

Company: COG Operating LLC (Concho)

Lease/Well: Burch Keely Unit/No 930H



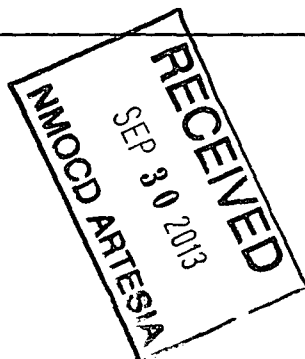
Rig Name: Silver Oak #3

State/County: New Mexico/Eddy

Latitude: 32.84, Longitude: -104.04

GRID North is 0.16 Degrees East of True North

VS-Azi: 0.00 Degrees



Depth Reference : RKB=17 Feet

DRILLOG HA GYRO SURVEY CALCULATIONS

Filename: bku #930h.ut

Minimum Curvature Method

Report Date/Time: 5/1/2013 / 10:44

Vaughn Energy Services

Midland, Texas

432-563-5444

Surveyor: Logan Henry

Burch Keely Unit No 930H / API 30-015-40969

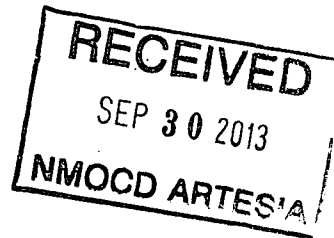
Measured Depth FT	Incl Angle Deg	Drift Direction Deg	TVD FT	+N/-S FT	+E/-W FT	Vertical Section FT	Closure Distance FT	Closure Direction Deg	Dogleg Severity Deg/100
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	****
100.00	0.31	187.20	100.00	-0.27	-0.03	-0.27	0.27	187.20	0.31
200.00	0.32	242.48	200.00	-0.67	-0.32	-0.67	0.74	205.45	0.29
300.00	0.11	258.10	300.00	-0.82	-0.66	-0.82	1.05	218.94	0.22
400.00	0.18	261.56	400.00	-0.86	-0.91	-0.86	1.25	226.58	0.07
500.00	0.27	275.24	500.00	-0.86	-1.30	-0.86	1.56	236.43	0.10
600.00	0.69	320.06	599.99	-0.38	-1.92	-0.38	1.96	258.85	0.53
700.00	0.76	14.40	699.99	0.73	-2.14	0.73	2.26	288.70	0.66
800.00	1.15	26.82	799.97	2.26	-1.53	2.26	2.73	326.01	0.44
900.00	1.28	30.90	899.95	4.12	-0.50	4.12	4.15	353.09	0.16
1000.00	1.47	37.00	999.92	6.10	0.85	6.10	6.16	7.90	0.24
1100.00	1.19	44.81	1099.89	7.86	2.35	7.86	8.21	16.65	0.33
1200.00	1.04	40.57	1199.87	9.29	3.68	9.29	9.99	21.59	0.17
1300.00	0.69	42.91	1299.86	10.42	4.68	10.42	11.42	24.17	0.36
1400.00	0.51	38.93	1399.86	11.21	5.36	11.21	12.42	25.58	0.18
1500.00	0.27	31.63	1499.86	11.75	5.77	11.75	13.09	26.14	0.25
1600.00	0.23	349.20	1599.85	12.15	5.85	12.15	13.49	25.72	0.18
1700.00	0.14	318.89	1699.85	12.44	5.73	12.44	13.70	24.74	0.13
1800.00	0.32	312.43	1799.85	12.72	5.45	12.72	13.84	23.18	0.18

15-40969

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
1900.00	0.43	313.83	1899.85	13.17	4.97	13.17	14.07	20.69	0.11
2000.00	0.33	312.96	1999.85	13.62	4.50	13.62	14.34	18.27	0.10
2100.00	0.44	301.37	2099.85	14.01	3.96	14.01	14.56	15.78	0.14
2200.00	0.21	299.02	2199.84	14.30	3.47	14.30	14.72	13.64	0.23
2300.00	0.39	310.13	2299.84	14.61	3.05	14.61	14.93	11.79	0.19
2400.00	0.38	328.97	2399.84	15.11	2.62	15.11	15.34	9.83	0.13
2500.00	0.10	335.57	2499.84	15.48	2.41	15.48	15.66	8.86	0.27
2600.00	0.36	342.38	2599.84	15.86	2.28	15.86	16.02	8.18	0.26
2700.00	0.16	347.85	2699.84	16.30	2.15	16.30	16.44	7.53	0.20
2800.00	0.34	343.02	2799.84	16.72	2.04	16.72	16.84	6.95	0.18
2900.00	0.31	47.40	2899.84	17.19	2.15	17.19	17.32	7.14	0.35
3000.00	0.54	40.00	2999.83	17.73	2.66	17.73	17.93	8.52	0.23
3100.00	0.46	40.84	3099.83	18.39	3.22	18.39	18.67	9.92	0.08
3200.00	0.58	38.05	3199.83	19.09	3.79	19.09	19.46	11.23	0.13
3300.00	0.58	24.88	3299.82	19.95	4.31	19.95	20.41	12.20	0.13
3400.00	0.67	28.39	3399.81	20.92	4.80	20.92	21.46	12.93	0.09
3500.00	0.57	25.47	3499.81	21.88	5.29	21.88	22.51	13.60	0.10
3600.00	0.49	26.69	3599.80	22.71	5.70	22.71	23.42	14.09	0.09
3700.00	0.56	23.53	3699.80	23.54	6.09	23.54	24.31	14.50	0.08
3800.00	0.28	11.87	3799.80	24.23	6.33	24.23	25.04	14.65	0.29
3900.00	0.22	14.22	3899.80	24.65	6.43	24.65	25.47	14.62	0.07
4000.00	0.36	19.66	3999.79	25.13	6.58	25.13	25.97	14.68	0.15
4100.00	0.45	26.79	4099.79	25.77	6.86	25.77	26.67	14.91	0.11
4200.00	0.35	37.82	4199.79	26.37	7.23	26.37	27.34	15.33	0.13
4247.00	0.36	41.52	4246.79	26.59	7.41	26.59	27.60	15.58	0.05



PO Box 1370
Artesia, NM 88211-1370
(575) 748-1288



May 13, 2013

COG, LLC
One Concho Center
600 W. Illinois Ave.
Midland, TX 79701

RE: Burch Keely Unit #930H
240' FNL & 490' FWL
Sec. 13, T17S, R29E
Eddy County, New Mexico

Dear Sir,

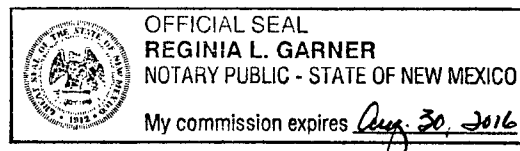
The attached is the Deviation Survey for the above captioned well.

Very truly yours,

Chris Graham
Drilling Superintendent

State of New Mexico }
County of Eddy }

The foregoing was acknowledged before me this 13th day of May, 2013.



Burch Keely Unit #930H

Date	Depth	Dev/Incl	Dir/Azm
4/24/2013	85.00	0.20	
4/24/2013	175.00	0.50	
4/24/2013	276.00	0.30	
4/26/2013	507.00	0.70	
4/26/2013	750.00	1.40	
4/26/2013	1081.00	1.20	
4/28/2013	1306.00	1.10	
4/28/2013	1547.00	0.30	
4/28/2013	2041.00	0.80	
4/28/2013	2541.00	0.40	
4/29/2013	3041.00	0.60	
4/29/2013	3540.00	0.50	
4/29/2013	4039.00	0.50	
4/30/2013	4284.00	0.35	53.80
5/1/2013	4565.00	17.11	100.96
5/1/2013	4659.00	27.03	102.53
5/1/2013	4753.00	37.00	103.78
5/1/2013	4847.00	46.80	106.89
5/1/2013	4878.00	50.53	106.58
5/1/2013	4910.00	53.98	106.48
5/1/2013	4941.00	57.43	106.13
5/1/2013	4972.00	60.71	106.41
5/1/2013	5004.00	63.78	106.40
5/1/2013	5035.00	66.88	106.21
5/1/2013	5066.00	69.47	106.82
5/2/2013	5129.00	75.88	106.35
5/2/2013	5160.00	78.76	106.29
5/2/2013	5220.00	85.10	107.08
5/2/2013	5251.00	87.62	107.12
5/2/2013	5282.00	87.87	105.97
5/2/2013	5314.00	88.61	104.39
5/2/2013	5345.00	89.48	103.02
5/2/2013	5376.00	90.19	101.05
5/3/2013	5470.00	90.49	96.84
5/3/2013	5501.00	90.65	95.33
5/3/2013	5533.00	90.83	94.24
5/3/2013	5596.00	91.57	91.43
5/3/2013	5690.00	89.97	88.02
5/3/2013	5784.00	92.10	87.98
5/4/2013	5877.00	93.15	87.68
5/4/2013	5973.00	91.66	88.05
5/4/2013	6066.00	92.50	87.65
5/4/2013	6161.00	91.11	88.36

Date	Depth	Dev/Incl	Dir/Azm
5/4/2013	6254.00	91.08	89.40
5/4/2013	6349.00	90.28	89.69
5/4/2013	6442.00	90.93	89.15
5/5/2013	6536.00	89.63	89.87
5/5/2013	6630.00	90.15	89.85
5/5/2013	6725.00	90.55	89.78
5/5/2013	6818.00	90.98	89.77
5/5/2013	6912.00	90.71	88.70
5/5/2013	7005.00	91.02	88.57
5/6/2013	7100.00	91.39	89.32
5/6/2013	7193.00	90.31	88.42
5/6/2013	7287.00	90.49	88.00
5/6/2013	7381.00	91.05	88.06
5/6/2013	7475.00	91.57	88.30
5/6/2013	7569.00	90.55	88.46
5/7/2013	7690.00	91.11	88.05
5/7/2013	7784.00	91.36	88.10
5/7/2013	7971.00	91.48	88.06
5/7/2013	8065.00	90.06	89.17
5/8/2013	8159.00	89.82	88.59
5/8/2013	8253.00	90.12	88.42
5/8/2013	8347.00	91.17	88.95
5/8/2013	8441.00	91.48	88.53
5/8/2013	8534.00	92.56	87.93
5/9/2013	8628.00	91.97	89.30
5/9/2013	8815.00	91.29	90.68
5/9/2013	8909.00	90.46	89.98
5/10/2013	9002.00	90.00	89.04
5/10/2013	9096.00	90.06	89.30

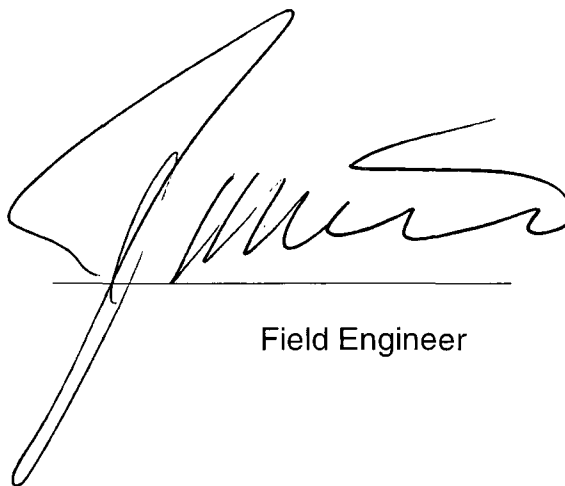
HALLIBURTON

3950 Interwood S. Parkway • Houston, TX 77032

PHONE 281.986.4400 • FAX 281.986.4499

State of New Mexico, Eddy County

I, Jeffrey Moriarty, certify that I am employed by Halliburton Energy Services, Inc. (aka Sperry Drilling Services) and that on the dates of 29 April-13 through 10-May-13, I did conduct or supervise the taking of DWD directional surveys for the Burch Keely Unit 930H well from a depth of 4284' MD to a depth of 9096' MD. This data is true, correct, complete and within the limitations of the tools as set forth by Halliburton Energy Services, Inc. (aka Sperry Drilling). I am authorized and qualified to make this report and these surveys were conducted at the request of COG Operating LLC for the Burch Keely Unit 930H, API No. 30-015-40969-0000 in Eddy County, NM. I have reviewed this report and find that it conforms to the principles and procedures as set forth by Halliburton Energy Services, Inc. (aka Sperry Drilling Services).

A handwritten signature in black ink, appearing to read 'Jeff Moriarty', is written over a horizontal line. The signature is stylized with a large, sweeping initial 'J'.

Field Engineer

COG Operating LLC.

Burch Keely Unit 930H

Eddy Co., NM

SilverOak #3

API# 30-015-40969-0000

April 29, 2013 To May 10, 2013

HD-MJ-0900393273

Sperry Drilling

MWD SURVEY Report

Submitted by Jeffrey Moriarty

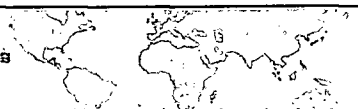
3950 Interwood S. Pkwy

Houston, TX 77032

Ph: 281.986.4400

HALLIBURTON

**Drilling and Formation
Evaluation**

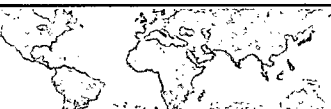


Survey Report for COG Operating LLC.

Rig : SilverOak 3
Well Name : Burch Keely Unit 930H
Field Name : CR 215- (Yesa Formation)
Country : USA
Job Number : HD-XX-0900393273
Job Start Date : 29-Apr-13
API Number : 30-015-40969-0000

**TABLE OF CONTENTS**

1. General Information
2. Directional Survey Data



GENERAL INFORMATION

Company	: COG Operating LLC.
Rig	: SilverOak 3
Well	: Burch Keely Unit 930H
Field	: CR 215- (Yesa Formation)
Lease Name	: Burch Keely unit 930H
State	: New Mexico
County	: Eddy County
Country	: USA
API Number	: 30-015-40969-0000
Sperry Drilling Job Number	: HD-XX-0900393273
Job Start Date	: 29-Apr-13
Job End Date	: 09-May-13
North Reference	: Grid
Total Correction (deg)	: 7.565
Dip Angle (deg)	: 60.593
Total Magnetic Field (nT)	: 48719
Date of Magnetic Data	: 30 April, 2013
Well Head coordinates N	: 32 deg. 50 min 27.67 sec North
Well Head coordinates E	: 104 deg. 2 min 5.08 sec West
Vertical section direction (deg)	: 91.15
Unit Number	: 11310664
MWD Engineers	: Jeffrey Moriarty, Mark Taylor
Company Representatives	: David Foster
Company Geologist:	:



DIRECTIONAL SURVEY DATA

Tie-in

0.00

0.00

0.00

0.00

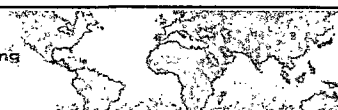
0.00 N

0.00 E

Measured Depth (ft)	Inclination (deg)	Direction (deg)	Vertical Depth (ft)	Latitude (ft)	Departure (ft)	Vertical Section (ft)	Dogleg (°/100')
100.00	0.31	187.20	100.00	0.27 S	0.03 W	-0.03	0.31
200.00	0.32	242.48	200.00	0.67 S	0.32 W	-0.30	0.29
300.00	0.11	258.10	300.00	0.81 S	0.66 W	-0.64	0.22
400.00	0.18	261.56	400.00	0.86 S	0.91 W	-0.89	0.07
500.00	0.27	275.24	500.00	0.86 S	1.30 W	-1.28	0.10
600.00	0.69	320.06	599.99	0.38 S	1.92 W	-1.91	0.53
700.00	0.76	14.40	699.99	0.73 N	2.14 W	-2.15	0.67
800.00	1.15	26.82	799.97	2.27 N	1.52 W	-1.57	0.44
900.00	1.28	30.90	899.95	4.12 N	0.50 W	-0.58	0.16
1000.00	1.47	37.00	999.92	6.10 N	0.85 E	0.73	0.24
1100.00	1.19	44.81	1,099.89	7.86 N	2.35 E	2.20	0.33
1200.00	1.04	40.57	1,199.88	9.29 N	3.68 E	3.49	0.17
1300.00	0.69	42.91	1,299.86	10.42 N	4.68 E	4.47	0.35
1400.00	0.51	38.93	1,399.86	11.21 N	5.37 E	5.14	0.18
1500.00	0.27	31.63	1,499.86	11.75 N	5.77 E	5.53	0.24
1600.00	0.23	349.20	1,599.85	12.15 N	5.86 E	5.61	0.18
1700.00	0.14	318.89	1,699.85	12.44 N	5.74 E	5.49	0.13
1800.00	0.32	312.43	1,799.85	12.72 N	5.45 E	5.19	0.18
1900.00	0.43	313.83	1,899.85	13.17 N	4.97 E	4.71	0.11
2000.00	0.33	312.96	1,999.85	13.63 N	4.49 E	4.22	0.10
2100.00	0.44	301.37	2,099.85	14.02 N	3.95 E	3.67	0.13
2200.00	0.21	299.02	2,199.85	14.31 N	3.47 E	3.18	0.23
2300.00	0.39	310.13	2,299.84	14.62 N	3.05 E	2.75	0.19
2400.00	0.38	328.97	2,399.84	15.12 N	2.61 E	2.31	0.13
2500.00	0.10	335.57	2,499.84	15.49 N	2.41 E	2.10	0.28
2600.00	0.36	342.38	2,599.84	15.87 N	2.28 E	1.96	0.26
2700.00	0.16	347.85	2,699.84	16.30 N	2.15 E	1.82	0.20
2800.00	0.34	343.02	2,799.84	16.72 N	2.04 E	1.70	0.18
2900.00	0.31	47.40	2,899.84	17.19 N	2.15 E	1.80	0.35
3000.00	0.54	40.00	2,999.83	17.73 N	2.65 E	2.29	0.24
3100.00	0.46	40.84	3,099.83	18.40 N	3.22 E	2.85	0.08
3200.00	0.58	38.05	3,199.83	19.10 N	3.79 E	3.41	0.12
3300.00	0.58	24.88	3,299.82	19.96 N	4.31 E	3.91	0.13
3400.00	0.67	28.39	3,399.81	20.93 N	4.81 E	4.38	0.10
3500.00	0.57	25.47	3,499.81	21.89 N	5.30 E	4.86	0.10
3600.00	0.49	26.69	3,599.80	22.73 N	5.70 E	5.25	0.08
3700.00	0.56	23.53	3,699.80	23.56 N	6.09 E	5.62	0.08
3800.00	0.28	11.87	3,799.80	24.24 N	6.34 E	5.85	0.29
3900.00	0.22	14.22	3,899.80	24.67 N	6.43 E	5.94	0.06
4000.00	0.36	19.66	3,999.80	25.15 N	6.59 E	6.08	0.14
4100.00	0.45	26.79	4,099.79	25.80 N	6.87 E	6.35	0.10

DIRECTIONAL SURVEY DATA

Measured Depth (ft)	Inclination (deg)	Direction (deg)	Vertical Depth (ft)	Latitude (ft)	Departure (ft)	Vertical Section (ft)	Dogleg (%/100)
4200.00	0.35	37.82	4,199.79	26.39 N	7.23 E	6.70	0.13
4247.00	0.36	41.52	4,246.79	26.61 N	7.42 E	6.88	0.05
4284.00	0.35	53.80	4,283.79	26.77 N	7.59 E	7.05	0.21
4315.00	0.50	33.31	4,314.79	26.94 N	7.74 E	7.20	0.68
4346.00	1.02	66.11	4,345.79	27.16 N	8.07 E	7.52	2.14
4377.00	2.59	78.57	4,376.77	27.41 N	9.01 E	8.45	5.17
4409.00	4.47	90.92	4,408.71	27.53 N	10.96 E	10.41	6.32
4440.00	7.03	93.68	4,439.55	27.39 N	14.06 E	13.51	8.29
4471.00	9.36	94.82	4,470.23	27.06 N	18.47 E	17.92	7.53
4502.00	11.77	96.35	4,500.70	26.50 N	24.12 E	23.59	7.85
4533.00	14.52	97.54	4,530.89	25.64 N	31.12 E	30.60	8.89
4565.00	17.11	100.96	4,561.67	24.22 N	39.72 E	39.23	8.60
4596.00	20.68	102.07	4,591.00	22.20 N	49.55 E	49.10	11.56
4627.00	23.85	102.67	4,619.69	19.68 N	61.02 E	60.61	10.25
4659.00	27.03	102.53	4,648.58	16.69 N	74.43 E	74.08	9.95
4691.00	30.32	103.20	4,676.65	13.26 N	89.40 E	89.11	10.33
4722.00	33.96	103.11	4,702.90	9.51 N	105.45 E	105.24	11.74
4753.00	37.00	103.78	4,728.14	5.32 N	122.95 E	122.82	9.89
4784.00	40.10	105.62	4,752.38	0.41 N	141.63 E	141.59	10.67
4815.00	43.57	106.22	4,775.47	5.26 S	161.51 E	161.58	11.27
4847.00	46.80	106.89	4,798.02	11.73 S	183.26 E	183.46	10.19
4878.00	50.53	106.58	4,818.50	18.43 S	205.55 E	205.88	12.05
4910.00	53.98	106.48	4,838.08	25.63 S	229.81 E	230.27	10.80
4941.00	57.43	106.13	4,855.55	32.82 S	254.38 E	254.99	11.16
4972.00	60.71	106.41	4,871.48	40.27 S	279.91 E	280.66	10.63
5004.00	63.78	106.40	4,886.38	48.26 S	307.07 E	307.98	9.59
5035.00	66.88	106.21	4,899.31	56.17 S	334.10 E	335.16	10.02
5066.00	69.47	106.82	4,910.84	64.35 S	361.69 E	362.91	8.54
5097.00	72.43	106.76	4,920.95	72.82 S	389.74 E	391.12	9.55
5129.00	75.28	106.55	4,929.85	81.62 S	419.19 E	420.74	8.92
5160.00	78.76	106.29	4,936.81	90.16 S	448.16 E	449.88	11.28
5193.00	82.18	107.58	4,942.28	99.64 S	479.29 E	481.19	11.05
5220.00	85.10	107.08	4,945.27	107.63 S	504.90 E	506.96	10.98
5251.00	87.62	107.12	4,947.24	116.73 S	534.47 E	536.70	8.15
5282.00	87.87	105.97	4,948.46	125.55 S	564.16 E	566.57	3.81
5314.00	88.61	104.39	4,949.44	133.92 S	595.03 E	597.60	5.44
5345.00	89.48	103.02	4,949.96	141.27 S	625.14 E	627.85	5.22
5376.00	90.19	101.05	4,950.05	147.73 S	655.46 E	658.29	6.76
5408.00	90.53	99.67	4,949.85	153.49 S	686.93 E	689.87	4.43
5439.00	90.53	98.44	4,949.56	158.37 S	717.54 E	720.58	3.97
5470.00	90.49	96.84	4,949.29	162.49 S	748.27 E	751.38	5.16
5501.00	90.65	95.35	4,948.98	165.78 S	779.09 E	782.26	4.85
5533.00	90.83	94.24	4,948.57	168.46 S	810.97 E	814.19	3.50
5564.00	91.08	92.96	4,948.05	170.41 S	841.91 E	845.16	4.22
5596.00	91.57	91.43	4,947.31	171.63 S	873.87 E	877.14	5.02



DIRECTIONAL SURVEY DATA

Measured Depth (ft)	Inclination (deg)	Direction (deg)	Vertical Depth (ft)	Latitude (ft)	Departure (ft)	Vertical Section (ft)	Dogleg (°/100)
5690.00	89.97	88.02	4,946.04	171.18 S	967.85 E	971.09	4.01
5784.00	92.10	87.98	4,944.35	167.91 S	1,061.77 E	1064.93	2.27
5877.00	93.15	87.68	4,940.09	164.39 S	1,154.60 E	1157.67	1.17
5973.00	91.66	88.05	4,936.06	160.81 S	1,250.45 E	1253.43	1.60
6066.00	92.50	87.65	4,932.68	157.33 S	1,343.32 E	1346.21	0.99
6161.00	91.11	88.36	4,929.69	154.03 S	1,438.22 E	1441.02	1.64
6254.00	91.08	89.40	4,927.92	152.22 S	1,531.18 E	1533.93	1.12
6349.00	90.28	89.69	4,926.80	151.47 S	1,626.17 E	1628.88	0.89
6442.00	90.93	89.15	4,925.82	150.53 S	1,719.16 E	1721.83	0.91
6536.00	89.63	89.87	4,925.37	149.73 S	1,813.15 E	1815.79	1.58
6630.00	90.15	89.85	4,925.54	149.50 S	1,907.15 E	1909.77	0.56
6725.00	90.55	89.78	4,924.96	149.20 S	2,002.15 E	2004.74	0.43
6818.00	90.98	89.77	4,923.71	148.83 S	2,095.14 E	2097.70	0.46
6912.00	90.71	88.70	4,922.32	147.58 S	2,189.12 E	2191.64	1.18
7005.00	91.02	88.57	4,920.92	145.37 S	2,282.08 E	2284.54	0.36
7100.00	91.39	89.32	4,918.92	143.62 S	2,377.04 E	2379.45	0.88
7193.00	90.31	88.42	4,917.54	141.79 S	2,470.01 E	2472.36	1.51
7287.00	90.49	88.00	4,916.89	138.85 S	2,563.96 E	2566.24	0.49
7381.00	91.05	88.06	4,915.62	135.63 S	2,657.90 E	2660.09	0.59
7475.00	91.57	88.30	4,913.48	132.65 S	2,751.83 E	2753.94	0.61
7569.00	90.55	88.46	4,911.74	129.99 S	2,845.77 E	2847.81	1.10
7628.00	90.77	88.39	4,911.06	128.37 S	2,904.75 E	2906.74	0.39
7690.00	91.11	88.05	4,910.04	126.44 S	2,966.71 E	2968.65	0.77
7784.00	91.36	88.10	4,908.02	123.28 S	3,060.63 E	3062.49	0.27
7877.00	91.32	88.16	4,905.84	120.25 S	3,153.56 E	3155.34	0.08
7971.00	91.48	88.06	4,903.54	117.16 S	3,247.48 E	3249.18	0.20
8065.00	90.06	89.17	4,902.28	114.89 S	3,341.44 E	3343.07	1.91
8159.00	89.82	88.59	4,902.38	113.05 S	3,435.42 E	3437.00	0.68
8253.00	90.12	88.42	4,902.43	110.60 S	3,529.39 E	3530.90	0.37
8347.00	91.17	88.95	4,901.37	108.44 S	3,623.36 E	3624.80	1.25
8441.00	91.48	88.53	4,899.19	106.38 S	3,717.31 E	3718.70	0.55
8534.00	92.56	87.93	4,895.92	103.52 S	3,810.21 E	3811.52	1.33
8628.00	91.97	89.30	4,892.21	101.25 S	3,904.10 E	3905.35	1.58
8722.00	90.99	90.74	4,889.78	101.28 S	3,998.07 E	3999.29	1.85
8815.00	91.29	90.68	4,887.93	102.43 S	4,091.04 E	4092.27	0.33
8909.00	90.46	89.98	4,886.48	102.98 S	4,185.03 E	4186.25	1.16
9002.00	90.00	89.04	4,886.11	102.18 S	4,278.02 E	4279.21	1.13
9096.00	90.06	89.30	4,886.06	100.81 S	4,372.01 E	4373.15	0.28
9173.00	90.06	89.30	4,885.98	99.87 S	4,449.01 E	4450.11	0.00

SURVEY FOOTER

SURVEYS CALCULATED USING LONG COLLAR METHOD.

TIE-ON ASSUMED VERTICAL AT SURFACE.

SURVEYS FROM 100.00' MD TO 4247' MD PROVIDED BY VAUGHN ENERGY SERVICE.

SURVEYS FROM 4284' MD TO 9096' MD PROVIDED BY SPERRY DRILLING SERVICES.

SURVEY 9096' MD IS PROJECTED TO BIT AT 9173' MD.

SPERRY ENGINEERS: J. MORIARTY, M. TAYLOR

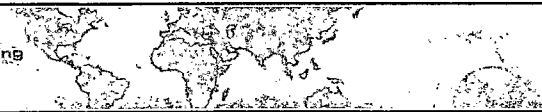
HALLIBURTON

Sperry Drilling



HALLIBURTON / SPERRY DRILLING
3950 INTERWOOD SOUTH PARKWAY
HOUSTON, TEXAS 77032-3346

PHONE: 281-986-4400
FAX: 281-986-4498

**SURVEY FOOTER****DIRECTIONAL SURVEY DATA NOTES**

- Calculation based on minimum curvature method.
- Survey coordinates relative to well system reference point.
- TVD values given relative to drilling measurement point.
- Vertical section relative to well head.
- Vertical section is computed along a direction of 91.15 degrees (Grid)
- A total correction of 7.56 deg from Magnetic north to Grid north has been applied
- Horizontal displacement is relative to the well head.
- Horizontal displacement (closure) at 9,173.00 feet is 4,450.13 feet along 91.29 degrees (Grid)

WARRANTY

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