

PETROLEUM DEVELOPMENT CORP Weld County CO

Well Name: **Ram Land 30K-243**

Surface Location: Ram Land 30GK-HZ Pad Sec.30-T4N-R66W
 North American Datum 1983 , US State Plane 1983 , Colorado Northern Zone

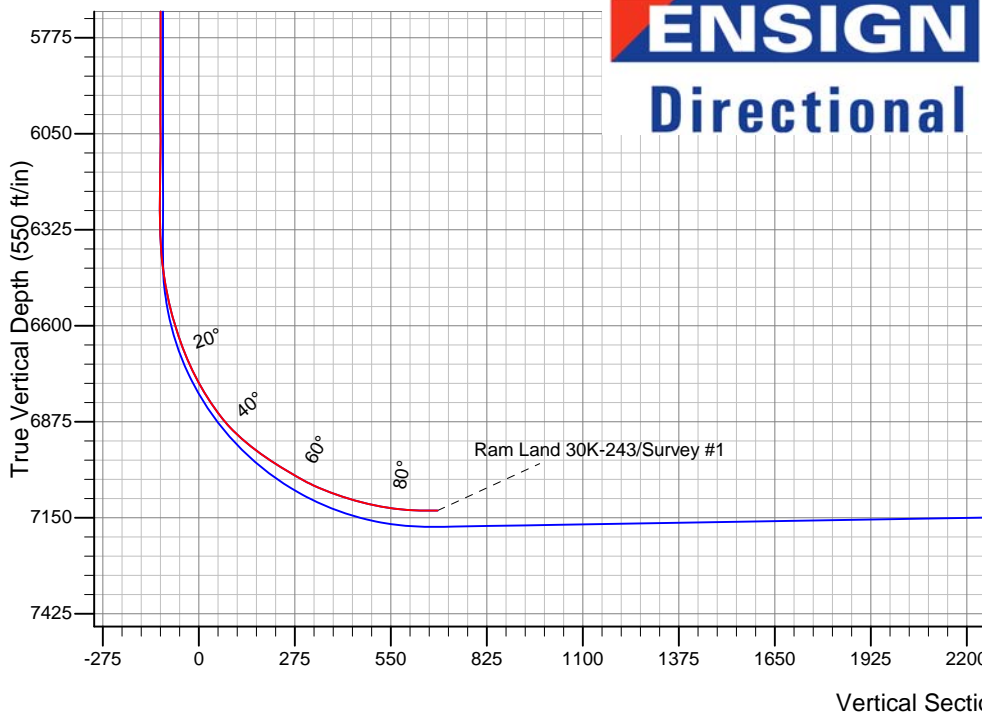
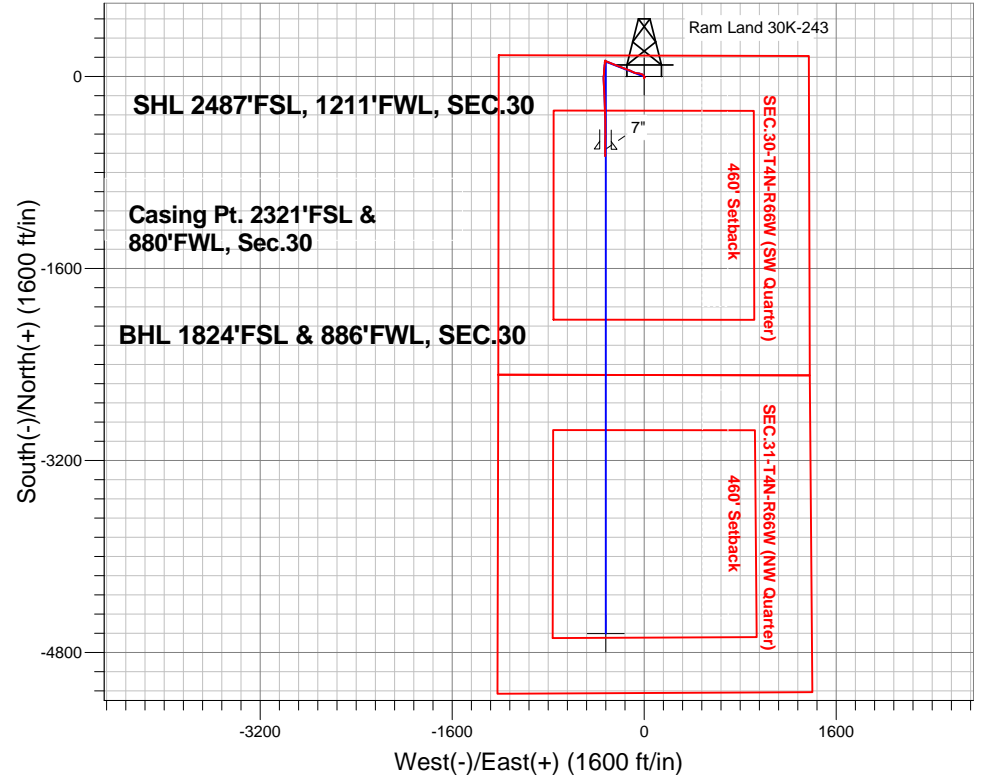
Ground Elevation: 4758.0

+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Slot
0.0	0.0	1346351.64	3188199.45	40.282170	-104.825430	

Ensign Rig #121 - RKB - 13.5' WELL @ 4771.5ft (Ensign Rig #121 - RKB - 13.5')

FINAL SURVEY

Projected Bottom Hole Location
 7617'MD 7130'TVD 663'S & 325'W of SHL
 90.0 degree Incl @ 180.6 degree AZM

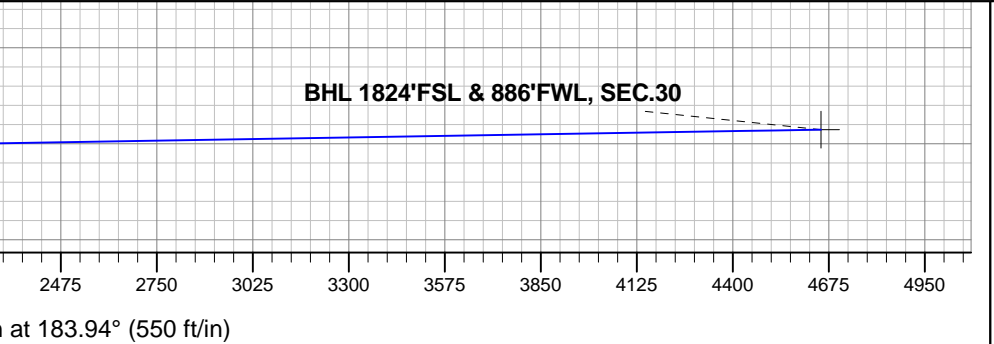


Ram Land 30GK-HZ Pad Sec.30-T4N-R66W
 Ram Land 30K-243
 Wellbore #1
 12:54, May 20 2014

ANNOTATIONS
 No annotation data is available.

LEGEND

- ◆ Ram Land 30K-243, Wellbore #1, Plan #1 (5-02-14)R V0
- Wellbore #1
- Survey #1





PETROLEUM DEVELOPMENT CORP Weld County CO

SEC.30-T4N-R66W

Ram Land 30GK-HZ Pad Sec.30-T4N-R66W

Ram Land 30K-243

Wellbore #1

Survey: Survey #1

Standard Survey Report

20 May, 2014



Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Ram Land 30K-243
Project:	SEC.30-T4N-R66W	TVD Reference:	WELL @ 4771.5ft (Ensign Rig #121 - RKB - 13.5')
Site:	Ram Land 30GK-HZ Pad Sec.30-T4N-R66W	MD Reference:	WELL @ 4771.5ft (Ensign Rig #121 - RKB - 13.5')
Well:	Ram Land 30K-243	North Reference:	True
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	Landmark

Project	SEC.30-T4N-R66W, Weld County, CO		
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	Ram Land 30GK-HZ Pad Sec.30-T4N-R66W				
Site Position:		Northing:	1,346,533.34 ft	Latitude:	40.282640
From:	Lat/Long	Easting:	3,189,570.75 ft	Longitude:	-104.820510
Position Uncertainty:	0.0 ft	Slot Radius:	"	Grid Convergence:	0.44 °

Well	Ram Land 30K-243					
Well Position	+N-S	0.0 ft	Northing:	1,346,351.64 ft	Latitude:	40.282170
	+E-W	0.0 ft	Easting:	3,188,199.45 ft	Longitude:	-104.825430
Position Uncertainty		0.0 ft	Wellhead Elevation:	ft	Ground Level:	4,758.0 ft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	5/2/2014	8.50	66.85	52,760

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	183.94	

Survey Program	Date	5/20/2014			
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
161.0	7,617.0	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	
1.0	0.00	130.90	1.0	0.0	0.0	0.0	0.25	0.25	0.00	
SHL 2487'FSL, 1211'FWL, SEC.30										
161.0	0.40	130.90	161.0	-0.4	0.4	0.3	0.25	0.25	0.00	
251.0	0.50	173.60	251.0	-1.0	0.7	0.9	0.38	0.11	47.44	
343.0	0.40	199.10	343.0	-1.7	0.6	1.6	0.24	-0.11	27.72	
435.0	0.50	156.90	435.0	-2.3	0.7	2.3	0.37	0.11	-45.87	
526.0	0.60	176.60	526.0	-3.2	0.9	3.1	0.23	0.11	21.65	
617.0	0.50	166.00	617.0	-4.0	1.0	4.0	0.16	-0.11	-11.65	
709.0	0.60	158.10	709.0	-4.9	1.3	4.8	0.14	0.11	-8.59	

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Ram Land 30K-243
Project:	SEC.30-T4N-R66W	TVD Reference:	WELL @ 4771.5ft (Ensign Rig #121 - RKB - 13.5')
Site:	Ram Land 30GK-HZ Pad Sec.30-T4N-R66W	MD Reference:	WELL @ 4771.5ft (Ensign Rig #121 - RKB - 13.5')
Well:	Ram Land 30K-243	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)
800.0	0.50	189.90	800.0	-5.7	1.4	5.6	0.35	-0.11	34.95
883.0	0.60	192.60	883.0	-6.5	1.2	6.4	0.12	0.12	3.25
992.0	0.90	208.00	992.0	-7.8	0.7	7.7	0.33	0.28	14.13
1,087.0	0.80	217.70	1,087.0	-9.0	0.0	9.0	0.18	-0.11	10.21
1,182.0	0.80	209.80	1,181.9	-10.1	-0.8	10.1	0.12	0.00	-8.32
1,278.0	1.00	212.90	1,277.9	-11.4	-1.6	11.5	0.21	0.21	3.23
1,372.0	0.90	71.10	1,371.9	-11.8	-1.3	11.9	1.91	-0.11	-150.85
1,468.0	1.10	44.00	1,467.9	-10.9	0.0	10.9	0.53	0.21	-28.23
1,563.0	2.50	10.30	1,562.9	-8.2	1.0	8.1	1.79	1.47	-35.47
1,658.0	4.20	348.60	1,657.7	-2.8	0.7	2.7	2.20	1.79	-22.84
1,753.0	6.00	332.60	1,752.3	5.0	-2.2	-4.9	2.40	1.89	-16.84
1,849.0	5.60	310.30	1,847.8	12.5	-8.1	-11.9	2.37	-0.42	-23.23
1,944.0	6.00	296.40	1,942.4	17.7	-16.1	-16.6	1.53	0.42	-14.63
2,040.0	6.50	287.10	2,037.8	21.6	-25.8	-19.7	1.17	0.52	-9.69
2,135.0	6.70	282.50	2,132.2	24.3	-36.4	-21.8	0.59	0.21	-4.84
2,230.0	6.20	280.10	2,226.6	26.4	-46.8	-23.2	0.60	-0.53	-2.53
2,326.0	5.90	280.30	2,322.0	28.2	-56.8	-24.3	0.31	-0.31	0.21
2,421.0	5.20	278.50	2,416.6	29.7	-65.8	-25.2	0.76	-0.74	-1.89
2,517.0	5.50	286.90	2,512.2	31.7	-74.5	-26.5	0.87	0.31	8.75
2,612.0	5.20	283.40	2,606.8	34.0	-83.1	-28.3	0.47	-0.32	-3.68
2,708.0	5.40	299.80	2,702.3	37.3	-91.2	-30.9	1.59	0.21	17.08
2,803.0	5.50	296.30	2,796.9	41.5	-99.2	-34.6	0.37	0.11	-3.68
2,899.0	5.40	294.10	2,892.5	45.4	-107.4	-37.9	0.24	-0.10	-2.29
2,994.0	5.20	291.90	2,987.1	48.9	-115.5	-40.8	0.30	-0.21	-2.32
3,089.0	5.00	289.80	3,081.7	51.9	-123.4	-43.3	0.29	-0.21	-2.21
3,184.0	4.90	292.90	3,176.3	54.8	-131.0	-45.7	0.30	-0.11	3.26
3,279.0	5.40	294.50	3,271.0	58.3	-138.8	-48.6	0.55	0.53	1.68
3,374.0	5.10	285.90	3,365.6	61.3	-147.0	-51.0	0.89	-0.32	-9.05
3,470.0	5.50	290.10	3,461.2	64.0	-155.4	-53.2	0.58	0.42	4.38
3,565.0	6.20	291.90	3,555.7	67.5	-164.4	-56.0	0.76	0.74	1.89
3,660.0	5.50	287.80	3,650.2	70.8	-173.5	-58.7	0.86	-0.74	-4.32
3,755.0	6.10	290.80	3,744.7	74.0	-182.6	-61.3	0.71	0.63	3.16
3,851.0	7.00	293.80	3,840.1	78.2	-192.7	-64.7	1.00	0.94	3.13
3,946.0	6.80	291.00	3,934.4	82.5	-203.2	-68.4	0.41	-0.21	-2.95
4,041.0	6.70	293.60	4,028.7	86.8	-213.6	-71.9	0.34	-0.11	2.74
4,136.0	5.90	290.80	4,123.1	90.7	-223.2	-75.2	0.90	-0.84	-2.95
4,232.0	6.70	294.10	4,218.6	94.8	-232.9	-78.5	0.91	0.83	3.44
4,327.0	6.50	289.90	4,312.9	98.8	-243.1	-81.9	0.55	-0.21	-4.42
4,422.0	6.90	289.00	4,407.3	102.5	-253.5	-84.9	0.44	0.42	-0.95
4,517.0	6.20	291.00	4,501.7	106.2	-263.7	-87.8	0.77	-0.74	2.11
4,613.0	6.10	293.60	4,597.1	110.1	-273.2	-91.1	0.31	-0.10	2.71
4,708.0	5.90	292.20	4,691.6	114.0	-282.4	-94.3	0.26	-0.21	-1.47
4,803.0	5.40	292.90	4,786.1	117.6	-291.0	-97.3	0.53	-0.53	0.74
4,898.0	5.00	289.00	4,880.7	120.7	-299.0	-99.8	0.56	-0.42	-4.11
4,993.0	5.80	293.40	4,975.3	123.9	-307.3	-102.5	0.95	0.84	4.63
5,089.0	3.90	288.20	5,071.0	126.9	-314.9	-104.9	2.03	-1.98	-5.42
5,184.0	2.80	290.10	5,165.8	128.7	-320.2	-106.4	1.16	-1.16	2.00
5,279.0	1.50	319.10	5,260.7	130.4	-323.1	-107.9	1.74	-1.37	30.53
5,374.0	0.70	282.50	5,355.7	131.5	-324.5	-108.9	1.08	-0.84	-38.53
5,469.0	0.50	286.40	5,450.7	131.7	-325.5	-109.0	0.21	-0.21	4.11
5,564.0	0.40	283.80	5,545.7	131.9	-326.2	-109.2	0.11	-0.11	-2.74

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Ram Land 30K-243
Project:	SEC.30-T4N-R66W	TVD Reference:	WELL @ 4771.5ft (Ensign Rig #121 - RKB - 13.5')
Site:	Ram Land 30GK-HZ Pad Sec.30-T4N-R66W	MD Reference:	WELL @ 4771.5ft (Ensign Rig #121 - RKB - 13.5')
Well:	Ram Land 30K-243	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)	
5,660.0	0.10	255.80	5,641.7	132.0	-326.6	-109.2	0.33	-0.31	-29.17	
5,755.0	0.10	16.80	5,736.7	132.0	-326.7	-109.3	0.18	0.00	127.37	
5,850.0	0.20	12.00	5,831.7	132.3	-326.6	-109.5	0.11	0.11	-5.05	
5,945.0	0.10	14.80	5,926.7	132.5	-326.6	-109.8	0.11	-0.11	2.95	
6,040.0	0.30	354.30	6,021.7	132.8	-326.6	-110.1	0.22	0.21	-21.58	
6,136.0	0.30	27.10	6,117.7	133.3	-326.5	-110.6	0.18	0.00	34.17	
6,231.0	0.40	54.40	6,212.7	133.7	-326.1	-111.0	0.20	0.11	28.74	
6,326.0	0.30	104.50	6,307.7	133.9	-325.6	-111.2	0.33	-0.11	52.74	
6,421.0	5.50	189.70	6,402.6	129.3	-326.1	-106.6	5.77	5.47	89.68	
6,468.0	8.50	189.20	6,449.2	123.7	-327.0	-100.9	6.38	6.38	-1.06	
6,517.0	10.30	181.30	6,497.5	115.7	-327.7	-92.9	4.51	3.67	-16.12	
6,564.0	13.50	183.10	6,543.5	106.0	-328.1	-83.2	6.85	6.81	3.83	
6,612.0	16.90	187.40	6,589.8	93.5	-329.3	-70.6	7.46	7.08	8.96	
6,659.0	18.60	189.00	6,634.6	79.3	-331.4	-56.4	3.76	3.62	3.40	
6,707.0	21.70	184.30	6,679.7	62.9	-333.2	-39.9	7.28	6.46	-9.79	
6,754.0	25.60	182.20	6,722.7	44.1	-334.3	-21.0	8.49	8.30	-4.47	
6,802.0	29.20	184.60	6,765.3	22.1	-335.6	1.1	7.84	7.50	5.00	
6,849.0	31.70	183.80	6,805.8	-1.7	-337.3	24.9	5.39	5.32	-1.70	
6,897.0	36.10	180.10	6,845.7	-28.4	-338.2	51.6	10.12	9.17	-7.71	
6,944.0	41.30	176.50	6,882.3	-57.8	-337.3	80.8	12.05	11.06	-7.66	
6,992.0	48.10	176.20	6,916.4	-91.5	-335.1	114.3	14.17	14.17	-0.63	
7,039.0	52.80	176.70	6,946.4	-127.6	-332.9	150.2	10.03	10.00	1.06	
7,087.0	55.10	177.40	6,974.6	-166.4	-330.9	188.7	4.93	4.79	1.46	
7,134.0	57.60	177.20	7,000.6	-205.5	-329.1	227.6	5.33	5.32	-0.43	
7,183.0	59.40	177.10	7,026.2	-247.2	-327.0	269.1	3.68	3.67	-0.20	
7,230.0	63.60	178.10	7,048.7	-288.4	-325.3	310.1	9.13	8.94	2.13	
7,278.0	67.40	180.20	7,068.6	-332.1	-324.6	353.6	8.86	7.92	4.38	
7,325.0	70.80	180.20	7,085.3	-376.0	-324.8	397.4	7.23	7.23	0.00	
7,372.0	74.40	179.70	7,099.4	-420.8	-324.7	442.2	7.73	7.66	-1.06	
7,419.0	77.20	179.50	7,110.9	-466.4	-324.4	487.6	5.97	5.96	-0.43	
7,468.0	80.00	180.20	7,120.6	-514.4	-324.3	535.5	5.88	5.71	1.43	
7,515.0	84.90	180.10	7,126.8	-561.0	-324.4	582.0	10.43	10.43	-0.21	
7,567.0	89.00	180.60	7,129.5	-612.9	-324.7	633.8	7.94	7.88	0.96	
7,617.0	90.00	180.60	7,130.0	-662.9	-325.3	683.7	2.00	2.00	0.00	

BHL 2154'FNL & 901'FWL, SEC.31

Checked By: _____ Approved By: _____ Date: _____