

ArkLaTex Gyro Services

November 18, 2013

COG Production, LLC.
600 W. Illinois Ave.
Midland, TX 79701

15-41528

Attn: Mark Ellerbe

RE: Quien Sabe 25 Federal #1H (Gyro Survey)

Dear Mark,

ArkLaTex Gyro Services, LLC performed a directional survey on November 18, 2013 at the request of COG Production, LLC. for the Quien Sabe 25 Federal #1H located in Eddy County, NM. I have attached two certified copies of these survey reports for your records.

Please let me know if you require anything else.

Sincerely,

Heather Runa

ArkLaTex Gyro Services, LLC

Phone: (318) 290-3480

Fax: (318) 290-3484

E-Mail: HRuna@arklatexgyro.com



COG Production, LLC.
600 W. Illinois Ave.
Midland, TX 79701

Survey Certification Sheet

Company: COG Production, LLC.
Job Number: 13237334
Date(s) of Survey: 11/17/2013-11/18/2013
Well Name: Quien Sabe 25 Federal #1H
County & State: Eddy County, NM
Surveyed Depths: 0 Feet to 9235 Feet MD
Type of Survey: Drop Method Gyro
Calculation Method: Minimum of Curvature
Directional Survey Engineer: Andrew Bolgiano

I, Jay Craig, certify that; I am employed by ArkLaTex Gyro Services, LLC; that ArkLaTex Gyro Services, LLC did on the day(s) of 11/17/2013 through 11/18/2013 conduct the taking of a Gyro survey(s) from a depth of 0' feet to a depth of 9,235' feet; that the data is true, correct, complete and within the limitations of the tool set forth by ArkLaTex Gyro Services, LLC; that I am authorized and qualified to make this report; that this report was conducted at the request of COG Production, LLC. for the Quien Sabe 25 Federal, Well No. 1H, in Eddy County, NM; and that I have reviewed this report and find that it conforms to the principles and procedures as set forth by ArkLaTex Gyro Services, LLC.

A handwritten signature in black ink, appearing to be "JC" or "Jay Craig", written over a horizontal line.

Jay Craig
Survey Manager
ArkLaTex Gyro Services, LLC
P.O. Box 65116
Shreveport, LA 71136
Phone: (318) 290-3480



Job Number: 13237334

Company: COG OPERATING

Lease/Well: QUIEN SABE 25 FEDERAL #1H

Location: EDDY COUNTY

Rig Name: PATTERSON #79

RKB: 18'

G.L. or M.S.L.:

State/Country: NEW MEXICO

Declination:

Grid: 7.45 EAST (M-G)

File name: C:\WINSERVE\QUIEN1H.SVY

Date/Time: 18-Nov-13 / 12:54

Curve Name: QUIEN SABE 25 FEDERAL #1H (GYRO)

ARKLATEX GYRO SERVICES, LLC

WINSERVE SURVEY CALCULATIONS

Minimum Curvature Method

Vertical Section Plane 177.23

Vertical Section Referenced to Wellhead

Rectangular Coordinates Referenced to Wellhead

Measured Depth FT	Incl Angle Deg	Drift Direction Deg	True Vertical Depth	N-S FT	E-W FT	Vertical Section FT	CLOSURE Distance FT	Direction Deg	Dogleg Severity Deg/100
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
85.00	.34	343.50	85.00	.24	-.07	-.25	.25	343.50	.40
175.00	.86	63.27	175.00	.80	.46	-.78	.92	29.62	.96
264.00	.97	15.45	263.99	1.83	1.25	-1.77	2.22	34.43	.84
354.00	1.52	353.14	353.96	3.75	1.31	-3.68	3.97	19.31	.80
443.00	1.15	324.81	442.94	5.65	.66	-5.61	5.69	6.64	.84
533.00	.76	276.40	532.93	6.45	-.46	-6.47	6.47	355.96	.96
627.00	.52	339.53	626.92	6.92	-1.22	-6.97	7.03	349.97	.75
722.00	.59	346.79	721.92	7.80	-1.49	-7.87	7.94	349.21	.10
816.00	.88	307.45	815.91	8.71	-2.17	-8.81	8.98	346.01	.60
911.00	.45	336.16	910.91	9.50	-2.90	-9.63	9.93	343.02	.56
1005.00	.33	328.46	1004.90	10.07	-3.19	-10.21	10.56	342.41	.14
1100.00	.64	313.18	1099.90	10.66	-3.72	-10.83	11.29	340.76	.35

Measured Depth FT	Incl Angle Deg	Drift Direction Deg	True Vertical Depth	N-S FT	E-W FT	Vertical Section FT	CLOSURE		Dogleg Severity Deg/100
							Distance FT	Direction Deg	
1195.00	1.50	285.73	1194.88	11.36	-5.31	-11.61	12.54	334.97	1.03
1289.00	.65	265.25	1288.87	11.65	-7.02	-11.98	13.60	328.93	.98
1384.00	.57	259.86	1383.86	11.52	-8.02	-11.90	14.04	325.16	.10
1478.00	.40	249.17	1477.86	11.33	-8.79	-11.74	14.34	322.18	.20
1573.00	.78	234.06	1572.85	10.83	-9.62	-11.28	14.49	318.37	.43
1668.00	.80	224.12	1667.84	9.97	-10.61	-10.47	14.56	313.23	.15
1762.00	.35	197.06	1761.84	9.23	-11.15	-9.75	14.47	309.61	.55
1857.00	.59	253.67	1856.84	8.81	-11.70	-9.37	14.65	306.98	.52
1951.00	1.07	255.40	1950.83	8.45	-13.02	-9.07	15.52	303.00	.51
2046.00	.93	244.56	2045.81	7.90	-14.57	-8.59	16.58	298.46	.25
2141.00	1.03	264.42	2140.80	7.49	-16.12	-8.26	17.77	294.91	.37
2235.00	1.22	263.70	2234.78	7.29	-17.95	-8.15	19.38	292.11	.20
2330.00	.87	240.97	2329.76	6.83	-19.59	-7.77	20.75	289.23	.56
2424.00	.84	195.08	2423.75	5.82	-20.39	-6.80	21.21	285.93	.71
2519.00	.84	180.11	2518.74	4.45	-20.58	-5.44	21.05	282.21	.23
2614.00	.75	165.52	2613.74	3.15	-20.42	-4.14	20.66	278.78	.23
2708.00	.80	188.73	2707.73	1.91	-20.37	-2.89	20.46	275.36	.34
2803.00	.92	189.83	2802.72	.50	-20.60	-1.50	20.60	271.40	.13
2897.00	.60	225.85	2896.71	-.58	-21.08	-.44	21.09	268.41	.60
2992.00	.59	203.72	2991.70	-1.38	-21.63	.33	21.68	266.36	.24
3086.00	.62	214.25	3085.70	-2.24	-22.12	1.17	22.23	264.21	.12
3181.00	1.13	205.13	3180.69	-3.51	-22.80	2.41	23.07	261.24	.55
3276.00	.31	221.59	3275.68	-4.55	-23.37	3.42	23.81	258.97	.88
3370.00	.65	192.28	3369.68	-5.27	-23.65	4.12	24.23	257.45	.43
3465.00	.37	189.15	3464.67	-6.10	-23.82	4.94	24.58	255.64	.30
3559.00	.49	189.22	3558.67	-6.79	-23.93	5.63	24.87	254.15	.13
3654.00	.74	230.50	3653.66	-7.58	-24.47	6.39	25.62	252.78	.52
3749.00	.36	201.50	3748.66	-8.25	-25.05	7.03	26.37	251.77	.48
3843.00	.71	208.04	3842.66	-9.04	-25.43	7.80	26.99	250.43	.38
3938.00	.67	205.12	3937.65	-10.06	-25.94	8.80	27.83	248.80	.06
4032.00	.31	206.35	4031.64	-10.79	-26.29	9.50	28.42	247.69	.38
4127.00	.30	206.25	4126.64	-11.24	-26.51	9.95	28.80	247.03	.01
4222.00	.38	208.02	4221.64	-11.74	-26.77	10.43	29.23	246.32	.08
4316.00	.37	204.87	4315.64	-12.29	-27.05	10.97	29.71	245.56	.02

Measured Depth FT	Incl Angle Deg	Drift Direction Deg	True Vertical Depth	N-S FT	E-W FT	Vertical Section FT	CLOSURE		Dogleg Severity Deg/100
							Distance FT	Direction Deg	
4411.00	.26	201.50	4410.64	-12.77	-27.25	11.44	30.10	244.89	.12
4505.00	.55	157.11	4504.64	-13.39	-27.16	12.06	30.28	243.76	.43
4600.00	.62	173.80	4599.63	-14.32	-26.92	13.00	30.49	242.00	.19
4694.00	.49	160.50	4693.63	-15.20	-26.74	13.89	30.75	240.38	.19
4789.00	.51	164.27	4788.62	-15.99	-26.49	14.69	30.94	238.88	.04
4884.00	.51	164.92	4883.62	-16.81	-26.26	15.52	31.18	237.38	.01
4978.00	.47	178.77	4977.62	-17.60	-26.14	16.31	31.51	236.06	.13
5073.00	.47	187.99	5072.61	-18.37	-26.19	17.08	31.99	234.95	.08
5167.00	.36	206.53	5166.61	-19.02	-26.37	17.72	32.52	234.21	.18
5262.00	.51	206.64	5261.61	-19.66	-26.70	18.35	33.16	233.63	.16
5357.00	.75	195.86	5356.60	-20.64	-27.06	19.31	34.03	232.67	.28
5451.00	.81	188.14	5450.59	-21.89	-27.32	20.54	35.01	231.30	.13
5546.00	.84	189.16	5545.58	-23.24	-27.53	21.88	36.02	229.83	.04
5640.00	.96	182.67	5639.57	-24.71	-27.67	23.34	37.10	228.24	.17
5735.00	1.16	173.09	5734.56	-26.46	-27.59	25.09	38.23	226.21	.28
5830.00	1.52	169.98	5829.53	-28.65	-27.26	27.30	39.55	223.57	.39
5924.00	1.73	169.52	5923.49	-31.27	-26.78	29.94	41.18	220.58	.22
6019.00	1.86	170.27	6018.44	-34.20	-26.26	32.89	43.12	217.52	.14
6113.00	1.78	168.24	6112.40	-37.14	-25.71	35.85	45.17	214.69	.11
6208.00	1.52	193.14	6207.36	-39.81	-25.69	38.52	47.38	212.84	.80
6303.00	1.57	224.03	6302.33	-41.97	-26.88	40.62	49.84	212.64	.87
6397.00	1.74	210.63	6396.29	-44.12	-28.51	42.70	52.53	212.86	.45
6492.00	2.12	188.56	6491.23	-47.10	-29.50	45.62	55.58	212.06	.87
6586.00	2.04	184.25	6585.17	-50.49	-29.88	48.99	58.67	210.62	.19
6681.00	1.49	186.48	6680.13	-53.40	-30.15	51.89	61.33	209.45	.58
6775.00	1.12	195.45	6774.10	-55.50	-30.53	53.96	63.35	208.81	.45
6870.00	1.26	215.11	6869.08	-57.25	-31.38	55.67	65.29	208.73	.45
6965.00	2.00	230.29	6964.04	-59.17	-33.26	57.49	67.87	209.34	.90
7059.00	2.10	230.43	7057.98	-61.31	-35.85	59.51	71.02	210.31	.11
7154.00	1.63	233.27	7152.93	-63.23	-38.27	61.31	73.91	211.18	.50
7248.00	1.91	226.26	7246.89	-65.11	-40.47	63.08	76.67	211.86	.38
7343.00	1.96	235.34	7341.83	-67.13	-42.95	64.98	79.70	212.61	.33
7438.00	1.70	223.41	7436.79	-69.08	-45.26	66.81	82.58	213.23	.48
7532.00	.78	201.69	7530.76	-70.69	-46.45	68.36	84.58	213.31	1.08

Measured Depth FT	Incl Angle Deg	Drift Direction Deg	True Vertical Depth	N-S FT	E-W FT	Vertical Section FT	CLOSURE		Dogleg Severity Deg/100
							Distance FT	Direction Deg	
7627.00	1.25	166.74	7625.75	-72.29	-46.45	69.97	85.93	212.72	.80
7721.00	1.62	167.25	7719.72	-74.59	-45.93	72.28	87.59	211.62	.39
7816.00	1.57	169.53	7814.68	-77.18	-45.39	74.89	89.54	210.46	.09
7911.00	1.42	178.02	7909.65	-79.63	-45.12	77.36	91.53	209.53	.28
8005.00	1.23	178.38	8003.63	-81.81	-45.05	79.53	93.39	208.84	.20
8100.00	1.14	185.87	8098.61	-83.77	-45.11	81.49	95.14	208.31	.19
8194.00	1.75	204.39	8192.58	-86.00	-45.80	83.69	97.44	208.04	.81
8289.00	1.60	202.75	8287.53	-88.55	-46.91	86.18	100.21	207.92	.17
8383.00	2.29	185.64	8381.48	-91.63	-47.61	89.22	103.26	207.46	.95
8478.00	1.86	178.43	8476.42	-95.06	-47.75	92.64	106.38	206.67	.53
8573.00	2.23	179.84	8571.36	-98.45	-47.70	96.03	109.40	205.85	.39
8667.00	2.06	175.97	8665.29	-101.96	-47.58	99.54	112.52	205.02	.24
8762.00	2.02	177.41	8760.23	-105.34	-47.38	102.92	115.50	204.22	.07
8856.00	1.55	160.77	8854.19	-108.19	-46.89	105.80	117.92	203.43	.74
8951.00	1.43	140.71	8949.16	-110.32	-45.72	107.98	119.42	202.51	.56
9046.00	1.37	131.02	9044.13	-111.99	-44.11	109.72	120.36	201.50	.26
9140.00	1.34	122.75	9138.10	-113.32	-42.34	111.14	120.97	200.49	.21
9235.00	1.37	116.48	9233.07	-114.42	-40.39	112.34	121.34	199.44	.16



COG Operating, LLC

Eddy County, NM (NAD 27)

Sec 25, T24S, R27E

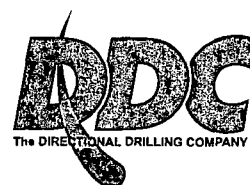
Quien Sabe 25 Fed #1H

Curve & Lateral

Design: Curve & Lateral

DDC Survey Report

11 December, 2013





DDC
Survey Report



Company:	COG Operating, LLC	Local Co-ordinate Reference:	Well Quien Sabe 25 Fed #1H
Project:	Eddy County, NM (NAD 27)	TVD Reference:	WELL @ 3126.0usft (Patterson #79)
Site:	Sec 25, T24S, R27E	MD Reference:	WELL @ 3126.0usft (Patterson #79)
Well:	Quien Sabe 25 Fed #1H	North Reference:	Grid
Wellbore:	Curve & Lateral	Survey Calculation Method:	Minimum Curvature
Design:	Curve & Lateral	Database:	EDM 5000.1 Single User Db

Project:	Eddy County, NM (NAD 27)		
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:	Sec 25, T24S, R27E		
Site Position:		Northing:	434,747.60 usft
From:	Map	Easting:	560,748.20 usft
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16 "
		Latitude:	32° 11' 42.309 N
		Longitude:	104° 8' 13.025 W
		Grid Convergence:	0.10 °

Well:	Quien Sabe 25 Fed #1H		
Well Position	+N/-S	0.0 usft	Northing:
	+E/-W	0.0 usft	Easting:
Position Uncertainty	0.0 usft	Wellhead Elevation:	usft
		Latitude:	32° 11' 42.309 N
		Longitude:	104° 8' 13.025 W
		Ground Level:	3,108.0 usft

Wellbore:	Curve & Lateral		
Magnetics	Model Name	Sample Date	Declination
	IGRF2010	11/18/2013	(°)
			Dip Angle
			(°)
			Field Strength
			(nT)
			60.00
			48,297

Design:	Curve & Lateral		
Audit Notes:			
Version:	1.0	Phase:	ACTUAL
		Tie On Depth:	7,248.0
Vertical Section:	Depth From (TVD)	+N/-S	+E/-W
	(usft)	(usft)	(usft)
	0.0	0.0	0.0
			Direction
			(°)
			177.21

Survey Program	Date: 12/11/2013		
From	To	Survey (Wellbore)	Tool Name
(usft)	(usft)		
85.0	7,248.0	ArkLaTex Gyro (Pilot Hole)	Good_gyro
7,304.0	12,319.0	MWD (Curve & Lateral)	Good Gyro

Survey									
Measured	Inclination	Azimuth	Vertical	+N/-S	+E/-W	Vertical	Dogleg	Build	Turn
Depth	(°)	(°)	Depth	(usft)	(usft)	Section	Rate	Rate	Rate
(usft)			(usft)			(usft)	(°/100usft)	(°/100usft)	(°/100usft)
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	0.00
85.0	0.34	343.50	85.0	0.2	-0.1	-0.2	0.40	0.40	0.00
175.0	0.86	63.27	175.0	0.8	0.5	-0.8	0.96	0.58	88.63
264.0	0.97	15.45	264.0	1.8	1.3	-1.8	0.84	0.12	-53.73
354.0	1.52	353.14	354.0	3.7	1.3	-3.7	0.80	0.61	-24.79
443.0	1.15	324.81	442.9	5.6	0.7	-5.6	0.84	-0.42	-31.83
533.0	0.76	276.40	532.9	6.5	-0.5	-6.5	0.96	-0.43	-53.79
627.0	0.52	339.53	626.9	6.9	-1.2	-7.0	0.75	-0.26	67.16
722.0	0.59	346.79	721.9	7.8	-1.5	-7.9	0.10	0.07	7.64
816.0	0.88	307.45	815.9	8.7	-2.2	-8.8	0.60	0.31	-41.85



DDC
Survey Report



Company:	COG Operating, LLC	Local Co-ordinate Reference:	Well Quien-Sabe 25 Fed #1H
Project:	Eddy County, NM (NAD 27)	TVD Reference:	WELL @ 3126.0usft (Patterson #79)
Site:	Sec 25, T24S, R27E	MD Reference:	WELL @ 3126.0usft (Patterson #79)
Well:	Quien Sabe 25 Fed #1H	North Reference:	Grid
Wellbore:	Curve & Lateral	Survey Calculation Method:	Minimum Curvature
Design:	Curve & Lateral	Database:	EDM 5000.1 Single User Db

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)
911.0	0.45	336.16	910.9	9.5	-2.9	-9.6	0.56	-0.45	30.22
1,005.0	0.33	328.46	1,004.9	10.1	-3.2	-10.2	0.14	-0.13	-8.19
1,100.0	0.64	313.18	1,099.9	10.7	-3.7	-10.8	0.35	0.33	-16.08
1,195.0	1.50	285.73	1,194.9	11.4	-5.3	-11.6	1.03	0.91	-28.89
1,289.0	0.65	265.25	1,288.9	11.7	-7.0	-12.0	0.98	-0.90	-21.79
1,384.0	0.57	259.86	1,383.9	11.5	-8.0	-11.9	0.10	-0.08	-5.67
1,478.0	0.40	249.17	1,477.9	11.3	-8.8	-11.7	0.20	-0.18	-11.37
1,573.0	0.78	234.06	1,572.9	10.8	-9.6	-11.3	0.43	0.40	-15.91
1,668.0	0.80	224.12	1,667.8	10.0	-10.6	-10.5	0.15	0.02	-10.46
1,762.0	0.35	197.06	1,761.8	9.2	-11.1	-9.8	0.55	-0.48	-28.79
1,857.0	0.59	253.67	1,856.8	8.8	-11.7	-9.4	0.52	0.25	59.59
1,951.0	1.07	255.40	1,950.8	8.5	-13.0	-9.1	0.51	0.51	1.84
2,046.0	0.93	244.56	2,045.8	7.9	-14.6	-8.6	0.25	-0.15	-11.41
2,141.0	1.03	264.42	2,140.8	7.5	-16.1	-8.3	0.37	0.11	20.91
2,235.0	1.22	263.70	2,234.8	7.3	-18.0	-8.2	0.20	0.20	-0.77
2,330.0	0.87	240.97	2,329.8	6.8	-19.6	-7.8	0.56	-0.37	-23.93
2,424.0	0.84	195.08	2,423.8	5.8	-20.4	-6.8	0.71	-0.03	-48.82
2,519.0	0.84	180.11	2,518.7	4.5	-20.6	-5.4	0.23	0.00	-15.76
2,614.0	0.75	165.52	2,613.7	3.2	-20.4	-4.1	0.23	-0.09	-15.36
2,708.0	0.80	188.73	2,707.7	1.9	-20.4	-2.9	0.34	0.05	24.69
2,803.0	0.92	189.83	2,802.7	0.5	-20.6	-1.5	0.13	0.13	1.16
2,897.0	0.60	225.85	2,896.7	-0.6	-21.1	-0.4	0.60	-0.34	38.32
2,992.0	0.59	203.72	2,991.7	-1.4	-21.6	0.3	0.24	-0.01	-23.29
3,086.0	0.62	214.25	3,085.7	-2.2	-22.1	1.2	0.12	0.03	11.20
3,181.0	1.13	205.13	3,180.7	-3.5	-22.8	2.4	0.55	0.54	-9.60
3,276.0	0.31	221.59	3,275.7	-4.6	-23.4	3.4	0.88	-0.86	17.33
3,370.0	0.65	192.28	3,369.7	-5.3	-23.7	4.1	0.43	0.36	-31.18
3,465.0	0.37	189.15	3,464.7	-6.1	-23.8	4.9	0.30	-0.29	-3.29
3,559.0	0.49	189.22	3,558.7	-6.8	-23.9	5.6	0.13	0.13	0.07
3,654.0	0.74	230.50	3,653.7	-7.6	-24.5	6.4	0.52	0.26	43.45
3,749.0	0.36	201.50	3,748.7	-8.3	-25.0	7.0	0.48	-0.40	-30.53
3,843.0	0.71	208.04	3,842.7	-9.0	-25.4	7.8	0.38	0.37	6.96
3,938.0	0.67	205.12	3,937.6	-10.1	-25.9	8.8	0.06	-0.04	-3.07
4,032.0	0.31	206.35	4,031.6	-10.8	-26.3	9.5	0.38	-0.38	1.31
4,127.0	0.30	206.25	4,126.6	-11.2	-26.5	9.9	0.01	-0.01	-0.11
4,222.0	0.38	208.02	4,221.6	-11.7	-26.8	10.4	0.08	0.08	1.86
4,316.0	0.37	204.87	4,315.6	-12.3	-27.0	11.0	0.02	-0.01	-3.35
4,411.0	0.26	201.50	4,410.6	-12.8	-27.3	11.4	0.12	-0.12	-3.55
4,505.0	0.55	157.11	4,504.6	-13.4	-27.2	12.0	0.43	0.31	-47.22
4,600.0	0.62	173.80	4,599.6	-14.3	-26.9	13.0	0.19	0.07	17.57
4,694.0	0.49	160.50	4,693.6	-15.2	-26.7	13.9	0.19	-0.14	-14.15
4,789.0	0.51	164.27	4,788.6	-16.0	-26.5	14.7	0.04	0.02	3.97
4,884.0	0.51	164.92	4,883.6	-16.8	-26.3	15.5	0.01	0.00	0.68



DDC
Survey Report



Company:	COG Operating, LLC	Local Co-ordinate Reference:	Well Quien Sabe 25 Fed #1H
Project:	Eddy County, NM (NAD 27)	TVD Reference:	WELL @ 3126.0usft (Patterson #79)
Site:	Sec 25, T24S, R27E	MD Reference:	WELL @ 3126.0usft (Patterson #79)
Well:	Quien Sabe 25 Fed #1H	North Reference:	Grid
Wellbore:	Curve & Lateral	Survey Calculation Method:	Minimum Curvature
Design:	Curve & Lateral	Database:	EDM 5000.1 Single User-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)
4,978.0	0.47	178.77	4,977.6	-17.6	-26.1	16.3	0.13	-0.04	14.73
5,073.0	0.47	187.99	5,072.6	-18.4	-26.2	17.1	0.08	0.00	9.71
5,167.0	0.36	206.53	5,166.6	-19.0	-26.4	17.7	0.18	-0.12	19.72
5,262.0	0.51	206.64	5,261.6	-19.7	-26.7	18.3	0.16	0.16	0.12
5,357.0	0.75	195.86	5,356.6	-20.6	-27.1	19.3	0.28	0.25	-11.35
5,451.0	0.81	188.14	5,450.6	-21.9	-27.3	20.5	0.13	0.06	-8.21
5,546.0	0.84	189.16	5,545.6	-23.2	-27.5	21.9	0.04	0.03	1.07
5,640.0	0.96	182.67	5,639.6	-24.7	-27.7	23.3	0.17	0.13	-6.90
5,735.0	1.16	173.09	5,734.6	-26.5	-27.6	25.1	0.28	0.21	-10.08
5,830.0	1.52	169.98	5,829.5	-28.7	-27.3	27.3	0.39	0.38	-3.27
5,924.0	1.73	169.52	5,923.5	-31.3	-26.8	29.9	0.22	0.22	-0.49
6,019.0	1.86	170.27	6,018.4	-34.2	-26.3	32.9	0.14	0.14	0.79
6,113.0	1.78	168.24	6,112.4	-37.1	-25.7	35.8	0.11	-0.09	-2.16
6,208.0	1.52	193.14	6,207.4	-39.8	-25.7	38.5	0.80	-0.27	26.21
6,303.0	1.57	224.03	6,302.3	-42.0	-26.9	40.6	0.87	0.05	32.52
6,397.0	1.74	210.63	6,396.3	-44.1	-28.5	42.7	0.45	0.18	-14.26
6,492.0	2.12	188.56	6,491.2	-47.1	-29.5	45.6	0.87	0.40	-23.23
6,586.0	2.04	184.25	6,585.2	-50.5	-29.9	49.0	0.19	-0.09	-4.59
6,681.0	1.49	186.48	6,680.1	-53.4	-30.1	51.9	0.58	-0.58	2.35
6,775.0	1.12	195.45	6,774.1	-55.5	-30.5	54.0	0.45	-0.39	9.54
6,870.0	1.26	215.11	6,869.1	-57.3	-31.4	55.7	0.45	0.15	20.69
6,965.0	2.00	230.29	6,964.0	-59.2	-33.3	57.5	0.90	0.78	15.98
7,059.0	2.10	230.43	7,058.0	-61.3	-35.8	59.5	0.11	0.11	0.15
7,154.0	1.63	233.27	7,152.9	-63.2	-38.3	61.3	0.50	-0.49	2.99
7,248.0	1.91	226.26	7,246.9	-65.1	-40.5	63.1	0.38	0.30	-7.46
Tie In @ 7304' MD / 7303' TVD									
7,304.0	7.40	198.90	7,302.7	-69.2	-42.3	67.0	10.30	9.80	-48.86
7,336.0	11.60	189.40	7,334.2	-74.3	-43.5	72.1	13.97	13.13	-29.69
7,367.0	15.90	180.80	7,364.4	-81.6	-44.1	79.4	15.32	13.87	-27.74
7,399.0	20.10	179.50	7,394.8	-91.5	-44.1	89.3	13.18	13.13	-4.06
7,431.0	22.70	175.90	7,424.6	-103.2	-43.6	100.9	9.10	8.13	-11.25
7,462.0	24.70	174.60	7,453.0	-115.6	-42.6	113.4	6.67	6.45	-4.19
7,494.0	27.50	172.20	7,481.7	-129.6	-40.9	127.4	9.35	8.75	-7.50
Crossed Hard Line @ 7519' MD / 7504' TVD									
7,518.7	28.66	172.04	7,503.5	-141.1	-39.3	139.0	4.70	4.69	-0.63
7,526.0	29.00	172.00	7,509.9	-144.6	-38.9	142.5	4.70	4.69	-0.60
7,558.0	28.80	172.30	7,537.9	-159.9	-36.7	157.9	0.77	-0.63	0.94
7,589.0	32.70	171.60	7,564.5	-175.6	-34.5	173.7	12.63	12.58	-2.26
7,621.0	37.60	170.60	7,590.7	-193.8	-31.7	192.0	15.42	15.31	-3.13
7,653.0	40.80	170.20	7,615.5	-213.7	-28.3	212.1	10.03	10.00	-1.25
7,685.0	41.50	168.60	7,639.6	-234.4	-24.4	232.9	3.95	2.19	-5.00
7,716.0	41.90	167.80	7,662.7	-254.6	-20.2	253.3	2.15	1.29	-2.58
7,748.0	46.00	168.60	7,685.8	-276.3	-15.7	275.2	12.93	12.81	2.50
7,780.0	50.00	170.10	7,707.2	-299.7	-11.3	298.8	12.98	12.50	4.69



DDC
Survey Report



Company:	COG Operating, LLC	Local Co-ordinate Reference:	Well Quien Sabe 25 Fed #1H
Project:	Eddy County, NM (NAD 27)	TVD Reference:	WELL @ 3126.0usft (Patterson #79)
Site:	Sec 25, T24S, R27E	MD Reference:	WELL @ 3126.0usft (Patterson #79)
Well:	Quien Sabe 25 Fed #1H	North Reference:	Grid
Wellbore:	Curve & Lateral	Survey Calculation Method:	Minimum Curvature
Design:	Curve & Lateral	Database:	EDM 5000.1 Single User 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)
7,811.0	52.70	171.80	7,726.5	-323.6	-7.5	322.9	9.71	8.71	5.48
7,843.0	55.50	172.90	7,745.3	-349.3	-4.0	348.7	9.18	8.75	3.44
7,874.0	58.00	172.50	7,762.3	-375.0	-0.7	374.5	8.14	8.06	-1.29
7,906.0	60.80	171.30	7,778.6	-402.3	3.2	401.9	9.33	8.75	-3.75
7,938.0	63.50	170.10	7,793.5	-430.2	7.7	430.0	9.07	8.44	-3.75
7,970.0	65.70	170.40	7,807.2	-458.7	12.6	458.7	6.93	6.88	0.94
8,001.0	68.50	170.80	7,819.3	-486.8	17.3	487.1	9.11	9.03	1.29
8,033.0	71.30	170.80	7,830.3	-516.5	22.1	517.0	8.75	8.75	0.00
8,065.0	73.90	170.90	7,839.9	-546.6	26.9	547.3	8.13	8.13	0.31
8,097.0	76.80	172.90	7,848.0	-577.3	31.3	578.1	10.89	9.06	6.25
8,128.0	77.70	174.80	7,854.8	-607.4	34.5	608.3	6.65	2.90	6.13
8,160.0	77.10	176.60	7,861.8	-638.5	36.9	639.5	5.80	-1.88	5.63
8,287.0	85.70	178.80	7,880.8	-763.8	41.9	765.0	6.98	6.77	1.73
8,382.0	89.10	177.80	7,885.1	-858.7	44.7	859.8	3.73	3.58	-1.05
8,477.0	90.50	177.60	7,885.4	-953.6	48.5	954.8	1.49	1.47	-0.21
8,571.0	90.00	177.10	7,885.0	-1,047.5	52.9	1,048.8	0.75	-0.53	-0.53
8,666.0	90.10	176.90	7,884.9	-1,142.4	57.8	1,143.8	0.24	0.11	-0.21
8,760.0	89.80	176.40	7,885.0	-1,236.2	63.3	1,237.8	0.62	-0.32	-0.53
8,855.0	89.70	175.10	7,885.4	-1,330.9	70.4	1,332.8	1.37	-0.11	-1.37
8,950.0	90.80	177.30	7,885.0	-1,425.7	76.7	1,427.8	2.59	1.16	2.32
9,044.0	90.80	176.40	7,883.7	-1,519.6	81.8	1,521.8	0.96	0.00	-0.96
9,138.0	91.00	176.00	7,882.2	-1,613.4	88.1	1,615.7	0.48	0.21	-0.43
9,233.0	90.40	178.10	7,881.0	-1,708.2	93.0	1,710.7	2.30	-0.63	2.21
9,327.0	90.00	176.90	7,880.7	-1,802.1	97.1	1,804.7	1.35	-0.43	-1.28
9,422.0	87.80	178.30	7,882.5	-1,897.0	101.0	1,899.7	2.74	-2.32	1.47
9,514.0	88.20	177.60	7,885.7	-1,988.9	104.3	1,991.6	0.88	0.43	-0.76
9,609.0	88.60	177.40	7,888.4	-2,083.8	108.5	2,086.6	0.47	0.42	-0.21
9,704.0	88.60	177.10	7,890.7	-2,178.6	113.0	2,181.6	0.32	0.00	-0.32
9,799.0	88.70	176.90	7,893.0	-2,273.5	118.0	2,276.5	0.24	0.11	-0.21
9,894.0	90.20	178.10	7,893.9	-2,368.4	122.1	2,371.5	2.02	1.58	1.26
9,989.0	90.80	178.10	7,893.0	-2,463.3	125.3	2,466.5	0.63	0.63	0.00
10,084.0	91.20	177.80	7,891.4	-2,558.2	128.7	2,561.5	0.53	0.42	-0.32
10,178.0	90.70	178.30	7,889.8	-2,652.2	131.9	2,655.5	0.75	-0.53	0.53
10,274.0	88.90	178.00	7,890.2	-2,748.1	135.0	2,751.4	1.90	-1.88	-0.31
10,369.0	89.20	177.80	7,891.7	-2,843.1	138.5	2,846.4	0.38	0.32	-0.21
10,463.0	89.30	177.60	7,893.0	-2,937.0	142.2	2,940.4	0.24	0.11	-0.21
10,559.0	89.40	176.90	7,894.1	-3,032.8	146.8	3,036.4	0.74	0.10	-0.73
10,655.0	87.90	176.60	7,896.3	-3,128.7	152.3	3,132.4	1.59	-1.56	-0.31
10,750.0	87.80	176.20	7,899.9	-3,223.4	158.2	3,227.3	0.43	-0.11	-0.42
10,845.0	88.30	175.90	7,903.1	-3,318.1	164.8	3,322.2	0.61	0.53	-0.32
10,940.0	87.80	178.00	7,906.3	-3,412.9	169.8	3,417.2	2.27	-0.53	2.21
11,036.0	88.20	177.40	7,909.7	-3,508.8	173.7	3,513.1	0.75	0.42	-0.63
11,130.0	88.50	176.90	7,912.4	-3,602.6	178.3	3,607.1	0.62	0.32	-0.53



DDC
Survey Report



Company:	COG Operating, LLC	Local Co-ordinate Reference:	Well Quien Sabe 25 Fed #1H
Project:	Eddy County, NM (NAD 27)	TVD Reference:	WELL @ 3126.0usft (Patterson #79)
Site:	Sec 25, T24S, R27E	MD Reference:	WELL @ 3126.0usft (Patterson #79)
Well:	Quien Sabe 25 Fed #1H	North Reference:	Grid
Wellbore:	Curve & Lateral	Survey Calculation Method:	Minimum Curvature
Design:	Curve & Lateral	Database:	EDM 5000.1 Single User Db

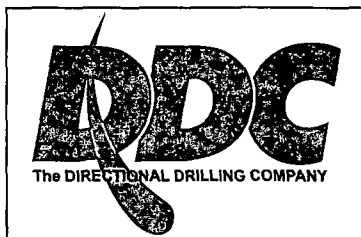
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	N/S (usft)	E/W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
11,225.0	88.80	176.40	7,914.6	-3,697.5	183.9	3,702.0	0.61	0.32	-0.53
11,320.0	90.50	176.90	7,915.2	-3,792.3	189.5	3,797.0	1.87	1.79	0.53
11,415.0	90.70	176.60	7,914.2	-3,887.1	194.8	3,892.0	0.38	0.21	-0.32
11,511.0	89.10	175.70	7,914.4	-3,982.9	201.3	3,988.0	1.91	-1.67	-0.94
11,607.0	88.70	177.40	7,916.2	-4,078.7	207.1	4,084.0	1.82	-0.42	1.77
11,700.0	89.30	177.30	7,917.9	-4,171.6	211.4	4,176.9	0.65	0.65	-0.11
11,794.0	89.10	176.20	7,919.2	-4,265.4	216.7	4,270.9	1.19	-0.21	-1.17
11,887.0	89.30	178.00	7,920.5	-4,358.3	221.4	4,363.9	1.95	0.22	1.94
11,980.0	90.00	178.30	7,921.0	-4,451.3	224.4	4,456.9	0.82	0.75	0.32
12,075.0	90.30	177.80	7,920.8	-4,546.2	227.6	4,551.9	0.61	0.32	-0.53
12,169.0	89.50	178.80	7,921.0	-4,640.2	230.4	4,645.9	1.36	-0.85	1.06
TD @ 12319' MD / 7922' TVD									
12,319.0	89.50	178.80	7,922.3	-4,790.1	233.6	4,795.8	0.00	0.00	0.00

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		N/S (usft)	E/W (usft)	
7,304.0	7,302.7	-69.2	-42.3	Tie In @ 7304' MD / 7303' TVD
7,518.7	7,503.5	-141.1	-39.3	Crossed Hard Line @ 7519' MD / 7504' TVD
12,319.0	7,922.3	-4,790.1	233.6	TD @ 12319' MD / 7922' TVD

Checked By: _____ Approved By: _____ Date: _____

Company Name: COG Operating, LLC
 Quien Sabe 25 Fed #1H
 Eddy County, NM (NAD 27)
 Rig: Patterson #79
 Created By: James Dawson
 Date: 12/12/2013

Quien Sabe 25 Fed #1H
 Eddy County, NM (NAD 27)
 Q130913 & WT-13835
 Design #2 - Tied to Gyro



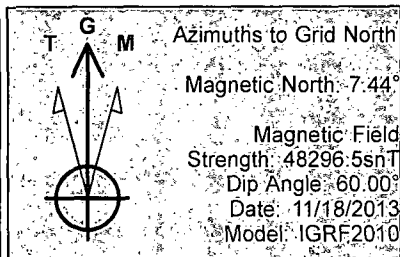
ANNOTATIONS

MD	Inc	Azi	TVD	+N-S	+E-W	Vsect	Departure	Annotation
7304.0	7.40	198.90	7302.7	-69.2	-42.3	87.0	116.7	Tie In @ 7304' MD / 7303' TVD
7519.7	28.86	172.04	7503.5	-141.1	-38.3	139.0	199.1	Crossed Hard Line @ 7519' MD / 7504' TVD
12319.0	88.60	176.90	7922.3	-4790.1	233.6	4795.8	4849.2	TD @ 12319' MD / 7922' TVD

DESIGN TARGET DETAILS

Name	TVD	+N-S	+E-W	Northing	Easting	Latitude	Longitude
PBHL Quien Sabe 25 Fed #1H Dm2	7925.0	-4791.0	231.7	429956.60	560979.90	32° 10' 54.891 N	104° 8' 10.430 W

- plan hits target center



PROJECT DETAILS: Eddy County, NM (NAD 27)

Geodetic System: US State Plane 1927 (Exact solution)
 Datum: NAD 1927 (NADCON CONUS)
 Ellipsoid: Clarke 1866
 Zone: New Mexico East 3001
 System Datum: Mean Sea Level

WELL DETAILS: Quien Sabe 25 Fed #1H

Ground Level:				3108.0	
+N-S	+E-W	Northing	Easting	Latitude	Longitude
0.0	0.0	434747.80	560748.20	32° 11' 42.309 N	104° 8' 13.025 W

