



30 015 42033

September 11, 2014

Devon Energy Production Co., L. P.
333 West Sheridan Ave
Oklahoma City, Oklahoma 73102-5010

Attn: David Cook

Re: **Arcturus 18 Federal Com No. 008H**

Please find enclosed a copy of the survey from 0.00' to 7206.00' ran on the above referenced well.

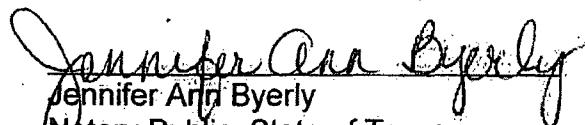
If I can be of any further service please do not hesitate to call me at 800-606-4976.

Sincerely,

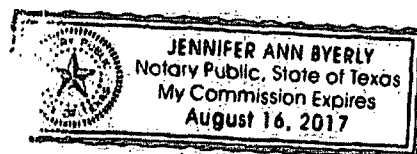

Keith Havelka
Operations

STATE OF TEXAS §
 §
COUNTY OF NUECES §

This instrument was acknowledged before me on the 11 day of September A.D., 2014, by Keith Havelka.

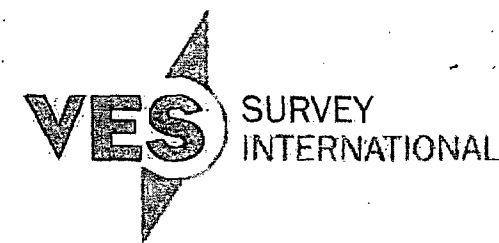

Jennifer Ann Byerly
Notary Public, State of Texas

VES Survey International
P.O. Box 261021 Corpus Christi, TX 78426
T (361) 767-0602 F (361) 767-0612
www.vessurvey.com





Company: DEVON ENERGY PRODUCTION COMPANY
Lease/Well: ARCTURUS 18 FEDERAL COM /No. 008H



Rig Name: SCAN TEXAS
State/County: NEW MEXICO/EDDY
Latitude: 32.65, Longitude: -103.90
GRID North is 0.23 Degrees East of True North
VS-Azi: 269.15 Degrees

Depth Reference : R.K.B= 26FT

DRILLOG MS GYRO SURVEY CALCULATIONS

Filename: arcturus 18 federal com 8h.ut

Minimum Curvature Method

Report Date/Time: 9/8/2014 / 16:26

VES Survey International

(432) 563-5444

West Texas

Surveyor: Javier Estrada

Arcturus 18 Federal Com No. 008H / API 30-015-42033

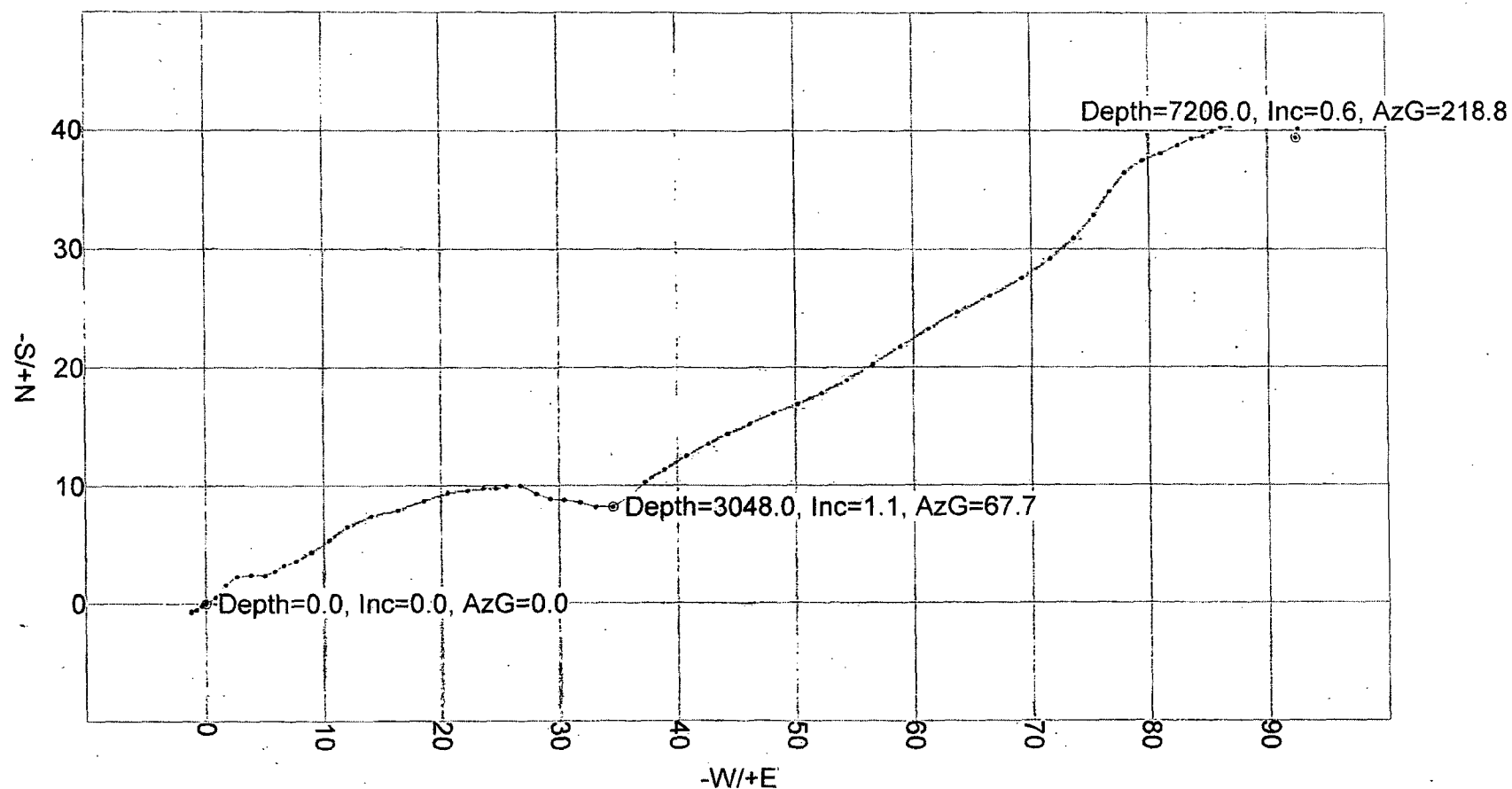
Measured Depth FT	Incl Angle Deg	Drift Direction Deg	TVD FT	+N/-S FT	+E/-W FT	Vertical Section FT	Closure Distance FT	Closure Direction Deg	Dogleg Severity Deg/100
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	****
118.50	0.11	2.43	118.50	0.12	0.01	-0.01	0.12	2.43	0.10
213.00	0.46	225.25	213.00	-0.05	-0.26	0.26	0.26	258.46	0.58
307.50	0.43	229.76	307.50	-0.55	-0.80	0.81	0.97	235.51	0.04
402.00	0.24	274.51	401.99	-0.77	-1.27	1.28	1.48	238.86	0.33
496.50	0.30	62.70	496.49	-0.64	-1.24	1.25	1.40	242.84	0.54
591.00	0.86	65.10	590.99	-0.23	-0.38	0.39	0.44	239.32	0.59
685.50	0.87	48.66	685.48	0.55	0.80	-0.81	0.97	55.63	0.26
780.00	0.81	31.59	779.97	1.59	1.69	-1.71	2.32	46.74	0.27
874.50	0.73	76.27	874.46	2.30	2.62	-2.66	3.49	48.76	0.62
969.00	0.73	89.68	968.95	2.45	3.81	-3.85	4.53	57.32	0.18
1063.50	0.69	95.54	1063.45	2.40	4.99	-5.02	5.53	64.34	0.09
1158.00	0.60	32.30	1157.94	2.76	5.82	-5.86	6.44	64.62	0.72
1252.50	0.61	81.78	1252.44	3.25	6.58	-6.63	7.34	63.69	0.54
1347.00	0.75	64.71	1346.93	3.59	7.63	-7.68	8.43	64.82	0.26
1441.50	1.12	57.66	1441.42	4.34	8.97	-9.03	9.96	64.15	0.41
1536.00	1.10	52.10	1535.90	5.39	10.46	-10.54	11.77	62.72	0.12
1630.50	1.22	54.86	1630.38	6.53	11.99	-12.09	13.65	61.45	0.14
1725.00	1.50	76.03	1724.85	7.40	14.01	-14.12	15.85	62.16	0.60

Measured Depth FT	Incl Angle Deg	Drift Direction Deg	TVD FT	+N/-S FT	+E/-W FT	Vertical Section FT	Closure Distance FT	Closure Direction Deg	Dogleg Severity Deg/100
1819.50	1.42	78.50	1819.32	7.93	16.36	-16.47	18.18	64.13	0.11
1914.00	1.46	63.35	1913.79	8.71	18.58	-18.70	20.52	64.89	0.40
2008.50	1.14	81.30	2008.27	9.39	20.58	-20.72	22.62	65.48	0.54
2103.00	0.91	84.75	2102.75	9.60	22.26	-22.40	24.24	66.67	0.25
2197.50	0.71	80.38	2197.25	9.76	23.59	-23.73	25.53	67.51	0.22
2292.00	0.64	100.82	2291.74	9.76	24.68	-24.83	26.54	68.42	0.27
2386.50	0.62	50.45	2386.23	9.99	25.59	-25.74	27.48	68.67	0.57
2481.00	0.97	112.13	2480.73	10.02	26.73	-26.88	28.55	69.45	0.92
2575.50	0.89	121.99	2575.21	9.33	28.09	-28.23	29.60	71.63	0.19
2670.00	0.66	95.70	2669.71	8.89	29.25	-29.38	30.58	73.10	0.44
2764.50	0.81	96.18	2764.20	8.76	30.46	-30.59	31.70	73.95	0.16
2859.00	0.83	98.78	2858.69	8.59	31.81	-31.93	32.94	74.89	0.05
2953.50	0.85	115.26	2953.18	8.18	33.12	-33.24	34.12	76.13	0.26
3048.00	1.06	67.65	3047.67	8.21	34.56	-34.68	35.53	76.63	0.84
3142.50	1.01	45.87	3142.15	9.12	35.97	-36.10	37.11	75.77	0.42
3237.00	1.09	52.04	3236.64	10.25	37.27	-37.42	38.66	74.62	0.14
3331.50	1.32	59.70	3331.11	11.35	38.92	-39.08	40.54	73.74	0.30
3426.00	1.33	57.59	3425.59	12.49	40.78	-40.96	42.65	72.97	0.05
3520.50	1.22	62.63	3520.07	13.54	42.60	-42.80	44.70	72.37	0.16
3615.00	1.10	63.62	3614.55	14.41	44.31	-44.52	46.59	71.99	0.12
3709.50	1.35	67.02	3709.02	15.25	46.15	-46.37	48.60	71.72	0.27
3804.00	1.31	65.45	3803.50	16.13	48.16	-48.39	50.79	71.48	0.06
3898.50	1.39	73.65	3897.97	16.90	50.24	-50.49	53.01	71.41	0.22
3993.00	1.38	58.28	3992.45	17.82	52.31	-52.57	55.26	71.18	0.39
4087.50	1.48	65.46	4086.92	18.93	54.39	-54.66	57.59	70.81	0.22
4182.00	1.68	53.29	4181.38	20.27	56.61	-56.90	60.13	70.30	0.41
4276.50	1.65	59.95	4275.84	21.78	58.90	-59.22	62.80	69.71	0.21
4371.00	1.75	55.89	4370.30	23.27	61.27	-61.61	65.54	69.21	0.17
4465.50	1.75	65.49	4464.76	24.67	63.78	-64.14	68.39	68.85	0.31
4560.00	1.91	62.13	4559.21	26.01	66.49	-66.87	71.39	68.63	0.21
4654.50	1.88	59.54	4653.66	27.53	69.22	-69.62	74.49	68.31	0.10
4749.00	1.66	50.56	4748.11	29.19	71.61	-72.03	77.33	67.82	0.37
4843.50	1.59	48.47	4842.57	30.92	73.65	-74.10	79.88	67.22	0.10
4938.00	1.53	33.40	4937.04	32.85	75.32	-75.80	82.17	66.44	0.44
5032.50	1.39	35.05	5031.51	34.84	76.67	-77.18	84.22	65.56	0.16
5127.00	1.15	46.72	5125.98	36.42	78.02	-78.55	86.10	64.97	0.37
5221.50	1.06	63.48	5220.47	37.46	79.49	-80.03	87.87	64.77	0.35
5316.00	1.01	74.67	5314.95	38.07	81.06	-81.62	89.56	64.84	0.22
5410.50	0.92	53.72	5409.44	38.74	82.48	-83.04	91.12	64.84	0.38

Measured Depth FT	Incl Angle Deg	Drift Direction Deg	TVD FT	+N/-S FT	+E/-W FT	Vertical Section FT	Closure Distance FT	Closure Direction Deg	Dogleg Severity Deg/100
5505.00	0.70	77.51	5503.93	39.31	83.66	-84.23	92.43	64.83	0.43
5599.50	0.56	83.29	5598.42	39.49	84.67	-85.25	93.43	64.99	0.16
5694.00	0.55	40.40	5692.92	39.89	85.42	-86.01	94.28	64.97	0.43
5788.50	0.53	91.70	5787.42	40.23	86.15	-86.74	95.08	64.97	0.49
5883.00	0.46	67.49	5881.91	40.36	86.94	-87.53	95.85	65.10	0.23
5977.50	0.48	83.52	5976.41	40.55	87.69	-88.28	96.61	65.18	0.14
6072.00	0.44	44.99	6070.91	40.85	88.33	-88.93	97.32	65.18	0.32
6166.50	0.47	90.13	6165.40	41.10	88.98	-89.58	98.01	65.21	0.37
6261.00	0.45	89.64	6259.90	41.10	89.74	-90.34	98.70	65.39	0.02
6355.50	0.36	49.69	6354.40	41.30	90.34	-90.94	99.33	65.43	0.31
6450.00	0.43	51.75	6448.90	41.71	90.84	-91.45	99.96	65.34	0.07
6544.50	0.55	113.88	6543.39	41.75	91.54	-92.15	100.61	65.48	0.55
6639.00	0.57	117.14	6637.89	41.35	92.38	-92.98	101.21	65.89	0.04
6733.50	0.04	107.38	6732.39	41.12	92.84	-93.44	101.54	66.11	0.56
6828.00	0.06	222.76	6826.89	41.07	92.84	-93.44	101.52	66.13	0.09
6922.50	0.25	186.23	6921.39	40.83	92.78	-93.37	101.37	66.25	0.22
7017.00	0.13	248.94	7015.89	40.59	92.66	-93.25	101.16	66.34	0.24
7111.50	0.50	170.69	7110.38	40.14	92.63	-93.21	100.95	66.57	0.52
7206.00	0.59	218.81	7204.88	39.35	92.39	-92.97	100.42	66.93	0.48



VES Survey International
(432) 563-5444
West Texas
Surveyor: Javier Estrada
Arcturus 18 Federal Com No. 008H / API 30-015-42033



VES Survey Date: 08/20/2014



Directional Survey

District DELAWARE BASIN	County EDDY	Field Name HACKBERRY	Project Group DELAWARE BASIN REG	State/Province NM			
Surface Legal Location Sec. 17 T19S R31E	API/UWI 3001542033	Latitude (°) 32° 39' 14.3" N	Longitude (°) 103° 53' 56.438" W	Ground Elev... 3,422.20	KB - GL (ft) 26.00	Orig KB Elev (ft) 3,448.20	Tubing Head Elevation (ft)
Wellbores							
Wellbore Name OH	Parent Wellbore	SAP Well ID	Kick Off Depth (ftKB) 7,330.0	Vertical Section Direction (°) 269.15			
Actual Deviation Survey GYRO/MWD, Proposed? No		Definitive? Yes	Proposed? No	Proposed Deviation Survey			

Deviation Survey

Date 8/20/2014	Description GYRO/MWD				
MD Tie In (ftKB) 0.00	TVD Tie In (ftKB) 0.00	Inclination Tie In (°) 0.00	Azimuth Tie In (°) 0.00	NS Tie In (ft) 0.00	EW Tie In (ft) 0.00

Survey Data

Date	MD (ftKB)	Incl (°)	Azm (°)	TVD (ftKB)	VS (ft)	N/S (ft)	E/W (ft)	DLS (°/100ft)	Survey Tool	Survey Company
8/20/2014	118.50	0.11	2.43	118.50	-0.01	0.11	0.00	0.09	GYRO	VAUHG N ENERGY SERVICES
8/20/2014	213.00	0.46	225.25	213.00	0.26	-0.06	-0.26	0.58	GYRO	VAUHG N ENERGY SERVICES
8/20/2014	307.50	0.43	229.76	307.50	0.81	-0.56	-0.80	0.05	GYRO	VAUHG N ENERGY SERVICES
8/20/2014	402.00	0.24	274.51	401.99	1.28	-0.77	-1.27	0.33	GYRO	VAUHG N ENERGY SERVICES
8/20/2014	496.50	0.30	62.70	496.49	1.26	-0.64	-1.25	0.55	GYRO	VAUHG N ENERGY SERVICES
8/20/2014	591.00	0.86	65.10	590.99	0.39	-0.23	-0.38	0.59	GYRO	VAUHG N ENERGY SERVICES
8/20/2014	685.50	0.87	48.66	685.48	-0.81	0.54	0.80	0.26	GYRO	VAUHG N ENERGY SERVICES
8/20/2014	780.00	0.81	31.59	779.97	-1.71	1.58	1.69	0.27	GYRO	VAUHG N ENERGY SERVICES
8/20/2014	874.50	0.73	76.27	874.46	-2.66	2.30	2.62	0.62	GYRO	VAUHG N ENERGY SERVICES
8/20/2014	969.00	0.73	89.68	968.95	-3.84	2.44	3.81	0.18	GYRO	VAUHG N ENERGY SERVICES
8/20/2014	1,063.50	0.69	95.54	1,063.45	-5.01	2.39	4.98	0.09	GYRO	VAUHG N ENERGY SERVICES
8/20/2014	1,158.00	0.60	32.30	1,157.94	-5.85	2.75	5.81	0.72	GYRO	VAUHG N ENERGY SERVICES
8/20/2014	1,252.50	0.61	81.78	1,252.44	-6.62	3.24	6.57	0.54	GYRO	VAUHG N ENERGY SERVICES
8/20/2014	1,347.00	0.75	64.71	1,346.93	-7.68	3.58	7.63	0.26	GYRO	VAUHG N ENERGY SERVICES
8/20/2014	1,441.50	1.12	57.66	1,441.42	-9.03	4.34	8.97	0.41	GYRO	VAUHG N ENERGY SERVICES
8/20/2014	1,536.00	1.10	52.10	1,535.90	-10.54	5.39	10.46	0.12	GYRO	VAUHG N ENERGY SERVICES
8/20/2014	1,630.50	1.22	54.86	1,630.38	-12.10	6.53	12.00	0.14	GYRO	VAUHG N ENERGY SERVICES
8/20/2014	1,725.00	1.50	76.03	1,724.85	-14.13	7.40	14.02	0.60	GYRO	VAUHG N ENERGY SERVICES
8/20/2014	1,819.50	1.42	78.50	1,819.32	-16.49	7.94	16.37	0.11	GYRO	VAUHG N ENERGY SERVICES
8/20/2014	1,914.00	1.46	63.35	1,913.79	-18.72	8.71	18.60	0.40	GYRO	VAUHG N ENERGY SERVICES
8/20/2014	2,008.50	1.14	81.30	2,008.27	-20.74	9.39	20.60	0.54	GYRO	VAUHG N ENERGY SERVICES
8/20/2014	2,103.00	0.91	84.75	2,102.75	-22.42	9.60	22.28	0.25	GYRO	VAUHG N ENERGY SERVICES
8/20/2014	2,197.50	0.71	80.38	2,197.24	-23.74	9.77	23.60	0.22	GYRO	VAUHG N ENERGY SERVICES
8/20/2014	2,292.00	0.64	100.82	2,291.74	-24.84	9.77	24.70	0.26	GYRO	VAUHG N ENERGY SERVICES
8/20/2014	2,386.50	0.62	50.45	2,386.23	-25.76	9.99	25.61	0.57	GYRO	VAUHG N ENERGY SERVICES
8/20/2014	2,481.00	0.97	112.13	2,480.73	-26.89	10.02	26.75	0.92	GYRO	VAUHG N ENERGY SERVICES
8/20/2014	2,575.50	0.89	121.99	2,575.21	-28.24	9.33	28.11	0.19	GYRO	VAUHG N ENERGY SERVICES
8/20/2014	2,670.00	0.66	95.70	2,669.70	-29.40	8.89	29.27	0.44	GYRO	VAUHG N ENERGY SERVICES
8/20/2014	2,764.50	0.81	96.18	2,764.20	-30.60	8.76	30.48	0.16	GYRO	VAUHG N ENERGY SERVICES
8/20/2014	2,859.00	0.83	98.78	2,858.69	-31.94	8.58	31.82	0.04	GYRO	VAUHG N ENERGY SERVICES
8/20/2014	2,953.50	0.85	115.26	2,953.18	-33.25	8.18	33.13	0.26	GYRO	VAUHG N ENERGY SERVICES
8/20/2014	3,048.00	1.06	67.65	3,047.67	-34.69	8.21	34.57	0.84	GYRO	VAUHG N ENERGY SERVICES
8/20/2014	3,142.50	1.01	45.87	3,142.15	-36.11	9.12	35.98	0.42	GYRO	VAUHG N ENERGY SERVICES
8/20/2014	3,237.00	1.09	52.04	3,236.63	-37.43	10.26	37.28	0.15	GYRO	VAUHG N ENERGY SERVICES
8/20/2014	3,331.50	1.32	59.70	3,331.11	-39.10	11.36	38.93	0.30	GYRO	VAUHG N ENERGY SERVICES
8/20/2014	3,426.00	1.33	57.59	3,425.59	-40.98	12.50	40.80	0.05	GYRO	VAUHG N ENERGY SERVICES
8/20/2014	3,520.50	1.22	62.63	3,520.07	-42.81	13.55	42.62	0.17	GYRO	VAUHG N ENERGY SERVICES
8/20/2014	3,615.00	1.10	63.62	3,614.55	-44.53	14.41	44.32	0.13	GYRO	VAUHG N ENERGY SERVICES
8/20/2014	3,709.50	1.35	67.02	3,709.02	-46.38	15.25	46.16	0.28	GYRO	VAUHG N ENERGY SERVICES
8/20/2014	3,804.00	1.31	65.45	3,803.50	-48.40	16.13	48.17	0.06	GYRO	VAUHG N ENERGY SERVICES
8/20/2014	3,898.50	1.39	73.65	3,897.97	-50.50	16.90	50.25	0.22	GYRO	VAUHG N ENERGY SERVICES
8/20/2014	3,993.00	1.38	58.28	3,992.45	-52.58	17.83	52.32	0.39	GYRO	VAUHG N ENERGY SERVICES
8/20/2014	4,087.50	1.48	65.46	4,086.92	-54.67	18.93	54.40	0.22	GYRO	VAUHG N ENERGY SERVICES
8/20/2014	4,182.00	1.68	53.29	4,181.38	-56.91	20.27	56.62	0.41	GYRO	VAUHG N ENERGY SERVICES
8/20/2014	4,276.50	1.65	59.95	4,275.84	-59.22	21.78	58.91	0.21	GYRO	VAUHG N ENERGY SERVICES
8/20/2014	4,371.00	1.75	55.89	4,370.30	-61.62	23.27	61.28	0.17	GYRO	VAUHG N ENERGY SERVICES
8/20/2014	4,465.50	1.75	65.49	4,464.75	-64.14	24.67	63.79	0.31	GYRO	VAUHG N ENERGY SERVICES

Directional Survey

District DELAWARE BASIN	County EDDY	Field Name HACKBERRY	Project Group DELAWARE BASIN REG	State/Province NM
Surface Legal Location Sec. 17 T19S R31E	API/UWI 3001542033	Latitude (°) 32° 39' 14.3" N	Longitude (°) 103° 53' 56.438" W	Ground Elev... 3,422.20
			KB - GL (ft) 26.00	Orig KB Elev (ft) 3,448.20
				Tubing Head Elevation (ft)

Survey Data

Date	MD (ftKB)	Incl (°)	Azm (°)	TVD (ftKB)	VS (ft)	N/S (ft)	E/W (ft)	DLS (°/100ft)	Survey Tool	Survey Company
8/20/2014	4,560.00	1.91	62.13	4,559.21	-66.87	26.01	66.49	0.20	GYRO	VAUHGN ENERGY SERVICES
8/20/2014	4,654.00	1.88	59.54	4,653.66	-69.62	27.53	69.22	0.10	GYRO	VAUHGN ENERGY SERVICES
8/20/2014	4,749.00	1.66	50.56	4,748.11	-72.04	29.19	71.61	0.37	GYRO	VAUHGN ENERGY SERVICES
8/20/2014	4,843.50	1.59	48.47	4,842.57	-74.10	30.92	73.65	0.10	GYRO	VAUHGN ENERGY SERVICES
8/20/2014	4,938.00	1.53	33.40	4,937.04	-75.81	32.85	75.33	0.44	GYRO	VAUHGN ENERGY SERVICES
8/20/2014	5,032.50	1.39	35.05	5,031.51	-77.19	34.84	76.68	0.15	GYRO	VAUHGN ENERGY SERVICES
8/20/2014	5,127.00	1.15	46.72	5,125.98	-78.56	36.43	78.03	0.37	GYRO	VAUHGN ENERGY SERVICES
8/20/2014	5,221.50	1.06	63.48	5,220.47	-80.05	37.47	79.50	0.35	GYRO	VAUHGN ENERGY SERVICES
8/20/2014	5,316.00	1.01	74.67	5,314.95	-81.64	38.08	81.09	0.22	GYRO	VAUHGN ENERGY SERVICES
8/20/2014	5,410.50	0.92	53.72	5,409.44	-83.07	38.75	82.50	0.38	GYRO	VAUHGN ENERGY SERVICES
8/20/2014	5,505.00	0.70	77.51	5,503.93	-84.25	39.32	83.68	0.42	GYRO	VAUHGN ENERGY SERVICES
8/20/2014	5,599.50	0.56	83.29	5,598.42	-85.27	39.50	84.70	0.16	GYRO	VAUHGN ENERGY SERVICES
8/20/2014	5,694.00	0.55	40.40	5,692.92	-86.03	39.90	85.45	0.43	GYRO	VAUHGN ENERGY SERVICES
8/20/2014	5,788.50	0.53	91.70	5,787.42	-86.77	40.23	86.18	0.50	GYRO	VAUHGN ENERGY SERVICES
8/20/2014	5,883.00	0.46	67.49	5,881.91	-87.56	40.36	86.97	0.23	GYRO	VAUHGN ENERGY SERVICES
8/20/2014	5,977.50	0.48	83.52	5,976.41	-88.30	40.55	87.71	0.14	GYRO	VAUHGN ENERGY SERVICES
8/20/2014	6,072.00	0.44	44.99	6,070.91	-88.96	40.85	88.36	0.32	GYRO	VAUHGN ENERGY SERVICES
8/20/2014	6,166.50	0.47	90.13	6,165.40	-89.61	41.11	89.01	0.37	GYRO	VAUHGN ENERGY SERVICES
8/20/2014	6,261.00	0.45	89.64	6,259.90	-90.37	41.11	89.77	0.02	GYRO	VAUHGN ENERGY SERVICES
8/20/2014	6,355.50	0.36	49.69	6,354.40	-90.97	41.31	90.36	0.31	GYRO	VAUHGN ENERGY SERVICES
8/20/2014	6,450.00	0.43	51.75	6,448.90	-91.48	41.72	90.87	0.08	GYRO	VAUHGN ENERGY SERVICES
8/20/2014	6,544.50	0.55	113.88	6,543.39	-92.17	41.75	91.56	0.55	GYRO	VAUHGN ENERGY SERVICES
8/20/2014	6,639.00	0.57	117.14	6,637.89	-93.00	41.36	92.39	0.04	GYRO	VAUHGN ENERGY SERVICES
8/20/2014	6,733.50	0.04	107.38	6,732.39	-93.44	41.13	92.84	0.56	GYRO	VAUHGN ENERGY SERVICES
8/20/2014	6,828.00	0.06	222.76	6,826.89	-93.44	41.09	92.84	0.09	GYRO	VAUHGN ENERGY SERVICES
8/20/2014	6,922.50	0.25	186.23	6,921.39	-93.38	40.84	92.79	0.22	GYRO	VAUHGN ENERGY SERVICES
8/20/2014	7,017.00	0.13	248.94	7,015.89	-93.26	40.60	92.66	0.24	GYRO	VAUHGN ENERGY SERVICES
8/20/2014	7,111.50	0.50	170.69	7,110.38	-93.22	40.16	92.63	0.52	GYRO	VAUHGN ENERGY SERVICES
8/20/2014	7,206.00	0.59	218.81	7,204.88	-92.97	39.37	92.39	0.48	GYRO	VAUHGN ENERGY SERVICES
8/21/2014	7,298.00	0.56	210.61	7,296.88	-92.43	38.61	91.87	0.10	MWD	WEATHERFORD
8/21/2014	7,330.00	1.55	259.79	7,328.87	-91.92	38.40	91.36	3.93	MWD	WEATHERFORD
8/22/2014	7,361.00	4.64	274.89	7,359.82	-90.26	38.43	89.70	10.22	MWD	WEATHERFORD
8/22/2014	7,393.00	8.08	277.55	7,391.62	-86.74	38.84	86.18	10.79	MWD	WEATHERFORD
8/22/2014	7,424.00	11.80	278.67	7,422.15	-81.46	39.60	80.88	12.02	MWD	WEATHERFORD
8/22/2014	7,456.00	15.27	280.72	7,453.26	-74.10	40.88	73.51	10.95	MWD	WEATHERFORD
8/22/2014	7,487.00	18.29	280.10	7,482.93	-65.33	42.49	64.70	9.76	MWD	WEATHERFORD
8/22/2014	7,519.00	20.39	278.24	7,513.13	-54.89	44.17	54.24	6.84	MWD	WEATHERFORD
8/22/2014	7,550.00	23.26	277.50	7,541.90	-43.50	45.75	42.83	9.30	MWD	WEATHERFORD
8/22/2014	7,581.00	25.84	274.20	7,570.10	-30.71	47.04	30.02	9.42	MWD	WEATHERFORD
8/22/2014	7,613.00	28.19	272.88	7,598.60	-16.22	47.93	15.51	7.58	MWD	WEATHERFORD
8/22/2014	7,676.00	32.01	271.48	7,653.10	15.32	49.11	-16.05	6.16	MWD	WEATHERFORD
8/22/2014	7,708.00	34.30	272.28	7,679.89	32.80	49.69	-33.54	7.29	MWD	WEATHERFORD
8/22/2014	7,739.00	36.95	274.62	7,705.09	50.80	50.79	-51.56	9.61	MWD	WEATHERFORD
8/22/2014	7,771.00	39.89	275.19	7,730.15	70.59	52.49	-71.37	9.25	MWD	WEATHERFORD
8/22/2014	7,802.00	42.79	275.54	7,753.43	90.94	54.41	-91.76	9.38	MWD	WEATHERFORD
8/22/2014	7,834.00	45.04	276.29	7,776.48	112.98	56.70	-113.83	7.22	MWD	WEATHERFORD
8/22/2014	7,865.00	47.84	276.42	7,797.84	135.26	59.18	-136.16	9.04	MWD	WEATHERFORD
8/22/2014	7,897.00	51.25	274.88	7,818.60	159.45	61.57	-160.38	11.27	MWD	WEATHERFORD
8/22/2014	7,928.00	54.18	274.81	7,837.37	183.99	63.66	-184.96	9.45	MWD	WEATHERFORD
8/22/2014	7,959.00	57.37	274.88	7,854.81	209.49	65.82	-210.49	10.29	MWD	WEATHERFORD
8/22/2014	7,991.00	61.30	274.71	7,871.13	236.88	68.12	-237.92	12.29	MWD	WEATHERFORD
8/22/2014	8,022.00	64.85	275.10	7,885.16	264.38	70.48	-265.45	11.51	MWD	WEATHERFORD
8/22/2014	8,053.00	68.07	274.45	7,897.54	292.66	72.85	-293.77	10.56	MWD	WEATHERFORD
8/23/2014	8,085.00	70.68	273.82	7,908.81	322.49	75.01	-323.64	8.36	MWD	WEATHERFORD
8/23/2014	8,117.00	72.75	273.61	7,918.85	352.77	76.97	-353.96	6.50	MWD	WEATHERFORD

Directional Survey

District DELAWARE BASIN	County EDDY	Field Name HACKBERRY	Project Group DELAWARE BASIN REG	State/Province NM
Surface Legal Location Sec. 17 T19S R31E	API/UWI 3001542033	Latitude (°) 32° 39' 14.3" N	Longitude (°) 103° 53' 56.438" W	Ground Elev... 3,422.20
			KB - GL (ft) 26.00	Orig KB Elev (ft) 3,448.20
				Tubing Head Elevation (ft)

Survey Data

Date	MD (ftKB)	Inc. (°)	Azm (°)	TVD (ftKB)	VS (ft)	NS (ft)	EW (ft)	DLS (%/100ft)	Survey Tool	Survey Company
8/23/2014	8,148.00	75.30	273.02	7,927.38	382.50	78.70	-383.71	8.43	MWD	WEATHERFORD
8/23/2014	8,180.00	77.07	272.82	7,935.02	413.50	80.28	-414.74	5.56	MWD	WEATHERFORD
8/23/2014	8,211.00	79.38	273.89	7,941.35	443.77	82.06	-445.03	8.18	MWD	WEATHERFORD
8/23/2014	8,242.00	81.94	272.52	7,946.38	474.27	83.76	-475.57	9.34	MWD	WEATHERFORD
8/23/2014	8,270.00	83.11	273.38	7,950.02	501.98	85.19	-503.29	5.17	MWD	WEATHERFORD
8/23/2014	8,301.00	84.54	272.76	7,953.36	532.72	86.84	-534.07	5.02	MWD	WEATHERFORD
8/23/2014	8,332.00	85.66	272.38	7,956.00	563.55	88.23	-564.92	3.81	MWD	WEATHERFORD
8/23/2014	8,426.00	89.86	269.42	7,959.68	657.41	89.70	-658.81	5.46	MWD	WEATHERFORD
8/23/2014	8,521.00	90.98	269.04	7,958.98	752.40	88.42	-753.80	1.24	MWD	WEATHERFORD
8/23/2014	8,615.00	91.26	268.91	7,957.15	846.38	86.74	-847.76	0.33	MWD	WEATHERFORD
8/23/2014	8,709.00	91.12	269.16	7,955.19	940.36	85.16	-941.73	0.30	MWD	WEATHERFORD
8/23/2014	8,804.00	90.70	269.31	7,953.68	1,035.35	83.89	-1,036.71	0.47	MWD	WEATHERFORD
8/23/2014	8,898.00	90.35	268.48	7,952.82	1,129.34	82.08	-1,130.69	0.96	MWD	WEATHERFORD
8/23/2014	8,992.00	89.65	267.88	7,952.82	1,223.33	79.09	-1,224.64	0.98	MWD	WEATHERFORD
8/23/2014	9,087.00	90.00	269.17	7,953.11	1,318.32	76.65	-1,319.60	1.41	MWD	WEATHERFORD
8/23/2014	9,181.00	90.21	269.07	7,952.94	1,412.32	75.20	-1,413.59	0.25	MWD	WEATHERFORD
8/23/2014	9,275.00	91.68	268.97	7,951.39	1,506.31	73.60	-1,507.56	1.57	MWD	WEATHERFORD
8/23/2014	9,370.00	92.45	269.13	7,947.97	1,601.24	72.02	-1,602.49	0.83	MWD	WEATHERFORD
8/23/2014	9,464.00	91.89	269.19	7,944.41	1,695.18	70.65	-1,696.41	0.60	MWD	WEATHERFORD
8/23/2014	9,559.00	91.47	269.43	7,941.62	1,790.13	69.50	-1,791.36	0.51	MWD	WEATHERFORD
8/23/2014	9,653.00	91.26	269.74	7,939.38	1,884.10	68.82	-1,885.33	0.40	MWD	WEATHERFORD
8/23/2014	9,747.00	90.70	269.75	7,937.78	1,978.09	68.40	-1,979.32	0.60	MWD	WEATHERFORD
8/23/2014	9,841.00	91.47	269.63	7,936.00	2,072.06	67.89	-2,073.30	0.83	MWD	WEATHERFORD
8/23/2014	9,936.00	92.45	269.37	7,932.75	2,167.01	67.07	-2,168.24	1.07	MWD	WEATHERFORD
8/23/2014	10,030.00	92.10	269.39	7,929.02	2,260.93	66.05	-2,262.16	0.37	MWD	WEATHERFORD
8/23/2014	10,124.00	92.03	269.77	7,925.63	2,354.87	65.36	-2,356.10	0.41	MWD	WEATHERFORD
8/23/2014	10,218.00	91.75	269.61	7,922.53	2,448.81	64.85	-2,450.04	0.34	MWD	WEATHERFORD
8/23/2014	10,312.00	91.61	270.23	7,919.77	2,542.76	64.72	-2,544.00	0.68	MWD	WEATHERFORD
8/23/2014	10,406.00	91.26	269.91	7,917.42	2,636.72	64.84	-2,637.97	0.50	MWD	WEATHERFORD
8/23/2014	10,500.00	91.26	269.93	7,915.35	2,730.69	64.71	-2,731.95	0.02	MWD	WEATHERFORD
8/23/2014	10,595.00	92.03	270.13	7,912.62	2,825.64	64.76	-2,826.91	0.84	MWD	WEATHERFORD
8/23/2014	10,689.00	90.70	268.95	7,910.39	2,919.60	64.00	-2,920.88	1.89	MWD	WEATHERFORD
8/23/2014	10,784.00	90.35	268.44	7,909.51	3,014.60	61.84	-3,015.85	0.65	MWD	WEATHERFORD
8/23/2014	10,878.00	91.26	269.05	7,908.19	3,108.58	59.78	-3,109.81	1.17	MWD	WEATHERFORD
8/23/2014	10,973.00	90.84	268.98	7,906.45	3,203.57	58.15	-3,204.78	0.45	MWD	WEATHERFORD
8/23/2014	11,068.00	90.35	268.78	7,905.47	3,298.56	56.29	-3,299.76	0.56	MWD	WEATHERFORD
8/23/2014	11,161.00	90.00	268.69	7,905.18	3,391.56	54.24	-3,392.74	0.39	MWD	WEATHERFORD
8/23/2014	11,256.00	89.30	268.62	7,905.76	3,486.55	52.01	-3,487.71	0.74	MWD	WEATHERFORD
8/23/2014	11,350.00	89.79	268.32	7,906.51	3,580.54	49.50	-3,581.67	0.61	MWD	WEATHERFORD
8/23/2014	11,445.00	90.14	267.91	7,906.57	3,675.53	46.37	-3,676.62	0.57	MWD	WEATHERFORD
8/23/2014	11,539.00	89.72	267.81	7,906.68	3,769.50	42.86	-3,770.55	0.46	MWD	WEATHERFORD
8/23/2014	11,634.00	91.05	268.68	7,906.04	3,864.49	39.95	-3,865.50	1.67	MWD	WEATHERFORD
8/23/2014	11,728.00	91.12	268.80	7,904.26	3,958.47	37.88	-3,959.46	0.15	MWD	WEATHERFORD
8/23/2014	11,822.00	91.19	268.96	7,902.37	4,052.45	36.05	-4,053.43	0.19	MWD	WEATHERFORD
8/23/2014	11,917.00	90.91	268.93	7,900.63	4,147.43	34.30	-4,148.39	0.30	MWD	WEATHERFORD
8/23/2014	12,011.00	91.47	269.10	7,898.68	4,241.41	32.68	-4,242.36	0.62	MWD	WEATHERFORD
8/23/2014	12,105.00	91.47	269.28	7,896.26	4,335.38	31.36	-4,336.32	0.19	MWD	WEATHERFORD
8/23/2014	12,199.00	91.26	269.09	7,894.03	4,429.35	30.02	-4,430.28	0.30	MWD	WEATHERFORD
8/23/2014	12,293.00	90.84	269.02	7,892.30	4,523.33	28.47	-4,524.25	0.45	MWD	WEATHERFORD
8/23/2014	12,387.00	91.40	268.98	7,890.47	4,617.32	26.83	-4,618.22	0.60	MWD	WEATHERFORD
8/23/2014	12,481.00	91.12	268.82	7,888.40	4,711.29	25.02	-4,712.18	0.34	MWD	WEATHERFORD
8/23/2014	12,576.00	91.89	268.85	7,885.90	4,806.26	23.09	-4,807.13	0.81	MWD	WEATHERFORD
8/23/2014	12,670.00	91.75	269.08	7,882.92	4,900.21	21.40	-4,901.07	0.29	MWD	WEATHERFORD
8/23/2014	12,765.00	91.54	269.08	7,880.19	4,995.17	19.87	-4,996.01	0.22	MWD	WEATHERFORD
8/23/2014	12,858.00	91.33	269.03	7,877.86	5,088.14	18.34	-5,088.97	0.23	MWD	WEATHERFORD



Directional Survey

District DELAWARE BASIN	County EDDY	Field Name HACKBERRY	Project Group DELAWARE BASIN REG	State/Province NM			
Surface Legal Location Sec. 17 T19S R31E	API/UWI 3001542033	Latitude (°) 32° 39' 14.3" N	Longitude (°) 103° 53' 56.438" W	Ground Elev... 3,422.20	KB - GL (ft) 26.00	Orig KB Elev (ft) 3,448.20	Tubing Head Elevation (ft)

Survey Data

Date	MD (ftKB)	Incl (°)	Azm (°)	TVD (ftKB)	VS (ft)	N/S (ft)	EW (ft)	DLS (°/100ft)	Survey Tool	Survey Company
8/23/2014	12,948.00	91.33	269.03	7,875.77	5,178.12	16.81	-5,178.94	0.00	BIT	WEATHERFORD