



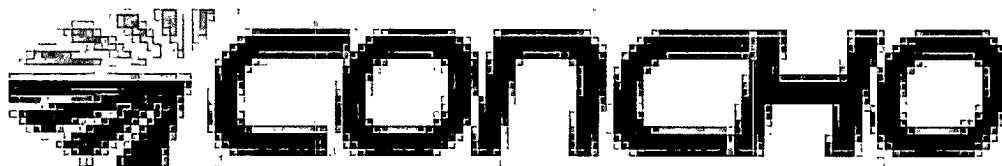
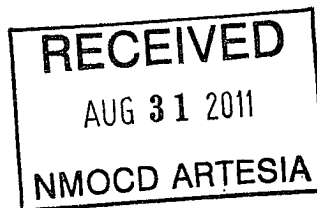
30-015-38572

Ryan Energy Directional Drilling Report

Field: Eddy Co, NM
Site: Burch Keely Unit #694
Well: #694
Wellpath: OH

Prepared For:

COG Operating LLC



Ryan Energy Technology

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Ryan Energy Technologies

Survey Report



Company: COG Operating LLC	Date: 7/13/2011	Time: 15:49.31	Page: 1
Field: Eddy Co, NM	Co-ordinate(NE) Reference:	Site: Burch Keely Unit #694, Grid North	
Site: Burch Keely Unit #694	Vertical (TVD) Reference:	SITE 3598.0	
Well: #694	Section (VS) Reference:	Well (0.00N,0.00E,269 85Azi)	
Wellpath: OH	Survey Calculation Method:	Minimum Curvature	Db: Sybase

Field: Eddy Co, NM New Mexico U.S.A	Map System: US State Plane Coordinate System 1927	Map Zone: New Mexico, Eastern Zone
Geo Datum: NAD27 (Clarke 1866)	Coordinate System: Site Centre	
Sys Datum: Mean Sea Level	Geomagnetic Model: IGRF2010	

Site: Burch Keely Unit #694 S25, T17S, R29E Eddy Co, NM	
Site Position:	Northing: 658835 40 ft Latitude: 32 48 39 083 N
From: Map	Easting: 593573 20 ft Longitude: 104 1 43 569 W
Position Uncertainty: 2.00 ft	North Reference: Grid
Ground Level: 3598 00 ft	Grid Convergence: 0 17 deg

Well: #694	Slot Name:
Well Position: +N/-S 0 00 ft Northing: 658835 40 ft Latitude: 32 48 39 083 N	
+E/-W 0 00 ft Easting: 593573 20 ft Longitude: 104 1 43 569 W	
Position Uncertainty: 0 00 ft	

Wellpath: OH Paddock	Drilled From: Surface
Current Datum: SITE	Tie-on Depth: 0 00 ft
Magnetic Data: 6/28/2011	Above System Datum: Mean Sea Level
Field Strength: 48941 nT	Declination: 7 84 deg
Vertical Section: Depth From (TVD)	Mag Dip Angle: 60 65 deg
ft	+N/-S ft +E/-W ft Direction deg
0.00	0 00 0 00 269.85

Survey Program for Definitive Wellpath			Version: 0	Tool Name
Date: 7/10/2011	Validated: No	Toolcode		
Actual From ft	To ft	Survey		
100 00	824 00	Survey #1 (100 00-824 00)	Gyro	Gyro
1071 00	4355 00	Survey #2 (1071 00-4355 00)	Ryan MWD	Ryan MWD
4398 00	4398 00	Survey #3 (4398 00-4398 00)	Projection	Projection

Survey

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
0 00	0 00	0.00	0.00	0 00	0 00	0 00	0.00	0.00	0.00	TIE LINE
100 00	0 46	231.00	100 00	-0 25	-0 31	0 31	0 46	0 46	0.00	Gyro
200 00	0 51	223.26	200 00	-0 83	-0 93	0 93	0 08	0 05	-7 74	Gyro
300 00	0 53	226 64	299 99	-1 47	-1 57	1 57	0 04	0 02	3 38	Gyro
400 00	0 66	228.43	399 99	-2 17	-2 34	2 34	0 13	0 13	1 79	Gyro
500 00	0 61	224.30	499 98	-2 93	-3 14	3 15	0 07	-0 05	-4 13	Gyro
600 00	0 22	215.46	599 98	-3 47	-3 62	3 63	0 39	-0 39	-8 84	Gyro
700 00	0 02	39.52	699 98	-3 61	-3 72	3 73	0 24	-0 20	-175 94	Gyro
800 00	0 55	31.52	799 98	-3 19	-3 46	3 47	0 53	0 53	-8 00	Gyro
824 00	0 75	38.40	823 97	-2 97	-3 30	3 31	0 89	0 83	28 67	Gyro
1071 00	0 40	18.20	1070 96	-0 88	-2 03	2 03	0 16	-0 14	-8 18	Ryan MWD
1167 00	0 90	2.80	1166 95	0 19	-1 89	1 89	0 55	0 52	-16 04	Ryan MWD
1263 00	0 70	343.80	1262 95	1 50	-2 02	2 01	0 34	-0 21	-19 79	Ryan MWD
1358 00	0 90	314.80	1357 94	2 59	-2 71	2 70	0 47	0 21	-30 53	Ryan MWD
1454 00	1 50	286 80	1453 92	3 48	-4 44	4 44	0 86	0 62	-29 17	Ryan MWD
1549 00	2 60	277.70	1548 85	4 13	-7 77	7 76	1 20	1 16	-9 58	Ryan MWD
1645 00	3 50	274 70	1644 72	4 66	-12 85	12 84	0 95	0 94	-3 12	Ryan MWD
1740 00	4 30	270.70	1739 50	4 94	-19 30	19 29	0 89	0 84	-4 21	Ryan MWD
1836 00	5 40	271 10	1835 15	5 07	-27 42	27 40	1 15	1 15	0 42	Ryan MWD
1932 00	6 20	269 80	1930 66	5 14	-37 12	37 10	0 84	0 83	-1 35	Ryan MWD
2027 00	7 20	270 30	2025 01	5 15	-48 20	48 19	1 05	1 05	0 53	Ryan MWD



Ryan Energy Technologies Survey Report



Company: COG Operating LLC
Field: Eddy Co, NM
Site: Burch Keely Unit #694
Well: #694
Wellpath: OH

Date: 7/13/2011 Time: 15:49:31 Page: 2
Co-ordinate(NE) Reference: Site, Burch Keely Unit #694, Grid North
Vertical (TVD) Reference: SITE 3598.0
Section (VS) Reference: Well (0.00N,0.00E,269.85Azi)
Survey Calculation Method: Minimum Curvature Db: Sybase

Survey

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
2123.00	8.00	268.60	2120.16	5.02	-60.89	60.88	0.87	0.83	-1.77	Ryan MWD
2219.00	8.90	268.10	2215.12	4.61	-74.99	74.98	0.94	0.94	-0.52	Ryan MWD
2314.00	9.20	269.20	2308.94	4.26	-89.93	89.92	0.36	0.32	1.16	Ryan MWD
2410.00	9.40	269.60	2403.68	4.10	-105.45	105.43	0.22	0.21	0.42	Ryan MWD
2505.00	9.90	269.80	2497.33	4.02	-121.37	121.36	0.53	0.53	0.21	Ryan MWD
2601.00	9.30	268.70	2591.99	3.81	-137.38	137.37	0.65	-0.62	-1.15	Ryan MWD
2697.00	9.20	269.20	2686.74	3.53	-152.81	152.80	0.13	-0.10	0.52	Ryan MWD
2793.00	9.20	268.40	2781.50	3.21	-168.15	168.14	0.13	0.00	-0.83	Ryan MWD
2888.00	8.90	268.40	2875.32	2.79	-183.09	183.08	0.32	-0.32	0.00	Ryan MWD
2984.00	9.30	266.40	2970.11	2.10	-198.25	198.25	0.53	0.42	-2.08	Ryan MWD
3079.00	9.10	266.60	3063.89	1.17	-213.41	213.41	0.21	-0.21	0.21	Ryan MWD
3175.00	8.90	269.40	3158.71	0.64	-228.42	228.42	0.50	-0.21	2.92	Ryan MWD
3271.00	9.10	269.10	3253.53	0.45	-243.43	243.43	0.21	0.21	-0.31	Ryan MWD
3366.00	9.10	271.70	3347.33	0.55	-258.46	258.45	0.43	0.00	2.74	Ryan MWD
3461.00	9.00	271.60	3441.15	0.98	-273.39	273.39	0.11	-0.11	-0.11	Ryan MWD
3557.00	8.80	272.00	3535.99	1.45	-288.24	288.23	0.22	-0.21	0.42	Ryan MWD
3653.00	7.20	267.20	3631.06	1.41	-301.59	301.58	1.80	-1.67	-5.00	Ryan MWD
3749.00	5.40	269.90	3726.47	1.11	-312.11	312.11	1.90	-1.87	2.81	Ryan MWD
3845.00	5.40	269.00	3822.05	1.02	-321.15	321.14	0.09	0.00	-0.94	Ryan MWD
3940.00	4.50	267.90	3916.69	0.81	-329.34	329.34	0.95	-0.95	-1.16	Ryan MWD
4036.00	4.00	275.70	4012.43	1.00	-336.44	336.43	0.79	-0.52	8.12	Ryan MWD
4131.00	2.90	268.80	4107.26	1.28	-342.14	342.13	1.24	-1.16	-7.26	Ryan MWD
4227.00	1.10	261.10	4203.19	1.09	-345.47	345.47	1.89	-1.87	-8.02	Ryan MWD
4323.00	0.80	276.80	4299.18	1.02	-347.05	347.05	0.41	-0.31	16.35	Ryan MWD
4355.00	0.90	272.80	4331.18	1.06	-347.52	347.52	0.36	0.31	-12.50	Ryan MWD
4398.00	0.90	272.80	4374.17	1.09	-348.20	348.19	0.00	0.00	0.00	Projection