

COG OPERATING, LLC
RECEIVED

AUG 03 2012

ARTESIA WFS

HOBBS OCD

30-025-40069

OCT 16 2012

ELG 11-8-2012
RECEIVED

Well Name & Number: Sol "28" Federal ~~Com~~ #1H

API Number: 30-025-40069

Location: 440 FSL & 440 FEL, Lot I, Sec. 28, Township 25-S, Range 32-E, Lea County, New Mexico

Operator: COG Operating, LLC

Drilling Contractor: Union Drilling, Inc.

The undersigned hereby certifies that he is an authorized representative of the drilling Contractor who drilled the above described well and that deviation survey tests were conducted and he obtained the following results:

SUR: P-28-25s-32e, 440/S & 440/E
BHL: M-28-25s-32e, 349/S & 360/W
API # 30-025-40069

RECORD OF INCLINATION

*11 Measured Depth (feet)	12 Course Length (Hundreds of feet)	*13 Angle of Inclination (Degrees)	14 Displacement per Hundred Feet (Sine of Angle X100)	15 Course Displacement (feet)	16 Accumulative Displacement (feet)
450	450	.5	0.87	3.93	3.93
1198	748	1.5	2.62	19.58	23.51
1987	789	1	1.75	13.77	37.28
2834	847	2.9	5.06	42.87	80.15
3750	916	.5	0.87	7.99	88.14
4698	948	1.7	2.97	28.13	116.27
5695	997	1	1.75	17.40	133.67
6327	632	.4	0.70	4.41	138.08
7124	797	.25	0.44	3.48	141.56
7965	841	.5	0.87	7.34	148.90
8924	959	5.4	9.42	90.35	239.25
DIRECTIONAL					
TOOK OVER					

Drilling Contractor: Union Drilling, Inc.

By: *Jim Mayfield*
Jim Mayfield

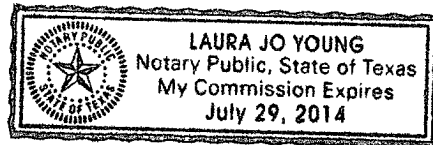
Title: Division Manager

Subscribed and sworn to before me this 30TH Day of July, 2012.

Laura Jo Young
Notary Public

My Commission Expires: July 29, 2014

COUNTY OF TAYLOR)
)
STATE OF TEXAS)





Company: COG Operating LLC (Concho)

Lease/Well: Sol 28 Federal/1H

Location: S28 T25s R32e

Rig Name: UDI 216

State/County: New Mexico/Lea

Latitude: 32.10

GRID North is 0.35 Degrees East of True North

VS-Azi: 0.00 Degrees

SUR: P-28-25s-32e, 440/S & 440/E
BHL: M-28-25s-32e, 349/S & 360/W
API # 30-025-40069

HOBBS OCD

RKB : 20 Feet

OCT 16 2012

DRILLOG HA GYRO SURVEY CALCULATIONS

Filename: outrun gyro survey.ut

Minimum Curvature Method

Report Date/Time: 7/23/2012 / 13:43

Vaughn Energy Services
Gardendale, TX

800-606-4976

Surveyor: Dustin Wedel

Sol 28 Federal 1H / API 30-025-40069

RECEIVED

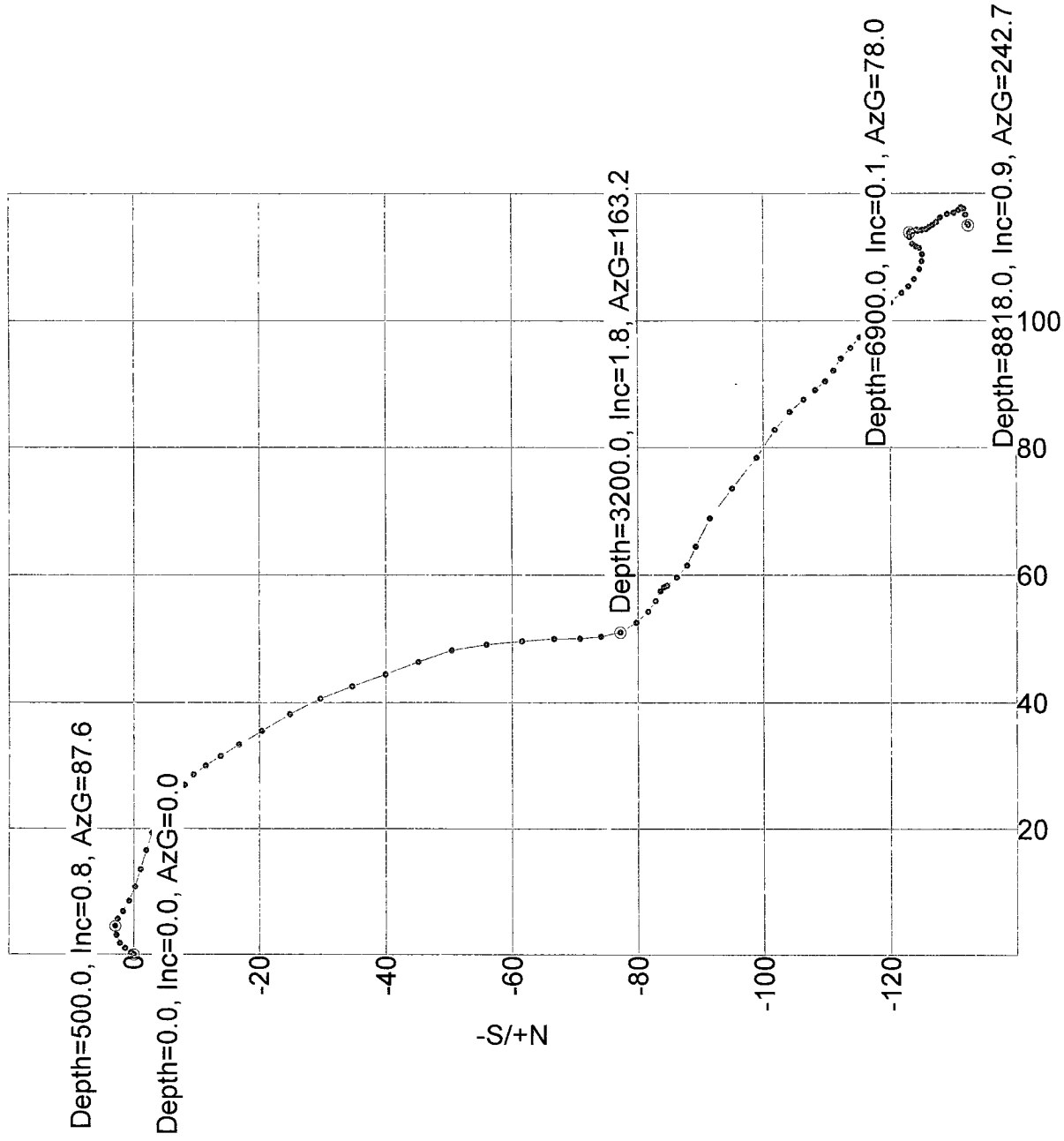
Measured Depth FT	Incl Angle Deg	Drift Direction Deg	TVD FT	+N/-S FT	+E/-W FT	Closure Distance FT	Closure Direction Deg	Dogleg Severity Deg/100
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	****
100.00	0.68	35.81	100.00	0.48	0.35	0.60	35.81	0.68
200.00	0.62	36.13	199.99	1.40	1.02	1.73	35.91	0.06
300.00	0.71	51.71	299.98	2.23	1.82	2.88	39.32	0.20
400.00	0.95	77.75	399.97	2.79	3.12	4.19	48.25	0.44
500.00	0.76	87.56	499.96	2.99	4.60	5.49	56.93	0.24
600.00	0.76	127.11	599.95	2.62	5.79	6.36	65.67	0.52
700.00	0.88	123.97	699.94	1.79	6.96	7.19	75.61	0.13
800.00	1.26	119.86	799.93	0.81	8.55	8.59	84.60	0.39
900.00	1.57	108.17	899.90	-0.17	10.81	10.81	90.88	0.42
1000.00	1.77	107.71	999.85	-1.06	13.58	13.62	94.48	0.20
1100.00	1.81	104.94	1099.81	-1.94	16.58	16.69	96.67	0.09
1200.00	1.61	113.98	1199.76	-2.92	19.38	19.60	98.56	0.33
1300.00	2.03	128.16	1299.71	-4.58	22.06	22.53	101.74	0.62
1400.00	1.78	125.18	1399.66	-6.57	24.73	25.59	104.89	0.27
1500.00	1.26	122.26	1499.62	-8.06	26.93	28.11	106.66	0.53
1600.00	1.27	140.87	1599.60	-9.50	28.56	30.10	108.41	0.41
1700.00	1.47	145.89	1699.57	-11.43	29.98	32.08	110.87	0.23
1800.00	1.74	148.62	1799.53	-13.78	31.49	34.37	113.64	0.28

measured Depth FT	Angle Deg	Direction Deg	TVD FT	+N/-S		+E/-W		Closure Distance FT		Closure Direction Deg		Dogleg Severity Deg/100
				FT		FT		FT		Deg		
1900.00	2.19	148.63	1899.47	-16.71		33.27		37.23		116.67		0.45
2000.00	2.75	149.31	1999.38	-20.40		35.49		40.94		119.90		0.56
2100.00	3.13	148.71	2099.24	-24.80		38.13		45.49		123.04		0.38
2200.00	3.10	157.23	2199.10	-29.63		40.60		50.26		126.12		0.46
2300.00	3.15	160.69	2298.95	-34.72		42.55		54.92		129.21		0.20
2400.00	3.23	159.98	2398.79	-39.96		44.43		59.75		131.97		0.08
2500.00	3.20	158.94	2498.64	-45.21		46.40		64.78		134.26		0.06
2600.00	3.19	163.90	2598.48	-50.49		48.17		69.78		136.35		0.28
2700.00	3.18	177.47	2698.33	-55.93		49.06		74.40		138.74		0.75
2800.00	3.22	171.36	2798.17	-61.49		49.61		79.00		141.10		0.34
2900.00	2.74	181.24	2898.04	-66.65		49.98		83.31		143.14		0.70
3000.00	1.99	177.17	2997.95	-70.78		50.01		86.67		144.76		0.77
3100.00	1.81	172.15	3097.90	-74.08		50.31		89.55		145.82		0.25
3200.00	1.84	163.18	3197.84	-77.18		50.99		92.50		146.55		0.29
3300.00	1.65	132.82	3297.80	-79.69		52.51		95.44		146.62		0.93
3400.00	1.33	144.61	3397.77	-81.62		54.24		98.00		146.39		0.44
3500.00	1.16	104.00	3497.74	-82.81		55.90		99.91		145.98		0.88
3600.00	0.88	134.15	3597.73	-83.59		57.43		101.42		145.51		0.60
3700.00	0.10	105.49	3697.73	-84.15		58.07		102.24		145.39		0.79
3800.00	0.10	291.72	3797.73	-84.15		58.08		102.24		145.39		0.20
3900.00	0.69	147.17	3897.72	-84.62		58.33		102.78		145.42		0.77
4000.00	1.66	137.95	3997.70	-86.21		59.63		104.83		145.33		0.99
4100.00	1.22	121.73	4097.67	-87.85		61.51		107.24		145.00		0.60
4200.00	2.50	111.47	4197.61	-89.21		64.44		110.05		144.16		1.32
4300.00	3.21	121.32	4297.49	-91.46		68.86		114.48		143.02		0.86
4400.00	3.59	132.54	4397.32	-95.03		73.55		120.17		142.26		0.76
4500.00	3.54	124.49	4497.12	-98.89		78.40		126.20		141.59		0.50
4600.00	2.52	121.64	4596.98	-101.79		82.82		131.23		140.87		1.03
4700.00	1.81	139.25	4696.91	-104.14		85.73		134.89		140.54		0.97
4800.00	1.52	140.01	4796.87	-106.36		87.61		137.79		140.52		0.29
4900.00	1.24	140.74	4896.84	-108.21		89.15		140.21		140.52		0.28
5000.00	1.10	136.83	4996.82	-109.76		90.50		142.25		140.49		0.16
5100.00	1.36	118.55	5096.80	-111.03		92.20		144.32		140.29		0.46
5200.00	1.16	123.24	5196.77	-112.15		94.08		146.39		140.01		0.22
5300.00	1.42	137.77	5296.75	-113.62		95.76		148.59		139.87		0.41
5400.00	1.15	122.19	5396.72	-115.07		97.44		150.78		139.74		0.44
5500.00	1.57	126.24	5496.69	-116.41		99.40		153.07		139.51		0.44
5600.00	1.36	141.56	5596.66	-118.15		101.24		155.59		139.41		0.44
5700.00	1.51	137.03	5696.63	-120.05		102.88		158.10		139.40		0.19

Measured Depth FT	Incl Angle Deg	Drift Direction Deg	TVD FT	+N/-S		+E/-W		Closure Distance FT	Closure Direction Deg	Dogleg Severity Deg/100
				FT		FT				
5800.00	1.20	139.55	5796.60	-121.81		104.45		160.46	139.39	0.32
5900.00	0.56	134.82	5896.59	-122.95		105.48		162.00	139.37	0.64
6000.00	1.09	127.15	5996.58	-123.87		106.59		163.42	139.29	0.54
6100.00	1.03	109.13	6096.56	-124.74		108.20		165.13	139.06	0.34
6200.00	0.44	105.29	6196.55	-125.14		109.42		166.23	138.83	0.59
6300.00	0.79	86.18	6296.55	-125.19		110.48		166.97	138.57	0.40
6400.00	0.55	36.19	6396.54	-124.76		111.45		167.29	138.22	0.61
6500.00	0.26	358.38	6496.54	-124.15		111.73		167.02	138.01	0.38
6600.00	0.62	51.75	6596.54	-123.59		112.15		166.89	137.78	0.51
6700.00	0.70	78.74	6696.53	-123.14		113.17		167.25	137.42	0.32
6800.00	0.08	130.08	6796.53	-123.06		113.82		167.63	137.23	0.66
6900.00	0.06	77.95	6896.53	-123.09		113.93		167.72	137.22	0.06
7000.00	0.18	151.63	6996.53	-123.22		114.05		167.91	137.21	0.18
7100.00	0.08	265.57	7096.53	-123.37		114.05		168.01	137.25	0.23
7200.00	0.45	163.21	7196.52	-123.75		114.09		168.32	137.32	0.47
7300.00	0.10	139.87	7296.52	-124.18		114.26		168.75	137.38	0.36
7400.00	0.04	189.69	7396.52	-124.29		114.31		168.86	137.39	0.08
7500.00	0.25	218.64	7496.52	-124.49		114.16		168.91	137.48	0.21
7600.00	0.61	152.58	7596.52	-125.13		114.27		169.46	137.60	0.56
7700.00	0.33	197.15	7696.52	-125.88		114.43		170.12	137.73	0.44
7800.00	0.41	110.62	7796.52	-126.29		114.69		170.59	137.76	0.51
7900.00	0.57	175.16	7896.51	-126.91		115.06		171.31	137.80	0.54
8000.00	0.44	100.29	7996.51	-127.48		115.48		172.01	137.83	0.62
8100.00	0.79	148.37	8096.50	-128.13		116.22		172.99	137.79	0.59
8200.00	0.64	163.30	8196.50	-129.25		116.74		174.17	137.91	0.23
8300.00	0.57	176.10	8296.49	-130.29		116.94		175.07	138.09	0.15
8400.00	0.58	128.31	8396.49	-131.10		117.37		175.96	138.16	0.47
8500.00	0.12	160.37	8496.48	-131.51		117.80		176.56	138.15	0.48
8600.00	0.39	222.64	8596.48	-131.86		117.60		176.69	138.27	0.35
8700.00	0.84	266.52	8696.48	-132.16		116.63		176.27	138.57	0.62
8800.00	0.79	244.63	8796.47	-132.50		115.28		175.63	138.98	0.31
8818.00	0.93	242.72	8814.47	-132.62		115.03		175.56	139.06	0.82



Vaughn Energy Services
Gardendale, TX
800-606-4976
Surveyor: Dustin Wedel
Sol 28 Federal 1H / API 30-025-40069



CRESCENT

DIRECTIONAL DRILLING

Minimum Curvature Calculation

30-025-40069

Client: Concho Oil and Gas
Well: SOL 28 Federal 1H
County: Lea
Rig: U.D.I.# 216

M.W.D. OPERATORS: J.Jones/F.Foust
DIRECTIONAL DRILLERS: B.Hoffman/T.Engle
Tool Azimuth to Grid North: 7.14
Job #: PB-12446

Vertical Section Angle: 268.55

Sur #	Meas. Depth	Inc.	Azm.	T.V.D.	Ver.Sect.	+N/-S	+E/-W	DLS
Tie In	8818.00	0.93	242.72	8814.47	-111.61	-132.56	115.01	0.00
1	8924.00	5.40	285.00	8920.29	-106.06	-131.66	109.42	4.48
2	8955.00	11.40	282.30	8950.94	-101.68	-130.63	105.02	19.39
3	8987.00	16.70	282.10	8981.97	-94.13	-128.99	97.43	16.56
4	9018.00	20.80	284.80	9011.32	-84.51	-126.65	87.75	13.52
5	9050.00	24.80	285.00	9040.82	-72.62	-123.46	75.77	12.50
6	9082.00	28.90	286.70	9069.36	-58.83	-119.50	61.87	13.03
7	9113.00	33.40	283.40	9095.89	-43.45	-115.37	46.39	15.52
8	9145.00	37.40	278.50	9121.97	-25.36	-111.89	28.20	15.32
9	9176.00	39.50	274.40	9146.25	-6.27	-109.74	9.05	10.65
10	9208.00	39.40	273.40	9170.96	13.97	-108.36	-11.24	2.01
11	9240.00	39.50	273.90	9195.67	34.23	-107.06	-31.53	1.04
12	9271.00	43.20	274.40	9218.94	54.60	-105.58	-51.95	11.98
13	9303.00	47.70	277.40	9241.38	77.21	-103.21	-74.62	15.57
14	9334.00	52.20	277.90	9261.33	100.63	-100.05	-98.13	14.57
15	9365.00	55.80	278.10	9279.54	125.37	-96.56	-122.96	11.62
16	9402.00	57.80	276.70	9299.80	155.96	-92.58	-153.66	6.26
17	9433.00	62.30	278.00	9315.28	182.49	-89.14	-180.29	14.96
18	9465.00	65.20	278.50	9329.43	210.78	-85.02	-208.69	9.17
19	9496.00	68.30	278.50	9341.66	238.83	-80.81	-236.86	10.00
20	9528.00	69.90	278.60	9353.08	268.27	-76.36	-266.42	5.01
21	9560.00	71.10	279.20	9363.76	297.94	-71.69	-296.22	4.15
22	9591.00	72.30	279.70	9373.49	326.84	-66.86	-325.25	4.16
23	9623.00	73.40	279.60	9382.93	356.85	-61.74	-355.40	3.45
24	9654.00	76.70	279.60	9390.93	386.24	-56.74	-384.93	10.65
25	9686.00	79.80	278.70	9397.44	417.03	-51.76	-415.85	10.07
26	9718.00	81.60	278.50	9402.61	448.12	-47.04	-447.08	5.66
27	9749.00	81.70	278.00	9407.12	478.36	-42.64	-477.43	1.63
28	9781.00	82.70	277.50	9411.46	509.65	-38.36	-508.84	3.49
29	9812.00	85.70	276.90	9414.59	540.14	-34.50	-539.44	9.87
30	9844.00	88.00	277.10	9416.35	571.74	-30.61	-571.15	7.21
31	9875.00	88.10	277.10	9417.40	602.38	-26.78	-601.89	0.32
32	9907.00	88.90	276.90	9418.24	634.02	-22.88	-633.64	2.58
33	9939.00	88.90	275.50	9418.86	665.73	-19.42	-665.45	4.37
34	9970.00	88.70	272.70	9419.51	696.57	-17.21	-696.36	9.05
35	10065.00	88.90	270.30	9421.50	791.42	-14.72	-791.30	2.53
36	10159.00	89.00	270.30	9423.22	885.36	-14.23	-885.28	0.11
37	10254.00	91.20	269.80	9423.05	980.32	-14.15	-980.28	2.37
38	10349.00	91.60	269.50	9420.73	1075.28	-14.73	-1075.25	0.53
39	10444.00	92.30	269.70	9417.50	1170.20	-15.39	-1170.19	0.77

SUR: P-28-25s-32e, 440/S & 440/E
 BHL: M-28-25s-32e, 349/S & 360/W
 API # 30-025-40069

CRESCENT

DIRECTIONAL DRILLING

Minimum Curvature Calculation

Client: Concho Oil and Gas
Well: SOL 28 Federal 1H
County: Lea
Rig: U.D.I.# 216

M.W.D. OPERATORS: J.Jones/F.Foust
DIRECTIONAL DRILLERS: B.Hoffman/T.Engle
Tool Azimuth to Grid North: 7.14
Job #: PB-12446

Vertical Section Angle: 268.55

Sur #	Meas. Depth	Inc.	Azm.	T.V.D.	Ver.Sect.	+N/-S	+E/-W	DLS
40	10538.00	91.30	268.00	9414.55	1264.15	-17.28	-1264.12	2.10
41	10633.00	91.30	266.70	9412.39	1359.10	-21.67	-1358.99	1.37
42	10728.00	91.50	266.60	9410.07	1454.02	-27.22	-1453.80	0.24
43	10822.00	91.50	267.90	9407.61	1547.96	-31.72	-1547.66	1.38
44	10917.00	92.30	267.30	9404.46	1642.90	-35.70	-1642.52	1.05
45	11012.00	93.20	267.70	9399.90	1737.77	-39.84	-1737.32	1.04
46	11107.00	90.90	269.90	9396.50	1832.70	-41.83	-1832.23	3.35
47	11201.00	90.70	269.20	9395.19	1926.67	-42.56	-1926.21	0.77
48	11296.00	91.50	268.60	9393.37	2021.65	-44.39	-2021.18	1.05
49	11422.00	92.90	268.00	9388.53	2147.56	-48.12	-2147.03	1.21
50	11517.00	91.30	268.30	9385.05	2242.49	-51.19	-2241.91	1.71
51	11612.00	90.60	269.10	9383.47	2337.47	-53.34	-2336.87	1.12
52	11707.00	94.00	269.70	9379.66	2432.37	-54.34	-2431.77	3.63
53	11801.00	92.10	269.00	9374.66	2526.22	-55.40	-2525.63	2.15
54	11896.00	90.30	268.40	9372.67	2621.20	-57.56	-2620.58	2.00
55	11959.00	90.80	268.40	9372.07	2684.19	-59.32	-2683.55	0.79
56	12054.00	90.00	268.20	9371.40	2779.19	-62.13	-2778.51	0.87
57	12149.00	90.30	268.10	9371.15	2874.19	-65.20	-2873.46	0.33
58	12244.00	89.40	267.60	9371.40	2969.18	-68.76	-2968.39	1.08
59	12338.00	89.80	267.40	9372.06	3063.16	-72.86	-3062.30	0.48
60	12433.00	89.90	267.40	9372.31	3158.14	-77.17	-3157.20	0.11
61	12528.00	89.60	266.90	9372.72	3253.11	-81.90	-3252.08	0.61
62	12622.00	90.80	268.30	9372.39	3347.09	-85.83	-3345.99	1.96
63	12717.00	91.60	268.30	9370.40	3442.07	-88.65	-3440.93	0.84
64	12780.00	92.20	268.20	9368.32	3505.04	-90.57	-3503.87	0.97
65	12843.00	91.80	268.90	9366.12	3568.00	-92.17	-3566.81	1.28
66	12907.00	92.30	268.50	9363.83	3631.96	-93.62	-3630.75	1.00
67	13001.00	91.20	268.30	9360.96	3725.91	-96.24	-3724.67	1.19
68	13096.00	91.00	268.10	9359.13	3820.89	-99.23	-3819.60	0.30
69	13191.00	91.30	268.10	9357.23	3915.87	-102.37	-3914.53	0.32
70	13286.00	91.90	268.00	9354.57	4010.83	-105.61	-4009.44	0.64
71	13380.00	92.50	267.60	9350.97	4104.75	-109.21	-4103.30	0.77
72	13444.00	92.60	267.60	9348.12	4168.68	-111.89	-4167.18	0.16
73	13538.00	91.60	267.80	9344.67	4262.60	-115.66	-4261.04	1.08
74	13633.00	89.90	265.90	9343.43	4357.54	-120.88	-4355.88	2.68
PTD	13795.00	89.90	265.90	9343.71	4519.37	-132.46	-4517.47	0.00