

Final @ TD
30-015-39138

Echo Production Co
Field: Eddy Co, NM NAD83
Site: Stiletto 21 Federal Com 3H
Well: Well # 3H
Wellpath: 3H
Plan: Plan #3

SITE DETAILS
 Stiletto 21 Federal Com 3H
 Eddy Co, NM
 Site Centre Northing: 569397.33
 Easting: 493535.22
 Ground Level: 3457.00
 Positional Uncertainty: 0.00
 Convergence: -0.08

FIELD DETAILS
 Eddy Co, NM NAD83
 Geodetic System: US State Plane Coordinate System 1983
 Ellipsoid: GRS 1980
 Zone: New Mexico, Eastern Zone
 Magnetic Model: IGRF2010
 System Datum: Mean Sea Level
 Local North: Grid North



Azimuths to Grid North
 True North: 0.08°
 Magnetic North: 8.13°
 Magnetic Field
 Strength: 48754nT
 Dip Angle: 60.35°
 Date: 5/7/2011
 Model: IGRF2010

TARGET DETAILS

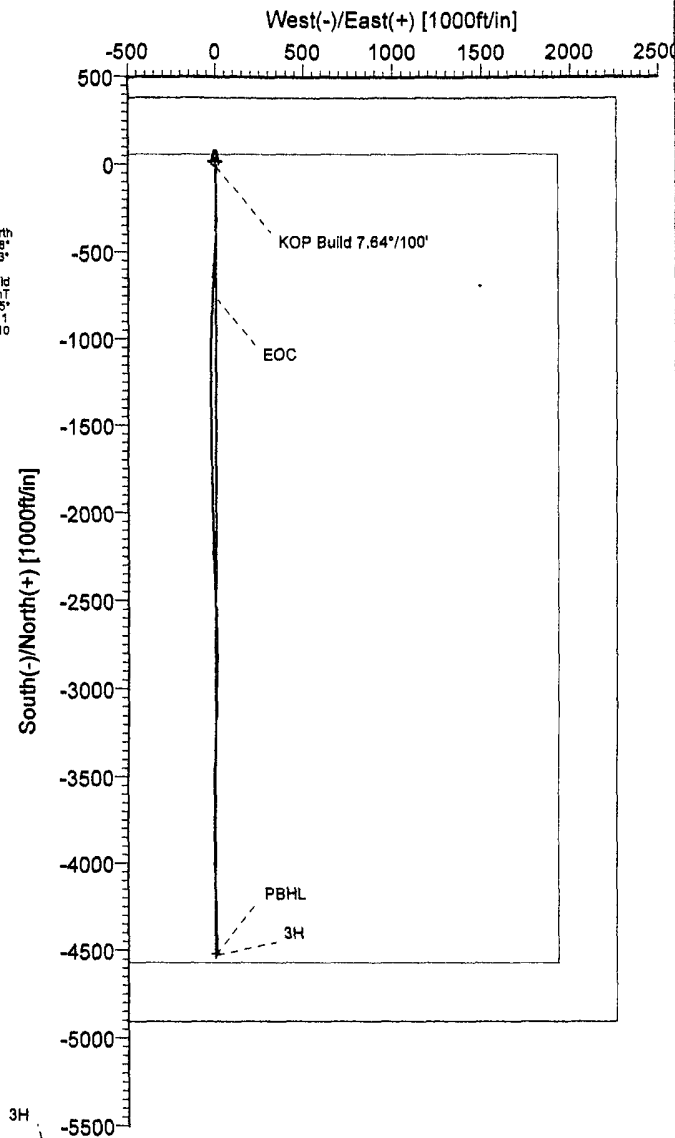
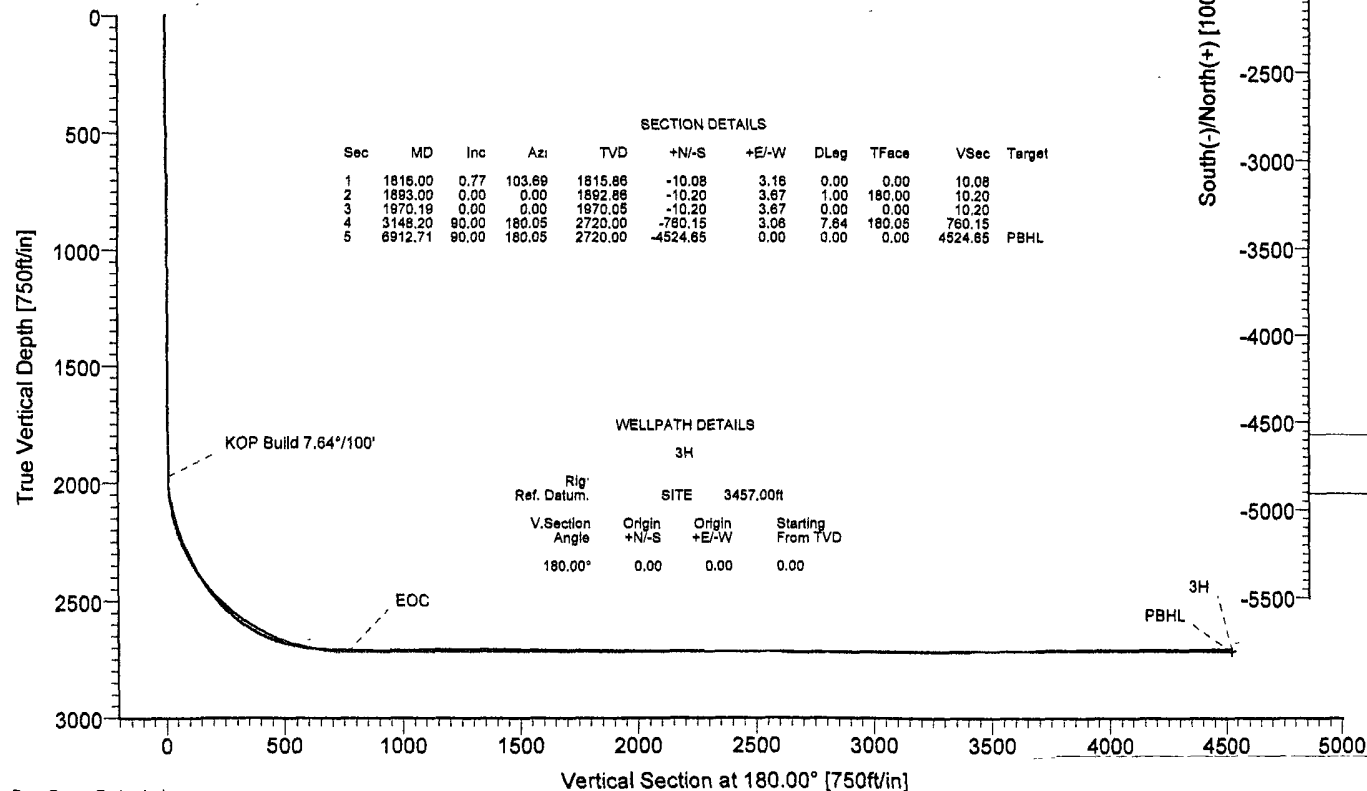
Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Shape
PBHL	2720.00	-4524.65	0.00	564872.68	493535.22	32°33'10.054N	104°29'18.533W	Point

SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	DLeg	TFace	VSec	Target
1	1815.00	0.77	103.69	1815.86	-10.08	3.16	0.00	0.00	10.08	
2	1893.00	0.00	0.00	1892.88	-10.20	3.67	1.00	180.00	10.20	
3	1970.19	0.00	0.00	1970.05	-10.20	3.67	0.00	0.00	10.20	
4	3148.20	90.00	180.05	2720.00	-760.15	3.06	7.64	180.05	760.15	
5	6912.71	90.00	180.05	2720.00	-4524.65	0.00	0.00	0.00	4524.65	PBHL

WELLPATH DETAILS

Rig	Ref. Datum	SITE	4935.00ft
V.Section Angle	Origin +N/-S	Origin +E/-W	Starting From TVD
180.00°	0.00	0.00	0.00



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Survey Report



Company: Echo Production Co	Date: 6/28/2011	Time: 06:47:10	Page: 1
Field: Eddy Co, NM NAD83	Co-ordinate(NE) Reference:	Site: Stiletto 21 Federal Com 3H	
Site: Stiletto 21 Federal Com 3H	Vertical (TVD) Reference:	SITE 3457.0	
Well: Well # 3H	Section (VS) Reference:	Well (0.00N,0.00E,180.00Azi)	
Wellpath: 3H	Survey Calculation Method:	Minimum Curvature	Db: Sybase

Field: Eddy Co, NM NAD83

Map System: US State Plane Coordinate System 1983
 Geo Datum: GRS 1980
 Sys Datum: Mean Sea Level

Map Zone: New Mexico, Eastern Zone
 Coordinate System: Site Centre
 Geomagnetic Model: IGRF2010

Site: Stiletto 21 Federal Com 3H

Eddy Co, NM

Site Position:	Northing:	569397.33 ft	Latitude:	32 33	54.828 N
From: Map	Easting:	493535.22 ft	Longitude:	104 29	18.610 W
Position Uncertainty:		0.00 ft	North Reference:		Grid
Ground Level:		3457.00 ft	Grid Convergence:		-0.08 deg

Well: Well # 3H

Slot Name:

Well Position:	+N/-S	0.00 ft	Northing:	569397.33 ft	Latitude:	32 33	54.828 N
	+E/-W	0.00 ft	Easting:	493535.22 ft	Longitude:	104 29	18.610 W
Position Uncertainty:		0.00 ft					

Wellpath: 3H

Drilled From: Surface

Current Datum: SITE	Height	3457.00 ft	Tie-on Depth:	0.00 ft	Above System Datum:	Mean Sea Level
Magnetic Data: 5/7/2011			Declination:	8.04 deg		
Field Strength: 48754 nT			Mag Dip Angle:	60.35 deg		
Vertical Section:	Depth From (TVD)	+N/-S	+E/-W	Direction		
	ft	ft	ft	deg		
	0.00	0.00	0.00	180.00		

Survey Program for Definitive Wellpath

Date: 6/28/2011 Validated: No

Version: 0

Actual From	To	Survey	Toolcode	Tool Name
100.00	1816.00	Survey #1 (100.00-1816.00)	Gyro	Gyro
1930.00	6866.00	Survey #2 (1930.00-6866.00)	Ryan MWD	Ryan MWD
6921.00	6921.00	Survey #3 (6921.00-6921.00)	Projection	Projection

Survey

MD ft	Incl deg	Azim deg	TVD ft	+N/-S ft	+E/-W ft	VS ft	DLS deg/100ft	Build deg/100ft	Turn deg/100ft	Tool/Comment
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	TIE LINE
100.00	0.48	296.44	100.00	0.19	-0.38	-0.19	0.48	0.48	0.00	Gyro
200.00	0.41	282.53	200.00	0.45	-1.10	-0.45	0.13	-0.07	-13.91	Gyro
300.00	0.55	272.13	299.99	0.55	-1.93	-0.55	0.16	0.14	-10.40	Gyro
400.00	0.74	224.11	399.99	0.10	-2.86	-0.10	0.55	0.19	-48.02	Gyro
500.00	0.71	208.02	499.98	-0.91	-3.60	0.91	0.21	-0.03	-16.09	Gyro
600.00	0.76	210.95	599.97	-2.03	-4.23	2.03	0.06	0.05	2.93	Gyro
700.00	0.81	219.97	699.96	-3.14	-5.03	3.14	0.13	0.05	9.02	Gyro
800.00	0.72	201.79	799.95	-4.26	-5.71	4.26	0.26	-0.09	-18.18	Gyro
900.00	0.66	199.99	899.95	-5.39	-6.14	5.39	0.06	-0.06	-1.80	Gyro
1000.00	0.70	176.31	999.94	-6.54	-6.30	6.54	0.28	0.04	-23.68	Gyro
1100.00	0.91	146.35	1099.93	-7.81	-5.82	7.81	0.46	0.21	-29.96	Gyro
1200.00	0.77	110.01	1199.92	-8.70	-4.75	8.70	0.54	-0.14	-36.34	Gyro
1300.00	0.77	104.35	1299.91	-9.10	-3.47	9.10	0.08	0.00	-5.66	Gyro
1400.00	0.97	88.98	1399.90	-9.25	-1.97	9.25	0.31	0.20	-15.37	Gyro
1500.00	0.97	94.95	1499.88	-9.30	-0.28	9.30	0.10	0.00	5.97	Gyro
1600.00	0.48	100.56	1599.88	-9.45	0.97	9.45	0.49	-0.49	5.61	Gyro
1700.00	0.58	112.34	1699.87	-9.72	1.85	9.72	0.15	0.10	11.78	Gyro
1800.00	0.74	100.78	1799.86	-10.04	2.96	10.04	0.21	0.16	-11.56	Gyro
1816.00	0.77	103.69	1815.86	-10.08	3.16	10.08	0.30	0.19	18.19	Gyro
1930.00	0.70	106.80	1929.85	-10.46	4.57	10.46	0.07	-0.06	2.73	Ryan MWD

Ryan Energy Technologies

Survey Report



Company: Echo Production Co Field: Eddy Co, NM NAD83 Site: Stiletto 21 Federal Com 3H Well: Well # 3H Wellpath: 3H	Date: 6/28/2011 Time: 06:47:10 Page: 2 Co-ordinate(NE) Reference: Site: Stiletto 21 Federal Com 3H Vertical (TVD) Reference: SITE 3457.0 Section (VS) Reference: Well (0.00N,0.00E,180.00Azi) Survey Calculation Method: Minimum Curvature Db: Sybase
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Survey

MD ft	Incl deg	Azim deg	TVD ft	+N/-S ft	+E/-W ft	VS ft	DLS deg/100ft	Build deg/100ft	Turn deg/100ft	Tool/Comment
1961.00	0.80	102.80	1960.85	-10.57	4.97	10.57	0.36	0.32	-12.90	Ryan MWD
1970.20	0.89	127.10	1970.05	-10.62	5.09	10.62	3.98	0.98	264.13	Ryan MWD
1992.00	1.50	158.50	1991.85	-10.99	5.33	10.99	4.01	2.80	144.04	Ryan MWD
2023.00	4.70	176.70	2022.80	-12.64	5.55	12.64	10.67	10.32	58.71	Ryan MWD
2053.00	8.00	178.10	2052.61	-15.95	5.69	15.95	11.01	11.00	4.67	Ryan MWD
2091.00	11.00	178.70	2090.08	-22.22	5.86	22.22	7.90	7.89	1.58	Ryan MWD
2122.00	13.10	179.90	2120.40	-28.69	5.93	28.69	6.82	6.77	3.87	Ryan MWD
2154.00	15.60	182.10	2151.40	-36.62	5.78	36.62	7.99	7.81	6.87	Ryan MWD
2184.00	17.80	182.40	2180.13	-45.23	5.44	45.23	7.34	7.33	1.00	Ryan MWD
2213.00	19.60	182.40	2207.60	-54.52	5.05	54.52	6.21	6.21	0.00	Ryan MWD
2244.00	21.00	183.40	2236.67	-65.26	4.50	65.26	4.65	4.52	3.23	Ryan MWD
2274.00	23.60	182.90	2264.43	-76.63	3.88	76.63	8.69	8.67	-1.67	Ryan MWD
2305.00	25.50	182.00	2292.62	-89.50	3.33	89.50	6.25	6.13	-2.90	Ryan MWD
2335.00	26.00	180.70	2319.64	-102.52	3.03	102.52	2.51	1.67	-4.33	Ryan MWD
2365.00	26.60	179.80	2346.54	-115.82	2.97	115.82	2.40	2.00	-3.00	Ryan MWD
2396.00	27.80	179.60	2374.11	-129.99	3.05	129.99	3.88	3.87	-0.65	Ryan MWD
2426.00	30.70	180.80	2400.28	-144.64	2.99	144.64	9.86	9.67	4.00	Ryan MWD
2456.00	33.30	180.70	2425.72	-160.54	2.78	160.54	8.67	8.67	-0.33	Ryan MWD
2486.00	36.00	180.40	2450.40	-177.59	2.62	177.59	9.02	9.00	-1.00	Ryan MWD
2516.00	38.20	180.20	2474.32	-195.69	2.52	195.69	7.34	7.33	-0.67	Ryan MWD
2546.00	40.50	179.30	2497.52	-214.71	2.61	214.71	7.90	7.67	-3.00	Ryan MWD
2576.00	42.90	178.30	2519.92	-234.66	3.03	234.66	8.30	8.00	-3.33	Ryan MWD
2607.00	45.50	178.10	2542.14	-256.26	3.71	256.26	8.40	8.39	-0.65	Ryan MWD
2638.00	48.80	177.10	2563.22	-278.96	4.67	278.96	10.90	10.65	-3.23	Ryan MWD
2669.00	51.70	178.60	2583.04	-302.77	5.56	302.77	10.07	9.35	4.84	Ryan MWD
2701.00	54.60	179.90	2602.23	-328.37	5.89	328.37	9.63	9.06	4.06	Ryan MWD
2733.00	57.80	181.40	2620.03	-354.96	5.58	354.96	10.73	10.00	4.69	Ryan MWD
2765.00	60.90	181.90	2636.34	-382.47	4.78	382.47	9.78	9.69	1.56	Ryan MWD
2797.00	64.60	182.10	2650.99	-410.90	3.79	410.90	11.58	11.56	0.62	Ryan MWD
2828.00	68.10	182.10	2663.43	-439.27	2.75	439.27	11.29	11.29	0.00	Ryan MWD
2860.00	71.40	182.40	2674.50	-469.27	1.57	469.27	10.35	10.31	0.94	Ryan MWD
2892.00	74.20	182.90	2683.96	-499.80	0.16	499.80	8.88	8.75	1.56	Ryan MWD
2924.00	76.40	184.00	2692.08	-530.69	-1.71	530.69	7.64	6.87	3.44	Ryan MWD
2956.00	79.20	184.30	2698.84	-561.89	-3.97	561.89	8.80	8.75	0.94	Ryan MWD
2988.00	81.60	183.90	2704.18	-593.36	-6.23	593.36	7.60	7.50	-1.25	Ryan MWD
3020.00	84.30	183.10	2708.11	-625.05	-8.17	625.05	8.79	8.44	-2.50	Ryan MWD
3051.00	87.30	182.20	2710.38	-655.93	-9.59	655.93	10.10	9.68	-2.90	Ryan MWD
3147.00	88.40	182.40	2713.98	-751.78	-13.44	751.78	1.16	1.15	0.21	Ryan MWD
3243.00	89.20	182.70	2715.99	-847.67	-17.71	847.67	0.89	0.83	0.31	Ryan MWD
3338.00	90.50	182.90	2716.24	-942.55	-22.35	942.55	1.38	1.37	0.21	Ryan MWD
3434.00	91.70	181.50	2714.40	-1038.46	-26.04	1038.46	1.92	1.25	-1.46	Ryan MWD
3529.00	90.90	180.50	2712.24	-1133.42	-27.70	1133.42	1.35	-0.84	-1.05	Ryan MWD
3624.00	90.20	179.80	2711.33	-1228.41	-27.95	1228.41	1.04	-0.74	-0.74	Ryan MWD
3720.00	88.90	178.60	2712.08	-1324.40	-26.61	1324.40	1.84	-1.35	-1.25	Ryan MWD
3815.00	89.90	179.00	2713.08	-1419.37	-24.62	1419.37	1.13	1.05	0.42	Ryan MWD
3911.00	89.00	179.40	2714.00	-1515.35	-23.28	1515.35	1.03	-0.94	0.42	Ryan MWD
4006.00	90.10	180.00	2714.75	-1610.35	-22.78	1610.35	1.32	1.16	0.63	Ryan MWD
4101.00	89.40	178.60	2715.16	-1705.34	-21.62	1705.34	1.65	-0.74	-1.47	Ryan MWD
4197.00	90.60	178.60	2715.16	-1801.31	-19.27	1801.31	1.25	1.25	0.00	Ryan MWD
4292.00	89.00	178.80	2715.49	-1896.28	-17.12	1896.28	1.70	-1.68	0.21	Ryan MWD
4387.00	90.00	178.60	2716.32	-1991.25	-14.96	1991.25	1.07	1.05	-0.21	Ryan MWD
4482.00	89.00	178.30	2717.15	-2086.21	-12.39	2086.21	1.10	-1.05	-0.32	Ryan MWD
4577.00	90.20	179.00	2717.81	-2181.18	-10.15	2181.18	1.46	1.26	0.74	Ryan MWD
4672.00	88.80	177.90	2718.64	-2276.14	-7.58	2276.14	1.87	-1.47	-1.16	Ryan MWD

Ryan Energy Technologies

Survey Report



Company: Echo Production Co
Field: Eddy Co, NM NAD83
Site: Stiletto 21 Federal Com 3H
Well: Well # 3H
Wellpath: 3H

Date: 6/28/2011 **Time:** 06:47:10 **Page:** 3
Co-ordinate(NE) Reference: Site: Stiletto 21 Federal Com 3H
Vertical (TVD) Reference: SITE 3457.0
Section (VS) Reference: Well (0.00N,0.00E,180.00Azi)
Survey Calculation Method: Minimum Curvature **Db:** Sybase

Survey

MD ft	Incl deg	Azim deg	TVD ft	+N/-S ft	+E/-W ft	VS ft	DLS deg/100ft	Build deg/100ft	Turn deg/100ft	Tool/Comment
4767.00	89.50	178.00	2720.05	-2371.06	-4.19	2371.06	0.74	0.74	0.11	Ryan MWD
4863.00	90.60	178.10	2719.97	-2467.01	-0.92	2467.01	1.15	1.15	0.10	Ryan MWD
4959.00	88.80	178.00	2720.47	-2562.95	2.35	2562.95	1.88	-1.87	-0.10	Ryan MWD
5054.00	89.60	178.80	2721.80	-2657.90	5.00	2657.90	1.19	0.84	0.84	Ryan MWD
5149.00	90.70	179.20	2721.55	-2752.88	6.66	2752.88	1.23	1.16	0.42	Ryan MWD
5244.00	89.40	180.30	2721.46	-2847.88	7.07	2847.88	1.79	-1.37	1.16	Ryan MWD
5340.00	90.00	180.90	2721.97	-2943.87	6.07	2943.87	0.88	0.62	0.62	Ryan MWD
5406.00	90.60	181.40	2721.62	-3009.85	4.74	3009.85	1.18	0.91	0.76	Ryan MWD
5498.00	89.80	180.90	2721.30	-3101.83	2.89	3101.83	1.03	-0.87	-0.54	Ryan MWD
5593.00	89.10	180.80	2722.21	-3196.82	1.49	3196.82	0.74	-0.74	-0.11	Ryan MWD
5688.00	90.20	180.60	2722.79	-3291.81	0.32	3291.81	1.18	1.16	-0.21	Ryan MWD
5784.00	91.30	180.80	2721.54	-3387.79	-0.85	3387.79	1.16	1.15	0.21	Ryan MWD
5879.00	90.60	181.10	2719.96	-3482.77	-2.42	3482.77	0.80	-0.74	0.32	Ryan MWD
5974.00	89.90	180.40	2719.55	-3577.75	-3.67	3577.75	1.04	-0.74	-0.74	Ryan MWD
6069.00	90.90	180.40	2718.88	-3672.75	-4.33	3672.75	1.05	1.05	0.00	Ryan MWD
6164.00	90.40	179.60	2717.81	-3767.74	-4.33	3767.74	0.99	-0.53	-0.84	Ryan MWD
6260.00	91.70	179.30	2716.05	-3863.72	-3.41	3863.72	1.39	1.35	-0.31	Ryan MWD
6355.00	90.40	179.80	2714.31	-3958.70	-2.66	3958.70	1.47	-1.37	0.53	Ryan MWD
6451.00	89.30	178.90	2714.56	-4054.69	-1.57	4054.69	1.48	-1.15	-0.94	Ryan MWD
6546.00	90.40	179.00	2714.81	-4149.67	0.17	4149.67	1.16	1.16	0.11	Ryan MWD
6641.00	89.50	178.60	2714.89	-4244.65	2.16	4244.65	1.04	-0.95	-0.42	Ryan MWD
6737.00	90.40	179.10	2714.97	-4340.63	4.08	4340.63	1.07	0.94	0.52	Ryan MWD
6866.00	92.00	179.50	2712.27	-4469.59	5.66	4469.59	1.28	1.24	0.31	Ryan MWD
6921.00	92.00	179.50	2710.35	-4524.55	6.14	4524.55	0.00	0.00	0.00	PROJECTED to TD