



Frac Report

Well Name: Cecil #11-12

Contractor: Halliburton Energy Services

Stimulations & Treatments

Sand Frac on 3/23/2011 09:00

| | | | | | | | |
|---------------------------------|----------------------------------|----------------------------|--------------------------|------------------|-----------------|----------------------|----------------------|
| Date | Type | Zone | Delivery Mode | Supervisor | District | | |
| 3/23/2011 | Sand Frac | Niobrara, Original Hole | Casing | K.Lewis | Evans | | |
| P(break) (psi) | Avg Treat Pressure (psi) | ISIP (psi) | Max Treat Pressure (psi) | P(si-post) (psi) | P(si-pre) (psi) | Avg Treat Rate (gpm) | Max Treat Rate (gpm) |
| 4,023.0 | 4,659.0 | | 4,999.0 | 3,481.0 | | 44.40 | 51.80 |
| Total Clean Volume Pumped (bbl) | Total Slurry Volume Pumped (bbl) | Proppant In Formation (lb) | Total Add Amount | Icon | | | |
| 4130.50 | 4399.50 | 250,020.0 | | Fracture | | | |

Comment

Niobrara Hybrid: RIH with PSI wireline using High pressure control unit and grease head. Set RMOR Cast Iron Flowthru 10k frac plug @ 6830' with a Baker #10. Dual fire 3 1/8" slick gun and EXT charges (22.7 gram, .42 entry hole, 35.1" penetration, 120 degree phasing). Niobrara "B" Bench @ 6740'-6748" (3 SPF) Niobrara "A" Bench @ 6618" - 6620" (2 SPF) (28 New holes). POOH and RDMO PSI Wireline.

MIRU HES. Well was loaded @ open. (Break 4023 psi @ 3.1 BPM) Pumped 119 bbls FE-1A Pad, 1547 bbls of Slickwater pad, 145 bbls of 20# pHaser pad, 166 bbls of 1.0 ppg 20/40 slurry with 20# pHaser, 786 bbls of 2.0 ppg 20/40 slurry with 20# pHaser, 832 bbls of 3.0 ppg 20/40 slurry with 20# pHaser, 339 bbls of 4.0 ppg 20/40 slurry with 20# pHaser, 89 bbls of 4.0 ppg SB Excel 20/40 slurry with 20# pHaser. Flushed well to top of the Niobrara B perf (107.5 bbls) Shutdown (ISDP 3481 psi) (FG .96). Fluid contained the following chemicals: .6 gpt CL-23, 1.0 gpt BA-20, 2.0 gpt GasPerm 1100, 1.25 gpt Clayfix III, 0.5 - 3.0 gpt Vicon NF, 0.15 - .75 gpt CAT 3, 2.0 gpt FR-66, 22 ppt WG-18 (238020 lbs 20/40 Preferred Rock) (12000 20/40 SB Excel). RD HES. MTP = 4999 psi, ATP = 4659 psi, AIR = 44.4 bpm. Pressure response was flat for entire treatment. Treatment went good.

Pumping Details

| Sig No. | Stage Type | P (lub-st) (psi) | Gas Type | V clean (bbl) | Cum V clean (bbl) | V slurry (bbl) | Cum V slurry (bbl) | Foam Quality (%) | V (gas) (mcf) | Comment |
|---------|----------------|------------------|----------|---------------|-------------------|----------------|--------------------|------------------|---------------|---------|
| 1 | FE-1A PAD | 4,870.0 | | 119.00 | 119.00 | 119.00 | 119.00 | | | |
| 2 | SLICKWATER PAD | 4,750.0 | | 1547.00 | 1666.00 | 1547.00 | 1666.00 | | | |
| 3 | 20# X-LINK PAD | 4,900.0 | | 145.00 | 1811.00 | 145.00 | 1811.00 | | | |
| 4 | 1 PPG | 4,810.0 | | 166.00 | 1977.00 | 174.00 | 1985.00 | | | |
| 5 | 2 PPG | 4,600.0 | | 786.00 | 2763.00 | 857.00 | 2842.00 | | | |
| 6 | 3 PPG | 4,460.0 | | 832.00 | 3595.00 | 946.00 | 3788.00 | | | |
| 7 | 4 PPG | 4,380.0 | | 339.00 | 3934.00 | 401.00 | 4189.00 | | | |
| 8 | 4 PPG SB EXCEL | 4,340.0 | | 89.00 | 4023.00 | 103.00 | 4292.00 | | | |
| 9 | FLUSH | 4,500.0 | | 107.50 | 4130.50 | 107.50 | 4399.50 | | | |

Perforations

| Date | Zone | Top (ftKB) | Blm (ftKB) | Shot Dens (shots/ft) |
|------------|---------------------------|------------|------------|----------------------|
| 12/22/2004 | Codell, Original Hole | 6,900.0 | 6,910.0 | |
| 3/23/2011 | Niobrara A, Original Hole | 6,618.0 | 6,620.0 | 2.0 |
| 3/23/2011 | Niobrara B, Original Hole | 6,740.0 | 6,748.0 | 3.0 |



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Sand Frac on 3/23/2011 07:00

| | | | | | | | | |
|---------------------------------|--------------------------|----------------------------------|--------------------------|----------------------------|-----------------|----------------------|----------------------|----------|
| Date | Type | Zone | Delivery Mode | Supervisor | District | | | |
| 3/23/2011 | Sand Frac | Codell, Original Hole | Casing | K.Lewis | Evans | | | |
| P(break) (psi) | Avg Treat Pressure (psi) | ISIP (psi) | Max Treat Pressure (psi) | P(si-post) (psi) | P(si-pre) (psi) | Avg Treat Rate (gpm) | Max Treat Rate (gpm) | |
| 2,806.0 | 3,783.0 | | 4,177.0 | 3,399.0 | | 34.60 | 35.10 | |
| Total Clean Volume Pumped (bbl) | | Total Slurry Volume Pumped (bbl) | | Proppant In Formation (lb) | | Total Add Amount | | Icon |
| 2839.00 | | 3075.00 | | 225,260.0 | | | | Fracture |

Comment

2 Stage Codell ReFrac / Niobrara ReComplete: MIRU HES. Well took 58 bbls to load. (Break 2806 psi @ 3.0 BPM) Pumped 119 bbls of Active pad, 595 bbls of 26# pHaser pad, 190 bbls of 1.0 ppg 20/40 slurry with 26# pHaser, 524 bbls of 2.0 ppg 20/40 slurry with 26# pHaser, 928 bbls of 3.0 ppg 20/40 slurry with 26# pHaser, 287 bbls of 4.0 ppg 20/40 slurry with 26# pHaser, 86 bbls of 4.0 ppg SB Excel slurry with 26# pHaser. Flushed well to top of the Codell perf (110.0 bbls) with a 3 bbl spacer followed by 24 bbls of 15% HCl followed by 83 bbls claytreated water (Spotting acid @ bottom of Niobrara B Bench). Shutdown (ISDP 3399 psi) (FG .93). Fluid contained the following chemicals: .6 gpt CL-23, .5 gpt BA-20, 1.5 gpt GasPerm 1100, 1.25 gpt Clayfix III, 3.0 - 5.0 gpt Vicon NF, 0.25 - .75 gpt CAT 3, 7.0 gpt LG-6, 1.0 gpt Losurf-300 (217260 lbs 20/40 Preferred Rock) (8000 lbs 20/40 SB Excel). RD HES, MIRU PSI Wireline. MTP = 4177 psi, ATP = 3783 psi, AIR = 34.6 bpm. Pressure response was slightly positive for entire treatment. Treatment went good.

Pumping Details

| Sig No. | Stage Type | P (tub-st) (psi) | Gas Type | V clean (bbl) | Cum V clean (bbl) | V slurry (bbl) | Cum V slurry (bbl) | Foam Quality (%) | V (gas) (mcf) | Comment |
|---------|----------------|------------------|----------|---------------|-------------------|----------------|--------------------|------------------|---------------|---------|
| 1 | ACTIVE PAD | 3,000.0 | | 119.00 | 119.00 | 119.00 | 119.00 | | | |
| 2 | 26# X-LINK PAD | 4,020.0 | | 595.00 | 714.00 | 595.00 | 714.00 | | | |
| 3 | 1 PPG | 3,910.0 | | 190.00 | 904.00 | 190.00 | 904.00 | | | |
| 4 | 2 PPG | 3,750.0 | | 524.00 | 1428.00 | 570.00 | 1474.00 | | | |
| 5 | 3 PPG | 3,640.0 | | 928.00 | 2356.00 | 1055.00 | 2529.00 | | | |
| 6 | 4 PPG | 3,500.0 | | 287.00 | 2643.00 | 339.00 | 2868.00 | | | |
| 7 | 4 PPG SB EXCEL | 3,490.0 | | 86.00 | 2729.00 | 97.00 | 2965.00 | | | |
| 8 | SPACER | 3,300.0 | | 3.00 | 2732.00 | 3.00 | 2968.00 | | | |
| 9 | 15% ACID | 3,300.0 | | 24.00 | 2756.00 | 24.00 | 2992.00 | | | |
| 10 | FLUSH | 3,800.0 | | 83.00 | 2839.00 | 83.00 | 3075.00 | | | |

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| 3/23/2011 | Niobrara A, Original Hole | 6,618.0 | 6,620.0 | 2.0 |
| 3/23/2011 | Niobrara B, Original Hole | 6,740.0 | 6,748.0 | 3.0 |