

Company: COG Operating LLC (Concho)

Lease/Well: Patton 5 Fee / No. 006H



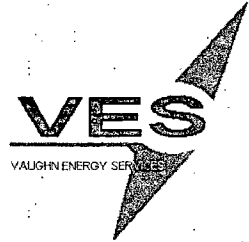
Rig Name: JW 4

State/County: New Mexico / Eddy

Latitude: 32.69, Longitude: -104.41

GRID North is 0.04 Degrees West of True North

VS-Azi: 0.00 Degrees



Service Company : RKB = 15'

DRILLOG HA GYRO SURVEY CALCULATIONS

Filename: gyro survey.ut

Minimum Curvature Method

Report Date/Time: 1/16/2013 / 10:56

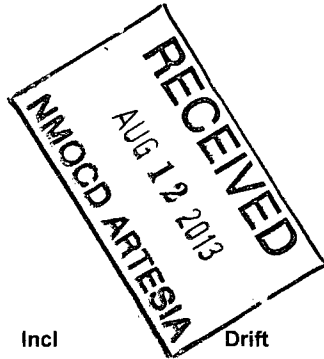
Vaughn Energy Services

Gardendale, Texas

432-563-5444

Surveyor: Kyle Willis

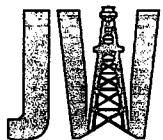
Patton 5 Fee No. 006H / API: 30-015-39716



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	0.08	268.14	100.00	0.00	-0.07	0.00	0.07	268.14	0.08
200.00	0.07	46.83	200.00	0.04	-0.10	0.04	0.10	291.34	0.14
300.00	0.35	335.54	300.00	0.36	-0.18	0.36	0.40	333.60	0.34
400.00	0.30	338.40	400.00	0.89	-0.40	0.89	0.97	335.51	0.05
500.00	0.37	340.94	500.00	1.44	-0.61	1.44	1.56	337.13	0.07
600.00	0.49	277.92	599.99	1.81	-1.14	1.81	2.13	327.79	0.46
700.00	0.28	302.92	699.99	2.00	-1.77	2.00	2.67	318.49	0.26
800.00	0.37	289.27	799.99	2.24	-2.29	2.24	3.20	314.44	0.12
900.00	0.36	301.03	899.99	2.51	-2.86	2.51	3.80	311.27	0.08
1000.00	0.51	301.16	999.98	2.90	-3.51	2.90	4.55	309.58	0.16
1100.00	0.09	321.68	1099.98	3.20	-3.94	3.20	5.07	309.03	0.43
1200.00	0.04	280.06	1199.98	3.26	-4.02	3.26	5.18	309.06	0.07
1300.00	0.11	65.95	1299.98	3.31	-3.96	3.31	5.16	309.85	0.14
1400.00	0.12	212.16	1399.98	3.26	-3.93	3.26	5.11	309.65	0.22
1500.00	0.27	181.51	1499.98	2.93	-3.99	2.93	4.95	306.28	0.18
1600.00	0.34	182.05	1599.98	2.40	-4.01	2.40	4.67	300.90	0.07
1700.00	0.31	148.94	1699.98	1.87	-3.88	1.87	4.31	295.78	0.19
1800.00	0.36	175.71	1799.98	1.33	-3.72	1.33	3.95	289.67	0.16

30-015-39716

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	0.47	179.87	1899.98	0.61	-3.69	0.61	3.74	279.35	0.11
2000.00	0.69	213.82	1999.97	-0.30	-4.03	-0.30	4.04	265.71	0.40
2100.00	0.54	232.54	2099.96	-1.09	-4.74	-1.09	4.87	257.03	0.25
2185.00	0.49	234.05	2184.96	-1.55	-5.35	-1.55	5.57	253.86	0.06



DRILLING INC. Oil Well Drilling Contractor

Post Office Box 160 Artesia, New Mexico 88211-0160 Office (575) 748-8704 Fax (575) 748-8719

January 14, 2013

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

Re: Patton 5 Fee # 6H
Sec. 5, T-19-S, R-26-E
Eddy County, New Mexico

Attn: Jim Evans

The following is a Deviation Survey on the referenced well in Eddy County, New Mexico:

255' - 0.5°	799' - 0.25°	1531' - .00°
457' - 0.5°	1154' - 1°	1811' - 0.5°

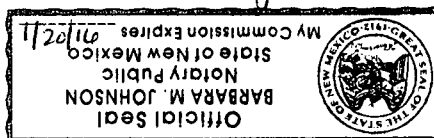
Sincerely,

Gary W. Chappell
Contracts Manager

STATE OF NEW MEXICO)
COUNTY OF EDDY)

The foregoing was acknowledged before me this 14th day of January , 2013 by Gary W. Chappell.

NOTARY PUBLIC





Concho

Eddy County, New Mexico (Nad27)

Patton 5 Fee

Patton 5 Fee #6H

OH - Job #1310014 (JW 4)

Survey: Phoenix MWD

Standard Survey Report

16 January, 2013





Phoenix Technology Services
Survey Report



Company:	Concho	Local Co-ordinate Reference:	Well Patton 5 Fee #6H
Project:	Eddy County New Mexico (Nad27)	TVD Reference:	WELL @ 3378.00usft (JW #4)
Site:	Patton 5 Fee	MD Reference:	WELL @ 3378.00usft (JW #4)
Well:	Patton 5 Fee #6H	North Reference:	Grid
Wellbore:	QH - Job #1310014 (JW 4)	Survey Calculation Method:	Minimum Curvature
Design:	Surveys	Database:	GCR DB

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
4,920.00	90.10	88.30	2,899.97	40.43	2,295.93	2,296.07	0.65	-0.11	-0.64
5,013.00	89.90	89.00	2,899.97	42.62	2,388.90	2,389.05	0.78	-0.22	0.75
5,107.00	90.90	89.20	2,899.31	44.09	2,482.89	2,483.04	1.08	1.06	0.21
5,200.00	90.70	90.20	2,898.01	44.58	2,575.88	2,576.03	1.10	-0.22	1.08
5,294.00	89.70	91.50	2,897.68	43.19	2,669.86	2,670.01	1.74	-1.06	1.38
5,387.00	89.90	90.70	2,898.01	41.40	2,762.84	2,762.98	0.89	0.22	-0.86
5,481.00	89.70	90.30	2,898.34	40.58	2,856.84	2,856.97	0.48	-0.21	-0.43
5,574.00	89.40	90.80	2,899.07	39.69	2,949.83	2,949.96	0.63	-0.32	0.54
5,668.00	88.50	91.70	2,900.79	37.64	3,043.79	3,043.91	1.35	-0.96	0.96
5,762.00	88.30	91.40	2,903.42	35.10	3,137.72	3,137.83	0.38	-0.21	-0.32
5,855.00	89.80	90.50	2,904.96	33.56	3,230.69	3,230.80	1.88	1.61	-0.97
5,949.00	89.60	89.90	2,905.45	33.23	3,324.69	3,324.79	0.67	-0.21	-0.64
6,042.00	89.30	89.30	2,906.34	33.88	3,417.68	3,417.79	0.72	-0.32	-0.65
6,137.00	90.30	89.30	2,906.67	35.04	3,512.67	3,512.78	1.05	1.05	0.00
6,230.00	90.60	89.80	2,905.94	35.77	3,605.67	3,605.78	0.63	0.32	0.54
6,324.00	89.20	90.70	2,906.11	35.36	3,699.66	3,699.77	1.77	-1.49	0.96
6,417.00	88.90	90.30	2,907.65	34.55	3,792.65	3,792.75	0.54	-0.32	-0.43
6,511.00	88.10	89.90	2,910.11	34.38	3,886.61	3,886.72	0.95	-0.85	-0.43
6,604.00	88.60	89.30	2,912.79	35.03	3,979.57	3,979.68	0.84	0.54	-0.65
6,698.00	88.90	90.70	2,914.84	35.03	4,073.55	4,073.65	1.52	0.32	1.49
6,791.00	90.40	90.20	2,915.41	34.30	4,166.54	4,166.64	1.70	1.61	-0.54
6,885.00	89.80	89.80	2,915.24	34.30	4,260.54	4,260.64	0.77	-0.64	-0.43
Phoenix Survey									
6,981.00	89.80	89.80	2,915.58	34.64	4,356.54	4,356.64	0.00	0.00	0.00
7,355.40	89.80	89.80	2,916.88	35.94	4,730.93	4,731.04	0.00	0.00	0.00
Projectio to TD @ 7355.40' MD									

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
2,268.00	2,267.96	-1.87	-5.74	First Phoenix MWD Survey
6,885.00	2,915.24	34.30	4,260.54	Phoenix Survey
7,355.40	2,916.88	35.94	4,730.93	Projectio to TD @ 7355.40' MD

Checked By: _____ Approved By: _____ Date: _____



Phoenix Technology Services

Survey Report



Company:	Concho	Local Co-ordinate Reference:	Well Patton 5 Fee #6H
Project:	Eddy County, New Mexico (Nad27)	TVD Reference:	WELL @ 3378.00usft (JW #4)
Site:	Patton 5 Fee	MD Reference:	WELL @ 3378.00usft (JW #4)
Well:	Patton 5 Fee #6H	North Reference:	Grid
Wellbore:	OH - Job #1310014 (JW 4)	Survey Calculation Method:	Minimum Curvature
Design:	Surveys	Database:	GCR DB

Project:	Eddy County, New Mexico (Nad27)		
Map System:	US State Plane 1927 (Exact solution)	System Datum:	Mean Sea Level
Geo Datum:	NAD 1927 (NADCON CONUS)		
Map Zone:	New Mexico East 3001		

Site:	Patton 5 Fee				
Site Position:		Northing:	613,610.70 usft	Latitude:	32° 41' 12.8058 N
From:	Map	Easting:	475,920.20 usft	Longitude:	104° 24' 41.7618 W
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "	Grid Convergence:	-0.04 °

Well:	Patton 5 Fee #6H					
Well Position	+N-S	0.00 usft	Northing:	613,610.70 usft	Latitude:	32° 41' 12.8058 N
	+E-W	0.00 usft	Easting:	475,920.20 usft	Longitude:	104° 24' 41.7618 W
Position Uncertainty		0.00 usft	Wellhead Elevation:	usft	Ground Level:	3,364.00 usft

Wellbore	OH - Job #1310014 (JW 4)				
Magnetics	Model Name	Sample Date	Declination	Dip Angle	Field Strength
			(°)	(°)	(nT)
	IGRF2010_14	01/09/13	7.81	60.43	48,644

Design		Surveys			
Audit Notes:					
Version:		1.0		Phase: ACTUAL	
Tie On Depth:		0.00			
Vertical Section:		Depth From (TVD)		+N/ S	
		(usft)		+E/-W	
		0.00		(usft)	
		0.00		0.00	
		0.00		89.78	

Survey Program		Date	01/16/13		
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
100.00	2,185.00	VES Gyro (OH - Job #1310014 (JW 4))	UNKNOWN	Unknown survey	
2,268.00	7,355.40	Phoenix MWD (OH - Job #1310014 (JW 4)	MWD	MWD - Standard	

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
2,185.00	0.49	234.05	2,184.96	-1.57	-5.34	-5.34	0.00	0.00	0.00
2,268.00	0.20	232.70	2,267.96	-1.87	-5.74	-5.75	0.35	-0.35	-1.63
First Phoenix MWD Survey									
2,300.00	1.30	98.20	2,299.96	-1.95	-5.43	-5.43	4.52	3.44	-420.31
2,331.00	6.30	86.30	2,330.88	-1.89	-3.38	-3.39	16.24	16.13	-38.39
2,362.00	11.50	79.00	2,361.50	-1.19	1.35	1.35	17.13	16.77	-23.55
2,393.00	15.30	79.60	2,391.65	0.14	8.41	8.41	12.27	12.26	1.94
2,424.00	17.60	83.10	2,421.38	1.44	17.09	17.10	8.08	7.42	11.29
2,455.00	20.20	84.70	2,450.70	2.50	27.07	27.08	8.55	8.39	5.16
2,487.00	23.30	86.20	2,480.42	3.43	38.89	38.91	9.84	9.69	4.69



Phoenix Technology Services

Survey Report



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Project:	Eddy County, New Mexico (Nad27)	TVD Reference:	WELL @ 3378.00usft (JW #4)
Site:	Patton 5 Fee	MD Reference:	WELL @ 3378.00usft (JW #4)
Well:	Patton 5 Fee #6H	North Reference:	Grid
Wellbore:	OH - Job #1310014 (JW 4)	Survey Calculation Method:	Minimum Curvature
Design:	Surveys	Database:	GCR DB

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
2,518.00	25.70	87.00	2,508.63	4.18	51.73	51.74	7.82	7.74	2.58
2,549.00	28.10	86.60	2,536.27	4.97	65.73	65.75	7.76	7.74	-1.29
2,580.00	30.60	87.80	2,563.29	5.71	80.90	80.92	8.28	8.06	3.87
2,611.00	33.50	88.50	2,589.56	6.23	97.34	97.37	9.43	9.35	2.26
2,642.00	36.20	88.30	2,615.00	6.73	115.05	115.07	8.72	8.71	-0.65
2,674.00	39.20	88.40	2,640.32	7.29	134.61	134.63	9.38	9.38	0.31
2,705.00	41.50	87.80	2,663.94	7.96	154.67	154.69	7.52	7.42	-1.94
2,736.00	43.70	87.40	2,686.76	8.84	175.63	175.66	7.15	7.10	-1.29
2,767.00	45.80	87.60	2,708.77	9.79	197.43	197.47	6.79	6.77	0.65
2,798.00	47.30	87.80	2,730.09	10.69	219.92	219.96	4.86	4.84	0.65
2,829.00	49.40	87.50	2,750.69	11.64	243.06	243.10	6.81	6.77	-0.97
2,860.00	51.40	86.90	2,770.45	12.81	266.92	266.96	6.62	6.45	-1.94
2,892.00	54.20	86.30	2,789.80	14.33	292.36	292.41	8.88	8.75	-1.88
2,923.00	57.30	85.40	2,807.24	16.18	317.91	317.97	10.28	10.00	-2.90
2,954.00	60.10	84.20	2,823.35	18.59	344.29	344.35	9.62	9.03	-3.87
2,985.00	62.10	85.60	2,838.33	21.00	371.32	371.39	7.57	6.45	4.52
3,016.00	65.80	86.30	2,851.94	22.96	399.09	399.18	12.11	11.94	2.26
3,047.00	68.90	86.10	2,863.88	24.86	427.63	427.73	10.02	10.00	-0.65
3,079.00	72.60	86.30	2,874.43	26.86	457.77	457.87	11.58	11.56	0.63
3,110.00	75.70	86.40	2,882.89	28.76	487.53	487.64	10.00	10.00	0.32
3,141.00	80.10	86.60	2,889.39	30.61	517.78	517.89	14.21	14.19	0.65
3,172.00	84.70	86.80	2,893.49	32.37	548.45	548.57	14.85	14.84	0.65
3,203.00	87.10	88.30	2,895.70	33.70	579.34	579.46	9.12	7.74	4.84
3,235.00	88.00	91.10	2,897.07	33.86	611.30	611.43	9.18	2.81	8.75
3,266.00	89.80	92.10	2,897.67	33.00	642.28	642.41	6.64	5.81	3.23
3,297.00	90.60	92.00	2,897.56	31.89	673.26	673.38	2.60	2.58	-0.32
3,328.00	90.70	91.80	2,897.21	30.86	704.24	704.36	0.72	0.32	-0.65
3,422.00	90.20	91.90	2,896.47	27.83	798.19	798.29	0.54	-0.53	0.11
3,515.00	90.00	91.50	2,896.31	25.07	891.15	891.24	0.48	-0.22	-0.43
3,609.00	90.30	89.50	2,896.06	24.25	985.14	985.23	2.15	0.32	-2.13
3,703.00	89.80	88.90	2,895.98	25.56	1,079.13	1,079.22	0.83	-0.53	-0.64
3,796.00	89.40	88.00	2,896.63	28.08	1,172.09	1,172.19	1.06	-0.43	-0.97
3,890.00	89.30	88.50	2,897.69	30.95	1,266.04	1,266.15	0.54	-0.11	0.53
3,983.00	89.60	88.40	2,898.59	33.46	1,359.01	1,359.12	0.34	0.32	-0.11
4,077.00	90.30	89.70	2,898.67	35.02	1,452.99	1,453.11	1.57	0.74	1.38
4,171.00	90.20	89.50	2,898.26	35.68	1,546.99	1,547.11	0.24	-0.11	-0.21
4,265.00	88.80	89.90	2,899.08	36.17	1,640.98	1,641.11	1.55	-1.49	0.43
4,358.00	89.90	90.20	2,900.13	36.09	1,733.97	1,734.10	1.23	1.18	0.32
4,452.00	89.80	89.90	2,900.38	36.00	1,827.97	1,828.10	0.34	-0.11	-0.32
4,545.00	89.60	89.40	2,900.87	36.57	1,920.97	1,921.09	0.58	-0.22	-0.54
4,639.00	90.30	90.10	2,900.95	36.98	2,014.97	2,015.09	1.05	0.74	0.74
4,732.00	90.20	89.80	2,900.54	37.06	2,107.97	2,108.09	0.34	-0.11	-0.32
4,826.00	90.20	88.90	2,900.21	38.13	2,201.96	2,202.09	0.96	0.00	-0.96