

15-39393

A Gyrodata Directional Survey

for

DEVON ENERGY

Lease: RIGEL 20 FED COM Well: 1H, 4 1/2 INCH DRILLPIPE
Location: MC VAY #10, EDDY COUNTY, NEW MEXICO

Job Number: MD1211GVCW507

Run Date: 12/7/2011 12:05:09 PM

Surveyor: Che Garcia, Natilo Pena

Calculation Method: MINIMUM CURVATURE

Survey surface coordinates obtained from: Hand Held GPS

Survey Latitude: 32.651889 deg. N Longitude: 103.898167 deg. W

Azimuth Correction:

Gyro: -0.23000 deg to Grid North

Depth Reference: Rotary Table

Rotary Table Elevation: 20.00

Vertical Section Calculated from Well Head Location

Closure Calculated from Well Head Location

Horizontal Coordinates Calculated from Well Head Location

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MEASURED DEPTH feet	INCL deg.	AZIMUTH deg.	DOGLEG SEVERITY deg./ 100 ft.	VERTICAL DEPTH feet	CLOSURE DIST. feet	AZIMUTH deg.	HORIZONTAL COORDINATES feet
0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.00 N 0.00 E
0 TO 9182.65 FT RATE VERTICAL CONTINUOUS SURVEY TO RUN INSIDE 4 1/2 INCH DRILLPIPE							
ALL MEASURED DEPTHS AND COORDINATES REFERENCED TO MC VAY 10 RIG WITH A R.K.B HEIGHT OF 20FT							
100.00	0.41	35.00	0.41	100.00	0.4	35.0	0.29 N 0.21 E
200.00	0.75	35.58	0.34	199.99	1.4	35.3	1.12 N 0.79 E
300.00	0.48	359.43	0.46	299.99	2.4	29.4	2.08 N 1.17 E
400.00	0.86	6.29	0.39	399.98	3.5	21.1	3.25 N 1.25 E
500.00	0.84	4.40	0.03	499.97	4.9	16.4	4.72 N 1.39 E
600.00	0.93	23.63	0.31	599.96	6.4	15.9	6.20 N 1.77 E
700.00	1.01	16.47	0.15	699.94	8.1	16.8	7.78 N 2.34 E
800.00	0.88	35.84	0.34	799.93	9.7	18.2	9.24 N 3.04 E
900.00	1.06	52.91	0.34	899.92	11.2	22.1	10.42 N 4.23 E
1000.00	1.30	53.90	0.23	999.90	13.0	26.8	11.65 N 5.88 E
1100.00	1.37	48.42	0.15	1099.87	15.2	30.4	13.11 N 7.69 E
1200.00	2.04	53.76	0.68	1199.82	18.0	33.8	14.96 N 10.02 E
1300.00	3.03	56.47	0.99	1299.72	22.2	38.0	17.47 N 13.66 E
1400.00	3.79	52.38	0.80	1399.55	27.9	41.4	20.94 N 18.48 E
1500.00	3.88	49.31	0.22	1499.32	34.5	43.2	25.17 N 23.66 E
1600.00	3.01	54.06	0.92	1599.14	40.5	44.4	28.91 N 28.35 E
1700.00	2.77	56.91	0.28	1699.02	45.4	45.6	31.77 N 32.50 E
1800.00	2.84	59.93	0.16	1798.90	50.2	46.9	34.33 N 36.66 E
1900.00	2.94	60.79	0.11	1898.77	55.1	48.1	36.82 N 41.05 E

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2000.00	2.58	66.21	0.44	1998.65	59.8 49.3	38.98 N 45.34 E
2100.00	1.93	70.05	0.67	2098.57	63.5 50.4	40.46 N 48.99 E
2200.00	1.81	72.45	0.14	2198.52	66.6 51.4	41.52 N 52.08 E
2300.00	1.86	71.05	0.07	2298.47	69.6 52.4	42.52 N 55.12 E
2400.00	1.79	67.89	0.13	2398.42	72.7 53.1	43.63 N 58.10 E
2500.00	1.77	65.49	0.08	2498.37	75.7 53.6	44.86 N 60.95 E
2600.00	1.74	76.81	0.35	2598.32	78.6 54.3	45.85 N 63.84 E
2700.00	1.96	86.51	0.38	2698.27	81.5 55.4	46.30 N 67.03 E
2800.00	1.83	88.44	0.14	2798.22	84.3 56.6	46.45 N 70.33 E
2900.00	1.90	82.82	0.20	2898.16	87.1 57.6	46.70 N 73.57 E
3000.00	1.86	94.12	0.37	2998.11	90.0 58.7	46.79 N 76.83 E
3100.00	1.94	96.94	0.13	3098.06	92.6 59.9	46.47 N 80.13 E
3200.00	2.11	101.84	0.24	3197.99	95.4 61.2	45.89 N 83.60 E
3300.00	1.88	101.86	0.22	3297.93	98.0 62.6	45.18 N 87.01 E
3400.00	1.86	101.14	0.03	3397.88	100.6 63.7	44.53 N 90.20 E
3500.00	1.61	95.67	0.30	3497.83	103.1 64.7	44.07 N 93.19 E
3600.00	1.48	70.73	0.68	3597.80	105.6 65.2	44.36 N 95.81 E
3700.00	1.15	83.92	0.45	3697.77	107.8 65.4	44.90 N 98.03 E
3800.00	0.99	84.18	0.16	3797.76	109.6 65.7	45.09 N 99.88 E
3900.00	0.69	99.01	0.37	3897.74	110.9 66.0	45.08 N 101.34 E
4000.00	0.70	89.63	0.11	3997.74	112.0 66.3	44.99 N 102.55 E

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MEASURED DEPTH feet	INCL deg.	AZIMUTH deg.	DOGLEG SEVERITY deg./ 100 ft.	VERTICAL DEPTH feet	CLOSURE DIST. AZIMUTH feet deg.	HORIZONTAL COORDINATES feet
4100.00	0.63	95.45	0.10	4097.73	113.0 66.6	44.94 N 103.70 E
4200.00	0.68	97.61	0.06	4197.72	114.0 66.9	44.81 N 104.84 E
4300.00	0.60	106.26	0.12	4297.72	114.9 67.2	44.59 N 105.93 E
4400.00	0.42	79.93	0.29	4397.71	115.7 67.4	44.50 N 106.81 E
4500.00	0.32	67.44	0.13	4497.71	116.3 67.4	44.68 N 107.43 E
4600.00	0.39	73.00	0.07	4597.71	117.0 67.4	44.88 N 108.01 E
4700.00	0.38	52.46	0.14	4697.71	117.6 67.4	45.18 N 108.60 E
4800.00	0.44	332.18	0.53	4797.71	117.9 67.2	45.72 N 108.68 E
4900.00	0.77	320.62	0.35	4897.70	117.7 66.7	46.59 N 108.07 E
5000.00	0.70	336.40	0.22	4997.69	117.5 66.1	47.67 N 107.40 E
5100.00	0.79	348.18	0.18	5097.68	117.7 65.4	48.90 N 107.01 E
5200.00	0.86	22.08	0.48	5197.67	118.4 64.9	50.27 N 107.15 E
5300.00	1.03	35.34	0.28	5297.66	119.7 64.4	51.70 N 107.95 E
5400.00	1.00	74.32	0.68	5397.65	121.3 64.3	52.67 N 109.32 E
5500.00	0.67	336.70	1.28	5497.64	122.2 64.1	53.44 N 109.93 E
5600.00	0.83	335.72	0.16	5597.63	122.3 63.5	54.64 N 109.40 E
5700.00	0.82	318.18	0.25	5697.62	122.1 62.8	55.83 N 108.62 E
5800.00	0.88	306.20	0.19	5797.61	121.6 62.2	56.81 N 107.53 E
5900.00	1.02	296.59	0.22	5897.60	120.8 61.5	57.67 N 106.11 E
6000.00	1.02	298.00	0.03	5997.58	119.8 60.8	58.48 N 104.53 E
6100.00	1.02	296.94	0.02	6097.56	118.8 60.1	59.31 N 102.95 E
6200.00	1.18	283.03	0.31	6197.55	117.6 59.3	59.94 N 101.15 E

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6300.00	0.72	297.62	0.51	6297.53	116.5 58.7	60.47 N 99.59 E
6400.00	0.53	310.94	0.24	6397.53	116.0 58.3	61.06 N 98.69 E
6500.00	0.24	298.23	0.31	6497.52	115.8 57.9	61.47 N 98.15 E
6600.00	0.41	205.81	0.48	6597.52	115.4 58.0	61.24 N 97.81 E
6700.00	0.46	218.38	0.11	6697.52	114.7 58.1	60.60 N 97.41 E
6800.00	0.41	211.29	0.07	6797.52	114.0 58.3	59.98 N 96.98 E
6900.00	0.81	187.32	0.47	6897.51	113.3 58.6	58.98 N 96.70 E
7000.00	0.81	163.10	0.34	6997.50	112.7 59.2	57.60 N 96.81 E
7100.00	0.88	160.23	0.09	7097.49	112.3 60.0	56.21 N 97.28 E
7200.00	1.50	145.51	0.69	7197.47	112.3 61.0	54.40 N 98.28 E
7300.00	2.16	117.25	1.10	7297.42	113.5 62.5	52.46 N 100.70 E
7400.00	1.80	101.60	0.65	7397.36	115.9 63.7	51.28 N 103.91 E
7500.00	1.41	101.88	0.40	7497.32	118.1 64.6	50.71 N 106.65 E
7600.00	1.47	102.58	0.07	7597.29	120.1 65.3	50.18 N 109.11 E
7700.00	1.36	92.44	0.27	7697.26	122.2 65.9	49.85 N 111.54 E
7800.00	1.43	94.31	0.09	7797.23	124.3 66.4	49.71 N 113.96 E
7900.00	1.29	114.50	0.50	7897.20	126.2 67.1	49.15 N 116.23 E
8000.00	0.94	140.63	0.61	7997.18	127.2 67.8	48.05 N 117.77 E
8100.00	0.94	157.58	0.28	8097.17	127.4 68.5	46.66 N 118.60 E
8200.00	0.80	179.37	0.35	8197.16	127.2 69.2	45.21 N 118.92 E
8300.00	1.45	189.70	0.68	8297.14	126.4 70.0	43.26 N 118.72 E
8400.00	1.01	219.24	0.76	8397.12	125.0 70.7	41.34 N 117.95 E

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8500.00	0.70	215.27	0.31	8497.11	123.7 71.1	40.16 N 117.04 E
8600.00	1.16	182.28	0.69	8597.09	122.9 71.7	38.66 N 116.65 E
8700.00	2.08	192.88	0.97	8697.05	121.6 72.8	35.88 N 116.20 E
8800.00	3.76	197.80	1.70	8796.92	118.9 74.9	30.98 N 114.80 E
8900.00	4.41	194.87	0.68	8896.66	115.4 77.9	24.14 N 112.81 E
9000.00	3.44	199.02	1.01	8996.43	112.2 81.0	17.58 N 110.84 E
9100.00	2.42	195.09	1.05	9096.30	110.0 83.4	12.70 N 109.31 E
9182.65	2.32	209.48	0.73	9178.88	108.5 84.9	9.56 N 108.03 E

Final Station Closure: Distance: 108.45 ft Az: 84.94 deg.

DEVON ENERGY

WELL NUMBER : RIGEL 20 FED COM 1H

4 1/2 INCH DRILLPIPE SURVEY

DATE RUN : 071211

JOB NUMBER : MD1211GVCW507

Azimuth Corrected: -0.2300 deg to Grid North

MD	INC	AZ	TVD	LOCAL		V/S	DOG/ 100FT	
				N	E			
100	0.41	35	100	0.29	0.21	0.3	0.41	
200	0.75	35.58	199.99	1.12	0.79	1.1	0.34	
300	0.48	359.43	299.99	2.08	1.17	2.1	0.46	
400	0.86	6.29	399.98	3.25	1.25	3.2	0.39	
500	0.84	4.4	499.97	4.72	1.39	4.7	0.03	
600	0.93	23.63	599.96	6.2	1.77	6.2	0.31	
700	1.01	16.47	699.94	7.78	2.34	7.8	0.15	
800	0.88	35.84	799.93	9.24	3.04	9.2	0.34	
900	1.06	52.91	899.92	10.42	4.23	10.4	0.34	
1000	1.3	53.9	999.9	11.65	5.88	11.6	0.23	
1100	1.37	48.42	1099.87	13.11	7.69	13.1	0.15	
1200	2.04	53.76	1199.82	14.96	10.02	15	0.68	
1300	3.03	56.47	1299.72	17.47	13.66	17.5	0.99	
1400	3.79	52.38	1399.55	20.94	18.48	20.9	0.8	
1500	3.88	49.31	1499.32	25.17	23.66	25.2	0.22	
1600	3.01	54.06	1599.14	28.91	28.35	28.9	0.92	
1700	2.77	56.91	1699.02	31.77	32.5	31.8	0.28	
1800	2.84	59.93	1798.9	34.33	36.66	34.3	0.16	
1900	2.94	60.79	1898.77	36.82	41.05	36.8	0.11	
2000	2.58	66.21	1998.65	38.98	45.34	39	0.44	
2100	1.93	70.05	2098.57	40.46	48.99	40.5	0.67	
2200	1.81	72.45	2198.52	41.52	52.08	41.5	0.14	
2300	1.86	71.05	2298.47	42.52	55.12	42.5	0.07	
2400	1.79	67.89	2398.42	43.63	58.1	43.6	0.13	
2500	1.77	65.49	2498.37	44.86	60.95	44.9	0.08	
2600	1.74	76.81	2598.32	45.85	63.84	45.9	0.35	
2700	1.96	86.51	2698.27	46.3	67.03	46.3	0.38	
2800	1.83	88.44	2798.22	46.45	70.33	46.5	0.14	
2900	1.9	82.82	2898.16	46.7	73.57	46.7	0.2	
3000	1.86	94.12	2998.11	46.79	76.83	46.8	0.37	
3100	1.94	96.94	3098.06	46.47	80.13	46.5	0.13	
3200	2.11	101.84	3197.99	45.89	83.6	45.9	0.24	
3300	1.88	101.86	3297.93	45.18	87.01	45.2	0.22	
3400	1.86	101.14	3397.88	44.53	90.2	44.5	0.03	
3500	1.61	95.67	3497.83	44.07	93.19	44.1	0.3	
3600	1.48	70.73	3597.8	44.36	95.81	44.4	0.68	
3700	1.15	83.92	3697.77	44.9	98.03	44.9	0.45	
3800	0.99	84.18	3797.76	45.09	99.88	45.1	0.16	
3900	0.69	99.01	3897.74	45.08	101.34	45.1	0.37	

4000	0.7	89.63	3997.74	44.99	102.55	45	0.11
4100	0.63	95.45	4097.73	44.94	103.7	44.9	0.1
4200	0.68	97.61	4197.72	44.81	104.84	44.8	0.06
4300	0.6	106.26	4297.72	44.59	105.93	44.6	0.12
4400	0.42	79.93	4397.71	44.5	106.81	44.5	0.29
4500	0.32	67.44	4497.71	44.68	107.43	44.7	0.13
4600	0.39	73	4597.71	44.88	108.01	44.9	0.07
4700	0.38	52.46	4697.71	45.18	108.6	45.2	0.14
4800	0.44	332.18	4797.71	45.72	108.68	45.7	0.53
4900	0.77	320.62	4897.7	46.59	108.07	46.6	0.35
5000	0.7	336.4	4997.69	47.67	107.4	47.7	0.22
5100	0.79	348.18	5097.68	48.9	107.01	48.9	0.18
5200	0.86	22.08	5197.67	50.27	107.15	50.3	0.48
5300	1.03	35.34	5297.66	51.7	107.95	51.7	0.28
5400	1	74.32	5397.65	52.67	109.32	52.7	0.68
5500	0.67	336.7	5497.64	53.44	109.93	53.4	1.28
5600	0.83	335.72	5597.63	54.64	109.4	54.6	0.16
5700	0.82	318.18	5697.62	55.83	108.62	55.8	0.25
5800	0.88	306.2	5797.61	56.81	107.53	56.8	0.19
5900	1.02	296.59	5897.6	57.67	106.11	57.7	0.22
6000	1.02	298	5997.58	58.48	104.53	58.5	0.03
6100	1.02	296.94	6097.56	59.31	102.95	59.3	0.02
6200	1.18	283.03	6197.55	59.94	101.15	59.9	0.31
6300	0.72	297.62	6297.53	60.47	99.59	60.5	0.51
6400	0.53	310.94	6397.53	61.06	98.69	61.1	0.24
6500	0.24	298.23	6497.52	61.47	98.15	61.5	0.31
6600	0.41	205.81	6597.52	61.24	97.81	61.2	0.48
6700	0.46	218.38	6697.52	60.6	97.41	60.6	0.11
6800	0.41	211.29	6797.52	59.98	96.98	60	0.07
6900	0.81	187.32	6897.51	58.98	96.7	59	0.47
7000	0.81	163.1	6997.5	57.6	96.81	57.6	0.34
7100	0.88	160.23	7097.49	56.21	97.28	56.2	0.09
7200	1.5	145.51	7197.47	54.4	98.28	54.4	0.69
7300	2.16	117.25	7297.42	52.46	100.7	52.5	1.1
7400	1.8	101.6	7397.36	51.28	103.91	51.3	0.65
7500	1.41	101.88	7497.32	50.71	106.65	50.7	0.4
7600	1.47	102.58	7597.29	50.18	109.11	50.2	0.07
7700	1.36	92.44	7697.26	49.85	111.54	49.9	0.27
7800	1.43	94.31	7797.23	49.71	113.96	49.7	0.09
7900	1.29	114.5	7897.2	49.15	116.23	49.1	0.5
8000	0.94	140.63	7997.18	48.05	117.77	48.1	0.61
8100	0.94	157.58	8097.17	46.66	118.6	46.7	0.28
8200	0.8	179.37	8197.16	45.21	118.92	45.2	0.35
8300	1.45	189.7	8297.14	43.26	118.72	43.3	0.68
8400	1.01	219.24	8397.12	41.34	117.95	41.3	0.76
8500	0.7	215.27	8497.11	40.16	117.04	40.2	0.31
8600	1.16	182.28	8597.09	38.66	116.65	38.7	0.69

8700	2.08	192.88	8697.05	35.88	116.2	35.9	0.97
8800	3.76	197.8	8796.92	30.98	114.8	31	1.7
8900	4.41	194.87	8896.66	24.14	112.81	24.1	0.68
9000	3.44	199.02	8996.43	17.58	110.84	17.6	1.01
9100	2.42	195.09	9096.3	12.7	109.31	12.7	1.05
9182.7	2.32	209.48	9178.88	9.56	108.03	9.6	0.73



Devon Energy Production Co, LP

Eddy Co., New Mexico (Nad 83)

Rigel 20 Fed Com 1H

Rigel 20 Fed Com 1H

Lateral #1

Survey: Survey #1

Standard Survey Report

19 December, 2011



CUDD Drilling and Measurement Survey Report

Company:	Devon Energy Production Co, LP	Local Co-ordinate Reference:	Site Rigel 20 Fed Com 1H
Project:	Eddy Co., New Mexico (Nad 83)	TVD Reference:	WELL @ 3438 00ft (Original Well Elev)
Site:	Rigel 20 Fed Com 1H	MD Reference:	WELL @ 3438 00ft (Original Well Elev)
Well:	Rigel 20 Fed Com 1H	North Reference:	Grid
Wellbore:	Lateral #1	Survey Calculation Method:	Minimum Curvature
Design:	Lateral #1	Database:	EDM 5000 1 Single User Db

Project	Eddy Co., New Mexico (Nad 83)		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	New Mexico Eastern Zone		

Site	Rigel 20 Fed Com 1H, Sec 20, T-19S, R-31E			
Site Position:		Northing:	601,184.15 usft	Latitude: 32° 39' 7.024 N
From:	Map	Easting:	675,027.79 usft	Longitude: 103° 53' 56.248 W
Position Uncertainty:	0.00 ft	Slot Radius:	13-3/16 "	Grid Convergence: 0 23 °

Well	Rigel 20 Fed Com 1H			
Well Position	+N/-S	0 00 ft	Northing:	601,184.15 usft
	+E/-W	0.00 ft	Easting:	675,027.79 usft
Position Uncertainty		0 00 ft	Wellhead Elevation:	3,438 00 ft
			Ground Level:	3,418.00 ft

Wellbore	Lateral #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	11/9/2011	7.72	60.52	48,798

Design	Lateral #1				
Audit Notes:					
Version:	1 0	Phase:	ACTUAL	Tie On Depth:	8,200.00
Vertical Section:	Depth From (TVD) (ft)	+N/-S (ft)	+E/-W (ft)	Direction (°)	
	0 00	0 00	0.00	89.37	

Survey Program	Date 12/19/2011				
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
100 00	8,200 00	Gyro (Pilot Hole)	NS-GYRO-MS	North sensing gyrocompassing m/s	
8,200 00	12,959 00	Survey #1 (Lateral #1)	CUDD MWD	MWD - Standard CUDD MWD	

Survey										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
8,200.00	0 80	179.37	8,197.16	45.19	118.95	119.44	0.00	0 00	0.00	
Tie-in to Gyro										
8,263 00	3 80	53.00	8,260.11	46 01	120 62	121.12	6 86	4 76	-200.59	
First CUDD survey										
8,295.00	6 70	109.90	8,292 00	46 01	123.23	123.73	17.53	9 06	177 81	
8,327 00	8.60	113.40	8,323 71	44.42	127.18	127.66	6.11	5 94	10.94	
8,358 00	12 00	110.20	8,354 21	42 39	132.33	132.79	11.12	10.97	-10 32	
8,390.00	15.50	109.80	8,385 28	39 79	139.48	139.91	10 94	10 94	-1 25	
8,422 00	19 10	106.20	8,415 83	36.88	148.53	148.93	11.73	11 25	-11 25	



CUDD Drilling and Measurement Survey Report

Company:	Devon Energy Production Co, LP	Local Co-ordinate Reference:	Site Rigel 20 Fed Com 1H
Project:	Eddy Co , New Mexico (Nad 83)	TVD Reference:	WELL @ 3438.00ft (Original Well Elev)
Site:	Rigel 20 Fed Com 1H	MD Reference:	WELL @ 3438 00ft (Original Well Elev)
Well:	Rigel 20 Fed Com 1H	North Reference:	Grid
Wellbore:	Lateral #1	Survey Calculation Method:	Minimum Curvature
Design:	Lateral #1	Database:	EDM 5000.1 Single User Db

Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
8,454.00	21.80	101.10	8,445.82	34.28	159.39	159.76	10.10	8.44	-15.94
8,486.00	24.70	98.20	8,475.21	32.18	171.85	172.19	9.74	9.06	-9.06
8,517.00	28.70	95.50	8,502.90	30.54	185.67	186.00	13.48	12.90	-8.71
8,549.00	32.90	92.90	8,530.39	29.36	202.01	202.32	13.77	13.13	-8.13
8,581.00	36.70	92.10	8,556.66	28.57	220.25	220.55	11.96	11.88	-2.50
8,613.00	38.40	91.40	8,582.03	27.98	239.74	240.04	5.48	5.31	-2.19
8,644.00	40.10	90.30	8,606.03	27.69	259.35	259.64	5.93	5.48	-3.55
8,676.00	41.80	89.90	8,630.20	27.66	280.32	280.61	5.38	5.31	-1.25
8,708.00	44.20	89.90	8,653.60	27.69	302.15	302.43	7.50	7.50	0.00
8,740.00	46.50	89.60	8,676.09	27.79	324.91	325.20	7.22	7.19	-0.94
8,774.00	49.80	88.60	8,698.77	28.20	350.23	350.52	9.95	9.71	-2.94
8,806.00	53.30	88.90	8,718.67	28.74	375.28	375.57	10.96	10.94	0.94
8,838.00	56.00	89.40	8,737.18	29.13	401.38	401.67	8.53	8.44	1.56
8,870.00	59.50	89.30	8,754.25	29.44	428.43	428.73	10.94	10.94	-0.31
8,901.00	62.90	90.00	8,769.19	29.60	455.59	455.89	11.14	10.97	2.26
8,933.00	66.50	90.60	8,782.86	29.45	484.52	484.81	11.38	11.25	1.88
8,965.00	69.40	90.50	8,794.87	29.16	514.17	514.46	9.07	9.06	-0.31
8,997.00	71.60	90.70	8,805.55	28.84	544.33	544.62	6.90	6.88	0.63
9,028.00	73.30	90.70	8,814.90	28.48	573.89	574.17	5.48	5.48	0.00
9,060.00	76.80	90.60	8,823.15	28.13	604.80	605.07	10.94	10.94	-0.31
9,092.00	80.20	90.50	8,829.53	27.83	636.15	636.42	10.63	10.63	-0.31
9,121.00	82.70	90.90	8,833.84	27.48	664.82	665.08	8.73	8.62	1.38
9,153.00	85.80	90.10	8,837.05	27.20	696.66	696.91	10.00	9.69	-2.50
9,185.00	88.30	90.20	8,838.70	27.12	728.61	728.87	7.82	7.81	0.31
9,217.00	88.50	90.20	8,839.59	27.01	760.60	760.85	0.63	0.63	0.00
9,312.00	88.70	89.80	8,841.91	27.01	855.57	855.82	0.47	0.21	-0.42
9,407.00	89.10	89.50	8,843.73	27.59	950.55	950.80	0.53	0.42	-0.32
9,502.00	89.30	89.40	8,845.06	28.50	1,045.54	1,045.79	0.24	0.21	-0.11
9,598.00	88.10	89.50	8,847.24	29.42	1,141.51	1,141.76	1.25	-1.25	0.10
9,693.00	88.10	90.50	8,850.39	29.42	1,236.45	1,236.70	1.05	0.00	1.05
9,788.00	89.20	90.00	8,852.63	29.01	1,331.42	1,331.66	1.27	1.16	-0.53
9,883.00	89.20	89.50	8,853.95	29.42	1,426.41	1,426.65	0.53	0.00	-0.53
9,979.00	89.30	89.10	8,855.21	30.60	1,522.40	1,522.64	0.43	0.10	-0.42
10,074.00	89.80	89.70	8,855.96	31.59	1,617.39	1,617.64	0.82	0.53	0.63
10,169.00	89.90	89.20	8,856.20	32.50	1,712.38	1,712.64	0.54	0.11	-0.53
10,265.00	89.20	90.20	8,856.96	33.01	1,808.38	1,808.63	1.27	-0.73	1.04
10,360.00	89.50	90.50	8,858.04	32.42	1,903.37	1,903.61	0.45	0.32	0.32
10,455.00	89.60	90.50	8,858.78	31.60	1,998.36	1,998.59	0.11	0.11	0.00
10,551.00	89.70	90.20	8,859.37	31.01	2,094.36	2,094.57	0.33	0.10	-0.31
10,646.00	89.90	90.00	8,859.70	30.84	2,189.36	2,189.57	0.30	0.21	-0.21
10,741.00	90.40	89.80	8,859.45	31.01	2,284.36	2,284.56	0.57	0.53	-0.21
10,837.00	90.70	89.50	8,858.53	31.60	2,380.35	2,380.55	0.44	0.31	-0.31
10,929.00	90.90	88.90	8,857.24	32.88	2,472.33	2,472.54	0.69	0.22	-0.65



CUDD Drilling and Measurement Survey Report

Company:	Devon Energy Production Co, LP	Local Co-ordinate Reference:	Site Rigel 20 Fed Com 1H
Project:	Eddy Co , New Mexico (Nad 83)	TVD Reference:	WELL @ 3438 00ft (Original Well Elev)
Site:	Rigel 20 Fed Com 1H	MD Reference:	WELL @ 3438.00ft (Original Well Elev)
Well:	Rigel 20 Fed Com 1H	North Reference:	Grid
Wellbore:	Lateral #1	Survey Calculation Method:	Minimum Curvature
Design:	Lateral #1	Database:	EDM 5000 1 Single User Db

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
11,021.00	90.30	89.40	8,856.28	34.24	2,564.32	2,564.54	0.85	-0.65	0.54
11,116.00	89.50	89.30	8,856.45	35.32	2,659.31	2,659.54	0.85	-0.84	-0.11
11,210.00	89.90	89.10	8,856.94	36.63	2,753.30	2,753.54	0.48	0.43	-0.21
11,304.00	89.10	88.80	8,857.76	38.36	2,847.28	2,847.53	0.91	-0.85	-0.32
11,403.00	88.70	90.40	8,859.66	39.05	2,946.25	2,946.51	1.67	-0.40	1.62
11,498.00	87.70	90.40	8,862.64	38.39	3,041.20	3,041.44	1.05	-1.05	0.00
11,590.00	85.20	90.20	8,868.34	37.90	3,133.02	3,133.25	2.73	-2.72	-0.22
11,684.00	85.80	89.50	8,875.72	38.15	3,226.73	3,226.95	0.98	0.64	-0.74
11,777.00	85.90	89.10	8,882.45	39.28	3,319.48	3,319.71	0.44	0.11	-0.43
11,870.00	85.70	88.90	8,889.26	40.90	3,412.21	3,412.46	0.30	-0.22	-0.22
11,966.00	87.50	88.80	8,894.95	42.83	3,508.02	3,508.28	1.88	1.88	-0.10
12,060.00	88.70	87.20	8,898.07	46.10	3,601.91	3,602.20	2.13	1.28	-1.70
12,153.00	89.00	85.40	8,899.93	52.10	3,694.69	3,695.04	1.96	0.32	-1.94
12,247.00	89.70	86.20	8,901.00	58.99	3,788.43	3,788.85	1.13	0.74	0.85
12,339.00	89.90	86.80	8,901.32	64.60	3,880.26	3,880.73	0.69	0.22	0.65
12,431.00	88.70	87.60	8,902.45	69.10	3,972.14	3,972.66	1.57	-1.30	0.87
12,526.00	91.60	90.90	8,902.20	70.34	4,067.11	4,067.64	4.62	3.05	3.47
12,621.00	91.60	91.00	8,899.54	68.77	4,162.06	4,162.56	0.11	0.00	0.11
12,716.00	91.60	91.90	8,896.89	66.36	4,256.99	4,257.46	0.95	0.00	0.95
12,808.00	91.50	91.00	8,894.40	64.04	4,348.92	4,349.37	0.98	-0.11	-0.98
12,902.00	90.90	91.50	8,892.43	61.99	4,442.88	4,443.29	0.83	-0.64	0.53
Last CUDD survey									
12,959.00	90.90	91.50	8,891.54	60.50	4,499.85	4,500.25	0.00	0.00	0.00
Projection to bit									

Survey Annotations				
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
8,200.00	8,197.16	45.19	118.95	Tie-in to Gyro
8,263.00	8,260.11	46.01	120.62	First CUDD survey
12,902.00	8,892.43	61.99	4,442.88	Last CUDD survey
12,959.00	8,891.54	60.50	4,499.85	Projection to bit

Checked By: _____ Approved By: _____ Date: _____

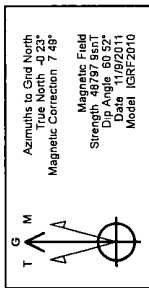


Project: Eddy Co., New Mexico (Nad 83)
Site: Rigel 20 Fed Com 1H
Well: Rigel 20 Fed Com 1H
Wellbore Lateral #1
Design: Design #5



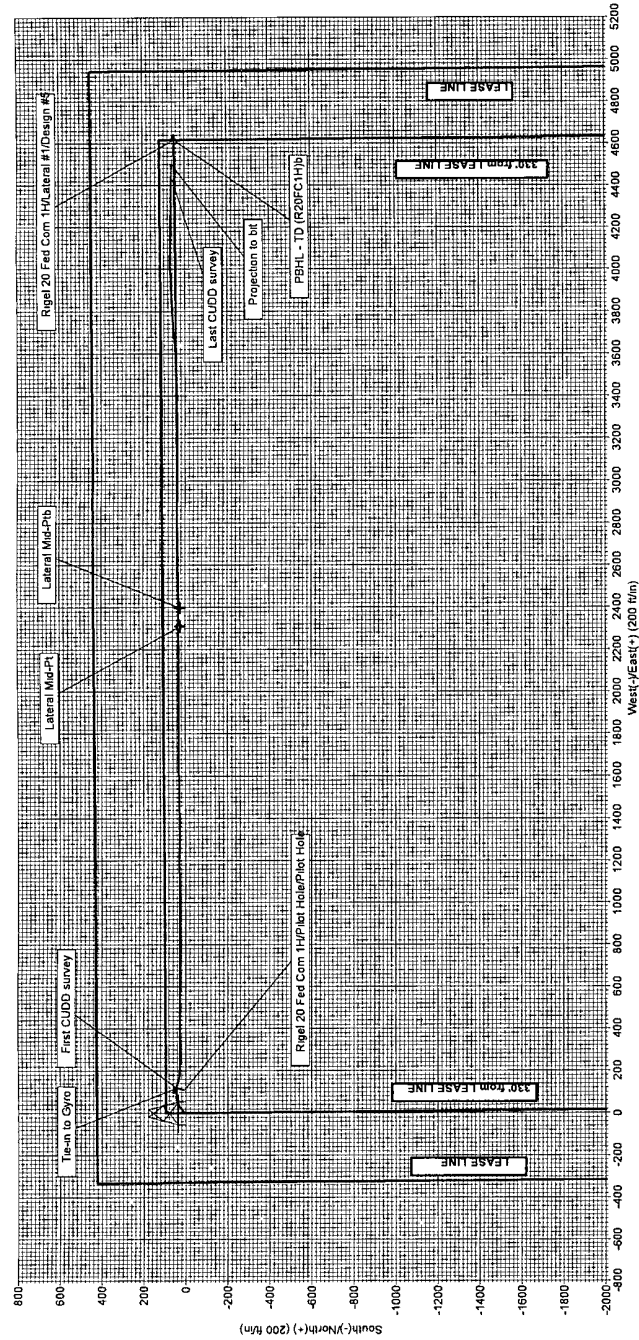
PROJECT DETAILS Eddy Co., New Mexico (Nad 83)

Geodetic System: US State Plane 1983
Datum: Eddy County Datum 1983
Ellipsoid: GRS 1980
Zone: New Mexico Eastern Zone
System Datum: Mean Sea Level



Plan Design #5 (Rigel 20 Fed Com 1H/Lateral #1)

Created By	Eric Minchew	Date	8/50, December 19 2011
Checked		Date	
Reviewed		Date	
Approved		Date	



WELL DETAILS Rigel 20 Fed Com 1H

Ground Level	3418.00
WELL @ 3438.00R (Original Well Elev)	
+N/S	0.00
+E/W	0.00
North	801184.15
East	675027.78
Latitude	32° 38' 7.024 N
Longitude	103° 53' 56.248 W
Slot	

SECTION DETAILS

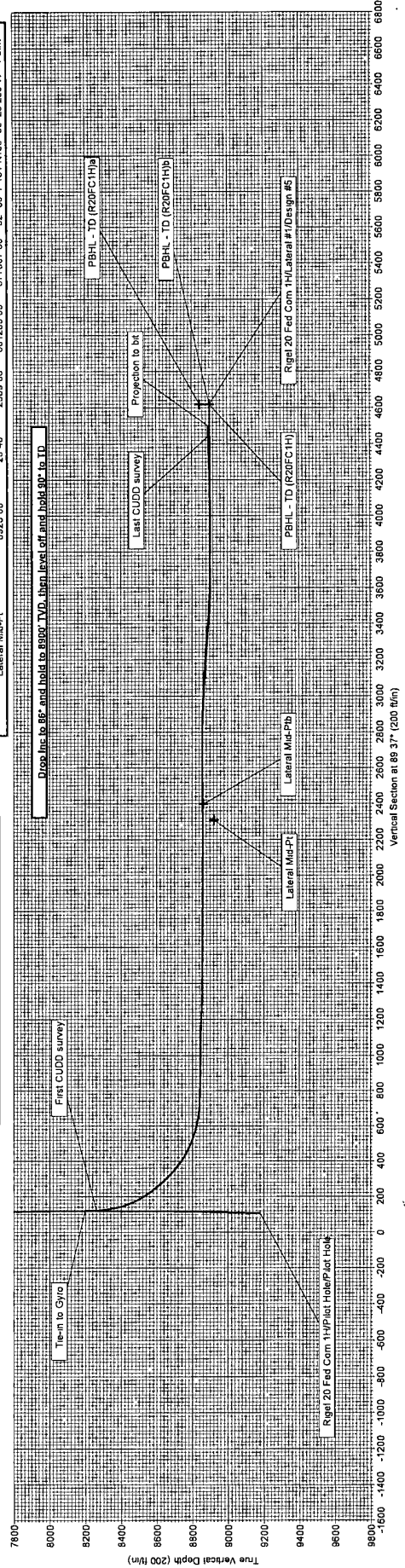
Sec	MD	Inc	Azi	TVD	+N/S	+E/W	Deg	TFace	VFace	Target
1	11363.00	88.10	88.80	8859.69	39.59	2906.26	0.00	0.00	2806.52	
2	11470.27	85.00	89.66	8853.27	41.04	3013.41	3.00	164.62	3013.88	
3	11577.54	82.00	90.00	8846.85	42.00	3020.00	3.00	0.00	3020.00	
4	12063.09	90.00	89.66	8900.00	44.50	3604.99	3.00	0.03	3605.26	
5	13076.09	90.00	89.66	8950.00	50.66	4617.97	0.00	0.00	4618.25	PBHL - TD (R20FC1H)

ANNOTATIONS

No annotation data is available

WELLBORE TARGET DETAILS (MAP CO-ORDINATES AND LAT/LONG)

Name	TVD	+N/S	+E/W	North	East	Latitude	Longitude	Shape
PBHL - TD (R20FC1H)	8845.00	50.66	4617.97	601234.81	675945.75	32° 39' 7.335 N	103° 53' 2.231 W	Point
Lateral Mid-Pb	8853.00	46.37	2391.89	601234.81	675945.75	32° 39' 7.335 N	103° 53' 2.231 W	Point
PBHL - TD (R20FC1H)	8853.00	50.66	4617.97	601234.81	675945.75	32° 39' 7.335 N	103° 53' 2.231 W	Point
Lateral Mid-Pt	8853.00	25.40	2309.86	601208.55	677337.85	32° 39' 7.181 N	103° 53' 29.230 W	Point



Rigel 20 Fed Com 1H_Final MWD Survey-Report_12-19-11.txt
Devon Energy Production Co, LP
Rigel 20 Fed Com 1H - Survey #1

Eddy Co., New Mexico (Nad 83)
Rigel 20 Fed Com 1H

Measured Dogleg Depth Rate (ft) (°/100ft)	Incl.	Azim.	Vertical Depth (ft)	Northings (ft)	Eastings (ft)	Vertical Section (ft)
8200.00	0.800	179.370	8197.16	45.19 N	118.95 E	119.44
0.00						
8263.00	3.800	53.000	8260.11	46.01 N	120.62 E	121.12
6.86						
8295.00	6.700	109.900	8292.00	46.01 N	123.23 E	123.73
17.53						
8327.00	8.600	113.400	8323.71	44.42 N	127.18 E	127.66
6.11						
8358.00	12.000	110.200	8354.21	42.39 N	132.33 E	132.79
11.12						
8390.00	15.500	109.800	8385.28	39.79 N	139.48 E	139.91
10.94						
8422.00	19.100	106.200	8415.83	36.88 N	148.53 E	148.93
11.73						
8454.00	21.800	101.100	8445.81	34.28 N	159.39 E	159.76
10.10						
8486.00	24.700	98.200	8475.21	32.18 N	171.85 E	172.19
9.74						
8517.00	28.700	95.500	8502.90	30.54 N	185.67 E	186.00
13.48						
8549.00	32.900	92.900	8530.39	29.36 N	202.01 E	202.32
13.77						
8581.00	36.700	92.100	8556.66	28.57 N	220.25 E	220.55
11.96						
8613.00	38.400	91.400	8582.03	27.98 N	239.74 E	240.04
5.48						
8644.00	40.100	90.300	8606.03	27.69 N	259.35 E	259.64
5.93						
8676.00	41.800	89.900	8630.20	27.66 N	280.32 E	280.61
5.38						
8708.00	44.200	89.900	8653.60	27.69 N	302.15 E	302.43
7.50						
8740.00	46.500	89.600	8676.09	27.79 N	324.91 E	325.20
7.22						
8774.00	49.800	88.600	8698.77	28.20 N	350.23 E	350.52
9.95						
8806.00	53.300	88.900	8718.67	28.74 N	375.28 E	375.57
10.96						
8838.00	56.000	89.400	8737.18	29.13 N	401.38 E	401.67
8.53						
8870.00	59.500	89.300	8754.25	29.44 N	428.43 E	428.73
10.94						
8901.00	62.900	90.000	8769.18	29.60 N	455.59 E	455.89
11.14						
8933.00	66.500	90.600	8782.86	29.45 N	484.52 E	484.81
11.38						
8965.00	69.400	90.500	8794.87	29.16 N	514.17 E	514.46
9.07						
8997.00	71.600	90.700	8805.55	28.84 N	544.33 E	544.62
6.90						

	Rigel	20 Fed Com	1H_Final	MWD	Survey-Report_12-19-11.txt	
9028.00	73.300	90.700	8814.90	28.48 N	573.89 E	574.17
5.48						
9060.00	76.800	90.600	8823.15	28.13 N	604.80 E	605.07
10.94						
9092.00	80.200	90.500	8829.53	27.83 N	636.15 E	636.42
10.63						
9121.00	82.700	90.900	8833.84	27.48 N	664.82 E	665.08
8.73						
9153.00	85.800	90.100	8837.05	27.20 N	696.66 E	696.91
10.00						
9185.00	88.300	90.200	8838.70	27.12 N	728.61 E	728.87
7.82						
9217.00	88.500	90.200	8839.59	27.01 N	760.60 E	760.85
0.63						
9312.00	88.700	89.800	8841.91	27.01 N	855.57 E	855.82
0.47						
9407.00	89.100	89.500	8843.73	27.59 N	950.55 E	950.80
0.53						
9502.00	89.300	89.400	8845.06	28.50 N	1045.54 E	1045.79
0.24						
9598.00	88.100	89.500	8847.24	29.42 N	1141.51 E	1141.76
1.25						
9693.00	88.100	90.500	8850.39	29.42 N	1236.45 E	1236.70
1.05						
9788.00	89.200	90.000	8852.63	29.01 N	1331.42 E	1331.66
1.27						
9883.00	89.200	89.500	8853.95	29.42 N	1426.41 E	1426.65
0.53						
9979.00	89.300	89.100	8855.21	30.60 N	1522.40 E	1522.64
0.43						
10074.00	89.800	89.700	8855.95	31.59 N	1617.39 E	1617.64
0.82						
10169.00	89.900	89.200	8856.20	32.50 N	1712.38 E	1712.64
0.54						
10265.00	89.200	90.200	8856.96	33.01 N	1808.38 E	1808.63
1.27						
10360.00	89.500	90.500	8858.04	32.42 N	1903.37 E	1903.61
0.45						
10455.00	89.600	90.500	8858.78	31.60 N	1998.36 E	1998.59
0.11						
10551.00	89.700	90.200	8859.37	31.01 N	2094.36 E	2094.57
0.33						
10646.00	89.900	90.000	8859.70	30.84 N	2189.36 E	2189.57
0.30						
10741.00	90.400	89.800	8859.45	31.01 N	2284.36 E	2284.56
0.57						
10837.00	90.700	89.500	8858.53	31.60 N	2380.35 E	2380.55
0.44						
10929.00	90.900	88.900	8857.24	32.88 N	2472.33 E	2472.54
0.69						
11021.00	90.300	89.400	8856.28	34.24 N	2564.32 E	2564.54
0.85						
11116.00	89.500	89.300	8856.45	35.32 N	2659.31 E	2659.54
0.85						
11210.00	89.900	89.100	8856.94	36.63 N	2753.30 E	2753.54
0.48						
11304.00	89.100	88.800	8857.76	38.36 N	2847.28 E	2847.53
0.91						
11403.00	88.700	90.400	8859.66	39.05 N	2946.25 E	2946.51
1.67						
11498.00	87.700	90.400	8862.64	38.39 N	3041.20 E	3041.44
1.05						
11590.00	85.200	90.200	8868.34	37.90 N	3133.02 E	3133.25

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2.73	11684.00	85.800	89.500	8875.72	38.15 N	3226.73 E	3226.95
0.98	11777.00	85.900	89.100	8882.45	39.28 N	3319.48 E	3319.71
0.44	11870.00	85.700	88.900	8889.26	40.90 N	3412.21 E	3412.46
0.30	11966.00	87.500	88.800	8894.95	42.83 N	3508.02 E	3508.28
1.88	12060.00	88.700	87.200	8898.07	46.10 N	3601.91 E	3602.20
2.13	12153.00	89.000	85.400	8899.93	52.10 N	3694.69 E	3695.04
1.96	12247.00	89.700	86.200	8901.00	58.99 N	3788.43 E	3788.85
1.13	12339.00	89.900	86.800	8901.32	64.60 N	3880.26 E	3880.73
0.69	12431.00	88.700	87.600	8902.45	69.10 N	3972.14 E	3972.66
1.57	12526.00	91.600	90.900	8902.20	70.34 N	4067.11 E	4067.64
4.62	12621.00	91.600	91.000	8899.54	68.77 N	4162.06 E	4162.56
0.11	12716.00	91.600	91.900	8896.89	66.36 N	4256.99 E	4257.46
0.95	12808.00	91.500	91.000	8894.40	64.04 N	4348.92 E	4349.37
0.98	12902.00	90.900	91.500	8892.43	61.99 N	4442.88 E	4443.29
0.83	12959.00	90.900	91.500	8891.54	60.50 N	4499.85 E	4500.25
0.00							

All data are in feet unless otherwise stated. Directions and coordinates are relative to Grid North.
Vertical depths are relative to WELL. Northings and Eastings are relative to Site.

The Dogleg Severity is in Degrees per 100 feet.
Vertical Section is from Slot and calculated along an Azimuth of 89.370° (Grid).

Coordinate System is North American Datum 1983 US State Plane 1983, New Mexico Eastern Zone.
Central meridian is -104.333°.
Grid Convergence at Surface is 0.234°.

Based upon Minimum Curvature type calculations, at a Measured Depth of 12959.00ft., the Bottom Hole Displacement is 4500.26ft., in the Direction of 89.370° (Grid).