

PathFinder

Survey Report

Company: EOG Resources	Date: 10/25/2005	Time: 16:12:04	Page: 1
Field: Thames Field	Co-ordinate(NE) Reference:	Site: Rio Grande 23 Federal #1	
Site: Rio Grande 23 Federal #1	Vertical (TVD) Reference:	SITE: 0.0	
Well: Sec. 23 T16-S R24-E	Section (VS) Reference:	Well: (0.00N,0.00E,0.16Azi)	
Wellpath: Original Hole	Survey Calculation Method:	Minimum Curvature	Db: Sybase

Field: Thames Field	Map System: US State Plane Coordinate System 1927	Map Zone: New Mexico, Eastern Zone
Eddy, Co. NM	Geo Datum: NAD27 (Clarke 1866)	Coordinate System: Site Centre
USA	Sys Datum: Mean Sea Level	Geomagnetic Model: igrf2005

Site: Rio Grande 23 Federal #1

Section 23, T16-S, R24-E

Site Position:	Northing: 692274.00 ft	Latitude: 32 54 10.611 N
From: Map	Easting: 432662.00 ft	Longitude: 104 33 9.840 W
Position Uncertainty: 0.00 ft		North Reference: Grid
Ground Level: 3623.00 ft		Grid Convergence: -0.12 deg

Well: Sec. 23 T16-S R24-E	Slot Name:
Well Position: +N/-S 0.00 ft	Latitude: 32 54 10.611 N
+E/-W 0.00 ft	Longitude: 104 33 9.840 W
Position Uncertainty: 0.00 ft	

Wellpath: Original Hole	Drilled From: Surface
Current Datum: SITE	Tie-on Depth: 0.00 ft
Magnetic Data: 9/21/2005	Above System Datum: Mean Sea Level
Field Strength: 49524 nT	Declination: 8.76 deg
Vertical Section: Depth From (TVD)	Mag Dip Angle: 60.78 deg
ft	+N/-S
	ft
0.00	0.00
	+E/-W
	ft
	0.00
	Direction
	deg
	0.16

Survey: PathFinder MWD Surveys	Start Date: 9/26/2005
Company: PathFinder Energy Services	Engineer: Ron McIntyre
Tool:	Tied-to: From: Definitive Path

Survey: PathFinder MWD Surveys

MD ft	Incl deg	Azim deg	TVD ft	+N/-S ft	+E/-W ft	VS ft	DLS deg/100ft	Bulld deg/100ft	Turn deg/100ft	Tool/Comment
4200.00	1.77	130.25	4199.59	-34.75	24.39	-34.68	0.00	0.00	0.00	Tie-In to SDI Gyro Begin PathFinder MWD Sur
4248.00	1.58	105.17	4247.57	-35.40	25.59	-35.33	1.56	-0.40	-52.25	
4280.00	2.02	41.98	4279.56	-35.09	26.40	-35.02	6.01	1.37	-197.47	
4312.00	4.84	11.13	4311.50	-33.35	27.03	-33.27	10.23	8.81	-96.41	
4344.00	8.71	1.73	4343.27	-29.60	27.37	-29.52	12.54	12.09	-29.37	
4375.00	12.31	359.00	4373.75	-23.95	27.38	-23.87	11.72	11.61	-8.81	Tie-In for ST1
4407.00	16.27	359.53	4404.75	-16.05	27.29	-15.98	12.38	12.37	1.66	
4439.00	20.14	359.70	4435.14	-6.06	27.22	-5.98	12.09	12.09	0.53	
4470.00	24.36	359.70	4463.83	5.68	27.16	5.75	13.61	13.61	0.00	
4502.00	28.75	359.44	4492.44	19.98	27.05	20.06	13.72	13.72	-0.81	
4533.00	33.41	359.18	4518.99	35.98	26.85	36.05	15.04	15.03	-0.84	
4565.00	37.81	359.00	4545.00	54.60	26.56	54.68	13.75	13.75	-0.56	
4596.00	41.86	358.91	4568.80	74.45	26.19	74.53	13.07	13.06	-0.29	
4628.00	45.90	359.18	4591.86	96.63	25.83	96.70	12.64	12.62	0.84	
4660.00	50.21	359.09	4613.24	120.42	25.47	120.49	13.47	13.47	-0.28	
4692.00	54.52	358.65	4632.78	145.75	24.96	145.82	13.51	13.47	-1.37	
4723.00	57.86	357.51	4650.02	171.49	24.10	171.55	11.20	10.77	-3.68	
4755.00	61.03	356.89	4666.29	199.01	22.75	199.07	10.05	9.91	-1.94	
4787.00	64.46	357.44	4680.94	227.42	21.34	227.47	10.83	10.72	1.72	
4819.00	68.24	358.23	4693.78	256.70	20.24	256.76	12.03	11.81	2.47	
4851.00	72.02	358.30	4704.65	286.78	19.33	286.83	11.81	11.81	0.22	
4883.00	75.97	358.74	4713.47	317.52	18.53	317.57	12.41	12.34	1.37	

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Site: Rio Grande 23 Federal #1	Vertical (TVD) Reference:	SITE 0.0	
Well: Sec. 23 T16-S R24-E	Section (VS) Reference:	Well (0.00N,0.00E,0.16Azi)	
Wellpath: Orginal Hole	Survey Calculation Method:	Minimum Curvature	Db: Sybase

Annotation

MD ft	TVD ft	
4200.00	4199.59	Tie-In to SDI Gyro
4248.00	4247.57	Begin PathFinder MWD Surveys
4692.00	4632.78	Tie-In for ST1

PathFinder

Survey Report

Company: EOG Resources	Date: 10/25/2005	Time: 16:14:03	Page: 1
Field: Thames Field	Co-ordinate(NE) Reference:	Site: Rio Grande 23 Federal #1	
Site: Rio Grande 23 Federal #1	Vertical (TVD) Reference:	SITE 0.0	
Well: Sec. 23 T16-S R24-E	Section (VS) Reference:	Well (0.00N,0.00E,0.16Azi)	
Wellpath: Original Hole	Survey Calculation Method:	Minimum Curvature	Db: Sybase

Field: Thames Field	Map System: US State Plane Coordinate System 1927	Map Zone: New Mexico, Eastern Zone
Eddy, Co. NM	Geo Datum: NAD27 (Clarke 1866)	Coordinate System: Site Centre
USA	Sys Datum: Mean Sea Level	Geomagnetic Model: igrf2005

Site: Rio Grande 23 Federal #1

Section 23, T16-S, R24-E

Site Position:	Northing: 692274.00 ft	Latitude: 32 54 10.611 N
From: Map	Easting: 432662.00 ft	Longitude: 104 33 9.840 W
Position Uncertainty: 0.00 ft		North Reference: Grid
Ground Level: 3623.00 ft		Grid Convergence: -0.12 deg

Well: Sec. 23 T16-S R24-E	Slot Name:
Well Position: +N/-S 0.00 ft	Latitude: 32 54 10.611 N
+E/-W 0.00 ft	Longitude: 104 33 9.840 W
Position Uncertainty: 0.00 ft	

Wellpath: Original Hole	Drilled From: Surface
Current Datum: SITE	Tie-on Depth: 0.00 ft
Magnetic Data: 9/21/2005	Above System Datum: Mean Sea Level
Field Strength: 49524 nT	Declination: 8.76 deg
Vertical Section: Depth From (TVD)	Mag Dip Angle: 60.78 deg
ft	+E/-W
	ft
	Direction
	deg
0.00	0.00
0.00	0.00
	0.16

Survey: PathFinder ST Surveys	Start Date: 9/29/2005
Company: PathFinder Energy Services	Engineer: Ron McIntyre
Tool:	Tied-to: From: Definitive Path

Survey: PathFinder ST Surveys

MD ft	Incl deg	Azim deg	TVD ft	+N/-S ft	+E/-W ft	VS ft	DLS deg/100ft	Build deg/100ft	Turn deg/100ft	Tool/Comment
4200.00	1.77	130.25	4199.59	-34.75	24.39	-34.68	0.00	0.00	0.00	Tie-In to SDI Gyro
4248.00	1.58	105.17	4247.57	-35.40	25.59	-35.33	1.56	-0.40	-52.25	Begin PathFinder MWD Sur
4692.00	54.52	358.65	4632.78	145.75	24.96	145.82	12.38	11.92	-23.99	Tie-In for ST1
4718.00	53.29	353.29	4648.10	166.69	23.50	166.76	17.31	-4.73	-20.62	
4761.00	59.53	349.24	4671.89	202.06	18.01	202.11	16.49	14.51	-9.42	
4793.00	65.16	350.50	4686.73	229.95	13.04	229.99	17.94	17.59	3.94	
4825.00	70.08	351.88	4698.91	259.19	8.52	259.21	15.88	15.37	4.31	
4856.00	75.18	352.67	4708.17	288.49	4.54	288.51	16.63	16.45	2.55	
4888.00	78.70	354.87	4715.40	319.48	1.16	319.48	12.88	11.00	6.87	
4920.00	81.87	357.95	4720.80	350.95	-0.81	350.94	13.72	9.91	9.62	
4952.00	84.42	0.41	4724.62	382.71	-1.26	382.70	11.03	7.97	7.69	
4984.00	86.53	0.41	4727.14	414.61	-1.03	414.60	6.59	6.59	0.00	
5015.00	86.97	0.58	4728.90	445.56	-0.76	445.55	1.52	1.42	0.55	
5047.00	88.81	0.14	4730.08	477.53	-0.56	477.53	5.91	5.75	-1.37	
5079.00	90.66	0.41	4730.22	509.53	-0.41	509.53	5.84	5.78	0.84	
5111.00	92.59	1.81	4729.32	541.51	0.21	541.51	7.45	6.03	4.37	
5143.00	92.77	2.08	4727.82	573.46	1.30	573.46	1.01	0.56	0.84	
5174.00	92.07	1.64	4726.51	604.41	2.30	604.42	2.67	-2.26	-1.42	
5206.00	92.33	1.20	4725.28	636.38	3.09	636.38	1.60	0.81	-1.37	
5238.00	91.19	1.11	4724.30	668.36	3.74	668.36	3.57	-3.56	-0.28	
5270.00	91.01	0.58	4723.69	700.35	4.21	700.36	1.75	-0.56	-1.66	
5302.00	91.19	0.85	4723.07	732.34	4.61	732.35	1.01	0.56	0.84	
5334.00	90.84	0.41	4722.51	764.33	4.96	764.34	1.76	-1.09	-1.37	
5365.00	89.60	359.35	4722.39	795.33	4.90	795.34	5.26	-4.00	-3.42	

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Site: Rio Grande 23 Federal #1	Vertical (TVD) Reference:	SITE 0.0	
Well: Sec. 23 T16-S R24-E	Section (VS) Reference:	Well (0.00N,0.00E,0.16Azi)	
Wellpath: Original Hole	Survey Calculation Method:	Minimum Curvature	Db: Sybase

Survey: PathFinder ST Surveys

MD ft	Incl deg	Azim deg	TVD ft	+N-S ft	+E-W ft	VS ft	DLS deg/100ft	Build deg/100ft	Turn deg/100ft	Tool/Comment
5397.00	88.99	358.39	4722.78	827.32	4.26	827.33	3.55	-1.91	-3.00	
5429.00	89.69	359.09	4723.15	859.31	3.56	859.32	3.09	2.19	2.19	
5492.00	90.31	359.26	4723.15	922.30	2.65	922.31	1.02	0.98	0.27	
5556.00	92.51	359.09	4721.57	986.27	1.73	986.27	3.45	3.44	-0.27	
5619.00	92.68	359.35	4718.72	1049.20	0.88	1049.20	0.49	0.27	0.41	
5683.00	92.95	359.00	4715.58	1113.12	-0.04	1113.11	0.69	0.42	-0.55	
5747.00	91.28	357.86	4713.22	1177.05	-1.80	1177.04	3.16	-2.61	-1.78	
5810.00	91.01	358.74	4711.96	1240.01	-3.67	1239.99	1.46	-0.43	1.40	
5873.00	91.98	359.61	4710.31	1302.98	-4.57	1302.96	2.07	1.54	1.38	
5936.00	87.23	358.91	4710.75	1365.95	-5.39	1365.93	7.62	-7.54	-1.11	
5999.00	88.55	359.35	4713.07	1428.90	-6.34	1428.88	2.21	2.10	0.70	
6063.00	88.72	359.35	4714.59	1492.88	-7.07	1492.85	0.27	0.27	0.00	
6126.00	89.25	0.49	4715.71	1555.87	-7.15	1555.84	2.00	0.84	1.81	
6190.00	89.25	0.85	4716.55	1619.86	-6.41	1619.83	0.56	0.00	0.56	
6253.00	90.13	1.46	4716.89	1682.84	-5.14	1682.82	1.70	1.40	0.97	
6317.00	89.25	0.76	4717.23	1746.83	-3.90	1746.81	1.76	-1.37	-1.09	
6381.00	89.52	1.11	4717.92	1810.82	-2.85	1810.80	0.69	0.42	0.55	
6443.00	90.75	1.55	4717.77	1872.80	-1.41	1872.79	2.11	1.98	0.71	
6506.00	90.48	1.46	4717.10	1935.77	0.24	1935.77	0.45	-0.43	-0.14	
6570.00	91.28	2.25	4716.11	1999.73	2.31	1999.73	1.76	1.25	1.23	
6633.00	90.22	1.50	4715.29	2062.69	4.37	2062.69	2.06	-1.68	-1.19	
6697.00	89.08	0.53	4715.68	2126.68	5.51	2126.68	2.34	-1.78	-1.52	
6759.00	89.34	359.56	4716.54	2188.67	5.56	2188.68	1.62	0.42	-1.56	
6823.00	89.43	359.74	4717.22	2252.67	5.16	2252.67	0.31	0.14	0.28	
6886.00	90.66	359.92	4717.17	2315.66	4.98	2315.67	1.97	1.95	0.29	
6950.00	91.71	0.62	4715.85	2379.65	5.28	2379.65	1.97	1.64	1.09	

Annotation

MD ft	TVD ft	
4200.00	4199.59	Tie-In to SDI Gyro
4248.00	4247.57	Begin PathFinder MWD Surveys
4692.00	4632.78	Tie-In for ST1



Rio Grande "23" Federal #1H Section 23, T16-S, R 24-E, N.M.P.M. Eddy County, New Mexico Final Plot



COMPANY DETAILS

EOG Resources
4000 N. Big Spring, Ste. 500
Midland, TX 79705

Calculation Method: Minimum Curvature
Error System: Systematic Ellipse
Scan Method: Closest Approach 3D
Error Surface: Ellipsoidal Conic
Warning Method: Error Ratio

LEGEND

Proposed Sidetrack Plan
Rio Grande 23 Federal #1, Sec. 23 T16-S R24-E, Original Hole
Pathfinder ST Surveys

WELLPATH DETAILS				
Original Hole				
Rig:	McVay #4			
Ref. Datum:	SITE 0.00R			
V. Section Angle	Origin +N-S	Origin +E-W	Starting From TVD	
0.16°	0.00	0.00	0.00	

SITE DETAILS

Rio Grande 23 Federal #1
Section 23, T16-S, R24-E
Site Centre Northing: 692274.00
Easting: 432662.00
Ground Level: 3623.00
Positional Uncertainty: 0.00
Convergence: -0.12

ANNOTATIONS

No.	TVD	MD	Annotation
1	4199.59	4200.00	Tie-In to SDI Gyro
2	4247.57	4248.00	Begin Pathfinder MWD Surveys
3	4632.78	4692.00	Tie-In for ST1
4	4717.17	6886.00	Tie-In for ST2

WELL DETAILS

Name	+N-S	+E-W	Northing	Easting	Latitude	Longitude	Slot
Sec. 23 T16-S R24-E	0.00	0.00	692274.00	432662.00	32°54'10.611N	104°33'09.840W	N/A

