

30-025- 41 476



COG Operating L L C

Lea County, NM (NAD27 NME)

Sec. 17, T 19S. , R 32 E

King Air 8 Fed Com #3H

Wellbore #1

Design: Wellbore #1

HOBBS OCD

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Survey Report - Geographic

07 October, 2016





Integrity Directional Services, LLC

Survey Report - Geographic



Company:	COG Operating L L C	Local Co-ordinate Reference:	Well King Air 8 Fed Com #3H
Project:	Lea County, NM (NAD27 NME)	TVD Reference:	RKB @ 3635.40ft (Scandrell Freedom)
Site:	Sec. 17, T 19S. , R 32 E	MD Reference:	RKB @ 3635.40ft (Scandrell Freedom)
Well:	King Air 8 Fed Com #3H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	EDM 5000.1 Multi User Db

Project	Lea County, NM (NAD27 NME)		
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. 17, T 19S. , R 32 E		
Site Position:		Northing:	602,059.7932 usft
From:	Map	Easting:	669,581.1001 usft
Position Uncertainty:	5.00 ft	Slot Radius:	13-3/16 "
		Latitude:	32.654°N
		Longitude:	103.782°W
		Grid Convergence:	0.30 °

Well	King Air 8 Fed Com #3H		
Well Position	+N/-S	0.00 ft	Northing: 606,605.4000 usft
	+E/-W	0.00 ft	Easting: 667,159.7000 usft
Position Uncertainty	0.00 ft	Wellhead Elevation:	0.00 ft
		Latitude:	32.666°N
		Longitude:	103.790°W
		Ground Level:	3,609.40 ft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2015	9/2/2016	7.17	60.44	48,258

Design	Wellbore #1			
Audit Notes:				
Version:	1.0	Phase:	ACTUAL	Tie On Depth: 0.00
Vertical Section:	Depth From (TVD) (ft)	+N/-S (ft)	+E/-W (ft)	Direction (°)
	0.00	0.00	0.00	1.78

Survey Program	Date	10/7/2016		
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description
100.00	8,750.00	Gyro Surveys (Wellbore #1)	Keeper	Standard Wireline Keeper ver 1.0.2
8,832.00	17,215.00	IDS MWD Surveys (Wellbore #1)	MWD	MWD - Standard

Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
0.00	0.00	0.00	0.00	0.00	0.00	606,605.4000	667,159.7000	32.666°N	103.790°W
100.00	0.07	42.78	100.00	0.04	0.04	606,605.4449	667,159.7414	32.666°N	103.790°W
200.00	0.10	71.26	200.00	0.12	0.17	606,605.5177	667,159.8656	32.666°N	103.790°W
300.00	0.20	153.60	300.00	-0.01	0.33	606,605.3894	667,160.0258	32.666°N	103.790°W
400.00	0.41	186.06	400.00	-0.52	0.37	606,604.8773	667,160.0656	32.666°N	103.790°W
500.00	0.58	207.87	499.99	-1.33	0.09	606,604.0741	667,159.7913	32.666°N	103.790°W
600.00	0.63	218.96	599.99	-2.20	-0.49	606,603.1992	667,159.2090	32.666°N	103.790°W
700.00	0.98	216.40	699.98	-3.32	-1.34	606,602.0834	667,158.3558	32.666°N	103.790°W
800.00	0.67	218.36	799.97	-4.46	-2.21	606,600.9366	667,157.4855	32.666°N	103.790°W
900.00	0.69	223.67	899.96	-5.36	-2.99	606,600.0426	667,156.7069	32.666°N	103.790°W
1,000.00	0.90	214.91	999.95	-6.44	-3.86	606,598.9630	667,155.8417	32.666°N	103.790°W



Integrity Directional Services, LLC
Survey Report - Geographic



Company:	COG Operating L L C	Local Co-ordinate Reference:	Well King Air 8 Fed Com #3H
Project:	Lea County, NM (NAD27 NME)	TVD Reference:	RKB @ 3635.40ft (Scandrift Freedom)
Site:	Sec. 17, T 19S. , R 32 E	MD Reference:	RKB @ 3635.40ft (Scandrift Freedom)
Well:	King Air 8 Fed Com #3H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	EDM 5000.1 Multi User Db

Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
1,100.00	1.05	211.56	1,099.94	-7.86	-4.79	606,597.5383	667,154.9127	32.666°N	103.790°W
1,200.00	1.12	208.24	1,199.92	-9.50	-5.73	606,595.8965	667,153.9707	32.666°N	103.790°W
1,300.00	1.35	203.88	1,299.90	-11.44	-6.67	606,593.9584	667,153.0314	32.666°N	103.790°W
1,400.00	1.38	201.55	1,399.87	-13.64	-7.59	606,591.7613	667,152.1122	32.666°N	103.790°W
1,500.00	1.53	199.01	1,499.84	-16.02	-8.46	606,589.3791	667,151.2350	32.666°N	103.790°W
1,600.00	1.55	190.08	1,599.80	-18.61	-9.14	606,586.7853	667,150.5634	32.666°N	103.790°W
1,700.00	1.38	122.88	1,699.77	-20.60	-8.36	606,584.7998	667,151.3381	32.666°N	103.790°W
1,800.00	1.47	92.25	1,799.74	-21.30	-6.07	606,584.0958	667,153.6310	32.666°N	103.790°W
1,900.00	1.94	52.45	1,899.70	-20.32	-3.45	606,585.0770	667,156.2548	32.666°N	103.790°W
2,000.00	1.83	50.14	1,999.65	-18.27	-0.88	606,587.1320	667,158.8224	32.666°N	103.790°W
2,100.00	1.36	51.46	2,099.61	-16.51	1.28	606,588.8947	667,160.9763	32.666°N	103.790°W
2,200.00	1.26	52.69	2,199.58	-15.10	3.08	606,590.3005	667,162.7790	32.666°N	103.790°W
2,300.00	1.91	54.63	2,299.54	-13.47	5.31	606,591.9316	667,165.0124	32.666°N	103.790°W
2,400.00	2.11	57.07	2,399.48	-11.50	8.22	606,593.8970	667,167.9164	32.666°N	103.790°W
2,500.00	0.41	94.29	2,499.46	-10.53	10.12	606,594.8711	667,169.8185	32.666°N	103.790°W
2,600.00	0.81	216.50	2,599.45	-11.12	10.05	606,594.2761	667,169.7548	32.666°N	103.790°W
2,700.00	1.10	225.66	2,699.44	-12.36	8.95	606,593.0370	667,168.6479	32.666°N	103.790°W
2,800.00	1.32	224.91	2,799.42	-13.85	7.45	606,591.5504	667,167.1482	32.666°N	103.790°W
2,900.00	1.29	225.41	2,899.39	-15.46	5.83	606,589.9444	667,165.5334	32.666°N	103.790°W
3,000.00	0.55	96.52	2,999.38	-16.30	5.51	606,589.0997	667,165.2086	32.666°N	103.790°W
3,100.00	0.83	75.18	3,099.38	-16.17	6.69	606,589.2304	667,166.3857	32.666°N	103.790°W
3,200.00	0.98	75.57	3,199.36	-15.77	8.21	606,589.6288	667,167.9140	32.666°N	103.790°W
3,300.00	1.04	65.03	3,299.35	-15.18	9.86	606,590.2250	667,169.5649	32.666°N	103.790°W
3,400.00	0.96	68.78	3,399.33	-14.49	11.47	606,590.9113	667,171.1685	32.666°N	103.790°W
3,500.00	0.77	53.89	3,499.32	-13.79	12.79	606,591.6105	667,172.4923	32.666°N	103.790°W
3,600.00	1.18	63.63	3,599.31	-12.94	14.26	606,592.4639	667,173.9577	32.666°N	103.790°W
3,700.00	0.97	46.37	3,699.29	-11.89	15.79	606,593.5052	667,175.4929	32.666°N	103.790°W
3,800.00	1.03	30.45	3,799.27	-10.54	16.86	606,594.8641	667,176.5610	32.666°N	103.790°W
3,900.00	1.00	26.20	3,899.26	-8.98	17.70	606,596.4219	667,177.4018	32.666°N	103.790°W
4,000.00	0.74	20.11	3,999.25	-7.59	18.31	606,597.8113	667,178.0091	32.666°N	103.790°W
4,100.00	0.49	26.40	4,099.24	-6.60	18.72	606,598.8007	667,178.4212	32.666°N	103.790°W
4,200.00	0.34	23.83	4,199.24	-5.94	19.03	606,599.4551	667,178.7312	32.666°N	103.790°W
4,300.00	0.35	9.90	4,299.24	-5.37	19.20	606,600.0274	667,178.9036	32.666°N	103.790°W
4,400.00	0.25	13.36	4,399.24	-4.86	19.31	606,600.5405	667,179.0066	32.666°N	103.790°W
4,500.00	0.33	347.59	4,499.23	-4.37	19.30	606,601.0340	667,178.9951	32.666°N	103.790°W
4,600.00	0.30	348.17	4,599.23	-3.83	19.18	606,601.5715	667,178.8795	32.666°N	103.790°W
4,700.00	0.42	349.56	4,699.23	-3.21	19.06	606,602.1882	667,178.7594	32.666°N	103.790°W
4,800.00	0.60	342.17	4,799.23	-2.35	18.83	606,603.0471	667,178.5327	32.666°N	103.790°W
4,900.00	0.83	327.06	4,899.22	-1.25	18.28	606,604.1534	667,177.9785	32.666°N	103.790°W
5,000.00	1.14	323.17	4,999.20	0.16	17.29	606,605.5574	667,176.9884	32.666°N	103.790°W
5,100.00	1.22	324.16	5,099.18	1.82	16.07	606,607.2167	667,175.7688	32.666°N	103.790°W
5,200.00	1.53	326.83	5,199.15	3.80	14.72	606,609.1972	667,174.4150	32.666°N	103.790°W
5,300.00	1.69	327.44	5,299.11	6.16	13.19	606,611.5575	667,172.8910	32.666°N	103.790°W
5,400.00	1.86	327.94	5,399.07	8.78	11.54	606,614.1756	667,171.2360	32.667°N	103.790°W
5,500.00	2.12	325.55	5,499.01	11.68	9.63	606,617.0763	667,169.3282	32.667°N	103.790°W
5,600.00	2.06	329.23	5,598.94	14.75	7.66	606,620.1458	667,167.3624	32.667°N	103.790°W
5,700.00	2.14	327.46	5,698.87	17.86	5.74	606,623.2640	667,165.4387	32.667°N	103.790°W
5,800.00	2.13	326.81	5,798.80	20.99	3.72	606,626.3932	667,163.4171	32.667°N	103.790°W
5,900.00	2.27	327.82	5,898.73	24.22	1.65	606,629.6245	667,161.3451	32.667°N	103.790°W
6,000.00	2.35	327.27	5,998.65	27.63	-0.52	606,633.0254	667,159.1818	32.667°N	103.790°W
6,100.00	2.26	325.93	6,098.57	30.98	-2.73	606,636.3834	667,156.9688	32.667°N	103.790°W
6,200.00	2.24	324.61	6,198.49	34.21	-4.97	606,639.6098	667,154.7324	32.667°N	103.790°W
6,300.00	2.30	321.44	6,298.41	37.37	-7.35	606,642.7720	667,152.3499	32.667°N	103.790°W
6,400.00	2.22	320.49	6,398.33	40.44	-9.83	606,645.8354	667,149.8669	32.667°N	103.790°W
6,500.00	2.31	321.65	6,498.26	43.51	-12.32	606,648.9102	667,147.3842	32.667°N	103.790°W



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Survey Report - Geographic



Company:	COG Operating L L C	Local Co-ordinate Reference:	Well King Air 8 Fed Com #3H
Project:	Lea County, NM (NAD27 NME)	TVD Reference:	RKB @ 3635.40ft (Scandril Freedom)
Site:	Sec. 17, T 19S. , R 32 E	MD Reference:	RKB @ 3635.40ft (Scandril Freedom)
Well:	King Air 8 Fed Com #3H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	EDM 5000.1 Multi User Db

Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
6,600.00	2.16	316.61	6,598.18	46.46	-14.86	606,651.8601	667,144.8392	32.667°N	103.790°W
6,700.00	2.25	316.21	6,698.11	49.25	-17.51	606,654.6466	667,142.1862	32.667°N	103.790°W
6,800.00	2.42	316.16	6,798.02	52.19	-20.33	606,657.5864	667,139.3654	32.667°N	103.790°W
6,900.00	2.30	312.92	6,897.94	55.08	-23.27	606,660.4756	667,136.4337	32.667°N	103.790°W
7,000.00	2.55	311.13	6,997.85	57.91	-26.41	606,663.3053	667,133.2887	32.667°N	103.790°W
7,100.00	2.38	302.78	7,097.76	60.49	-29.83	606,665.8927	667,129.8674	32.667°N	103.790°W
7,200.00	2.42	301.46	7,197.67	62.72	-33.38	606,668.1187	667,126.3208	32.667°N	103.790°W
7,300.00	2.28	298.35	7,297.58	64.77	-36.93	606,670.1651	667,122.7693	32.667°N	103.790°W
7,400.00	1.75	286.46	7,397.52	66.14	-40.15	606,671.5424	667,119.5544	32.667°N	103.790°W
7,500.00	1.80	283.26	7,497.47	66.94	-43.14	606,672.3353	667,116.5614	32.667°N	103.790°W
7,600.00	2.08	282.05	7,597.42	67.67	-46.44	606,673.0743	667,113.2580	32.667°N	103.790°W
7,700.00	2.08	282.18	7,697.35	68.44	-49.99	606,673.8361	667,109.7093	32.667°N	103.790°W
7,800.00	2.23	274.11	7,797.28	68.96	-53.71	606,674.3584	667,105.9949	32.667°N	103.790°W
7,900.00	2.35	272.02	7,897.20	69.17	-57.69	606,674.5701	667,102.0054	32.667°N	103.790°W
8,000.00	2.53	259.20	7,997.11	68.83	-61.91	606,674.2288	667,097.7884	32.667°N	103.790°W
8,100.00	2.55	262.10	8,097.01	68.11	-66.28	606,673.5095	667,093.4170	32.667°N	103.790°W
8,200.00	2.44	267.81	8,196.92	67.72	-70.61	606,673.1224	667,089.0864	32.667°N	103.790°W
8,300.00	1.35	261.93	8,296.86	67.48	-73.91	606,672.8757	667,085.7929	32.667°N	103.790°W
8,400.00	1.06	250.28	8,396.84	67.00	-75.94	606,672.3982	667,083.7558	32.667°N	103.790°W
8,500.00	0.34	123.54	8,496.83	66.52	-76.57	606,671.9221	667,083.1324	32.667°N	103.790°W
8,600.00	0.26	102.01	8,596.83	66.31	-76.10	606,671.7110	667,083.6016	32.667°N	103.790°W
8,700.00	0.13	159.73	8,696.83	66.16	-75.84	606,671.5573	667,083.8629	32.667°N	103.790°W
8,750.00	0.24	225.19	8,746.83	66.03	-75.89	606,671.4303	667,083.8082	32.667°N	103.790°W
8,832.00	2.80	38.00	8,828.80	67.49	-74.78	606,672.8879	667,084.9197	32.667°N	103.790°W
First IDS MWD Survey									
8,863.00	8.10	47.70	8,859.65	69.56	-72.70	606,674.9559	667,087.0027	32.667°N	103.790°W
8,894.00	12.10	47.00	8,890.16	73.24	-68.70	606,678.6431	667,090.9959	32.667°N	103.790°W
8,957.00	18.10	46.30	8,950.96	84.52	-56.79	606,689.9178	667,102.9111	32.667°N	103.790°W
9,004.00	24.40	45.70	8,994.74	96.35	-44.55	606,701.7540	667,115.1496	32.667°N	103.790°W
9,051.00	30.70	42.00	9,036.40	112.07	-29.56	606,717.4672	667,130.1418	32.667°N	103.790°W
9,098.00	36.50	35.90	9,075.54	132.33	-13.32	606,737.7294	667,146.3848	32.667°N	103.790°W
9,144.00	41.80	33.20	9,111.20	156.26	3.11	606,761.6581	667,162.8141	32.667°N	103.790°W
9,191.00	47.50	29.60	9,144.63	184.46	20.27	606,789.8574	667,179.9658	32.667°N	103.790°W
9,237.00	51.50	27.30	9,174.50	215.21	36.91	606,820.6117	667,196.6055	32.667°N	103.790°W
9,284.00	57.50	25.70	9,201.78	249.45	53.95	606,854.8462	667,213.6519	32.667°N	103.790°W
9,331.00	61.90	24.30	9,225.49	286.22	71.09	606,891.6181	667,230.7866	32.667°N	103.790°W
9,378.00	66.10	23.10	9,246.09	324.89	88.05	606,930.2922	667,247.7547	32.667°N	103.790°W
9,425.00	69.80	22.20	9,263.73	365.09	104.82	606,970.4888	667,264.5233	32.667°N	103.790°W
9,457.00	72.50	21.40	9,274.07	393.21	116.07	606,998.6045	667,275.7670	32.668°N	103.790°W
9,475.56	74.09	20.94	9,279.40	409.78	122.49	607,015.1807	667,282.1866	32.668°N	103.790°W
Sec 17/8 Line Crossing Point									
9,519.00	77.80	19.90	9,289.95	449.27	137.18	607,054.6649	667,296.8842	32.668°N	103.790°W
9,566.00	80.20	19.40	9,298.92	492.71	152.70	607,098.1114	667,312.3967	32.668°N	103.790°W
9,614.00	84.20	18.50	9,305.44	537.68	168.14	607,143.0808	667,327.8351	32.668°N	103.790°W
9,643.00	86.40	18.10	9,307.81	565.12	177.21	607,170.5198	667,336.9096	32.668°N	103.790°W
9,736.00	88.80	14.50	9,311.71	654.28	203.28	607,259.6827	667,362.9799	32.668°N	103.789°W
9,829.00	89.40	15.10	9,313.17	744.19	227.03	607,349.5852	667,386.7332	32.669°N	103.789°W
9,924.00	89.80	12.50	9,313.83	836.43	249.69	607,441.8324	667,409.3913	32.669°N	103.789°W
10,017.00	92.20	8.90	9,312.21	927.78	266.95	607,533.1794	667,426.6526	32.669°N	103.789°W
10,111.00	92.20	4.90	9,308.60	1,021.01	278.24	607,626.4106	667,437.9348	32.669°N	103.789°W
10,204.00	89.80	1.40	9,306.97	1,113.84	283.34	607,719.2345	667,443.0421	32.670°N	103.789°W
10,298.00	87.40	359.40	9,309.27	1,207.79	284.00	607,813.1923	667,443.6989	32.670°N	103.789°W
10,391.00	88.40	359.00	9,312.68	1,300.72	282.70	607,906.1193	667,442.4013	32.670°N	103.789°W
10,485.00	89.20	358.60	9,314.65	1,394.68	280.73	608,000.0769	667,440.4331	32.670°N	103.789°W
10,578.00	89.60	358.40	9,315.62	1,487.64	278.30	608,093.0395	667,437.9988	32.671°N	103.789°W



Integrity Directional Services, LLC

Survey Report - Geographic



Company:	COG Operating L L C	Local Co-ordinate Reference:	Well King Air 8 Fed Com #3H
Project:	Lea County, NM (NAD27 NME)	TVD Reference:	RKB @ 3635.40ft (Scandrill Freedom)
Site:	Sec. 17, T 19S. , R 32 E	MD Reference:	RKB @ 3635.40ft (Scandrill Freedom)
Well:	King Air 8 Fed Com #3H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	EDM 5000.1 Multi User Db

Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
10,671.00	89.00	0.10	9,316.76	1,580.62	277.08	608,186.0206	667,436.7815	32.671°N	103.789°W
10,765.00	89.60	0.10	9,317.91	1,674.62	277.25	608,280.0128	667,436.9455	32.671°N	103.789°W
10,859.00	90.00	359.70	9,318.23	1,768.62	277.08	608,374.0115	667,436.7815	32.671°N	103.789°W
10,953.00	90.00	359.60	9,318.23	1,862.61	276.51	608,468.0096	667,436.2073	32.672°N	103.789°W
11,046.00	90.50	359.80	9,317.83	1,955.61	276.02	608,561.0069	667,435.7203	32.672°N	103.789°W
11,140.00	90.80	2.30	9,316.76	2,049.58	277.74	608,654.9773	667,437.4425	32.672°N	103.789°W
11,234.00	91.60	1.60	9,314.79	2,143.51	280.94	608,748.9007	667,440.6404	32.672°N	103.789°W
11,327.00	89.70	1.20	9,313.74	2,236.47	283.21	608,841.8623	667,442.9123	32.673°N	103.789°W
11,421.00	89.90	0.90	9,314.07	2,330.45	284.94	608,935.8457	667,444.6348	32.673°N	103.789°W
11,515.00	89.80	1.30	9,314.31	2,424.43	286.74	609,029.8276	667,446.4394	32.673°N	103.789°W
11,608.00	90.20	1.20	9,314.31	2,517.41	288.77	609,122.8051	667,448.4682	32.673°N	103.789°W
11,701.00	91.30	1.60	9,313.09	2,610.37	291.04	609,215.7676	667,450.7401	32.674°N	103.789°W
11,795.00	90.20	359.80	9,311.86	2,704.35	292.19	609,309.7470	667,451.8881	32.674°N	103.789°W
11,889.00	91.10	0.20	9,310.80	2,798.35	292.19	609,403.7396	667,451.8881	32.674°N	103.789°W
11,982.00	89.00	359.10	9,310.72	2,891.34	291.62	609,496.7310	667,451.3200	32.674°N	103.789°W
12,075.00	89.30	359.60	9,312.10	2,984.32	290.57	609,589.7142	667,450.2651	32.675°N	103.789°W
12,169.00	89.10	0.30	9,313.41	3,078.31	290.48	609,683.7042	667,450.1831	32.675°N	103.789°W
12,262.00	89.50	0.10	9,314.54	3,171.30	290.81	609,776.6963	667,450.5077	32.675°N	103.789°W
12,356.00	90.50	0.50	9,314.54	3,265.30	291.30	609,870.6934	667,450.9999	32.675°N	103.789°W
12,449.00	91.20	0.60	9,313.17	3,358.28	292.19	609,963.6781	667,451.8925	32.676°N	103.789°W
12,543.00	88.90	359.10	9,313.08	3,452.28	291.95	610,057.6686	667,451.6464	32.676°N	103.789°W
12,636.00	88.50	359.80	9,315.19	3,545.25	291.05	610,150.6394	667,450.7539	32.676°N	103.789°W
12,731.00	88.30	359.90	9,317.85	3,640.21	290.81	610,245.6018	667,450.5052	32.676°N	103.789°W
12,824.00	89.40	359.80	9,319.71	3,733.19	290.56	610,338.5811	667,450.2618	32.677°N	103.789°W
12,917.00	89.80	359.60	9,320.36	3,826.18	290.08	610,431.5772	667,449.7749	32.677°N	103.789°W
13,010.00	89.90	359.10	9,320.60	3,919.18	289.02	610,524.5704	667,448.7199	32.677°N	103.789°W
13,104.00	90.10	358.40	9,320.60	4,013.16	286.97	610,618.5472	667,446.6693	32.678°N	103.789°W
13,197.00	91.40	358.40	9,319.39	4,106.11	284.37	610,711.5008	667,444.0728	32.678°N	103.789°W
13,291.00	92.40	358.30	9,316.27	4,200.02	281.67	610,805.4088	667,441.3678	32.678°N	103.789°W
13,384.00	91.50	357.70	9,313.11	4,292.91	278.42	610,898.2967	667,438.1239	32.678°N	103.789°W
13,478.00	90.40	356.90	9,311.55	4,386.79	274.00	610,992.1771	667,433.6965	32.679°N	103.789°W
13,571.00	90.20	357.80	9,311.06	4,479.68	269.70	611,085.0752	667,429.3968	32.679°N	103.789°W
13,665.00	89.10	359.90	9,311.64	4,573.66	267.81	611,179.0476	667,427.5103	32.679°N	103.789°W
13,758.00	90.20	359.40	9,312.20	4,666.65	267.24	611,272.0422	667,426.9422	32.679°N	103.789°W
13,852.00	91.10	358.70	9,311.14	4,760.63	265.68	611,366.0215	667,425.3839	32.680°N	103.789°W
13,946.00	90.00	359.90	9,310.23	4,854.62	264.54	611,460.0068	667,424.2357	32.680°N	103.789°W
14,040.00	90.80	359.80	9,309.58	4,948.61	264.29	611,554.0032	667,423.9896	32.680°N	103.789°W
14,133.00	91.50	359.70	9,307.71	5,041.59	263.88	611,646.9827	667,423.5839	32.680°N	103.789°W
14,227.00	92.70	358.70	9,304.27	5,135.52	262.57	611,740.9074	667,422.2727	32.681°N	103.789°W
14,320.00	91.00	358.60	9,301.27	5,228.44	260.38	611,833.8295	667,420.0828	32.681°N	103.789°W
14,411.00	89.10	357.70	9,301.19	5,319.39	257.45	611,924.7767	667,417.1452	32.681°N	103.789°W
14,504.00	89.30	357.40	9,302.48	5,412.29	253.47	612,017.6823	667,413.1701	32.681°N	103.789°W
14,598.00	89.90	357.80	9,303.14	5,506.21	249.53	612,111.5968	667,409.2339	32.682°N	103.789°W
14,692.00	90.40	359.10	9,302.89	5,600.17	246.99	612,205.5596	667,406.6914	32.682°N	103.789°W
14,780.90	90.50	358.81	9,302.20	5,689.05	245.37	612,294.4418	667,405.0726	32.682°N	103.789°W
S 1/2 Sec. 5 Crossing Point									
14,785.00	90.50	358.80	9,302.16	5,693.15	245.29	612,298.5408	667,404.9872	32.682°N	103.789°W
14,879.00	90.00	0.60	9,301.75	5,787.15	244.80	612,392.5343	667,404.4951	32.682°N	103.789°W
14,973.00	89.80	0.90	9,301.92	5,881.14	246.03	612,486.5257	667,405.7255	32.683°N	103.789°W
15,067.00	90.50	1.40	9,301.67	5,975.12	247.91	612,580.5054	667,407.6120	32.683°N	103.789°W
15,160.00	88.60	2.40	9,302.40	6,068.06	251.00	612,673.4458	667,410.6951	32.683°N	103.789°W
15,253.00	86.70	1.50	9,306.22	6,160.92	254.16	612,766.3083	667,413.8573	32.683°N	103.789°W
15,346.00	89.00	1.00	9,309.70	6,253.83	256.18	612,859.2140	667,415.8842	32.684°N	103.789°W
15,440.00	90.00	0.70	9,310.52	6,347.81	257.58	612,953.1986	667,417.2786	32.684°N	103.789°W
15,533.00	91.20	0.60	9,309.55	6,440.80	258.63	613,046.1857	667,418.3335	32.684°N	103.789°W



Integrity Directional Services, LLC

Survey Report - Geographic



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Project:	Lea County, NM (NAD27 NME)	TVD Reference:	RKB @ 3635.40ft (Scandrell Freedom)
Site:	Sec. 17, T 19S. , R 32 E	MD Reference:	RKB @ 3635.40ft (Scandrell Freedom)
Well:	King Air 8 Fed Com #3H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	EDM 5000.1 Multi User Db

Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
15,626.00	92.10	0.60	9,306.87	6,533.75	259.61	613,139.1409	667,419.3070	32.684°N	103.789°W
15,721.00	91.30	0.60	9,304.05	6,628.71	260.60	613,234.0929	667,420.3013	32.685°N	103.789°W
15,815.00	89.90	0.70	9,303.07	6,722.69	261.67	613,328.0791	667,421.3676	32.685°N	103.789°W
15,909.00	90.30	1.00	9,302.91	6,816.68	263.06	613,422.0682	667,422.7621	32.685°N	103.789°W
16,002.00	90.60	1.50	9,302.18	6,909.66	265.09	613,515.0426	667,424.7908	32.685°N	103.789°W
16,097.00	89.80	0.30	9,301.84	7,004.64	266.58	613,610.0276	667,426.2829	32.686°N	103.789°W
16,190.00	90.70	0.30	9,301.44	7,097.64	267.07	613,703.0243	667,426.7699	32.686°N	103.789°W
16,283.00	91.50	0.30	9,299.65	7,190.62	267.56	613,796.0049	667,427.2567	32.686°N	103.789°W
16,377.00	90.60	359.80	9,297.93	7,284.60	267.64	613,889.9877	667,427.3387	32.687°N	103.789°W
16,470.00	89.10	359.70	9,298.17	7,377.60	267.23	613,982.9836	667,426.9329	32.687°N	103.789°W
16,564.00	89.80	359.90	9,299.08	7,471.59	266.91	614,076.9779	667,426.6048	32.687°N	103.789°W
16,657.00	90.40	0.50	9,298.91	7,564.59	267.23	614,169.9762	667,426.9294	32.687°N	103.789°W
16,751.00	89.00	0.10	9,299.41	7,658.59	267.72	614,263.9709	667,427.4216	32.688°N	103.789°W
16,844.00	89.50	0.10	9,300.62	7,751.58	267.88	614,356.9623	667,427.5839	32.688°N	103.789°W
16,937.00	90.00	0.00	9,301.03	7,844.58	267.97	614,449.9609	667,427.6651	32.688°N	103.789°W
17,032.00	90.40	359.80	9,300.70	7,939.58	267.80	614,544.9597	667,427.4993	32.688°N	103.789°W
17,158.00	91.00	359.50	9,299.16	8,065.56	267.03	614,670.9470	667,426.7296	32.689°N	103.789°W
Final IDS MWD Survey									
17,215.00	91.00	359.50	9,298.16	8,122.55	266.53	614,727.9360	667,426.2323	32.689°N	103.789°W
Projection to TD									

Design Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
8,832.00	8,828.80	67.49	-74.78	First IDS MWD Survey
9,475.56	9,279.40	409.78	122.49	Sec 17/8 Line Crossing Point
14,780.90	9,302.20	5,689.05	245.37	S 1/2 Sec. 5 Crossing Point
17,158.00	9,299.16	8,065.56	267.03	Final IDS MWD Survey
17,215.00	9,298.16	8,122.55	266.53	Projection to TD

Checked By: _____ Approved By: _____ Date: _____