



Cog Operating LLC- Eastern NM

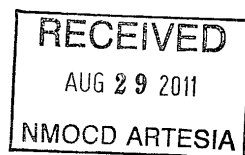
Eddy County (NAD 27)
Seabiscuit Federal Com
#2H
OH

30-015-37607

Design: OH

Pathfinder X&Y Report

09 August, 2011



The logo for PATHFINDER, with "PATH" in a standard font and "FINDER" in a bold, italicized font, separated by a stylized swoosh.

A Schlumberger Company



Pathfinder
Pathfinder X&Y Report

PATHFINDER
A Schlumberger Company

Company: Cog Operating LLC- Eastern NM
Project: Eddy County (NAD 27)
Site: Seabiscuit Federal Com
Well: #2H
Wellbore: OH
Design: OH

Local Co-ordinate Reference: Well #2H
TVD Reference: WELL @ 3588.00usft (22' KB)
MD Reference: WELL @ 3588.00usft (22' KB)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: EDM 5000.1 Single User Db

Project: Eddy County (NAD 27)

Map System: US State Plane 1927 (Exact solution)
Geo Datum: NAD 1927 (NADCON CONUS)
Map Zone: New Mexico East 3001

System Datum: Mean Sea Level

Site: Seabiscuit Federal Com

Site Position:		Northing:	446,236.500 usft	Latitude:	32° 13' 31.515 N
From:	Map	Easting:	683,988.900 usft	Longitude:	103° 44' 18.078 W
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "	Grid Convergence:	0.32 °

Well:	#2H					
Well Position	+N/-S	0.00 usft	Northing:	446,243.100 usft	Latitude:	32° 13' 31.477 N
	+E/-W	0.00 usft	Easting:	685,868.500 usft	Longitude:	103° 43' 56.197 W
Position Uncertainty	0.00 usft		Wellhead Elevation:	usft	Ground Level:	3,566.00 usft

Wellbore: OH

Magnetics:	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF200510	7/16/2009	7.88	60.22	48,819

Design: OH

Audit Notes:

Version: 1.0 Phase: ACTUAL Tie On Depth: 0.00

Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	0.00	0.00	0.00	359.71



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Survey Program		Date	8/9/2011		
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
100.00	8,545.00	GYRO (OH)	CB-GYRO-MS	Camera based gyro multishot	
8,626.00	13,500.00	MWD #1 (OH)	MWD	MWD - Standard	

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	TVDSS (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	DLag (°/100usft)	Northing (usft)	Easting (usft)
0.00	0.00	0.00	0.00	-3,588.00	0.00	0.00	0.00	0.00	446,243.10	685,868.50
100.00	0.27	187.39	100.00	-3,488.00	-0.23	-0.03	-0.23	0.27	446,242.87	685,868.47
200.00	0.42	204.79	200.00	-3,388.00	-0.80	-0.21	-0.80	0.18	446,242.30	685,868.29
300.00	0.48	193.02	299.99	-3,288.01	-1.54	-0.46	-1.54	0.11	446,241.56	685,868.04
400.00	0.49	187.91	399.99	-3,188.01	-2.37	-0.62	-2.37	0.04	446,240.73	685,867.88
500.00	0.50	184.13	499.99	-3,088.01	-3.23	-0.71	-3.23	0.03	446,239.87	685,867.79
600.00	0.57	190.39	599.98	-2,988.02	-4.16	-0.83	-4.15	0.09	446,238.94	685,867.67
700.00	0.71	176.56	699.98	-2,888.02	-5.26	-0.88	-5.26	0.21	446,237.84	685,867.62
800.00	0.61	178.95	799.97	-2,788.03	-6.41	-0.83	-6.41	0.10	446,236.69	685,867.67
900.00	0.72	188.79	899.96	-2,688.04	-7.57	-0.92	-7.56	0.16	446,235.53	685,867.58
1,000.00	0.56	179.86	999.96	-2,588.04	-8.68	-1.01	-8.67	0.19	446,234.42	685,867.49
1,100.00	0.27	176.68	1,099.95	-2,488.05	-9.40	-1.00	-9.40	0.29	446,233.70	685,867.50
1,200.00	0.19	251.41	1,199.95	-2,388.05	-9.69	-1.14	-9.68	0.29	446,233.41	685,867.36
1,300.00	0.14	21.73	1,299.95	-2,288.05	-9.63	-1.25	-9.62	0.30	446,233.47	685,867.25
1,400.00	0.36	4.76	1,399.95	-2,188.05	-9.20	-1.18	-9.20	0.23	446,233.90	685,867.32
1,500.00	0.57	354.72	1,499.95	-2,088.05	-8.39	-1.20	-8.39	0.22	446,234.71	685,867.30
1,600.00	0.69	355.96	1,599.94	-1,988.06	-7.30	-1.29	-7.29	0.12	446,235.80	685,867.21
1,700.00	0.90	353.08	1,699.93	-1,888.07	-5.92	-1.43	-5.91	0.21	446,237.18	685,867.07
1,800.00	0.89	350.62	1,799.92	-1,788.08	-4.37	-1.65	-4.36	0.04	446,238.73	685,866.85
1,900.00	1.02	5.09	1,899.91	-1,688.09	-2.72	-1.70	-2.71	0.27	446,240.38	685,866.80
2,000.00	1.02	17.77	1,999.89	-1,588.11	-0.98	-1.35	-0.98	0.23	446,242.12	685,867.15



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Wellbore: OH
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MD Reference:
North Reference:
Survey Calculation Method:
Database:

Well #2H
WELL @ 3588.00usft (22' KB)
WELL @ 3588.00usft (22' KB)
Grd
Minimum Curvature
EDM 5000.1 Single User Db

Survey:

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	TVDSS (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	DLeg (°/100usft)	Northing (usft)	Easting (usft)
2,100.00	1.45	21.89	2,099.87	-1,488.13	1.04	-0.60	1.04	0.44	446,244.14	685,867.90
2,200.00	1.30	25.10	2,199.84	-1,388.16	3.24	0.35	3.24	0.17	446,246.34	685,868.85
2,300.00	1.24	26.65	2,299.82	-1,288.18	5.23	1.32	5.23	0.07	446,248.33	685,869.82
2,400.00	0.97	37.27	2,399.80	-1,188.20	6.87	2.31	6.86	0.34	446,249.97	685,870.81
2,500.00	0.91	43.15	2,499.78	-1,088.22	8.13	3.37	8.11	0.11	446,251.23	685,871.87
2,600.00	0.94	57.78	2,599.77	-988.23	9.14	4.61	9.12	0.24	446,252.24	685,873.11
2,700.00	1.17	65.55	2,699.75	-888.25	10.00	6.23	9.97	0.27	446,253.10	685,874.73
2,800.00	1.35	62.54	2,799.73	-788.27	10.97	8.21	10.93	0.19	446,254.07	685,876.71
2,900.00	1.59	57.14	2,899.70	-688.30	12.26	10.42	12.21	0.28	446,255.36	685,878.92
3,000.00	1.98	57.89	2,999.65	-588.35	13.94	13.04	13.87	0.39	446,257.04	685,881.54
3,100.00	1.72	52.47	3,099.60	-488.40	15.77	15.70	15.69	0.31	446,258.87	685,884.20
3,200.00	1.03	49.75	3,199.57	-388.43	17.26	17.57	17.17	0.69	446,260.36	685,886.07
3,300.00	0.60	30.76	3,299.56	-288.44	18.29	18.53	18.20	0.50	446,261.39	685,887.03
3,400.00	0.51	15.96	3,399.55	-188.45	19.17	18.92	19.08	0.17	446,262.27	685,887.42
3,500.00	0.55	0.16	3,499.55	-88.45	20.08	19.04	19.98	0.15	446,263.18	685,887.54
3,600.00	0.46	337.67	3,599.54	11.54	20.93	18.89	20.84	0.22	446,264.03	685,887.39
3,700.00	0.50	340.92	3,699.54	111.54	21.71	18.60	21.62	0.05	446,264.81	685,887.10
3,800.00	0.54	333.22	3,799.54	211.54	22.55	18.24	22.46	0.08	446,265.65	685,886.74
3,900.00	0.44	113.31	3,899.53	311.53	22.82	18.38	22.72	0.92	446,265.92	685,886.88
4,000.00	0.79	111.15	3,999.53	411.53	22.42	19.38	22.32	0.35	446,265.52	685,887.88
4,100.00	0.87	124.98	4,099.52	511.52	21.73	20.64	21.63	0.22	446,264.83	685,889.14
4,200.00	1.37	142.52	4,199.50	611.50	20.35	21.99	20.24	0.60	446,263.45	685,890.49
4,300.00	1.48	141.35	4,299.47	711.47	18.39	23.52	18.27	0.11	446,261.49	685,892.02
4,400.00	1.31	139.52	4,399.44	811.44	16.51	25.07	16.39	0.18	446,259.61	685,893.57
4,500.00	1.06	138.15	4,499.42	911.42	14.95	26.43	14.82	0.25	446,258.05	685,894.93
4,600.00	0.79	190.83	4,599.40	1,011.40	13.59	26.92	13.45	0.86	446,256.69	685,895.42
4,700.00	0.77	184.89	4,699.40	1,111.40	12.24	26.73	12.11	0.08	446,255.34	685,895.23



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Survey											
MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	TVDSS (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	DLeg (°/100usft)	Northing (usft)	Easting (usft)	
4,800.00	0.60	172.04	4,799.39	1,211.39	11.05	26.75	10.92	0.23	446,254.15	685,895.25	
4,900.00	0.56	172.99	4,899.38	1,311.38	10.05	26.88	9.91	0.04	446,253.15	685,895.38	
5,000.00	0.53	177.10	4,999.38	1,411.38	9.10	26.96	8.97	0.05	446,252.20	685,895.46	
5,100.00	0.06	185.15	5,099.38	1,511.38	8.59	26.98	8.45	0.47	446,251.69	685,895.48	
5,200.00	0.08	327.07	5,199.38	1,611.38	8.60	26.94	8.46	0.13	446,251.70	685,895.44	
5,300.00	0.20	22.07	5,299.38	1,711.38	8.82	26.97	8.68	0.17	446,251.92	685,895.47	
5,400.00	0.34	28.36	5,399.38	1,811.38	9.24	27.17	9.10	0.14	446,252.34	685,895.67	
5,500.00	0.42	16.22	5,499.37	1,911.37	9.85	27.42	9.71	0.11	446,252.95	685,895.92	
5,600.00	0.47	29.32	5,599.37	2,011.37	10.56	27.72	10.42	0.11	446,253.66	685,896.22	
5,700.00	0.58	27.27	5,699.37	2,111.37	11.37	28.15	11.23	0.11	446,254.47	685,896.65	
5,800.00	0.46	31.37	5,799.36	2,211.36	12.16	28.59	12.02	0.13	446,255.26	685,897.09	
5,900.00	0.61	25.44	5,899.36	2,311.36	12.98	29.03	12.84	0.16	446,256.08	685,897.53	
6,000.00	0.60	22.82	5,999.35	2,411.35	13.95	29.46	13.80	0.03	446,257.05	685,897.96	
6,100.00	0.67	26.21	6,099.35	2,511.35	14.96	29.93	14.80	0.08	446,258.06	685,898.43	
6,200.00	0.46	357.65	6,199.34	2,611.34	15.88	30.17	15.73	0.35	446,258.98	685,898.67	
6,300.00	0.33	339.64	6,299.34	2,711.34	16.55	30.05	16.40	0.18	446,259.65	685,898.55	
6,400.00	0.16	277.50	6,399.34	2,811.34	16.84	29.81	16.69	0.29	446,259.94	685,898.31	
6,500.00	0.01	338.19	6,499.34	2,911.34	16.87	29.67	16.72	0.16	446,259.97	685,898.17	
6,600.00	0.08	313.18	6,599.34	3,011.34	16.92	29.62	16.77	0.07	446,260.02	685,898.12	
6,700.00	0.07	276.98	6,699.34	3,111.34	16.98	29.50	16.83	0.05	446,260.08	685,898.00	
6,800.00	0.16	210.79	6,799.34	3,211.34	16.86	29.37	16.72	0.15	446,259.96	685,897.87	
6,900.00	0.24	219.76	6,899.34	3,311.34	16.58	29.17	16.44	0.09	446,259.68	685,897.67	
7,000.00	1.40	222.19	6,999.33	3,411.33	15.52	28.21	15.37	1.16	446,258.62	685,896.71	
7,100.00	1.39	221.15	7,099.30	3,511.30	13.70	26.59	13.56	0.03	446,256.80	685,895.09	
7,200.00	1.17	215.31	7,199.27	3,611.27	11.95	25.21	11.83	0.26	446,255.05	685,893.71	
7,300.00	0.59	175.06	7,299.26	3,711.26	10.61	24.66	10.48	0.81	446,253.71	685,893.16	
7,400.00	0.51	176.41	7,399.25	3,811.25	9.65	24.73	9.52	0.08	446,252.75	685,893.23	



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7,500.00	0.58	158.23	7,499.25	3,911.25	8.74	24.95	8.61	0.19	446,251.84	685,893.45
7,600.00	0.60	153.16	7,599.24	4,011.24	7.80	25.37	7.67	0.06	446,250.90	685,893.87
7,700.00	0.71	136.17	7,699.24	4,111.24	6.88	26.04	6.75	0.22	446,249.98	685,894.54
7,800.00	0.81	139.12	7,799.23	4,211.23	5.90	26.93	5.77	0.11	446,249.00	685,895.43
7,900.00	1.21	125.60	7,899.21	4,311.21	4.75	28.25	4.61	0.46	446,247.85	685,896.75
8,000.00	1.80	121.51	7,999.18	4,411.18	3.32	30.45	3.16	0.60	446,246.42	685,898.95
8,100.00	1.81	123.90	8,099.13	4,511.13	1.62	33.10	1.45	0.08	446,244.72	685,901.60
8,200.00	1.96	121.92	8,199.08	4,611.08	-0.17	35.86	-0.35	0.16	446,242.93	685,904.36
8,300.00	2.28	111.07	8,299.01	4,711.01	-1.79	39.17	-1.99	0.51	446,241.31	685,907.67
8,400.00	2.22	112.57	8,398.93	4,810.93	-3.25	42.81	-3.46	0.08	446,239.85	685,911.31
8,500.00	1.71	119.00	8,498.87	4,910.87	-4.71	45.91	-4.95	0.55	446,238.39	685,914.41
8,545.00	1.47	90.15	8,543.85	4,955.85	-5.04	47.07	-5.28	1.83	446,238.06	685,915.57
8,626.00	1.58	48.28	8,624.83	5,036.83	-4.30	48.94	-4.55	1.35	446,238.80	685,917.44
8,658.00	4.75	359.77	8,656.78	5,068.78	-2.68	49.27	-2.93	12.15	446,240.42	685,917.77
8,689.00	9.67	350.60	8,687.53	5,099.53	1.17	48.84	0.93	16.25	446,244.27	685,917.34
8,721.00	14.77	348.30	8,718.79	5,130.79	7.82	47.57	7.58	16.01	446,250.92	685,916.07
8,752.00	19.87	347.01	8,748.38	5,160.38	16.83	45.58	16.60	16.50	446,259.93	685,914.08
8,784.00	24.97	347.67	8,777.95	5,189.95	28.74	42.92	28.52	15.96	446,271.84	685,911.42
8,815.00	29.11	348.88	8,805.55	5,217.55	42.54	40.06	42.33	13.47	446,285.64	685,908.56
8,846.00	32.80	349.93	8,832.13	5,244.13	58.21	37.14	58.02	12.03	446,301.31	685,905.64
8,878.00	36.58	350.21	8,858.44	5,270.44	76.14	34.00	75.97	11.82	446,319.24	685,902.50
8,910.00	40.54	350.14	8,883.46	5,295.46	95.79	30.60	95.64	12.38	446,338.89	685,899.10
8,942.00	43.62	349.81	8,907.21	5,319.21	116.91	26.86	116.77	9.65	446,360.01	685,895.36
8,973.00	46.17	349.61	8,929.16	5,341.16	138.44	22.95	138.32	8.24	446,381.54	685,891.45
9,005.00	48.36	349.22	8,950.88	5,362.88	161.54	18.64	161.44	6.90	446,404.64	685,887.14
9,036.00	49.51	348.79	8,971.24	5,383.24	184.48	14.18	184.41	3.85	446,427.58	685,882.68
9,068.00	51.70	348.73	8,991.55	5,403.55	208.73	9.36	208.68	6.85	446,451.83	685,877.86



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9,100.00	54.34	349.15	9,010.80	5,422.80	233.82	4.45	233.80	8.32	446,476.92	685,872.95	
9,131.00	56.45	349.89	9,028.40	5,440.40	258.91	-0.18	258.91	7.08	446,502.01	685,868.32	
9,163.00	59.18	350.10	9,045.45	5,457.45	285.58	-4.89	285.60	8.55	446,528.68	685,863.61	
9,195.00	62.17	350.04	9,061.12	5,473.12	313.06	-9.70	313.10	9.35	446,556.16	685,858.80	
9,226.00	65.07	349.80	9,074.89	5,486.89	340.40	-14.56	340.47	9.38	446,583.50	685,853.94	
9,258.00	67.62	349.92	9,087.73	5,499.73	369.25	-19.72	369.34	7.98	446,612.35	685,848.78	
9,289.00	68.76	350.15	9,099.24	5,511.24	397.59	-24.70	397.71	3.74	446,640.69	685,843.80	
9,320.00	70.87	350.67	9,109.94	5,521.94	426.28	-29.55	426.43	6.99	446,669.38	685,838.95	
9,352.00	74.74	350.57	9,119.40	5,531.40	456.44	-34.53	456.61	12.10	446,699.54	685,833.97	
9,383.00	77.38	350.84	9,126.87	5,538.87	486.13	-39.39	486.32	8.56	446,729.23	685,829.11	
9,418.00	81.51	350.32	9,133.28	5,545.28	520.06	-45.02	520.28	11.89	446,763.16	685,823.48	
9,449.00	84.06	349.82	9,137.17	5,549.17	550.35	-50.32	550.60	8.38	446,793.45	685,818.18	
9,481.00	87.14	347.86	9,139.62	5,551.62	581.65	-56.50	581.93	11.40	446,824.75	685,812.00	
9,513.00	90.22	347.18	9,140.36	5,552.36	612.88	-63.41	613.20	9.86	446,855.98	685,805.09	
9,544.00	90.92	346.64	9,140.05	5,552.05	643.07	-70.43	643.42	2.85	446,886.17	685,798.07	
9,576.00	90.57	347.18	9,139.64	5,551.64	674.24	-77.68	674.63	2.01	446,917.34	685,790.82	
9,607.00	89.34	348.47	9,139.66	5,551.66	704.54	-84.21	704.96	5.75	446,947.64	685,784.29	
9,639.00	89.96	348.08	9,139.86	5,551.86	735.87	-90.72	736.32	2.29	446,978.97	685,777.78	
9,670.00	88.46	350.35	9,140.28	5,552.28	766.32	-96.52	766.80	8.78	447,009.42	685,771.98	
9,702.00	87.49	351.19	9,141.41	5,553.41	797.89	-101.65	798.39	4.01	447,040.99	685,766.85	
9,734.00	87.41	352.94	9,142.84	5,554.84	829.55	-106.06	830.07	5.47	447,072.65	685,762.44	
9,766.00	88.02	353.91	9,144.11	5,556.11	861.31	-109.72	861.85	3.58	447,104.41	685,758.78	
9,797.00	88.81	354.94	9,144.97	5,556.97	892.15	-112.73	892.71	4.19	447,135.25	685,755.77	
9,828.00	89.87	356.03	9,145.33	5,557.33	923.05	-115.17	923.62	4.90	447,166.15	685,753.33	
9,860.00	90.31	356.52	9,145.28	5,557.28	954.98	-117.25	955.57	2.06	447,198.08	685,751.25	
9,891.00	90.40	357.86	9,145.09	5,557.09	985.95	-118.77	986.53	4.33	447,229.05	685,749.73	
9,922.00	90.31	359.12	9,144.89	5,556.89	1,016.93	-119.59	1,017.53	4.07	447,260.03	685,748.91	



Pathfinder
Pathfinder X&Y Report

PATHFINDER
A Schlumberger Company

Company: Cog Operating LLC- Eastern NM
Project: Eddy County (NAD 27)
Site: Seabiscuit Federal Com
Well: #2H
Wellbore: OH
Design: OH

Local Co-ordinate Reference:
TVD Reference:
MD Reference:
North Reference:
Survey Calculation Method:
Database:
Well #2H
WELL @ 3588.00usft (22' KB)
WELL @ 3588.00usft (22' KB)
Grid
Minimum Curvature
EDM 5000.1 Single User Db

Survey

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	TVDSS (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	DLeg (°/100usft)	Northing (usft)	Easting (usft)
9,954.00	90.31	0.29	9,144.72	5,556.72	1,048.93	-119.75	1,049.52	3.66	447,292.03	685,748.75
9,985.00	89.96	0.23	9,144.65	5,556.65	1,079.93	-119.61	1,080.52	1.15	447,323.03	685,748.89
10,017.00	88.90	359.87	9,144.97	5,556.97	1,111.93	-119.58	1,112.52	3.50	447,355.03	685,748.92
10,048.00	89.08	0.77	9,145.51	5,557.51	1,142.92	-119.41	1,143.51	2.96	447,386.02	685,749.09
10,080.00	89.96	1.31	9,145.78	5,557.78	1,174.92	-118.83	1,175.50	3.23	447,418.02	685,749.67
10,112.00	90.75	1.84	9,145.58	5,557.58	1,206.90	-117.95	1,207.49	2.97	447,450.00	685,750.55
10,175.00	90.57	1.47	9,144.86	5,556.86	1,269.87	-116.13	1,270.44	0.65	447,512.97	685,752.37
10,238.00	90.22	1.17	9,144.42	5,556.42	1,332.86	-114.68	1,333.42	0.73	447,575.96	685,753.82
10,299.00	90.31	1.25	9,144.14	5,556.14	1,393.84	-113.39	1,394.40	0.20	447,636.94	685,755.11
10,362.00	90.57	2.23	9,143.66	5,555.66	1,456.81	-111.48	1,457.35	1.61	447,699.91	685,757.02
10,425.00	90.40	2.41	9,143.12	5,555.12	1,519.76	-108.93	1,520.29	0.39	447,762.86	685,759.57
10,488.00	89.16	1.06	9,143.37	5,555.37	1,582.72	-107.02	1,583.24	2.91	447,825.82	685,761.48
10,551.00	89.08	2.24	9,144.33	5,556.33	1,645.69	-105.21	1,646.20	1.88	447,888.79	685,763.29
10,614.00	89.34	2.23	9,145.20	5,557.20	1,708.63	-102.75	1,709.13	0.41	447,951.73	685,765.75
10,677.00	88.55	1.81	9,146.36	5,558.36	1,771.58	-100.53	1,772.07	1.42	448,014.68	685,767.97
10,741.00	87.67	1.81	9,148.47	5,560.47	1,835.52	-98.51	1,835.99	1.37	448,078.62	685,769.99
10,804.00	89.87	2.73	9,149.82	5,561.82	1,898.45	-96.01	1,898.91	3.78	448,141.55	685,772.49
10,867.00	90.92	2.45	9,149.39	5,561.39	1,961.38	-93.17	1,961.83	1.72	448,204.48	685,775.33
10,930.00	90.75	2.52	9,148.47	5,560.47	2,024.32	-90.44	2,024.75	0.29	448,267.42	685,778.06
10,993.00	89.87	2.46	9,148.13	5,560.13	2,087.25	-87.70	2,087.67	1.40	448,330.35	685,780.80
11,056.00	90.22	1.93	9,148.08	5,560.08	2,150.21	-85.29	2,150.61	1.01	448,393.31	685,783.21
11,120.00	90.57	2.25	9,147.64	5,559.64	2,214.16	-82.95	2,214.56	0.74	448,457.26	685,785.55
11,184.00	90.13	1.96	9,147.25	5,559.25	2,278.12	-80.60	2,278.50	0.82	448,521.22	685,787.90
11,247.00	88.81	2.16	9,147.83	5,559.83	2,341.07	-78.34	2,341.44	2.12	448,584.17	685,790.16
11,311.00	86.97	1.59	9,150.19	5,562.19	2,404.99	-76.24	2,405.35	3.01	448,648.09	685,792.26
11,374.00	86.97	1.24	9,153.52	5,565.52	2,467.89	-74.69	2,468.23	0.55	448,710.99	685,793.81
11,438.00	89.43	1.76	9,155.53	5,567.53	2,531.83	-73.02	2,532.16	3.93	448,774.93	685,795.48



Pathfinder
Pathfinder X&Y Report



Company: Cog Operating LLC- Eastern NM
Project: Eddy County (NAD 27)
Site: Seabiscuit Federal Com
Well: #2H
Wellbore: OH
Design: OH

Local Co-ordinate Reference
TVD Reference: Well #2H
MD Reference: WELL @ 3588.00usft (22' KB)
North Reference: WELL @ 3588.00usft (22' KB)
Survey Calculation Method: Grid
Database: Minimum Curvature
EDM 5000.1 Single User Db

Survey

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	TVDSS (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	DLeg (°/100usft)	Northing (usft)	Easting (usft)
11,501.00	89.43	1.89	9,156.16	5,568.16	2,594.79	-71.01	2,595.12	0.21	448,837.89	685,797.49
11,565.00	88.99	0.61	9,157.04	5,569.04	2,658.77	-69.61	2,659.09	2.11	448,901.87	685,798.89
11,628.00	89.78	0.94	9,157.71	5,569.71	2,721.76	-68.76	2,722.07	1.36	448,964.86	685,799.74
11,692.00	89.96	0.22	9,157.86	5,569.86	2,785.76	-68.11	2,786.06	1.16	449,028.86	685,800.39
11,755.00	89.96	359.52	9,157.90	5,569.90	2,848.76	-68.26	2,849.06	1.11	449,091.86	685,800.24
11,819.00	91.19	1.17	9,157.26	5,569.26	2,912.75	-67.87	2,913.05	3.22	449,155.85	685,800.63
11,882.00	92.42	2.48	9,155.28	5,567.28	2,975.68	-65.87	2,975.98	2.85	449,218.78	685,802.63
11,946.00	91.71	1.84	9,152.97	5,564.97	3,039.59	-63.46	3,039.88	1.49	449,282.69	685,805.04
12,010.00	88.55	0.98	9,152.83	5,564.83	3,103.57	-61.88	3,103.84	5.12	449,346.67	685,806.62
12,073.00	87.76	0.97	9,154.85	5,566.85	3,166.52	-60.81	3,166.79	1.25	449,409.62	685,807.69
12,135.00	88.29	0.18	9,156.99	5,568.99	3,228.48	-60.19	3,228.75	1.53	449,471.58	685,808.31
12,198.00	89.08	0.47	9,158.44	5,570.44	3,291.46	-59.83	3,291.73	1.34	449,534.56	685,808.67
12,262.00	88.72	1.03	9,159.67	5,571.67	3,355.45	-58.99	3,355.70	1.04	449,598.55	685,809.51
12,325.00	89.52	1.77	9,160.63	5,572.63	3,418.42	-57.45	3,418.67	1.73	449,661.52	685,811.05
12,389.00	90.40	1.98	9,160.68	5,572.68	3,482.38	-55.36	3,482.62	1.41	449,725.48	685,813.14
12,452.00	91.19	1.67	9,159.80	5,571.80	3,545.35	-53.35	3,545.57	1.35	449,788.45	685,815.15
12,516.00	91.36	1.05	9,158.38	5,570.38	3,609.31	-51.83	3,609.53	1.00	449,852.41	685,816.67
12,579.00	91.89	1.14	9,156.59	5,568.59	3,672.27	-50.63	3,672.48	0.85	449,915.37	685,817.87
12,643.00	91.80	1.29	9,154.53	5,566.53	3,736.23	-49.27	3,736.43	0.27	449,979.33	685,819.23
12,707.00	90.13	1.00	9,153.45	5,565.45	3,800.20	-48.00	3,800.40	2.65	450,043.30	685,820.50
12,770.00	89.60	0.78	9,153.60	5,565.60	3,863.19	-47.02	3,863.38	0.91	450,106.29	685,821.48
12,833.00	89.16	0.53	9,154.28	5,566.28	3,926.19	-46.30	3,926.37	0.80	450,169.29	685,822.20
12,897.00	89.87	0.79	9,154.83	5,566.83	3,990.18	-45.56	3,990.36	1.18	450,233.28	685,822.94
12,960.00	90.13	0.79	9,154.83	5,566.83	4,053.17	-44.69	4,053.35	0.41	450,296.27	685,823.81
13,023.00	89.96	359.96	9,154.78	5,566.78	4,116.17	-44.28	4,116.34	1.34	450,359.27	685,824.22
13,087.00	89.43	0.70	9,155.12	5,567.12	4,180.17	-43.91	4,180.34	1.42	450,423.27	685,824.59
13,150.00	90.13	0.66	9,155.36	5,567.36	4,243.16	-43.16	4,243.33	1.11	450,486.26	685,825.34



Pathfinder
Pathfinder X&Y Report

PATHFINDER
A Schlumberger Company

Company: Cog Operating LLC- Eastern NM
Project: Eddy County (NAD 27)
Site: Seabiscuit Federal Com
Well: #2H
Wellbore: OH
Design: OH

Local Co-ordinate Reference: Well #2H
TVD Reference: WELL @ 3588.00usft (22' KB)
MD Reference: WELL @ 3588.00usft (22' KB)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: EDM 5000.1 Single User Db

Survey:

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	TVDSS (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	DLeg (°/100usft)	Northing (usft)	Easting (usft)
13,213.00	90.13	1.41	9,155.22	5,567.22	4,306.15	-42.03	4,306.31	1.19	450,549.25	685,826.47
13,276.00	90.31	2.08	9,154.97	5,566.97	4,369.12	-40.11	4,369.27	1.10	450,612.22	685,828.39
13,339.00	90.22	1.69	9,154.68	5,566.68	4,432.09	-38.03	4,432.22	0.64	450,675.19	685,830.47
13,403.00	90.04	1.58	9,154.54	5,566.54	4,496.06	-36.21	4,496.19	0.33	450,739.16	685,832.29
13,446.00	90.22	1.56	9,154.44	5,566.44	4,539.05	-35.03	4,539.16	0.42	450,782.15	685,833.47
13,500.00	90.22	1.56	9,154.23	5,566.23	4,593.03	-33.56	4,593.14	0.00	450,836.13	685,834.94
PBHL(SB#2)										

Checked By: _____ Approved By: _____ Date: _____