

PETROLEUM DEVELOPMENT CORP Weld County CO

Well Name: **Guttersen 31Q-221**

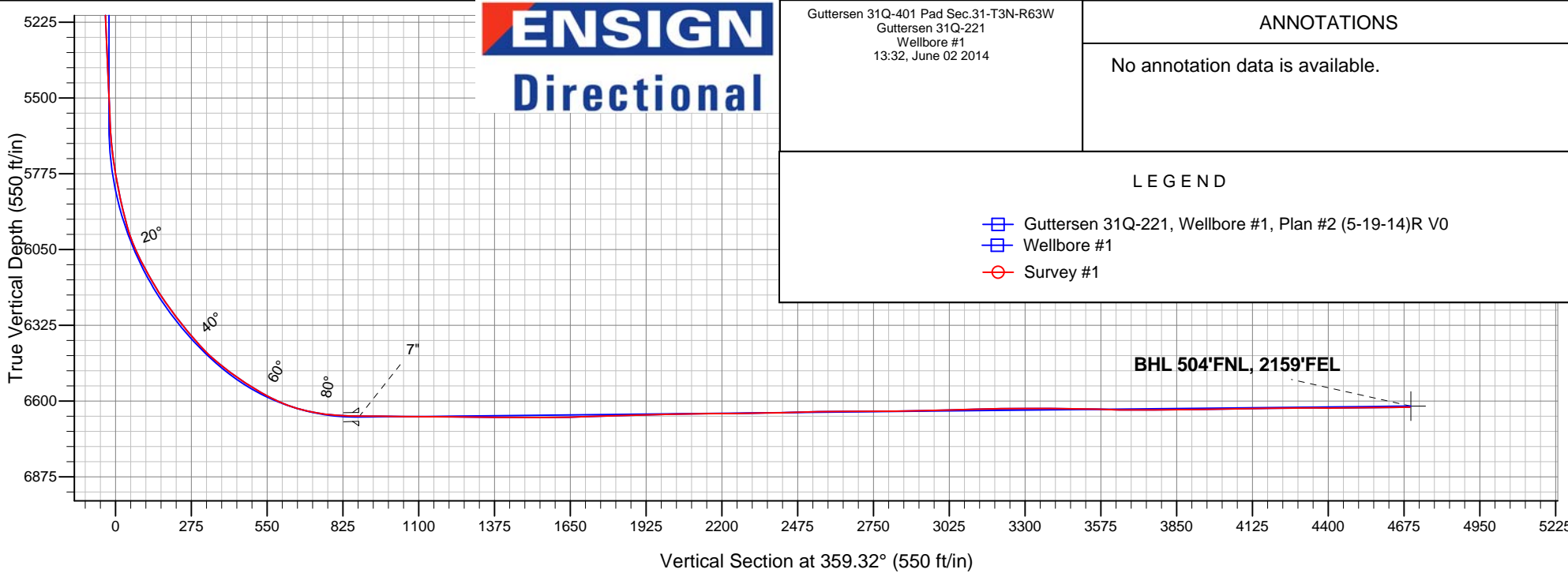
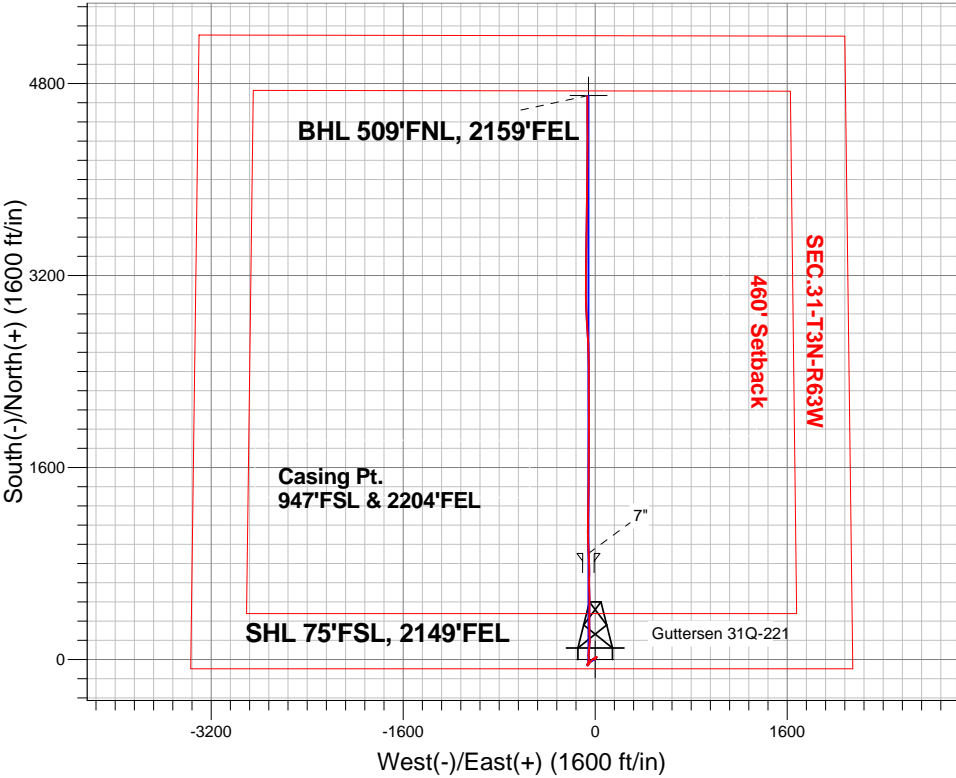
Surface Location: Guttersen 31Q-401 Pad Sec.31-T3N-R63W
North American Datum 1983 , US State Plane 1983 , Colorado Northern Zone

Ground Elevation: 4823.0

+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Slot
0.0	0.0	1308191.75	3285406.03	40.174870	-104.478610	
Ensign Rig #136 - RKB - 12.5' WELL @ 4835.5ft (Ensign Rig #136 - RKB - 12.5')						

FINAL SURVEY

Projected Bottom Hole Location
10956'MD 6622'TVD 4696'N & 66'W of SHL
90.5 degree Incl @ 0.82 degree AZM



Guttersen 31Q-401 Pad Sec.31-T3N-R63W Guttersen 31Q-221 Wellbore #1 13:32, June 02 2014	ANNOTATIONS
	No annotation data is available.
LEGEND	
Guttersen 31Q-221, Wellbore #1, Plan #2 (5-19-14)R V0	
Wellbore #1	
Survey #1	

BHL 504'FNL, 2159'FEL



PETROLEUM DEVELOPMENT CORP Weld County CO

SEC.31-T3N-R63W

Guttersen 31Q-401 Pad Sec.31-T3N-R63W

Guttersen 31Q-221

Wellbore #1

Survey: Survey #1

Standard Survey Report

02 June, 2014

Company:	PETROLEUM DEVELOPMENT CORP Weld County CO	Local Co-ordinate Reference:	Well Gutteresen 31Q-221
Project:	SEC.31-T3N-R63W	TVD Reference:	WELL @ 4835.5ft (Ensign Rig #136 - RKB - 12.5')
Site:	Gutteresen 31Q-401 Pad Sec.31-T3N-R63W	MD Reference:	WELL @ 4835.5ft (Ensign Rig #136 - RKB - 12.5')
Well:	Gutteresen 31Q-221	North Reference:	True
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	Landmark

Project	SEC.31-T3N-R63W, 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		Guttersen 31Q-401 Pad Sec.31-T3N-R63W			
Site Position:		Northing:	1,308,191.41 ft	Latitude:	40.174870
From:	Lat/Long	Easting:	3,285,375.30 ft	Longitude:	-104.478720
Position Uncertainty:	0.0 ft	Slot Radius:	"	Grid Convergence:	0.66 °

Well	Guttersen 31Q-221					
Well Position	+N-S	0.0 ft	Northing:	1,308,191.75 ft	Latitude:	40.174870
	+E-W	0.0 ft	Easting:	3,285,406.03 ft	Longitude:	-104.478610
Position Uncertainty		0.0 ft	Wellhead Elevation:	ft	Ground Level:	4,823.0 ft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	5/19/2014	8.30	66.81	52,735

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	359.32	

Survey Program	Date 6/2/2014			
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description
76.0	10,956.0	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	0.01	303.80	1.0	0.0	0.0	0.0	1.18	1.18	0.00	
SHL 75°FSL, 2149°FEL										
76.0	0.90	303.80	76.0	0.3	-0.5	0.3	1.18	1.18	0.00	
164.0	0.70	299.00	164.0	1.0	-1.5	1.0	0.24	-0.23	-5.45	
258.0	0.40	265.40	258.0	1.2	-2.4	1.3	0.46	-0.32	-35.74	
349.0	0.40	234.50	349.0	1.0	-2.9	1.1	0.23	0.00	-33.96	
439.0	0.50	241.90	439.0	0.7	-3.5	0.7	0.13	0.11	8.22	
530.0	0.60	228.20	530.0	0.1	-4.3	0.2	0.18	0.11	-15.05	
621.0	0.90	228.90	621.0	-0.6	-5.1	-0.6	0.33	0.33	0.77	

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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)
712.0	0.90	232.60	712.0	-1.5	-6.3	-1.5	0.06	0.00	4.07
803.0	0.30	30.60	803.0	-1.8	-6.7	-1.7	1.30	-0.66	173.63
889.0	0.40	34.30	889.0	-1.3	-6.4	-1.3	0.12	0.12	4.30
959.0	0.40	345.30	958.9	-0.9	-6.3	-0.8	0.47	0.00	-70.00
1,054.0	0.30	358.50	1,053.9	-0.3	-6.4	-0.2	0.13	-0.11	13.89
1,145.0	0.20	244.40	1,144.9	-0.2	-6.6	-0.1	0.46	-0.11	-125.38
1,236.0	0.40	8.80	1,235.9	0.1	-6.7	0.2	0.59	0.22	136.70
1,327.0	0.10	102.90	1,326.9	0.4	-6.5	0.5	0.46	-0.33	103.41
1,417.0	0.30	2.30	1,416.9	0.6	-6.5	0.7	0.37	0.22	-111.78
1,508.0	0.20	340.70	1,507.9	1.0	-6.5	1.1	0.15	-0.11	-23.74
1,599.0	0.50	24.30	1,598.9	1.5	-6.4	1.6	0.42	0.33	47.91
1,690.0	0.40	17.60	1,689.9	2.2	-6.1	2.2	0.12	-0.11	-7.36
1,781.0	0.60	0.60	1,780.9	2.9	-6.0	3.0	0.27	0.22	-18.68
1,871.0	1.10	44.90	1,870.9	4.0	-5.4	4.1	0.88	0.56	49.22
1,962.0	1.30	49.80	1,961.9	5.3	-4.0	5.4	0.25	0.22	5.38
2,053.0	1.20	26.80	2,052.9	6.8	-2.8	6.9	0.56	-0.11	-25.27
2,144.0	1.10	36.80	2,143.9	8.4	-1.8	8.4	0.25	-0.11	10.99
2,237.0	1.30	31.90	2,236.8	10.0	-0.8	10.0	0.24	0.22	-5.27
2,332.0	1.40	62.80	2,331.8	11.4	0.9	11.4	0.76	0.11	32.53
2,427.0	0.70	80.70	2,426.8	12.1	2.5	12.0	0.81	-0.74	18.84
2,523.0	1.10	86.20	2,522.8	12.2	4.0	12.2	0.43	0.42	5.73
2,618.0	0.90	40.30	2,617.8	12.8	5.3	12.8	0.84	-0.21	-48.32
2,713.0	1.20	42.00	2,712.8	14.2	6.5	14.1	0.32	0.32	1.79
2,808.0	1.80	34.30	2,807.7	16.1	8.0	16.0	0.66	0.63	-8.11
2,903.0	1.60	41.20	2,902.7	18.4	9.7	18.2	0.30	-0.21	7.26
2,998.0	0.80	8.30	2,997.7	20.0	10.7	19.9	1.08	-0.84	-34.63
3,093.0	1.80	231.40	3,092.7	19.7	9.6	19.6	2.57	1.05	-144.11
3,188.0	5.60	240.50	3,187.4	16.5	4.4	16.5	4.03	4.00	9.58
3,283.0	5.90	240.50	3,282.0	11.8	-3.9	11.9	0.32	0.32	0.00
3,378.0	5.70	235.80	3,376.5	6.8	-12.0	6.9	0.54	-0.21	-4.95
3,474.0	6.80	235.60	3,471.9	0.9	-20.7	1.1	1.15	1.15	-0.21
3,569.0	8.50	221.20	3,566.1	-7.6	-29.9	-7.2	2.68	1.79	-15.16
3,664.0	8.80	219.80	3,660.0	-18.4	-39.2	-18.0	0.39	0.32	-1.47
3,759.0	9.00	218.00	3,753.8	-29.9	-48.4	-29.3	0.36	0.21	-1.89
3,854.0	7.40	208.50	3,847.9	-41.1	-55.9	-40.4	2.20	-1.68	-10.00
3,949.0	3.50	230.80	3,942.4	-48.3	-61.1	-47.6	4.60	-4.11	23.47
4,044.0	0.40	299.70	4,037.4	-50.0	-63.6	-49.2	3.55	-3.26	72.53
4,139.0	0.40	256.30	4,132.4	-49.9	-64.2	-49.1	0.31	0.00	-45.68
4,234.0	0.50	268.80	4,227.4	-50.0	-65.0	-49.2	0.15	0.11	13.16
4,330.0	0.50	25.90	4,323.4	-49.6	-65.2	-48.8	0.89	0.00	121.98
4,425.0	0.50	48.60	4,418.4	-49.0	-64.7	-48.2	0.21	0.00	23.89
4,520.0	0.60	8.10	4,513.4	-48.2	-64.3	-47.4	0.41	0.11	-42.63
4,615.0	0.40	12.50	4,608.4	-47.4	-64.2	-46.6	0.21	-0.21	4.63
4,711.0	1.00	327.50	4,704.3	-46.4	-64.6	-45.6	0.80	0.63	-46.88
4,806.0	0.80	307.70	4,799.3	-45.3	-65.5	-44.5	0.39	-0.21	-20.84
4,901.0	0.70	284.50	4,894.3	-44.7	-66.6	-43.9	0.33	-0.11	-24.42
4,996.0	0.80	19.90	4,989.3	-43.9	-67.0	-43.1	1.17	0.11	100.42
5,091.0	2.20	22.70	5,084.3	-41.6	-66.0	-40.8	1.48	1.47	2.95
5,187.0	2.50	30.10	5,180.2	-38.1	-64.3	-37.4	0.44	0.31	7.71
5,282.0	2.60	25.40	5,275.1	-34.4	-62.3	-33.6	0.24	0.11	-4.95
5,377.0	2.70	20.30	5,370.0	-30.3	-60.6	-29.6	0.27	0.11	-5.37

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Design:	Wellbore #1	Database:	Landmark

Survey									
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5,472.0	2.80	14.60	5,464.9	-26.0	-59.2	-25.3	0.31	0.11	-6.00
5,568.0	2.30	19.00	5,560.8	-21.9	-58.0	-21.2	0.56	-0.52	4.58
5,599.0	2.40	17.10	5,591.8	-20.7	-57.6	-20.0	0.41	0.32	-6.13
5,631.0	3.90	13.90	5,623.7	-19.0	-57.2	-18.3	4.72	4.69	-10.00
5,663.0	4.90	3.00	5,655.6	-16.6	-56.8	-15.9	4.06	3.13	-34.06
5,694.0	6.50	1.80	5,686.5	-13.5	-56.7	-12.8	5.18	5.16	-3.87
5,726.0	8.10	4.60	5,718.2	-9.4	-56.5	-8.8	5.12	5.00	8.75
5,758.0	9.00	8.30	5,749.9	-4.7	-55.9	-4.0	3.29	2.81	11.56
5,789.0	9.50	6.70	5,780.5	0.2	-55.3	0.9	1.81	1.61	-5.16
5,821.0	10.10	3.40	5,812.0	5.6	-54.8	6.3	2.57	1.88	-10.31
5,853.0	11.40	357.90	5,843.4	11.6	-54.8	12.3	5.17	4.06	-17.19
5,885.0	12.80	356.70	5,874.7	18.3	-55.1	19.0	4.44	4.38	-3.75
5,917.0	13.90	356.70	5,905.9	25.7	-55.5	26.3	3.44	3.44	0.00
5,948.0	14.80	0.20	5,935.9	33.4	-55.7	34.0	4.03	2.90	11.29
5,980.0	16.30	2.10	5,966.7	41.9	-55.5	42.6	4.95	4.69	5.94
6,012.0	17.70	5.00	5,997.3	51.3	-54.9	51.9	5.11	4.38	9.06
6,043.0	21.50	6.00	6,026.5	61.6	-53.9	62.3	12.31	12.26	3.23
6,075.0	25.00	5.70	6,055.9	74.2	-52.7	74.8	10.94	10.94	-0.94
6,107.0	27.20	5.80	6,084.6	88.2	-51.2	88.8	6.88	6.88	0.31
6,139.0	28.10	5.00	6,113.0	103.0	-49.8	103.6	3.04	2.81	-2.50
6,170.0	29.30	4.10	6,140.2	117.8	-48.7	118.4	4.11	3.87	-2.90
6,202.0	30.30	2.70	6,168.0	133.7	-47.7	134.2	3.81	3.13	-4.38
6,234.0	31.40	1.10	6,195.4	150.1	-47.2	150.6	4.29	3.44	-5.00
6,266.0	33.20	358.80	6,222.5	167.2	-47.2	167.7	6.81	5.63	-7.19
6,297.0	35.30	358.10	6,248.1	184.6	-47.7	185.2	6.89	6.77	-2.26
6,329.0	36.80	358.10	6,274.0	203.4	-48.3	204.0	4.69	4.69	0.00
6,361.0	37.90	358.60	6,299.4	222.9	-48.9	223.4	3.57	3.44	1.56
6,392.0	38.80	358.80	6,323.7	242.1	-49.3	242.6	2.93	2.90	0.65
6,424.0	39.70	359.00	6,348.5	262.3	-49.7	262.9	2.84	2.81	0.63
6,456.0	40.20	358.50	6,373.0	282.9	-50.1	283.4	1.86	1.56	-1.56
6,488.0	42.00	0.00	6,397.1	303.9	-50.4	304.5	6.41	5.63	4.69
6,520.0	44.90	2.00	6,420.4	325.9	-50.0	326.5	10.03	9.06	6.25
6,551.0	48.70	1.40	6,441.6	348.5	-49.4	349.0	12.34	12.26	-1.94
6,583.0	50.60	1.80	6,462.3	372.9	-48.7	373.4	6.01	5.94	1.25
6,615.0	52.20	0.70	6,482.3	397.9	-48.1	398.4	5.68	5.00	-3.44
6,647.0	53.70	0.20	6,501.6	423.4	-47.9	423.9	4.85	4.69	-1.56
6,678.0	55.40	0.00	6,519.5	448.6	-47.9	449.2	5.51	5.48	-0.65
6,710.0	57.50	359.20	6,537.2	475.3	-48.1	475.9	6.89	6.56	-2.50
6,742.0	58.70	358.50	6,554.1	502.5	-48.6	503.0	4.18	3.75	-2.19
6,773.0	60.40	357.90	6,569.8	529.2	-49.5	529.7	5.73	5.48	-1.94
6,805.0	62.40	357.90	6,585.2	557.3	-50.5	557.8	6.25	6.25	0.00
6,837.0	65.30	358.60	6,599.3	586.0	-51.4	586.5	9.27	9.06	2.19
6,869.0	68.20	359.90	6,611.9	615.4	-51.7	615.9	9.80	9.06	4.06
6,900.0	72.30	0.40	6,622.4	644.5	-51.7	645.1	13.31	13.23	1.61
6,932.0	75.30	1.10	6,631.3	675.3	-51.3	675.8	9.61	9.38	2.19
6,964.0	78.50	1.10	6,638.5	706.4	-50.7	707.0	10.00	10.00	0.00
6,996.0	81.20	0.00	6,644.2	737.9	-50.4	738.5	9.09	8.44	-3.44
7,027.0	83.50	358.60	6,648.3	768.6	-50.7	769.2	8.66	7.42	-4.52
7,059.0	85.60	357.60	6,651.3	800.5	-51.8	801.0	7.26	6.56	-3.13
7,072.0	86.40	357.40	6,652.2	813.4	-52.4	814.0	6.34	6.15	-1.54
7,131.0	89.20	356.70	6,654.5	872.3	-55.4	872.9	4.89	4.75	-1.19
7,222.0	90.00	358.10	6,655.1	963.2	-59.5	963.8	1.77	0.88	1.54

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7,313.0	88.80	359.70	6,656.1	1,054.2	-61.3	1,054.8	2.20	-1.32	1.76
7,404.0	90.30	1.30	6,656.8	1,145.2	-60.5	1,145.8	2.41	1.65	1.76
7,495.0	89.30	0.60	6,657.1	1,236.1	-59.0	1,236.8	1.34	-1.10	-0.77
7,585.0	89.00	0.00	6,658.5	1,326.1	-58.5	1,326.7	0.75	-0.33	-0.67
7,676.0	90.30	1.60	6,659.0	1,417.1	-57.2	1,417.7	2.27	1.43	1.76
7,767.0	89.50	0.90	6,659.2	1,508.1	-55.2	1,508.6	1.17	-0.88	-0.77
7,858.0	90.70	359.90	6,659.0	1,599.1	-54.6	1,599.6	1.72	1.32	-1.10
7,950.0	92.00	0.00	6,656.9	1,691.1	-54.7	1,691.6	1.42	1.41	0.11
8,045.0	91.80	0.40	6,653.7	1,786.0	-54.4	1,786.5	0.47	-0.21	0.42
8,140.0	91.50	0.00	6,651.0	1,881.0	-54.0	1,881.5	0.53	-0.32	-0.42
8,235.0	91.30	0.00	6,648.7	1,975.9	-54.0	1,976.4	0.21	-0.21	0.00
8,331.0	91.10	0.70	6,646.6	2,071.9	-53.4	2,072.4	0.76	-0.21	0.73
8,426.0	90.10	359.20	6,645.6	2,166.9	-53.5	2,167.4	1.90	-1.05	-1.58
8,521.0	91.20	0.00	6,644.6	2,261.9	-54.2	2,262.4	1.43	1.16	0.84
8,616.0	90.50	0.00	6,643.2	2,356.9	-54.2	2,357.4	0.74	-0.74	0.00
8,711.0	91.90	359.20	6,641.2	2,451.9	-54.8	2,452.3	1.70	1.47	-0.84
8,806.0	91.10	358.30	6,638.7	2,546.8	-56.9	2,547.3	1.27	-0.84	-0.95
8,901.0	90.70	357.80	6,637.2	2,641.7	-60.2	2,642.3	0.67	-0.42	-0.53
8,996.0	90.00	356.20	6,636.6	2,736.6	-65.1	2,737.2	1.84	-0.74	-1.68
9,091.0	90.30	356.90	6,636.4	2,831.4	-70.8	2,832.1	0.80	0.32	0.74
9,186.0	91.50	357.60	6,634.9	2,926.3	-75.4	2,927.0	1.46	1.26	0.74
9,282.0	91.50	358.60	6,632.4	3,022.2	-78.6	3,022.9	1.04	0.00	1.04
9,377.0	91.60	0.60	6,629.8	3,117.2	-79.2	3,117.9	2.11	0.11	2.11
9,472.0	90.80	1.10	6,627.8	3,212.1	-77.8	3,212.8	0.99	-0.84	0.53
9,567.0	90.10	0.00	6,627.1	3,307.1	-76.9	3,307.8	1.37	-0.74	-1.16
9,662.0	89.70	0.90	6,627.2	3,402.1	-76.2	3,402.8	1.04	-0.42	0.95
9,757.0	89.40	1.60	6,628.0	3,497.1	-74.1	3,497.7	0.80	-0.32	0.74
9,852.0	87.70	0.20	6,630.4	3,592.0	-72.6	3,592.7	2.32	-1.79	-1.47
9,947.0	90.60	1.30	6,631.8	3,687.0	-71.4	3,687.6	3.26	3.05	1.16
10,042.0	90.10	359.90	6,631.2	3,782.0	-70.4	3,782.6	1.56	-0.53	-1.47
10,138.0	90.30	1.10	6,630.9	3,878.0	-69.5	3,878.6	1.27	0.21	1.25
10,233.0	91.00	0.20	6,629.8	3,973.0	-68.5	3,973.5	1.20	0.74	-0.95
10,328.0	91.00	0.70	6,628.1	4,068.0	-67.7	4,068.5	0.53	0.00	0.53
10,423.0	91.00	1.60	6,626.5	4,162.9	-65.8	4,163.4	0.95	0.00	0.95
10,518.0	90.60	0.20	6,625.1	4,257.9	-64.3	4,258.4	1.53	-0.42	-1.47
10,614.0	89.60	359.50	6,625.0	4,353.9	-64.6	4,354.4	1.27	-1.04	-0.73
10,709.0	90.70	359.20	6,624.7	4,448.9	-65.6	4,449.4	1.20	1.16	-0.32
10,804.0	90.70	359.70	6,623.6	4,543.9	-66.6	4,544.4	0.53	0.00	0.53
10,899.0	90.60	0.40	6,622.5	4,638.9	-66.5	4,639.3	0.74	-0.11	0.74
10,956.0	90.54	0.82	6,621.9	4,695.9	-65.9	4,696.3	0.74	-0.11	0.74
BHL 500'FNL, 2149'FEL									

Checked By: _____ Approved By: _____ Date: _____