

Phoenix Technology Services
SURVEY DATA CERTIFICATION



PHOENIX JOB NUMBER 1310494

OPERATOR Chesapeake Energy

WELL NAME West Shugart 2-19-30 State #3H

COUNTY & STATE

Eddy Co, NM

API WELL NUMBER 3001540842

PROPOSED DIRECTION 89.82

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	FIRST SURVEY		
DATE	DEPTH	INCLIN	AZIMUTH
GYRO	100 ft	0.27	349.24

SURVEY INSTRUMENT
TYPE
Phoenix MWD

LAST SURVEY	LAST SURVEY		
DATE	DEPTH	INCLIN	AZIMUTH
25-May-13	13,063 ft	88.3	90.6

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
25-May-13	13,130 ft	88.3	90.6

Derek Webster

PRINT YOUR NAME ABOVE

[Signature]

SIGN YOUR NAME ABOVE

MAGNETIC DECLINATION OR TOTAL GRID

TOTAL CORRECTION USED	7.37
DECLINATION OR GRID	GRID

5/25/2013

TODAY'S DATE

MWD SUPERVISOR 1

Derek Webster

DIRECTIONAL DRILLER 1

Keith Sheppler

MWD SUPERVISOR 2

Zak Dawson

DIRECTIONAL DRILLER 2

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Directional Survey

30-015-40842

Well Name *CHK*WEST SHUGART 2-19-30 STATE 003H		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) 8,083	Vertical Section Direction (°) 89.82
UTM Northing (Y) (ft)		UTM Easting (X) (ft)		UTM Grid Zone	
Date 5/6/2013		Definitive? N		Description Actual Survey – Original Hole	Planned? N
MD Tie In (ftKB)	TVD Tie In (ftKB)	Inclination Tie In (°)	Azimuth Tie In (°)	NS Tie 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
100	0.27	349.24	100.00	0.23	-0.04	-0.04	0.27	Gyro MS	Gyrodata Inc.	0.27	0.24	349.24	N
200	0.91	338.10	199.99	1.20	-0.38	-0.38	0.65	Gyro MS	Gyrodata Inc.	0.64	1.26	-11.14	N
300	1.75	341.61	299.97	3.39	-1.16	-1.15	0.84	Gyro MS	Gyrodata Inc.	0.84	3.58	3.51	N
400	2.74	344.29	399.89	7.14	-2.29	-2.27	1.00	Gyro MS	Gyrodata Inc.	0.99	7.49	2.68	N
500	4.02	343.62	499.71	12.80	-3.93	-3.89	1.28	Gyro MS	Gyrodata Inc.	1.28	13.39	-0.67	N
600	6.04	340.78	599.32	21.13	-6.65	-6.58	2.03	Gyro MS	Gyrodata Inc.	2.02	22.15	-2.84	N
700	6.40	336.73	698.73	31.22	-10.58	-10.48	0.57	TieIn	Phoenix	0.36	32.96	-4.05	N
923	5.70	339.70	920.49	53.02	-19.33	-19.17	0.34	MWD	Phoenix	-0.31	56.44	1.33	N
1,102	1.90	9.70	1,099.08	64.29	-21.92	-21.72	2.33	MWD	Phoenix	-2.12	67.92	-	N
												184.36	
1,281	0.90	124.20	1,278.04	66.43	-20.26	-20.05	1.35	MWD	Phoenix	-0.56	69.45	63.97	N
1,459	0.90	120.70	1,456.02	64.93	-17.90	-17.69	0.03	MWD	Phoenix	0.00	67.35	-1.97	N
1,638	0.80	106.90	1,635.00	63.85	-15.49	-15.29	0.13	MWD	Phoenix	-0.06	65.70	-7.71	N
1,817	0.80	100.40	1,813.98	63.26	-13.07	-12.87	0.05	MWD	Phoenix	0.00	64.59	-3.63	N
1,996	0.60	80.60	1,992.97	63.18	-10.91	-10.72	0.17	MWD	Phoenix	-0.11	64.12	-11.06	N
2,175	0.70	68.60	2,171.96	63.74	-8.97	-8.77	0.09	MWD	Phoenix	0.06	64.36	-6.70	N
2,354	0.90	56.80	2,350.94	64.90	-6.78	-6.57	0.14	MWD	Phoenix	0.11	65.26	-6.59	N
2,533	0.70	61.20	2,529.93	66.20	-4.64	-4.44	0.12	MWD	Phoenix	-0.11	66.36	2.46	N
2,711	0.60	64.10	2,707.91	67.13	-2.85	-2.64	0.06	MWD	Phoenix	-0.06	67.19	1.63	N
2,890	0.70	73.50	2,886.90	67.85	-0.96	-0.75	0.08	MWD	Phoenix	0.06	67.86	5.25	N
3,069	0.60	51.30	3,065.89	68.75	0.82	1.04	0.15	MWD	Phoenix	-0.06	68.75	-12.40	N
3,247	0.40	56.40	3,243.88	69.68	2.06	2.28	0.11	MWD	Phoenix	-0.11	69.71	2.87	N
3,426	0.50	17.00	3,422.88	70.77	2.81	3.04	0.18	MWD	Phoenix	0.06	70.82	-22.01	N
3,534	0.40	14.70	3,530.88	71.58	3.05	3.27	0.09	MWD	Phoenix	-0.09	71.65	-2.13	N
3,713	0.30	21.60	3,709.87	72.62	3.38	3.61	0.06	MWD	Phoenix	-0.06	72.70	3.85	N
3,891	0.50	359.10	3,887.87	73.83	3.54	3.77	0.14	MWD	Phoenix	0.11	73.92	189.61	N
4,070	1.80	183.90	4,066.84	71.81	3.33	3.56	1.28	MWD	Phoenix	0.73	71.89	-97.88	N
4,248	1.40	184.70	4,244.77	66.85	2.97	3.18	0.23	MWD	Phoenix	-0.22	66.92	0.45	N
4,427	0.80	202.40	4,423.74	63.52	2.31	2.51	0.38	MWD	Phoenix	-0.34	63.56	9.89	N
4,605	0.70	228.10	4,601.73	61.64	1.03	1.22	0.20	MWD	Phoenix	-0.06	61.65	14.44	N
4,784	1.00	287.20	4,780.71	61.37	-1.28	-1.09	0.49	MWD	Phoenix	0.17	61.39	33.02	N
4,962	1.00	239.10	4,958.69	61.04	-4.10	-3.90	0.46	MWD	Phoenix	0.00	61.17	-27.02	N
5,141	2.10	254.40	5,137.62	59.35	-8.60	-8.41	0.65	MWD	Phoenix	0.61	59.97	8.55	N
5,320	2.50	250.00	5,316.47	57.13	-15.42	-15.24	0.24	MWD	Phoenix	0.22	59.18	-2.46	N
5,498	2.50	260.90	5,494.31	55.19	-22.90	-22.73	0.27	MWD	Phoenix	0.00	59.76	6.12	N
5,677	2.50	267.00	5,673.14	54.37	-30.66	-30.49	0.15	MWD	Phoenix	0.00	62.42	3.41	N
5,856	2.40	267.40	5,851.97	54.00	-38.30	-38.13	0.06	MWD	Phoenix	-0.06	66.20	0.22	N
6,034	1.90	271.60	6,029.85	53.91	-44.97	-44.80	0.29	MWD	Phoenix	-0.28	70.21	2.36	N
6,213	1.70	273.90	6,208.76	54.17	-50.59	-50.42	0.12	MWD	Phoenix	-0.11	74.12	1.28	N
6,392	0.20	175.40	6,387.73	54.04	-53.21	-53.04	0.97	MWD	Phoenix	-0.84	75.84	-55.03	N
6,570	0.40	156.50	6,565.73	53.16	-52.94	-52.77	0.12	MWD	Phoenix	0.11	75.03	-10.62	N
6,748	0.50	210.90	6,743.72	51.93	-53.09	-52.93	0.24	MWD	Phoenix	0.06	74.26	30.56	N
6,927	0.40	253.00	6,922.72	51.07	-54.09	-53.93	0.19	MWD	Phoenix	-0.06	74.39	23.52	N
7,106	0.70	244.90	7,101.71	50.43	-55.68	-55.52	0.17	MWD	Phoenix	0.17	75.12	-4.53	N
7,285	0.30	289.00	7,280.70	50.12	-57.11	-56.95	0.29	MWD	Phoenix	-0.22	75.98	24.64	N
7,464	0.10	297.10	7,459.70	50.34	-57.69	-57.53	0.11	MWD	Phoenix	-0.11	76.57	4.53	N
7,643	0.40	307.20	7,638.70	50.79	-58.33	-58.17	0.17	MWD	Phoenix	0.17	77.34	5.64	N



Directional Survey

Well Name *CHK*WEST SHUGART 2-19-30 STATE 003H		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 (ft)	Incl (°)	Azm (°)	TVD (ft)	NS (ft)	EW (ft)	VS (ft)	DLS (°/100ft)	Method	Survey Company	Build (°/100ft)	Depart (ft)	Turn (°/100ft)	Unuse d data
7,821	0.30	245.30	7,816.70	50.97	-59.25	-59.09	0.21	MWD	Phoenix	-0.06	78.15	-34.78	N
7,907	0.40	179.50	7,902.70	50.58	-59.45	-59.29	0.45	MWD	Phoenix	0.12	78.05	-76.51	N
7,950	0.40	194.50	7,945.70	50.28	-59.49	-59.33	0.24	MWD	Phoenix	0.00	77.89	34.88	N
7,995	1.20	93.60	7,990.69	50.10	-59.05	-58.90	2.97	MWD	Phoenix	1.78	77.44	-	N
												224.22	
8,039	6.40	80.30	8,034.58	50.48	-56.18	-56.02	11.91	MWD	Phoenix	11.82	75.53	-30.23	N
8,084	11.50	80.10	8,079.02	51.68	-49.28	-49.12	11.33	MWD	Phoenix	11.33	71.41	-0.44	N
8,129	17.50	81.40	8,122.57	53.46	-38.16	-37.99	13.35	MWD	Phoenix	13.33	65.68	2.89	N
8,173	23.00	83.90	8,163.83	55.37	-23.06	-22.89	12.65	MWD	Phoenix	12.50	59.98	5.68	N
8,218	27.00	85.20	8,204.61	57.16	-4.13	-3.95	8.97	MWD	Phoenix	8.89	57.31	2.89	N
8,263	30.00	87.10	8,244.15	58.58	17.29	17.47	6.96	MWD	Phoenix	6.67	61.08	4.22	N
8,307	31.90	87.40	8,281.88	59.66	39.89	40.08	4.33	MWD	Phoenix	4.32	71.77	0.68	N
8,352	34.60	92.80	8,319.52	59.58	64.54	64.73	8.90	MWD	Phoenix	6.00	87.84	12.00	N
8,397	39.40	95.50	8,355.45	57.59	91.53	91.71	11.26	MWD	Phoenix	10.67	108.14	6.00	N
8,442	42.50	94.60	8,389.44	55.00	120.91	121.08	7.01	MWD	Phoenix	6.89	132.83	-2.00	N
8,486	46.20	91.00	8,420.90	53.53	151.62	151.78	10.17	MWD	Phoenix	8.41	160.79	-8.18	N
8,531	49.50	88.90	8,451.09	53.57	184.97	185.14	8.11	MWD	Phoenix	7.33	192.57	-4.67	N
8,576	54.70	90.20	8,478.73	53.84	220.46	220.63	11.78	MWD	Phoenix	11.56	226.94	2.89	N
8,620	59.40	91.70	8,502.65	53.21	257.37	257.53	11.06	MWD	Phoenix	10.68	262.81	3.41	N
8,665	64.70	96.90	8,523.75	50.19	296.97	297.13	15.58	MWD	Phoenix	11.78	301.18	11.56	N
8,710	68.50	100.40	8,541.62	43.96	337.78	337.92	11.06	MWD	Phoenix	8.44	340.63	7.78	N
8,754	71.90	100.40	8,556.53	36.49	378.49	378.61	7.73	MWD	Phoenix	7.73	380.25	0.00	N
8,799	76.20	98.80	8,568.89	29.28	421.15	421.24	10.15	MWD	Phoenix	9.56	422.16	-3.56	N
8,844	82.20	96.10	8,577.32	23.57	464.95	465.02	14.58	MWD	Phoenix	13.33	465.55	-6.00	N
8,889	87.10	93.90	8,581.51	19.67	509.57	509.63	11.93	MWD	Phoenix	10.89	509.95	-4.89	N
8,978	90.10	92.70	8,583.69	14.55	598.38	598.43	3.63	MWD	Phoenix	3.37	598.56	-1.35	N
9,067	93.60	94.10	8,580.82	9.27	687.17	687.19	4.24	MWD	Phoenix	3.93	687.23	1.57	N
9,157	94.10	94.30	8,574.77	2.70	776.72	776.73	0.60	MWD	Phoenix	0.56	776.73	0.22	N
9,246	94.20	94.30	8,568.33	-3.96	865.24	865.22	0.11	MWD	Phoenix	0.11	865.25	0.00	N
9,336	94.30	94.10	8,561.66	-10.53	954.75	954.71	0.25	MWD	Phoenix	0.11	954.81	-0.22	N
9,425	93.20	93.20	8,555.84	-16.19	1,043.38	1,043.32	1.60	MWD	Phoenix	-1.24	1,043.50	-1.01	N
9,514	91.40	92.20	8,552.27	-20.37	1,132.20	1,132.13	2.31	MWD	Phoenix	-2.02	1,132.38	-1.12	N
9,604	91.50	91.90	8,549.99	-23.59	1,222.11	1,222.03	0.35	MWD	Phoenix	0.11	1,222.34	-0.33	N
9,693	90.20	90.70	8,548.67	-25.61	1,311.08	1,310.99	1.99	MWD	Phoenix	-1.46	1,311.33	-1.35	N
9,783	90.50	91.00	8,548.12	-26.95	1,401.07	1,400.97	0.47	MWD	Phoenix	0.33	1,401.33	0.33	N
9,872	89.10	89.90	8,548.43	-27.65	1,490.06	1,489.96	2.00	MWD	Phoenix	-1.57	1,490.32	-1.24	N
9,961	88.70	89.40	8,550.14	-27.10	1,579.04	1,578.95	0.72	MWD	Phoenix	-0.45	1,579.27	-0.56	N
10,051	89.00	89.40	8,551.95	-26.16	1,669.02	1,668.93	0.33	MWD	Phoenix	0.33	1,669.22	0.00	N
10,140	89.30	88.90	8,553.27	-24.84	1,758.00	1,757.91	0.66	MWD	Phoenix	0.34	1,758.17	-0.56	N
10,229	89.70	88.70	8,554.04	-22.98	1,846.97	1,846.89	0.50	MWD	Phoenix	0.45	1,847.12	-0.22	N
10,319	90.20	88.60	8,554.12	-20.86	1,936.95	1,936.87	0.57	MWD	Phoenix	0.56	1,937.06	-0.11	N
10,408	90.90	88.50	8,553.27	-18.60	2,025.92	2,025.85	0.79	MWD	Phoenix	0.79	2,026.00	-0.11	N
10,497	91.40	88.40	8,551.48	-16.20	2,114.87	2,114.80	0.57	MWD	Phoenix	0.56	2,114.93	-0.11	N



Directional Survey

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Survey Data

MD (ft)	Incl (°)	Azm (°)	TVD (ft)	NS (ft)	EW (ft)	VS (ft)	DLS (°/100ft)	Method	Survey Company	Build (°/100ft)	Depart (ft)	Turn (°/100ft)	Unused data
10,587	90.10	89.00	8,550.30	-14.16	2,204.83	2,204.78	1.59	MWD	Phoenix	-1.44	2,204.88	0.67	N
10,676	91.20	89.40	8,549.29	-12.91	2,293.82	2,293.76	1.32	MWD	Phoenix	1.24	2,293.85	0.45	N
10,766	88.70	89.20	8,549.37	-11.81	2,383.80	2,383.75	2.79	MWD	Phoenix	-2.78	2,383.83	-0.22	N
10,855	89.50	89.20	8,550.77	-10.57	2,472.78	2,472.74	0.90	MWD	Phoenix	0.90	2,472.80	0.00	N
10,945	86.50	89.90	8,553.91	-9.86	2,562.71	2,562.67	3.42	MWD	Phoenix	-3.33	2,562.73	0.78	N
11,034	86.50	90.10	8,559.34	-9.86	2,651.55	2,651.50	0.22	MWD	Phoenix	0.00	2,651.57	0.22	N
11,123	86.80	91.40	8,564.55	-11.03	2,740.39	2,740.34	1.50	MWD	Phoenix	0.34	2,740.41	1.46	N
11,213	87.20	91.50	8,569.26	-13.30	2,830.23	2,830.18	0.46	MWD	Phoenix	0.44	2,830.26	0.11	N
11,302	87.40	91.00	8,573.45	-15.24	2,919.11	2,919.05	0.60	MWD	Phoenix	0.22	2,919.15	-0.56	N
11,392	87.90	89.10	8,577.14	-15.32	3,009.03	3,008.97	2.18	MWD	Phoenix	0.56	3,009.07	-2.11	N
11,481	88.20	88.20	8,580.17	-13.22	3,097.96	3,097.90	1.07	MWD	Phoenix	0.34	3,097.98	-1.01	N
11,571	88.40	88.30	8,582.84	-10.48	3,187.87	3,187.83	0.25	MWD	Phoenix	0.22	3,187.89	0.11	N
11,660	89.70	88.00	8,584.31	-7.60	3,276.81	3,276.77	1.50	MWD	Phoenix	1.46	3,276.82	-0.34	N
11,749	89.60	87.60	8,584.86	-4.19	3,365.75	3,365.72	0.46	MWD	Phoenix	-0.11	3,365.75	-0.45	N
11,839	90.10	87.30	8,585.09	-0.18	3,455.66	3,455.64	0.65	MWD	Phoenix	0.56	3,455.66	-0.33	N
11,928	90.70	86.40	8,584.47	4.71	3,544.52	3,544.52	1.22	MWD	Phoenix	0.67	3,544.52	-1.01	N
12,017	90.90	84.90	8,583.23	11.46	3,633.25	3,633.27	1.70	MWD	Phoenix	0.22	3,633.27	-1.69	N
12,107	91.70	86.80	8,581.19	17.97	3,722.99	3,723.02	2.29	MWD	Phoenix	0.89	3,723.03	2.11	N
12,196	92.00	86.30	8,578.31	23.32	3,811.78	3,811.83	0.65	MWD	Phoenix	0.34	3,811.85	-0.56	N
12,285	92.20	89.00	8,575.05	26.97	3,900.64	3,900.70	3.04	MWD	Phoenix	0.22	3,900.73	3.03	N
12,375	92.30	89.10	8,571.52	28.46	3,990.55	3,990.62	0.16	MWD	Phoenix	0.11	3,990.66	0.11	N
12,464	90.00	89.90	8,569.73	29.24	4,079.53	4,079.60	2.74	MWD	Phoenix	-2.58	4,079.63	0.90	N
12,553	90.00	90.30	8,569.73	29.08	4,168.53	4,168.60	0.45	MWD	Phoenix	0.00	4,168.63	0.45	N
12,642	90.90	89.80	8,569.03	29.00	4,257.52	4,257.59	1.16	MWD	Phoenix	1.01	4,257.62	-0.56	N
12,732	89.80	90.80	8,568.48	28.53	4,347.52	4,347.58	1.65	MWD	Phoenix	-1.22	4,347.61	1.11	N
12,821	87.40	91.80	8,570.66	26.51	4,436.46	4,436.52	2.92	MWD	Phoenix	-2.70	4,436.54	1.12	N
12,910	87.40	91.40	8,574.69	24.03	4,525.33	4,525.39	0.45	MWD	Phoenix	0.00	4,525.40	-0.45	N
13,000	88.00	91.20	8,578.31	21.99	4,615.24	4,615.28	0.70	MWD	Phoenix	0.67	4,615.29	-0.22	N
13,063	88.30	90.60	8,580.34	21.00	4,678.20	4,678.24	1.06	MWD	Phoenix	0.48	4,678.24	-0.95	N



Directional Survey

Well Name *CHK*WEST SHUGART 2-19-30 STATE 003H		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 (°)	Azm (°)	TVD (ftKB)	NS (ft)	EW (ft)	VS (ft)	DLS (°/100ft)	Method	Survey Company	Build (°/100ft)	Depart (ft)	Turn (°/100ft)	Unuse d data
13,130	88.30	90.60	8,582.33	20.30	4,745.16	4,745.20	0.00	MWD	Phoenix	0.00	4,745.21	0.00	N