

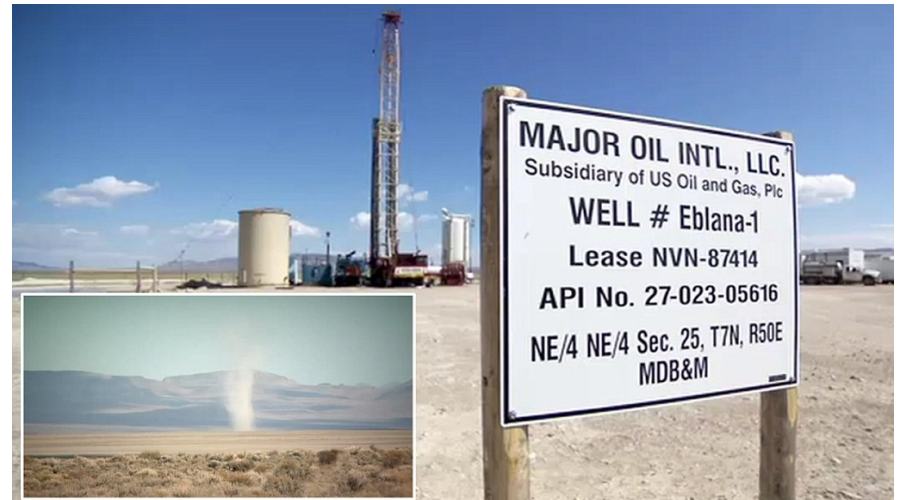
Hot Creek Valley Oil Field

Discovery Well Eblana - 1

MAJOR OIL INTERNATIONAL LLC

**Brief on well sidetracking down to
13,000 ft**

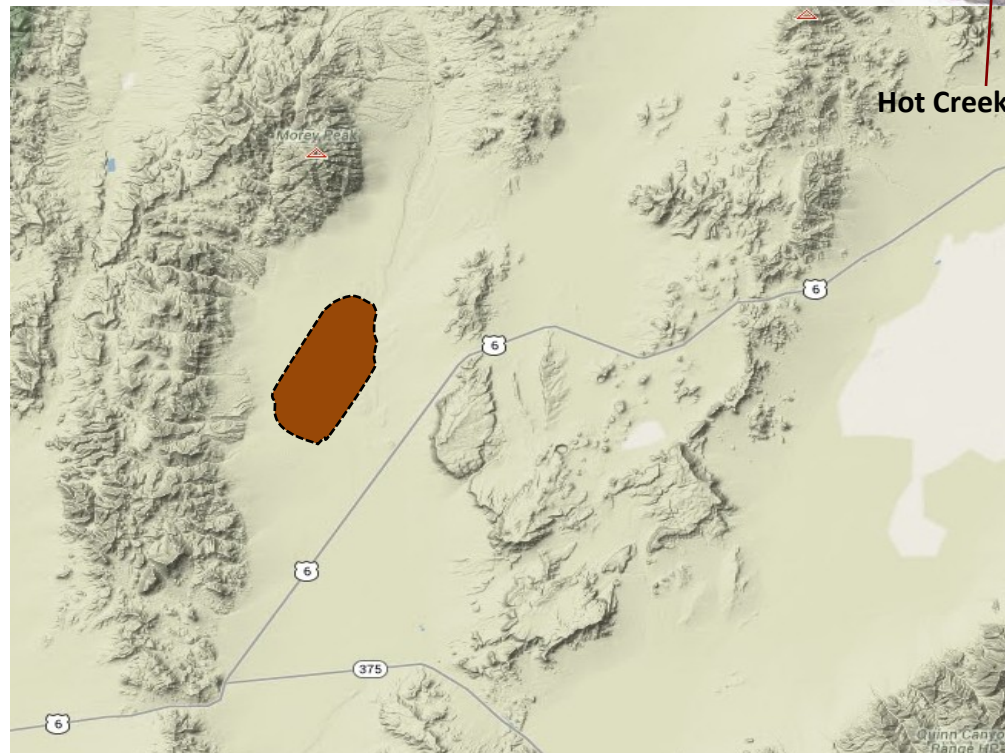
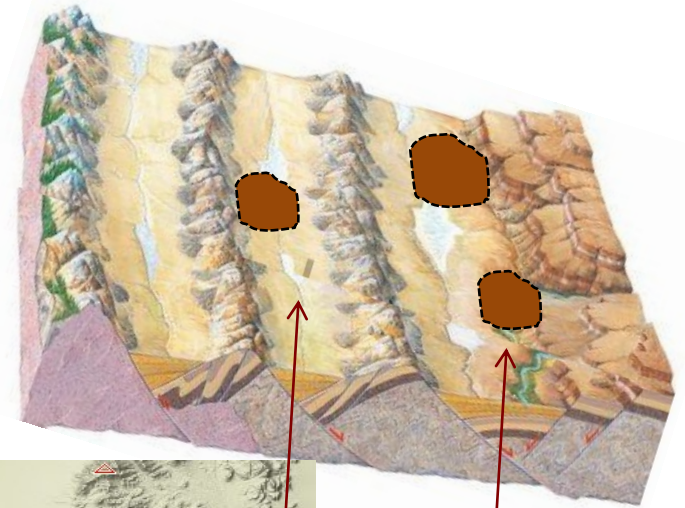
**Prepared by
Soran Talabani and Karim Akrawi**



Field Location

Hot Creek Valley:

- Nearby oilfields in Railroad Valley
- Tertiary Fluvial Volcanic rocks
- Outcrops & 2D Seismic showing faults & fractures
- High tectonic area
- Possible three potential oil reservoirs at different geological depths



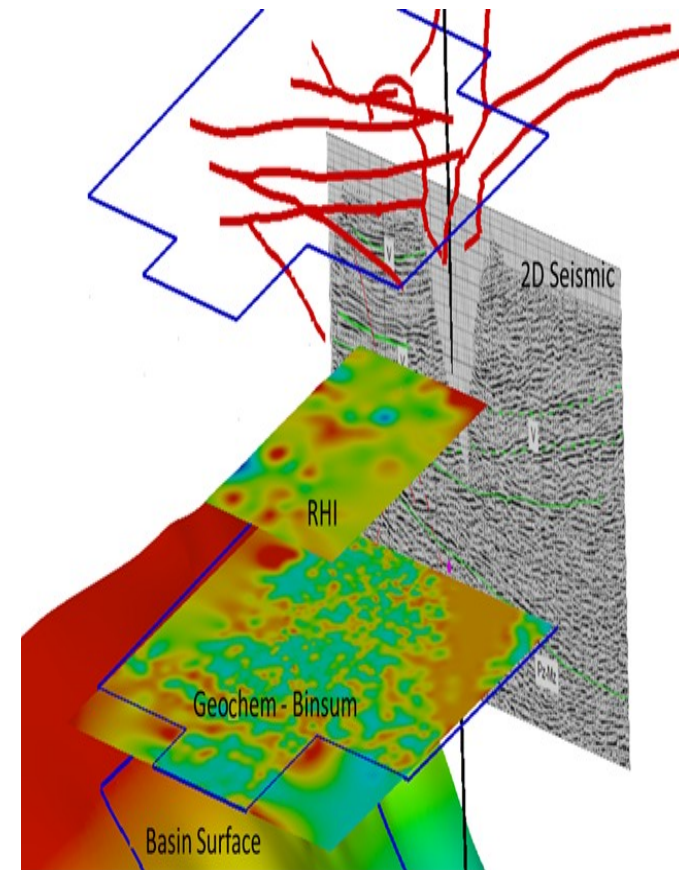
Hot Creek Valley

Railroad Valley

Sequence of Events

After the well drilled and tested:

- Confirmed two zones with oil flow (high water cut) of two Tertiary Reservoir Targets
- Paleozoics yet to drill through
- 3D reservoir modeling recommended:
 - Run VSP
 - Drill new well or Re-enter EB-1 if economic
 - Deep Drilling to Paleozoics, test for oil
- Full Geophysical reviews (2014-2015).
- Completed Halliburton VSP modeling (Jan 2016)
- Cement Bond Log for 5 ½ " casing run with good results (March 2016)

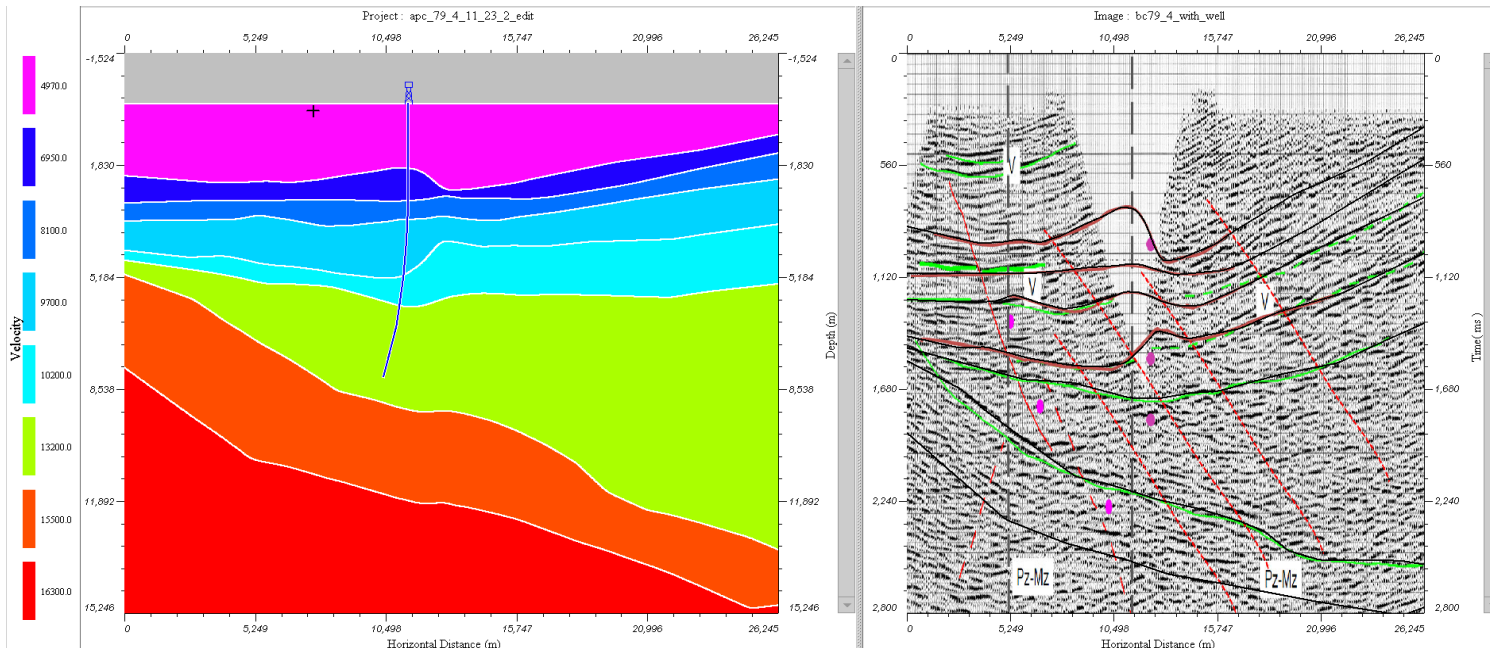


Sequence of Events

VSP and Drilling:

- Halliburton VSP modeling (Jan 2016): This modeling was very important for area coverage
- VSP will confirm:
 - Location & structural configuration of surrounding compartments
 - All faults and mega fractures
 - Estimates of the depth of the Paleozoic zones
 - Proposed model for the re-entry (sidetracking direction) plan

Halliburton VSP Modeling



Re-entering Eb-1

Re-entering Eb – 1, Economics

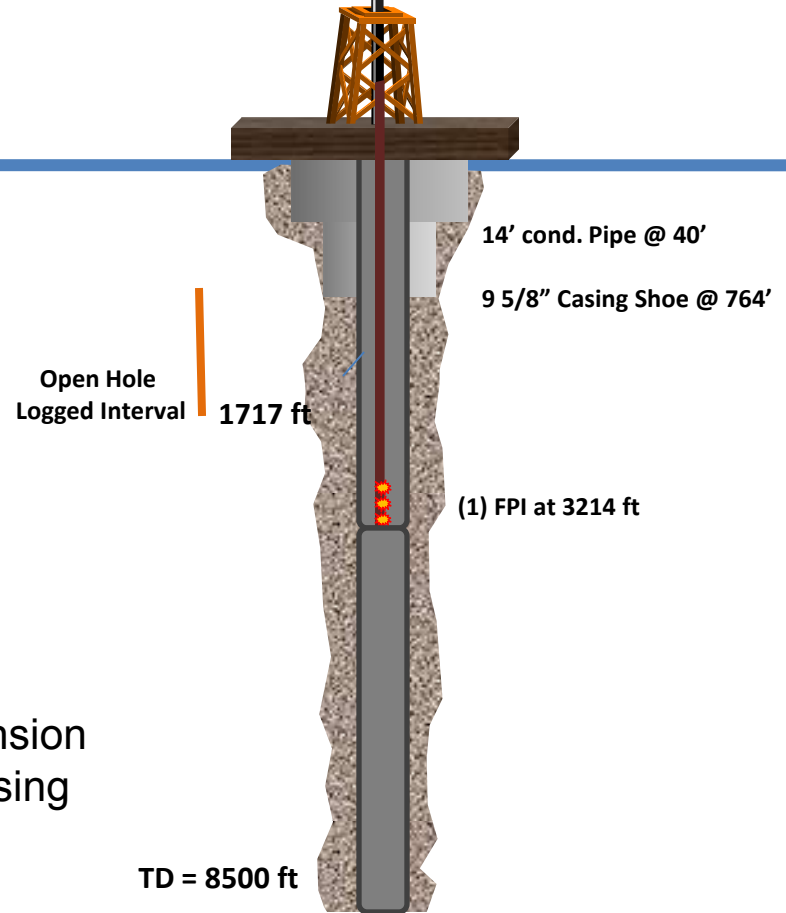
- June 2015: Re-entering EB-1 is (Oil price = 65 USD, service prices high
 - Required technologies either over-priced or unavailable

- Today: Re-entering EB-1 is economic (after a slump of oil price to < 40 USD and reduced service prices:
 - All service companies lowered their prices (40 – 70%)
 - VSP current price is 40 – 65% less (including data processing)
 - Expensive technologies now available
 - Taper mill (if needed for top casing joint removal) costs 20%
Free Point Indicator (FPI) down by 45%. Before cement log we estimated the need for 16 – 20 FPI ops. After cement log run (March 2016), need 3-6 FPI to release 5 ½" casing and re-enter the well
 - Will set a new 7" casing to cover trouble zones (3,900 + ft)
 - 6" hole size is easy to manage down to deep horizons (up to 13,000 + ft)
 - EB – 1 already has two proven oil zones, & need to retest and re-evaluate properly
 - Well foundation is already there, saving time & money and simplifying permissions

EB – 1 Re-entering Plan

Stage I:

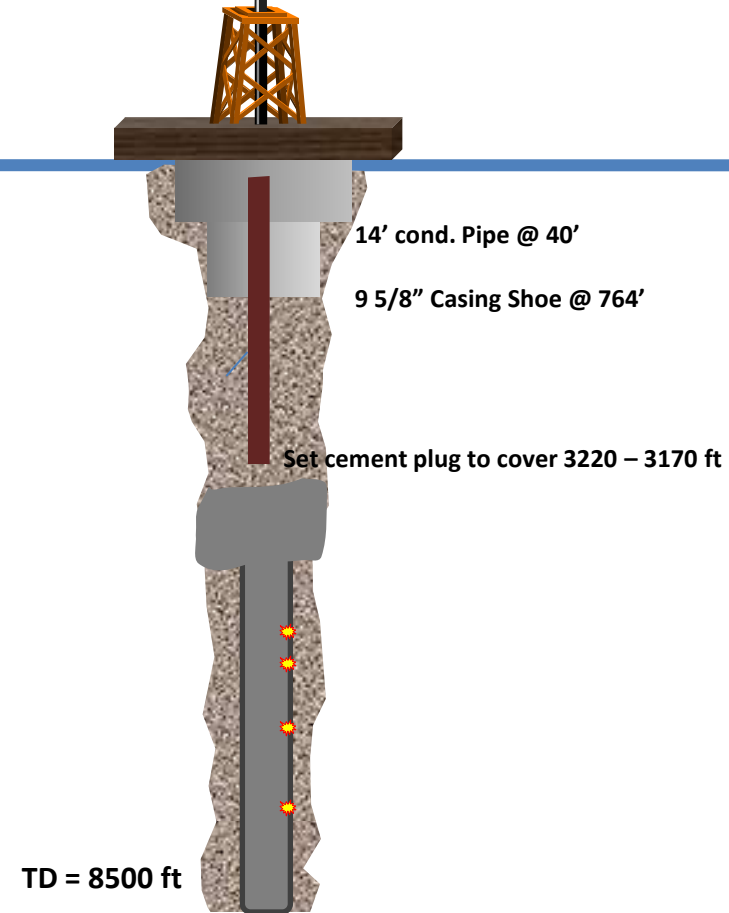
- Cement plug inside 5 ½" casing from 8,550 ft up to 3,220 ft, squeeze 10 bbls into perforations.
- Wait for cement to set, prepare FPI
- Put a connection casing joint at surface
- Set casing under tension and run FPI across the first three joints (20 – 158 ft), release joints
- Run FPI down to 3,214 ft and set casing under tension
- Release all casing at 3,214 ft and pull out 5 ½" casing



EB – 1 Re-entering Plan

Stage II

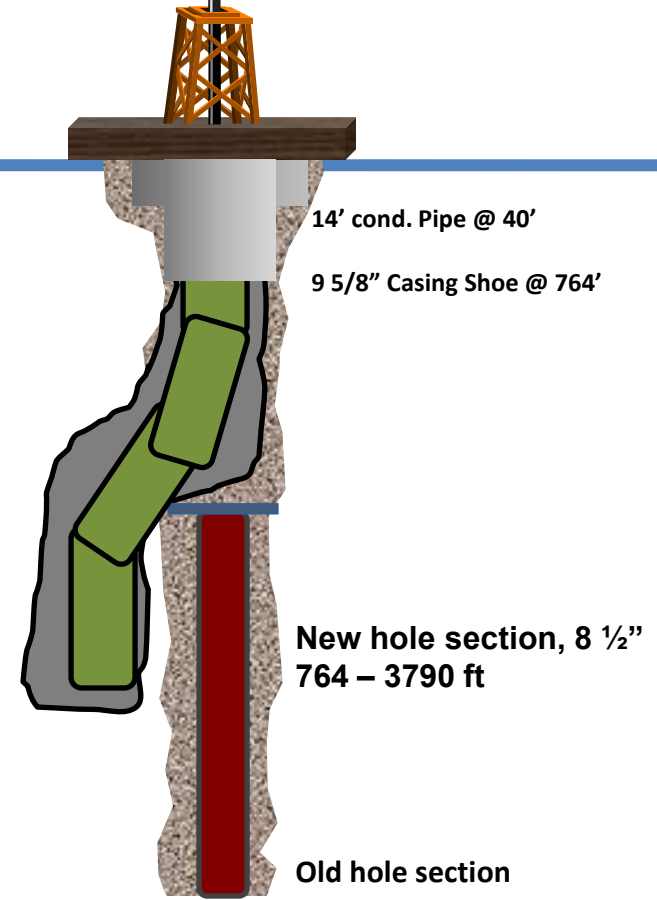
- Set another cement plug to cover 3,220 – 3,170 ft
- Wait for cement to set
- Tag cement top and make sure cement is hard
- Pull out and run 8 ½" bit



EB – 1 Re-entering Plan

Stage III

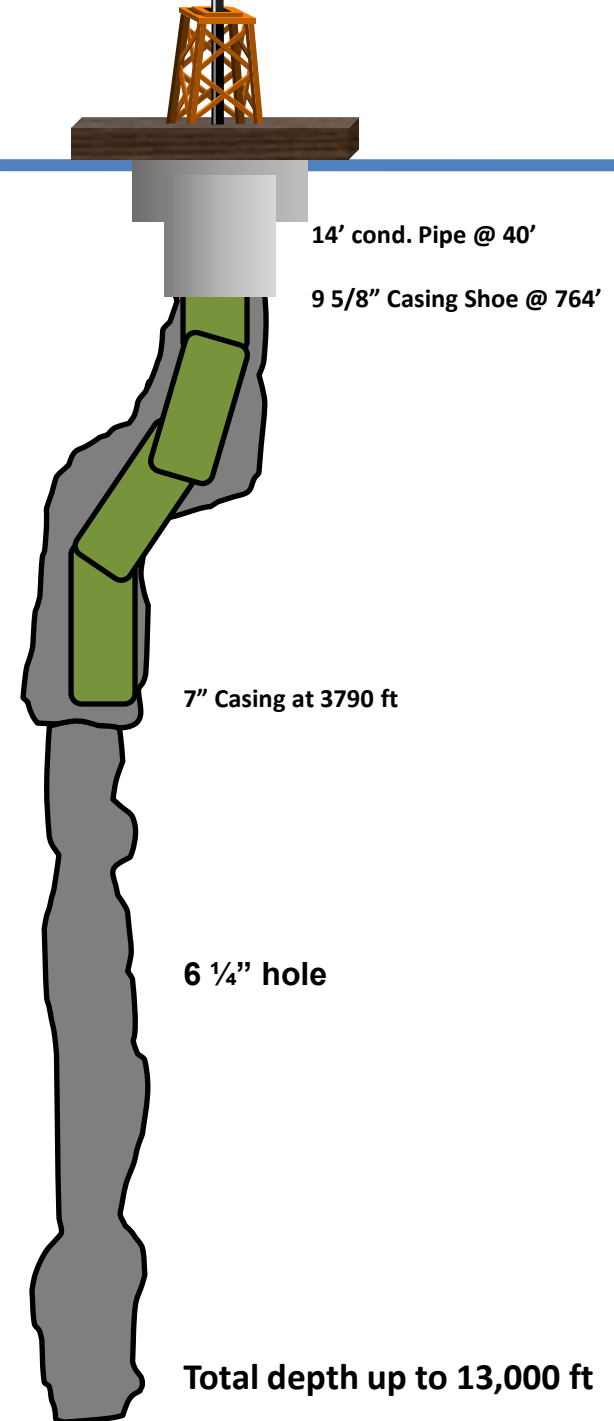
- RIH BHA with 8 ½" bit and drill with build angle 2-7 deg, 3,170 – 3,250 ft
- Continue to drill with zero deg angle (vertical) to 3,790 ft (or deeper if required)
- Use of aerated mud to control possible well problems
- Set the 7" casing at 3,790 ft
- Cement 7" casing, BOP changes, etc..
- Resume drilling with BHA and 6 ¼" bit to TD up to 13,000 ft (Paleozoic zone)
- Test different intervals of interest



EB – 1 Re-entering Plan

Stage IV

- RIH BHA with 6 1/4" bit
- Drill from 3,790 ft to TD up to 13,000 ft
- Get approval for testing different intervals with oil/gas shows
- Run 5 1/2" casing to TD (if there is oil show)
- If no oil shows, plug the open hole section
- Start well completion after approvals



Possible Problems

Will re-drilling through EB-1 face problems

- Yes, if the old hole section is loose and enlarged
- Yes, if we face complete losses
- Yes, if entire 7" casing section is not fully covered with cement
- How do we manage this:
 - Use aerated mud to drill the hole
 - Drill fast
 - Use light crete cement

