

PETROLEUM DEVELOPMENT CORP Weld County CO

Well Name: **Ram Land 30G-303**

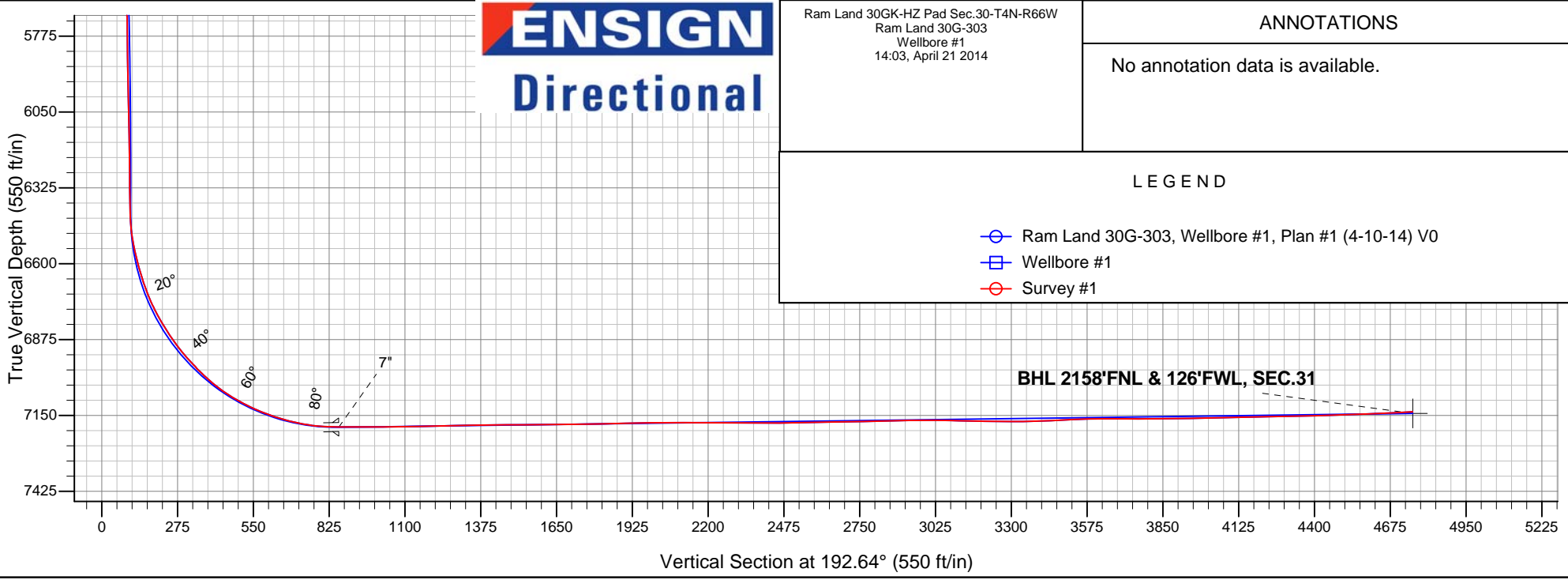
Surface Location: Ram Land 30GK-HZ Pad Sec.30-T4N-R66W
North American Datum 1983 , US State Plane 1983 , Colorado Northern Zone

Ground Elevation: 4758.0

+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Slot
0.0	0.0	1346351.16	3188138.08	40.282170	-104.825650	
Ensign Rig #121 - RKB - 13.5' WELL @ 4771.5ft (Ensign Rig #121 - RKB - 13.5')						

FINAL SURVEY

Projected Bottom Hole Location
11724'MD 7137'TVD 4642'S & 1035'W of
SHL 92.9 degree Incl @ 178.3 degree AZM





PETROLEUM DEVELOPMENT CORP Weld County CO

SEC.30-T4N-R66W

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

Ram Land 30G-303

Wellbore #1

Survey: Survey #1

Standard Survey Report

21 April, 2014

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Ram Land 30G-303
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 30G-303	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 30G-303					
Well Position	+N-S	0.0 ft	Northing:	1,346,351.16 ft	Latitude:	40.282170
	+E-W	0.0 ft	Easting:	3,188,138.08 ft	Longitude:	-104.825650
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	4/10/2014	8.51	66.85	52,767

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	192.64	

Survey Program	Date	4/21/2014			
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
161.0	11,724.0	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	297.10	1.0	0.0	0.0	0.0	0.00	0.00	0.00	
SHL 2487'FSL, 1151'FWL, SEC.30										
161.0	0.20	297.10	161.0	0.1	-0.3	-0.1	0.13	0.13	0.00	
251.0	1.20	304.20	251.0	0.7	-1.2	-0.5	1.11	1.11	7.89	
343.0	2.70	306.80	342.9	2.6	-3.7	-1.7	1.63	1.63	2.83	
434.0	4.70	305.60	433.7	6.0	-8.4	-4.0	2.20	2.20	-1.32	
525.0	5.90	290.60	524.4	9.8	-15.9	-6.1	2.00	1.32	-16.48	
616.0	7.60	284.10	614.7	13.0	-26.1	-6.9	2.05	1.87	-7.14	
707.0	9.10	278.70	704.8	15.5	-39.0	-6.6	1.86	1.65	-5.93	

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Well:	Ram Land 30G-303	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)
798.0	10.30	278.20	794.5	17.8	-54.2	-5.5	1.32	1.32	-0.55
883.0	10.40	274.80	878.1	19.5	-69.4	-3.8	0.73	0.12	-4.00
959.0	11.30	272.20	952.7	20.3	-83.6	-1.5	1.35	1.18	-3.42
991.0	11.10	271.00	984.1	20.5	-89.8	-0.4	0.96	-0.63	-3.75
1,087.0	10.50	277.10	1,078.4	21.8	-107.8	2.4	1.34	-0.63	6.35
1,182.0	12.70	281.50	1,171.5	24.9	-126.6	3.4	2.49	2.32	4.63
1,277.0	12.20	279.20	1,264.2	28.6	-146.7	4.2	0.74	-0.53	-2.42
1,372.0	11.20	273.80	1,357.3	30.8	-165.9	6.2	1.56	-1.05	-5.68
1,467.0	10.10	263.90	1,450.6	30.5	-183.3	10.3	2.24	-1.16	-10.42
1,563.0	10.00	262.20	1,545.2	28.5	-200.0	15.9	0.33	-0.10	-1.77
1,658.0	11.70	275.50	1,638.5	28.3	-217.7	20.0	3.17	1.79	14.00
1,753.0	10.70	272.90	1,731.7	29.7	-236.1	22.7	1.18	-1.05	-2.74
1,849.0	11.10	278.30	1,825.9	31.5	-254.2	24.9	1.14	0.42	5.63
1,944.0	12.00	278.90	1,919.0	34.3	-273.0	26.3	0.96	0.95	0.63
2,039.0	12.50	281.70	2,011.8	37.9	-292.8	27.1	0.82	0.53	2.95
2,135.0	11.10	273.80	2,105.8	40.7	-312.2	28.7	2.22	-1.46	-8.23
2,230.0	11.10	270.60	2,199.0	41.4	-330.5	32.0	0.65	0.00	-3.37
2,326.0	11.00	271.50	2,293.3	41.7	-348.9	35.7	0.21	-0.10	0.94
2,421.0	10.90	276.90	2,386.5	43.0	-366.8	38.3	1.08	-0.11	5.68
2,517.0	11.40	281.00	2,480.7	45.9	-385.2	39.5	0.98	0.52	4.27
2,612.0	11.60	279.00	2,573.8	49.2	-403.8	40.4	0.47	0.21	-2.11
2,708.0	11.80	278.00	2,667.8	52.1	-423.1	41.8	0.30	0.21	-1.04
2,803.0	11.50	276.00	2,760.9	54.4	-442.1	43.7	0.53	-0.32	-2.11
2,898.0	10.90	277.60	2,854.1	56.6	-460.4	45.5	0.71	-0.63	1.68
2,994.0	10.80	276.40	2,948.3	58.8	-478.4	47.3	0.26	-0.10	-1.25
3,089.0	11.30	278.30	3,041.6	61.1	-496.4	49.0	0.65	0.53	2.00
3,184.0	10.50	275.20	3,134.9	63.3	-514.3	50.8	1.04	-0.84	-3.26
3,279.0	10.60	277.60	3,228.3	65.2	-531.5	52.7	0.47	0.11	2.53
3,374.0	10.40	281.00	3,321.7	68.0	-548.6	53.7	0.69	-0.21	3.58
3,469.0	10.10	284.70	3,415.2	71.7	-565.1	53.7	0.76	-0.32	3.89
3,564.0	10.00	279.70	3,508.7	75.2	-581.3	53.8	0.92	-0.11	-5.26
3,660.0	10.30	278.90	3,603.2	78.0	-598.0	54.8	0.35	0.31	-0.83
3,755.0	10.00	276.20	3,696.7	80.2	-614.6	56.3	0.59	-0.32	-2.84
3,850.0	10.20	278.20	3,790.2	82.3	-631.1	57.8	0.42	0.21	2.11
3,946.0	10.00	278.00	3,884.7	84.6	-647.8	59.2	0.21	-0.21	-0.21
4,041.0	11.30	276.90	3,978.1	86.9	-665.2	60.8	1.38	1.37	-1.16
4,136.0	10.40	274.50	4,071.4	88.7	-683.0	62.9	1.06	-0.95	-2.53
4,231.0	9.90	275.50	4,164.9	90.2	-699.6	65.1	0.56	-0.53	1.05
4,327.0	10.70	272.70	4,259.4	91.4	-716.7	67.7	0.98	0.83	-2.92
4,422.0	10.00	276.00	4,352.8	92.6	-733.8	70.2	0.97	-0.74	3.47
4,517.0	9.90	275.90	4,446.4	94.3	-750.1	72.1	0.11	-0.11	-0.11
4,612.0	11.00	278.20	4,539.8	96.5	-767.2	73.7	1.24	1.16	2.42
4,707.0	10.30	277.30	4,633.2	98.8	-784.6	75.2	0.76	-0.74	-0.95
4,803.0	10.90	278.00	4,727.5	101.2	-802.1	76.8	0.64	0.63	0.73
4,898.0	11.90	279.70	4,820.7	104.1	-820.6	78.0	1.11	1.05	1.79
4,993.0	11.50	278.30	4,913.7	107.1	-839.7	79.2	0.52	-0.42	-1.47
5,088.0	10.20	274.60	5,007.0	109.2	-857.4	81.1	1.55	-1.37	-3.89
5,183.0	10.60	273.40	5,100.4	110.4	-874.5	83.7	0.48	0.42	-1.26
5,279.0	10.60	277.60	5,194.8	112.0	-892.1	85.9	0.80	0.00	4.38
5,374.0	10.60	281.50	5,288.2	114.9	-909.3	86.8	0.76	0.00	4.11
5,469.0	10.30	278.50	5,381.6	117.9	-926.3	87.6	0.65	-0.32	-3.16

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Survey										
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5,564.0	10.00	276.90	5,475.1	120.2	-942.9	89.1	0.43	-0.32	-1.68	
5,659.0	9.90	279.20	5,568.7	122.5	-959.1	90.4	0.43	-0.11	2.42	
5,754.0	9.90	280.60	5,662.3	125.3	-975.2	91.2	0.25	0.00	1.47	
5,850.0	8.70	276.90	5,757.0	127.7	-990.5	92.2	1.40	-1.25	-3.85	
5,945.0	8.10	276.90	5,851.0	129.3	-1,004.3	93.6	0.63	-0.63	0.00	
6,040.0	7.20	273.80	5,945.1	130.5	-1,016.9	95.1	1.04	-0.95	-3.26	
6,135.0	6.10	270.60	6,039.5	131.0	-1,027.9	97.1	1.22	-1.16	-3.37	
6,231.0	4.70	269.20	6,135.1	131.0	-1,036.9	99.1	1.46	-1.46	-1.46	
6,326.0	2.70	272.50	6,229.9	131.0	-1,043.0	100.4	2.12	-2.11	3.47	
6,421.0	1.10	261.80	6,324.8	131.0	-1,046.2	101.1	1.72	-1.68	-11.26	
6,516.0	1.60	196.20	6,419.8	129.6	-1,047.4	102.8	1.60	0.53	-69.05	
6,563.0	5.50	181.00	6,466.7	126.7	-1,047.7	105.6	8.46	8.30	-32.34	
6,611.0	9.90	178.70	6,514.3	120.3	-1,047.6	111.9	9.19	9.17	-4.79	
6,658.0	13.20	179.20	6,560.3	110.9	-1,047.4	121.0	7.02	7.02	1.06	
6,707.0	15.70	181.00	6,607.7	98.7	-1,047.5	133.0	5.18	5.10	3.67	
6,754.0	17.90	181.30	6,652.7	85.1	-1,047.8	146.3	4.68	4.68	0.64	
6,802.0	20.70	180.10	6,698.0	69.2	-1,047.9	161.8	5.89	5.83	-2.50	
6,849.0	25.00	179.00	6,741.3	51.0	-1,047.8	179.6	9.19	9.15	-2.34	
6,897.0	29.30	178.10	6,784.0	29.1	-1,047.2	200.8	9.00	8.96	-1.88	
6,944.0	32.10	178.80	6,824.4	5.1	-1,046.6	224.1	6.01	5.96	1.49	
6,992.0	34.40	181.70	6,864.6	-21.2	-1,046.7	249.8	5.82	4.79	6.04	
7,039.0	38.40	182.50	6,902.4	-49.1	-1,047.7	277.2	8.57	8.51	1.70	
7,087.0	41.60	182.40	6,939.2	-79.9	-1,049.1	307.5	6.67	6.67	-0.21	
7,134.0	44.10	181.00	6,973.6	-111.8	-1,050.0	338.9	5.69	5.32	-2.98	
7,182.0	47.60	179.40	7,007.1	-146.3	-1,050.1	372.5	7.67	7.29	-3.33	
7,229.0	51.80	177.80	7,037.5	-182.1	-1,049.2	407.3	9.31	8.94	-3.40	
7,277.0	56.30	177.60	7,065.6	-220.9	-1,047.6	444.8	9.38	9.38	-0.42	
7,324.0	60.90	177.30	7,090.1	-261.0	-1,045.9	483.5	9.80	9.79	-0.64	
7,372.0	63.80	179.00	7,112.4	-303.5	-1,044.5	524.7	6.81	6.04	3.54	
7,419.0	67.00	180.80	7,131.9	-346.2	-1,044.4	566.4	7.65	6.81	3.83	
7,467.0	70.80	179.70	7,149.2	-391.0	-1,044.6	610.1	8.20	7.92	-2.29	
7,514.0	74.50	179.90	7,163.2	-435.8	-1,044.5	653.8	7.88	7.87	0.43	
7,563.0	77.10	180.10	7,175.3	-483.3	-1,044.5	700.2	5.32	5.31	0.41	
7,610.0	81.30	179.50	7,184.1	-529.5	-1,044.3	745.2	9.02	8.94	-1.28	
7,658.0	85.60	179.50	7,189.5	-577.2	-1,043.9	791.6	8.96	8.96	0.00	
7,675.0	87.70	179.50	7,190.5	-594.1	-1,043.7	808.1	12.35	12.35	0.00	
7,750.0	90.50	179.90	7,191.7	-669.1	-1,043.3	881.2	3.77	3.73	0.53	
7,846.0	89.60	179.00	7,191.6	-765.1	-1,042.4	974.7	1.33	-0.94	-0.94	
7,941.0	91.00	178.80	7,191.1	-860.1	-1,040.6	1,067.0	1.49	1.47	-0.21	
8,036.0	90.90	179.40	7,189.6	-955.1	-1,039.1	1,159.3	0.64	-0.11	0.63	
8,131.0	91.20	179.70	7,187.8	-1,050.0	-1,038.4	1,251.8	0.45	0.32	0.32	
8,226.0	91.40	180.20	7,185.7	-1,145.0	-1,038.3	1,344.5	0.57	0.21	0.53	
8,322.0	90.00	179.50	7,184.5	-1,241.0	-1,038.0	1,438.1	1.63	-1.46	-0.73	
8,417.0	90.70	181.00	7,183.9	-1,336.0	-1,038.4	1,530.9	1.74	0.74	1.58	
8,512.0	90.20	180.10	7,183.2	-1,431.0	-1,039.4	1,623.8	1.08	-0.53	-0.95	
8,607.0	90.70	179.40	7,182.4	-1,526.0	-1,038.9	1,716.4	0.91	0.53	-0.74	
8,702.0	91.00	181.10	7,181.0	-1,621.0	-1,039.4	1,809.1	1.82	0.32	1.79	
8,797.0	91.90	180.10	7,178.6	-1,715.9	-1,040.3	1,902.0	1.42	0.95	-1.05	
8,892.0	90.10	179.50	7,176.9	-1,810.9	-1,040.0	1,994.6	2.00	-1.89	-0.63	
8,988.0	90.00	180.10	7,176.9	-1,906.9	-1,039.7	2,088.2	0.63	-0.10	0.63	
9,082.0	90.20	179.20	7,176.7	-2,000.9	-1,039.1	2,179.8	0.98	0.21	-0.96	
9,178.0	89.90	180.20	7,176.6	-2,096.9	-1,038.6	2,273.4	1.09	-0.31	1.04	

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9,273.0	89.20	180.60	7,177.4	-2,191.9	-1,039.3	2,366.2	0.85	-0.74	0.42	
9,368.0	90.70	182.20	7,177.4	-2,286.9	-1,041.6	2,459.4	2.31	1.58	1.68	
9,463.0	90.90	181.10	7,176.1	-2,381.8	-1,044.3	2,552.6	1.18	0.21	-1.16	
9,558.0	91.20	180.80	7,174.4	-2,476.8	-1,045.9	2,645.6	0.45	0.32	-0.32	
9,654.0	91.20	180.10	7,172.4	-2,572.8	-1,046.7	2,739.4	0.73	0.00	-0.73	
9,749.0	91.10	179.40	7,170.5	-2,667.7	-1,046.2	2,832.0	0.74	-0.11	-0.74	
9,844.0	91.30	178.70	7,168.5	-2,762.7	-1,044.7	2,924.4	0.77	0.21	-0.74	
9,939.0	89.30	179.90	7,168.0	-2,857.7	-1,043.5	3,016.8	2.46	-2.11	1.26	
10,034.0	88.80	180.60	7,169.5	-2,952.7	-1,043.9	3,109.6	0.91	-0.53	0.74	
10,129.0	89.00	181.70	7,171.4	-3,047.6	-1,045.8	3,202.6	1.18	0.21	1.16	
10,224.0	89.90	182.50	7,172.3	-3,142.6	-1,049.3	3,296.0	1.27	0.95	0.84	
10,319.0	91.70	182.70	7,170.9	-3,237.5	-1,053.6	3,389.6	1.91	1.89	0.21	
10,414.0	93.20	180.80	7,166.9	-3,332.3	-1,056.5	3,482.7	2.55	1.58	-2.00	
10,509.0	91.40	179.20	7,163.1	-3,427.2	-1,056.5	3,575.4	2.53	-1.89	-1.68	
10,605.0	89.50	178.30	7,162.3	-3,523.2	-1,054.4	3,668.5	2.19	-1.98	-0.94	
10,700.0	89.90	179.20	7,162.8	-3,618.2	-1,052.3	3,760.8	1.04	0.42	0.95	
10,795.0	90.70	180.10	7,162.3	-3,713.2	-1,051.8	3,853.3	1.27	0.84	0.95	
10,890.0	90.90	178.70	7,161.0	-3,808.2	-1,050.8	3,945.8	1.49	0.21	-1.47	
10,985.0	91.50	178.30	7,159.0	-3,903.1	-1,048.3	4,037.9	0.76	0.63	-0.42	
11,081.0	91.40	178.30	7,156.6	-3,999.0	-1,045.4	4,130.9	0.10	-0.10	0.00	
11,176.0	90.60	179.20	7,154.9	-4,094.0	-1,043.4	4,223.1	1.27	-0.84	0.95	
11,271.0	91.10	180.60	7,153.5	-4,189.0	-1,043.2	4,315.7	1.56	0.53	1.47	
11,366.0	91.80	179.70	7,151.1	-4,283.9	-1,043.4	4,408.5	1.20	0.74	-0.95	
11,461.0	92.30	178.30	7,147.7	-4,378.9	-1,041.8	4,500.7	1.56	0.53	-1.47	
11,557.0	91.70	179.00	7,144.4	-4,474.8	-1,039.5	4,593.8	0.96	-0.63	0.73	
11,667.0	92.90	178.30	7,139.9	-4,584.7	-1,036.9	4,700.5	1.26	1.09	-0.64	
11,723.2	92.90	178.30	7,137.1	-4,640.7	-1,035.3	4,754.8	0.00	0.00	0.00	
BHL 2158'FNL & 120'FWL, SEC.31										
11,724.0	92.90	178.30	7,137.1	-4,641.6	-1,035.3	4,755.6	0.00	0.00	0.00	

Checked By: _____	Approved By: _____	Date: _____
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