



Well Name: THISTLE UNIT 71H

Report Printed: 8/4/2015



Directional Survey

Well Name: THISTLE UNIT 71H

Sub-Division		Region		Field Name		County		State/Province	
DELAWARE BASIN		DELAWARE BASIN EAST		JOHNSON RANCH		LEA		NM	
Surface Legal Location		API/UWI		Latitude (°)		Longitude (°)		Orig KB Elevation (ft)	
SEC27 T2S R33E		3002542425		32° 16' 56.123" N		103° 33' 11.643" W		3,706.00	
								Ground Elev MSL (ft)	
								3,681.00	
								KB - GL (ft)	
								25.00	

Survey Data										
Date	MD (ftKB)	Incl (°)	Azm (°)	TVD (ftKB)	VS (ft)	N/S (ft)	E/W (ft)	DLS (°/100ft)	Survey Tool	Survey Company
4/18/2015	6,346.00	2.42	99.49	6,341.53	-43.55	44.00	59.30	0.15	MWD	EXTREME SURVEY TOOL
4/18/2015	6,436.00	2.20	103.22	6,431.46	-42.82	43.29	62.85	0.30	MWD	EXTREME SURVEY TOOL
4/18/2015	6,525.00	2.20	98.30	6,520.39	-42.15	42.65	66.21	0.21	MWD	EXTREME SURVEY TOOL
4/18/2015	6,614.00	2.00	95.40	6,609.33	-41.74	42.26	69.44	0.25	MWD	EXTREME SURVEY TOOL
4/18/2015	6,704.00	2.00	95.00	6,699.28	-41.43	41.97	72.57	0.02	MWD	EXTREME SURVEY TOOL
4/18/2015	6,793.00	1.90	92.89	6,788.23	-41.20	41.76	75.59	0.14	MWD	EXTREME SURVEY TOOL
4/18/2015	6,883.00	2.00	92.28	6,878.17	-41.03	41.63	78.65	0.11	MWD	EXTREME SURVEY TOOL
4/18/2015	6,972.00	1.80	92.72	6,967.13	-40.88	41.50	81.60	0.23	MWD	EXTREME SURVEY TOOL
4/18/2015	7,061.00	1.90	101.42	7,056.08	-40.50	41.14	84.44	0.33	MWD	EXTREME SURVEY TOOL
4/18/2015	7,151.00	2.10	101.59	7,146.02	-39.85	40.51	87.52	0.22	MWD	EXTREME SURVEY TOOL
4/18/2015	7,240.00	1.80	108.10	7,234.97	-39.07	39.75	90.44	0.42	MWD	EXTREME SURVEY TOOL
4/18/2015	7,329.00	1.90	106.12	7,323.93	-38.21	38.91	93.19	0.13	MWD	EXTREME SURVEY TOOL
4/18/2015	7,418.00	1.80	113.11	7,412.88	-37.23	37.95	95.89	0.28	MWD	EXTREME SURVEY TOOL
4/18/2015	7,507.00	1.90	109.20	7,501.83	-36.17	36.91	98.57	0.18	MWD	EXTREME SURVEY TOOL
4/18/2015	7,597.00	1.90	103.70	7,591.78	-35.31	36.07	101.43	0.20	MWD	EXTREME SURVEY TOOL
4/18/2015	7,686.00	1.90	115.39	7,680.74	-34.31	35.09	104.20	0.43	MWD	EXTREME SURVEY TOOL
4/18/2015	7,775.00	1.50	110.60	7,769.70	-33.25	34.05	106.62	0.48	MWD	EXTREME SURVEY TOOL
4/18/2015	7,865.00	1.40	126.20	7,859.67	-32.17	32.98	108.61	0.45	MWD	EXTREME SURVEY TOOL
4/18/2015	7,954.00	1.50	132.18	7,948.64	-30.73	31.56	110.35	0.20	MWD	EXTREME SURVEY TOOL
4/19/2015	8,044.00	1.60	137.19	8,038.61	-29.00	29.85	112.08	0.19	MWD	EXTREME SURVEY TOOL
4/19/2015	8,133.00	1.60	144.49	8,127.57	-27.07	27.92	113.64	0.23	MWD	EXTREME SURVEY TOOL
4/19/2015	8,222.00	1.10	161.58	8,216.55	-25.24	26.10	114.64	0.72	MWD	EXTREME SURVEY TOOL
4/19/2015	8,311.00	1.60	161.32	8,305.52	-23.25	24.11	115.30	0.56	MWD	EXTREME SURVEY TOOL
4/19/2015	8,490.00	1.70	156.61	8,484.45	-18.43	19.31	117.16	0.09	MWD	EXTREME SURVEY TOOL
4/19/2015	8,579.00	1.50	160.00	8,573.41	-16.12	17.00	118.08	0.25	MWD	EXTREME SURVEY TOOL
4/19/2015	8,669.00	1.50	174.81	8,663.38	-13.83	14.72	118.59	0.43	MWD	EXTREME SURVEY TOOL
4/19/2015	8,758.00	1.50	173.88	8,752.35	-11.51	12.40	118.82	0.03	MWD	EXTREME SURVEY TOOL
4/19/2015	8,848.00	1.20	171.38	8,842.33	-9.41	10.30	119.09	0.34	MWD	EXTREME SURVEY TOOL
4/19/2015	8,937.00	1.30	174.98	8,931.31	-7.48	8.37	119.31	0.14	MWD	EXTREME SURVEY TOOL
4/19/2015	9,026.00	1.30	186.98	9,020.28	-5.47	6.37	119.28	0.31	MWD	EXTREME SURVEY TOOL
4/19/2015	9,116.00	1.40	192.39	9,110.26	-3.39	4.28	118.92	0.18	MWD	EXTREME SURVEY TOOL
4/19/2015	9,205.00	1.70	191.99	9,199.23	-1.04	1.93	118.41	0.34	MWD	EXTREME SURVEY TOOL
4/19/2015	9,294.00	2.02	188.08	9,288.18	1.80	-0.92	117.92	0.39	MWD	EXTREME SURVEY TOOL
4/19/2015	9,384.00	2.20	198.01	9,378.12	5.01	-4.13	117.16	0.45	MWD	EXTREME SURVEY TOOL
4/19/2015	9,473.00	2.20	205.61	9,467.05	8.17	-7.30	115.89	0.33	MWD	EXTREME SURVEY TOOL
4/19/2015	9,563.00	2.50	204.51	9,556.98	11.50	-10.64	114.33	0.34	MWD	EXTREME SURVEY TOOL
4/19/2015	9,652.00	2.29	192.78	9,645.90	14.99	-14.14	113.13	0.60	MWD	EXTREME SURVEY TOOL
4/19/2015	9,742.00	3.12	191.51	9,735.80	19.14	-18.29	112.25	0.92	MWD	EXTREME SURVEY TOOL
4/19/2015	9,831.00	2.81	201.31	9,824.68	23.53	-22.70	110.97	0.67	MWD	EXTREME SURVEY TOOL
4/19/2015	9,891.00	2.42	222.18	9,884.62	25.83	-25.01	109.59	1.70	MWD	EXTREME SURVEY TOOL
4/21/2015	9,949.00	2.40	243.40	9,942.57	27.27	-26.46	107.68	1.53	MWD	PRECISION MWD
4/21/2015	9,979.00	3.20	227.90	9,972.53	28.10	-27.30	106.50	3.65	MWD	PRECISION MWD
4/21/2015	10,008.00	5.50	209.50	10,001.45	29.84	-29.06	105.21	9.18	MWD	PRECISION MWD
4/21/2015	10,038.00	8.80	206.50	10,031.21	33.14	-32.36	103.48	11.07	MWD	PRECISION MWD
4/21/2015	10,068.00	12.10	206.30	10,060.71	37.99	-37.24	101.06	11.00	MWD	PRECISION MWD
4/21/2015	10,097.00	14.90	206.50	10,088.91	44.03	-43.30	98.05	9.66	MWD	PRECISION MWD
4/21/2015	10,127.00	19.00	203.80	10,117.60	51.93	-51.22	94.36	13.91	MWD	PRECISION MWD
4/21/2015	10,157.00	22.10	200.80	10,145.69	61.64	-60.97	90.38	10.91	MWD	PRECISION MWD
4/21/2015	10,187.00	24.30	197.30	10,173.26	72.79	-72.14	86.54	8.65	MWD	PRECISION MWD
4/21/2015	10,217.00	27.30	193.80	10,200.27	85.34	-84.72	83.06	11.21	MWD	PRECISION MWD
4/21/2015	10,247.00	30.50	189.90	10,226.53	99.50	-98.90	80.11	12.37	MWD	PRECISION MWD
4/21/2015	10,276.00	33.40	186.40	10,251.14	114.67	-114.09	77.96	11.86	MWD	PRECISION MWD
4/21/2015	10,306.00	36.90	183.40	10,275.66	131.86	-131.29	76.50	13.01	MWD	PRECISION MWD
4/21/2015	10,336.00	40.50	183.10	10,299.07	150.58	-150.02	75.44	12.02	MWD	PRECISION MWD
4/21/2015	10,365.00	43.50	183.30	10,320.62	169.94	-169.39	74.36	10.36	MWD	PRECISION MWD
4/21/2015	10,395.00	47.20	182.40	10,341.70	191.25	-190.70	73.30	12.52	MWD	PRECISION MWD
4/21/2015	10,425.00	50.70	181.00	10,361.40	213.85	-213.31	72.64	12.19	MWD	PRECISION MWD
4/21/2015	10,455.00	53.80	179.40	10,379.77	237.57	-237.03	72.56	11.16	MWD	PRECISION MWD
4/21/2015	10,485.00	57.80	178.20	10,396.62	262.37	-261.83	73.09	13.74	MWD	PRECISION MWD
4/21/2015	10,515.00	60.50	178.20	10,412.01	288.11	-287.57	73.89	9.00	MWD	PRECISION MWD
4/21/2015	10,544.00	62.50	178.20	10,425.84	313.59	-313.04	74.70	6.90	MWD	PRECISION MWD
4/21/2015	10,574.00	64.60	178.50	10,439.21	340.44	-339.89	75.47	7.06	MWD	PRECISION MWD
4/21/2015	10,604.00	67.50	179.20	10,451.38	367.86	-367.30	76.02	9.90	MWD	PRECISION MWD
4/21/2015	10,633.00	70.90	180.30	10,461.68	394.96	-394.40	76.13	12.25	MWD	PRECISION MWD
4/21/2015	10,663.00	75.00	180.30	10,470.47	423.63	-423.08	75.98	13.67	MWD	PRECISION MWD
4/21/2015	10,693.00	77.10	180.10	10,477.71	452.75	-452.19	75.88	7.03	MWD	PRECISION MWD
4/21/2015	10,722.00	79.40	179.70	10,483.61	481.14	-480.58	75.93	8.05	MWD	PRECISION MWD
4/21/2015	10,752.00	81.80	179.90	10,488.51	510.73	-510.17	76.03	8.03	MWD	PRECISION MWD
4/23/2015	10,781.00	84.60	180.30	10,491.94	539.52	-538.97	75.98	9.75	MWD	PRECISION MWD
4/23/2015	10,811.00	86.40	180.50	10,494.30	569.43	-568.87	75.77	6.04	MWD	PRECISION MWD
4/23/2015	10,841.00	87.10	180.80	10,496.00	599.37	-598.82	75.43	2.54	MWD	PRECISION MWD
4/23/2015	10,930.00	88.30	181.50	10,499.57	688.26	-687.73	73.65	1.56	MWD	PRECISION MWD
4/23/2015	11,019.00	88.70	182.20	10,501.90	777.16	-776.65	70.78	0.91	MWD	PRECISION MWD
4/23/2015	11,109.00	89.90	182.90	10,503.00	867.03	-866.56	66.77	1.54	MWD	PRECISION MWD
4/23/2015	11,198.00	88.70	182.40	10,504.09	955.89	-955.45	62.66	1.46	MWD	PRECISION MWD
4/23/2015	11,287.00	88.80	180.50	10,506.03	1,044.82	-1,044.40	60.41	2.14	MWD	PRECISION MWD
4/23/2015	11,377.00	90.40	181.30	10,506.66	1,134.79	-1,134.38	58.99	1.99	MWD	PRECISION MWD



Directional Survey

Well Name: THISTLE UNIT 71H

Sub-Division	Region	Field Name	County	State/Province		
DELAWARE BASIN	DELAWARE BASIN EAST	JOHNSON RANCH	LEA	NM		
Surface Legal Location	API/UWI	Latitude (°)	Longitude (°)	Orig KB Elevation (ft)	Ground Elev MSL (ft)	KB - GL (ft)
SEC27 T23S R33E	3002542425	32° 16' 56.123" N	103° 33' 11.643" W	3,706.00	3,681.00	25.00

Survey Data										
Date	MD (ftKB)	Incl (°)	Azm (°)	TVD (ftKB)	VS (ft)	N/S (ft)	E/W (ft)	DLS (°/100ft)	Survey Tool	Survey Company
4/23/2015	11,466.00	90.40	180.30	10,506.04	1,223.77	-1,223.37	57.75	1.12	MWD	PRECISION MWD
4/23/2015	11,556.00	88.80	179.70	10,506.66	1,313.76	-1,313.36	57.75	1.90	MWD	PRECISION MWD
4/23/2015	11,645.00	89.10	180.60	10,508.29	1,402.74	-1,402.35	57.52	1.07	MWD	PRECISION MWD
4/23/2015	11,735.00	89.00	182.20	10,509.79	1,492.68	-1,492.30	55.32	1.78	MWD	PRECISION MWD
4/23/2015	11,824.00	89.50	181.00	10,510.95	1,581.61	-1,581.26	52.83	1.46	MWD	PRECISION MWD
4/24/2015	11,913.00	89.30	179.40	10,511.88	1,670.60	-1,670.25	52.52	1.81	MWD	PRECISION MWD
4/24/2015	12,002.00	90.50	179.70	10,512.04	1,759.60	-1,759.25	53.22	1.39	MWD	PRECISION MWD
4/24/2015	12,091.00	91.50	179.90	10,510.49	1,848.58	-1,848.23	53.53	1.15	MWD	PRECISION MWD
4/24/2015	12,181.00	90.70	179.40	10,508.76	1,938.56	-1,938.21	54.08	1.05	MWD	PRECISION MWD
4/24/2015	12,270.00	90.50	178.70	10,507.83	2,027.56	-2,027.20	55.56	0.82	MWD	PRECISION MWD
4/24/2015	12,359.00	91.60	179.00	10,506.20	2,116.53	-2,116.16	57.34	1.28	MWD	PRECISION MWD
4/24/2015	12,447.00	90.50	178.90	10,504.58	2,204.51	-2,204.13	58.96	1.26	MWD	PRECISION MWD
4/24/2015	12,538.00	88.10	178.50	10,505.69	2,295.49	-2,295.09	61.02	2.67	MWD	PRECISION MWD
4/24/2015	12,627.00	88.60	178.90	10,508.26	2,384.44	-2,384.03	63.04	0.72	MWD	PRECISION MWD
4/24/2015	12,717.00	89.40	178.90	10,509.83	2,474.42	-2,474.00	64.77	0.89	MWD	PRECISION MWD
4/24/2015	12,806.00	90.30	179.00	10,510.06	2,563.41	-2,562.99	66.40	1.02	MWD	PRECISION MWD
4/24/2015	12,895.00	92.70	179.90	10,507.73	2,652.37	-2,651.94	67.25	2.88	MWD	PRECISION MWD
4/24/2015	12,985.00	90.80	179.60	10,504.98	2,742.33	-2,741.90	67.64	2.14	MWD	PRECISION MWD
4/24/2015	13,074.00	88.40	178.30	10,505.60	2,831.31	-2,830.87	69.28	3.07	MWD	PRECISION MWD
4/24/2015	13,163.00	88.80	178.70	10,507.78	2,920.27	-2,919.81	71.60	0.64	MWD	PRECISION MWD
4/24/2015	13,253.00	90.50	178.90	10,508.33	3,010.26	-3,009.79	73.49	1.90	MWD	PRECISION MWD
4/24/2015	13,342.00	87.60	178.90	10,509.80	3,099.23	-3,098.75	75.20	3.26	MWD	PRECISION MWD
4/25/2015	13,431.00	87.60	179.00	10,513.53	3,188.14	-3,187.66	76.83	0.11	MWD	PRECISION MWD
4/25/2015	13,521.00	88.60	179.20	10,516.51	3,278.09	-3,277.60	78.24	1.13	MWD	PRECISION MWD
4/25/2015	13,610.00	89.70	179.60	10,517.83	3,367.08	-3,366.58	79.17	1.32	MWD	PRECISION MWD
4/25/2015	13,699.00	90.50	179.90	10,517.68	3,456.08	-3,455.58	79.56	0.96	MWD	PRECISION MWD
4/25/2015	13,789.00	89.90	180.30	10,517.37	3,546.07	-3,545.58	79.40	0.80	MWD	PRECISION MWD
4/25/2015	13,878.00	92.10	181.00	10,515.81	3,635.04	-3,634.55	78.39	2.59	MWD	PRECISION MWD
4/25/2015	13,967.00	91.10	181.50	10,513.33	3,723.96	-3,723.49	76.45	1.26	MWD	PRECISION MWD
4/25/2015	14,057.00	90.90	181.90	10,511.76	3,813.89	-3,813.44	73.78	0.50	MWD	PRECISION MWD
4/25/2015	14,146.00	88.50	182.20	10,512.22	3,902.80	-3,902.38	70.60	2.72	MWD	PRECISION MWD
4/25/2015	14,236.00	88.90	182.70	10,514.26	3,992.66	-3,992.27	66.75	0.71	MWD	PRECISION MWD
4/25/2015	14,325.00	91.00	183.40	10,514.34	4,081.49	-4,081.14	62.02	2.49	MWD	PRECISION MWD
4/25/2015	14,415.00	90.10	182.00	10,513.48	4,171.35	-4,171.03	57.78	1.85	MWD	PRECISION MWD
4/25/2015	14,504.00	88.40	181.00	10,514.64	4,260.28	-4,259.99	55.45	2.22	MWD	PRECISION MWD
4/26/2015	14,594.00	88.40	180.80	10,517.16	4,350.23	-4,349.94	54.04	0.22	MWD	PRECISION MWD
4/26/2015	14,683.00	89.00	181.00	10,519.17	4,439.18	-4,438.91	52.64	0.71	MWD	PRECISION MWD
4/26/2015	14,773.00	91.70	181.50	10,518.63	4,529.13	-4,528.88	50.68	3.05	MWD	PRECISION MWD
4/26/2015	14,862.00	92.80	182.00	10,515.13	4,617.99	-4,617.76	47.96	1.36	MWD	PRECISION MWD
4/26/2015	14,911.00	93.10	182.40	10,512.61	4,666.88	-4,666.66	46.08	1.02	MWD	PRECISION MWD
4/26/2015	14,979.00	93.10	182.40	10,508.93	4,734.70	-4,734.50	43.24	0.00	BIT	PRECISION MWD