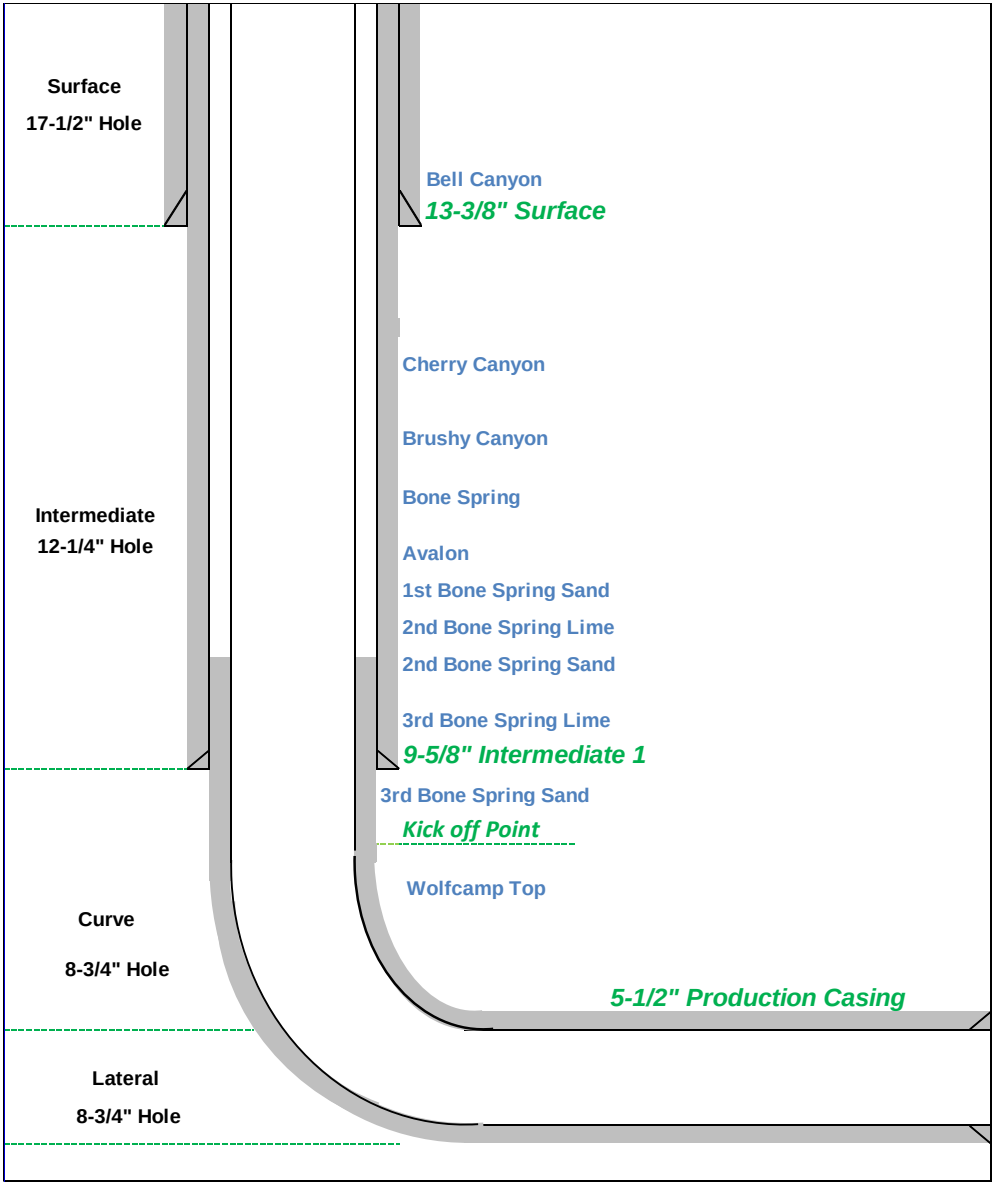
Design:

- 4" core → 8-$^{3}/_{4}$" hole size
- Pore pressure → 9-$^{5}/_{8}$" shoe depth
- 9-$^{5}/_{8}$" shoe depth → engineered casing design
- Core/log analysis → drilling fluid selection
- Service provider selection

Challenges:

- Trip schedule, mud weight, and well control
- Managing the transitions
- Formation specific coring runs

Fiberoptic Installation Well Design



Objective:

- External fiberoptic installation
- Heel and toe pressure gauge installation

Design:

- Fiberoptic jewelry → 8-$^{3}/_{4}$" hole size
- Lateral tortuosity → RSS application
- Inability to rotate casing → dedicated reamer run
- Pore pressure → 9-$^{5}/_{8}$" shoe depth
- 9-$^{5}/_{8}$" shoe depth → engineered casing design
- Service provider selection

Challenges:

- Crew engagement and attention to detail
- Curve design
- Managing the transitions

Conclusions

- **Understand the objectives**
  - **Identify the challenges**
  - **Fit for purpose well design**
- **This is NOT development**
  - **Detailed pre-planning allows educated real-time decision making**
  - **Question the "knowns"**