

30-015-36882



EOG Resources, Inc.

Eddy County
Sand Tank 7 Fed Com #4H
Sand Tank #4
OH

Survey: MWD

Pathfinder X & Y Survey Report

13 February, 2009

PATHFINDER
ENERGY SERVICES



Project: Eddy County
 Site: Sand Tank 7 Fed Com #4H
 Well: Sand Tank #4
 Wellbore: OH
 Plan: Plan #1 (Sand Tank #4/OH)



Azimuths to Grid North
 True North -0.17°
 Magnetic North -7.93°
 Magnetic Field
 Strength: 49160 7anT
 Dip Angle: 60.69°
 Date: 01/19/2009
 Model: IGRF200510



PROJECT DETAILS Eddy County
 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
 Local North Grid

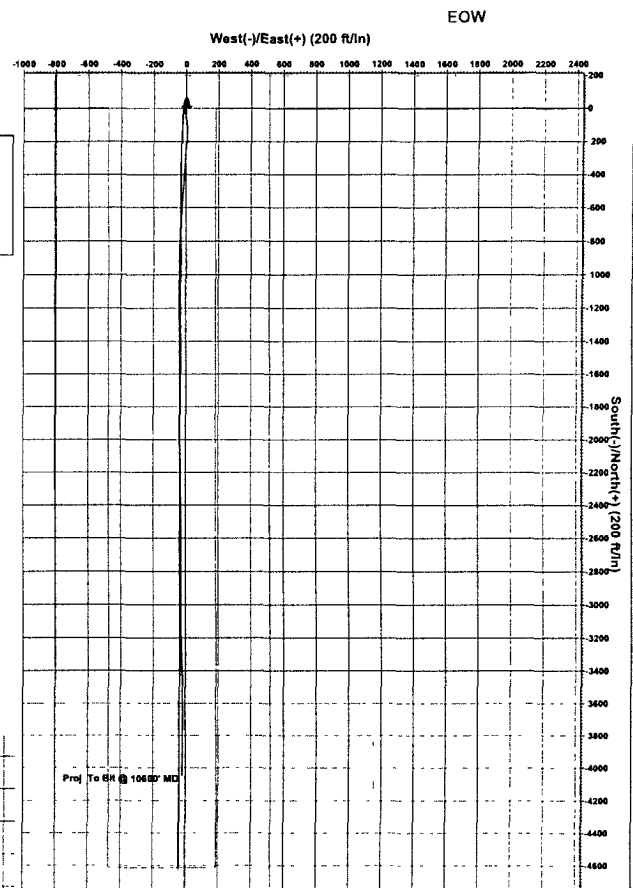
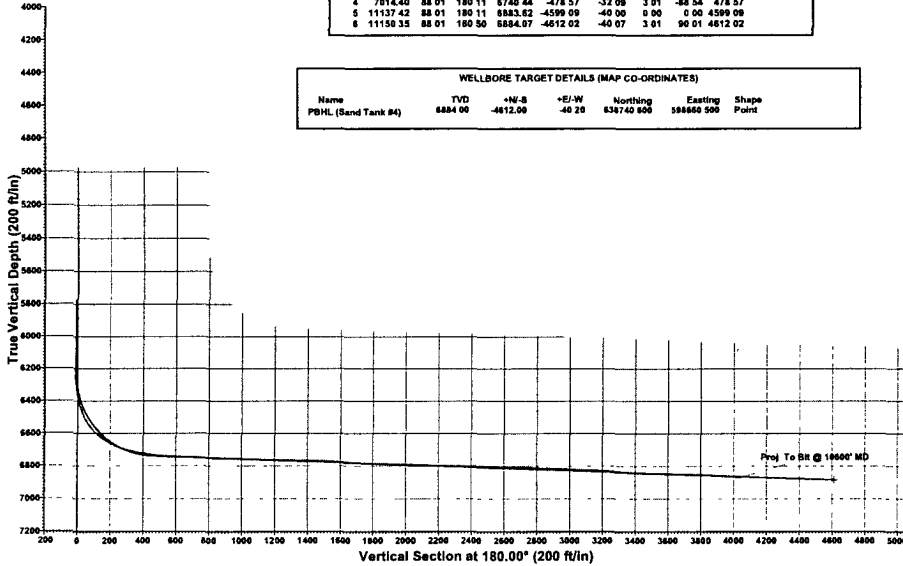
WELL DETAILS Sand Tank #4						
Ground Elevation	3531.30					
RKB Elevation	WELL @ 3536.30ft (Original Well Elev)					
Rig Name	Original Well Elev					
+N-S	+E-W	Northing	Easting	Latitude	Longitude	Slot
8.00	0.00	843352.606	568790.700	32° 48' 5.728 N	104° 0' 44.639 W	

LEGEND

- Sand Tank #4, OH, MWD
- Plan #1

SECTION DETAILS										
Sec	MD	Inc	Azi	TVD	+N-S	+E-W	DLeg	TFace	VSec	Target
1	5773.00	1.20	256.86	5772.27	5.24	-8.54	0.00	0.00	-5.24	
2	6258.00	1.20	256.86	6257.18	2.93	-19.43	0.00	0.00	-2.93	
3	7001.46	88.00	180.50	6739.99	-485.64	-32.02	11.80	-76.40	485.64	
4	7614.40	88.01	180.11	6740.44	-478.57	-32.09	3.01	-86.54	478.57	
5	11137.42	88.01	180.11	6843.62	-4599.09	-40.00	0.00	0.00	4599.09	
6	11150.35	88.01	180.50	6884.07	-4612.02	-40.07	3.01	90.01	4612.02	

WELLBORE TARGET DETAILS (MAP CO-ORDINATES)						
Name	TVD	+N-S	+E-W	Northing	Easting	Shape
PBHL (Sand Tank #4)	6884.00	-4612.00	-40.00	638740.606	588666.500	Point



Plan Plan #1 (Sand Tank #4/OH)

Created By: Kasey Bingham Date: 7 Feb, February 13 2008

Checked: _____ Date: _____



Pathfinder X & Y Survey Report



Company: EOG Resources, Inc.
Project: Eddy County
Site: Sand Tank 7 Fed Com #4H
Well: Sand Tank #4
Wellbore: OH
Design: OH

Local Co-ordinate Reference: Well Sand Tank #4
TVD Reference: WELL @ 3550.30ft (Original Well Elev)
MD Reference: WELL @ 3550.30ft (Original Well Elev)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: Midland Database

Project: Eddy County

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: Sand Tank 7 Fed Com #4H

Site Position:	Map	Northing:	643,352.600 ft	Latitude:	32° 46' 5.726 N
From:		Easting:	598,700.700 ft	Longitude:	104° 0' 44.039 W
Position Uncertainty:	0.00 ft	Slot Radius:	"	Grid Convergence:	0.17 °

Well: Sand Tank #4

Well Position	+N/-S	0.00 ft	Northing:	643,352.600 ft	Latitude:	32° 46' 5.726 N
	+E/-W	0.00 ft	Easting:	598,700.700 ft	Longitude:	104° 0' 44.039 W
Position Uncertainty		0.00 ft	Wellhead Elevation:	ft	Ground Level:	3,531.30 ft

Wellbore: OH

Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF200510	01/19/2009	8.11	60.69	49,161

Design: OH

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	180.00



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Survey Program		Date 02/13/2009		
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description
100.00	2,808.00	GYRO (OH)	Gyro	Gyro
3,003.00	5,170.00	Single Shot (OH)	MWD	MWD - Standard
6,072.00	10,600.00	MWD (OH)	MWD	MWD - Standard

MD (ft)	Inc (")	Azi (")	TVD (ft)	TVDSS (ft)	N/S (ft)	E/W (ft)	V. Sec (ft)	DLeg ("/100ft)	North (ft)	East (ft)
5,773.00	1.20	256.86	5,772.27	2,221.97	5.24	-8.54	-5.24	0.00	643,357.84	598,692.16
6,072.00	1.49	324.69	6,071.21	2,520.91	7.70	-13.83	-7.70	0.51	643,360.30	598,686.87
6,132.00	1.67	321.44	6,131.18	2,580.88	9.02	-14.83	-9.02	0.34	643,361.62	598,685.87
6,198.00	2.02	323.02	6,197.15	2,646.85	10.71	-16.13	-10.71	0.54	643,363.31	598,684.57
6,230.00	1.76	321.52	6,229.13	2,678.83	11.54	-16.77	-11.54	0.83	643,364.14	598,683.93
6,261.00	1.32	214.21	6,260.13	2,709.83	11.62	-17.27	-11.62	8.05	643,364.22	598,683.43
6,292.00	4.04	170.44	6,291.09	2,740.79	10.25	-17.29	-10.25	10.38	643,362.85	598,683.41
6,324.00	7.30	165.69	6,322.93	2,772.63	7.16	-16.60	-7.16	10.28	643,359.76	598,684.10
6,355.00	10.11	162.88	6,353.57	2,803.27	2.65	-15.31	-2.65	9.17	643,355.25	598,685.39
6,386.00	12.93	162.00	6,383.94	2,833.64	-3.25	-13.44	3.25	9.11	643,349.35	598,687.26
6,418.00	15.21	163.15	6,414.98	2,864.68	-10.67	-11.11	10.67	7.18	643,341.93	598,689.59
6,449.00	17.50	167.22	6,444.73	2,894.43	-19.11	-8.90	19.11	8.26	643,333.49	598,691.80
6,481.00	22.16	166.39	6,474.82	2,924.52	-29.67	-6.42	29.67	14.59	643,322.93	598,694.28
6,512.00	26.82	168.18	6,503.02	2,952.72	-42.21	-3.61	42.21	15.22	643,310.39	598,697.09
6,543.00	32.18	170.20	6,530.00	2,979.70	-57.20	-0.77	57.20	17.58	643,295.40	598,699.93
6,575.00	36.93	174.11	6,556.35	3,006.05	-75.17	1.67	75.17	16.38	643,277.43	598,702.37
6,606.00	41.50	177.05	6,580.36	3,030.06	-94.70	3.16	94.70	15.91	643,257.90	598,703.86
6,637.00	47.66	178.78	6,602.43	3,052.13	-116.44	3.93	116.44	20.25	643,236.16	598,704.63
6,669.00	53.64	179.20	6,622.71	3,072.41	-141.17	4.36	141.17	18.71	643,211.43	598,705.06
6,700.00	57.33	180.50	6,640.27	3,089.97	-166.70	4.42	166.70	12.39	643,185.90	598,705.12



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Survey Calculation Method: Minimum Curvature
Database: Midland Database

Survey												
MD (ft)	Inc (°)	Azi (°)	TVD (ft)	TVDSS (ft)	N/S (ft)	E/W (ft)	V. Sec (ft)	DLeg (°/100ft)	Northing (ft)	Easting (ft)		
6,731.00	60.67	182.30	6,656.24	3,105.94	-193.26	3.77	193.26	11.87	643,159.34	598,704.47		
6,763.00	64.19	183.33	6,671.05	3,120.75	-221.59	2.37	221.59	11.36	643,131.01	598,703.07		
6,794.00	68.32	183.70	6,683.53	3,133.23	-249.90	0.63	249.90	13.37	643,102.70	598,701.33		
6,825.00	72.19	183.00	6,694.00	3,143.70	-279.03	-1.08	279.03	12.66	643,073.57	598,699.62		
6,856.00	76.24	184.32	6,702.43	3,152.13	-308.79	-2.98	308.79	13.69	643,043.81	598,697.72		
6,887.00	78.08	184.28	6,709.32	3,159.02	-338.93	-5.25	338.93	5.94	643,013.67	598,695.45		
6,919.00	77.91	184.24	6,715.97	3,165.67	-370.14	-7.57	370.14	0.55	642,982.46	598,693.13		
6,950.00	79.49	184.22	6,722.05	3,171.75	-400.46	-9.82	400.46	5.10	642,952.14	598,690.88		
6,982.00	81.43	184.15	6,727.35	3,177.05	-431.93	-12.12	431.93	6.07	642,920.67	598,688.58		
7,013.00	82.31	184.45	6,731.74	3,181.44	-462.53	-14.42	462.53	3.00	642,890.07	598,686.28		
7,044.00	84.06	184.62	6,735.41	3,185.11	-493.21	-16.85	493.21	5.67	642,859.39	598,683.85		
7,076.00	86.44	184.45	6,738.06	3,187.76	-525.00	-19.37	525.00	7.46	642,827.60	598,681.33		
7,107.00	87.58	184.86	6,739.68	3,189.38	-555.86	-21.89	555.86	3.91	642,796.74	598,678.81		
7,137.00	87.32	184.73	6,741.02	3,190.72	-585.72	-24.39	585.72	0.97	642,766.88	598,676.31		
7,168.00	87.58	184.50	6,742.40	3,192.10	-616.59	-26.88	616.59	1.12	642,736.01	598,673.82		
7,199.00	87.41	184.18	6,743.75	3,193.45	-647.47	-29.23	647.47	1.17	642,705.13	598,671.47		
7,231.00	88.46	183.98	6,744.90	3,194.60	-679.37	-31.50	679.37	3.34	642,673.23	598,669.20		
7,293.00	88.46	183.95	6,746.57	3,196.27	-741.20	-35.79	741.20	0.05	642,611.40	598,664.91		
7,356.00	88.02	182.88	6,748.50	3,198.20	-804.06	-39.54	804.06	1.84	642,548.54	598,661.16		
7,419.00	87.49	180.96	6,750.97	3,200.67	-866.97	-41.65	866.97	3.16	642,485.63	598,659.05		
7,481.00	87.76	180.13	6,753.54	3,203.24	-928.91	-42.24	928.91	1.41	642,423.69	598,658.46		
7,544.00	87.93	179.65	6,755.91	3,205.61	-991.87	-42.12	991.87	0.81	642,360.73	598,658.58		
7,607.00	87.85	179.57	6,758.23	3,207.93	-1,054.82	-41.69	1,054.82	0.18	642,297.78	598,659.01		
7,670.00	88.29	179.63	6,760.35	3,210.05	-1,117.79	-41.25	1,117.79	0.70	642,234.81	598,659.45		
7,732.00	88.37	179.28	6,762.16	3,211.86	-1,179.76	-40.66	1,179.76	0.58	642,172.84	598,660.04		
7,795.00	89.08	179.41	6,763.56	3,213.26	-1,242.74	-39.94	1,242.74	1.15	642,109.86	598,660.76		
7,858.00	89.78	179.92	6,764.19	3,213.89	-1,305.73	-39.57	1,305.73	1.37	642,046.87	598,661.13		



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Wellbore: OH
Design: OH

Local Co-ordinate Reference: Well Sand Tank #4
TVD Reference: WELL @ 3550.30ft (Original Well Elev)
MD Reference: WELL @ 3550 30ft (Original Well Elev)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: Midland Database

MD (ft)	Inc. (°)	Azi (°)	TVD (ft)	TVDSS (ft)	N/S (ft)	EW (ft)	V. Sec (ft)	DLeg (°/100ft)	Northing (ft)	Easting (ft)
7,920.00	88.46	179.90	6,765.14	3,214.84	-1,367.72	-39.47	1,367.72	2.13	641,984.88	598,661.23
7,983.00	88.11	179.93	6,767.03	3,216.73	-1,430.70	-39.38	1,430.70	0.56	641,921.90	598,661.32
8,046.00	88.29	179.91	6,769.00	3,218.70	-1,493.66	-39.29	1,493.66	0.29	641,858.94	598,661.41
8,109.00	86.53	179.95	6,771.85	3,221.55	-1,556.60	-39.22	1,556.60	2.79	641,796.00	598,661.48
8,171.00	86.17	179.40	6,775.80	3,225.50	-1,618.47	-38.86	1,618.47	1.06	641,734.13	598,661.84
8,234.00	86.44	179.19	6,779.86	3,229.56	-1,681.33	-38.09	1,681.33	0.54	641,671.27	598,662.61
8,297.00	87.14	178.73	6,783.39	3,233.09	-1,744.23	-36.95	1,744.23	1.33	641,608.37	598,663.75
8,359.00	87.85	180.25	6,786.10	3,235.80	-1,806.16	-36.40	1,806.16	2.70	641,546.44	598,664.30
8,423.00	89.34	180.79	6,787.66	3,237.36	-1,870.14	-36.98	1,870.14	2.48	641,482.46	598,663.72
8,485.00	88.81	180.21	6,788.67	3,238.37	-1,932.13	-37.52	1,932.13	1.27	641,420.47	598,663.18
8,548.00	88.02	179.07	6,790.41	3,240.11	-1,995.10	-37.12	1,995.10	2.20	641,357.50	598,663.58
8,611.00	88.20	178.07	6,792.49	3,242.19	-2,058.04	-35.55	2,058.04	1.61	641,294.56	598,665.15
8,673.00	88.11	178.80	6,794.48	3,244.18	-2,119.99	-33.86	2,119.99	1.19	641,232.61	598,666.84
8,736.00	87.76	179.61	6,796.75	3,246.45	-2,182.94	-32.99	2,182.94	1.40	641,169.66	598,667.71
8,799.00	88.90	179.17	6,798.59	3,248.29	-2,245.91	-32.32	2,245.91	1.94	641,106.69	598,668.38
8,862.00	89.60	178.75	6,799.41	3,249.11	-2,308.89	-31.17	2,308.89	1.30	641,043.71	598,669.53
8,925.00	89.34	179.23	6,800.00	3,249.70	-2,371.88	-30.06	2,371.88	0.87	640,980.72	598,670.64
8,987.00	89.25	179.23	6,800.76	3,250.46	-2,433.87	-29.23	2,433.87	0.15	640,918.73	598,671.47
9,050.00	88.55	179.88	6,801.97	3,251.67	-2,496.86	-28.74	2,496.86	1.52	640,855.74	598,671.96
9,113.00	88.99	179.80	6,803.32	3,253.02	-2,559.84	-28.56	2,559.84	0.71	640,792.76	598,672.14
9,175.00	88.29	180.23	6,804.79	3,254.49	-2,621.82	-28.58	2,621.82	1.32	640,730.78	598,672.12
9,238.00	87.58	180.85	6,807.06	3,256.76	-2,684.78	-29.17	2,684.78	1.50	640,667.82	598,671.53
9,301.00	87.05	180.22	6,810.01	3,259.71	-2,747.71	-29.76	2,747.71	1.31	640,604.89	598,670.94
9,364.00	87.49	180.12	6,813.01	3,262.71	-2,810.63	-29.95	2,810.63	0.72	640,541.97	598,670.75
9,427.00	88.76	179.89	6,815.08	3,264.78	-2,873.60	-29.95	2,873.60	2.05	640,479.00	598,670.75
9,490.00	87.85	180.17	6,816.94	3,266.64	-2,936.57	-29.99	2,936.57	1.51	640,416.03	598,670.71
9,552.00	86.97	179.50	6,819.74	3,269.44	-2,998.51	-29.81	2,998.51	1.78	640,354.09	598,670.89



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9,615.00	87.49	180.19	6,822.79	3,272.49	-3,061.43	-29.64	3,061.43	1.37	640,291.17	598,671.06	
9,678.00	87.93	179.74	6,825.30	3,275.00	-3,124.38	-29.60	3,124.38	1.00	640,228.22	598,671.10	
9,740.00	87.14	178.80	6,827.97	3,277.67	-3,186.32	-28.81	3,186.32	1.98	640,166.28	598,671.89	
9,803.00	86.17	178.56	6,831.64	3,281.34	-3,249.19	-27.36	3,249.19	1.59	640,103.41	598,673.34	
9,866.00	85.30	177.89	6,836.33	3,286.03	-3,311.99	-25.42	3,311.99	1.74	640,040.61	598,675.28	
9,927.00	86.35	177.58	6,840.77	3,290.47	-3,372.78	-23.01	3,372.78	1.79	639,979.82	598,677.69	
9,988.00	87.49	177.47	6,844.05	3,293.75	-3,433.63	-20.38	3,433.63	1.88	639,918.97	598,680.32	
10,051.00	88.72	177.98	6,846.13	3,295.83	-3,496.55	-17.88	3,496.55	2.11	639,856.05	598,682.82	
10,113.00	89.25	179.06	6,847.23	3,296.93	-3,558.51	-16.28	3,558.51	1.94	639,794.09	598,684.42	
10,176.00	88.55	180.03	6,848.44	3,298.14	-3,621.50	-15.78	3,621.50	1.90	639,731.10	598,684.92	
10,239.00	89.25	180.41	6,849.65	3,299.35	-3,684.49	-16.02	3,684.49	1.26	639,668.11	598,684.68	
10,302.00	89.16	180.52	6,850.52	3,300.22	-3,747.48	-16.53	3,747.48	0.23	639,605.12	598,684.17	
10,364.00	86.97	180.71	6,852.62	3,302.32	-3,809.44	-17.20	3,809.44	3.55	639,543.16	598,683.50	
10,427.00	86.26	180.59	6,856.34	3,306.04	-3,872.32	-17.91	3,872.32	1.14	639,480.28	598,682.79	
10,521.00	85.82	180.78	6,862.83	3,312.53	-3,966.09	-19.03	3,966.09	0.51	639,386.51	598,681.67	
10,551.00	86.09	180.62	6,864.94	3,314.64	-3,996.01	-19.40	3,996.01	1.05	639,356.59	598,681.30	
10,600.00	86.09	180.62	6,868.29	3,317.99	-4,044.90	-19.93	4,044.90	0.00	639,307.70	598,680.77	
Proj. To Bit @ 10600' MD											



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Database: Midland Database

Targets:

Target Name	Dip Angle	Dip Dir.	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
- hit/miss target	(°)	(°)	(ft)	(ft)	(ft)	(ft)	(ft)		
- Shape									
PBHL (Sand Tank #4)	0.00	0.00	6,884.00	-4,612.00	-40.20	638,740.600	598,660.500	32° 45' 20.090 N	104° 0' 44.674 W
- survey misses by 567.68ft at 10600.00ft MD (6868.29 TVD, -4044.90 N, -19.93 E)									
- Point									

Survey Annotations

Measured Depth	Vertical Depth	Local Coordinates		Comment
(ft)	(ft)	+N/-S	+E/-W	
10,600.00	6,868.29	-4,044.90	-19.93	Proj To Bit @ 10600' MD

Checked By: _____ Approved By: _____ Date: _____