

30.025-42795

Phoenix Technology Services SURVEY DATA CERTIFICATION

HOBBS OCD
DEC 19 2016
RECEIVED



PHOENIX
TECHNOLOGY SERVICES

PHOENIX JOB NUMBER

1610088

OPERATOR

Chevron

WELL NAME SD EA 18 Fed P6 5H

COUNTY & STATE

Lea County, NM

API WELL NUMBER

30-025-42795

PROPOSED DIRECTION

354.12

TIE-IN DATA						
MEASURED	VERTICAL			N-S	E-W	DATA
DEPTH	DEPTH	INCLIN	AZIMUTH	COORD	COORD	SOURCE
.00 ft	.00 ft	0.0°	0.0°	0.00 N	0.00 E	Surface

FIRST	FIRST		
SURVEY	SURVEY		
DATE	DEPTH	INCLIN	AZIMUTH
27-Jan	183 ft	0.5°	78.4°

SURVEY INSTRUMENT

TYPE

Phoenix MWD

LAST	LAST		
SURVEY	SURVEY		
DATE	DEPTH	INCLIN	AZIMUTH
9-Apr-16	14,156 ft	91.3°	359.1°

TO THE BEST OF MY KNOWLEDGE I
CERTIFY THIS SURVEY DATA TO BE
TRUE AND CORRECT.

PROJECTED	PROJECTED		
TD SURVEY	TD SURVEY		
DATE	DEPTH	INCLIN	AZIMUTH
9-Apr-16	14,214 ft	91.3°	359.1°

Lance Mosby

PRINT YOUR NAME ABOVE

Lance Mosby

SIGN YOUR NAME ABOVE

MAGNETIC DECLINATION OR TOTAL GRID

TOTAL CORRECTION USED

6.60°

DECLINATION OR GRID

GRID

Saturday, April 09, 2016

TODAY'S DATE

MWD SUPERVISOR 1

Robert Brewer

DIRECTIONAL DRILLER 1

Casey Tubbe

MWD SUPERVISOR 2

Lance Mosby

DIRECTIONAL DRILLER 2

Justin Jackson

12329 Cutten Rd.,

Houston, Texas 77066

(713)337-0600 (Voice), (713)337-0599 (Fax)



Chevron

Lea County, NM (NAD27 NME)
SD EA 18 Fed
P6 5H

OH / Job 1610088

Survey: Phoenix MWD Surveys

Standard Survey Report

11 April, 2016

HOBBS OCD
DEC 19 2016
RECEIVED





Phoenix Technology Services Survey Report



Company: Chevron
Project: Lea County, NM (NAD27 NME)
Site: SD EA 18 Fed
Well: P6 5H
Wellbore: OH / Job 1610088
Design: Surveys (Pace X30)

Local Co-ordinate Reference: Well P6 5H
TVD Reference: RKB @ 3232.00usft (Pace X30)
MD Reference: RKB @ 3232.00usft (Pace X30)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: Compass 5000 GCR

Project	Lea County, NM (NAD27 NME)		
Map System:	US State Plane 1927 (Exact solution)	System Datum:	Mean Sea Level
Geo Datum:	NAD 1927 (NADCON CONUS)		
Map Zone:	New Mexico East 3001		

Site	SD EA 18 Fed		
Site Position:		Northing:	377,363.00 usft
From:	Map	Easting:	724,737.00 usft
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "
		Latitude:	32° 2' 7.48080 N
		Longitude:	103° 36' 29.13299 W
		Grid Convergence:	0 38 °

Well	P6 5H		
Well Position	+N/-S	0.00 usft	Northing: 377,363.00 usft
	+E/-W	0.00 usft	Easting: 724,737.00 usft
Position Uncertainty	0.00 usft	Wellhead Elevation:	0.00 usft
		Latitude:	32° 2' 7.48080 N
		Longitude:	103° 36' 29.13299 W
		Ground Level:	3,205.00 usft

Wellbore	OH / Job 1610088		
Magnetics	Model Name	Sample Date	Declination
	HDGM	1/27/2016	(°) 6.98
			Dip Angle (°) 59.77
			Field Strength (nT) 48,056

Design	Surveys (Pace X30)		
Audit Notes:			
Version:	1.0	Phase:	ACTUAL
		Tie On Depth:	0.00
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)
	0.00	0.00	0.00
			Direction (°) 354.12

Survey Program	Date 4/11/2016		
From (usft)	To (usft)	Survey (Wellbore)	Tool Name
183.00	14,214.00	Phoenix MWD Surveys (OH / Job 1610088)	PHX+MWD+HDGM
			Description
			PHX+OWSG MWD + HDGM

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
183.00	0.50	78.40	183.00	0.16	0.78	0.08	0.27	0.27	0.00
First Phoenix Survey									
369.00	1.10	64.40	368.98	1.10	3.19	0.76	0.34	0.32	-7.53
492.00	1.60	60.00	491.94	2.46	5.74	1.86	0.41	0.41	-3.58
676.00	1.90	60.60	675.86	5.25	10.62	4.13	0.16	0.16	0.33
798.00	2.30	65.60	797.78	7.25	14.61	5.72	0.36	0.33	4.10
969.00	2.30	70.80	968.64	9.80	20.98	7.60	0.12	0.00	3.04
1,154.00	0.80	310.80	1,153.59	11.86	23.51	9.39	1.51	-0.81	-64.86
1,339.00	2.40	279.30	1,338.52	13.33	18.71	11.35	0.96	0.86	-17.03
1,520.00	5.00	284.80	1,518.12	15.96	7.34	15.12	1.45	1.44	3.04



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North Reference: Grid
Survey Calculation Method: Minimum Curvature
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Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Bulld Rate (°/100usft)	Turn Rate (°/100usft)
1,697.00	5.50	285.70	1,695.38	20.22	-8.29	20.97	0.29	0.28	0.51
1,874.00	6.10	284.20	1,871.47	24.83	-25.57	27.31	0.35	0.34	-0.85
2,051.00	6.80	285.00	2,047.35	29.85	-44.81	34.28	0.40	0.40	0.45
2,228.00	5.40	291.50	2,223.35	35.61	-62.68	41.84	0.88	-0.79	3.67
2,406.00	5.10	294.40	2,400.60	41.95	-77.68	49.68	0.22	-0.17	1.63
2,583.00	4.00	289.30	2,577.04	47.24	-90.67	56.27	0.66	-0.62	-2.88
2,760.00	4.00	286.60	2,753.61	51.04	-102.41	61.26	0.11	0.00	-1.53
2,938.00	4.80	290.00	2,931.09	55.36	-115.36	66.88	0.47	0.45	1.91
3,115.00	4.00	298.50	3,107.56	60.84	-127.74	73.60	0.58	-0.45	4.80
3,292.00	3.90	295.30	3,284.14	66.36	-138.61	80.20	0.14	-0.06	-1.81
3,470.00	2.80	304.00	3,461.84	71.38	-147.69	86.13	0.68	-0.62	4.89
3,647.00	1.70	308.90	3,638.70	75.45	-153.32	90.75	0.63	-0.62	2.77
3,825.00	4.20	298.20	3,816.45	80.18	-161.12	96.26	1.43	1.40	-6.01
4,002.00	5.10	296.90	3,992.87	86.81	-173.85	104.15	0.51	0.51	-0.73
4,179.00	4.60	301.00	4,169.23	94.02	-186.94	112.67	0.34	-0.28	2.32
4,356.00	4.30	304.80	4,345.70	101.46	-198.48	121.25	0.24	-0.17	2.15
4,534.00	3.60	299.90	4,523.27	108.06	-208.80	128.87	0.44	-0.39	-2.75
4,670.00	4.30	300.90	4,658.95	112.81	-216.88	134.42	0.52	0.51	0.74
4,793.00	4.00	297.60	4,781.63	117.16	-224.64	139.55	0.31	-0.24	-2.68
4,970.00	4.20	297.60	4,958.18	123.02	-235.85	146.53	0.11	0.11	0.00
5,147.00	4.50	296.40	5,134.67	129.11	-247.82	153.81	0.18	0.17	-0.68
5,325.00	4.30	293.50	5,312.14	134.88	-260.19	160.81	0.17	-0.11	-1.63
5,502.00	4.40	293.00	5,488.63	140.18	-272.52	167.35	0.06	0.06	-0.28
5,679.00	4.20	291.50	5,665.13	145.21	-284.81	173.60	0.13	-0.11	-0.85
5,856.00	4.10	294.10	5,841.67	150.17	-296.61	179.75	0.12	-0.06	1.47
6,034.00	4.30	293.90	6,019.19	155.47	-308.52	186.24	0.11	0.11	-0.11
6,211.00	4.30	293.50	6,195.69	160.80	-320.67	192.79	0.02	0.00	-0.23
6,389.00	4.20	292.20	6,373.20	165.93	-332.83	199.13	0.08	-0.06	-0.73
6,566.00	4.10	290.60	6,549.74	170.60	-344.75	205.00	0.09	-0.06	-0.90
6,743.00	3.90	286.40	6,726.31	174.53	-356.45	210.11	0.20	-0.11	-2.37
6,921.00	4.00	292.50	6,903.89	178.61	-367.99	215.35	0.24	0.06	3.43
7,098.00	3.30	291.90	7,080.53	182.88	-378.42	220.66	0.40	-0.40	-0.34
7,275.00	3.90	302.10	7,257.18	187.97	-388.25	226.74	0.49	0.34	5.76
7,453.00	3.70	300.50	7,434.79	194.11	-398.33	233.87	0.13	-0.11	-0.90
7,630.00	3.60	284.30	7,611.43	198.38	-408.63	239.17	0.58	-0.06	-9.15
7,807.00	3.50	297.90	7,788.10	202.28	-418.79	244.09	0.48	-0.06	7.68
7,985.00	3.90	301.00	7,965.72	207.94	-428.78	250.75	0.25	0.22	1.74
8,162.00	3.00	296.60	8,142.40	213.11	-438.08	256.85	0.53	-0.51	-2.49
8,340.00	2.80	316.50	8,320.18	218.35	-445.24	262.79	0.57	-0.11	11.18
8,517.00	2.50	303.40	8,496.99	223.61	-451.44	268.66	0.38	-0.17	-7.40
8,695.00	3.30	295.10	8,674.76	227.92	-459.32	273.75	0.51	0.45	-4.66
8,796.00	6.70	333.80	8,775.39	234.45	-464.56	280.78	4.56	3.37	38.32
8,840.00	11.80	346.00	8,818.81	241.12	-466.78	287.64	12.36	11.59	27.73



Phoenix Technology Services

Survey Report



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 Site: SD EA 18 Fed
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 Wellbore: OH / Job 1610088
 Design: Surveys (Pace X30)

Local Co-ordinate Reference: Well P6 5H
 TVD Reference: RKB @ 3232.00usft (Pace X30)
 MD Reference: RKB @ 3232.00usft (Pace X30)
 North Reference: Grid
 Survey Calculation Method: Minimum Curvature
 Database: Compass 5000 GCR

Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N-S (usft)	+E-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
8,885.00	16.90	353.90	8,862.39	252.10	-468.59	298.75	12.11	11.33	17.56
8,929.00	22.00	353.00	8,903.87	266.65	-470.27	313.39	11.61	11.59	-2.05
8,973.00	25.90	351.80	8,944.07	284.34	-472.65	331.24	8.93	8.86	-2.73
9,018.00	28.50	347.60	8,984.09	304.56	-476.36	351.73	7.18	5.78	-9.33
9,062.00	30.30	347.00	9,022.43	325.63	-481.11	373.18	4.15	4.09	-1.36
9,106.00	31.20	345.60	9,060.24	347.49	-486.44	395.46	2.61	2.05	-3.18
9,151.00	35.50	348.10	9,097.82	371.57	-492.04	420.00	10.03	9.56	5.56
9,195.00	40.60	349.70	9,132.46	398.18	-497.24	447.00	11.80	11.59	3.64
9,239.00	47.30	351.20	9,164.12	428.28	-502.27	477.45	15.41	15.23	3.41
9,284.00	53.50	352.70	9,192.79	462.59	-507.11	512.08	14.01	13.78	3.33
9,328.00	61.10	356.00	9,216.55	499.41	-510.70	549.07	18.39	17.27	7.50
9,372.00	68.20	359.00	9,235.38	539.10	-512.41	588.73	17.27	16.14	6.82
9,424.00	78.60	359.10	9,250.22	588.86	-513.23	638.32	20.00	20.00	0.19
9,504.00	89.10	359.20	9,258.77	668.28	-514.41	717.44	13.13	13.13	0.13
9,593.00	90.80	359.90	9,258.85	757.27	-515.11	806.04	2.07	1.91	0.79
9,682.00	91.40	359.70	9,257.14	846.26	-515.42	894.58	0.71	0.67	-0.22
9,770.00	92.50	359.50	9,254.15	934.20	-516.03	982.13	1.27	1.25	-0.23
9,859.00	93.20	359.30	9,249.72	1,023.09	-516.96	1,070.64	0.82	0.79	-0.22
9,948.00	93.90	359.50	9,244.21	1,111.91	-517.89	1,159.09	0.82	0.79	0.22
10,037.00	93.70	0.00	9,238.31	1,200.71	-518.28	1,247.47	0.60	-0.22	0.56
10,125.00	94.10	359.60	9,232.33	1,288.51	-518.59	1,334.83	0.64	0.45	-0.45
10,214.00	95.60	359.40	9,224.81	1,377.19	-519.36	1,423.12	1.70	1.69	-0.22
10,302.00	95.40	0.00	9,216.37	1,464.78	-519.82	1,510.30	0.72	-0.23	0.68
10,391.00	94.30	0.80	9,208.85	1,553.46	-519.20	1,598.45	1.53	-1.24	0.90
10,481.00	93.00	0.70	9,203.12	1,643.26	-518.02	1,687.67	1.45	-1.44	-0.11
10,570.00	92.80	1.10	9,198.61	1,732.14	-516.63	1,775.93	0.50	-0.22	0.45
10,659.00	92.90	1.10	9,194.19	1,821.01	-514.92	1,864.16	0.11	0.11	0.00
10,748.00	88.90	359.00	9,192.79	1,909.98	-514.84	1,952.65	5.08	-4.49	-2.36
10,836.00	88.60	359.10	9,194.71	1,997.94	-516.30	2,040.31	0.36	-0.34	0.11
10,925.00	89.60	359.30	9,196.11	2,086.92	-517.54	2,128.95	1.15	1.12	0.22
11,014.00	90.80	359.70	9,195.80	2,175.92	-518.32	2,217.55	1.42	1.35	0.45
11,103.00	92.00	359.90	9,193.62	2,264.89	-518.63	2,306.09	1.37	1.35	0.22
11,192.00	92.10	0.20	9,190.44	2,353.83	-518.55	2,394.55	0.36	0.11	0.34
11,281.00	91.70	359.70	9,187.49	2,442.78	-518.63	2,483.05	0.72	-0.45	-0.56
11,370.00	90.40	0.10	9,185.86	2,531.77	-518.79	2,571.58	1.53	-1.46	0.45
11,458.00	90.50	359.50	9,185.17	2,619.76	-519.09	2,659.14	0.69	0.11	-0.68
11,547.00	90.30	358.20	9,184.55	2,708.74	-520.88	2,747.84	1.48	-0.22	-1.46
11,635.00	90.10	357.90	9,184.24	2,796.69	-523.88	2,835.63	0.41	-0.23	-0.34
11,725.00	91.30	359.30	9,183.14	2,886.65	-526.07	2,925.34	2.05	1.33	1.56
11,813.00	90.50	357.50	9,181.76	2,974.60	-528.53	3,013.08	2.24	-0.91	-2.05
11,902.00	90.70	358.30	9,180.82	3,063.54	-531.79	3,101.88	0.93	0.22	0.90
11,990.00	91.70	2.10	9,178.98	3,151.50	-531.49	3,189.35	4.46	1.14	4.32
12,079.00	93.40	2.60	9,175.02	3,240.33	-527.84	3,277.35	1.99	1.91	0.56



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Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
12,167.00	92.20	1.60	9,170.72	3,328.17	-524.62	3,364.39	1.77	-1.36	-1.14
12,256.00	91.10	0.40	9,168.16	3,417.11	-523.07	3,452.71	1.83	-1.24	-1.35
12,345.00	88.20	359.30	9,168.70	3,506.10	-523.30	3,541.25	3.48	-3.26	-1.24
12,434.00	89.10	358.60	9,170.80	3,595.06	-524.93	3,629.91	1.28	1.01	-0.79
12,522.00	87.90	357.30	9,173.10	3,682.97	-528.08	3,717.68	2.01	-1.36	-1.48
12,611.00	88.20	358.80	9,176.13	3,771.86	-531.10	3,806.42	1.72	0.34	1.69
12,700.00	89.70	2.70	9,177.76	3,860.82	-529.94	3,894.79	4.69	1.69	4.38
12,788.00	91.60	4.50	9,176.77	3,948.63	-524.41	3,981.57	2.97	2.16	2.05
12,877.00	91.60	2.60	9,174.28	4,037.42	-518.91	4,069.33	2.13	0.00	-2.13
12,966.00	91.20	0.40	9,172.11	4,126.36	-516.58	4,157.57	2.51	-0.45	-2.47
13,055.00	91.70	0.10	9,169.85	4,215.33	-516.19	4,246.03	0.66	0.56	-0.34
13,144.00	91.90	359.50	9,167.06	4,304.29	-516.50	4,334.55	0.71	0.22	-0.67
13,232.00	90.90	359.70	9,164.91	4,392.26	-517.11	4,422.12	1.16	-1.14	0.23
13,321.00	91.20	359.00	9,163.28	4,481.24	-518.12	4,510.73	0.86	0.34	-0.79
13,410.00	90.50	359.10	9,161.96	4,570.21	-519.60	4,599.39	0.79	-0.79	0.11
13,499.00	90.00	358.00	9,161.57	4,659.18	-521.85	4,688.13	1.36	-0.56	-1.24
13,588.00	92.20	358.80	9,159.86	4,748.12	-524.33	4,776.86	2.63	2.47	0.90
13,677.00	91.50	357.90	9,156.99	4,837.04	-526.90	4,865.57	1.28	-0.79	-1.01
13,766.00	88.70	358.30	9,156.83	4,925.98	-529.85	4,954.34	3.18	-3.15	0.45
13,854.00	90.10	359.30	9,157.75	5,013.95	-531.69	5,042.04	1.96	1.59	1.14
13,943.00	91.30	358.20	9,156.67	5,102.92	-533.63	5,130.74	1.83	1.35	-1.24
14,032.00	90.20	359.10	9,155.50	5,191.89	-535.73	5,219.46	1.60	-1.24	1.01
14,121.00	90.80	359.00	9,154.72	5,280.87	-537.20	5,308.12	0.68	0.67	-0.11
14,156.00	91.30	359.10	9,154.08	5,315.86	-537.78	5,342.99	1.46	1.43	0.29
Final Phoenix MWD Survey									
14,214.00	91.30	359.10	9,152.77	5,373.84	-538.69	5,400.75	0.00	0.00	0.00
Projection to TD									

Survey Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
183.00	183.00	0.16	0.78	First Phoenix Survey
14,156.00	9,154.08	5,315.86	-537.78	Final Phoenix MWD Survey
14,214.00	9,152.77	5,373.84	-538.69	Projection to TD

Checked By: _____ Approved By: _____ Date: _____

SD EA 18 FED P6 @005H

PERF & FRAC INFORMATION

STAGE 1: 14015, 13953, 13893, 13833, 13773

6 spf, .41 dia hole.

PUMP STAGE 1:

Sand in formation 419,808 lbs 100% Prime up & test lines to 9500psi.
Equalize/open well @ 1219 psi. Avg Rate 83.3 bpm. Avg press:5336 psi.
Max Rate: 85.5 bpm Max Press:8603 psi. ISIP:1957 psi
Pump Time 124 mins Total clean fluid 9157 bbls Total slurry volume 9609 bbls
Sand pumped: Sand 100 – 328240 lbs Sand 40/70 – 387,208 lbs TOTAL:420,032 lbs

STAGE 2: 13743, 13717, 13651, 13593, 12533, 13473

6 jspf, .41 dia hole. Total bbls pmpd: 330 bbls, max pressure 2323 psi

PUMP STAGE 2:

Sand in formation 419,808 lbs: 100% Test lines to 9500 psi.
Equalize/open well @ 1661 psi. Avg Rate: 89.2 bpm Avg Pressure 5044 psi
Max rate: 91.1 bpm Max Pressure 7443 psi ISIP 2267 psi
Pump Time: 60 mins. Total clean fluid:9109 bbls Total Slurry volume:9560 bbls
Sand pumped: Sand 100 – 30,956 lbs, Sand 40/70: 388,040 lbs TOTAL: 418,996 lbs

STAGE 3: 13443, 13413, 13353, 13270, 13210, 13173

6 jspf, .41 dia hole. Total bbls pmpd: 300 bbls. Max pressure: 2356 psi

PUMP STAGE 3

Sand in formation 419,808 lbs, 100% Prime up & test lines to 9500psi.
Equalize/open well @ 1157 psi. Ave Rate: 90.4 bpm Ave Pressure: 6212 psi
Max Rate:90.7 bpm, Max Pressure: 7506 psi. ISIP: 2273 psi.
Pump Time: 113 mins. Total clean fluid: 8861 bbls. Total slurry volume:9314 bbls
Sand Pumped: Sand 100 –33,097 lbs, Sand 40/70:387,875 lbs. TOTAL: 420,972 lbs

STAGE 4: 13103, 13063, 12993, 12933, 12873

6 JSPF, .41 dia hole. Line tension before set 1300 psi & 1040 after. Max press of 2327 psi w/244 bbls pumped.

PUMP STAGE 4:

Sand in formation 419,808 lbs, 100% Prime up & test lines to 9500 psi.
Equalize/open well @ 1716 psi. Avg Rate: 89.7 bpm, Avg Pressure: 6039 psi.
Max Rate: 90.4 bpm, Max Pressure: 8661 psi. ISIP:2254 psi.
Pump Time: 122 mins. Total clean fluid: 9118 bbls, Total slurry volume: 9570 bbls
Sand pumped: Sand 100: 32,227 lbs, Sand 40/70L 387,525 lbs, TOTAL: 419,752 lbs

STAGE 5: 12831, 12797, 12732, 12695, 12634, 12574

6 JSPF, .41 dia hole. Pump dn @ 12 bpm. . Max pressure of 2456 psi w/227 bbls pumped.

PUMP STAGE 5:

Sand in formation: 419,808 lbs, 100%, Prime up & test lines to 9500psi.
Equalize/open well @1907 psi. Ave Rate: 89.3 bpm, Avg pressure:6096 psi
Max Rate:90.3 bpm, Max Pressure: 8628 psi. ISIP: 2488 psi.
Pump Time: 120 mins. Total clean fluid:8734 bbls, Total Slurry volume:9187 bbls

Sand pumped: Sand 100:33,159 lbs, Sand 40/70:388,234 lbs, TOTAL: 421,393 lbs

STAGE 6: 12539, 12513, 12453, 12393, 12333, 12273

6 JSPF, .41 dia hole. Pump dn @ 12 bpm. Max Pressure of 2733 psi w/255 bbls pumped.

PUMP STAGE 6:

Sand in formation: 419,808 lbs, 100%. Prime up & test lines to 9500 psi.

Equalize/open well @ 1779 psi. Ave Rate:85.5 bpm, Ave Pressure: 5702 psi.

Max rate:86.8 bpm, Max Pressure:8634 psi. ISIP:2581 psi.

Pump time:118 mins. Total clean fluid: 8956 bbls, Total Slurry volume:9409 bbls

Sand pumped: sand 100:33,784 lbs, sand 40/70:386,525 lbs. TOTAL:420,309 lbs

STAGE 7: 12233, 12213, 12153, 12093, 12033, 11973

6 JSPF, .41 dia hole. Pump dn @ 12 bpm. . Max pressure of 2603 psi w/226 bbls pumped.

PUMP STAGE 7:

Sand in formation: 419,808 lbs,101 %, Prime up & test lines to 9500 psi.

Equalize/open hole @1835 psi. Ave rate:90.0 bpm, Ave Pressure:6044 psi

Max rate: 90.0 bpm, Max Pressure:8676 psi. ISIP: 2521 psi.

Pump time:118 mins. Total clean fluid:8891 bbls, Total slurry volume:9346 bbls.

Sand Pumped: Sand 100:32,508 lbs, Sand 40/70: 389,592 lbs, TOTAL:422,100 lbs

STAGE 8: 11943, 11913, 11853, 11773, 11723, 11673

6 JSPF, .41 dia hole. Pump dn @ 12 bpm. Max pressure of 2370 psi w/171 bbls pumped.

PUMP STAGE 8:

Sand in formation: 419,808 lbs, 100%, Prime up & test lines to 9500 psi.

Equalize/open hole @ 1886 psi. Ave Rate: 85.5 bpm, Ave pressure: 5914 psi

Max Rate: 87.4 bpm, Max pressure: 8545 psi. ISIP: 2496 psi.

Pump time: 118 mins. Total clean fluid: 8798 bbls, Total slurry volume: 9252 bbls

Sand pumped: Sand 100: 33,410 lbs, Sand 40/70: 387,713 lbs. TOTAL 421,123 lbs

STAGE 9: 11633, 11613, 11550, 11493, 11438, 11373

6 JSPF, .41 dia hole. Pump dn @ 12 bpm. Max pressure of 2577 psi w/187 bbls pumped.

PUMP STAGE 9:

Sand in Formation: 419,808 lbs, 100% Prime up & test lines to 9500 psi.

Equalize/open well @ 1791 psi. Ave Rate: 85.4 bpm, Ave Pressure: 5914 psi.

Max rate: 86.1 bpm, Max pressure: 8262 psi. ISIP: 2469 psi.

Pump time: 118 mins. Total Clean fluid: 8832 bbls, Total slurry volume: 9285 bbls

Sand pumped: Sand 100: 33,266 lbs, Sand 40/70: 387,565 lbs. TOTAL: 420,831 lbs

STAGE 10: 11300, 11260, 11220, 11180, 11040

6 JSPF, .41 dia hole. Pump dn @ 12 bpm. Max press of 5893 psi w/196 bbls pumped.

PUMP STAGE 10:

Sand in formation: 299,975 lbs, 100% Prime up and test lines to 9500 psi.

Equalize/open well @ 1903 psi. Ave Rate: 90.0 bpm, Ave Pressure: 5470 psi.

Max Rate: 90.0 bpm, Max pressure: 7332 psi. ISIP: 2603 psi.

Pump time: 118 mins. Total clean fluid: 6669 bbls, Total slurry volume: 6993bbls

Sand pumped: Sand 100: 20,091 lbs, Sand 40/70: 280,457 lbs. TOTAL 300,548 lbs

STAGE 11: 11110, 11070, 11030, 10990, 10950, 10910

6 JSPF, .41 dia hole. Pump dn @ 12 bpm. Max Press 4319 psi w/152 bbls pumped.

PUMP STAGE 11:

Sand in formation: 299,975 lbs, 64%, Prime up and test lines to 9500 psi.

Equalize/open well @ 1777 psi. Ave Rate: 83.1 bpm. Ave Pressure: 6228 psi.

Max rate: 86.2 bpm, Max pressure: 8746 psi. ISIP: 3468 psi.

Pump time: 157 mins. Total clean fluid: 6362 bbls, total slurry volume 6568 bbls.

Sand pumped: Sand 100: 20,963 lbs, Sand 40/70: 170,620 lbs, TOTAL: 191,583 lbs

STAGE 12: 10870, 10830, 10780, 10725, 10680, 10630

6 JSPF, .41 dia hole. Pump dn @ 12 bpm. Max Pressure of 4948 psi w/151 bbls pumped.

PUMP STAGE 12:

Sand in formation: 369,967 lbs, 100% Prime up and test lines to 9500 psi.

Equalize/open well @ 1871 psi. Ave Rate: 85.0 bpm, Ave pressure: 5579 psi

Max rate: 86.0 bpm, Max pressure: 7878 psi, ISIP: 2792 psi.

Pump time: 126 mins, Total clean fluid: 7969 bbls, Total slurry volume: 8367 bbls.

Sand pumped: Sand 100: 23,560 lbs, Sand 40/70: 346,632 lbs, TOTAL: 370,192 lbs.

STAGE 13: 10595, 10535, 10465, 10395, 10328, 10265

6 JSPF, .41 dia hole. Pump dn @ 12 bpm. Max pressure of 2618 psi w/113 bbls pumped.

PUMP STAGE 13:

Sand in formation: 470,063 lbs, 100%, Prime up & test lines to 9500 psi.

Equalize/open well @ 1886 psi. Ave Rate: 90.0 bpm, Ave Pressure: 5570 psi.

Max Rate: 90.5 bpm, Max Pressure: 8179 psi. ISIP: 2780 psi.

Pump time: 120 mins. Total clean fluid: 9852 bbls, Total slurry volume: 10,358 bbls.

Sand pumped: Sand 100: 32,433 lbs, Sand 40/70: 438,114 lbs TOTAL: 470,547 lbs

STAGE 14: 10234, 10174, 10115, 10055, 9990, 9934

6 JSPF, .41 dia hole. Pump down @ 15 bpm. Max press of 2600 psi w/96 bbls pumped.

PUMP STAGE 14:

Sand in formation: 470,063 lbs 100%. Prime up & test lines to 9500 psi.

Equalize/open hole W 1843 psi. Ave rate: 84.8 bpm, Ave Press: 5489 psi

Max Rate: 85.4 bpm, Max pressure: 7857 psi. ISIP: 2566 psi.

Pump time: 148 mins. Total clean fluid: 9895 bbls, Total slurry volume: 10,401 bbls.

Sand pumped: Sand 100: 32,569 lbs, Sand 40/70: 437,437 lbs, TOTAL 470,006 lbs.

STAGE 15: 9904, 9874, 9815, 9750, 9685, 9619

6 JSPF, .41 dia hole. Pump dn @ 12 bpm. Max press 2426 psi @ 50 bbls pumped.

PUMP STAGE 15:

Sand in formation: 419850 lbs, 100%. Prime up & test lines to 9500 psi.

Equalize/open well @ 2013 psi. Ave Rate: 86.0 bpm, Ave Pressure: 5288 psi.

Max Rate: 86.6bpm, Max pressure: 8456 psi, ISIP:2474 psi.

Pump time 134 mins, Total clean fluid: 8846 bbls, Total slurry volume: 9298 bbls

Sand pumped: Sand 100: 33,970 lbs, Sand 40/70: 385,677 lbs, TOTAL 419,647 lbs