

**Phoenix Technology Services
SURVEY DATA CERTIFICATION**



PHOENIX JOB NUMBER 1310351

OPERATOR Chesapeake Energy

WELL NAME West Shugart 2-19-30 State #4H

COUNTY & STATE Eddy Co, NM

API WELL NUMBER	3001540843
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PROPOSED DIRECTION	89.82
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TIE-IN DATA						
MEASURED	VERTICAL			N-S	E-W	DATA
DEPTH	DEPTH	INCLIN	AZIMUTH	COORD	COORD	SOURCE
ft	.00 ft	.0 ft	.0 ft	.00 ft	.00 ft	Surface

FIRST SURVEY DATE	FIRST SURVEY DEPTH	INCLIN	AZIMUTH
27 APR 13	100 ft	0.05	357.1

SURVEY INSTRUMENT TYPE
Phoenix MWD

LAST SURVEY DATE	LAST SURVEY DEPTH	INCLIN	AZIMUTH
11-May-13	13,073 ft	94.5	84.6

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

PROJECTED TD SURVEY DATE	PROJECTED TD SURVEY DEPTH	INCLIN	AZIMUTH
11-May-13	13,140 ft	94.5	84.6

Derek Webster

PRINT YOUR NAME ABOVE

Derek Webster

SIGN YOUR NAME ABOVE

MAGNETIC DECLINATION OR TOTAL GRID

TOTAL CORRECTION USED	7.37
DECLINATION OR GRID	GRID

2013/05/11

TODAY'S DATE

MWD SUPERVISOR 1 Derek Webster

DIRECTIONAL DRILLER 1

Keith Scheppeler

MWD SUPERVISOR 2 Zak Dawson

DIRECTIONAL DRILLER 2

Justin Jackson

1805 Britmore Road Houston, Texas 77043 (713)3370609 (Voice), (713)337-0599 (Fax)



Directional Survey

30-015-4084/3

Well Name *CHK*WEST SHUGART 2-19-30 STATE 004H	Lease West Shugart	Field Name Benson	Business Unit Mid-Continent
Ground Elevation (ft)	Original RKB (ft)	Current RKB Elevation	Mud Line Elevation (ft) Water Depth (ft)

Wellbore Name Original Hole	Parent Wellbore Original Hole	Kick Off Depth (ftKB) 8,149	Vertical Section Direction (°) 89.82
UTM Northing (Y) (ft)	UTM Easting (X) (ft)	UTM Grid Zone	
Date 4/24/2013	Definitive? N	Description Actual Survey	Planned? N
MD Tie In (ftKB)	TVD Tie In (ftKB)	Inclination Tie In (°)	Azimuth Tie In (°)
		NSTie In (ft)	EW Tie In (ft)

Survey Data

MD (ftKB)	Incl (°)	Azm (°)	TVD (ftKB)	NS (ft)	EW (ft)	VS (ft)	DLS (°/100ft)	Method	Survey Company	Build (°/100ft)	Depart (ft)	Turn (°/100ft)	Unuse d data
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	MWD	Phoenix	0.00	0.00	0.00	N
100	0.05	357.10	100.00	0.04	0.00	0.00	0.05	Gyro MS	Phoenix	0.05	0.04	357.10	N
200	0.22	55.98	200.00	0.19	0.15	0.16	0.20	Gyro MS	Phoenix	0.17	0.25	-	N
												301.12	N
300	0.34	171.10	300.00	0.01	0.36	0.36	0.48	Gyro MS	Phoenix	0.12	0.36	115.12	N
400	0.15	317.26	400.00	-0.19	0.32	0.32	0.47	Gyro MS	Phoenix	-0.19	0.37	146.16	N
500	0.17	27.43	500.00	0.04	0.30	0.30	0.18	Gyro MS	Phoenix	0.02	0.30	-	N
												289.83	N
600	0.25	318.89	600.00	0.34	0.22	0.22	0.25	Gyro MS	Phoenix	0.08	0.40	291.46	N
655	0.20	275.50	655.00	0.44	0.05	0.05	0.31	MWD	Phoenix	-0.09	0.44	-78.89	N
836	0.10	12.20	836.00	0.62	-0.23	-0.23	0.13	MWD	Phoenix	-0.06	0.66	-	N
												145.47	N
1,026	0.40	68.50	1,026.00	1.03	0.42	0.42	0.19	MWD	Phoenix	0.16	1.11	29.63	N
1,215	0.50	87.00	1,214.99	1.31	1.86	1.86	0.09	MWD	Phoenix	0.05	2.27	9.79	N
1,406	0.50	49.20	1,405.98	1.90	3.32	3.32	0.17	MWD	Phoenix	0.00	3.82	-19.79	N
1,596	0.70	77.30	1,595.97	2.70	5.08	5.09	0.18	MWD	Phoenix	0.11	5.75	14.79	N
1,786	0.90	69.80	1,785.95	3.47	7.61	7.62	0.12	MWD	Phoenix	0.11	8.36	-3.95	N
1,976	0.70	65.30	1,975.94	4.47	10.07	10.08	0.11	MWD	Phoenix	-0.11	11.01	-2.37	N
2,166	0.50	25.10	2,165.93	5.70	11.47	11.49	0.24	MWD	Phoenix	-0.11	12.81	-21.16	N
2,357	0.50	356.40	2,356.92	7.29	11.77	11.80	0.13	MWD	Phoenix	0.00	13.85	173.46	N
2,547	0.40	339.70	2,546.91	8.74	11.49	11.52	0.09	MWD	Phoenix	-0.05	14.44	-8.79	N
2,737	0.40	10.40	2,736.91	10.01	11.38	11.41	0.11	MWD	Phoenix	0.00	15.16	-	N
												173.32	N
2,927	0.30	1.50	2,926.90	11.16	11.51	11.55	0.06	MWD	Phoenix	-0.05	16.04	-4.68	N
3,118	0.20	14.20	3,117.90	11.98	11.61	11.65	0.06	MWD	Phoenix	-0.05	16.68	6.65	N
3,308	0.30	339.00	3,307.90	12.77	11.51	11.55	0.09	MWD	Phoenix	0.05	17.19	170.95	N
3,450	0.50	312.40	3,449.90	13.53	10.92	10.96	0.19	MWD	Phoenix	0.14	17.39	-18.73	N
3,624	0.40	317.40	3,623.89	14.49	9.95	9.99	0.06	MWD	Phoenix	-0.06	17.58	2.87	N
3,814	0.50	314.20	3,813.89	15.56	8.91	8.95	0.05	MWD	Phoenix	0.05	17.93	-1.68	N
4,003	0.80	321.00	4,002.87	17.16	7.48	7.54	0.16	MWD	Phoenix	0.16	18.72	3.60	N
4,193	0.80	334.60	4,192.86	19.39	6.08	6.14	0.10	MWD	Phoenix	0.00	20.32	7.16	N
4,383	1.10	333.40	4,382.83	22.22	4.69	4.76	0.16	MWD	Phoenix	0.16	22.71	-0.63	N
4,573	1.50	304.40	4,572.78	25.25	1.83	1.91	0.40	MWD	Phoenix	0.21	25.32	-15.26	N
4,763	2.70	295.30	4,762.65	28.57	-4.27	-4.18	0.65	MWD	Phoenix	0.63	28.89	-4.79	N
4,953	0.70	335.10	4,952.56	31.54	-8.81	-8.71	1.16	MWD	Phoenix	-1.05	32.74	20.95	N
5,144	1.80	132.90	5,143.54	30.55	-7.10	-7.00	1.29	MWD	Phoenix	0.58	31.37	-	N
												105.86	N
5,333	0.70	260.50	5,332.51	28.34	-6.06	-5.98	1.21	MWD	Phoenix	-0.58	28.98	67.51	N
5,523	1.80	319.20	5,522.47	30.41	-9.16	-9.06	0.82	MWD	Phoenix	0.58	31.76	30.89	N
5,713	1.10	75.30	5,712.43	33.13	-9.35	-9.24	1.31	MWD	Phoenix	-0.37	34.42	-	N
												128.37	N
5,903	0.80	67.80	5,902.41	34.10	-6.35	-6.25	0.17	MWD	Phoenix	-0.16	34.68	-3.95	N
6,094	2.20	95.30	6,093.34	34.26	-1.47	-1.36	0.80	MWD	Phoenix	0.73	34.29	14.40	N
6,284	1.20	78.90	6,283.25	34.31	4.12	4.22	0.58	MWD	Phoenix	-0.53	34.55	-8.63	N
6,465	1.60	153.10	6,464.21	32.42	7.12	7.22	0.95	MWD	Phoenix	0.22	33.19	40.99	N
6,645	1.60	288.40	6,644.18	30.97	5.87	5.97	1.64	MWD	Phoenix	0.00	31.52	75.17	N
6,825	2.70	293.90	6,824.05	33.48	-0.39	-0.28	0.62	MWD	Phoenix	0.61	33.48	3.06	N



Directional Survey

Well Name *CHK*WEST SHUGART 2-19-30 STATE 004H		Lease West Shugart	Field Name Benson	Business Unit Mid-Continent	
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Survey Data

MD (ftKB)	Incl (°)	Azm (°)	TVD (ftKB)	NS (ft)	EW (ft)	VS (ft)	DLS (°/100ft)	Method	Survey Company	Build (°/100ft)	Depart (ft)	Turn (°/100ft)	Unuse d data
7,006	2.40	180.10	7,004.96	31.42	-4.30	-4.20	2.36	MWD	Phoenix	-0.17	31.71	-62.87	N
7,186	2.00	179.50	7,184.82	24.51	-4.27	-4.20	0.22	MWD	Phoenix	-0.22	24.88	-0.33	N
7,367	1.10	193.10	7,365.76	19.66	-4.64	-4.58	0.53	MWD	Phoenix	-0.50	20.20	7.51	N
7,548	0.90	103.90	7,546.74	17.62	-3.65	-3.60	0.78	MWD	Phoenix	-0.11	18.00	-49.28	N
7,728	1.20	123.60	7,726.71	16.24	-0.71	-0.66	0.26	MWD	Phoenix	0.17	16.26	10.94	N
7,909	0.80	71.70	7,907.68	15.59	2.07	2.11	0.52	MWD	Phoenix	-0.22	15.72	-28.67	N
7,987	0.30	47.40	7,985.68	15.90	2.73	2.78	0.69	MWD	Phoenix	-0.64	16.13	-31.15	N
8,044	0.90	291.40	8,042.68	16.16	2.43	2.48	1.87	MWD	Phoenix	1.05	16.34	428.07	N
8,089	1.20	333.40	8,087.67	16.71	1.89	1.94	1.78	MWD	Phoenix	0.67	16.82	93.33	N
8,134	5.80	80.60	8,132.59	17.51	3.92	3.98	13.91	MWD	Phoenix	10.22	17.94	-	N
												561.78	
8,179	11.60	83.40	8,177.06	18.40	10.66	10.72	12.92	MWD	Phoenix	12.89	21.27	6.22	N
8,225	18.00	84.20	8,221.51	19.65	22.34	22.40	13.92	MWD	Phoenix	13.91	29.75	1.74	N
8,270	23.80	86.40	8,263.53	20.92	38.33	38.40	13.00	MWD	Phoenix	12.89	43.67	4.89	N
8,315	29.50	89.20	8,303.73	21.65	58.49	58.56	12.97	MWD	Phoenix	12.67	62.37	6.22	N
8,360	34.70	89.50	8,341.84	21.92	82.39	82.46	11.56	MWD	Phoenix	11.56	85.26	0.67	N
8,405	36.20	92.90	8,378.50	21.35	108.48	108.55	5.50	MWD	Phoenix	3.33	110.56	7.56	N
8,450	36.60	95.90	8,414.73	19.30	135.10	135.16	4.05	MWD	Phoenix	0.89	136.47	6.67	N
8,496	40.20	92.30	8,450.77	17.30	163.58	163.64	9.21	MWD	Phoenix	7.83	164.50	-7.83	N
8,541	44.90	89.50	8,483.92	16.85	194.00	194.05	11.26	MWD	Phoenix	10.44	194.73	-6.22	N
8,586	51.60	87.40	8,513.87	17.79	227.53	227.59	15.29	MWD	Phoenix	14.89	228.23	-4.67	N
8,631	58.20	86.60	8,539.73	19.73	264.28	264.34	14.74	MWD	Phoenix	14.67	265.01	-1.78	N
8,676	64.70	87.40	8,561.22	21.79	303.73	303.80	14.53	MWD	Phoenix	14.44	304.51	1.78	N
8,721	70.30	91.50	8,578.44	22.16	345.28	345.34	15.02	MWD	Phoenix	12.44	345.99	9.11	N
8,766	74.70	93.50	8,591.97	20.28	388.14	388.20	10.66	MWD	Phoenix	9.78	388.67	4.44	N
8,811	80.30	93.10	8,601.71	17.75	431.98	432.04	12.47	MWD	Phoenix	12.44	432.35	-0.89	N
8,857	81.80	92.80	8,608.87	15.41	477.36	477.41	3.32	MWD	Phoenix	3.26	477.61	-0.65	N
8,902	85.10	92.90	8,614.00	13.19	522.00	522.04	7.34	MWD	Phoenix	7.33	522.17	0.22	N
8,947	90.30	93.20	8,615.80	10.80	566.89	566.92	11.57	MWD	Phoenix	11.56	566.99	0.67	N
8,992	91.90	93.10	8,614.94	8.32	611.81	611.83	3.56	MWD	Phoenix	3.56	611.87	-0.22	N
9,082	92.00	93.20	8,611.88	3.38	701.62	701.63	0.16	MWD	Phoenix	0.11	701.63	0.11	N
9,173	92.10	93.90	8,608.62	-2.25	792.39	792.38	0.78	MWD	Phoenix	0.11	792.39	0.77	N
9,263	89.10	93.90	8,607.68	-8.37	882.17	882.14	3.33	MWD	Phoenix	-3.33	882.21	0.00	N
9,353	89.00	93.80	8,609.17	-14.41	971.95	971.90	0.16	MWD	Phoenix	-0.11	972.06	-0.11	N
9,444	88.30	91.90	8,611.32	-18.94	1,062.81	1,062.74	2.22	MWD	Phoenix	-0.77	1,062.98	-2.09	N
9,534	89.50	91.10	8,613.04	-21.29	1,152.76	1,152.69	1.60	MWD	Phoenix	1.33	1,152.96	-0.89	N
9,624	90.50	90.00	8,613.04	-22.15	1,242.75	1,242.68	1.65	MWD	Phoenix	1.11	1,242.95	-1.22	N
9,714	91.10	89.90	8,611.79	-22.08	1,332.74	1,332.67	0.68	MWD	Phoenix	0.67	1,332.93	-0.11	N
9,805	91.80	89.90	8,609.49	-21.92	1,423.71	1,423.64	0.77	MWD	Phoenix	0.77	1,423.88	0.00	N
9,895	92.90	89.90	8,605.80	-21.76	1,513.64	1,513.56	1.22	MWD	Phoenix	1.22	1,513.79	0.00	N
9,986	93.00	89.40	8,601.11	-21.21	1,604.51	1,604.44	0.56	MWD	Phoenix	0.11	1,604.65	-0.55	N
10,076	92.50	89.70	8,596.79	-20.50	1,694.41	1,694.33	0.65	MWD	Phoenix	-0.56	1,694.53	0.33	N
10,166	90.90	90.30	8,594.12	-20.50	1,784.36	1,784.29	1.90	MWD	Phoenix	-1.78	1,784.48	0.67	N
10,257	91.50	90.30	8,592.22	-20.98	1,875.34	1,875.27	0.66	MWD	Phoenix	0.66	1,875.46	0.00	N



Directional Survey

Well Name *CHK*WEST SHUGART 2-19-30 STATE 004H		Lease West Shugart	Field Name Benson	Business Unit Mid-Continent	
Ground Elevation (ft)	Original RKB (ft)	Current RKB Elevation		Mud Line Elevation (ft)	Water Depth (ft)

Survey Data													
MD (ftKB)	Incl (°)	Azin (°)	TVD (ftKB)	NS (ft)	EW (ft)	VS (ft)	DLS (°/100ft)	Method	Survey Company	Build (°/100ft)	Depart (ft)	Turn (°/100ft)	Unuse d data
10,347	90.10	91.00	8,590.96	-22.00	1,965.32	1,965.25	1.74	MWD	Phoenix	-1.56	1,965.45	0.78	N
10,437	90.60	91.40	8,590.41	-23.88	2,055.30	2,055.22	0.71	MWD	Phoenix	0.56	2,055.44	0.44	N
10,527	90.20	91.40	8,589.78	-26.08	2,145.27	2,145.18	0.44	MWD	Phoenix	-0.44	2,145.43	0.00	N
10,618	89.80	91.20	8,589.78	-28.15	2,236.25	2,236.15	0.49	MWD	Phoenix	-0.44	2,236.43	-0.22	N
10,708	89.50	89.70	8,590.33	-28.85	2,326.24	2,326.14	1.70	MWD	Phoenix	-0.33	2,326.42	-1.67	N
10,798	89.50	89.30	8,591.12	-28.07	2,416.24	2,416.14	0.44	MWD	Phoenix	0.00	2,416.40	-0.44	N
10,889	90.60	89.50	8,591.04	-27.11	2,507.23	2,507.13	1.23	MWD	Phoenix	1.21	2,507.38	0.22	N
10,979	90.60	89.00	8,590.10	-25.94	2,597.22	2,597.12	0.56	MWD	Phoenix	0.00	2,597.35	-0.56	N
11,069	89.70	88.40	8,589.86	-23.89	2,687.19	2,687.10	1.20	MWD	Phoenix	-1.00	2,687.30	-0.67	N
11,159	88.00	88.20	8,591.67	-21.22	2,777.13	2,777.05	1.90	MWD	Phoenix	-1.89	2,777.21	-0.22	N
11,250	87.60	88.10	8,595.16	-18.29	2,868.02	2,867.94	0.45	MWD	Phoenix	-0.44	2,868.07	-0.11	N
11,340	89.30	88.10	8,597.59	-15.31	2,957.93	2,957.87	1.89	MWD	Phoenix	1.89	2,957.97	0.00	N
11,430	89.50	89.20	8,598.54	-13.19	3,047.90	3,047.84	1.24	MWD	Phoenix	0.22	3,047.93	1.22	N
11,520	88.00	91.20	8,600.50	-13.50	3,137.87	3,137.81	2.78	MWD	Phoenix	-1.67	3,137.90	2.22	N
11,610	88.40	93.90	8,603.33	-17.50	3,227.73	3,227.66	3.03	MWD	Phoenix	0.44	3,227.77	3.00	N
11,700	88.90	94.00	8,605.45	-23.70	3,317.49	3,317.40	0.57	MWD	Phoenix	0.56	3,317.57	0.11	N
11,791	88.00	92.60	8,607.91	-28.94	3,408.30	3,408.19	1.83	MWD	Phoenix	-0.99	3,408.42	-1.54	N
11,881	87.50	90.30	8,611.44	-31.21	3,498.20	3,498.08	2.61	MWD	Phoenix	-0.56	3,498.34	-2.56	N
11,971	90.20	88.80	8,613.25	-30.50	3,588.16	3,588.05	3.43	MWD	Phoenix	3.00	3,588.29	-1.67	N
12,061	89.10	86.60	8,613.80	-26.89	3,678.08	3,677.98	2.73	MWD	Phoenix	-1.22	3,678.18	-2.44	N
12,152	90.20	86.30	8,614.36	-21.26	3,768.91	3,768.82	1.25	MWD	Phoenix	1.21	3,768.97	-0.33	N
12,242	89.90	86.20	8,614.28	-15.37	3,858.71	3,858.65	0.35	MWD	Phoenix	-0.33	3,858.74	-0.11	N
12,332	89.40	85.90	8,614.83	-9.17	3,948.50	3,948.45	0.65	MWD	Phoenix	-0.56	3,948.51	-0.33	N
12,423	88.60	86.80	8,616.42	-3.38	4,039.30	4,039.27	1.32	MWD	Phoenix	-0.88	4,039.30	0.99	N
12,513	86.30	88.10	8,620.42	0.62	4,129.11	4,129.09	2.93	MWD	Phoenix	-2.56	4,129.11	1.44	N
12,603	86.80	87.30	8,625.84	4.23	4,218.87	4,218.87	1.05	MWD	Phoenix	0.56	4,218.88	-0.89	N
12,693	86.90	86.20	8,630.78	9.32	4,308.59	4,308.60	1.23	MWD	Phoenix	0.11	4,308.60	-1.22	N
12,784	88.30	85.40	8,634.59	15.98	4,399.27	4,399.29	1.77	MWD	Phoenix	1.54	4,399.29	-0.88	N
12,874	90.30	85.30	8,635.69	23.27	4,488.96	4,489.01	2.22	MWD	Phoenix	2.22	4,489.02	-0.11	N



Directional Survey

Well Name *CHK*WEST SHUGART 2-19-30 STATE 004H		Lease West Shugart		Field Name Benson		Business Unit Mid-Continent	
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Survey Data													
MD (ftKB)	Incl (°)	Azm (°)	TVD (ftKB)	NS (ft)	EW (ft)	VS (ft)	DLS (°/100ft)	Method	Survey Company	Build (°/100ft)	Depart (ft)	Turn (°/100ft)	Unuse d data
12,964	92.10	84.40	8,633.81	31.35	4,578.57	4,578.65	2.24	MWD	Phoenix	2.00	4,578.68	-1.00	N
13,054	94.00	84.80	8,629.02	39.81	4,668.04	4,668.14	2.16	MWD	Phoenix	2.11	4,668.21	0.44	N
13,073	94.50	84.60	8,627.61	41.56	4,686.91	4,687.01	2.83	MWD	Phoenix	2.63	4,687.09	-1.05	N
13,140	94.50	84.60	8,622.35	47.84	4,753.40	4,753.53	0.00	Projection	Phoenix	0.00	4,753.64	0.00	N