

HOBBS OCD
MAR 23 2015
RECEIVED



December 18, 2014

Devon Energy
333 West Sheridan Ave
Oklahoma City, Oklahoma 73102-5010

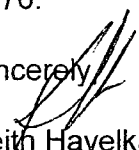
Attn: David Cook

Re: **Malachite 22 Federal 2H**

Please find enclosed a copy of the survey from 0.00' to 5214.23' ran on the above referenced well.

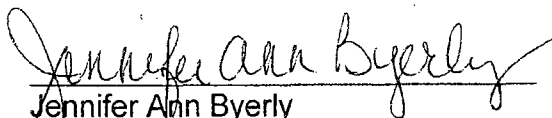
If I can be of any further service please do not hesitate to call me at 800-606-4976.

Sincerely,

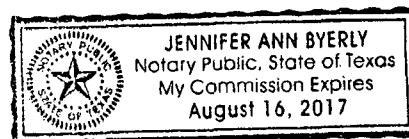

Keith Havelka
Operations

STATE OF TEXAS §
 §
COUNTY OF NUECES §

This instrument was acknowledged before me on the 18 day of December 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



MAR 26 2015



Company: Devon Energy
Lease/Well: Malachite 22 Federal/2H

Rig Name: HP 394
State/County: New Mexico/Lea
Latitude: 32.65, Longitude: -103.65
GRID North is 0.37 Degrees East of True North
VS-Azi: 0.00 Degrees



Depth Reference : RKB = 25 feet

DRILLOG MS GYRO SURVEY CALCULATIONS

Filename: gyro survey.ut
Minimum Curvature Method
Report Date/Time: 12/18/2014 / 12:49

VES Survey International
Midland, Texas
432-563-5444

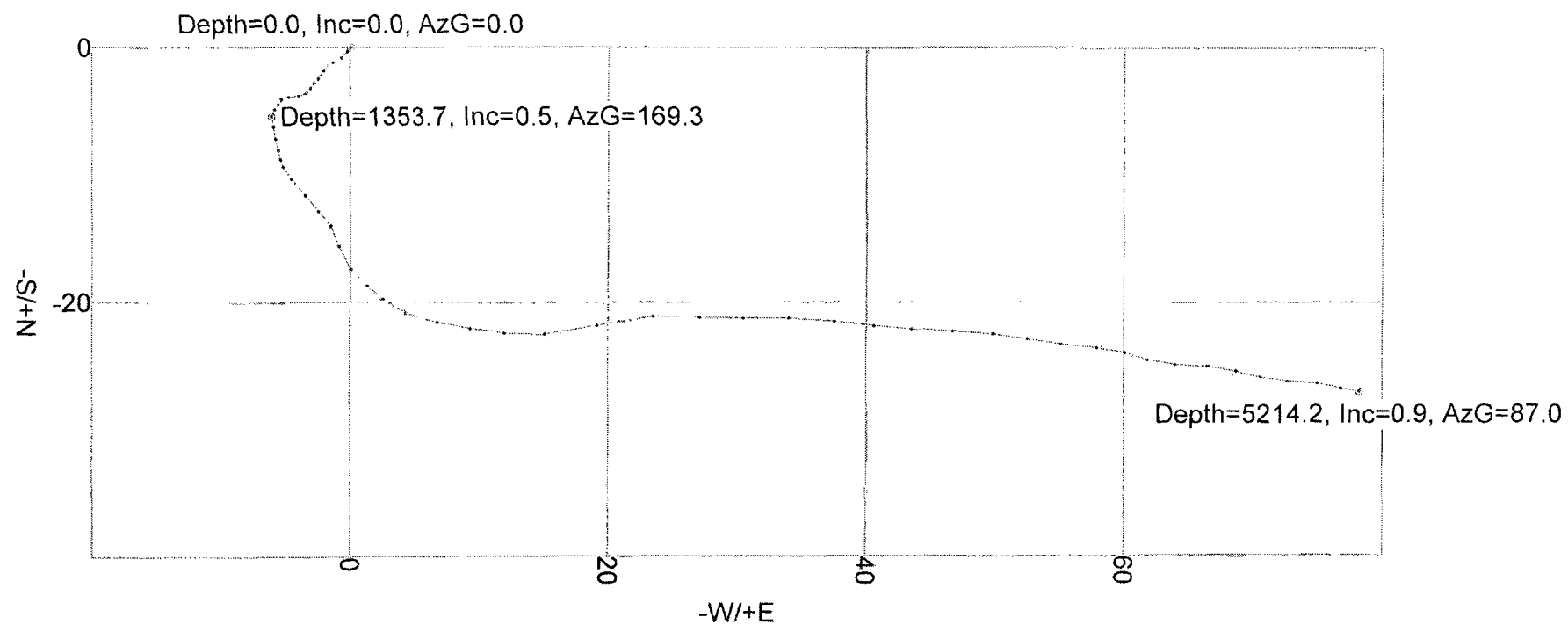
Surveyor: Adam Askew
Malachite 22 Federal 2H / API 30-025-40389

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	****
129.59	0.39	220.27	129.59	-0.34	-0.29	-0.34	0.44	220.27	0.30
223.75	0.38	226.14	223.75	-0.80	-0.72	-0.80	1.08	221.98	0.04
317.91	0.53	253.56	317.90	-1.14	-1.36	-1.14	1.78	230.08	0.27
412.07	0.71	207.31	412.06	-1.78	-2.04	-1.78	2.71	229.00	0.54
506.23	0.29	225.99	506.22	-2.46	-2.48	-2.46	3.49	225.28	0.47
600.39	0.30	220.60	600.37	-2.80	-2.81	-2.80	3.97	225.03	0.03
694.55	0.29	213.06	694.53	-3.19	-3.09	-3.19	4.44	224.15	0.04
788.71	0.31	221.83	788.69	-3.58	-3.39	-3.58	4.93	223.50	0.05
882.87	0.53	264.68	882.85	-3.81	-4.00	-3.81	5.52	226.41	0.39
977.03	0.40	262.96	977.01	-3.89	-4.76	-3.89	6.15	230.76	0.14
1071.19	0.37	239.15	1071.16	-4.09	-5.35	-4.09	6.73	232.63	0.17
1165.35	0.30	175.12	1165.32	-4.49	-5.60	-4.49	7.17	231.27	0.38
1259.51	0.41	243.78	1259.48	-4.88	-5.88	-4.88	7.64	230.30	0.44
1353.67	0.49	169.25	1353.64	-5.42	-6.11	-5.42	8.17	228.41	0.58
1447.83	0.53	176.68	1447.80	-6.25	-6.01	-6.25	8.67	223.87	0.09
1541.99	0.62	163.73	1541.95	-7.18	-5.84	-7.18	9.25	219.15	0.16
1636.15	0.55	165.01	1636.11	-8.10	-5.58	-8.10	9.84	214.59	0.07
1730.31	0.33	169.04	1730.26	-8.80	-5.42	-8.80	10.33	211.61	0.23

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
1824.47	0.44	156.47	1824.42	-9.40	-5.22	-9.40	10.75	209.03	0.15
1918.63	0.96	138.61	1918.57	-10.33	-4.55	-10.33	11.29	203.76	0.59
2012.79	1.07	139.42	2012.72	-11.59	-3.45	-11.59	12.10	196.60	0.11
2106.95	0.90	144.11	2106.86	-12.86	-2.45	-12.86	13.09	190.80	0.20
2201.11	0.90	136.83	2201.01	-13.99	-1.52	-13.99	14.07	186.18	0.12
2295.27	1.29	172.40	2295.16	-15.57	-0.87	-15.57	15.60	183.21	0.81
2389.43	1.33	136.61	2389.29	-17.42	0.02	-17.42	17.42	179.93	0.86
2483.59	0.91	129.09	2483.44	-18.68	1.35	-18.68	18.73	175.86	0.48
2577.75	1.03	133.85	2577.58	-19.74	2.54	-19.74	19.90	172.67	0.15
2671.91	1.53	112.37	2671.72	-20.80	4.31	-20.80	21.24	168.29	0.73
2766.07	1.71	102.10	2765.84	-21.58	6.85	-21.58	22.64	162.39	0.36
2860.23	1.45	99.78	2859.97	-22.07	9.40	-22.07	23.99	156.93	0.28
2954.39	1.73	96.15	2954.09	-22.43	11.99	-22.43	25.43	151.87	0.31
3048.55	2.16	88.52	3048.19	-22.53	15.18	-22.53	27.17	146.04	0.54
3142.71	2.82	73.88	3142.27	-21.85	19.18	-21.85	29.07	138.72	0.97
3236.87	2.50	87.64	3236.33	-21.12	23.46	-21.12	31.56	131.99	0.75
3331.03	1.89	95.89	3330.42	-21.19	27.06	-21.19	34.37	128.07	0.73
3425.19	2.23	87.08	3424.52	-21.26	30.43	-21.26	37.12	124.94	0.49
3519.35	2.16	92.79	3518.61	-21.25	34.02	-21.25	40.11	121.99	0.24
3613.51	2.11	96.04	3612.70	-21.52	37.52	-21.52	43.25	119.84	0.14
3707.67	1.63	96.05	3706.81	-21.84	40.57	-21.84	46.08	118.30	0.51
3801.83	1.94	93.46	3800.93	-22.08	43.50	-22.08	48.79	116.91	0.34
3895.99	1.94	93.26	3895.03	-22.27	46.69	-22.27	51.72	115.50	0.01
3990.15	1.88	94.87	3989.14	-22.49	49.82	-22.49	54.66	114.30	0.08
4084.31	1.43	104.13	4083.26	-22.91	52.50	-22.91	57.28	113.57	0.56
4178.47	1.76	94.15	4177.38	-23.30	55.08	-23.30	59.81	112.93	0.46
4272.63	1.62	97.44	4271.50	-23.58	57.85	-23.58	62.47	112.17	0.18
4366.79	1.13	104.80	4365.63	-23.99	60.07	-23.99	64.68	111.77	0.55
4460.95	1.14	108.83	4459.78	-24.53	61.85	-24.53	66.54	111.63	0.09
4555.11	1.55	93.78	4553.91	-24.92	64.02	-24.92	68.69	111.27	0.57
4649.27	1.54	92.43	4648.04	-25.05	66.55	-25.05	71.11	110.63	0.04
4743.43	1.21	110.65	4742.17	-25.46	68.74	-25.46	73.30	110.32	0.58
4837.59	1.16	97.48	4836.31	-25.93	70.61	-25.93	75.22	110.16	0.29
4931.75	1.41	97.25	4930.45	-26.20	72.70	-26.20	77.28	109.82	0.26
5025.91	1.39	93.56	5024.58	-26.42	74.99	-26.42	79.51	109.41	0.10
5120.07	0.90	112.81	5118.72	-26.77	76.82	-26.77	81.35	109.22	0.66
5214.23	0.87	86.95	5212.87	-27.02	78.22	-27.02	82.76	109.06	0.42



VES Survey International
Midland, Texas
432-563-5444
Surveyor: Adam Askew
Malachite 22 Federal 2H / API 30-025-40389





MALACHITE 22 FED 2H

DELAWARE BASIN UNRESTRICTED

Directional Survey

Sub-Division DELAWARE BASIN	County LEA	Field Name CORBIN SOUTH	Region DELAWARE SLOPE EAST	State/Province NM
Surface Legal Location SEC22 T19S R33E	API/UWI 3002540389	Latitude (°) 32° 39' 7.503" N	Longitude (°) 103° 39' 17.11" W	Ground Elev M... 3,644.40
				Orig KB Elev (ft) 3,669.40
				Tubing Head Elevation (ft)

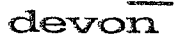
Wellbores				
Wellbore Name OH	Parent Wellbore	SAP Well ID 036783-020	Vertical Section Direction (°) 175.87	

Kick Offs & Key Depths				
Date	Type			Top Depth (ftKB)

Actual Deviation Survey	Definitive?	Proposed?	Proposed Deviation Survey	
GYRO/MWD, Proposed? No	Yes	No		

Deviation Survey						
Date 11/29/2014	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
11/29/2...	129.59	0.39	220.27	129.59	0.32	-0.34	-0.29	-0.30	GYRO	VAUHGN ENERGY SERVICES
11/29/2...	223.75	0.38	226.14	223.75	0.74	-0.80	-0.72	-0.04	GYRO	VAUHGN ENERGY SERVICES
11/29/2...	317.91	0.53	253.56	317.90	1.04	-1.14	-1.36	-0.28	GYRO	VAUHGN ENERGY SERVICES
11/29/2...	412.07	0.71	207.31	412.06	1.63	-1.78	-2.05	-0.55	GYRO	VAUHGN ENERGY SERVICES
11/29/2...	506.23	0.29	225.99	506.22	2.28	-2.46	-2.48	-0.47	GYRO	VAUHGN ENERGY SERVICES
11/29/2...	600.39	0.30	220.60	600.37	2.61	-2.82	-2.82	-0.03	GYRO	VAUHGN ENERGY SERVICES
11/29/2...	694.55	0.29	213.06	694.53	2.97	-3.20	-3.11	-0.04	GYRO	VAUHGN ENERGY SERVICES
11/29/2...	788.71	0.31	221.83	788.69	3.34	-3.59	-3.41	-0.05	GYRO	VAUHGN ENERGY SERVICES
11/29/2...	882.87	0.53	264.68	882.85	3.52	-3.82	-4.01	-0.39	GYRO	VAUHGN ENERGY SERVICES
11/29/2...	977.03	0.40	262.96	977.01	3.55	-3.90	-4.77	-0.14	GYRO	VAUHGN ENERGY SERVICES
11/29/2...	1,071.19	0.37	239.15	1,071.16	3.70	-4.10	-5.36	-0.17	GYRO	VAUHGN ENERGY SERVICES
11/29/2...	1,165.35	0.30	175.12	1,165.32	4.09	-4.50	-5.60	-0.38	GYRO	VAUHGN ENERGY SERVICES
11/29/2...	1,259.51	0.41	243.78	1,259.48	4.46	-4.89	-5.88	-0.44	GYRO	VAUHGN ENERGY SERVICES
11/29/2...	1,353.67	0.49	169.25	1,353.64	4.99	-5.44	-6.11	-0.58	GYRO	VAUHGN ENERGY SERVICES
11/29/2...	1,447.83	0.53	176.68	1,447.80	5.82	-6.27	-6.01	-0.08	GYRO	VAUHGN ENERGY SERVICES
11/29/2...	1,541.99	0.62	163.73	1,541.95	6.75	-7.19	-5.84	-0.17	GYRO	VAUHGN ENERGY SERVICES
11/29/2...	1,636.15	0.55	165.01	1,636.11	7.70	-8.12	-5.58	-0.08	GYRO	VAUHGN ENERGY SERVICES
11/29/2...	1,730.31	0.33	169.04	1,730.26	8.41	-8.82	-5.41	-0.24	GYRO	VAUHGN ENERGY SERVICES
11/29/2...	1,824.47	0.44	156.47	1,824.42	9.02	-9.42	-5.21	-0.15	GYRO	VAUHGN ENERGY SERVICES
11/29/2...	1,918.63	0.96	138.61	1,918.57	9.99	-10.34	-4.55	-0.59	GYRO	VAUHGN ENERGY SERVICES
11/29/2...	2,012.79	1.07	139.42	2,012.72	11.32	-11.60	-3.45	-0.12	GYRO	VAUHGN ENERGY SERVICES
11/29/2...	2,106.95	0.90	144.11	2,106.86	12.66	-12.87	-2.45	-0.20	GYRO	VAUHGN ENERGY SERVICES
11/29/2...	2,201.11	0.90	136.83	2,201.01	13.86	-14.01	-1.51	-0.12	GYRO	VAUHGN ENERGY SERVICES
11/29/2...	2,295.27	1.29	172.40	2,295.16	15.49	-15.60	-0.86	-0.81	GYRO	VAUHGN ENERGY SERVICES
11/29/2...	2,389.43	1.33	136.61	2,389.29	17.40	-17.44	-0.03	-0.86	GYRO	VAUHGN ENERGY SERVICES
11/29/2...	2,483.59	0.91	129.09	2,483.44	18.76	-18.71	-1.36	-0.47	GYRO	VAUHGN ENERGY SERVICES
11/29/2...	2,577.75	1.03	133.85	2,577.58	19.90	-19.77	-2.55	-0.15	GYRO	VAUHGN ENERGY SERVICES
11/29/2...	2,671.91	1.53	112.37	2,671.72	21.09	-20.83	-4.32	-0.73	GYRO	VAUHGN ENERGY SERVICES
11/29/2...	2,766.07	1.71	102.10	2,765.84	22.04	-21.60	-6.86	-0.36	GYRO	VAUHGN ENERGY SERVICES
11/29/2...	2,860.23	1.45	99.78	2,859.97	22.72	-22.10	-9.41	-0.28	GYRO	VAUHGN ENERGY SERVICES
11/29/2...	2,954.39	1.73	96.15	2,954.09	23.26	-22.45	-11.99	-0.32	GYRO	VAUHGN ENERGY SERVICES
11/29/2...	3,048.55	2.16	88.52	3,048.19	23.60	-22.56	-15.18	-0.53	GYRO	VAUHGN ENERGY SERVICES
11/29/2...	3,142.71	2.82	73.88	3,142.27	23.20	-21.87	-19.18	-0.97	GYRO	VAUHGN ENERGY SERVICES
11/29/2...	3,236.87	2.50	87.64	3,236.33	22.78	-21.14	-23.46	-0.76	GYRO	VAUHGN ENERGY SERVICES
11/29/2...	3,331.03	1.89	95.89	3,330.42	23.11	-21.22	-27.05	-0.73	GYRO	VAUHGN ENERGY SERVICES
11/29/2...	3,425.19	2.23	87.08	3,424.52	23.42	-21.29	-30.43	-0.49	GYRO	VAUHGN ENERGY SERVICES
11/29/2...	3,519.35	2.16	92.79	3,518.61	23.67	-21.28	-34.03	-0.24	GYRO	VAUHGN ENERGY SERVICES
11/29/2...	3,613.51	2.11	96.04	3,612.70	24.19	-21.55	-37.53	-0.14	GYRO	VAUHGN ENERGY SERVICES
11/29/2...	3,707.67	1.63	96.05	3,706.81	24.74	-21.87	-40.58	-0.51	GYRO	VAUHGN ENERGY SERVICES
11/29/2...	3,801.83	1.94	93.46	3,800.93	25.18	-22.11	-43.50	-0.34	GYRO	VAUHGN ENERGY SERVICES
11/29/2...	3,895.99	1.94	93.26	3,895.03	25.60	-22.29	-46.69	-0.01	GYRO	VAUHGN ENERGY SERVICES
11/29/2...	3,990.15	1.88	94.87	3,989.14	26.05	-22.52	-49.82	-0.09	GYRO	VAUHGN ENERGY SERVICES
11/29/2...	4,084.31	1.43	104.13	4,083.26	26.66	-22.93	-52.49	-0.55	GYRO	VAUHGN ENERGY SERVICES
11/29/2...	4,178.47	1.76	94.15	4,177.38	27.23	-23.33	-55.08	-0.46	GYRO	VAUHGN ENERGY SERVICES



MALACHITE 22 FED 2H

DELAWARE BASIN UNRESTRICTED

Directional Survey

Sub-Division DELAWARE BASIN	County LEA	Field Name CORBIN SOUTH	Region DELAWARE SLOPE EAST	State/Province NM
Surface Legal Location: SEC22 T19S R33E	APN/BLM 3002540389	Latitude (°) 32° 39' 7.503" N	Longitude (°) 103° 39' 17.11" W	Ground Elev M... 3,644.40
				Orig KB Elev (ft) 3,669.40
				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
11/29/2...	4,272.63	1.62	97.44	4,271.50	27.71	23.60	57.84	0.18	GYRO	VAUHGN ENERGY SERVICES
11/29/2...	4,366.79	1.13	104.80	4,365.63	28.28	24.01	60.05	0.55	GYRO	VAUHGN ENERGY SERVICES
11/29/2...	4,460.95	1.14	108.83	4,459.78	28.94	24.55	61.84	0.09	GYRO	VAUHGN ENERGY SERVICES
11/29/2...	4,555.11	1.55	93.78	4,553.91	29.48	24.94	64.00	0.57	GYRO	VAUHGN ENERGY SERVICES
11/29/2...	4,649.27	1.54	92.43	4,648.04	29.80	25.08	66.53	0.04	GYRO	VAUHGN ENERGY SERVICES
11/29/2...	4,743.43	1.21	110.65	4,742.17	30.36	25.48	68.73	0.58	GYRO	VAUHGN ENERGY SERVICES
11/29/2...	4,837.59	1.16	97.48	4,836.31	30.97	25.95	70.60	0.29	GYRO	VAUHGN ENERGY SERVICES
11/29/2...	4,931.75	1.41	97.25	4,930.45	31.39	26.22	72.70	0.27	GYRO	VAUHGN ENERGY SERVICES
11/29/2...	5,025.91	1.39	93.56	5,024.58	31.77	26.44	74.98	0.10	GYRO	VAUHGN ENERGY SERVICES
11/29/2...	5,120.07	0.90	112.81	5,118.72	32.26	26.80	76.81	0.65	GYRO	VAUHGN ENERGY SERVICES
11/29/2...	5,214.23	0.87	86.95	5,212.87	32.61	27.05	78.20	0.42	GYRO	VAUHGN ENERGY SERVICES
12/2/2014	5,388.00	1.50	54.50	5,386.60	31.45	25.66	81.37	0.52	MWD	LEAM DRILLING SYSTEMS
12/2/2014	5,482.00	5.60	40.60	5,480.40	27.55	21.46	85.36	4.43	MWD	LEAM DRILLING SYSTEMS
12/2/2014	5,577.00	6.20	35.20	5,574.90	20.29	13.75	91.33	0.86	MWD	LEAM DRILLING SYSTEMS
12/2/2014	5,671.00	6.00	35.50	5,668.37	12.58	5.60	97.11	0.22	MWD	LEAM DRILLING SYSTEMS
12/3/2014	5,765.00	5.50	35.00	5,761.89	5.30	2.09	102.55	0.53	MWD	LEAM DRILLING SYSTEMS
12/3/2014	5,860.00	5.30	35.90	5,856.47	1.59	9.37	107.73	0.23	MWD	LEAM DRILLING SYSTEMS
12/3/2014	5,954.00	5.00	33.60	5,950.09	8.15	16.30	112.54	0.39	MWD	LEAM DRILLING SYSTEMS
12/3/2014	6,049.00	4.20	32.00	6,044.79	14.24	22.70	116.68	0.85	MWD	LEAM DRILLING SYSTEMS
12/3/2014	6,143.00	4.70	42.70	6,138.50	19.65	28.45	121.11	1.03	MWD	LEAM DRILLING SYSTEMS
12/3/2014	6,238.00	5.00	46.90	6,233.16	24.92	34.14	126.78	0.49	MWD	LEAM DRILLING SYSTEMS
12/3/2014	6,332.00	4.40	45.90	6,326.85	29.81	39.45	132.36	0.64	MWD	LEAM DRILLING SYSTEMS
12/3/2014	6,427.00	4.20	45.50	6,421.58	34.41	44.42	137.46	0.21	MWD	LEAM DRILLING SYSTEMS
12/3/2014	6,521.00	4.10	44.30	6,515.33	38.87	49.24	142.26	0.14	MWD	LEAM DRILLING SYSTEMS
12/3/2014	6,616.00	3.90	41.40	6,610.10	43.38	54.09	146.77	0.30	MWD	LEAM DRILLING SYSTEMS
12/3/2014	6,710.00	4.20	45.70	6,703.87	47.84	58.90	151.34	0.45	MWD	LEAM DRILLING SYSTEMS
12/3/2014	6,805.00	5.50	47.50	6,798.53	52.91	64.40	157.19	1.38	MWD	LEAM DRILLING SYSTEMS
12/4/2014	6,899.00	5.60	46.40	6,892.09	58.62	70.61	163.83	0.16	MWD	LEAM DRILLING SYSTEMS
12/4/2014	6,994.00	4.70	39.20	6,986.70	64.40	76.82	169.65	1.16	MWD	LEAM DRILLING SYSTEMS
12/4/2014	7,088.00	4.50	38.30	7,080.40	69.93	82.70	174.37	0.23	MWD	LEAM DRILLING SYSTEMS
12/5/2014	7,183.00	4.40	35.90	7,175.11	75.47	88.58	178.82	0.22	MWD	LEAM DRILLING SYSTEMS
12/5/2014	7,277.00	3.70	38.90	7,268.88	80.45	93.86	182.83	0.78	MWD	LEAM DRILLING SYSTEMS
12/5/2014	7,371.00	2.50	41.70	7,362.74	84.09	97.75	186.10	1.29	MWD	LEAM DRILLING SYSTEMS
12/5/2014	7,466.00	0.70	60.80	7,457.70	85.78	99.58	187.99	1.95	MWD	LEAM DRILLING SYSTEMS
12/5/2014	7,560.00	0.30	77.50	7,551.69	86.06	99.91	188.73	0.45	MWD	LEAM DRILLING SYSTEMS
12/5/2014	7,658.00	0.10	136.20	7,649.69	86.03	99.91	189.04	0.27	MWD	LEAM DRILLING SYSTEMS
12/5/2014	7,749.00	0.40	26.90	7,740.69	86.24	100.13	189.24	0.49	MWD	LEAM DRILLING SYSTEMS
12/5/2014	7,843.00	0.30	319.20	7,834.69	86.72	100.61	189.23	0.42	MWD	LEAM DRILLING SYSTEMS
12/5/2014	7,938.00	0.40	350.70	7,929.69	87.25	101.13	189.01	0.22	MWD	LEAM DRILLING SYSTEMS
12/5/2014	8,032.00	0.40	311.00	8,023.69	87.81	101.66	188.71	0.29	MWD	LEAM DRILLING SYSTEMS
12/5/2014	8,187.00	0.50	331.00	8,178.68	88.81	102.61	187.97	0.12	MWD	LEAM DRILLING SYSTEMS
12/5/2014	8,222.00	0.40	332.80	8,213.68	89.06	102.85	187.84	0.29	MWD	LEAM DRILLING SYSTEMS
12/5/2014	8,316.00	0.60	325.70	8,307.68	89.79	103.55	187.42	0.22	MWD	LEAM DRILLING SYSTEMS
12/5/2014	8,411.00	0.90	298.00	8,402.67	90.61	104.31	186.48	0.49	MWD	LEAM DRILLING SYSTEMS
12/5/2014	8,569.00	1.20	302.90	8,560.64	92.27	105.79	183.99	0.20	MWD	LEAM DRILLING SYSTEMS
12/7/2014	8,587.00	1.40	308.00	8,578.64	92.53	106.03	183.66	1.28	MWD	LEAM DRILLING SYSTEMS
12/7/2014	8,618.00	1.30	287.60	8,609.63	92.91	106.37	183.03	1.57	MWD	LEAM DRILLING SYSTEMS
12/7/2014	8,650.00	2.90	202.20	8,641.61	92.32	105.73	182.37	9.63	MWD	LEAM DRILLING SYSTEMS
12/7/2014	8,681.00	6.50	185.80	8,672.51	89.89	103.26	181.90	12.28	MWD	LEAM DRILLING SYSTEMS
12/7/2014	8,713.00	10.40	180.50	8,704.15	85.23	98.57	181.69	12.42	MWD	LEAM DRILLING SYSTEMS
12/7/2014	8,744.00	14.30	178.30	8,734.43	78.61	91.94	181.78	12.67	MWD	LEAM DRILLING SYSTEMS
12/7/2014	8,776.00	18.00	178.80	8,765.16	69.72	83.04	182.00	11.57	MWD	LEAM DRILLING SYSTEMS
12/7/2014	8,807.00	21.20	177.50	8,794.36	59.33	72.65	182.35	10.42	MWD	LEAM DRILLING SYSTEMS
12/7/2014	8,839.00	25.00	177.50	8,823.79	46.78	60.11	182.90	11.87	MWD	LEAM DRILLING SYSTEMS
12/7/2014	8,870.00	28.90	176.30	8,851.42	32.74	46.09	183.66	12.70	MWD	LEAM DRILLING SYSTEMS
12/7/2014	8,901.00	33.00	175.80	8,878.00	16.80	30.18	184.77	13.25	MWD	LEAM DRILLING SYSTEMS
12/7/2014	8,933.00	37.40	176.10	8,904.14	1.64	11.79	186.07	13.76	MWD	LEAM DRILLING SYSTEMS



MALACHITE 22 FED 2H

DELAWARE BASIN UNRESTRICTED

Directional Survey

Sub-Division DELAWARE BASIN	County LEA	Field Name CORBIN SOUTH	Region DELAWARE SLOPE EAST	State/Province NM
Surface Legal Location SEC22 T19S R33E	API/UWI 3002540389	Latitude (°) 32° 39' 7.503" N	Longitude (°) 103° 39' 17.11" W	Ground Elev M... 3,644.40
				Orig KB Elev (ft) 3,669.40
				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
12/7/2014	8,965.00	41.10	177.40	8,928.92	21.88	-8.42	187.21	11.84	MWD	LEAM DRILLING SYSTEMS
12/7/2014	8,997.00	44.00	177.90	8,952.49	43.51	-30.04	188.09	9.12	MWD	LEAM DRILLING SYSTEMS
12/7/2014	9,028.00	47.10	178.30	8,974.20	65.62	-52.15	188.82	10.04	MWD	LEAM DRILLING SYSTEMS
12/7/2014	9,059.00	50.80	178.10	8,994.55	88.97	-75.52	189.56	11.95	MWD	LEAM DRILLING SYSTEMS
12/7/2014	9,090.00	54.60	177.50	9,013.33	113.61	-100.15	190.51	12.35	MWD	LEAM DRILLING SYSTEMS
12/7/2014	9,122.00	57.40	176.50	9,031.23	140.13	-126.64	191.90	9.13	MWD	LEAM DRILLING SYSTEMS
12/7/2014	9,153.00	58.50	176.80	9,047.68	166.41	-152.87	193.43	3.64	MWD	LEAM DRILLING SYSTEMS
12/8/2014	9,185.00	59.50	177.50	9,064.16	193.83	-180.27	194.80	3.64	MWD	LEAM DRILLING SYSTEMS
12/8/2014	9,216.00	60.50	178.80	9,079.66	220.65	-207.10	195.66	4.86	MWD	LEAM DRILLING SYSTEMS
12/8/2014	9,247.00	61.70	177.90	9,094.64	247.77	-234.23	196.44	4.63	MWD	LEAM DRILLING SYSTEMS
12/8/2014	9,279.00	61.40	177.90	9,109.88	275.88	-262.34	197.48	0.94	MWD	LEAM DRILLING SYSTEMS
12/8/2014	9,310.00	60.80	177.40	9,124.86	303.01	-289.46	198.59	2.40	MWD	LEAM DRILLING SYSTEMS
12/9/2014	9,342.00	62.10	176.50	9,140.16	331.11	-317.53	200.08	4.75	MWD	LEAM DRILLING SYSTEMS
12/9/2014	9,373.00	63.60	176.00	9,154.30	358.70	-345.05	201.89	5.05	MWD	LEAM DRILLING SYSTEMS
12/9/2014	9,405.00	65.30	175.60	9,168.11	387.57	-373.84	204.00	5.43	MWD	LEAM DRILLING SYSTEMS
12/9/2014	9,436.00	67.30	175.10	9,180.56	415.95	-402.13	206.31	6.62	MWD	LEAM DRILLING SYSTEMS
12/9/2014	9,468.00	68.70	174.90	9,192.55	445.61	-431.69	208.89	4.41	MWD	LEAM DRILLING SYSTEMS
12/9/2014	9,499.00	70.00	175.40	9,203.48	474.62	-460.59	211.34	4.46	MWD	LEAM DRILLING SYSTEMS
12/9/2014	9,531.00	71.30	175.60	9,214.09	504.81	-490.69	213.71	4.11	MWD	LEAM DRILLING SYSTEMS
12/10/2...	9,561.00	72.10	176.70	9,223.51	533.29	-519.11	215.62	4.39	MWD	LEAM DRILLING SYSTEMS
12/10/2...	9,593.00	74.20	176.50	9,232.78	563.91	-549.68	217.44	6.59	MWD	LEAM DRILLING SYSTEMS
12/10/2...	9,624.00	78.30	175.60	9,240.15	594.02	-579.71	219.52	13.52	MWD	LEAM DRILLING SYSTEMS
12/11/2...	9,656.00	83.30	174.00	9,245.26	625.59	-611.16	222.38	16.39	MWD	LEAM DRILLING SYSTEMS
12/11/2...	9,664.00	84.50	173.70	9,246.11	633.54	-619.07	223.23	15.46	MWD	LEAM DRILLING SYSTEMS
12/12/2...	9,689.00	88.20	173.30	9,247.71	658.46	-643.85	226.06	14.89	MWD	LEAM DRILLING SYSTEMS
12/12/2...	9,720.00	90.70	174.20	9,248.00	689.44	-674.67	229.43	8.57	MWD	LEAM DRILLING SYSTEMS
12/12/2...	9,752.00	91.50	174.20	9,247.39	721.42	-706.50	232.67	2.50	MWD	LEAM DRILLING SYSTEMS
12/12/2...	9,783.00	91.80	174.70	9,246.50	752.40	-737.34	235.66	1.88	MWD	LEAM DRILLING SYSTEMS
12/12/2...	9,815.00	92.30	175.10	9,245.35	784.37	-769.19	238.51	2.00	MWD	LEAM DRILLING SYSTEMS
12/12/2...	9,846.00	93.00	174.70	9,243.92	815.33	-800.03	241.26	2.60	MWD	LEAM DRILLING SYSTEMS
12/14/2...	9,878.00	92.10	175.10	9,242.49	847.30	-831.88	244.10	3.08	MWD	LEAM DRILLING SYSTEMS
12/14/2...	9,972.00	92.60	175.30	9,238.64	941.21	-925.47	251.96	0.57	MWD	LEAM DRILLING SYSTEMS
12/14/2...	10,067.00	90.90	175.10	9,235.74	1,036.16	-1,020.09	259.90	1.80	MWD	LEAM DRILLING SYSTEMS
12/14/2...	10,161.00	90.70	174.90	9,234.43	1,130.14	-1,113.72	268.10	0.30	MWD	LEAM DRILLING SYSTEMS
12/14/2...	10,255.00	91.20	175.30	9,232.87	1,224.11	-1,207.36	276.12	0.68	MWD	LEAM DRILLING SYSTEMS
12/14/2...	10,350.00	89.10	174.70	9,232.62	1,319.10	-1,302.00	284.40	2.30	MWD	LEAM DRILLING SYSTEMS
12/12/2...	10,444.00	90.20	175.30	9,233.19	1,413.08	-1,395.63	292.60	1.33	MWD	LEAM DRILLING SYSTEMS
12/12/2...	10,539.00	89.00	174.90	9,233.86	1,508.07	-1,490.28	300.71	1.33	MWD	LEAM DRILLING SYSTEMS
12/12/2...	10,633.00	90.10	174.90	9,234.59	1,602.05	-1,583.91	309.07	1.17	MWD	LEAM DRILLING SYSTEMS
12/12/2...	10,728.00	88.30	174.40	9,235.92	1,697.02	-1,678.48	317.92	1.97	MWD	LEAM DRILLING SYSTEMS
12/12/2...	10,822.00	86.40	173.70	9,240.27	1,790.86	-1,771.87	327.66	2.15	MWD	LEAM DRILLING SYSTEMS
12/13/2...	10,916.00	87.60	173.50	9,245.19	1,884.66	-1,865.15	338.12	1.29	MWD	LEAM DRILLING SYSTEMS
12/13/2...	11,011.00	88.70	173.90	9,248.25	1,979.54	-1,959.53	348.54	1.23	MWD	LEAM DRILLING SYSTEMS
12/13/2...	11,105.00	88.00	173.50	9,250.96	2,073.43	-2,052.92	358.85	0.86	MWD	LEAM DRILLING SYSTEMS
12/13/2...	11,200.00	89.00	174.70	9,253.45	2,168.35	-2,147.38	368.61	1.64	MWD	LEAM DRILLING SYSTEMS
12/13/2...	11,294.00	88.80	174.20	9,255.25	2,262.31	-2,240.92	377.70	0.57	MWD	LEAM DRILLING SYSTEMS
12/13/2...	11,389.00	89.30	174.00	9,256.83	2,357.25	-2,335.41	387.46	0.57	MWD	LEAM DRILLING SYSTEMS
12/13/2...	11,483.00	89.30	174.20	9,257.97	2,451.20	-2,428.90	397.13	0.21	MWD	LEAM DRILLING SYSTEMS
12/13/2...	11,577.00	88.10	172.80	9,260.11	2,545.09	-2,522.27	407.76	1.96	MWD	LEAM DRILLING SYSTEMS
12/13/2...	11,672.00	89.20	173.50	9,262.35	2,639.95	-2,616.56	419.09	1.37	MWD	LEAM DRILLING SYSTEMS
12/13/2...	11,767.00	89.00	175.60	9,263.84	2,734.91	-2,711.12	428.11	2.22	MWD	LEAM DRILLING SYSTEMS
12/13/2...	11,861.00	88.80	175.60	9,265.64	2,828.89	-2,804.82	435.32	0.21	MWD	LEAM DRILLING SYSTEMS
12/13/2...	11,956.00	91.60	177.90	9,265.31	2,923.86	-2,899.65	440.71	3.81	MWD	LEAM DRILLING SYSTEMS
12/13/2...	12,050.00	90.30	177.50	9,263.75	3,017.80	-2,993.56	444.48	1.45	MWD	LEAM DRILLING SYSTEMS
12/13/2...	12,145.00	89.90	176.70	9,263.59	3,112.78	-3,088.44	449.28	0.94	MWD	LEAM DRILLING SYSTEMS
12/13/2...	12,239.00	88.00	176.00	9,265.31	3,206.75	-3,182.23	455.27	2.15	MWD	LEAM DRILLING SYSTEMS



MALACHITE 22 FED 2H

DELAWARE BASIN UNRESTRICTED

Directional Survey

Sub-Division DELAWARE BASIN	County DEA	Field Name CORBIN SOUTH	Region DELAWARE SLOPE EAST	State/Province NM
Surface Legal Location SEC22 T19S R33E	API/WI 3002540389	Latitude (°) 32° 39' 7.503" N	Longitude (°) 103° 39' 17.11" W	Ground Elev M... 3,644.40
				Orig KB Elev (ft) 3,669.40
				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
12/13/2...	12,333.00	87.90	176.70	9,268.67	3,300.69	-3,275.98	461.25	0.75	MWD	LEAM DRILLING SYSTEMS
12/13/2...	12,428.00	88.20	176.70	9,271.90	3,395.62	-3,370.76	466.71	0.32	MWD	LEAM DRILLING SYSTEMS
12/13/2...	12,522.00	87.70	176.50	9,275.27	3,489.56	-3,464.54	472.28	0.57	MWD	LEAM DRILLING SYSTEMS
12/13/2...	12,616.00	88.10	175.60	9,278.71	3,583.49	-3,558.25	478.76	1.05	MWD	LEAM DRILLING SYSTEMS
12/13/2...	12,711.00	87.80	175.10	9,282.11	3,678.43	-3,652.88	486.45	0.61	MWD	LEAM DRILLING SYSTEMS
12/13/2...	12,805.00	89.70	176.50	9,284.16	3,772.40	-3,746.60	493.33	2.51	MWD	LEAM DRILLING SYSTEMS
12/15/2...	12,900.00	89.80	177.90	9,284.58	3,867.37	-3,841.48	497.97	1.48	MWD	LEAM DRILLING SYSTEMS
12/15/2...	12,995.00	90.00	177.70	9,284.74	3,962.31	-3,936.41	501.62	0.30	MWD	LEAM DRILLING SYSTEMS
12/15/2...	13,089.00	90.00	177.50	9,284.74	4,056.27	-4,030.33	505.56	0.21	MWD	LEAM DRILLING SYSTEMS
12/16/2...	13,184.00	89.80	177.20	9,284.91	4,151.24	-4,125.22	509.95	0.38	MWD	LEAM DRILLING SYSTEMS
12/16/2...	13,278.00	89.60	177.90	9,285.40	4,245.20	-4,219.14	513.97	0.77	MWD	LEAM DRILLING SYSTEMS
12/16/2...	13,373.00	90.00	178.30	9,285.73	4,340.12	-4,314.08	517.12	0.60	MWD	LEAM DRILLING SYSTEMS
12/16/2...	13,467.00	89.40	178.40	9,286.22	4,434.03	-4,408.04	519.82	0.65	MWD	LEAM DRILLING SYSTEMS
12/16/2...	13,561.00	89.10	178.80	9,287.45	4,527.92	-4,502.01	522.12	0.53	MWD	LEAM DRILLING SYSTEMS
12/16/2...	13,621.00	88.00	177.40	9,288.97	4,587.85	-4,561.95	524.11	2.97	MWD	LEAM DRILLING SYSTEMS
12/16/2...	13,676.00	88.00	177.40	9,290.89	4,642.80	-4,616.86	526.60	0.00	BIT	LEAM DRILLING SYSTEMS