

Results of Directional Survey

API number:	30-025-41466		
OGRID:		Operator:	DEVON ENERGY PRODUCTION COMPANY, LP
		Property:	THISTLE UNIT # 62H

surface	ULSTR:	O	22	T	23S	R	33E
				450	FSL	2250	FEL

BH Loc	ULSTR:	C	22	T	23S	R	33E
15750	MD	11080.4	TVD	332	FNL	1931	FWL
				4948	FSL	3349	FEL

Top Perf/OH	ULSTR:	N	22	T	23S	R	33E
11280	MD	11070.7	TVD	489	FSL	2148	FWL
						3132	FEL

Bot Perf/OH	ULSTR:	C	22	T	23S	R	33E
15694	MD	11081.8	TVD	388	FNL	1936	FWL
				4892	FSL	3344	FEL

	MD	N/S	E/W	VD
	11253	13.78	-881.71	11061.1
TOP PERFS/OH	11280	39.02	-881.84	11070.67
	11284	42.76	-881.86	11072.09
	15648	4396.29	-1090.89	11082.79
BOT PERFS/OH	15694	4442.14	-1094.45	11081.75
	15695	4443.14	-1094.53	11081.73

NEXT TO LAST	15695	4443.14	-1094.53	11081.73
LAST READING	15750.00	4497.93	-1099.13	11080.38
TD	15750	4497.93	-1099.13	11080.38

Surface Location	450	FS	2250	FE
Projected BHL	4948	FS	3349	FE
Location of				
Top Perfs/OH	489	FS	3132	FE
Bottom Perfs/OH	4892	FS	3344	FE

SUMMARY of Subsurface Locations

Surface Location	O-22-23S-33E	450	FS	2250	FE	Vert. Depth
Top Perfs/OH	N-22-23S-33E	489	FS	3132	FE	11070.67
Bottom Perfs/OH	C-22-23S-33E	4892	FS	3344	FE	11081.75
Projected TD	C-22-23S-33E	4948	FS	3349	FE	11080.38



Directional Survey

HOBS
NOV 18 2014
RECEIVED

THISTLE UNIT 62H

WEST UNRESTRICTED

District DELAWARE BASIN	County LEA	Field Name JOHNSON RANCH	Project Group DELAWARE BASIN REG	State/Province NM			
Surface Legal Location SEC22 T23S R33E	API/UWI 3002541466	Latitude (°) 32° 17' 3.026" N	Longitude (°) 103° 33' 32.225" W	Ground Elev... 3,692.80	KB - GL (ft) 25.00	Orig KB Elev (ft) 3,717.80	Tubing Head Elevation (ft)

Wellbores					
Wellbore Name OH	Parent Wellbore	SAP Well ID		Kick Off Depth (ftKB)	Vertical Section Direction (°) 346.46
Actual Deviation Survey MS GYRO SURVEY, Proposed? No		Definitive? Yes	Proposed? No	Proposed Deviation Survey	

Deviation Survey							
Date 5/26/2014	Description MS GYRO SURVEY						
MD Tie In (ftKB) 0.00	TVD Tie In (ftKB) 0.00	Inclination Tie In (°) 0.00	Azimuth Tie In (°) 0.00	NSTie In (ft) 0.00	EWTie 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
5/27/2014	84.90	0.44	147.47	84.90	-0.31	-0.27	0.18	0.52	GYRO	GYRODATA SERVICES CA...
5/27/2014	172.40	0.21	167.79	172.40	-0.79	-0.71	0.39	0.29	GYRO	GYRODATA SERVICES CA...
5/27/2014	263.20	0.29	261.66	263.20	-0.93	-0.91	0.20	0.41	GYRO	GYRODATA SERVICES CA...
5/27/2014	350.00	0.37	289.12	350.00	-0.76	-0.85	-0.28	0.20	GYRO	GYRODATA SERVICES CA...
5/27/2014	437.90	0.43	305.21	437.89	-0.36	-0.57	-0.82	0.14	GYRO	GYRODATA SERVICES CA...
5/27/2014	525.00	0.46	315.38	524.99	0.19	-0.13	-1.33	0.10	GYRO	GYRODATA SERVICES CA...
5/27/2014	619.10	0.59	326.95	619.09	0.97	0.54	-1.86	0.18	GYRO	GYRODATA SERVICES CA...
5/27/2014	711.30	0.57	348.30	711.28	1.87	1.39	-2.22	0.23	GYRO	GYRODATA SERVICES CA...
5/27/2014	804.60	0.59	357.14	804.58	2.81	2.33	-2.33	0.10	GYRO	GYRODATA SERVICES CA...
5/27/2014	896.90	0.45	352.82	896.87	3.63	3.16	-2.40	0.16	GYRO	GYRODATA SERVICES CA...
5/27/2014	989.40	0.54	13.73	989.37	4.38	3.94	-2.35	0.22	GYRO	GYRODATA SERVICES CA...
5/27/2014	1,084.00	0.62	21.69	1,083.97	5.20	4.85	-2.05	0.12	GYRO	GYRODATA SERVICES CA...
5/27/2014	1,178.80	0.70	19.74	1,178.76	6.10	5.87	-1.67	0.09	GYRO	GYRODATA SERVICES CA...
5/27/2014	1,273.40	0.76	18.27	1,273.35	7.12	7.01	-1.27	0.07	GYRO	GYRODATA SERVICES CA...
5/27/2014	1,367.90	0.71	19.50	1,367.84	8.14	8.16	-0.88	0.06	GYRO	GYRODATA SERVICES CA...
5/27/2014	1,415.80	0.51	16.39	1,415.74	8.57	8.65	-0.72	0.42	GYRO	GYRODATA SERVICES CA...
5/27/2014	1,447.00	0.40	353.40	1,446.94	8.80	8.89	-0.70	0.68	MWD	LEAM DRILLING SYSTEMS
5/27/2014	1,479.00	0.30	331.10	1,478.94	8.99	9.07	-0.75	0.52	MWD	LEAM DRILLING SYSTEMS
5/27/2014	1,510.00	0.70	268.50	1,509.94	9.11	9.14	-0.98	2.01	MWD	LEAM DRILLING SYSTEMS
5/27/2014	1,542.00	1.40	263.40	1,541.93	9.20	9.09	-1.56	2.20	MWD	LEAM DRILLING SYSTEMS
5/28/2014	1,573.00	2.20	263.80	1,572.92	9.32	8.98	-2.53	2.58	MWD	LEAM DRILLING SYSTEMS
5/28/2014	1,605.00	3.10	261.60	1,604.88	9.48	8.79	-4.00	2.83	MWD	LEAM DRILLING SYSTEMS
5/28/2014	1,636.00	3.60	261.50	1,635.83	9.64	8.52	-5.79	1.61	MWD	LEAM DRILLING SYSTEMS
5/28/2014	1,668.00	4.40	257.80	1,667.75	9.76	8.11	-7.98	2.63	MWD	LEAM DRILLING SYSTEMS
5/28/2014	1,699.00	5.10	253.00	1,698.65	9.70	7.46	-10.46	2.59	MWD	LEAM DRILLING SYSTEMS
5/28/2014	1,731.00	5.30	251.50	1,730.51	9.49	6.57	-13.22	0.76	MWD	LEAM DRILLING SYSTEMS
5/28/2014	1,763.00	5.60	247.10	1,762.37	9.10	5.50	-16.06	1.61	MWD	LEAM DRILLING SYSTEMS
5/28/2014	1,794.00	5.90	244.40	1,793.21	8.53	4.22	-18.89	1.30	MWD	LEAM DRILLING SYSTEMS
5/28/2014	1,826.00	6.20	243.00	1,825.03	7.78	2.72	-21.92	1.04	MWD	LEAM DRILLING SYSTEMS
5/28/2014	1,920.00	6.20	242.00	1,918.48	5.33	-1.96	-30.92	0.11	MWD	LEAM DRILLING SYSTEMS
5/28/2014	2,014.00	6.10	241.80	2,011.94	2.80	-6.71	-39.80	0.11	MWD	LEAM DRILLING SYSTEMS
5/28/2014	2,109.00	6.20	242.00	2,106.40	0.24	-11.50	-48.78	0.11	MWD	LEAM DRILLING SYSTEMS
5/28/2014	2,203.00	6.20	242.50	2,199.85	-2.25	-16.23	-57.77	0.06	MWD	LEAM DRILLING SYSTEMS
5/28/2014	2,298.00	6.20	243.00	2,294.29	-4.68	-20.92	-66.89	0.06	MWD	LEAM DRILLING SYSTEMS
5/28/2014	2,392.00	5.90	243.70	2,387.77	-6.93	-25.37	-75.74	0.33	MWD	LEAM DRILLING SYSTEMS
5/28/2014	2,487.00	5.90	242.80	2,482.26	-9.16	-29.76	-84.46	0.10	MWD	LEAM DRILLING SYSTEMS
5/28/2014	2,582.00	5.80	243.70	2,576.77	-11.38	-34.12	-93.11	0.14	MWD	LEAM DRILLING SYSTEMS
5/28/2014	2,676.00	5.80	242.80	2,670.29	-13.55	-38.40	-101.59	0.10	MWD	LEAM DRILLING SYSTEMS
5/28/2014	2,769.00	5.60	247.40	2,762.83	-15.37	-42.29	-109.96	0.54	MWD	LEAM DRILLING SYSTEMS
5/28/2014	2,864.00	5.50	246.50	2,857.38	-16.89	-45.89	-118.41	0.14	MWD	LEAM DRILLING SYSTEMS
5/28/2014	2,958.00	5.20	247.90	2,950.97	-18.30	-49.29	-126.49	0.35	MWD	LEAM DRILLING SYSTEMS
5/28/2014	3,053.00	5.00	242.30	3,045.60	-19.96	-52.83	-134.14	0.56	MWD	LEAM DRILLING SYSTEMS
5/28/2014	3,147.00	5.80	252.30	3,139.18	-21.30	-56.18	-142.30	1.31	MWD	LEAM DRILLING SYSTEMS
5/28/2014	3,241.00	5.60	250.60	3,232.72	-22.11	-59.15	-151.15	0.28	MWD	LEAM DRILLING SYSTEMS
5/28/2014	3,336.00	5.40	253.70	3,327.28	-22.80	-61.94	-159.81	0.38	MWD	LEAM DRILLING SYSTEMS
5/28/2014	3,430.00	5.30	250.60	3,420.87	-23.46	-64.62	-168.15	0.33	MWD	LEAM DRILLING SYSTEMS
5/28/2014	3,525.00	5.70	250.90	3,515.43	-24.36	-67.62	-176.75	0.42	MWD	LEAM DRILLING SYSTEMS



THISTLE UNIT 62H

WEST UNRESTRICTED

Directional Survey

District DELAWARE BASIN	County LEA	Field Name JOHNSON RANCH	Project Group DELAWARE BASIN REG	State/Province NM
Surface Legal Location SEC22 T23S R33E	API/UWI 3002541466	Latitude (°) 32° 17' 3.026" N	Longitude (°) 103° 33' 32.225" W	Ground Elev... 3,692.80
			KB - GL (ft) 25.00	Orig KB Elev (ft) 3,717.80
				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
5/28/2014	3,620.00	5.50	253.60	3,609.98	-25.05	-70.45	-185.57	0.35	MWD	LEAM DRILLING SYSTEMS
5/28/2014	3,714.00	5.70	252.30	3,703.53	-25.61	-73.14	-194.34	0.25	MWD	LEAM DRILLING SYSTEMS
5/28/2014	3,809.00	6.10	249.30	3,798.03	-26.58	-76.36	-203.56	0.53	MWD	LEAM DRILLING SYSTEMS
5/28/2014	3,903.00	5.80	248.80	3,891.52	-27.84	-79.85	-212.66	0.32	MWD	LEAM DRILLING SYSTEMS
5/28/2014	3,997.00	5.50	250.00	3,985.07	-28.98	-83.10	-221.32	0.34	MWD	LEAM DRILLING SYSTEMS
5/28/2014	4,092.00	6.40	243.70	4,079.55	-30.66	-87.01	-230.34	1.17	MWD	LEAM DRILLING SYSTEMS
5/28/2014	4,186.00	6.30	240.70	4,172.98	-33.22	-91.85	-239.54	0.37	MWD	LEAM DRILLING SYSTEMS
5/28/2014	4,281.00	5.90	243.20	4,267.44	-35.75	-96.61	-248.44	0.51	MWD	LEAM DRILLING SYSTEMS
5/28/2014	4,376.00	5.50	240.60	4,361.97	-38.12	-101.04	-256.77	0.50	MWD	LEAM DRILLING SYSTEMS
5/28/2014	4,471.00	5.70	236.90	4,456.52	-40.94	-105.85	-264.68	0.43	MWD	LEAM DRILLING SYSTEMS
5/28/2014	4,565.00	5.80	233.70	4,550.04	-44.34	-111.21	-272.42	0.36	MWD	LEAM DRILLING SYSTEMS
5/28/2014	4,660.00	6.00	236.90	4,644.54	-47.86	-116.77	-280.45	0.41	MWD	LEAM DRILLING SYSTEMS
5/28/2014	4,754.00	6.00	236.70	4,738.03	-51.17	-122.15	-288.67	0.02	MWD	LEAM DRILLING SYSTEMS
5/28/2014	4,849.00	5.70	229.10	4,832.53	-55.01	-127.96	-296.39	0.87	MWD	LEAM DRILLING SYSTEMS
5/28/2014	4,944.00	5.90	227.70	4,927.05	-59.53	-134.34	-303.57	0.26	MWD	LEAM DRILLING SYSTEMS
5/28/2014	5,038.00	6.00	238.30	5,020.54	-63.39	-140.17	-311.32	1.17	MWD	LEAM DRILLING SYSTEMS
5/28/2014	5,133.00	5.50	247.20	5,115.07	-65.67	-144.54	-319.74	1.07	MWD	LEAM DRILLING SYSTEMS
5/28/2014	5,203.00	4.90	241.10	5,184.78	-67.00	-147.29	-325.45	1.16	MWD	LEAM DRILLING SYSTEMS
5/28/2014	5,298.00	5.40	248.30	5,279.40	-68.71	-150.90	-333.16	0.86	MWD	LEAM DRILLING SYSTEMS
5/28/2014	5,392.00	6.40	253.20	5,372.90	-69.63	-154.05	-342.28	1.19	MWD	LEAM DRILLING SYSTEMS
5/28/2014	5,487.00	7.70	255.50	5,467.18	-70.04	-157.18	-353.51	1.40	MWD	LEAM DRILLING SYSTEMS
5/28/2014	5,581.00	7.70	254.80	5,560.33	-70.33	-160.40	-365.69	0.10	MWD	LEAM DRILLING SYSTEMS
5/28/2014	5,676.00	7.90	255.00	5,654.45	-70.68	-163.76	-378.13	0.21	MWD	LEAM DRILLING SYSTEMS
5/28/2014	5,771.00	7.70	249.50	5,748.57	-71.62	-167.68	-390.40	0.81	MWD	LEAM DRILLING SYSTEMS
5/28/2014	5,866.00	7.80	241.30	5,842.71	-74.08	-173.01	-402.02	1.17	MWD	LEAM DRILLING SYSTEMS
5/28/2014	5,960.00	6.90	237.00	5,935.94	-77.63	-179.14	-412.35	1.12	MWD	LEAM DRILLING SYSTEMS
5/28/2014	6,054.00	6.60	233.50	6,029.28	-81.61	-185.43	-421.43	0.54	MWD	LEAM DRILLING SYSTEMS
5/28/2014	6,149.00	6.60	234.80	6,123.65	-85.76	-191.83	-430.28	0.16	MWD	LEAM DRILLING SYSTEMS
5/28/2014	6,243.00	6.70	232.50	6,217.02	-89.98	-198.28	-439.04	0.30	MWD	LEAM DRILLING SYSTEMS
5/28/2014	6,338.00	6.70	233.70	6,311.37	-94.37	-204.93	-447.90	0.15	MWD	LEAM DRILLING SYSTEMS
5/28/2014	6,433.00	6.40	235.10	6,405.75	-98.45	-211.24	-456.71	0.36	MWD	LEAM DRILLING SYSTEMS
5/28/2014	6,528.00	6.20	234.80	6,500.18	-102.27	-217.23	-465.25	0.21	MWD	LEAM DRILLING SYSTEMS
5/28/2014	6,622.00	5.60	248.50	6,593.69	-104.78	-221.84	-473.66	1.62	MWD	LEAM DRILLING SYSTEMS
5/28/2014	6,717.00	5.60	252.30	6,688.23	-105.76	-224.95	-482.39	0.39	MWD	LEAM DRILLING SYSTEMS
5/28/2014	6,812.00	5.60	251.80	6,782.78	-106.47	-227.80	-491.21	0.05	MWD	LEAM DRILLING SYSTEMS
5/28/2014	6,906.00	5.60	252.30	6,876.33	-107.17	-230.63	-499.94	0.05	MWD	LEAM DRILLING SYSTEMS
5/28/2014	7,000.00	5.50	252.20	6,969.89	-107.84	-233.40	-508.59	0.11	MWD	LEAM DRILLING SYSTEMS
5/28/2014	7,095.00	5.80	252.20	7,064.43	-108.54	-236.26	-517.50	0.32	MWD	LEAM DRILLING SYSTEMS
5/28/2014	7,189.00	6.20	253.00	7,157.91	-109.19	-239.20	-526.88	0.43	MWD	LEAM DRILLING SYSTEMS
5/28/2014	7,284.00	6.20	249.50	7,252.36	-110.13	-242.49	-536.59	0.40	MWD	LEAM DRILLING SYSTEMS
5/28/2014	7,378.00	6.60	244.60	7,345.77	-111.85	-246.59	-546.22	0.72	MWD	LEAM DRILLING SYSTEMS
5/28/2014	7,473.00	6.70	244.40	7,440.13	-114.13	-251.32	-556.15	0.11	MWD	LEAM DRILLING SYSTEMS
5/28/2014	7,568.00	6.50	243.50	7,534.50	-116.49	-256.12	-565.96	0.24	MWD	LEAM DRILLING SYSTEMS
5/28/2014	7,663.00	6.50	243.20	7,628.89	-118.93	-260.94	-575.57	0.04	MWD	LEAM DRILLING SYSTEMS
5/28/2014	7,757.00	5.60	247.90	7,722.37	-120.84	-265.07	-584.57	1.09	MWD	LEAM DRILLING SYSTEMS
5/28/2014	7,852.00	5.00	249.90	7,816.96	-122.00	-268.23	-592.75	0.66	MWD	LEAM DRILLING SYSTEMS
5/28/2014	7,947.00	5.50	251.80	7,911.56	-122.84	-271.08	-600.97	0.56	MWD	LEAM DRILLING SYSTEMS
5/28/2014	8,041.00	5.50	251.80	8,005.13	-123.57	-273.89	-609.53	0.00	MWD	LEAM DRILLING SYSTEMS
5/28/2014	8,136.00	5.60	250.00	8,099.69	-124.47	-276.90	-618.21	0.21	MWD	LEAM DRILLING SYSTEMS
5/28/2014	8,231.00	5.40	250.40	8,194.25	-125.46	-279.98	-626.77	0.21	MWD	LEAM DRILLING SYSTEMS
5/28/2014	8,326.00	5.20	250.40	8,288.84	-126.39	-282.93	-635.04	0.21	MWD	LEAM DRILLING SYSTEMS
5/28/2014	8,420.00	5.40	249.20	8,382.44	-127.39	-285.93	-643.19	0.24	MWD	LEAM DRILLING SYSTEMS
5/28/2014	8,515.00	5.40	247.90	8,477.02	-128.62	-289.20	-651.51	0.13	MWD	LEAM DRILLING SYSTEMS
5/28/2014	8,609.00	5.20	247.60	8,570.62	-129.94	-292.48	-659.54	0.21	MWD	LEAM DRILLING SYSTEMS
5/28/2014	8,703.00	5.30	247.10	8,664.22	-131.30	-295.80	-667.48	0.12	MWD	LEAM DRILLING SYSTEMS



Directional Survey

District DELAWARE BASIN	County LEA	Field Name JOHNSON RANCH	Project Group DELAWARE BASIN REG	State/Province NM
Surface Legal Location SEC22 T23S R33E	API/UWI 3002541466	Latitude (°) 32° 17' 3.026" N	Longitude (°) 103° 33' 32.225" W	Ground Elev... 3,692.80
			KB - GL (ft) 25.00	Orig KB Elev (ft) 3,717.80
				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
5/28/2014	8,798.00	5.20	251.60	8,758.83	-132.38	-298.86	-675.61	0.45	MWD	LEAM DRILLING SYSTEMS
5/28/2014	8,893.00	5.50	250.00	8,853.41	-133.26	-301.78	-683.97	0.35	MWD	LEAM DRILLING SYSTEMS
5/28/2014	8,987.00	5.90	250.70	8,946.95	-134.25	-304.92	-692.77	0.43	MWD	LEAM DRILLING SYSTEMS
5/28/2014	9,082.00	5.00	249.90	9,041.52	-135.21	-307.95	-701.26	0.95	MWD	LEAM DRILLING SYSTEMS
5/28/2014	9,176.00	4.70	249.00	9,135.18	-136.18	-310.74	-708.70	0.33	MWD	LEAM DRILLING SYSTEMS
5/28/2014	9,271.00	4.80	248.80	9,229.85	-137.21	-313.57	-716.04	0.11	MWD	LEAM DRILLING SYSTEMS
5/28/2014	9,365.00	5.40	251.60	9,323.48	-138.11	-316.39	-723.91	0.69	MWD	LEAM DRILLING SYSTEMS
5/28/2014	9,460.00	5.60	253.00	9,418.04	-138.77	-319.16	-732.58	0.25	MWD	LEAM DRILLING SYSTEMS
5/28/2014	9,555.00	7.30	245.50	9,512.44	-140.20	-323.02	-742.51	1.99	MWD	LEAM DRILLING SYSTEMS
5/28/2014	9,649.00	7.20	246.40	9,605.69	-142.36	-327.85	-753.34	0.16	MWD	LEAM DRILLING SYSTEMS
5/28/2014	9,744.00	5.30	250.60	9,700.12	-143.85	-331.69	-762.93	2.06	MWD	LEAM DRILLING SYSTEMS
5/28/2014	9,839.00	5.50	245.10	9,794.70	-145.20	-335.07	-771.20	0.58	MWD	LEAM DRILLING SYSTEMS
5/28/2014	9,933.00	5.80	244.20	9,888.24	-147.09	-339.03	-779.56	0.33	MWD	LEAM DRILLING SYSTEMS
5/28/2014	10,028.00	5.70	248.30	9,982.76	-148.78	-342.86	-788.27	0.44	MWD	LEAM DRILLING SYSTEMS
5/28/2014	10,123.00	5.50	246.40	10,077.31	-150.25	-346.43	-796.82	0.29	MWD	LEAM DRILLING SYSTEMS
5/28/2014	10,217.00	5.90	253.00	10,170.85	-151.32	-349.65	-805.57	0.82	MWD	LEAM DRILLING SYSTEMS
5/28/2014	10,312.00	5.70	258.00	10,265.36	-151.49	-352.06	-814.86	0.57	MWD	LEAM DRILLING SYSTEMS
5/28/2014	10,407.00	5.40	261.10	10,359.92	-151.00	-353.73	-823.89	0.45	MWD	LEAM DRILLING SYSTEMS
5/28/2014	10,433.00	5.30	260.80	10,385.80	-150.81	-354.11	-826.28	0.40	MWD	LEAM DRILLING SYSTEMS
5/28/2014	10,527.00	5.30	263.50	10,479.40	-149.95	-355.29	-834.88	0.27	MWD	LEAM DRILLING SYSTEMS
5/28/2014	10,559.00	5.90	283.30	10,511.25	-149.03	-355.08	-837.95	6.29	MWD	LEAM DRILLING SYSTEMS
5/28/2014	10,590.00	8.70	308.40	10,542.00	-146.46	-353.26	-841.34	13.49	MWD	LEAM DRILLING SYSTEMS
5/28/2014	10,622.00	12.10	317.20	10,573.48	-141.63	-349.29	-845.52	11.70	MWD	LEAM DRILLING SYSTEMS
5/28/2014	10,653.00	16.50	322.50	10,603.51	-134.77	-343.41	-850.41	14.79	MWD	LEAM DRILLING SYSTEMS
5/28/2014	10,685.00	20.30	326.20	10,633.87	-125.41	-335.19	-856.26	12.42	MWD	LEAM DRILLING SYSTEMS
5/28/2014	10,716.00	23.20	330.40	10,662.66	-114.49	-325.41	-862.27	10.61	MWD	LEAM DRILLING SYSTEMS
5/28/2014	10,748.00	25.00	338.50	10,691.88	-101.73	-313.64	-867.87	11.76	MWD	LEAM DRILLING SYSTEMS
5/28/2014	10,780.00	27.30	345.80	10,720.61	-87.69	-300.23	-872.15	12.35	MWD	LEAM DRILLING SYSTEMS
5/28/2014	10,811.00	29.80	350.40	10,747.84	-72.89	-285.73	-875.18	10.73	MWD	LEAM DRILLING SYSTEMS
5/28/2014	10,843.00	30.20	356.20	10,775.56	-57.02	-269.86	-877.04	9.15	MWD	LEAM DRILLING SYSTEMS
5/28/2014	10,874.00	30.20	358.50	10,802.35	-41.71	-254.29	-877.76	3.73	MWD	LEAM DRILLING SYSTEMS
5/28/2014	10,906.00	31.60	357.80	10,829.81	-25.62	-237.86	-878.29	4.52	MWD	LEAM DRILLING SYSTEMS
5/28/2014	10,937.00	34.60	357.80	10,855.78	-9.03	-220.95	-878.94	9.68	MWD	LEAM DRILLING SYSTEMS
5/28/2014	10,969.00	37.80	358.50	10,881.60	9.48	-202.06	-879.54	10.08	MWD	LEAM DRILLING SYSTEMS
5/28/2014	11,000.00	39.70	359.00	10,905.77	28.44	-182.66	-879.97	6.21	MWD	LEAM DRILLING SYSTEMS
5/28/2014	11,032.00	42.30	358.90	10,929.92	48.93	-161.67	-880.35	8.13	MWD	LEAM DRILLING SYSTEMS
5/28/2014	11,063.00	44.30	359.70	10,952.48	69.66	-140.42	-880.61	6.69	MWD	LEAM DRILLING SYSTEMS
5/28/2014	11,126.00	49.90	359.90	10,995.35	114.54	-94.28	-880.77	8.89	MWD	LEAM DRILLING SYSTEMS
5/28/2014	11,158.00	54.30	359.40	11,015.00	139.12	-69.04	-880.92	13.81	MWD	LEAM DRILLING SYSTEMS
5/28/2014	11,189.00	58.60	359.20	11,032.13	164.31	-43.21	-881.24	13.88	MWD	LEAM DRILLING SYSTEMS
5/28/2014	11,221.00	63.00	359.60	11,047.74	191.52	-15.29	-881.53	13.79	MWD	LEAM DRILLING SYSTEMS
5/28/2014	11,253.00	67.60	359.70	11,061.10	219.82	13.78	-881.71	14.38	MWD	LEAM DRILLING SYSTEMS
5/28/2014	11,284.00	70.90	359.70	11,072.09	248.04	42.76	-881.86	10.65	MWD	LEAM DRILLING SYSTEMS
5/28/2014	11,316.00	74.70	359.40	11,081.55	277.81	73.32	-882.10	11.91	MWD	LEAM DRILLING SYSTEMS
5/28/2014	11,347.00	77.70	358.50	11,088.94	307.19	103.42	-882.65	10.08	MWD	LEAM DRILLING SYSTEMS
5/28/2014	11,379.00	80.00	356.70	11,095.13	338.00	134.78	-883.97	9.06	MWD	LEAM DRILLING SYSTEMS
5/28/2014	11,411.00	82.00	353.60	11,100.14	369.23	166.27	-886.64	11.43	MWD	LEAM DRILLING SYSTEMS
5/28/2014	11,442.00	84.30	352.50	11,103.83	399.81	196.82	-890.37	8.21	MWD	LEAM DRILLING SYSTEMS
5/28/2014	11,474.00	85.90	352.40	11,106.57	431.52	228.43	-894.56	5.01	MWD	LEAM DRILLING SYSTEMS
5/28/2014	11,485.00	87.00	353.80	11,107.25	442.42	239.33	-895.88	16.17	MWD	LEAM DRILLING SYSTEMS
5/28/2014	11,517.00	89.80	354.60	11,108.14	474.11	271.15	-899.11	9.10	MWD	LEAM DRILLING SYSTEMS
5/28/2014	11,548.00	90.80	355.30	11,107.98	504.77	302.02	-901.84	3.94	MWD	LEAM DRILLING SYSTEMS
5/28/2014	11,580.00	91.40	356.20	11,107.36	536.35	333.93	-904.21	3.38	MWD	LEAM DRILLING SYSTEMS
5/28/2014	11,674.00	91.80	357.30	11,104.74	628.80	427.74	-909.53	1.24	MWD	LEAM DRILLING SYSTEMS
5/28/2014	11,769.00	92.40	357.10	11,101.26	722.07	522.56	-914.17	0.67	MWD	LEAM DRILLING SYSTEMS



THISTLE UNIT 62H

WEST UNRESTRICTED

Directional Survey

District DELAWARE BASIN	County LEA	Field Name JOHNSON RANCH	Project Group DELAWARE BASIN REG	State/Province NM
Surface Legal Location SEC22 T23S R33E	API/UWI 3002541466	Latitude (°) 32° 17' 3.026" N	Longitude (°) 103° 33' 32.225" W	Ground Elev... 3,692.80
			KB - GL (ft) 25.00	Orig KB Elev (ft) 3,717.80
				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
5/28/2014	11,863.00	91.10	357.30	11,098.39	814.38	616.41	-918.76	1.40	MWD	LEAM DRILLING SYSTEMS
5/28/2014	11,959.00	91.20	357.80	11,096.46	908.57	712.30	-922.86	0.53	MWD	LEAM DRILLING SYSTEMS
5/28/2014	12,053.00	91.60	357.80	11,094.16	1,000.70	806.20	-926.47	0.43	MWD	LEAM DRILLING SYSTEMS
6/12/2014	12,148.00	91.60	358.30	11,091.51	1,093.73	901.11	-929.70	0.53	MWD	LEAM DRILLING SYSTEMS
6/12/2014	12,243.00	91.90	358.30	11,088.61	1,186.66	996.02	-932.52	0.32	MWD	LEAM DRILLING SYSTEMS
6/12/2014	12,337.00	92.40	358.90	11,085.08	1,278.50	1,089.93	-934.82	0.83	MWD	LEAM DRILLING SYSTEMS
6/12/2014	12,432.00	90.60	359.00	11,082.60	1,371.21	1,184.87	-936.56	1.90	MWD	LEAM DRILLING SYSTEMS
6/12/2014	12,527.00	91.00	359.20	11,081.27	1,463.90	1,279.85	-938.05	0.47	MWD	LEAM DRILLING SYSTEMS
6/12/2014	12,621.00	91.10	358.70	11,079.55	1,555.66	1,373.82	-939.77	0.54	MWD	LEAM DRILLING SYSTEMS
6/12/2014	12,716.00	90.70	358.70	11,078.06	1,648.49	1,468.78	-941.92	0.42	MWD	LEAM DRILLING SYSTEMS
6/12/2014	12,811.00	90.60	359.20	11,076.98	1,741.24	1,563.76	-943.67	0.54	MWD	LEAM DRILLING SYSTEMS
6/12/2014	12,905.00	91.20	359.40	11,075.50	1,832.87	1,657.74	-944.81	0.67	MWD	LEAM DRILLING SYSTEMS
6/12/2014	13,000.00	90.90	358.20	11,073.76	1,925.66	1,752.70	-946.80	1.30	MWD	LEAM DRILLING SYSTEMS
6/13/2014	13,189.00	89.90	357.10	11,072.44	2,111.06	1,941.54	-954.55	0.79	MWD	LEAM DRILLING SYSTEMS
6/13/2014	13,283.00	88.50	356.90	11,073.75	2,203.46	2,035.40	-959.47	1.50	MWD	LEAM DRILLING SYSTEMS
6/13/2014	13,378.00	88.70	357.40	11,076.08	2,296.78	2,130.25	-964.19	0.57	MWD	LEAM DRILLING SYSTEMS
6/13/2014	13,472.00	88.60	357.30	11,078.29	2,389.07	2,224.12	-968.54	0.15	MWD	LEAM DRILLING SYSTEMS
6/13/2014	13,567.00	88.50	356.70	11,080.69	2,482.43	2,318.96	-973.51	0.64	MWD	LEAM DRILLING SYSTEMS
6/13/2014	13,661.00	88.70	356.90	11,082.99	2,574.88	2,412.79	-978.75	0.30	MWD	LEAM DRILLING SYSTEMS
6/13/2014	13,756.00	88.80	356.20	11,085.06	2,668.39	2,507.59	-984.47	0.74	MWD	LEAM DRILLING SYSTEMS
6/13/2014	13,851.00	88.70	356.20	11,087.14	2,761.99	2,602.36	-990.76	0.11	MWD	LEAM DRILLING SYSTEMS
6/13/2014	13,945.00	88.50	356.60	11,089.43	2,854.55	2,696.15	-996.66	0.48	MWD	LEAM DRILLING SYSTEMS
6/13/2014	14,040.00	88.70	356.90	11,091.75	2,948.00	2,790.97	-1,002.05	0.38	MWD	LEAM DRILLING SYSTEMS
6/13/2014	14,135.00	89.00	356.90	11,093.66	3,041.41	2,885.81	-1,007.19	0.32	MWD	LEAM DRILLING SYSTEMS
6/13/2014	14,229.00	89.30	357.40	11,095.05	3,133.77	2,979.68	-1,011.86	0.62	MWD	LEAM DRILLING SYSTEMS
6/13/2014	14,324.00	89.90	357.30	11,095.72	3,227.05	3,074.58	-1,016.25	0.64	MWD	LEAM DRILLING SYSTEMS
6/13/2014	14,513.00	90.00	357.40	11,095.88	3,412.65	3,263.37	-1,024.99	0.07	MWD	LEAM DRILLING SYSTEMS
6/13/2014	14,608.00	90.03	357.10	11,095.86	3,505.97	3,358.26	-1,029.55	0.32	MWD	LEAM DRILLING SYSTEMS
6/13/2014	14,702.00	90.60	357.40	11,095.34	3,598.30	3,452.15	-1,034.06	0.69	MWD	LEAM DRILLING SYSTEMS
6/13/2014	14,797.00	90.30	357.10	11,094.59	3,691.62	3,547.04	-1,038.61	0.45	MWD	LEAM DRILLING SYSTEMS
6/14/2014	14,892.00	90.80	356.90	11,093.68	3,785.01	3,641.91	-1,043.59	0.57	MWD	LEAM DRILLING SYSTEMS
6/14/2014	14,986.00	91.40	356.70	11,091.88	3,877.47	3,735.74	-1,048.83	0.67	MWD	LEAM DRILLING SYSTEMS
6/14/2014	15,081.00	90.60	357.30	11,090.22	3,970.85	3,830.60	-1,053.80	1.05	MWD	LEAM DRILLING SYSTEMS
6/14/2014	15,175.00	91.00	356.60	11,088.91	4,063.27	3,924.45	-1,058.80	0.86	MWD	LEAM DRILLING SYSTEMS
6/14/2014	15,269.00	91.20	356.40	11,087.10	4,155.81	4,018.26	-1,064.54	0.30	MWD	LEAM DRILLING SYSTEMS
6/14/2014	15,364.00	91.30	356.60	11,085.03	4,249.34	4,113.06	-1,070.34	0.24	MWD	LEAM DRILLING SYSTEMS
6/14/2014	15,459.00	89.70	356.00	11,084.20	4,342.93	4,207.86	-1,076.47	1.80	MWD	LEAM DRILLING SYSTEMS
6/14/2014	15,553.00	90.40	355.30	11,084.12	4,435.73	4,301.58	-1,083.60	1.05	MWD	LEAM DRILLING SYSTEMS
6/14/2014	15,648.00	91.20	355.90	11,082.79	4,529.51	4,396.29	-1,090.89	1.05	MWD	LEAM DRILLING SYSTEMS
6/14/2014	15,695.00	91.40	355.20	11,081.73	4,575.91	4,443.14	-1,094.53	1.55	MWD	LEAM DRILLING SYSTEMS
6/14/2014	15,750.00	91.40	355.20	11,080.38	4,630.25	4,497.93	-1,099.13	0.00	BIT	LEAM DRILLING SYSTEMS