

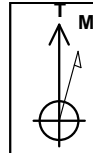


REFERENCE INFORMATION

Co-ordinate (N/E) Reference: Well Federal 44B-32-691, True North
Vertical (TVD) Reference: WELL @ 6531.70ft (Original Well Elev)
Section (VS) Reference: Slot - (0.00N, 0.00E)
Measured Depth Reference: WELL @ 6531.70ft (Original Well Elev)
Calculation Method: Minimum Curvature



Project: Project #1
Site: MDP #24
Well: Federal 44B-32-691
Wellbore: Federal 44B-32-691
Design: Design #1

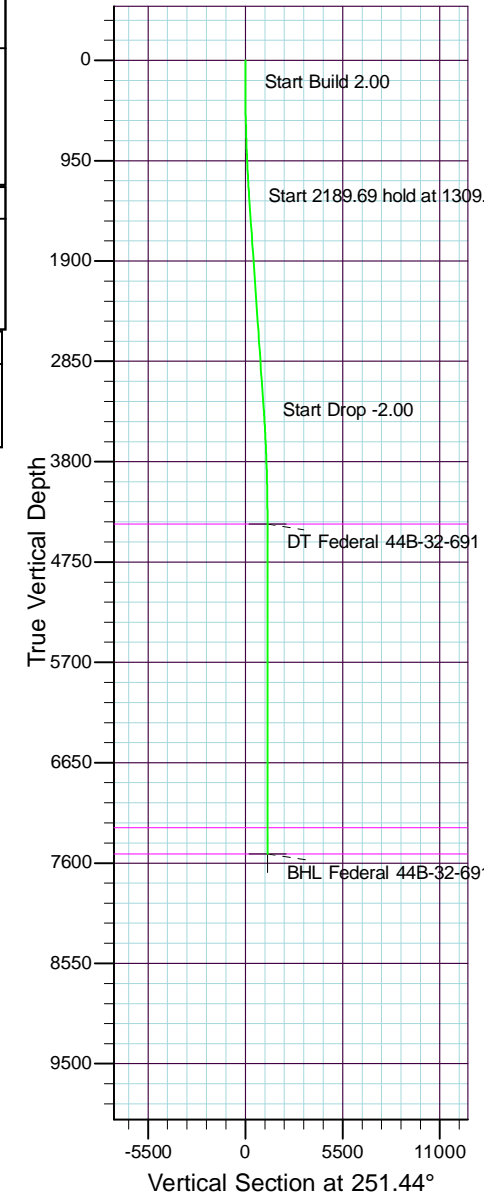
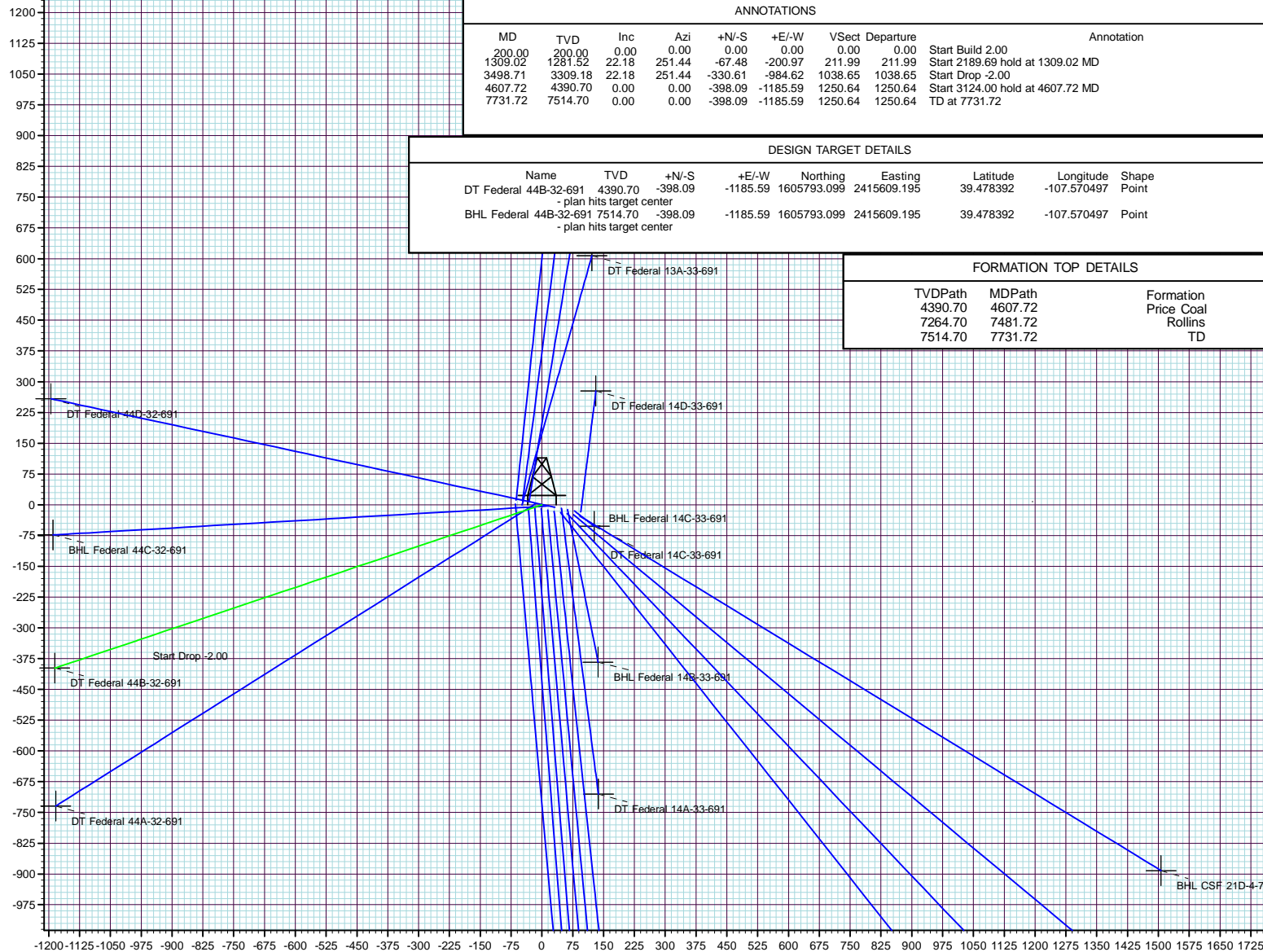


Azimuths to True North
Magnetic North: 9.42°
Magnetic Field

Strength: 51764.1nT
Dip Angle: 65.57°
Date: 12/31/2016
Model: HDGM

WELL DETAILS: Federal 44B-32-691

	Ground Level:	6531.70	
+N/-S	+E/-W	Northing	Easting
0.00	0.00	1606164.109	2416803.481
		Latitude	Longitude
		39.479485	-107.566297





Vanguard Natural Resources, LLC

Project #1

MDP #24

Federal 44B-32-691

Federal 44B-32-691

Plan: Design #1

Standard Planning Report

19 January, 2017

Database:	Compass DB Connection	Local Co-ordinate Reference:	Well Federal 44B-32-691
Company:	Vanguard Natural Resources, LLC	TVD Reference:	WELL @ 6531.70ft (Original Well Elev)
Project:	Project #1	MD Reference:	WELL @ 6531.70ft (Original Well Elev)
Site:	MDP #24	North Reference:	True
Well:	Federal 44B-32-691	Survey Calculation Method:	Minimum Curvature
Wellbore:	Federal 44B-32-691		
Design:	Design #1		

Project	Project #1		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	Colorado Central Zone		Using geodetic scale factor

Site	MDP #24				
Site Position:		Northing:	1,606,177.202 usft	Latitude:	39.479517
From:	Lat/Long	Easting:	2,416,740.817 usft	Longitude:	-107.566520
Position Uncertainty:	0.00 ft	Slot Radius:	13-3/16 "	Grid Convergence:	-1.30

Well	Federal 44B-32-691					
Well Position	+N/-S	-11.66 ft	Northing:	1,606,164.109 usft	Latitude:	39.479485
	+E/-W	62.95 ft	Easting:	2,416,803.481 usft	Longitude:	-107.566297
Position Uncertainty		0.00 ft	Wellhead Elevation:	6,531.70 ft	Ground Level:	6,531.70 ft

Wellbore	Federal 44B-32-691				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	HDGM	12/31/2016	9.42	65.57	51,764

Design	Design #1			
Audit Notes:				
Version:	Phase:	PROTOTYPE	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD) (ft)	+N/-S (ft)	+E/-W (ft)	Direction (°)
	0.00	0.00	0.00	251.44

Plan Sections										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	TFO (°)	Target
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
200.00	0.00	0.00	200.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,309.02	22.18	251.44	1,281.52	-67.48	-200.97	2.00	2.00	0.00	251.44	
3,498.71	22.18	251.44	3,309.18	-330.61	-984.62	0.00	0.00	0.00	0.00	
4,607.72	0.00	0.00	4,390.70	-398.09	-1,185.59	2.00	-2.00	0.00	180.00	DT Federal 44B-32-691
7,731.72	0.00	0.00	7,514.70	-398.09	-1,185.59	0.00	0.00	0.00	0.00	BHL Federal 44B-32-691

Database:	Compass DB Connection	Local Co-ordinate Reference:	Well Federal 44B-32-691
Company:	Vanguard Natural Resources, LLC	TVD Reference:	WELL @ 6531.70ft (Original Well Elev)
Project:	Project #1	MD Reference:	WELL @ 6531.70ft (Original Well Elev)
Site:	MDP #24	North Reference:	True
Well:	Federal 44B-32-691	Survey Calculation Method:	Minimum Curvature
Wellbore:	Federal 44B-32-691		
Design:	Design #1		

Planned Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
100.00	0.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00
200.00	0.00	0.00	200.00	0.00	0.00	0.00	0.00	0.00	0.00
Start Build 2.00									
300.00	2.00	251.44	299.98	-0.56	-1.65	1.75	2.00	2.00	0.00
400.00	4.00	251.44	399.84	-2.22	-6.62	6.98	2.00	2.00	0.00
500.00	6.00	251.44	499.45	-5.00	-14.88	15.69	2.00	2.00	0.00
600.00	8.00	251.44	598.70	-8.87	-26.43	27.88	2.00	2.00	0.00
700.00	10.00	251.44	697.47	-13.85	-41.26	43.52	2.00	2.00	0.00
800.00	12.00	251.44	795.62	-19.93	-59.35	62.60	2.00	2.00	0.00
900.00	14.00	251.44	893.06	-27.09	-80.67	85.10	2.00	2.00	0.00
1,000.00	16.00	251.44	989.64	-35.33	-105.20	110.98	2.00	2.00	0.00
1,100.00	18.00	251.44	1,085.27	-44.63	-132.92	140.21	2.00	2.00	0.00
1,200.00	20.00	251.44	1,179.82	-54.99	-163.78	172.77	2.00	2.00	0.00
1,300.00	22.00	251.44	1,273.17	-66.40	-197.75	208.60	2.00	2.00	0.00
1,309.02	22.18	251.44	1,281.52	-67.48	-200.97	211.99	2.00	2.00	0.00
Start 2189.69 hold at 1309.02 MD									
1,400.00	22.18	251.44	1,365.77	-78.41	-233.53	246.34	0.00	0.00	0.00
1,500.00	22.18	251.44	1,458.37	-90.43	-269.32	284.09	0.00	0.00	0.00
1,600.00	22.18	251.44	1,550.97	-102.45	-305.11	321.85	0.00	0.00	0.00
1,700.00	22.18	251.44	1,643.57	-114.46	-340.89	359.60	0.00	0.00	0.00
1,800.00	22.18	251.44	1,736.17	-126.48	-376.68	397.35	0.00	0.00	0.00
1,900.00	22.18	251.44	1,828.77	-138.50	-412.47	435.10	0.00	0.00	0.00
2,000.00	22.18	251.44	1,921.37	-150.52	-448.26	472.85	0.00	0.00	0.00
2,100.00	22.18	251.44	2,013.97	-162.53	-484.05	510.61	0.00	0.00	0.00
2,200.00	22.18	251.44	2,106.57	-174.55	-519.84	548.36	0.00	0.00	0.00
2,300.00	22.18	251.44	2,199.18	-186.57	-555.63	586.11	0.00	0.00	0.00
2,400.00	22.18	251.44	2,291.78	-198.58	-591.41	623.86	0.00	0.00	0.00
2,500.00	22.18	251.44	2,384.38	-210.60	-627.20	661.62	0.00	0.00	0.00
2,600.00	22.18	251.44	2,476.98	-222.62	-662.99	699.37	0.00	0.00	0.00
2,700.00	22.18	251.44	2,569.58	-234.63	-698.78	737.12	0.00	0.00	0.00
2,800.00	22.18	251.44	2,662.18	-246.65	-734.57	774.87	0.00	0.00	0.00
2,900.00	22.18	251.44	2,754.78	-258.67	-770.36	812.62	0.00	0.00	0.00
3,000.00	22.18	251.44	2,847.38	-270.68	-806.15	850.38	0.00	0.00	0.00
3,100.00	22.18	251.44	2,939.98	-282.70	-841.93	888.13	0.00	0.00	0.00
3,200.00	22.18	251.44	3,032.58	-294.72	-877.72	925.88	0.00	0.00	0.00
3,300.00	22.18	251.44	3,125.18	-306.74	-913.51	963.63	0.00	0.00	0.00
3,400.00	22.18	251.44	3,217.78	-318.75	-949.30	1,001.39	0.00	0.00	0.00
3,498.71	22.18	251.44	3,309.18	-330.61	-984.62	1,038.65	0.00	0.00	0.00
Start Drop -2.00									
3,500.00	22.15	251.44	3,310.38	-330.77	-985.09	1,039.14	2.00	-2.00	0.00
3,600.00	20.15	251.44	3,403.63	-342.26	-1,019.30	1,075.22	2.00	-2.00	0.00
3,700.00	18.15	251.44	3,498.09	-352.70	-1,050.40	1,108.03	2.00	-2.00	0.00
3,800.00	16.15	251.44	3,593.64	-362.09	-1,078.36	1,137.53	2.00	-2.00	0.00
3,900.00	14.15	251.44	3,690.16	-370.41	-1,103.14	1,163.67	2.00	-2.00	0.00
4,000.00	12.15	251.44	3,787.53	-377.65	-1,124.71	1,186.42	2.00	-2.00	0.00
4,100.00	10.15	251.44	3,885.63	-383.81	-1,143.05	1,205.77	2.00	-2.00	0.00
4,200.00	8.15	251.44	3,984.35	-388.87	-1,158.13	1,221.68	2.00	-2.00	0.00
4,300.00	6.15	251.44	4,083.57	-392.84	-1,169.94	1,234.13	2.00	-2.00	0.00
4,400.00	4.15	251.44	4,183.16	-395.70	-1,178.46	1,243.11	2.00	-2.00	0.00
4,500.00	2.15	251.44	4,283.00	-397.45	-1,183.67	1,248.62	2.00	-2.00	0.00
4,600.00	0.15	251.44	4,382.98	-398.09	-1,185.58	1,250.63	2.00	-2.00	0.00
4,607.72	0.00	0.00	4,390.70	-398.09	-1,185.59	1,250.64	2.00	-2.00	0.00
Start 3124.00 hold at 4607.72 MD									

Database:	Compass DB Connection	Local Co-ordinate Reference:	Well Federal 44B-32-691
Company:	Vanguard Natural Resources, LLC	TVD Reference:	WELL @ 6531.70ft (Original Well Elev)
Project:	Project #1	MD Reference:	WELL @ 6531.70ft (Original Well Elev)
Site:	MDP #24	North Reference:	True
Well:	Federal 44B-32-691	Survey Calculation Method:	Minimum Curvature
Wellbore:	Federal 44B-32-691		
Design:	Design #1		

Planned Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
4,700.00	0.00	0.00	4,482.98	-398.09	-1,185.59	1,250.64	0.00	0.00	0.00
4,800.00	0.00	0.00	4,582.98	-398.09	-1,185.59	1,250.64	0.00	0.00	0.00
4,900.00	0.00	0.00	4,682.98	-398.09	-1,185.59	1,250.64	0.00	0.00	0.00
5,000.00	0.00	0.00	4,782.98	-398.09	-1,185.59	1,250.64	0.00	0.00	0.00
5,100.00	0.00	0.00	4,882.98	-398.09	-1,185.59	1,250.64	0.00	0.00	0.00
5,200.00	0.00	0.00	4,982.98	-398.09	-1,185.59	1,250.64	0.00	0.00	0.00
5,300.00	0.00	0.00	5,082.98	-398.09	-1,185.59	1,250.64	0.00	0.00	0.00
5,400.00	0.00	0.00	5,182.98	-398.09	-1,185.59	1,250.64	0.00	0.00	0.00
5,500.00	0.00	0.00	5,282.98	-398.09	-1,185.59	1,250.64	0.00	0.00	0.00
5,600.00	0.00	0.00	5,382.98	-398.09	-1,185.59	1,250.64	0.00	0.00	0.00
5,700.00	0.00	0.00	5,482.98	-398.09	-1,185.59	1,250.64	0.00	0.00	0.00
5,800.00	0.00	0.00	5,582.98	-398.09	-1,185.59	1,250.64	0.00	0.00	0.00
5,900.00	0.00	0.00	5,682.98	-398.09	-1,185.59	1,250.64	0.00	0.00	0.00
6,000.00	0.00	0.00	5,782.98	-398.09	-1,185.59	1,250.64	0.00	0.00	0.00
6,100.00	0.00	0.00	5,882.98	-398.09	-1,185.59	1,250.64	0.00	0.00	0.00
6,200.00	0.00	0.00	5,982.98	-398.09	-1,185.59	1,250.64	0.00	0.00	0.00
6,300.00	0.00	0.00	6,082.98	-398.09	-1,185.59	1,250.64	0.00	0.00	0.00
6,400.00	0.00	0.00	6,182.98	-398.09	-1,185.59	1,250.64	0.00	0.00	0.00
6,500.00	0.00	0.00	6,282.98	-398.09	-1,185.59	1,250.64	0.00	0.00	0.00
6,600.00	0.00	0.00	6,382.98	-398.09	-1,185.59	1,250.64	0.00	0.00	0.00
6,700.00	0.00	0.00	6,482.98	-398.09	-1,185.59	1,250.64	0.00	0.00	0.00
6,800.00	0.00	0.00	6,582.98	-398.09	-1,185.59	1,250.64	0.00	0.00	0.00
6,900.00	0.00	0.00	6,682.98	-398.09	-1,185.59	1,250.64	0.00	0.00	0.00
7,000.00	0.00	0.00	6,782.98	-398.09	-1,185.59	1,250.64	0.00	0.00	0.00
7,100.00	0.00	0.00	6,882.98	-398.09	-1,185.59	1,250.64	0.00	0.00	0.00
7,200.00	0.00	0.00	6,982.98	-398.09	-1,185.59	1,250.64	0.00	0.00	0.00
7,300.00	0.00	0.00	7,082.98	-398.09	-1,185.59	1,250.64	0.00	0.00	0.00
7,400.00	0.00	0.00	7,182.98	-398.09	-1,185.59	1,250.64	0.00	0.00	0.00
7,500.00	0.00	0.00	7,282.98	-398.09	-1,185.59	1,250.64	0.00	0.00	0.00
7,600.00	0.00	0.00	7,382.98	-398.09	-1,185.59	1,250.64	0.00	0.00	0.00
7,700.00	0.00	0.00	7,482.98	-398.09	-1,185.59	1,250.64	0.00	0.00	0.00
7,731.72	0.00	0.00	7,514.70	-398.09	-1,185.59	1,250.64	0.00	0.00	0.00
TD at 7731.72									

Design Targets									
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (usft)	Easting (usft)	Latitude	Longitude
- hit/miss target									
- Shape									
DT Federal 44B-32-691	0.00	0.00	4,390.70	-398.09	-1,185.59	1,605,793.099	2,415,609.196	39.478392	-107.570497
- plan hits target center									
- Point									
BHL Federal 44B-32-691	0.00	0.00	7,514.70	-398.09	-1,185.59	1,605,793.099	2,415,609.196	39.478392	-107.570497
- plan hits target center									
- Point									

Database:	Compass DB Connection	Local Co-ordinate Reference:	Well Federal 44B-32-691
Company:	Vanguard Natural Resources, LLC	TVD Reference:	WELL @ 6531.70ft (Original Well Elev)
Project:	Project #1	MD Reference:	WELL @ 6531.70ft (Original Well Elev)
Site:	MDP #24	North Reference:	True
Well:	Federal 44B-32-691	Survey Calculation Method:	Minimum Curvature
Wellbore:	Federal 44B-32-691		
Design:	Design #1		

Formations					
Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
4,607.72	4,390.70	Price Coal		0.00	
7,481.72	7,264.70	Rollins		0.00	
7,731.72	7,514.70	TD		0.00	

Plan Annotations					
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates			
		+N/-S (ft)	+E/-W (ft)	Comment	
200.00	200.00	0.00	0.00	Start Build 2.00	
1,309.02	1,281.52	-67.48	-200.97	Start 2189.69 hold at 1309.02 MD	
3,498.71	3,309.18	-330.61	-984.62	Start Drop -2.00	
4,607.72	4,390.70	-398.09	-1,185.59	Start 3124.00 hold at 4607.72 MD	
7,731.72	7,514.70	-398.09	-1,185.59	TD at 7731.72	