Phoenix Technology Services
Survey Report 09-Mar-2018 06:58:03

HOBBS OCD
MAY 16 2018
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Energen Resources

Pegasus 23-35-16 State 251H
Lea County, NM (NAD83 NME)
OH/Job# 62309
Phoenix MWD Surveys

25-44199

Surface Loc.:
Northing: (Y) 473614.95
Easting: (X) 836231.68
GL+KB Elev: 3428.98'
GL Elev: 3403.98'

Survey Type Information:
H 168.00 - 14560.00 PHOENIX MWD SURVEYS : MWD+HDGM

Measured Depth (ft)	Incl.	Azim.	Sub-Sea Depth (ft)	Vertical Depth (ft)	Local Coor (+N/-S) (ft)	(+E/-W) (ft)	UTM Coorc Northings (ft)	Eastings (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Annotation
0	0	0	-3428.98	0	0	0	473615	836231.7	0	0	
168	0.42	135.46	-3260.98	168	-0.44	0.43	473614.5	836232.1	-0.44	0.25	First Phoenix MWD Survey
229	0.62	144.02	-3199.98	229	-0.87	0.78	473614.1	836232.5	-0.87	0.35	
320	0.53	151.75	-3108.99	319.99	-1.63	1.27	473613.3	836233	-1.65	0.13	
407	0.6	133.35	-3021.99	406.99	-2.3	1.79	473612.7	836233.5	-2.32	0.22	
496	0.62	150.07	-2933	495.98	-3.04	2.37	473611.9	836234.1	-3.06	0.2	
621	0.67	155.67	-2808.01	620.97	-4.29	3.01	473610.7	836234.7	-4.32	0.06	
682	0.61	150.03	-2747.01	681.97	-4.9	3.32	473610.1	836235	-4.93	0.14	
773	0.76	147.32	-2656.02	772.96	-5.82	3.89	473609.1	836235.6	-5.86	0.17	
864	0.77	147.87	-2565.02	863.96	-6.85	4.54	473608.1	836236.2	-6.89	0.01	
955	0.9	142.84	-2474.03	954.95	-7.94	5.3	473607	836237	-7.99	0.16	
1046	0.93	147.7	-2383.05	1045.93	-9.13	6.12	473605.8	836237.8	-9.19	0.09	
1136	1.07	145.49	-2293.06	1135.92	-10.44	6.99	473604.5	836238.7	-10.5	0.16	
1227	1.22	140.82	-2202.08	1226.9	-11.89	8.08	473603.1	836239.8	-11.97	0.19	
1318	1.21	139.79	-2111.1	1317.88	-13.38	9.31	473601.6	836241	-13.46	0.03	
1410	1.3	138.09	-2019.12	1409.86	-14.9	10.64	473600.1	836242.3	-14.99	0.11	
1501	1.39	140.51	-1928.14	1500.84	-16.52	12.03	473598.4	836243.7	-16.62	0.12	
1595	0.81	99.33	-1834.16	1594.82	-17.5	13.41	473597.5	836245.1	-17.62	1.01	
1690	1.4	38.14	-1739.18	1689.8	-16.7	14.79	473598.3	836246.5	-16.83	1.3	
1784	1.49	35.87	-1645.21	1783.77	-14.81	16.21	473600.1	836247.9	-14.95	0.11	
1859	1.64	37.1	-1570.23	1858.75	-13.16	17.43	473601.8	836249.1	-13.32	0.2	
2061	1.66	28.61	-1368.32	2060.66	-8.29	20.58	473606.7	836252.3	-8.47	0.12	
2155	1.34	26.63	-1274.35	2154.63	-6.11	21.72	473608.8	836253.4	-6.3	0.34	
2250	1.1	22.44	-1179.37	2249.61	-4.27	22.57	473610.7	836254.3	-4.48	0.27	
2344	0.95	20.19	-1085.39	2343.59	-2.71	23.18	473612.2	836254.9	-2.92	0.17	
2438	0.98	23.17	-991.4	2437.58	-1.24	23.77	473613.7	836255.5	-1.45	0.06	
2533	1.25	259.8	-896.41	2532.57	-0.67	23.07	473614.3	836254.8	-0.88	2.07	
2627	2.69	255.12	-802.47	2626.51	-1.42	19.93	473613.5	836251.6	-1.6	1.54	
2721	1.33	237.21	-708.53	2720.45	-2.58	16.88	473612.4	836248.6	-2.73	1.58	
2816	0.79	213.77	-613.54	2815.44	-3.72	15.59	473611.2	836247.3	-3.86	0.72	
2910	0.68	213.69	-519.55	2909.43	-4.72	14.92	473610.2	836246.6	-4.86	0.12	
3004	0.66	232.2	-425.56	3003.42	-5.52	14.18	473609.4	836245.9	-5.65	0.23	
3099	0.48	225.64	-330.56	3098.42	-6.13	13.46	473608.8	836245.1	-6.25	0.2	
3193	0.15	101.1	-236.56	3192.42	-6.43	13.3	473608.5	836245	-6.55	0.62	
3288	0.35	62.13	-141.56	3287.42	-6.32	13.68	473608.6	836245.4	-6.44	0.26	
3382	0.6	70.91	-47.57	3381.41	-6.02	14.4	473608.9	836246.1	-6.15	0.28	
3477	0.8	71.58	47.43	3476.41	-5.65	15.5	473609.3	836247.2	-5.79	0.21	
3571	1.04	57.32	141.41	3570.39	-4.98	16.84	473610	836248.5	-5.14	0.35	
3666	1.24	67.52	236.4	3665.38	-4.13	18.51	473610.8	836250.2	-4.29	0.3	
3760	0.07	349.89	330.39	3759.37	-3.68	19.44	473611.3	836251.1	-3.86	1.31	
3855	0.93	245.99	425.38	3854.36	-3.94	18.73	473611	836250.4	-4.11	1	
3949	0.87	236.97	519.37	3948.35	-4.64	17.43	473610.3	836249.1	-4.79	0.16	

4044	1.04	232.48	614.36	4043.34	-5.55	16.15	473609.4	836247.8	-5.7	0.2
4138	1.11	234.47	708.34	4137.32	-6.6	14.73	473608.4	836246.4	-6.74	0.08
4232	1.21	243.92	802.32	4231.3	-7.57	13.1	473607.4	836244.8	-7.69	0.23
4327	1.34	241.03	897.3	4326.28	-8.55	11.22	473606.4	836242.9	-8.65	0.15
4421	1.26	247.69	991.28	4420.26	-9.47	9.31	473605.5	836241	-9.56	0.18
4515	1.49	242.75	1085.25	4514.23	-10.42	7.26	473604.5	836238.9	-10.49	0.28
4610	1.04	301.18	1180.23	4609.21	-10.54	5.43	473604.4	836237.1	-10.59	1.36
4704	1.42	324.78	1274.21	4703.19	-9.15	4.03	473605.8	836235.7	-9.19	0.67
4799	1.29	326.41	1369.18	4798.16	-7.3	2.76	473607.7	836234.4	-7.32	0.14
4893	1.08	332.86	1463.16	4892.14	-5.63	1.77	473609.3	836233.5	-5.64	0.26
4988	0.86	326.66	1558.15	4987.13	-4.24	0.97	473610.7	836232.7	-4.24	0.26
5082	1.01	331.41	1652.13	5081.11	-2.92	0.18	473612	836231.9	-2.92	0.18
5177	1.06	325.63	1747.12	5176.1	-1.46	-0.72	473613.5	836231	-1.45	0.12
5271	0.88	335.83	1841.11	5270.09	-0.08	-1.5	473614.9	836230.2	-0.07	0.26
5366	0.88	342.85	1936.09	5365.07	1.28	-2.02	473616.2	836229.7	1.3	0.11
5460	1.04	332.36	2030.08	5459.06	2.73	-2.62	473617.7	836229.1	2.75	0.25
5555	1.22	335.21	2125.06	5554.04	4.41	-3.45	473619.4	836228.2	4.44	0.2
5649	1.2	342	2219.04	5648.02	6.25	-4.17	473621.2	836227.5	6.29	0.15
5743	1.24	340.36	2313.02	5742	8.15	-4.82	473623.1	836226.9	8.19	0.06
5838	0.38	220.49	2408.01	5836.99	8.88	-5.37	473623.8	836226.3	8.92	1.54
5932	1.12	191.52	2502.01	5930.99	7.74	-5.75	473622.7	836225.9	7.79	0.86
6026	2.15	185.14	2595.97	6024.95	5.08	-6.1	473620	836225.6	5.14	1.11
6121	3.25	177.03	2690.86	6119.84	0.62	-6.12	473615.6	836225.6	0.67	1.22
6215	4.43	176.93	2784.65	6213.63	-5.67	-5.78	473609.3	836225.9	-5.62	1.26
6310	5.17	179.61	2879.31	6308.29	-13.61	-5.56	473601.3	836226.1	-13.56	0.81
6404	5.88	184.2	2972.88	6401.86	-22.65	-5.88	473592.3	836225.8	-22.6	0.89
6498	6.84	187.34	3066.3	6495.28	-33	-6.95	473582	836224.7	-32.94	1.09
6593	7.38	189.04	3160.57	6589.55	-44.64	-8.63	473570.3	836223.1	-44.56	0.61
6687	7.27	190.31	3253.8	6682.78	-56.45	-10.64	473558.5	836221	-56.36	0.21
6782	7.23	186.9	3348.04	6777.02	-68.3	-12.44	473546.7	836219.2	-68.19	0.45
6876	6.73	186.67	3441.34	6870.32	-79.65	-13.79	473535.3	836217.9	-79.52	0.53
6971	6.67	183.35	3535.69	6964.67	-90.68	-14.76	473524.3	836216.9	-90.54	0.41
7065	6.91	178.71	3629.04	7058.02	-101.79	-14.95	473513.2	836216.7	-101.65	0.64
7160	6.63	178.57	3723.37	7152.35	-112.98	-14.68	473502	836217	-112.84	0.3
7254	6.4	177.18	3816.77	7245.75	-123.64	-14.29	473491.3	836217.4	-123.5	0.3
7348	6.82	177.41	3910.14	7339.12	-134.45	-13.78	473480.5	836217.9	-134.32	0.45
7443	6.25	176.84	4004.52	7433.5	-145.25	-13.24	473469.7	836218.4	-145.12	0.6
7537	6.35	176.59	4097.96	7526.94	-155.54	-12.65	473459.4	836219	-155.42	0.11
7631	5.47	179.19	4191.46	7620.44	-165.21	-12.28	473449.7	836219.4	-165.09	0.98
7726	5.38	176.14	4286.03	7715.01	-174.18	-11.91	473440.8	836219.8	-174.07	0.32
7820	5.77	173.65	4379.59	7808.57	-183.28	-11.09	473431.7	836220.6	-183.17	0.49
7914	5.65	172.92	4473.12	7902.1	-192.56	-10	473422.4	836221.7	-192.47	0.15
8009	5.86	174.59	4567.64	7996.62	-202.03	-8.97	473412.9	836222.7	-201.94	0.28
8103	5.16	171.88	4661.21	8090.19	-211	-7.92	473404	836223.8	-210.92	0.79
8197	5.25	173.74	4754.82	8183.8	-219.46	-6.85	473395.5	836224.8	-219.38	0.2
8292	5.37	174.06	4849.41	8278.39	-228.2	-5.92	473386.8	836225.8	-228.13	0.13
8386	5.12	173.37	4943.02	8372	-236.74	-4.98	473378.2	836226.7	-236.68	0.27
8480	5.02	173.38	5036.65	8465.63	-244.99	-4.02	473370	836227.7	-244.94	0.11
8575	5.27	175.39	5131.27	8560.25	-253.47	-3.19	473361.5	836228.5	-253.43	0.32
8669	5.13	174.75	5224.88	8653.86	-261.96	-2.46	473353	836229.2	-261.92	0.16
8764	5.21	175.91	5319.49	8748.47	-270.49	-1.76	473344.5	836229.9	-270.46	0.14
8858	4.36	171.34	5413.16	8842.14	-278.28	-0.92	473336.7	836230.8	-278.26	0.99
8953	3.96	165.89	5507.91	8936.89	-285.03	0.42	473329.9	836232.1	-285.02	0.59
9047	3.26	155.48	5601.73	9030.71	-290.61	2.32	473324.3	836234	-290.62	1.02
9141	3.03	151.71	5695.59	9124.57	-295.23	4.61	473319.7	836236.3	-295.26	0.33
9236	3.1	155.11	5790.45	9219.43	-299.77	6.88	473315.2	836238.6	-299.82	0.21
9339	3.6	139.48	5893.28	9322.26	-304.75	10.16	473310.2	836241.8	-304.83	1.01
9387	8.17	98.85	5941.03	9370.01	-306.42	14.51	473308.5	836246.2	-306.54	12.33
9434	12.63	72.95	5987.27	9416.25	-305.43	22.73	473309.5	836254.4	-305.62	13.53
9481	18.21	62.96	6032.57	9461.55	-300.58	34.19	473314.4	836265.9	-300.88	13.11
9528	24.22	50.4	6076.38	9505.36	-291.08	48.18	473323.9	836279.9	-291.51	15.97
9575	26.55	39.53	6118.87	9547.85	-276.83	62.31	473338.1	836294	-277.38	11.07
9622	28.9	27.78	6160.5	9589.48	-258.66	74.3	473356.3	836306	-259.32	12.64
9670	33.98	19.94	6201.46	9630.44	-235.76	84.29	473379.2	836316	-236.52	13.57
9717	39.59	13	6239.1	9668.08	-208.79	92.15	473406.2	836323.8	-209.62	14.84
9764	44.09	6.82	6274.12	9703.1	-177.94	97.46	473437	836329.1	-178.81	12.98

9811	48.86	0.65	6306.49	9735.47	-143.97	99.61	473471	836331.3	-144.86	13.91	
9858	54.27	356.46	6335.71	9764.69	-107.19	98.63	473507.8	836330.3	-108.08	13.46	
9905	60.28	353.8	6361.11	9790.09	-67.82	95.24	473547.1	836326.9	-68.68	13.64	
9952	65.76	354.63	6382.42	9811.4	-26.17	91.03	473588.8	836322.7	-26.99	11.77	
9999	70.08	355.42	6400.09	9829.07	17.21	87.26	473632.2	836318.9	16.42	9.32	
10046	73.48	355.61	6414.78	9843.76	61.71	83.77	473676.7	836315.5	60.95	7.24	
10093	77.33	356.46	6426.62	9855.6	107.08	80.63	473722	836312.3	106.34	8.38	
10141	81.11	356.26	6435.6	9864.58	154.13	77.63	473769.1	836309.3	153.42	7.89	
10188	84.66	356.59	6441.42	9870.4	200.67	74.73	473815.6	836306.4	199.98	7.59	
10236	85.47	357.19	6445.55	9874.53	248.42	72.13	473863.4	836303.8	247.75	2.1	
10283	86.48	356.88	6448.85	9877.83	295.24	69.71	473910.2	836301.4	294.6	2.25	
10330	86.55	357.07	6451.7	9880.68	342.09	67.23	473957	836298.9	341.46	0.43	
10377	84.63	355.52	6455.32	9884.3	388.85	64.2	474003.8	836295.9	388.25	5.24	
10425	84.86	356.14	6459.71	9888.69	436.52	60.73	474051.5	836292.4	435.95	1.37	
10472	85.37	355.31	6463.72	9892.7	483.22	57.24	474098.2	836288.9	482.68	2.07	
10519	86.23	355.27	6467.16	9896.14	529.93	53.39	474144.9	836285.1	529.43	1.83	
10566	87.91	354.28	6469.56	9898.54	576.67	49.11	474191.6	836280.8	576.2	4.15	
10614	89.78	353.18	6470.53	9899.51	624.37	43.87	474239.3	836275.6	623.95	4.52	
10708	92.21	353.48	6468.9	9897.88	717.72	32.96	474332.7	836264.6	717.39	2.6	
10802	89.5	352.64	6467.49	9896.47	811.01	21.6	474426	836253.3	810.78	3.02	
10897	91.3	353.55	6466.83	9895.81	905.31	10.18	474520.3	836241.9	905.18	2.12	
10991	89.56	352.75	6466.13	9895.11	998.63	-1.03	474613.6	836230.7	998.6	2.04	
11085	90.95	353.22	6465.71	9894.69	1091.93	-12.51	474706.9	836219.2	1091.99	1.56	
11180	88.59	354.58	6466.09	9895.07	1186.38	-22.6	474801.3	836209.1	1186.54	2.87	
11274	87.68	358.93	6469.15	9898.13	1280.15	-27.92	474895.1	836203.8	1280.36	4.73	
11369	88.28	358.75	6472.5	9901.48	1375.08	-29.84	474990	836201.8	1375.29	0.66	
11463	88.64	1.42	6475.02	9904	1469.03	-29.7	475084	836202	1469.24	2.87	
11557	90.12	2.14	6476.04	9905.02	1562.98	-26.78	475177.9	836204.9	1563.16	1.75	
11652	90.61	1.64	6475.44	9904.42	1657.92	-23.65	475272.9	836208	1658.07	0.74	
11746	91.84	1.59	6473.43	9902.41	1751.86	-21	475366.8	836210.7	1751.98	1.31	
11841	90.45	1.46	6471.53	9900.51	1846.81	-18.47	475461.8	836213.2	1846.9	1.47	
11935	92.6	1.6	6469.03	9898.01	1940.74	-15.97	475555.7	836215.7	1940.8	2.29	
12046	90.45	0.07	6466.07	9895.05	2051.68	-14.35	475666.6	836217.3	2051.72	2.38	
12140	88.99	0.24	6466.53	9895.51	2145.67	-14.1	475760.6	836217.6	2145.71	1.56	
12235	88.15	0.35	6468.9	9897.88	2240.64	-13.61	475855.6	836218.1	2240.67	0.89	
12329	87.68	0.67	6472.32	9901.3	2334.57	-12.77	475949.5	836218.9	2334.59	0.6	
12424	90.3	0.11	6474	9902.98	2429.55	-12.12	476044.5	836219.6	2429.56	2.82	
12518	91.59	359.65	6472.45	9901.43	2523.53	-12.32	476138.5	836219.4	2523.54	1.46	
12613	91.07	0.53	6470.24	9899.22	2618.51	-12.17	476233.5	836219.5	2618.51	1.08	
12707	91.39	0.33	6468.22	9897.2	2712.48	-11.47	476327.4	836220.2	2712.47	0.4	
12801	89.92	0.1	6467.15	9896.13	2806.47	-11.11	476421.4	836220.6	2806.46	1.58	
12896	89.62	359.3	6467.53	9896.51	2901.47	-11.61	476516.4	836220.1	2901.46	0.9	
12990	90.61	359.63	6467.34	9896.32	2995.46	-12.49	476610.4	836219.2	2995.45	1.11	
13085	91.71	359.16	6465.42	9894.4	3090.44	-13.49	476705.4	836218.2	3090.43	1.26	
13179	89.24	359	6464.64	9893.62	3184.41	-15	476799.4	836216.7	3184.42	2.63	
13274	89.87	358.54	6465.38	9894.36	3279.39	-17.04	476894.3	836214.6	3279.41	0.82	
13368	92.56	358.33	6463.38	9892.36	3373.32	-19.61	476988.3	836212.1	3373.36	2.87	
13463	90.52	358.9	6460.83	9889.81	3468.26	-21.9	477083.2	836209.8	3468.31	2.23	
13557	90.42	359.22	6460.06	9889.04	3562.24	-23.44	477177.2	836208.2	3562.31	0.36	
13652	92.01	359.49	6458.05	9887.03	3657.21	-24.51	477272.2	836207.2	3657.28	1.7	
13746	92.5	0.25	6454.35	9883.33	3751.14	-24.73	477366.1	836207	3751.21	0.96	
13841	91.18	0.4	6451.3	9880.28	3846.08	-24.19	477461	836207.5	3846.14	1.4	
13936	92.09	0.54	6448.59	9877.57	3941.04	-23.41	477556	836208.3	3941.09	0.97	
14030	89.64	0.23	6447.17	9876.15	4035.02	-22.78	477650	836208.9	4035.06	2.63	
14125	89.76	359.97	6447.66	9876.64	4130.02	-22.61	477745	836209.1	4130.05	0.3	
14219	91.09	0.44	6446.97	9875.95	4224.01	-22.27	477839	836209.4	4224.04	1.5	
14314	90.42	359.55	6445.72	9874.7	4319	-22.28	477934	836209.4	4319.03	1.17	
14408	89.67	359.26	6445.64	9874.62	4413	-23.26	478028	836208.4	4413.03	0.86	
14496	90.21	359.03	6445.73	9874.71	4500.99	-24.57	478115.9	836207.1	4501.03	0.67	Final Phoenix MWD Survey
14560	90.21	359.03	6445.5	9874.48	4564.98	-25.66	478179.9	836206	4565.02	0	Projection to TD

All data are in feet unless otherwise stated. Directions and coordinates are relative to Grid North.
Vertical depths are relative to GL+KB. Northings and Eastings are relative to Well.

The Dogleg Severity is in Degrees per 100 feet.

Vertical Section is from Slot and calculated along an Azimuth of 359.480° (Grid).

Coordinate System is North American Datum 1983 US State Plane 1983, New Mexico Eastern Zone.
Grid Convergence at Surface is 0.510°.

Based upon Minimum Curvature type calculations, at a Measured Depth of 14560.00ft.,
the Bottom Hole Displacement is 4565.05ft., in the Direction of 359.480° (Grid).