

Tekton Energy

Well Name: **Pavistma South 1 #1-5-32-090-4-NH**

Surface Location: Pavistma South Pad Sec.32-T6N-R67W

North American Datum 1983 , US State Plane 1983 , Colorado Northern Zone

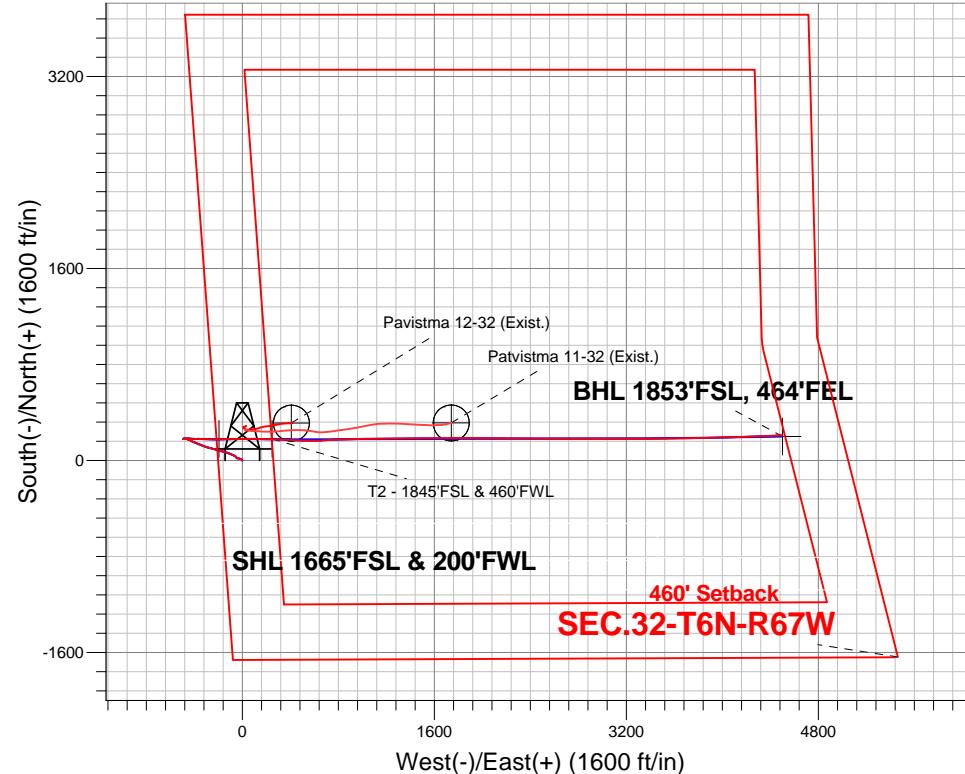
Frontier Rig 10 RKB - 22.5' Ground Elevation: 4954.0

+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Slot
0.0	0.0	1403844.66	3160105.04	40.440530	-104.924790	

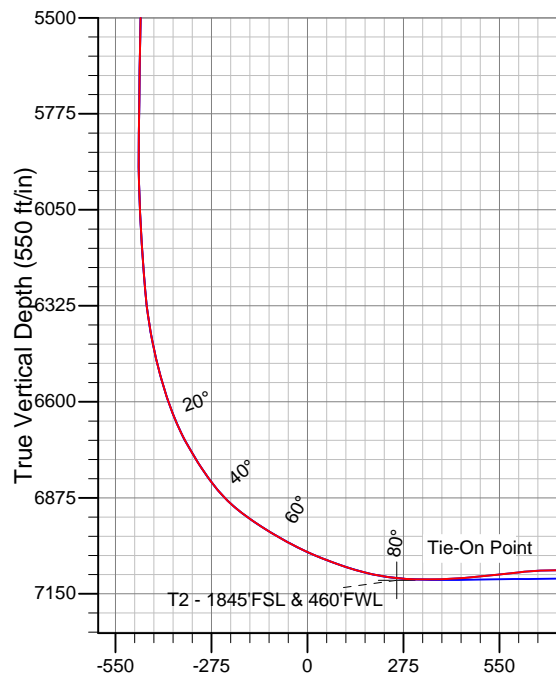
WELL @ 4976.5ft (Frontier Rig 10 RKB - 22.5')

FINAL SURVEY

Projected Bottom Hole Location
11775'MD 7117'TVD 209'N &
4497'W of SHL 91.8 degree Incl @
88.10 degree AZM



ENSIGN
Directional



Pavistma South Pad Sec.32-T6N-R67W
Pavistma South 1 #1-5-32-090-4-NH
Wellbore #1
16:12, September 20 2013

ANNOTATIONS

No annotation data is available.

LEGEND

- ◇ Pavistma South 1 #1-5-32-090-4-NH, Wellbore #1, Plan #6 (9-15-13) V0
- + Pavistma 12-32 (Exist.), Wellbore #1, Wellbore #1 V0
- x Patvistma 11-32 (Exist.), Wellbore #1, Wellbore #1 V0
- Wellbore #1
- Survey #1

BHL 1853'FSL, 464'FEL

Vertical Section at 87.45° (550 ft/in)



Tekton Energy

SEC.32-T6N-R67W

Pavistma South Pad Sec.32-T6N-R67W

Pavistma South 1 #1-5-32-090-4-NH

Wellbore #1

Survey: Survey #1

Standard Survey Report

20 September, 2013

Company:	Tekton Energy	Local Co-ordinate Reference:	Well Pavistma South 1 #1-5-32-090-4-NH
Project:	SEC.32-T6N-R67W	TVD Reference:	WELL @ 4976.5ft (Frontier Rig 10 RKB - 22.5')
Site:	Pavistma South Pad Sec.32-T6N-R67W	MD Reference:	WELL @ 4976.5ft (Frontier Rig 10 RKB - 22.5')
Well:	Pavistma South 1 #1-5-32-090-4-NH	North Reference:	True
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	Landmark

Project	SEC.32-T6N-R67W, 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	Pavistma South Pad Sec.32-T6N-R67W				
Site Position:		Northing:	1,403,844.69ft	Latitude:	40.440530
From:	Lat/Long	Easting:	3,160,105.04ft	Longitude:	-104.924790
Position Uncertainty:	0.0 ft	Slot Radius:	"	Grid Convergence:	0.37 °

Well	Pavistma South 1 #1-5-32-090-4-NH					
Well Position	+N/-S	0.0 ft	Northing:	1,403,844.66 ft	Latitude:	40.440530
	+E/-W	0.0 ft	Easting:	3,160,105.04 ft	Longitude:	-104.924790
Position Uncertainty		0.0 ft	Wellhead Elevation:	ft	Ground Level:	4,954.0 ft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	8/16/2013	8.66	66.98	52,906

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 (°)	
	7,126.5	0.0	0.0	87.45	

Survey Program	Date	9/20/2013			
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
167.0	11,775.0	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	
22.7	0.12	325.40	22.7	0.0	0.0	0.0	0.54	0.54	0.00	
Pavistma 11-32 BHL 150' Circle										
23.7	0.13	325.40	23.7	0.0	0.0	0.0	0.54	0.54	0.00	
Pavistma 12-32 BHL 150' Circle										
167.0	0.90	325.40	167.0	1.1	-0.7	-0.7	0.54	0.54	0.00	
259.0	1.10	327.00	259.0	2.4	-1.6	-1.5	0.22	0.22	1.74	
351.0	1.70	327.20	351.0	4.3	-2.9	-2.7	0.65	0.65	0.22	
444.0	2.40	337.00	443.9	7.3	-4.4	-4.0	0.84	0.75	10.54	
536.0	2.60	320.50	535.8	10.6	-6.4	-6.0	0.81	0.22	-17.93	
628.0	1.50	292.00	627.7	12.7	-8.9	-8.3	1.60	-1.20	-30.98	
720.0	1.70	283.30	719.7	13.5	-11.3	-10.7	0.34	0.22	-9.46	
812.0	1.80	279.40	811.7	14.0	-14.1	-13.4	0.17	0.11	-4.24	

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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)	
1,000.0	2.60	289.90	999.5	15.9	-21.0	-20.3	0.47	0.43	5.59	
1,092.0	2.20	276.40	1,091.4	16.9	-24.7	-24.0	0.75	-0.43	-14.67	
1,186.0	2.10	282.70	1,185.4	17.4	-28.2	-27.4	0.27	-0.11	6.70	
1,281.0	2.10	290.80	1,280.3	18.4	-31.5	-30.7	0.31	0.00	8.53	
1,373.0	1.90	276.20	1,372.3	19.2	-34.6	-33.7	0.59	-0.22	-15.87	
1,466.0	1.60	274.30	1,465.2	19.5	-37.4	-36.5	0.33	-0.32	-2.04	
1,558.0	1.40	279.20	1,557.2	19.7	-39.8	-38.9	0.26	-0.22	5.33	
1,650.0	1.50	275.50	1,649.2	20.0	-42.1	-41.2	0.15	0.11	-4.02	
1,742.0	1.50	280.60	1,741.1	20.4	-44.5	-43.6	0.15	0.00	5.54	
1,835.0	2.00	314.40	1,834.1	21.7	-46.9	-45.9	1.21	0.54	36.34	
1,927.0	4.20	331.20	1,925.9	25.8	-49.7	-48.5	2.56	2.39	18.26	
2,019.0	5.60	317.40	2,017.6	32.1	-54.3	-52.8	1.98	1.52	-15.00	
2,111.0	6.80	301.40	2,109.1	38.2	-62.0	-60.2	2.27	1.30	-17.39	
2,203.0	6.70	294.90	2,200.4	43.3	-71.5	-69.5	0.84	-0.11	-7.07	
2,298.0	8.80	295.20	2,294.6	48.7	-83.1	-80.9	2.21	2.21	0.32	
2,391.0	10.50	292.40	2,386.3	55.0	-97.4	-94.8	1.90	1.83	-3.01	
2,484.0	11.80	289.10	2,477.5	61.3	-114.2	-111.4	1.56	1.40	-3.55	
2,578.0	11.50	289.40	2,569.6	67.6	-132.1	-129.0	0.33	-0.32	0.32	
2,671.0	10.60	283.30	2,660.8	72.6	-149.2	-145.8	1.59	-0.97	-6.56	
2,764.0	10.90	284.00	2,752.2	76.7	-166.1	-162.5	0.35	0.32	0.75	
2,858.0	11.80	288.30	2,844.4	81.9	-183.8	-180.0	1.31	0.96	4.57	
2,952.0	10.90	286.20	2,936.5	87.4	-201.5	-197.4	1.05	-0.96	-2.23	
3,046.0	10.80	286.40	3,028.8	92.4	-218.5	-214.1	0.11	-0.11	0.21	
3,139.0	12.00	282.20	3,120.0	96.9	-236.3	-231.7	1.57	1.29	-4.52	
3,234.0	10.80	283.10	3,213.1	101.0	-254.6	-249.8	1.28	-1.26	0.95	
3,327.0	10.00	282.90	3,304.6	104.7	-270.9	-266.0	0.86	-0.86	-0.22	
3,421.0	9.30	287.10	3,397.3	108.8	-286.2	-281.0	1.06	-0.74	4.47	
3,514.0	9.60	288.70	3,489.0	113.5	-300.7	-295.3	0.43	0.32	1.72	
3,609.0	10.60	293.60	3,582.5	119.5	-316.2	-310.6	1.39	1.05	5.16	
3,704.0	10.70	292.40	3,675.9	126.4	-332.4	-326.4	0.26	0.11	-1.26	
3,799.0	10.60	291.00	3,769.3	132.9	-348.7	-342.4	0.29	-0.11	-1.47	
3,894.0	11.00	290.10	3,862.6	139.1	-365.3	-358.8	0.46	0.42	-0.95	
3,988.0	9.90	287.60	3,955.0	144.7	-381.5	-374.6	1.27	-1.17	-2.66	
4,081.0	9.10	290.60	4,046.8	149.7	-396.0	-388.9	1.01	-0.86	3.23	
4,176.0	9.10	297.10	4,140.6	155.7	-409.7	-402.3	1.08	0.00	6.84	
4,270.0	9.00	298.00	4,233.4	162.6	-422.8	-415.1	0.18	-0.11	0.96	
4,363.0	8.40	299.10	4,325.3	169.3	-435.2	-427.2	0.67	-0.65	1.18	
4,457.0	8.10	287.60	4,418.4	174.6	-447.5	-439.2	1.78	-0.32	-12.23	
4,550.0	5.50	294.50	4,510.7	178.5	-457.8	-449.4	2.93	-2.80	7.42	
4,645.0	4.90	280.60	4,605.3	181.1	-465.9	-457.4	1.46	-0.63	-14.63	
4,740.0	3.10	285.70	4,700.1	182.5	-472.4	-463.8	1.93	-1.89	5.37	
4,834.0	0.80	287.30	4,794.0	183.4	-475.4	-466.8	2.45	-2.45	1.70	
4,930.0	1.10	290.50	4,890.0	183.9	-476.9	-468.3	0.32	0.31	3.33	
5,024.0	1.20	284.10	4,984.0	184.5	-478.7	-470.0	0.17	0.11	-6.81	
5,118.0	0.90	290.10	5,078.0	185.0	-480.4	-471.7	0.34	-0.32	6.38	
5,213.0	0.90	284.80	5,172.9	185.4	-481.8	-473.1	0.09	0.00	-5.58	
5,309.0	0.80	277.30	5,268.9	185.7	-483.2	-474.4	0.16	-0.10	-7.81	
5,403.0	1.20	251.10	5,362.9	185.5	-484.8	-476.0	0.64	0.43	-27.87	
5,497.0	1.10	257.40	5,456.9	185.0	-486.6	-477.9	0.17	-0.11	6.70	
5,591.0	1.20	227.90	5,550.9	184.1	-488.2	-479.5	0.63	0.11	-31.38	
5,686.0	1.10	234.40	5,645.9	182.9	-489.7	-481.0	0.17	-0.11	6.84	
5,779.0	1.10	209.40	5,738.9	181.6	-490.9	-482.3	0.51	0.00	-26.88	
5,873.0	1.00	224.20	5,832.8	180.2	-491.9	-483.3	0.31	-0.11	15.74	
5,967.0	0.60	79.90	5,926.8	179.7	-492.0	-483.5	1.63	-0.43	-153.51	

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Well:	Pavistma South 1 #1-5-32-090-4-NH	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)
6,061.0	1.90	83.70	6,020.8	180.0	-489.9	-481.4	1.39	1.38	4.04
6,156.0	3.60	92.70	6,115.7	180.0	-485.4	-476.9	1.84	1.79	9.47
6,251.0	4.40	77.20	6,210.5	180.7	-478.8	-470.3	1.41	0.84	-16.32
6,298.0	4.50	72.00	6,257.3	181.7	-475.3	-466.8	0.88	0.21	-11.06
6,346.0	5.70	78.30	6,305.1	182.7	-471.2	-462.6	2.76	2.50	13.13
6,393.0	7.80	85.70	6,351.8	183.4	-465.7	-457.1	4.83	4.47	15.74
6,440.0	9.90	86.00	6,398.2	184.0	-458.5	-449.9	4.47	4.47	0.64
6,487.0	11.80	89.50	6,444.4	184.3	-449.7	-441.0	4.28	4.04	7.45
6,535.0	14.00	94.80	6,491.2	183.8	-439.0	-430.4	5.20	4.58	11.04
6,582.0	16.30	95.90	6,536.6	182.7	-426.8	-418.2	4.93	4.89	2.34
6,630.0	18.00	93.20	6,582.4	181.6	-412.7	-404.2	3.91	3.54	-5.63
6,677.0	20.40	92.00	6,626.8	180.9	-397.2	-388.8	5.17	5.11	-2.55
6,722.0	24.30	89.20	6,668.4	180.7	-380.1	-371.7	8.98	8.67	-6.22
6,769.0	28.10	88.10	6,710.6	181.2	-359.4	-350.9	8.15	8.09	-2.34
6,816.0	31.20	90.60	6,751.4	181.5	-336.1	-327.7	7.10	6.60	5.32
6,863.0	33.80	94.50	6,791.1	180.3	-310.9	-302.6	7.10	5.53	8.30
6,910.0	36.70	94.80	6,829.4	178.1	-283.9	-275.7	6.18	6.17	0.64
6,957.0	42.60	90.10	6,865.6	176.9	-254.0	-245.8	14.07	12.55	-10.00
7,003.0	48.80	89.70	6,897.7	177.0	-221.0	-212.9	13.49	13.48	-0.87
7,050.0	53.50	89.00	6,927.2	177.4	-184.5	-176.4	10.07	10.00	-1.49
7,097.0	57.20	88.80	6,953.9	178.2	-145.8	-137.7	7.88	7.87	-0.43
7,144.0	59.80	89.00	6,978.5	178.9	-105.7	-97.7	5.54	5.53	0.43
7,191.0	61.10	89.20	7,001.7	179.6	-64.9	-56.8	2.79	2.77	0.43
7,238.0	63.80	89.00	7,023.4	180.2	-23.2	-15.1	5.76	5.74	-0.43
7,285.0	67.70	88.80	7,042.7	181.0	19.6	27.7	8.31	8.30	-0.43
7,332.0	69.90	90.40	7,059.7	181.3	63.4	71.5	5.66	4.68	3.40
7,376.0	72.00	91.10	7,074.1	180.8	105.0	113.0	5.00	4.77	1.59
7,423.0	75.30	90.90	7,087.3	180.0	150.1	158.0	7.03	7.02	-0.43
7,471.0	79.50	91.10	7,097.7	179.2	196.9	204.7	8.76	8.75	0.42
7,491.0	82.10	92.00	7,100.9	178.7	216.7	224.4	13.74	13.00	4.50
7,522.9	84.23	91.41	7,104.7	177.7	248.3	256.0	6.92	6.67	-1.86
T2 - 1845'FSL & 460'FWL									
7,545.0	85.70	91.00	7,106.7	177.3	270.3	278.0	6.92	6.67	-1.84
7,594.0	89.69	93.03	7,108.7	175.5	319.3	326.8	9.13	8.14	4.14
7,689.0	93.47	92.68	7,106.0	170.8	414.1	421.3	4.00	3.98	-0.37
7,783.0	96.02	91.80	7,098.3	167.1	507.7	514.6	2.87	2.71	-0.94
7,877.0	96.38	89.17	7,088.1	166.4	601.1	607.9	2.81	0.38	-2.80
7,972.0	90.57	87.50	7,082.3	169.1	695.9	702.7	6.36	-6.12	-1.76
8,066.0	89.40	87.20	7,082.4	173.5	789.8	796.7	1.28	-1.24	-0.32
8,161.0	89.90	86.80	7,083.0	178.4	884.6	891.7	0.67	0.53	-0.42
8,255.0	89.30	89.50	7,083.6	181.5	978.6	985.7	2.94	-0.64	2.87
8,350.0	89.90	89.50	7,084.3	182.3	1,073.6	1,080.6	0.63	0.63	0.00
8,444.0	90.00	89.50	7,084.4	183.1	1,167.6	1,174.6	0.11	0.11	0.00
8,538.0	88.80	89.80	7,085.3	183.7	1,261.6	1,268.5	1.32	-1.28	0.32
8,633.0	88.70	88.80	7,087.4	184.8	1,356.5	1,363.4	1.06	-0.11	-1.05
8,727.0	88.90	89.50	7,089.4	186.2	1,450.5	1,457.3	0.77	0.21	0.74
8,822.0	89.10	90.10	7,091.0	186.6	1,545.5	1,552.3	0.67	0.21	0.63
8,916.0	89.60	90.10	7,092.1	186.4	1,639.5	1,646.1	0.53	0.53	0.00
9,011.0	90.20	89.26	7,092.3	186.9	1,734.5	1,741.1	1.09	0.63	-0.88
9,105.0	90.04	88.99	7,092.1	188.4	1,828.5	1,835.0	0.33	-0.17	-0.29
9,200.0	90.10	89.60	7,092.0	189.5	1,923.4	1,930.0	0.65	0.06	0.64
9,294.0	90.00	90.30	7,091.9	189.6	2,017.4	2,023.9	0.75	-0.11	0.74
9,389.0	90.10	90.80	7,091.8	188.7	2,112.4	2,118.8	0.54	0.11	0.53
9,483.0	89.90	91.30	7,091.8	187.0	2,206.4	2,212.6	0.57	-0.21	0.53

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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)
9,578.0	88.40	90.80	7,093.2	185.3	2,301.4	2,307.4	1.66	-1.58	-0.53
9,672.0	88.20	90.20	7,096.0	184.4	2,395.4	2,401.2	0.67	-0.21	-0.64
9,766.0	89.20	90.80	7,098.1	183.6	2,489.3	2,495.0	1.24	1.06	0.64
9,861.0	88.60	90.50	7,099.9	182.5	2,584.3	2,589.9	0.71	-0.63	-0.32
9,955.0	88.50	89.90	7,102.3	182.2	2,678.3	2,683.7	0.65	-0.11	-0.64
10,050.0	87.70	89.90	7,105.5	182.4	2,773.2	2,778.6	0.84	-0.84	0.00
10,144.0	89.10	90.20	7,108.1	182.3	2,867.2	2,872.4	1.52	1.49	0.32
10,238.0	87.90	89.50	7,110.6	182.5	2,961.1	2,966.3	1.48	-1.28	-0.74
10,333.0	87.70	90.50	7,114.2	182.5	3,056.1	3,061.2	1.07	-0.21	1.05
10,427.0	87.90	90.30	7,117.8	181.9	3,150.0	3,155.0	0.30	0.21	-0.21
10,522.0	88.60	90.60	7,120.7	181.1	3,244.9	3,249.8	0.80	0.74	0.32
10,617.0	88.60	89.70	7,123.0	180.9	3,339.9	3,344.7	0.95	0.00	-0.95
10,711.0	88.60	89.20	7,125.3	181.8	3,433.9	3,438.6	0.53	0.00	-0.53
10,806.0	88.60	89.00	7,127.7	183.3	3,528.8	3,533.5	0.21	0.00	-0.21
10,900.0	90.90	89.10	7,128.1	184.8	3,622.8	3,627.5	2.45	2.45	0.11
10,994.0	91.10	88.80	7,126.4	186.6	3,716.8	3,721.4	0.38	0.21	-0.32
11,089.0	90.00	88.00	7,125.5	189.2	3,811.8	3,816.4	1.43	-1.16	-0.84
11,183.0	90.70	89.30	7,124.9	191.4	3,905.7	3,910.4	1.57	0.74	1.38
11,278.0	90.90	88.50	7,123.6	193.2	4,000.7	4,005.3	0.87	0.21	-0.84
11,372.0	91.90	88.50	7,121.3	195.7	4,094.6	4,099.3	1.06	1.06	0.00
11,467.0	89.40	88.20	7,120.2	198.4	4,189.6	4,194.3	2.65	-2.63	-0.32
11,561.0	89.70	87.15	7,121.0	202.3	4,283.5	4,288.3	1.16	0.32	-1.12
11,656.0	90.90	88.30	7,120.5	206.0	4,378.4	4,383.2	1.75	1.26	1.21
11,697.0	91.80	88.10	7,119.5	207.3	4,419.4	4,424.2	2.25	2.20	-0.49
11,775.0	91.80	88.10	7,117.1	209.9	4,497.3	4,502.2	0.00	0.00	0.00
BHL 1845'FSL, 460'FEL									

Checked By: _____ Approved By: _____ Date: _____