Well Information *Cockroft 33-11 Niobrara Recomplete*

Well Name: Cockroft Well #: 33-11

Tubulars

Name	Measured Depth (ft)	Outer Diameter (in)	Inner Diameter (in)	Linear Weight (lbm/ft)
4 1/2" Production Casing	0 - 8000	4.5	4	10.5

Perforations

Interval Name/ Depth (ft)	Shot Density (spf)	# of Perfs	Phase (DEG)	Hole Diam. (in)	Mid-perf Depth (ft)
Niobrara B Perforation Interval / 6711 - 6719	3	24	120	0.42	6715
Niobrara A Perforation Interval / 6593 - 6595	2	4	120	0.42	6594

Formations

Name	Top MD (ft)	Bottom MD (ft)	Top TVD (ft)	Bottom TVD (ft)
Niobrara Formation	6593	6719	6593	6719

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Job Fluids Summary *Cockroft 33-11 Niobrara Recomplete*

pHaserFrac w/ ClaWeb						
Volume	Base Fluid	Clay Control	Surfactant	Catalyst	Breaker	Surfactant
99000 (Gal)	Fresh Water*	CLA-Web	Gasperm 1100	CAT-3	Vicon NF	Losurf-300D
Totals	99000 (Gal)	24.75 (Gal)	148.5 (Gal)	18.5 (Gal)	179 (Gal)	99 (Gal)

PDC Acitve Fluid Pad					
Volume	Base Fluid	Breaker	Clay Control	Surfactant	Surfactant
5000 (Gal)	Fresh Water*	Vicon NF	CLA-Web	Gasperm 1100	Losurf-300D
Totals	5000 (Gal)	50 (Gal)	1.25 (Gal)	50 (Gal)	5 (Gal)

FR-66 Water				
Volume	Base Fluid	Surfactant	Surfactant	Clay Control
65000 (Gal)	Fresh Water*	Gasperm 1100	Losurf-300D	CLA-Web
Totals	65000 (Gal)	97.5 (Gal)	65 (Gal)	16.25 (Gal)

Treated Water		
Volume	Base Fluid	Clay Control
5000 (Gal)	Fresh Water*	CLA-Web
Totals	5000 (Gal)	1.25 (Gal)

JOB TOTALS						
Volume (Gal)	Base Fluid (Gal)	Clay Control (Gal)	Surfactant (Gal)	Catalyst (Gal)	Breaker (Gal)	Surfactant (Gal)
	Fresh Water*	CLA-Web	Gasperm 1100	CAT-3	Vicon NF	Losurf-300D
	174000	43.5	296	18.5	229	169

Proppant		
	Designed Qty	**Requested**
CRC-20/40	12000 (lbm)	12000 (lbm)
Premium White-20/40	238000 (lbm)	238000 (lbm)

Customer Supplied Items *			
	Designed Qty	**Tank Bottom**	**Requested w/ Tank Bottom**
Fresh Water	174000 Gal	0 Gal	174000 Gal

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Treatment 1 *Cockroft 33-11 Niobrara Recomplete*

Well Name	Cockroft	PDC Acitve Fluid Pad	5000 Gal
Job Name	Cockroft 33-11 Niobrara Recomplete	FR-66 Water	65000 Gal
No. of Perfs/Jets	28	pHaserFrac w/ ClaWeb	99000 Gal
Mid Perf Depth	6368.5 ft	Treated Water	5000 Gal
Estimated Pump Time	1.63 hrs	Premium White-20/40	238000 lbm
BHST	230 degF	CRC-20/40	12000 lbm
Frac Gradient	0.89 psi/ft		

Casing (Surface)

Trt-Stage	Stage Desc.	Flow Path	Fluid Desc.	Rate-Liq+Prop	Clean Vol.	Proppant	Proppant Conc.	Prop. Mass
1-1	Pad	IN	PDC Acitve Fluid Pad	10	5000		0	0
1-2	Pad	IN	FR-66 Water	50	65000		0	0
1-3	Pad	IN	pHaserFrac w/ ClaWeb	50	6000		0	0
1-4	Proppant Laden Fluid	IN	pHaserFrac w/ ClaWeb	50	7000	Premium White-20/40	1	7000
1-5	Proppant Laden Fluid	IN	pHaserFrac w/ ClaWeb	50	33000	Premium White-20/40	2	66000
1-6	Proppant Laden Fluid	IN	pHaserFrac w/ ClaWeb	50	22000	Premium White-20/40	3	66000
1-7	Proppant Laden Fluid	IN	pHaserFrac w/ ClaWeb	50	13000	Premium White-20/40	3	39000
1-8	Proppant Laden Fluid	IN	pHaserFrac w/ ClaWeb	50	15000	Premium White-20/40	4	60000
1-9	Proppant Laden Fluid	IN	pHaserFrac w/ ClaWeb	50	3000	CRC-20/40	4	12000
1-10	Flush	IN	Treated Water	50	5000		0	0
Totals					**174000**			**250000**

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Fluid Details - Treatment 1 Cockroft 33-11 Niobrara Recomplete

PDC Acitve Fluid Pad					
Volume (Gal)	Base Fluid	Breaker (gal/Mgal)	Clay Control (gal/Mgal)	Surfactant (gal/Mgal)	Surfactant (gal/Mgal)
	Fresh Water *	Vicon NF	CLA-Web	Gasperm 1100	Losurf-300D
5000	0 - 5000	10	0.25	10	1

FR-66 Water				
Volume (Gal)	Base Fluid	Surfactant (gal/Mgal)	Surfactant (gal/Mgal)	Clay Control (gal/Mgal)
	Fresh Water *	Gasperm 1100	Losurf-300D	CLA-Web
65000	0 - 65000	1.5	1	0.25

pHaserFrac w/ ClaWeb						
Volume (Gal)	Base Fluid	Clay Control (gal/Mgal)	Surfactant (gal/Mgal)	Catalyst (gal/Mgal)	Breaker (gal/Mgal)	Surfactant (gal/Mgal)
	Fresh Water *	CLA-Web	Gasperm 1100	CAT-3	Vicon NF	Losurf-300D
	0 - 6000	0.25	1.5	0	1	1
	6000 - 46000	0.25	1.5	0	1.5	1
	46000 - 68000	0.25	1.5	0.25	1.5	1
	68000 - 81000	0.25	1.5	0.25	2	1
	81000 - 96000	0.25	1.5	0.5	3	1
99000	96000 - 99000	0.25	1.5	0.75	3	1

Treated Water		
Volume (Gal)	Base Fluid	Clay Control (gal/Mgal)
	Fresh Water *	CLA-Web
5000	0 - 5000	0.25

* Customer Supplied

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Cost Estimate *Cockroft 33-11 Niobrara Recomplete*

SAP Quote # 0

Mtrl Nbr	Description	Qty	U/M	Unit Price	Net Amt
342341	PE BOM-GELLED WATER FRAC - CONVENTIONAL	1	JOB		0.00
	Equipment Charges				
224401	FRACTURING -SOLUTION SERVICE CHARG	1	JOB	218,702.00	28,431.26
	BARRELS/CUBIC METRES (BBL/M3)	BBL			
	RATE PER BBL\CUM	50			
	PRESSURE UNITS (PSI/MPA/BAR)	PSI			
	PRESSURE	5000			
428543	2nd Stage Customer Rebate	1	EA		-5,000.00
	Chemical Charges				
467131	FR-66 WATER	65000	GAL		N/C
101766302	FR-66	130	GAL	152.55	2,578.09
101985045	CHEM, CLA-WEB - TOTE	44	GAL	474.30	2,713.00
437542	PHASERFRAC SBM	99000	GAL		27,902.16
	Vis	22			
	UNIT OF MEASURE - VISCOSITY				
100003833	CL-23	59	GAL		N/C
100003706	BA-20	99	GAL		N/C
100003707	WG-18	2574	LB		N/C
100003707	WG-18 Anything over 26# will be charged.	0	LB	51.90	0.00
101770760	GASPERM 1100	296	GAL	245.92	9,463.00
101783480	LOSURF-300D	169	GAL	113.64	2,496.67
100003852	VICON NF BREAKER	229	GAL	82.59	2,458.70
101244422	CAT-3	19	GAL	149.27	368.70
	Proppant Charges				
100003678	SAND-PREMIUM WHITE-20/40	2380	SK	43.83	13,561.00
101357947	SAND-CRC-20/40	12000	LB	3.03	4,726.80
216319	Proppant Handl & Stor. Sol Chg Per lb	250000	LB	0.09	2,925.00
216318	Proppant Del Sol Chg, per ton mile	3750	TNM	4.05	1,974.37
	Total	**USD**			**761,144.32**
	Discount	**USD**			**666,545.57**
	Discounted Total	**USD**			**94,598.75**

Primary Plant: Fort Lupton, CO, USA
US
Secondary Plant: Fort Lupton, CO, USA

Price Book Ref: 01 Western
Price Date: 1/1/2010

JOB INFORMATION AND TESTING CONDITIONS

Customer:	PDC	Fluid System:	pHaser	Bob Type:	B2
Well Name:	Cockroft 33-11	Water Source:	Tanks	Shear Rate (1/sec):	40
Date:	2/21/13	Temp. (^{o}F):	210	Lab Project ID:	Feb20303, 305

FLUID DESIGN

Test No:			1	2	3	4	5	6	7	8	9	10	Water Analysis	
Lot #	Chemical	Units	Chemical Concentrations										Sample ID:	
3020112	GasPerm 1100	gpt	1.50	1.50									Bicarbonate (mg/L)	
DV013849695	LoSurf 300	gpt	1.00	1.00									Calcium (mg/L)	
Not Given	Cla-Web	gpt	0.25	0.25									Carbonate (mg/L)	
1221301	BA-20	gpt	0.60	0.35									Chloride (mg/L)	
CP023810200	Cat-3	gpt	~	0.25									Conductivity (µS/cm)	
DV122849368	Vicon	gpt	1.00	1.50									Iron (mg/L)	
CL023 04041201	CL-23	gpt	0.60	0.60									Magnesium (mg/L)	
H142527D	WG-18	ppt	26.00	26.00									pH	
													Potassium (mg/L)	
													Resistivity (Ω-m)	
													Sodium (mg/L)*	
													Specific Gravity	
													Sulfate (mg/L)	
													TDS (mg/L)*	
													Temperature (^{o}F)	
													*calculated values	

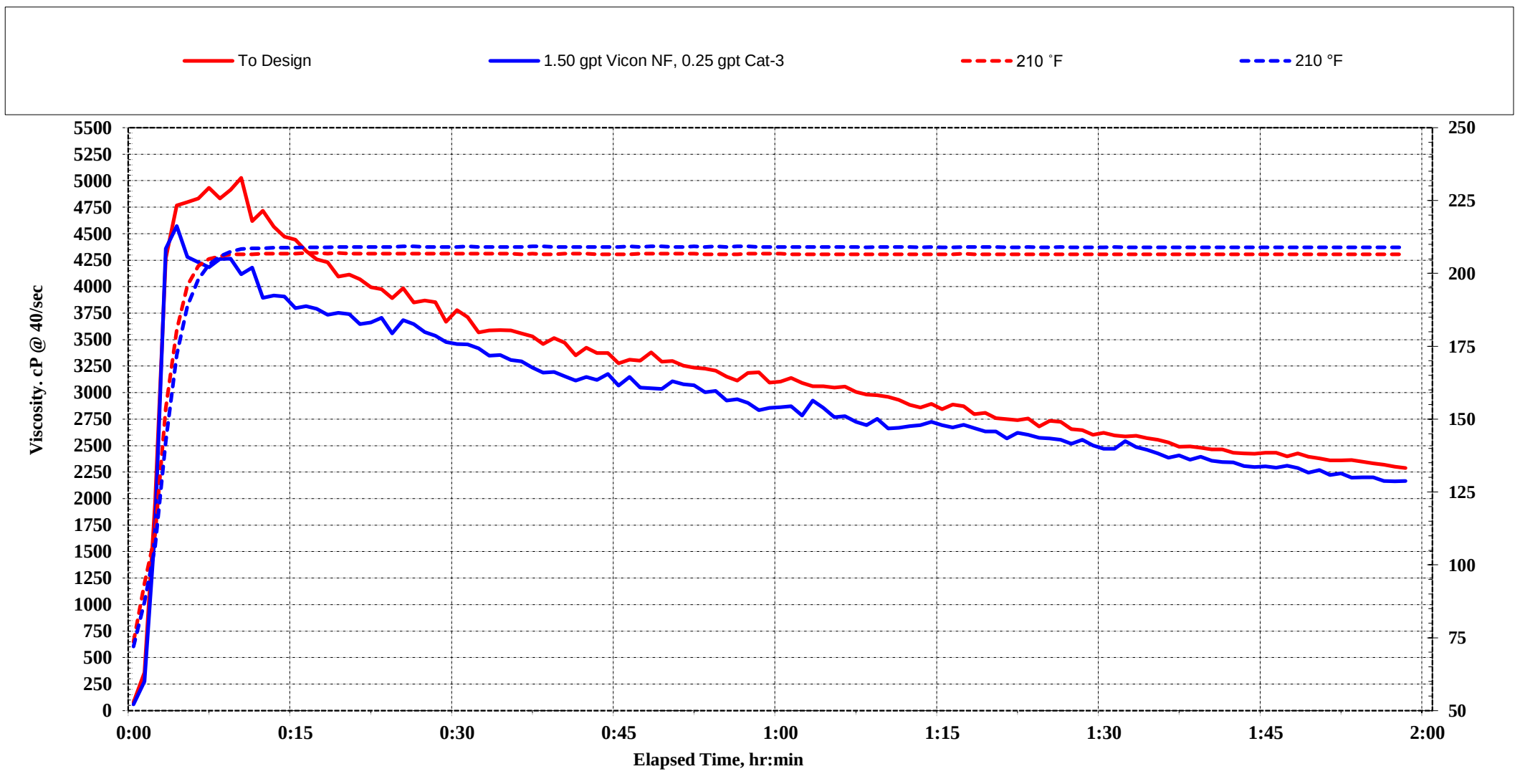
FLUID PROPERTIES

Test No:	1	2	3	4	5	6	7	8	9	10
Water pH	7.70	7.70								
Base Gel (#)	26	26								
Base Gel Visc (cP)	22.7	22.7								
Base Gel pH	8.68	8.68								
Base Gel Temp. (^{o}F)	63.6	63.6								
Buffered pH	4.85	4.86								
Crosslink pH	4.94	5.06								
Final pH	4.96	5.23								
Test Temp. (^{o}F)	210	210								
Break Time (hr:min)	~	~								

Gel Hydration (511/s)		
Min.	Viscosity (cP)	Temp. (oF):
3	22.5	62.1
6	22.7	62.9
9	22.7	63.6

Test Notes:

BREAK TEST CHART



Customer: PDC
Well: Cockroft 33-11
Date: 2/20/2013
Formation:
Analyzed by: cc

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TANK VOLUMES:

TANK:	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Initial Strap Job *(Inches)*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Fluid Vol. *(BBL)*	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Final Strap *(Inches)*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Fluid Vol. *(BBL)*	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**

LABORATORY WATER ANALYSIS

TANK:	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Temperature *(°F)*	59.0	58.9	60.1	63.1	63.2	63.0	63.5	63.5	63.4	63.0	63.2	63.2	63.1	64.0	64.0
pH	7.88	7.78	7.70	7.70	7.80	7.77	7.89	7.84	7.87	7.91	7.84	7.86	7.89	7.83	7.92
Specific Gravity	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Chlorides *(mg/L)* :	10	42	8	12	42	6	16	24	12	8	8	6	12	30	52
Potassium *(mg/L):*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sodium *(mg/L):*	19	26	14	24	45	23	15	36	2	8	8	6	6	31	36
Sulfate *(mg/L):*	7	3	9	8	7	11	12	6	4	5	2	5	6	5	13
Iron *(mg/L):*	0.23	0.06	0.01	0.17	0.00	0.03	0.04	0.01	0.05	0.03	0.90	0.16	0.03	0.07	0.77
Carbonates *(mg/L)*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Bicarbonates *(mg/L)*	81	81	61	81	81	81	102	102	61	81	61	61	81	81	81
Total Hardness *(mg/L):*	60	90	60	60	60	60	110	60	80	140	90	90	100	70	80
Calcium (Ca) *(mg/L):*	8	8	8	10	10	10	10	6	6	8	8	10	10	10	10
Magnesium (Mg) *(mg/L):*	5	12	5	2	2	2	15	7	12	24	12	10	12	5	7
Total Dissolved Solids *(mg/L)*	191	263	165	198	248	194	279	241	177	249	168	179	228	232	280

PRE-JOB WATER ANALYSIS

TANK:	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Temperature *(°F)*	1.0														
pH	1.00														
Specific Gravity	1.000														

Hydration Tank
0

0

Total Fluid Pumped
0

Job Averages
62.5
7.83
1.000
19
0
20
7
0.17
0
79
81
9
9
220

Job Average
1.0
1.0
1.0

Customer: PDC
Well: Cockroft 33-11
Date: 2/21/2013
Project Name: BRI13-0054
Lab Technicians: CG + SS

HALLIBURTON

Sand Type Ottawa 20/40
MM2466

Pan Size	COMP 1		COMP 2		COMP 3		COMP 4		COMP 5	
	Wt.	%	Wt.	%	Wt.	%	Wt.	%	Wt.	%
Pan #16	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%
Pan #20	2.3	2.3%	1.1	1.1%	0.5	0.5%	1.5	1.5%	3.4	3.4%
Pan #30	35.7	35.6%	32.8	33.0%	23.8	23.8%	41.7	42.0%	40.4	40.6%
Pan #35	35.5	35.4%	38.1	38.3%	35.6	35.5%	37.1	37.3%	32.1	32.2%
Pan #40	21.7	21.7%	20.7	20.8%	32.3	32.2%	15.1	15.2%	19.2	19.3%
Pan #50	4.7	4.7%	6.6	6.6%	7.7	7.7%	3.5	3.5%	4.4	4.4%
Pan	0.3	0.3%	0.2	0.2%	0.3	0.3%	0.5	0.5%	0.1	0.1%
Total	100.2	100.0%	99.5	100.0%	100.2	100.0%	99.4	100.0%	99.6	100.0%
Retained	92.7%		92.1%		91.5%		94.5%		92.1%	

Sand Type Ottawa 20/40
MM4671

Pan Size	COMP 1		COMP 2		COMP 3		COMP 4		COMP 5	
	Wt.	%	Wt.	%	Wt.	%	Wt.	%	Wt.	%
Pan #16	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%
Pan #20	2.6	2.6%	0.9	0.9%	0.9	0.9%	1.8	1.8%	1.0	1.0%
Pan #30	48.8	48.9%	33.2	33.3%	32.0	32.4%	38.1	37.8%	31.9	32.2%
Pan #35	34.0	34.1%	38.1	38.2%	36.8	37.2%	36.4	36.1%	37.0	37.3%
Pan #40	12.0	12.0%	21.6	21.6%	21.6	21.8%	19.9	19.7%	21.4	21.6%
Pan #50	2.2	2.2%	5.9	5.9%	7.4	7.5%	4.5	4.5%	6.0	6.1%
Pan	0.1	0.1%	0.1	0.1%	0.2	0.2%	0.1	0.1%	1.8	1.8%
Total	99.7	100.0%	99.8	100.0%	98.9	100.0%	100.8	100.0%	99.1	100.0%
Retained	95.1%		93.1%		91.4%		93.7%		91.1%	

HALLIBURTON | Production Enhancement

Halliburton Energy Services

On-Site Pre-Job Quality Control Testing

The following tests were performed:

- [x] Pre Job Water Analysis (Temp, pH, S.G.)
- [x] Sand Sieves
- [x] Fann 35 Break Test

Customer:	PDC
Lease:	Cockroft 33-11
Date:	February 21, 2013
Formation:	Niobrara
Ticket #:	900234366
Fluid System:	PHaserFrac

Tests Performed By: Rob Althenn
QC Operator

Tests Verified & Approved By: Troy Omsberg
Technical Professional

Customer:	P.D.C
Lease:	Cockroft
Date:	Feb 21,2013
Formation:	Niobrara
Ticket #:	900234366
Fluid System:	PHaserFrac

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TANKS	TEMP	pH	S.G.	TEMP Variance
1	58.1	6.77	1.002	-0.9
2	59.2	6.90	1.001	0.2
3	61.2	7.05	1.002	2.2
4	59.2	7.14	1.002	0.2
5	57.9	7.24	1.002	-1.1
6	57.7	7.37	1.001	-1.3
7	53.8	7.41	1.002	-5.2
8	59.7	7.39	1.002	0.7
9	62.6	7.39	1.002	3.6
10	59.7	7.41	1.001	0.7
11 & 12	59.0	7.44	1.002	0.0
13 & 14	59.7	7.42	1.002	0.7
Average	59.0	7.2	1.0	0.0

Customer:	P.D.C
Lease:	Cockroft
Date:	Feb 21,2013
Formation:	Niobrara
Ticket #:	900234366
Fluid System:	PHaserFrac

HALLIBURTON | Production Enhancement

Real Time Sand Sieves **20/40** Unit # **10794671**

MT Mover										
Initial Weight **(grams):**	**COMP 1**		**COMP 2**		**COMP 3**		**COMP 4**		**COMP 5**	
Sand Type:	Wt	%	Wt	%	Wt	%	Wt	%	Wt	%
Sieve # 16	0.0	**0.0**	0.0	**0.0**	0.0	**0.0**	0.0	**0.0**	0.0	**0.0**
Sieve # 20	4.1	**4.1**	2.0	**2.0**	1.9	**1.9**	1.8	**1.8**	2.7	**2.7**
Sieve # 30	59.4	**59.4**	52.5	**52.7**	54.0	**54.2**	54.6	**54.8**	57.3	**57.7**
Sieve # 35	28.4	**28.4**	35.0	**35.1**	33.9	**34.0**	32.8	**32.9**	31.5	**31.7**
Sieve # 40	5.5	**5.5**	7.6	**7.6**	7.2	**7.2**	7.5	**7.5**	5.8	**5.8**
Sieve # 50	1.5	**1.5**	2.4	**2.4**	2.5	**2.5**	2.8	**2.8**	1.9	**1.9**
Pan	0.0	**0.0**	0.0	**0.0**	0.0	**0.0**	0.0	**0.0**	0.0	**0.0**
Total	**98.9**	**98.9**	**99.5**	**99.8**	**99.5**	**99.8**	**99.5**	**99.9**	**99.2**	**99.9**
Retained	**93.3%**		**95.4%**		**95.4%**		**95.3%**		**95.3%**	

Real Time Sand Sieves **20/40** Unit # **10972466**

MT Mover	0									
Initial Weight **(grams):**	**COMP 1**		**COMP 2**		**COMP 3**		**COMP 4**		**COMP 5**	
Sand Type:	Wt	%	Wt	%	Wt	%	Wt	%	Wt	%
Sieve # 16	0.0	**0.0**	0.0	**0.0**	0.0	**0.0**	0.0	**0.0**	0.0	**0.0**
Sieve # 20	1.7	**1.7**	2.4	**2.4**	0.9	**0.9**	2.1	**2.1**	8.2	**8.3**
Sieve # 30	56.7	**56.7**	52.0	**52.2**	39.1	**39.2**	52.4	**52.6**	61.2	**61.6**
Sieve # 35	33.7	**33.7**	33.6	**33.7**	41.5	**41.6**	36.3	**36.4**	24.2	**24.4**
Sieve # 40	6.4	**6.4**	8.4	**8.4**	14.0	**14.0**	7.1	**7.1**	4.7	**4.7**
Sieve # 50	1.2	**1.2**	3.1	**3.1**	3.5	**3.5**	1.9	**1.9**	1.1	**1.1**
Pan	0.0	**0.0**	0.0	**0.0**	0.1	**0.1**	0.0	**0.0**	0.0	**0.0**
Total	**99.7**	**99.7**	**99.5**	**99.8**	**99.1**	**99.4**	**99.8**	**100.2**	**99.4**	**100.1**
Retained	**96.8%**		**94.3%**		**94.9%**		**96.2%**		**90.7%**	

HALLIBURTON | Production Enhancement

Customer: P.D.C
Lease: Cockroft
Formation Niobrara
Date: Feb 21,2013

Test No: pHaser Breaker Test
QC Operator: Rob Althenn
Ticket No: 900234366
Engineer: Troy Omsberg

Fann 35 Analysis Data Sheet
QC Field Test

Location Water
6.98 pH

Hydrated
8.05 pH

Buffered to
4.91 pH

Final
5.15 pH

Crosslink Time

Temperture	Time
132 °f	:58

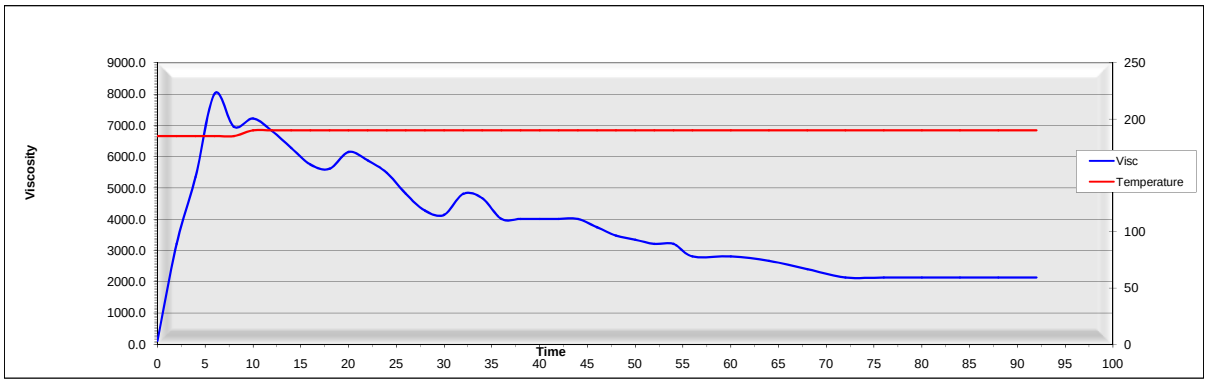
Hydration Test

Time	Visc.	Temp.
3	25	52.9 °f
6	25	53.6 °f
9	30	55.4 °f

Test Increments:		2	minutes
Time (Min)	Temp (°F)	Fann35 (Dial)	Apparent Visc
0	185	4	107.0
2	185	120	3209.4
4	185	200	5349.0
6	185	300	8023.5
8	185	260	6953.7
10	190	270	7221.2
12	190	255	6820.0
14	190	235	6285.1
16	190	215	5750.2
18	190	210	5616.5
20	190	230	6151.4
22	190	220	5883.9
24	190	205	5482.7
26	190	180	4814.1
28	190	160	4279.2
30	190	155	4145.5
32	190	180	4814.1
34	190	175	4680.4
36	190	150	4011.8
38	190	150	4011.8
40	190	150	4011.8
42	190	150	4011.8
44	190	150	4011.8
46	190	140	3744.3
48	190	130	3476.9
50	190	125	3343.1
52	190	120	3209.4
54	190	120	3209.4
56	190	105	2808.2
60	190	105	2808.2
64	190	100	2674.5
68	190	90	2407.1
72	190	80	2139.6
76	190	80	2139.6
80	190	80	2139.6
84	190	80	2139.6
88	190	80	2139.6
92	190	80	2139.6
96	190	80	2139.6
100	190	80	2139.6
60% of Initial Reading			64.188

Fluid	PHaserFrac

Dry Gel				
Submitted Location Water			1000	mL
setpoint:	26.00	WG-18	3.12	grams
Viscosity	cp	Temp	°f	
Components are mixed in		1000	mLs of Hydrated Gel	
Chemicals				
Miscellaneous				
setpoint:				
Surfactants				
setpoint:	1.00	LoSurf-300D	1.00	mL
setpoint:	1.50	GasPerm-1100	1.50	mL
setpoint:				
Clay Control / Stabilizers				
setpoint:	0.25	Cla-Web	0.25	mL
setpoint:				
Buffers				
setpoint:	0.48	BA-20	0.48	mL
setpoint:				
Crosslinkers				
Crosslinker Dilution:	1	To	0	
setpoint:	0.60	CL-23	0.60	mL
setpoint:				
setpoint:				
Breakers				
Hydrated Gel Used for Test:			200	mL
setpoint:	3.00	VICON NF	0.600	mL
setpoint:	0.75	CAT-3	0.150	mL
setpoint:				
setpoint:				
setpoint:				



Customer	**PDC Energy**	**2/21/2013**	API	05-123-22672	
Lease	**Cockroft 33-11**				
Formation	**Niobrara**				

HALLIBURTON | Production Enhancement

Treatment Interval	Stage Number	Fluid Description	Stage Description	Proppant Description	Prop Conc *(ppg)*	Slurry Rate *(bpm)*	Design Clean Volume *(gal)*	Design Clean Volume *(bbl)*	Actual Clean Volume *(gal)*	Actual Clean Volume *(bbl)*	Design Prop Total *(lbs)*	Actual Prop Total *(lbs)*	CL-23 *(gpt)*	BA-20 *(gpt)*	Gasperm 1100 *(gpt)*	Losurf 300D *(gpt)*	Cla-Web *(gpt)*	Vicon NF *(gpt)*	Cat-3 *(gpt)*	FR-66 *(gpt)*	WG-18 *(ppt)*
1	1	Active Fluid	Pre Pad			10	5,000	119.0	5,017	119.5					10.00	1.00	0.25	10.00			
	2	FR Water	Pad			50	65,000	1,547.6	65,004	1,547.7					1.50	1.00	0.25			1.10	
	3	pHaserFrac 22 visc	Pad			50	6,000	142.9	6,025	143.5			0.60	0.60	1.50	1.00	0.25	1.45		1.00	26.00
	4	pHaserFrac 22 visc	PLF	Ottawa 20/40	1.00	50	7,000	166.7	7,045	167.7	7,000	8,042	0.60	0.60	1.50	1.00	0.25	1.50		1.00	26.00
	5	pHaserFrac 22 visc	PLF	Ottawa 20/40	2.00	50	33,000	785.7	33,019	786.2	66,000	64,935	0.60	0.60	1.50	1.00	0.25	1.50		0.10	26.00
	6	pHaserFrac 22 visc	PLF	Ottawa 20/40	3.00	50	22,000	523.8	22,013	524.1	66,000	64,337	0.60	0.60	1.50	1.00	0.25	1.50	0.25		26.00
	7	pHaserFrac 22 visc	PLF	Ottawa 20/40	3.00	50	13,000	309.5	13,109	312.1	39,000	37,982	0.60	0.60	1.50	1.00	0.25	2.00	0.25		26.00
	8	pHaserFrac 22 visc	PLF	Ottawa 20/40	4.00	50	15,000	357.1	17,162	408.6	60,000	59,207	0.60	0.60	1.50	1.00	0.25	3.00	0.50		26.00
	9	pHaserFrac 22 visc	PLF	SB Excel 20/40	4.00	50	3,000	71.4	4,367	104.0	12,000	16,013	0.60	0.60	1.50	1.00	0.25	3.00	0.75		26.00
	10	Treated Water	Flush			50	5,000	119.0	4,487	106.8											
						Total Fluid	174,000	4,142.9	177248	4,220.2											

Wellbore Path		**Volume**	**109**	**bbl**	
	Top	**Bottom**	**Length**	**Volume**	**Perfs**
4 1/2" 11.6#	0	7,000	7,000	4,570	
Perforations	6,593	6,595	2		40
	6711	6,719	8		

	Total Proppant	CL-23	BA-20	Gasperm 1100	Losurf 300D	Cla-Web	Vicon NF	Cat-3	FR-66	WG-18
	(lbs)	(gal)	(gal)	(gal)	(gal)	(gal)	(gal)	(gal)	(gal)	(lbs)
Initial Designed Material Volume	**250,000**	**59**	**59**	**296**	**169**	**42**	**232**	**19**	**88**	**2,574**
Actual Designed Material Volume	**250,516**	**62**	**62**	**302**	**173**	**43**	**243**	**21**	**88**	**2,671**
Physical Material Volume Pumped	**250,190**	**64**	**56**	**300**	**170**	**46**	**257**	**20**	**97**	**2,498**
Percent Variance	**-0.1%**	**3.8%**	**-9.2%**	**-0.6%**	**-1.6%**	**6.5%**	**5.8%**	**-3.1%**	**10.4%**	**-6.5%**

	CL-23	BA-20	Gasperm 1100	Losurf 300D	Cla-Web	Vicon NF	Cat-3	FR-66	WG-18
	(gal)	(gal)	(gal)	(gal)	(gal)	(gal)	(gal)	(gal)	(lbs)
Loaded	254	275	441	542	302	396	320	336	3,319
Excess	195	216	145	373	260	164	302	248	745
Leaving	190	219	141	372	256	139	300	239	821

Post Stage Summary

Fluid Totals	**Planned**	**Pumped**
Active Fluid	5,000	5,017
FR Water	65,000	65,004
pHaserFrac 22 visc	99,000	102,740
Treated Water	5,000	4,487

Average	
Pressure	4,582 psi
Rate	54.2 bpm
Viscosity	22 cP
pH	5.10
Temperature	56 °F

Sand Totals	**Planned**	**Tickets**
Ottawa 20/40	238,000	238,080
SB Excel 20/40	12,000	12,110

Max	
Pressure	4,950 psi
Rate	54.7 bpm

ISIP (psi)	**2943**
FG (psi/ft)	**0.88**

Sand Tracking

Lease	Cockroft 33-11
Formation	Niobrara
Date	2/21/2013
SO#	900234366

	Ottawa 20/40
Type	
Design	238,000
Preload	238,080
Delivered	0
Total	*238,080*
Needed	0
Pumped	238,080
Remaining	0
Stages	

	Load	Weight	
1	41054	36480	(Missing ticket, but have on location)
2	37560	37560	Cockroft 33-11
3	113008	49720	Codell Stage
4	113010	49560	
5	113033	43900	
6	41052	48680	
7	41058	49000	Cockroft 33-11
8	41067	43600	Niobrara Stage
9	41060	48400	
10	41066	48400	

	SB Excel 20/40
Type	
Design	12,000
Preload	12,110
Delivered	0
Total	*12,110*
Needed	0
Pumped	12,110
Remaining	0
Stages	*0.0*

	Load	Weight
1	41103	20220

HALLIBURTON — JOB LOG

900234366

COUNTRY: UNITED STATES	LOCATION: BRIGHTON, COLORADO	BDA: ROCKIES NWA	TICKET DATE: 21-Feb-2013
H.E.S EMPLOYEE NAME: JOSE MALDONADO	MBU ID: N/A	EMP NO.: 417249	SUB PSL: PRODUCTION ENHANCEMENT
CUSTOMER REP. / PHONE: DOMINIC GARDELLA	COMPANY: PDC		JOB PURPOSE CODE: 15321
WELL NAME: COCKROFT	WELL NO.: 33-11	API/UWI #: 05-123-22672	COUNTY: WELD / JOB CLASSIFICATION: pHaserFrac
WELL LOCATION: LAND	SEC / TWP / RNG: SEC 6 / T3N / R63W	DEPARTMENT NO.: 5005	FORMATION: NIOBRARA

Chart No.	Time	Rate (BPM)	Volume (BBL)(GAL)	Pmps T	Pmps C	Press.(PSI) Tbg	Press.(PSI) Csg	Job Description / Remarks
	2:00 AM							CALLED OUT
	2:30 AM							YARD SAFETY MEETING
	3:30 AM							ON LOCATION
								PRE - RIGUP SAFETY MEETING
								PRIME UP TRUCKS
								TEST LINES TO 7920 MAX PRESSURE AT 7500
								POP OFFS AT 5507
								BACKSIDE AT N/A
								PRE - JOB SAFETY MEETING
								START JOB LOAD BREAK
								START ACID
								BREAK FORMATION 4490 @ 5.3
	7:57 PM						2755	START ACTIVE PAD
	8:03 PM	37.6	120		6		4662	START FR WATER PAD
	8:33 PM	54.4	1668		6		4618	START PHASERFRAC PAD
	8:36 PM	54.2	1811		6		4879	START 1.00 PPG SAND STAGE
		54.2	1918		6		4777	1.00 PPG SAND ON FORMATION
	8:39 PM	54.2	1979		6		4821	START 2.00 PPG SAND STAGE
	8:41 PM	54.1	2086		6		4695	2.00 PPG SAND ON FORMATION
	8:55 PM	54.3	2765		6		4661	START 3.00 PPG SAND STAGE
	8:57 PM	54.2	2872		6		4543	3.00 PPG SAND ON FORMATION
	9:06 PM	54.2	3289		6		4503	CONTINUE 3.00 SAND STAGE
	9:12 PM	54.3	3602		6		4510	START 4.00 SAND STAGE
	9:15 PM	54.3	3709		6		4397	4.00 PPG SAND ON FORMATION
	9:21 PM	54.1	4010		6		4427	START SBXL 4.00 SAND STAGE
	9:23 PM	54.4	4114		6		4389	FLUSH
	9:26 PM		4220				2943	END FLUSH
								JOB COMPLETED

AVERAGES :		SHUTIN PRESSURES :	
PRESSURE	4582	INSTANT	2943
RATE	54.2	5 MIN	N/A
TEMP	56	10 MIN	N/A
VIS.	22	15 MIN	N/A
MAX :		TOTAL VOLUME	4220
PRESSURE	4950	FLUSH VOLUME	107
RATE	54.7		

HALLIBURTON

Field Ticket

Field Ticket Number:	900234366	Field Ticket Date:	Thursday, February 21, 2013

Bill To:
PDC ENERGY EBUS
DO NOT MAIL - BOX 26
BRIDGEPORT, WV 26330

Ship To:
PETROLEUMD COCKROFT 33-11,WELD
COCKROFT 33-11
2461817
LUCERNE, CO 80646

Job Name:	Cockroft 33-11 Niobrara Recomplete
Order Type:	Streamline Order (ZOH)
Well Name:	Cockroft 33-11
Company Code:	1100
Customer PO No.:	NA
Shipping Point:	Fort Lupton, CO, USA
Sales Office:	Rocky Mountains BD
Well Type:	Gas
Well Category:	Workover

Material	Description	QTY	UOM	Base Amt	Unit Amt	Gross Amount	Discount	Net Amount
342341	PE BOM-GELLED WATER FRAC - CONVENTIONA	1	JOB	0.00	0.00	0.00	87%	0.00
224401	FRACTURING -SOLUTION SERVICE CHARG	1	JOB	0.00	218,702.00	218,702.00	87%	28,431.26
	BARRELS/CUBIC METRES (BBL/M3)		BBL					
	RATE PER BBL\CUM	50						
	PRESSURE UNITS (PSI/MPA/BAR)		PSI					
	PRESSURE	5000						
428543	2nd Stage Customer Rebate	1	EA	0.00	5,000.00	-5,000.00		-5,000.00
467131	FR-66 WATER	65004	GAL		0.00	0.00		0.00
101766302	FR-66	97	GAL	0.00	152.55	14,797.35	87%	1,923.66
101985045	CHEM, CLA-WEB - TOTE	46	GAL	0.00	474.30	21,817.80	87%	2,836.31
437542	PHASERFRAC SBM	102740	GAL		2.17	222,740.32	87%	28,956.24
	Vis	22						
	UNIT OF MEASURE - VISCOSITY	0						
100003833	CL-23	64	GAL		0.00	0.00		0.00
100003706	BA-20	56	GAL		0.00	0.00		0.00
100003707	WG-18	2498	LB		0.00	0.00		0.00
100003707	WG-18 Anything over 26# will be charged.	0	LB	0.00	51.90	0.00		0.00
101770760	GASPERM 1100	300	GAL	0.00	245.92	73,776.00	87%	9,590.88
101783480	LOSURF-300D	170	GAL	0.00	113.64	19,318.80	87%	2,511.44
100003852	VICON NF BREAKER	257	GAL	0.00	82.59	21,225.63	87%	2,759.33

HALLIBURTON

Field Ticket

Field Ticket Number:	900234366	*Field Ticket Date:*	Thursday, February 21, 2013

Bill To:
PDC ENERGY EBUS
DO NOT MAIL - BOX 26
BRIDGEPORT, WV 26330

Ship To:
PETROLEUMD COCKROFT 33-11,WELD
COCKROFT 33-11
2461817
LUCERNE, CO 80646

Job Name:	Cockroft 33-11 Niobrara Recomplete
Order Type:	Streamline Order (ZOH)
Well Name:	Cockroft 33-11
Company Code:	1100
Customer PO No.:	NA
Shipping Point:	Fort Lupton, CO, USA
Sales Office:	Rocky Mountains BD
Well Type:	Gas
Well Category:	Workover

Material	Description	QTY	UOM	Base Amt	Unit Amt	Gross Amount	Discount	Net Amount
101244422	CAT-3	20	GAL	0.00	149.27	2,985.40	87%	388.10
100003678	SAND-PREMIUM WHITE-20/40	2381	SK	0.00	43.83	104,359.23	87%	13,566.70
101357947	SAND-CRC-20/40	12110	LB	0.00	3.03	36,693.30	87%	4,770.13
216319	Proppant Handl & Stor. Sol Chg Per lb	250190	LB	0.00	0.09	22,517.10	87%	2,927.22
216318	Proppant Del Sol Chg, per ton mile	4378	TNM	0.00	4.05	17,730.90	87%	2,305.02
				Totals	***USD***	**771,663.83**	**675,697.54**	**95,966.29**

Halliburton Rep: DAMIAN BENNETT
Customer Agent: DOMINIC GARDELLA
Halliburton Approval

THIS OUTPUT DOES NOT INCLUDE TAXES. APPLICABLE SALES TAX WILL BE BILLED ON THE FINAL INVOICE.
CUSTOMER HEREBY ACKNOWLEDGES RECEIPT OF THE MATERIALS AND SERVICES DESCRIBED ABOVE AND ON THE ATTACHED DOCUMENTS.

X

Customer Signature

FIELD TICKET TOTAL: USD 95,966.29

Was our HSE performance satisfactory? **Y or N** *(Health, Safety, Environment)*
Were you satisfied with our Equipment? **Y or N**
Were you satisfied with our people? **Y or N**

Comments