

PATRIOT DRILLING, LLC

OPERATOR:
WELL/LEASE:
COUNTY:

COG Operating, LLC
Phantom 18 State # 1 H
Eddy Co., New Mexico
Sec. 18, T19S, R29E

COG OPERATING, LLC
RECEIVED

AUG 01 2012

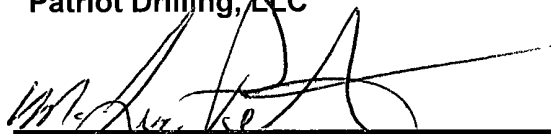
ARTESIA WEST

**STATE OF NEW MEXICO
DEVIATION REPORT**

<u>Depth</u>	<u>Deviation</u>	<u>Depth</u>	<u>Deviation</u>
253	3/4	4,305	1 1/4
493	1 1/2	4,491	1 3/4
641	1 1/2	4,685	1 1/4
1,044	1 1/2	4,876	1 1/2
1,237	1	5,059	2
1,590	1	5,317	2
1,930	1	5,415	2
2,550	1	5,571	2
2,875	3/4	5,701	2 1/2
3,310	1	5,887	2
3,796	3/4	6,327	2
4,112	1	6,710	3/4

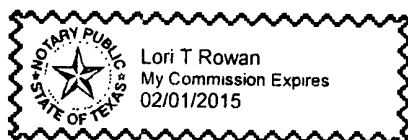


Patriot Drilling, LLC


M. Leroy Peterson, Executive Vice-
President

The foregoing instrument was acknowledged before me on this 26th day of July, 2012 by M. Leroy Peterson, Executive Vice-President of Patriot Drilling, LLC.

My Commission Expires: 02/01/2015




Lori T. Rowan
Notary Public for Ector Co., Texas

Company: COG Operating LLC (Concho)

Lease/Well: Phantom 18 State/1H



Rig Name: Patriot 6

State/County: New Mexico/Eddy

Latitude: 32.65

GRID North is 0.12 Degrees East of True North

VS-Azi: 359.43 Degrees



DRILLOG HA GYRO SURVEY CALCULATIONS

Filename: gyro survey.ut

Minimum Curvature Method

Report Date/Time: 7/30/2012 / 15:02

Vaughn Energy Services

Gardendale, Texas

432-563-5444

Surveyor: Ryan Langley

Phantom 18 State 1H / API 30-015-39612

Measured Depth FT	Incl Angle Deg	Drift Direction Deg	TVD FT	+N/-S FT	+E/-W FT	Closure Distance FT	Closure Direction Deg	Dogleg Severity Deg/100
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	****
100.00	0.17	293.27	100.00	0.06	-0.14	0.15	293.27	0.17
200.00	0.76	25.10	200.00	0.72	0.01	0.72	0.63	0.79
300.00	1.26	15.37	299.98	2.38	0.58	2.45	13.71	0.52
400.00	1.38	14.01	399.95	4.61	1.17	4.76	14.17	0.13
500.00	1.39	23.19	499.93	6.90	1.94	7.17	15.67	0.22
600.00	1.48	24.36	599.89	9.19	2.95	9.66	17.77	0.09
700.00	1.45	31.07	699.86	11.45	4.13	12.18	19.84	0.17
800.00	1.48	36.22	799.83	13.58	5.55	14.67	22.22	0.14
900.00	1.34	38.23	899.80	15.54	7.04	17.06	24.36	0.16
1000.00	1.31	48.89	999.77	17.21	8.62	19.25	26.60	0.25
1100.00	1.23	41.92	1099.75	18.76	10.20	21.35	28.53	0.17
1200.00	0.67	46.19	1199.73	19.96	11.33	22.95	29.58	0.57
1300.00	0.45	59.09	1299.73	20.56	12.09	23.85	30.45	0.25
1400.00	0.47	64.43	1399.73	20.94	12.80	24.54	31.43	0.05
1500.00	0.42	57.84	1499.72	21.32	13.48	25.22	32.31	0.07
1600.00	0.45	45.06	1599.72	21.79	14.07	25.94	32.85	0.10
1700.00	0.43	48.70	1699.72	22.32	14.63	26.69	33.25	0.04
1800.00	0.42	50.24	1799.71	22.80	15.20	27.40	33.69	0.01
1900.00	0.16	103.34	1899.71	23.01	15.62	27.81	34.18	0.35

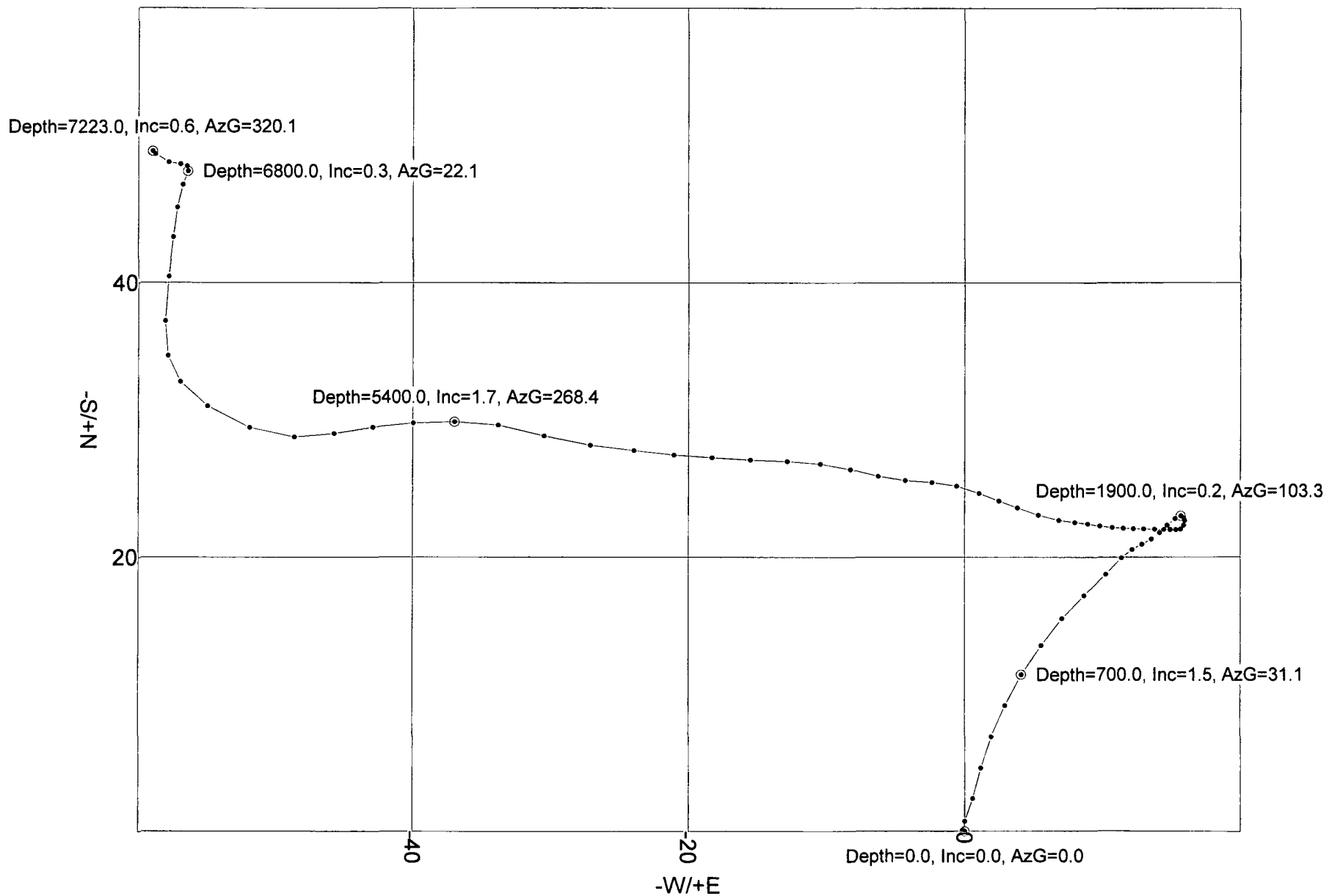
Measured Depth FT	Incl Angle Deg	Drift Direction Deg	TVD FT	+N/-S FT	+E/-W FT	Closure Distance FT	Closure Direction Deg	Dogleg Severity Deg/100
2000.00	0.15	153.05	1999.71	22.86	15.82	27.80	34.68	0.13
2100.00	0.09	175.64	2099.71	22.67	15.88	27.68	35.02	0.08
2200.00	0.32	193.90	2199.71	22.32	15.82	27.36	35.33	0.24
2300.00	0.18	265.43	2299.71	22.04	15.60	27.00	35.28	0.31
2400.00	0.21	264.07	2399.71	22.01	15.26	26.78	34.73	0.03
2500.00	0.25	272.94	2499.71	22.00	14.86	26.55	34.03	0.05
2600.00	0.29	269.46	2599.71	22.01	14.39	26.30	33.17	0.04
2700.00	0.48	272.16	2699.71	22.02	13.72	25.95	31.92	0.19
2800.00	0.43	271.77	2799.70	22.05	12.93	25.56	30.38	0.04
2900.00	0.42	271.84	2899.70	22.08	12.19	25.22	28.90	0.01
3000.00	0.42	272.93	2999.70	22.11	11.46	24.90	27.40	0.01
3100.00	0.51	274.86	3099.69	22.16	10.65	24.59	25.68	0.09
3200.00	0.52	279.42	3199.69	22.27	9.77	24.32	23.68	0.04
3300.00	0.52	279.56	3299.69	22.42	8.88	24.12	21.61	0.00
3400.00	0.56	274.70	3399.68	22.54	7.95	23.90	19.43	0.06
3500.00	0.76	279.57	3499.67	22.69	6.81	23.69	16.71	0.20
3600.00	0.99	288.22	3599.66	23.07	5.34	23.68	13.04	0.27
3700.00	0.85	290.08	3699.65	23.59	3.82	23.90	9.21	0.14
3800.00	0.77	291.33	3799.64	24.09	2.49	24.22	5.91	0.08
3900.00	0.99	291.02	3899.63	24.65	1.06	24.67	2.45	0.22
4000.00	0.99	284.59	3999.61	25.18	-0.59	25.18	358.66	0.11
4100.00	1.07	272.46	4099.60	25.43	-2.36	25.54	354.70	0.23
4200.00	1.16	275.96	4199.58	25.58	-4.30	25.94	350.45	0.11
4300.00	1.14	282.19	4299.56	25.89	-6.28	26.65	346.36	0.13
4400.00	1.24	284.41	4399.54	26.37	-8.30	27.65	342.52	0.11
4500.00	1.29	277.54	4499.51	26.79	-10.47	28.77	338.65	0.16
4600.00	1.45	271.36	4599.48	26.97	-12.85	29.88	334.52	0.21
4700.00	1.61	273.37	4699.45	27.08	-15.52	31.22	330.18	0.17
4800.00	1.56	273.25	4799.41	27.24	-18.29	32.81	326.13	0.05
4900.00	1.61	275.21	4899.37	27.45	-21.05	34.59	322.51	0.07
5000.00	1.75	277.35	4999.33	27.77	-23.96	36.68	319.21	0.15
5100.00	1.90	276.40	5099.28	28.15	-27.12	39.09	316.07	0.15
5200.00	2.03	286.36	5199.22	28.83	-30.47	41.95	313.42	0.36
5300.00	1.90	280.05	5299.16	29.62	-33.79	44.93	311.24	0.25
5400.00	1.73	268.36	5399.11	29.87	-36.93	47.50	308.96	0.40
5500.00	1.76	268.14	5499.06	29.77	-39.97	49.84	306.68	0.02
5600.00	1.69	259.87	5599.02	29.46	-42.96	52.09	304.44	0.26
5700.00	1.59	261.80	5698.98	29.00	-45.79	54.20	302.35	0.11
5800.00	1.78	268.38	5798.93	28.76	-48.72	56.57	300.56	0.27
5900.00	2.14	293.03	5898.88	29.45	-51.99	59.75	299.53	0.91

Measured Depth FT	Incl Angle Deg	Drift Direction Deg	TVD FT	+N/-S FT	+E/-W FT	Closure Distance FT	Closure Direction Deg	Dogleg Severity Deg/100
6000.00	1.78	303.34	5998.82	31.04	-55.01	63.16	299.43	0.50
6100.00	1.29	324.64	6098.78	32.81	-56.96	65.73	299.94	0.75
6200.00	1.15	344.97	6198.76	34.69	-57.87	67.47	300.94	0.45
6300.00	1.79	2.30	6298.73	37.22	-58.07	68.97	302.66	0.77
6400.00	1.92	6.31	6398.68	40.45	-57.82	70.56	304.98	0.18
6500.00	1.39	7.42	6498.63	43.32	-57.48	71.97	307.00	0.53
6600.00	1.10	8.50	6598.61	45.47	-57.18	73.06	308.50	0.29
6700.00	0.86	19.45	6698.60	47.13	-56.79	73.80	309.69	0.31
6800.00	0.33	22.07	6798.59	48.11	-56.43	74.15	310.45	0.52
6900.00	0.22	301.92	6898.59	48.48	-56.48	74.44	310.64	0.37
7000.00	0.36	278.67	6998.59	48.63	-56.96	74.90	310.49	0.18
7100.00	0.64	279.98	7098.58	48.78	-57.82	75.64	310.15	0.28
7200.00	0.75	319.22	7198.58	49.37	-58.79	76.77	310.02	0.48
7223.00	0.63	320.08	7221.58	49.58	-58.97	77.04	310.05	0.52

2



Vaughn Energy Services
Gardendale, Texas
432-563-5444
Surveyor: Ryan Langley
Phantom 18 State 1H / API 30-015-39612



VES Survey Date: 07/18/2012

Job Number: ☐State/Country: ☐Company: ☐Declination: ☐Lease/Well: ☐Grid: ☐Location: ☐

File name: C:\DOCUME~1\RGREEN6\DESKTOP\COGPHA~1\DAI\YR~1\0301.SVY

Rig Name: ☐

Date/Time: 24-Jul-12 / 10:27

RKB: ☐

Curve Name: As drilled

G.L. or M.S.L.: ☐

Scientific Drilling

WINSERVE SURVEY CALCULATIONS
 Minimum Curvature Method
 Vertical Section Plane 359.43
 Vertical Section Referenced to Wellhead
 Rectangular Coordinates Referenced to Wellhead

Measured Depth FT	Incl Angle Deg	Drift Direction Deg	True Vertical Depth	N-S FT	E-W FT	Vertical Section FT	C L O S U R E		Dogleg Severity Deg/100
							Distance FT	Direction Deg	
7223.00	.63	320.08	7221.58	49.58	-58.97	50.16	77.04	310.06	.00
7251.00	1.32	345.20	7249.58	50.01	-59.15	50.60	77.46	310.21	2.85
7282.00	4.75	358.56	7280.53	51.64	-59.28	52.23	78.61	311.06	11.21
7314.00	7.21	.75	7312.35	54.97	-59.28	55.56	80.85	312.84	7.72
7346.00	10.38	1.63	7343.97	59.86	-59.17	60.45	84.17	315.33	9.91
7377.00	13.63	4.71	7374.29	66.30	-58.79	66.88	88.61	318.43	10.68
7409.00	17.67	3.39	7405.10	74.91	-58.20	75.48	94.86	322.16	12.67
7441.00	21.37	359.26	7435.25	85.59	-57.99	86.16	103.38	325.88	12.33
7472.00	24.45	357.77	7463.81	97.65	-58.31	98.23	113.73	329.16	10.11
7504.00	26.47	356.89	7492.70	111.39	-58.95	111.97	126.03	332.11	6.42
7536.00	27.26	357.06	7521.24	125.83	-59.72	126.42	139.28	334.61	2.48
7567.00	30.42	358.21	7548.39	140.77	-60.32	141.36	153.15	336.80	10.35
7599.00	32.89	359.52	7575.63	157.56	-60.65	158.15	168.83	338.95	8.01

Measured Depth FT	Incl Angle Deg	Drift Direction Deg	True Vertical Depth	N-S FT	E-W FT	Vertical Section FT	C L O S U R E		Dogleg Severity Deg/100
							Distance FT	Direction Deg	
7625.00	35.44	1.28	7597.14	172.16	-60.54	172.75	182.49	340.62	10.52
7657.00	37.55	4.27	7622.87	191.16	-59.61	191.74	200.24	342.68	8.62
7689.00	41.33	7.26	7647.58	211.37	-57.55	211.94	219.07	344.77	13.22
7720.00	45.46	10.95	7670.10	232.39	-54.15	232.91	238.61	346.88	15.63
7752.00	50.39	12.88	7691.54	255.61	-49.23	256.09	260.31	349.10	16.04
7784.00	55.93	13.24	7710.72	280.55	-43.45	280.97	283.90	351.20	17.34
7815.00	60.76	9.90	7726.99	306.39	-38.18	306.76	308.76	352.90	18.08
7847.00	63.93	4.45	7741.85	334.50	-34.66	334.83	336.29	354.08	18.04
7874.00	66.21	.31	7753.23	358.96	-33.65	359.27	360.53	354.64	16.27
7906.00	69.47	357.06	7765.30	388.57	-34.34	388.90	390.09	354.95	13.86
7937.00	72.11	356.89	7775.50	417.80	-35.88	418.14	419.34	355.09	8.53
7969.00	74.04	356.36	7784.82	448.36	-37.69	448.72	449.95	355.20	6.24
8001.00	78.70	357.85	7792.36	479.41	-39.25	479.78	481.02	355.32	15.25
8032.00	81.87	358.38	7797.59	509.95	-40.26	510.32	511.54	355.49	10.36
Landed Curve PTB 91.79 TVD 7802'									
8064.00	85.65	358.56	7801.07	541.74	-41.11	542.12	543.30	355.66	11.83
8096.00	90.13	358.91	7802.24	573.70	-41.81	574.09	575.23	355.83	14.04
8127.00	92.33	359.44	7801.58	604.69	-42.26	605.08	606.17	356.00	7.30
8159.00	92.51	359.26	7800.23	636.66	-42.62	637.05	638.09	356.17	.80
8191.00	92.51	359.17	7798.83	668.63	-43.06	669.02	670.01	356.32	.28
8254.00	90.92	358.82	7796.94	731.59	-44.16	731.99	732.92	356.55	2.58
8349.00	90.04	357.94	7796.14	826.54	-46.85	826.97	827.87	356.76	1.31
8444.00	89.60	357.68	7796.44	921.47	-50.48	921.93	922.86	356.86	.54
8539.00	89.69	357.24	7797.03	1016.38	-54.69	1016.87	1017.85	356.92	.47
8634.00	89.16	356.98	7797.98	1111.25	-59.48	1111.79	1112.84	356.94	.62
8729.00	90.22	358.73	7798.50	1206.18	-63.03	1206.75	1207.83	357.01	2.15
8823.00	90.40	358.73	7797.99	1300.16	-65.12	1300.74	1301.78	357.13	.19
8918.00	90.84	358.65	7796.96	1395.12	-67.29	1395.72	1396.75	357.24	.47
9013.00	91.89	359.00	7794.70	1490.08	-69.24	1490.69	1491.68	357.34	1.17
9108.00	91.89	358.03	7791.57	1584.99	-71.70	1585.63	1586.61	357.41	1.02
9203.00	92.15	357.85	7788.22	1679.87	-75.11	1680.54	1681.55	357.44	.33
9298.00	90.40	358.82	7786.10	1774.80	-77.87	1775.49	1776.51	357.49	2.11
9393.00	91.19	358.65	7784.79	1869.77	-79.97	1870.47	1871.48	357.55	.85
9488.00	90.57	359.79	7783.33	1964.75	-81.26	1965.46	1966.43	357.63	1.37

Measured Depth FT	Incl Angle Deg	Drift Direction Deg	True Vertical Depth	N-S FT	E-W FT	Vertical Section FT	C L O S U R E		Dogleg Severity Deg/100
							Distance FT	Direction Deg	
9583.00	89.87	.58	7782.96	2059.74	-80.95	2060.45	2061.34	357.75	1.11
9678.00	89.52	.75	7783.47	2154.74	-79.85	2155.42	2156.22	357.88	.41
9773.00	90.04	.23	7783.83	2249.73	-79.04	2250.41	2251.12	357.99	.77
9868.00	91.54	359.96	7782.52	2344.72	-78.88	2345.39	2346.05	358.07	1.60
9963.00	89.87	.58	7781.35	2439.71	-78.43	2440.37	2440.97	358.16	1.88
10058.00	90.31	.31	7781.20	2534.70	-77.70	2535.35	2535.90	358.24	.54
10153.00	87.67	359.44	7782.88	2629.68	-77.90	2630.33	2630.83	358.30	2.93
10248.00	88.20	359.17	7786.30	2724.61	-79.05	2725.26	2725.76	358.34	.63
10343.00	88.64	1.72	7788.92	2819.56	-78.32	2820.20	2820.65	358.41	2.72
10437.00	89.43	1.46	7790.50	2913.51	-75.71	2914.12	2914.50	358.51	.88
10532.00	90.13	2.51	7790.87	3008.45	-72.42	3009.03	3009.33	358.62	1.33
10627.00	90.75	2.78	7790.14	3103.35	-68.03	3103.87	3104.10	358.74	.71
10722.00	91.01	2.51	7788.68	3198.24	-63.65	3198.71	3198.87	358.86	.39
10817.00	91.54	1.99	7786.57	3293.14	-59.92	3293.57	3293.68	358.96	.78
10912.00	92.86	1.81	7782.92	3388.02	-56.77	3388.41	3388.49	359.04	1.40
11007.00	92.51	.23	7778.47	3482.89	-55.09	3483.27	3483.33	359.09	1.70
11102.00	90.66	359.88	7775.84	3577.85	-54.99	3578.22	3578.27	359.12	1.98
11197.00	87.67	358.73	7777.23	3672.82	-56.15	3673.20	3673.25	359.12	3.37
11292.00	88.02	357.77	7780.80	3767.71	-59.04	3768.11	3768.17	359.10	1.07
11387.00	88.90	358.91	7783.35	3862.63	-61.80	3863.06	3863.13	359.08	1.52
11482.00	90.13	358.91	7784.16	3957.61	-63.60	3958.05	3958.12	359.08	1.29
11576.00	91.89	358.82	7782.50	4051.57	-65.46	4052.03	4052.10	359.07	1.87
11672.00	93.56	358.03	7777.94	4147.43	-68.10	4147.90	4147.98	359.06	1.92
11766.00	91.01	358.91	7774.19	4241.31	-70.61	4241.80	4241.90	359.05	2.87
11861.00	90.48	356.89	7772.95	4336.23	-74.09	4336.75	4336.86	359.02	2.20
11956.00	91.36	356.18	7771.43	4431.04	-79.83	4431.62	4431.76	358.97	1.19
12052.00	92.24	355.74	7768.41	4526.76	-86.59	4527.39	4527.59	358.90	1.02
PTB @ TD 15.4' ABOVE, 46.8'LEFT OF PLAN LINE									
12135.00	92.24	355.74	7765.17	4609.46	-92.75	4610.16	4610.40	358.85	.00