

PETROLEUM DEVELOPMENT CORP Weld County CO

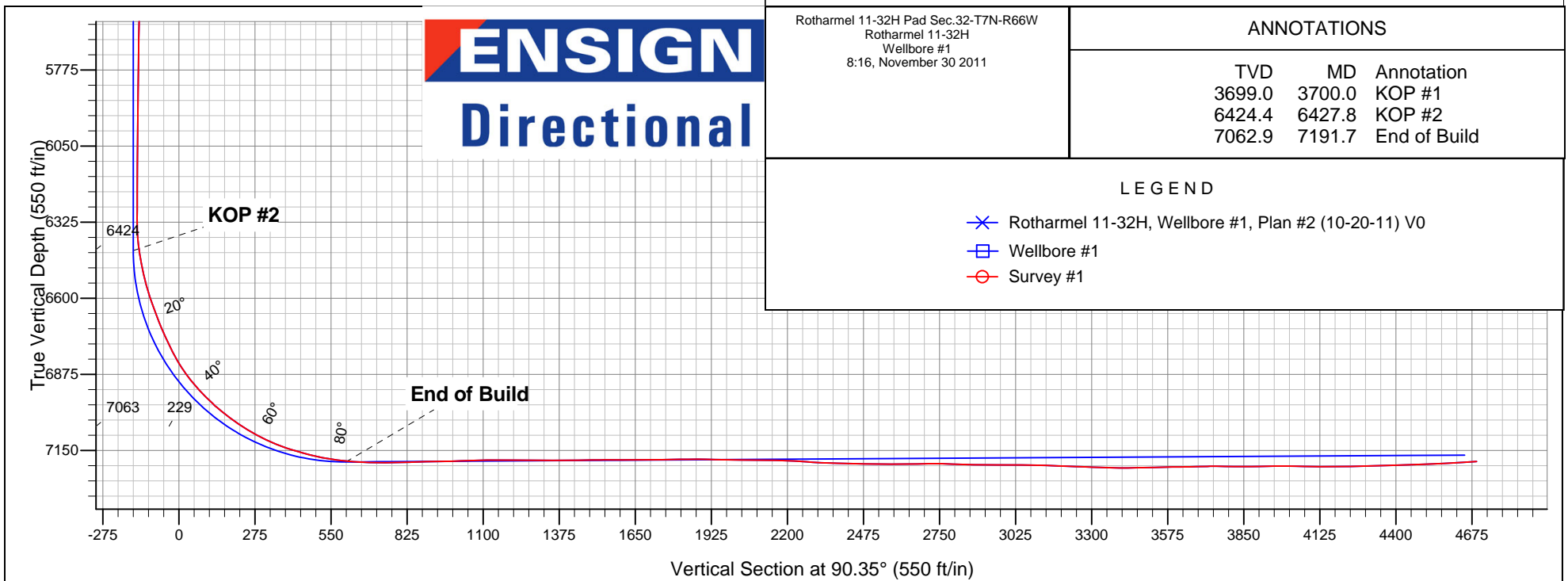
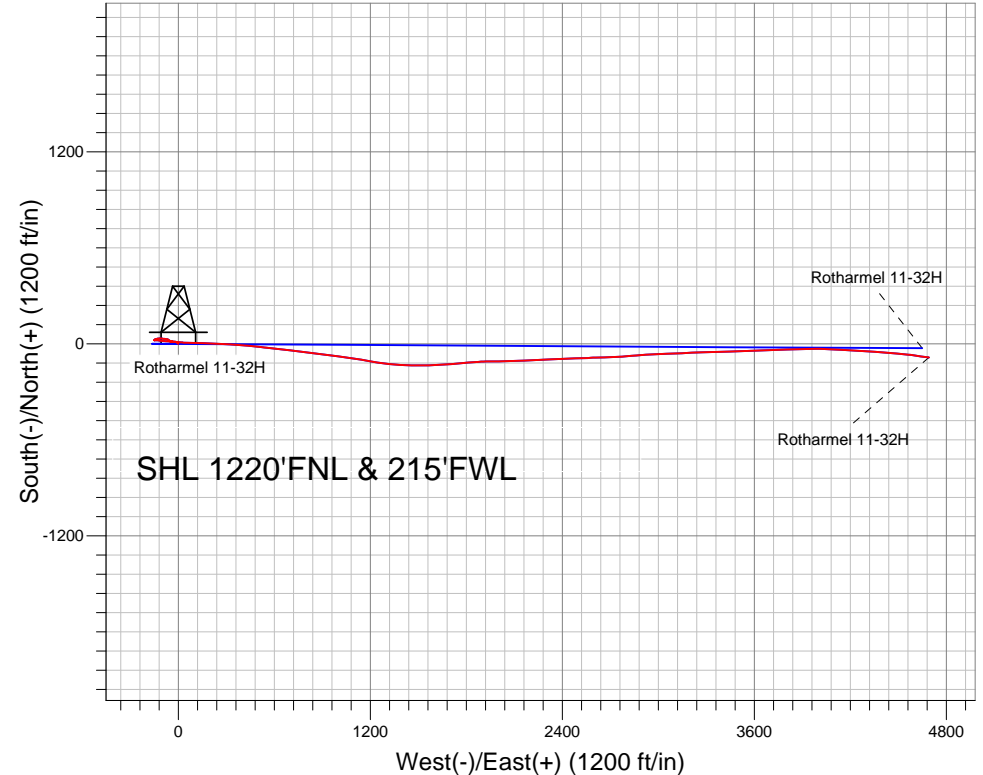
Well Name: **Rotharmel 11-32H**

Surface Location: Rotharmel 11-32H Pad Sec.32-T7N-R66W
 North American Datum 1983 , US State Plane 1983 , Colorado Northern Zone
 Ground Elevation: 4872.0

+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Slot
0.0	0.0	1438435.75	3191234.78	40.534870	-104.811990	
RKB Ensign 32 - 15' WELL @ 4887.0ft (RKB Ensign 32 - 15')						

FINAL SURVEY

Projected Bottom Hole Location
 11693' MD 7190' TVD 86' S & 4691' E of
 SHL
 93.6 degree Incl @ 98.0 degree AZM





Directional

PETROLEUM DEVELOPMENT CORP Weld County CO

SEC.32-T7N-R66W

Rotharmel 11-32H Pad Sec.32-T7N-R66W

Rotharmel 11-32H

Wellbore #1

Survey: Survey #1

Standard Survey Report

30 November, 2011

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Rotharmel 11-32H
Project:	SEC.32-T7N-R66W	TVD Reference:	WELL @ 4887.0ft (RKB Ensign 32 - 15')
Site:	Rotharmel 11-32H Pad Sec.32-T7N-R66W	MD Reference:	WELL @ 4887.0ft (RKB Ensign 32 - 15')
Well:	Rotharmel 11-32H	North Reference:	True
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	Landmark

Project	SEC.32-T7N-R66W, Weld County, Colorado		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		Using Well Reference Point
Map Zone:	Colorado Northern Zone		Using geodetic scale factor

Site		Rotharmel 11-32H Pad Sec.32-T7N-R66W			
Site Position:		Northing:	1,438,435.76ft	Latitude:	40.534870
From:	Lat/Long	Easting:	3,191,234.78ft	Longitude:	-104.811990
Position Uncertainty:	0.0 ft	Slot Radius:	"	Grid Convergence:	0.44 °

Well	Rotharmel 11-32H					
Well Position	+N-S	0.0 ft	Northing:	1,438,435.75 ft	Latitude:	40.534870
	+E-W	0.0 ft	Easting:	3,191,234.78 ft	Longitude:	-104.811990
Position Uncertainty		0.0 ft	Wellhead Elevation:	ft	Ground Level:	4,872.0 ft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	10/20/2011	8.86	67.14	53,160

Design	Wellbore #1				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.0
Vertical Section:	Depth From (TVD) (ft)	+N/-S (ft)	+E/-W (ft)	Direction (°)	
	0.0	0.0	0.0	90.35	

Survey Program	Date	11/30/2011			
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
915.0	11,693.0	Survey #1 (Wellbore #1)	MWD	MWD - Standard	

Survey										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	0.00	
HARDLINE BHL 460'FEL										
0.2	0.00	308.70	0.2	0.0	0.0	0.0	0.00	0.00	0.00	
SECTIONLINE 215'W OF SHL - HARDLINE SHL 460'FWL										
915.0	1.10	308.70	914.9	5.5	-6.9	-6.9	0.12	0.12	0.00	
1,006.0	1.00	320.80	1,005.9	6.7	-8.0	-8.1	0.27	-0.11	13.30	
1,098.0	0.90	305.10	1,097.9	7.7	-9.1	-9.2	0.30	-0.11	-17.07	
1,191.0	0.90	294.30	1,190.9	8.4	-10.4	-10.5	0.18	0.00	-11.61	
1,284.0	1.40	296.10	1,283.9	9.2	-12.1	-12.1	0.54	0.54	1.94	
1,377.0	1.40	296.20	1,376.9	10.2	-14.1	-14.2	0.00	0.00	0.11	
1,470.0	1.10	287.40	1,469.8	11.0	-16.0	-16.1	0.38	-0.32	-9.46	
1,564.0	1.30	278.20	1,563.8	11.4	-17.9	-18.0	0.29	0.21	-9.79	

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Rotharmel 11-32H
Project:	SEC.32-T7N-R66W	TVD Reference:	WELL @ 4887.0ft (RKB Ensign 32 - 15')
Site:	Rotharmel 11-32H Pad Sec.32-T7N-R66W	MD Reference:	WELL @ 4887.0ft (RKB Ensign 32 - 15')
Well:	Rotharmel 11-32H	North Reference:	True
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	Landmark

Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
1,657.0	1.10	286.10	1,656.8	11.8	-19.8	-19.9	0.28	-0.22	8.49
1,750.0	1.20	274.40	1,749.8	12.1	-21.6	-21.7	0.27	0.11	-12.58
1,843.0	1.60	259.80	1,842.7	12.0	-23.9	-24.0	0.57	0.43	-15.70
1,937.0	1.50	268.40	1,936.7	11.7	-26.4	-26.5	0.27	-0.11	9.15
2,030.0	1.40	268.10	2,029.7	11.6	-28.8	-28.8	0.11	-0.11	-0.32
2,123.0	1.80	275.00	2,122.6	11.7	-31.4	-31.4	0.48	0.43	7.42
2,216.0	1.50	286.10	2,215.6	12.2	-34.0	-34.1	0.47	-0.32	11.94
2,309.0	1.60	297.10	2,308.6	13.1	-36.3	-36.4	0.34	0.11	11.83
2,402.0	1.40	293.40	2,401.5	14.2	-38.5	-38.6	0.24	-0.22	-3.98
2,494.0	1.20	275.00	2,493.5	14.7	-40.5	-40.6	0.50	-0.22	-20.00
2,588.0	1.20	255.40	2,587.5	14.5	-42.4	-42.5	0.43	0.00	-20.85
2,681.0	0.90	243.60	2,680.5	14.0	-44.0	-44.1	0.40	-0.32	-12.69
2,773.0	0.90	271.20	2,772.5	13.6	-45.4	-45.5	0.47	0.00	30.00
2,866.0	0.80	251.90	2,865.5	13.5	-46.7	-46.8	0.32	-0.11	-20.75
2,960.0	0.50	267.60	2,959.5	13.2	-47.8	-47.9	0.37	-0.32	16.70
3,053.0	0.70	243.10	3,052.5	13.0	-48.7	-48.8	0.35	0.22	-26.34
3,147.0	0.40	250.60	3,146.4	12.6	-49.5	-49.6	0.33	-0.32	7.98
3,240.0	0.60	300.10	3,239.4	12.7	-50.2	-50.3	0.49	0.22	53.23
3,332.0	1.10	339.90	3,331.4	13.8	-51.0	-51.0	0.81	0.54	43.26
3,425.0	1.10	331.20	3,424.4	15.4	-51.7	-51.8	0.18	0.00	-9.35
3,519.0	3.60	317.20	3,518.3	18.4	-54.1	-54.2	2.71	2.66	-14.89
3,612.0	3.50	305.80	3,611.2	22.2	-58.4	-58.6	0.77	-0.11	-12.26
3,700.0	2.56	301.87	3,699.0	24.8	-62.3	-62.4	1.09	-1.06	-4.46
KOP #1									
3,706.0	2.50	301.50	3,705.0	24.9	-62.5	-62.6	1.09	-1.05	-6.24
3,799.0	3.00	293.40	3,797.9	27.0	-66.5	-66.6	0.68	0.54	-8.71
3,892.0	4.00	281.90	3,890.7	28.6	-71.9	-72.0	1.31	1.08	-12.37
3,985.0	4.00	275.30	3,983.5	29.6	-78.3	-78.5	0.49	0.00	-7.10
4,078.0	3.80	276.10	4,076.3	30.2	-84.6	-84.7	0.22	-0.22	0.86
4,172.0	3.50	273.30	4,170.1	30.7	-90.5	-90.7	0.37	-0.32	-2.98
4,265.0	3.50	273.10	4,262.9	31.0	-96.2	-96.4	0.01	0.00	-0.22
4,358.0	3.00	278.00	4,355.8	31.5	-101.4	-101.6	0.61	-0.54	5.27
4,451.0	2.60	275.10	4,448.7	32.0	-106.0	-106.1	0.46	-0.43	-3.12
4,545.0	2.80	276.00	4,542.6	32.5	-110.4	-110.6	0.22	0.21	0.96
4,638.0	2.70	274.70	4,635.5	32.9	-114.8	-115.0	0.13	-0.11	-1.40
4,731.0	2.50	263.60	4,728.4	32.8	-119.0	-119.2	0.58	-0.22	-11.94
4,824.0	2.30	261.30	4,821.3	32.3	-122.9	-123.1	0.24	-0.22	-2.47
4,917.0	2.20	259.10	4,914.2	31.7	-126.5	-126.6	0.14	-0.11	-2.37
5,010.0	1.80	267.20	5,007.2	31.3	-129.7	-129.9	0.53	-0.43	8.71
5,103.0	1.60	266.10	5,100.1	31.1	-132.4	-132.6	0.22	-0.22	-1.18
5,196.0	1.50	256.70	5,193.1	30.8	-134.9	-135.1	0.29	-0.11	-10.11
5,290.0	1.10	258.60	5,287.1	30.3	-137.0	-137.2	0.43	-0.43	2.02
5,384.0	1.10	264.10	5,381.0	30.0	-138.8	-138.9	0.11	0.00	5.85
5,477.0	1.50	262.80	5,474.0	29.8	-140.9	-141.0	0.43	0.43	-1.40
5,570.0	1.30	269.30	5,567.0	29.6	-143.1	-143.3	0.27	-0.22	6.99
5,663.0	1.10	228.50	5,660.0	29.0	-144.8	-145.0	0.92	-0.22	-43.87
5,757.0	1.30	217.80	5,754.0	27.6	-146.2	-146.3	0.32	0.21	-11.38
5,850.0	1.00	212.00	5,846.9	26.0	-147.3	-147.4	0.35	-0.32	-6.24
5,943.0	1.10	228.40	5,939.9	24.8	-148.4	-148.5	0.34	0.11	17.63
6,033.0	0.90	213.90	6,029.9	23.6	-149.4	-149.5	0.36	-0.22	-16.11
6,127.0	0.50	198.00	6,123.9	22.6	-149.9	-150.1	0.47	-0.43	-16.91
6,220.0	0.60	222.90	6,216.9	21.9	-150.4	-150.5	0.28	0.11	26.77
6,282.0	0.60	208.00	6,278.9	21.3	-150.8	-150.9	0.25	0.00	-24.03

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Rotharmel 11-32H
Project:	SEC.32-T7N-R66W	TVD Reference:	WELL @ 4887.0ft (RKB Ensign 32 - 15')
Site:	Rotharmel 11-32H Pad Sec.32-T7N-R66W	MD Reference:	WELL @ 4887.0ft (RKB Ensign 32 - 15')
Well:	Rotharmel 11-32H	North Reference:	True
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	Landmark

Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
6,313.0	0.40	233.00	6,309.9	21.1	-150.9	-151.1	0.94	-0.65	80.65
6,344.0	1.10	104.60	6,340.9	21.0	-150.7	-150.8	4.47	2.26	-414.19
6,375.0	3.70	90.40	6,371.9	20.9	-149.4	-149.6	8.54	8.39	-45.81
6,406.0	6.50	89.60	6,402.7	20.9	-146.7	-146.8	9.03	9.03	-2.58
6,427.8	7.98	89.98	6,424.4	20.9	-143.9	-144.1	6.78	6.77	1.74
KOP #2									
6,437.0	8.60	90.10	6,433.5	20.9	-142.6	-142.7	6.78	6.77	1.32
6,468.0	10.40	90.50	6,464.0	20.9	-137.5	-137.6	5.81	5.81	1.29
6,500.0	11.60	94.50	6,495.4	20.6	-131.4	-131.5	4.44	3.75	12.50
6,531.0	13.40	95.40	6,525.7	20.0	-124.7	-124.8	5.84	5.81	2.90
6,562.0	15.70	97.00	6,555.7	19.2	-117.0	-117.1	7.53	7.42	5.16
6,593.0	18.20	97.30	6,585.4	18.1	-108.0	-108.1	8.07	8.06	0.97
6,624.0	19.40	96.60	6,614.7	16.8	-98.1	-98.2	3.94	3.87	-2.26
6,655.0	20.00	94.10	6,643.9	15.9	-87.7	-87.8	3.34	1.94	-8.06
6,686.0	20.90	93.10	6,672.9	15.2	-76.9	-77.0	3.11	2.90	-3.23
6,717.0	22.30	91.50	6,701.8	14.7	-65.5	-65.6	4.90	4.52	-5.16
6,748.0	24.00	92.50	6,730.3	14.3	-53.3	-53.4	5.63	5.48	3.23
6,779.0	25.70	93.10	6,758.4	13.7	-40.3	-40.4	5.54	5.48	1.94
6,810.0	26.60	96.10	6,786.2	12.6	-26.7	-26.7	5.16	2.90	9.68
6,841.0	28.90	96.80	6,813.7	11.0	-12.3	-12.4	7.49	7.42	2.26
6,872.0	31.90	96.40	6,840.4	9.2	3.3	3.2	9.70	9.68	-1.29
6,903.0	35.00	94.40	6,866.3	7.6	20.3	20.2	10.61	10.00	-6.45
6,934.0	38.00	92.30	6,891.2	6.5	38.7	38.6	10.48	9.68	-6.77
6,965.0	40.90	92.90	6,915.1	5.6	58.3	58.3	9.44	9.35	1.94
6,996.0	43.10	92.90	6,938.1	4.5	79.1	79.0	7.10	7.10	0.00
7,027.0	45.50	91.50	6,960.3	3.7	100.7	100.7	8.36	7.74	-4.52
7,058.0	46.90	90.10	6,981.8	3.4	123.1	123.0	5.57	4.52	-4.52
7,089.0	49.70	90.00	7,002.4	3.4	146.2	146.2	9.04	9.03	-0.32
7,120.0	52.40	90.70	7,021.9	3.2	170.3	170.3	8.88	8.71	2.26
7,152.0	55.40	91.60	7,040.7	2.7	196.2	196.1	9.65	9.38	2.81
7,182.0	56.30	93.90	7,057.6	1.5	221.0	220.9	7.02	3.00	7.67
7,191.7	56.82	93.93	7,062.9	1.0	229.0	229.0	5.32	5.31	0.32
End of Build									
7,214.0	58.00	94.00	7,074.9	-0.3	247.8	247.8	5.32	5.31	0.31
7,245.0	60.40	93.10	7,090.8	-2.0	274.3	274.4	8.13	7.74	-2.90
7,276.0	63.50	93.10	7,105.4	-3.5	301.7	301.7	10.00	10.00	0.00
7,307.0	66.50	93.30	7,118.5	-5.0	329.7	329.7	9.70	9.68	0.65
7,338.0	69.00	93.50	7,130.2	-6.7	358.3	358.4	8.09	8.06	0.65
7,369.0	71.00	94.00	7,140.8	-8.6	387.4	387.5	6.63	6.45	1.61
7,400.0	73.00	94.60	7,150.4	-10.8	416.8	416.9	6.71	6.45	1.94
7,431.0	74.70	95.10	7,159.0	-13.4	446.5	446.6	5.70	5.48	1.61
7,462.0	76.40	95.20	7,166.8	-16.1	476.4	476.5	5.49	5.48	0.32
7,494.0	77.90	96.70	7,173.9	-19.3	507.4	507.5	6.55	4.69	4.69
7,525.0	80.00	97.10	7,179.8	-22.9	537.6	537.7	6.89	6.77	1.29
7,556.0	82.30	95.80	7,184.6	-26.4	568.0	568.2	8.50	7.42	-4.19
7,587.0	84.60	95.30	7,188.1	-29.4	598.7	598.9	7.59	7.42	-1.61
7,618.0	85.90	98.20	7,190.7	-33.0	629.4	629.6	10.22	4.19	9.35
7,628.0	86.10	97.80	7,191.4	-34.4	639.2	639.4	4.46	2.00	-4.00
7,660.0	87.90	97.30	7,193.1	-38.6	670.9	671.2	5.84	5.63	-1.56
7,692.0	89.10	96.70	7,193.9	-42.5	702.7	702.9	4.19	3.75	-1.88
7,724.0	90.10	96.70	7,194.1	-46.2	734.5	734.7	3.13	3.13	0.00
7,755.0	90.50	97.20	7,194.0	-50.0	765.2	765.5	2.07	1.29	1.61
7,787.0	91.00	97.10	7,193.6	-53.9	797.0	797.3	1.59	1.56	-0.31

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Rotharmel 11-32H
Project:	SEC.32-T7N-R66W	TVD Reference:	WELL @ 4887.0ft (RKB Ensign 32 - 15')
Site:	Rotharmel 11-32H Pad Sec.32-T7N-R66W	MD Reference:	WELL @ 4887.0ft (RKB Ensign 32 - 15')
Well:	Rotharmel 11-32H	North Reference:	True
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	Landmark

Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
7,819.0	91.50	97.30	7,192.9	-58.0	828.7	829.1	1.68	1.56	0.63
7,851.0	91.70	97.30	7,192.0	-62.0	860.4	860.8	0.63	0.63	0.00
7,883.0	91.60	97.40	7,191.0	-66.1	892.2	892.6	0.44	-0.31	0.31
7,915.0	91.30	96.50	7,190.2	-70.0	923.9	924.3	2.96	-0.94	-2.81
7,947.0	90.80	96.60	7,189.6	-73.6	955.7	956.1	1.59	-1.56	0.31
7,979.0	91.60	96.70	7,189.0	-77.3	987.5	987.9	2.52	2.50	0.31
8,011.0	91.80	96.90	7,188.0	-81.1	1,019.2	1,019.7	0.88	0.63	0.63
8,042.0	91.60	98.20	7,187.1	-85.2	1,050.0	1,050.5	4.24	-0.65	4.19
8,074.0	91.70	98.60	7,186.2	-89.9	1,081.6	1,082.1	1.29	0.31	1.25
8,106.0	91.00	99.70	7,185.4	-95.0	1,113.2	1,113.8	4.07	-2.19	3.44
8,137.0	90.20	100.00	7,185.1	-100.3	1,143.7	1,144.3	2.76	-2.58	0.97
8,169.0	89.70	100.30	7,185.1	-105.9	1,175.2	1,175.9	1.82	-1.56	0.94
8,202.0	89.80	99.70	7,185.3	-111.6	1,207.7	1,208.4	1.84	0.30	-1.82
8,233.0	89.40	98.80	7,185.5	-116.6	1,238.3	1,239.0	3.18	-1.29	-2.90
8,265.0	89.40	97.40	7,185.8	-121.1	1,270.0	1,270.7	4.37	0.00	-4.38
8,297.0	89.40	96.30	7,186.2	-124.9	1,301.8	1,302.5	3.44	0.00	-3.44
8,329.0	89.60	95.50	7,186.4	-128.2	1,333.6	1,334.4	2.58	0.63	-2.50
8,361.0	90.50	94.60	7,186.4	-131.0	1,365.5	1,366.3	3.98	2.81	-2.81
8,393.0	91.00	93.30	7,186.0	-133.2	1,397.4	1,398.2	4.35	1.56	-4.06
8,425.0	91.20	92.30	7,185.4	-134.8	1,429.4	1,430.2	3.19	0.63	-3.13
8,457.0	90.90	90.70	7,184.8	-135.6	1,461.3	1,462.1	5.09	-0.94	-5.00
8,489.0	89.80	90.10	7,184.6	-135.9	1,493.3	1,494.1	3.92	-3.44	-1.88
8,520.0	90.30	90.40	7,184.6	-136.0	1,524.3	1,525.1	1.88	1.61	0.97
8,551.0	89.30	87.70	7,184.7	-135.5	1,555.3	1,556.1	9.29	-3.23	-8.71
8,583.0	89.90	87.20	7,184.9	-134.1	1,587.3	1,588.1	2.44	1.88	-1.56
8,615.0	90.90	87.50	7,184.7	-132.6	1,619.3	1,620.0	3.26	3.13	0.94
8,647.0	91.00	86.30	7,184.2	-130.9	1,651.2	1,652.0	3.76	0.31	-3.75
8,679.0	89.90	86.10	7,183.9	-128.7	1,683.1	1,683.9	3.49	-3.44	-0.63
8,711.0	89.90	85.20	7,184.0	-126.3	1,715.0	1,715.8	2.81	0.00	-2.81
8,743.0	90.20	85.10	7,183.9	-123.6	1,746.9	1,747.7	0.99	0.94	-0.31
8,775.0	91.20	85.50	7,183.5	-121.0	1,778.8	1,779.5	3.37	3.13	1.25
8,806.0	91.20	85.60	7,182.9	-118.6	1,809.7	1,810.4	0.32	0.00	0.32
8,838.0	90.50	85.60	7,182.4	-116.1	1,841.6	1,842.3	2.19	-2.19	0.00
8,871.0	89.80	86.00	7,182.3	-113.7	1,874.5	1,875.2	2.44	-2.12	1.21
8,903.0	89.00	87.60	7,182.7	-111.9	1,906.5	1,907.1	5.59	-2.50	5.00
8,935.0	88.40	88.70	7,183.4	-110.9	1,938.5	1,939.1	3.91	-1.88	3.44
8,966.0	89.10	88.70	7,184.1	-110.2	1,969.4	1,970.1	2.26	2.26	0.00
8,998.0	88.80	88.80	7,184.7	-109.5	2,001.4	2,002.1	0.99	-0.94	0.31
9,030.0	89.60	88.10	7,185.1	-108.6	2,033.4	2,034.0	3.32	2.50	-2.19
9,062.0	89.80	89.30	7,185.3	-107.9	2,065.4	2,066.0	3.80	0.63	3.75
9,094.0	90.50	89.90	7,185.2	-107.7	2,097.4	2,098.0	2.88	2.19	1.88
9,126.0	89.60	88.10	7,185.2	-107.1	2,129.4	2,130.0	6.29	-2.81	-5.63
9,158.0	87.50	87.80	7,186.0	-106.0	2,161.4	2,162.0	6.63	-6.56	-0.94
9,190.0	87.00	87.20	7,187.5	-104.6	2,193.3	2,193.9	2.44	-1.56	-1.88
9,222.0	86.90	86.90	7,189.2	-102.9	2,225.2	2,225.8	0.99	-0.31	-0.94
9,254.0	86.80	87.40	7,191.0	-101.3	2,257.1	2,257.7	1.59	-0.31	1.56
9,286.0	86.50	87.20	7,192.8	-99.8	2,289.0	2,289.6	1.13	-0.94	-0.63
9,318.0	87.00	87.20	7,194.6	-98.3	2,320.9	2,321.5	1.56	1.56	0.00
9,350.0	88.00	86.80	7,196.0	-96.6	2,352.9	2,353.4	3.37	3.13	-1.25
9,381.0	88.70	86.90	7,196.9	-94.9	2,383.8	2,384.3	2.28	2.26	0.32
9,413.0	88.50	87.20	7,197.7	-93.3	2,415.7	2,416.3	1.13	-0.63	0.94
9,445.0	89.10	88.50	7,198.4	-92.1	2,447.7	2,448.2	4.47	1.88	4.06
9,477.0	89.20	88.40	7,198.9	-91.2	2,479.7	2,480.2	0.44	0.31	-0.31

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Rotharmel 11-32H
Project:	SEC.32-T7N-R66W	TVD Reference:	WELL @ 4887.0ft (RKB Ensign 32 - 15')
Site:	Rotharmel 11-32H Pad Sec.32-T7N-R66W	MD Reference:	WELL @ 4887.0ft (RKB Ensign 32 - 15')
Well:	Rotharmel 11-32H	North Reference:	True
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	Landmark

Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
9,509.0	89.30	88.40	7,199.3	-90.3	2,511.7	2,512.2	0.31	0.31	0.00
9,541.0	89.50	88.30	7,199.6	-89.4	2,543.7	2,544.2	0.70	0.63	-0.31
9,573.0	90.00	87.10	7,199.8	-88.1	2,575.6	2,576.1	4.06	1.56	-3.75
9,605.0	90.10	88.40	7,199.7	-86.8	2,607.6	2,608.1	4.07	0.31	4.06
9,636.0	90.80	87.90	7,199.5	-85.8	2,638.6	2,639.1	2.77	2.26	-1.61
9,668.0	90.90	88.90	7,199.0	-84.9	2,670.6	2,671.1	3.14	0.31	3.13
9,699.0	91.40	88.70	7,198.4	-84.3	2,701.6	2,702.0	1.74	1.61	-0.65
9,731.0	90.00	87.30	7,198.0	-83.2	2,733.5	2,734.0	6.19	-4.38	-4.38
9,762.0	88.10	85.50	7,198.5	-81.2	2,764.5	2,764.9	8.44	-6.13	-5.81
9,794.0	88.10	85.10	7,199.6	-78.6	2,796.4	2,796.8	1.25	0.00	-1.25
9,826.0	88.40	85.70	7,200.5	-76.0	2,828.2	2,828.7	2.10	0.94	1.88
9,858.0	88.60	84.00	7,201.4	-73.2	2,860.1	2,860.5	5.35	0.63	-5.31
9,889.0	88.80	86.40	7,202.1	-70.6	2,891.0	2,891.4	7.77	0.65	7.74
9,921.0	89.30	87.00	7,202.6	-68.7	2,922.9	2,923.3	2.44	1.56	1.88
9,953.0	90.00	87.80	7,202.8	-67.3	2,954.9	2,955.2	3.32	2.19	2.50
9,985.0	90.40	87.00	7,202.7	-65.8	2,986.9	2,987.2	2.80	1.25	-2.50
10,017.0	90.00	87.20	7,202.6	-64.2	3,018.8	3,019.1	1.40	-1.25	0.63
10,049.0	90.20	88.60	7,202.5	-63.0	3,050.8	3,051.1	4.42	0.63	4.38
10,081.0	88.00	88.10	7,203.0	-62.1	3,082.8	3,083.1	7.05	-6.88	-1.56
10,112.0	88.00	87.20	7,204.1	-60.8	3,113.7	3,114.0	2.90	0.00	-2.90
10,144.0	88.20	87.10	7,205.2	-59.3	3,145.7	3,146.0	0.70	0.63	-0.31
10,176.0	88.00	87.30	7,206.2	-57.7	3,177.6	3,177.9	0.88	-0.63	0.63
10,207.0	88.10	87.60	7,207.3	-56.3	3,208.6	3,208.8	1.02	0.32	0.97
10,239.0	87.90	87.60	7,208.4	-55.0	3,240.5	3,240.8	0.63	-0.63	0.00
10,270.0	88.00	88.30	7,209.5	-53.9	3,271.5	3,271.7	2.28	0.32	2.26
10,302.0	88.00	88.70	7,210.6	-53.0	3,303.4	3,303.7	1.25	0.00	1.25
10,334.0	88.00	88.60	7,211.8	-52.3	3,335.4	3,335.7	0.31	0.00	-0.31
10,366.0	88.70	88.50	7,212.7	-51.5	3,367.4	3,367.6	2.21	2.19	-0.31
10,398.0	89.50	87.70	7,213.2	-50.4	3,399.4	3,399.6	3.54	2.50	-2.50
10,430.0	90.20	88.10	7,213.3	-49.2	3,431.3	3,431.6	2.52	2.19	1.25
10,462.0	90.70	88.30	7,213.0	-48.2	3,463.3	3,463.6	1.68	1.56	0.63
10,494.0	91.30	87.70	7,212.5	-47.1	3,495.3	3,495.5	2.65	1.88	-1.88
10,526.0	92.00	87.40	7,211.5	-45.7	3,527.3	3,527.5	2.38	2.19	-0.94
10,558.0	91.40	88.30	7,210.6	-44.5	3,559.2	3,559.4	3.38	-1.88	2.81
10,590.0	90.10	88.00	7,210.2	-43.5	3,591.2	3,591.4	4.17	-4.06	-0.94
10,622.0	90.60	88.10	7,210.0	-42.4	3,623.2	3,623.4	1.59	1.56	0.31
10,653.0	91.70	88.70	7,209.3	-41.6	3,654.2	3,654.4	4.04	3.55	1.94
10,685.0	91.30	88.10	7,208.5	-40.7	3,686.1	3,686.3	2.25	-1.25	-1.88
10,717.0	91.50	87.30	7,207.7	-39.4	3,718.1	3,718.3	2.58	0.63	-2.50
10,749.0	89.40	88.00	7,207.5	-38.1	3,750.1	3,750.2	6.92	-6.56	2.19
10,781.0	89.20	88.70	7,207.9	-37.1	3,782.1	3,782.2	2.27	-0.63	2.19
10,813.0	89.50	89.20	7,208.2	-36.6	3,814.1	3,814.2	1.82	0.94	1.56
10,845.0	89.80	87.80	7,208.4	-35.7	3,846.0	3,846.2	4.47	0.94	-4.38
10,877.0	90.60	88.00	7,208.3	-34.6	3,878.0	3,878.2	2.58	2.50	0.63
10,909.0	90.60	89.30	7,208.0	-33.8	3,910.0	3,910.1	4.06	0.00	4.06
10,940.0	91.10	88.30	7,207.5	-33.1	3,941.0	3,941.1	3.61	1.61	-3.23
10,972.0	90.90	88.70	7,207.0	-32.3	3,973.0	3,973.1	1.40	-0.63	1.25
11,004.0	89.30	90.00	7,206.9	-31.9	4,005.0	4,005.1	6.44	-5.00	4.06
11,036.0	89.30	92.20	7,207.3	-32.6	4,037.0	4,037.1	6.87	0.00	6.88
11,068.0	89.20	94.80	7,207.7	-34.5	4,068.9	4,069.0	8.13	-0.31	8.13
11,100.0	89.80	92.90	7,208.0	-36.7	4,100.8	4,101.0	6.23	1.88	-5.94
11,132.0	89.20	92.60	7,208.3	-38.2	4,132.8	4,132.9	2.10	-1.88	-0.94
11,164.0	89.80	92.60	7,208.5	-39.6	4,164.8	4,164.9	1.88	1.88	0.00
11,195.0	90.10	93.00	7,208.6	-41.2	4,195.7	4,195.9	1.61	0.97	1.29

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Rotharmel 11-32H
Project:	SEC.32-T7N-R66W	TVD Reference:	WELL @ 4887.0ft (RKB Ensign 32 - 15')
Site:	Rotharmel 11-32H Pad Sec.32-T7N-R66W	MD Reference:	WELL @ 4887.0ft (RKB Ensign 32 - 15')
Well:	Rotharmel 11-32H	North Reference:	True
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	Landmark

Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
11,227.0	90.30	93.30	7,208.5	-42.9	4,227.7	4,227.9	1.13	0.63	0.94
11,259.0	91.00	93.00	7,208.1	-44.7	4,259.6	4,259.8	2.38	2.19	-0.94
11,291.0	91.90	92.60	7,207.3	-46.2	4,291.6	4,291.8	3.08	2.81	-1.25
11,323.0	92.30	94.00	7,206.1	-48.1	4,323.5	4,323.7	4.55	1.25	4.38
11,355.0	92.20	95.10	7,204.9	-50.6	4,355.4	4,355.6	3.45	-0.31	3.44
11,387.0	91.30	94.40	7,203.9	-53.3	4,387.2	4,387.5	3.56	-2.81	-2.19
11,419.0	91.90	93.70	7,203.0	-55.5	4,419.2	4,419.4	2.88	1.88	-2.19
11,451.0	91.70	94.30	7,202.0	-57.8	4,451.1	4,451.3	1.98	-0.63	1.88
11,483.0	92.20	94.90	7,200.9	-60.3	4,482.9	4,483.2	2.44	1.56	1.88
11,514.0	92.20	96.20	7,199.7	-63.3	4,513.8	4,514.1	4.19	0.00	4.19
11,546.0	92.70	95.80	7,198.3	-66.7	4,545.6	4,545.9	2.00	1.56	-1.25
11,578.0	92.60	97.40	7,196.9	-70.3	4,577.3	4,577.7	5.00	-0.31	5.00
11,610.0	93.00	98.30	7,195.3	-74.7	4,609.0	4,609.4	3.07	1.25	2.81
11,642.0	93.60	98.00	7,193.5	-79.2	4,640.6	4,641.0	2.10	1.88	-0.94
TARGET BHL 1320'FNL & 500'FEL									
11,693.0	93.60	98.00	7,190.3	-86.3	4,691.0	4,691.4	0.00	0.00	0.00

Survey Annotations				
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
3,700.0	3,699.0	24.8	-62.3	KOP #1
6,427.8	6,424.4	20.9	-143.9	KOP #2
7,191.7	7,062.9	1.0	229.0	End of Build

Checked By: _____ Approved By: _____ Date: _____