



Denver Division- Colorado

DJ - Hereford Ranch

Windmill 05-23H

Windmill 05-23H

Original Wellbore

Plan: APD Directional Plan

Standard Planning Report

11 January, 2011

Database:	EDM	Local Co-ordinate Reference:	Site Windmill 05-23H
Company:	Denver Division- Colorado	TVD Reference:	Rig @ 4609.00ft (TBD)
Project:	DJ - Hereford Ranch	MD Reference:	Rig @ 4609.00ft (TBD)
Site:	Windmill 05-23H	North Reference:	True
Well:	Windmill 05-23H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original Wellbore		
Design:	APD Directional Plan		

Project	DJ - Hereford Ranch, Weld County		
Map System:	US State Plane 1927 (Exact solution)	System Datum:	Mean Sea Level
Geo Datum:	NAD 1927 (NADCON CONUS)		
Map Zone:	Colorado North 501		

Site	Windmill 05-23H				
Site Position:		Northing:	383,531.58 ft	Latitude:	40° 22' 47.399 N
From:	Lat/Long	Easting:	2,338,914.79 ft	Longitude:	104° 17' 0.499 W
Position Uncertainty:	0.00 ft	Slot Radius:	"	Grid Convergence:	0.79 deg

Well	Windmill 05-23H					
Well Position	+N-S	0.00 ft	Northing:	383,531.58 ft	Latitude:	40° 22' 47.399 N
	+E-W	0.00 ft	Easting:	2,338,914.79 ft	Longitude:	104° 17' 0.499 W
Position Uncertainty		0.00 ft	Wellhead Elevation:	ft	Ground Level:	4,587.00 ft

Wellbore	Original Wellbore				
Magnetics	Model Name	Sample Date	Declination (deg)	Dip Angle (deg)	Field Strength (nT)
	IGRF200510	1/11/2011	8.62	67.14	53,239

Design	APD Directional Plan			
Audit Notes:				
Version:	Phase:	PROTOTYPE	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD) (ft)	+N/-S (ft)	+E/-W (ft)	Direction (deg)
	0.00	0.00	0.00	337.33

Plan Sections										
Measured Depth (ft)	Inclination (deg)	Azimuth (deg)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Dogleg Rate (?/100ft)	Build Rate (?/100ft)	Turn Rate (?/100ft)	TFO (deg)	Target
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
5,637.53	0.00	0.00	5,637.53	0.00	0.00	0.00	0.00	0.00	0.00	
6,387.54	90.00	337.33	6,115.00	440.58	-184.02	12.00	12.00	0.00	337.33	
10,424.97	90.00	337.33	6,115.00	4,166.08	-1,740.13	0.00	0.00	0.00	0.00	Windmill 5-23H (BH)

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Site:	Windmill 05-23H	North Reference:	True
Well:	Windmill 05-23H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original Wellbore		
Design:	APD Directional Plan		

Planned Survey									
Measured Depth (ft)	Inclination (deg)	Azimuth (deg)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (?/100ft)	Build Rate (?/100ft)	Turn Rate (?/100ft)
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
300.00	0.00	0.00	300.00	0.00	0.00	0.00	0.00	0.00	0.00
400.00	0.00	0.00	400.00	0.00	0.00	0.00	0.00	0.00	0.00
500.00	0.00	0.00	500.00	0.00	0.00	0.00	0.00	0.00	0.00
600.00	0.00	0.00	600.00	0.00	0.00	0.00	0.00	0.00	0.00
700.00	0.00	0.00	700.00	0.00	0.00	0.00	0.00	0.00	0.00
800.00	0.00	0.00	800.00	0.00	0.00	0.00	0.00	0.00	0.00
9-5/8"									
900.00	0.00	0.00	900.00	0.00	0.00	0.00	0.00	0.00	0.00
1,000.00	0.00	0.00	1,000.00	0.00	0.00	0.00	0.00	0.00	0.00
1,100.00	0.00	0.00	1,100.00	0.00	0.00	0.00	0.00	0.00	0.00
1,200.00	0.00	0.00	1,200.00	0.00	0.00	0.00	0.00	0.00	0.00
1,300.00	0.00	0.00	1,300.00	0.00	0.00	0.00	0.00	0.00	0.00
1,400.00	0.00	0.00	1,400.00	0.00	0.00	0.00	0.00	0.00	0.00
1,500.00	0.00	0.00	1,500.00	0.00	0.00	0.00	0.00	0.00	0.00
1,600.00	0.00	0.00	1,600.00	0.00	0.00	0.00	0.00	0.00	0.00
1,700.00	0.00	0.00	1,700.00	0.00	0.00	0.00	0.00	0.00	0.00
1,800.00	0.00	0.00	1,800.00	0.00	0.00	0.00	0.00	0.00	0.00
1,900.00	0.00	0.00	1,900.00	0.00	0.00	0.00	0.00	0.00	0.00
2,000.00	0.00	0.00	2,000.00	0.00	0.00	0.00	0.00	0.00	0.00
2,100.00	0.00	0.00	2,100.00	0.00	0.00	0.00	0.00	0.00	0.00
2,200.00	0.00	0.00	2,200.00	0.00	0.00	0.00	0.00	0.00	0.00
2,300.00	0.00	0.00	2,300.00	0.00	0.00	0.00	0.00	0.00	0.00
2,400.00	0.00	0.00	2,400.00	0.00	0.00	0.00	0.00	0.00	0.00
2,500.00	0.00	0.00	2,500.00	0.00	0.00	0.00	0.00	0.00	0.00
2,600.00	0.00	0.00	2,600.00	0.00	0.00	0.00	0.00	0.00	0.00
2,700.00	0.00	0.00	2,700.00	0.00	0.00	0.00	0.00	0.00	0.00
2,800.00	0.00	0.00	2,800.00	0.00	0.00	0.00	0.00	0.00	0.00
2,900.00	0.00	0.00	2,900.00	0.00	0.00	0.00	0.00	0.00	0.00
3,000.00	0.00	0.00	3,000.00	0.00	0.00	0.00	0.00	0.00	0.00
3,100.00	0.00	0.00	3,100.00	0.00	0.00	0.00	0.00	0.00	0.00
3,200.00	0.00	0.00	3,200.00	0.00	0.00	0.00	0.00	0.00	0.00
3,300.00	0.00	0.00	3,300.00	0.00	0.00	0.00	0.00	0.00	0.00
3,400.00	0.00	0.00	3,400.00	0.00	0.00	0.00	0.00	0.00	0.00
3,500.00	0.00	0.00	3,500.00	0.00	0.00	0.00	0.00	0.00	0.00
3,600.00	0.00	0.00	3,600.00	0.00	0.00	0.00	0.00	0.00	0.00
3,700.00	0.00	0.00	3,700.00	0.00	0.00	0.00	0.00	0.00	0.00
3,800.00	0.00	0.00	3,800.00	0.00	0.00	0.00	0.00	0.00	0.00
3,900.00	0.00	0.00	3,900.00	0.00	0.00	0.00	0.00	0.00	0.00
4,000.00	0.00	0.00	4,000.00	0.00	0.00	0.00	0.00	0.00	0.00
4,100.00	0.00	0.00	4,100.00	0.00	0.00	0.00	0.00	0.00	0.00
4,200.00	0.00	0.00	4,200.00	0.00	0.00	0.00	0.00	0.00	0.00
4,300.00	0.00	0.00	4,300.00	0.00	0.00	0.00	0.00	0.00	0.00
4,400.00	0.00	0.00	4,400.00	0.00	0.00	0.00	0.00	0.00	0.00
4,500.00	0.00	0.00	4,500.00	0.00	0.00	0.00	0.00	0.00	0.00
4,600.00	0.00	0.00	4,600.00	0.00	0.00	0.00	0.00	0.00	0.00
4,700.00	0.00	0.00	4,700.00	0.00	0.00	0.00	0.00	0.00	0.00
4,800.00	0.00	0.00	4,800.00	0.00	0.00	0.00	0.00	0.00	0.00
4,900.00	0.00	0.00	4,900.00	0.00	0.00	0.00	0.00	0.00	0.00
5,000.00	0.00	0.00	5,000.00	0.00	0.00	0.00	0.00	0.00	0.00
5,100.00	0.00	0.00	5,100.00	0.00	0.00	0.00	0.00	0.00	0.00

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Project:	DJ - Hereford Ranch	MD Reference:	Rig @ 4609.00ft (TBD)
Site:	Windmill 05-23H	North Reference:	True
Well:	Windmill 05-23H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original Wellbore		
Design:	APD Directional Plan		

Planned Survey									
Measured Depth (ft)	Inclination (deg)	Azimuth (deg)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (?/100ft)	Build Rate (?/100ft)	Turn Rate (?/100ft)
5,200.00	0.00	0.00	5,200.00	0.00	0.00	0.00	0.00	0.00	0.00
5,300.00	0.00	0.00	5,300.00	0.00	0.00	0.00	0.00	0.00	0.00
5,400.00	0.00	0.00	5,400.00	0.00	0.00	0.00	0.00	0.00	0.00
5,500.00	0.00	0.00	5,500.00	0.00	0.00	0.00	0.00	0.00	0.00
5,600.00	0.00	0.00	5,600.00	0.00	0.00	0.00	0.00	0.00	0.00
5,637.53	0.00	0.00	5,637.53	0.00	0.00	0.00	0.00	0.00	0.00
5,700.00	7.50	337.33	5,699.82	3.77	-1.57	4.08	12.00	12.00	0.00
5,800.00	19.50	337.33	5,796.88	25.26	-10.55	27.38	12.00	12.00	0.00
5,900.00	31.50	337.33	5,886.98	64.91	-27.11	70.34	12.00	12.00	0.00
6,000.00	43.50	337.33	5,966.17	120.97	-50.53	131.10	12.00	12.00	0.00
6,100.00	55.50	337.33	6,031.01	191.00	-79.78	207.00	12.00	12.00	0.00
6,200.00	67.50	337.33	6,078.64	271.95	-113.59	294.71	12.00	12.00	0.00
6,300.00	79.50	337.33	6,107.00	360.26	-150.48	390.42	12.00	12.00	0.00
6,387.54	90.00	337.33	6,115.00	440.58	-184.03	477.47	12.00	12.00	0.00
7"									
6,400.00	90.00	337.33	6,115.00	452.08	-188.83	489.93	0.00	0.00	0.00
6,500.00	90.00	337.33	6,115.00	544.35	-227.37	589.93	0.00	0.00	0.00
6,600.00	90.00	337.33	6,115.00	636.63	-265.91	689.93	0.00	0.00	0.00
6,700.00	90.00	337.33	6,115.00	728.90	-304.45	789.93	0.00	0.00	0.00
6,800.00	90.00	337.33	6,115.00	821.18	-343.00	889.93	0.00	0.00	0.00
6,900.00	90.00	337.33	6,115.00	913.45	-381.54	989.93	0.00	0.00	0.00
7,000.00	90.00	337.33	6,115.00	1,005.72	-420.08	1,089.93	0.00	0.00	0.00
7,100.00	90.00	337.33	6,115.00	1,098.00	-458.62	1,189.93	0.00	0.00	0.00
7,200.00	90.00	337.33	6,115.00	1,190.27	-497.16	1,289.93	0.00	0.00	0.00
7,300.00	90.00	337.33	6,115.00	1,282.55	-535.71	1,389.93	0.00	0.00	0.00
7,400.00	90.00	337.33	6,115.00	1,374.82	-574.25	1,489.93	0.00	0.00	0.00
7,500.00	90.00	337.33	6,115.00	1,467.09	-612.79	1,589.93	0.00	0.00	0.00
7,600.00	90.00	337.33	6,115.00	1,559.37	-651.33	1,689.93	0.00	0.00	0.00
7,700.00	90.00	337.33	6,115.00	1,651.64	-689.87	1,789.93	0.00	0.00	0.00
7,800.00	90.00	337.33	6,115.00	1,743.92	-728.42	1,889.93	0.00	0.00	0.00
7,900.00	90.00	337.33	6,115.00	1,836.19	-766.96	1,989.93	0.00	0.00	0.00
8,000.00	90.00	337.33	6,115.00	1,928.47	-805.50	2,089.93	0.00	0.00	0.00
8,100.00	90.00	337.33	6,115.00	2,020.74	-844.04	2,189.93	0.00	0.00	0.00
8,200.00	90.00	337.33	6,115.00	2,113.01	-882.58	2,289.93	0.00	0.00	0.00
8,300.00	90.00	337.33	6,115.00	2,205.29	-921.12	2,389.93	0.00	0.00	0.00
8,400.00	90.00	337.33	6,115.00	2,297.56	-959.67	2,489.93	0.00	0.00	0.00
8,500.00	90.00	337.33	6,115.00	2,389.84	-998.21	2,589.93	0.00	0.00	0.00
8,600.00	90.00	337.33	6,115.00	2,482.11	-1,036.75	2,689.93	0.00	0.00	0.00
8,700.00	90.00	337.33	6,115.00	2,574.38	-1,075.29	2,789.93	0.00	0.00	0.00
8,800.00	90.00	337.33	6,115.00	2,666.66	-1,113.83	2,889.93	0.00	0.00	0.00
8,900.00	90.00	337.33	6,115.00	2,758.93	-1,152.38	2,989.93	0.00	0.00	0.00
9,000.00	90.00	337.33	6,115.00	2,851.21	-1,190.92	3,089.93	0.00	0.00	0.00
9,100.00	90.00	337.33	6,115.00	2,943.48	-1,229.46	3,189.93	0.00	0.00	0.00
9,200.00	90.00	337.33	6,115.00	3,035.76	-1,268.00	3,289.93	0.00	0.00	0.00
9,300.00	90.00	337.33	6,115.00	3,128.03	-1,306.54	3,389.93	0.00	0.00	0.00
9,400.00	90.00	337.33	6,115.00	3,220.30	-1,345.09	3,489.93	0.00	0.00	0.00
9,500.00	90.00	337.33	6,115.00	3,312.58	-1,383.63	3,589.93	0.00	0.00	0.00
9,600.00	90.00	337.33	6,115.00	3,404.85	-1,422.17	3,689.93	0.00	0.00	0.00
9,700.00	90.00	337.33	6,115.00	3,497.13	-1,460.71	3,789.93	0.00	0.00	0.00
9,800.00	90.00	337.33	6,115.00	3,589.40	-1,499.25	3,889.93	0.00	0.00	0.00
9,900.00	90.00	337.33	6,115.00	3,681.67	-1,537.80	3,989.93	0.00	0.00	0.00
10,000.00	90.00	337.33	6,115.00	3,773.95	-1,576.34	4,089.93	0.00	0.00	0.00
10,100.00	90.00	337.33	6,115.00	3,866.22	-1,614.88	4,189.93	0.00	0.00	0.00

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Project:	DJ - Hereford Ranch	MD Reference:	Rig @ 4609.00ft (TBD)
Site:	Windmill 05-23H	North Reference:	True
Well:	Windmill 05-23H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original Wellbore		
Design:	APD Directional Plan		

Planned Survey									
Measured Depth (ft)	Inclination (deg)	Azimuth (deg)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (?/100ft)	Build Rate (?/100ft)	Turn Rate (?/100ft)
10,200.00	90.00	337.33	6,115.00	3,958.50	-1,653.42	4,289.93	0.00	0.00	0.00
10,300.00	90.00	337.33	6,115.00	4,050.77	-1,691.96	4,389.93	0.00	0.00	0.00
10,400.00	90.00	337.33	6,115.00	4,143.05	-1,730.50	4,489.93	0.00	0.00	0.00
10,424.97	90.00	337.33	6,115.00	4,166.08	-1,740.13	4,514.90	0.00	0.00	0.00

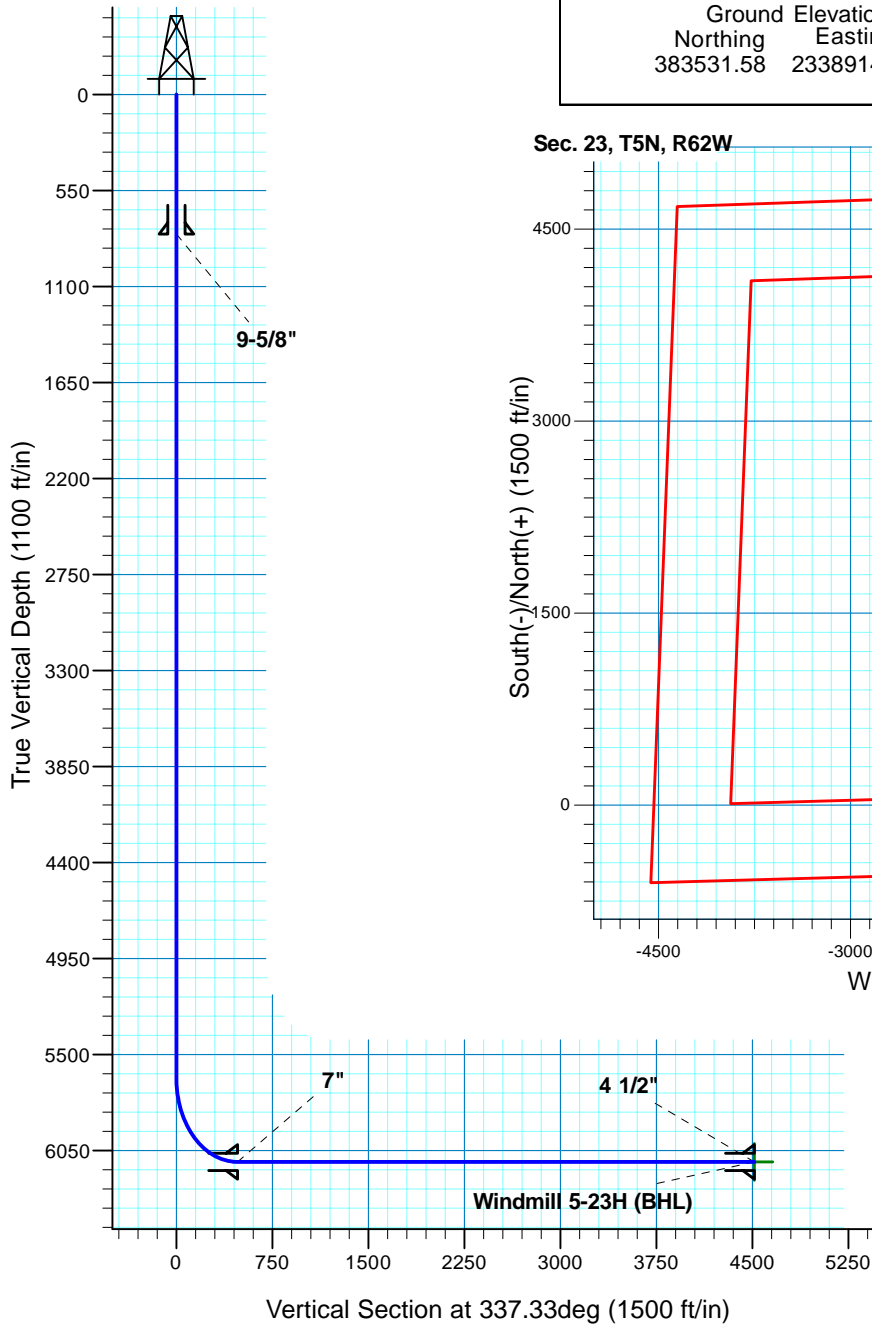
Targets									
Target Name	Dip Angle (deg)	Dip Dir. (deg)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (ft)	Easting (ft)	Latitude	Longitude
- hit/miss target									
- Shape									
Windmill 5-23H (BHL)	0.00	0.00	6,115.00	4,166.08	-1,740.13	387,673.40	2,337,117.68	40° 23' 28.568 N	104° 17' 22.988 W
- plan hits target center									
- Point									

Casing Points					
Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (")	Hole Diameter (")	
800.00	800.00	9-5/8"	9-5/8	13-1/2	
6,387.54	6,115.00	7"	7	8-3/4	
10,424.97	6,115.00	4 1/2"	4-1/2	6-1/4	

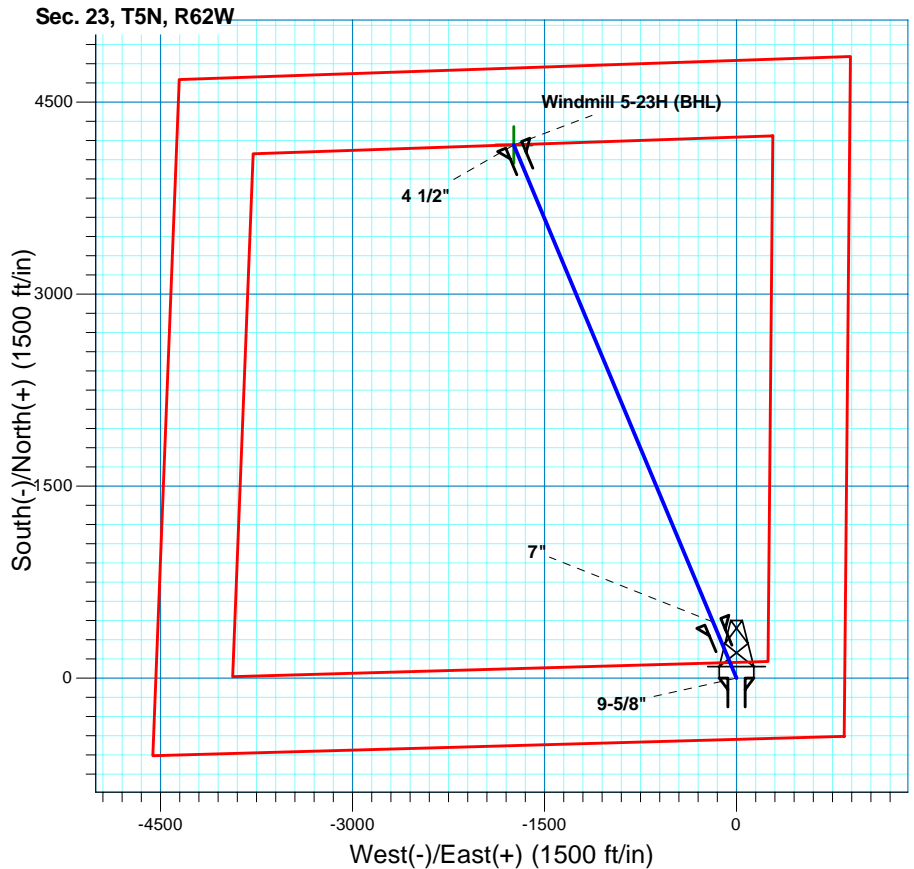
Windmill 05-23H

Section 23 T5N R62W

Weld County, CO



Surface Location					
NAD 1927 (NADCON CONUS) Colorado North 501					
Ground Elevation: 4587.00 Rig @ 4609.00ft (TBD)					
Northing	Easting	Latitude	Longitude		
383531.58	2338914.79	40° 22' 47.399 N	104° 17' 0.499 W		



T M

Azimuths to True North
Magnetic North: 8.62°

Magnetic Field
Strength: 53238.9snT
Dip Angle: 67.14°
Date: 1/11/2011
Model: IGRF200510

Project: DJ - Hereford Ranch
Site: Windmill 05-23H
Well: Windmill 05-23H
Plan: APD Directional Plan

SECTION DETAILS										
Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	DLeg	TFace	VSec	Target
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
2	5637.53	0.00	0.00	5637.53	0.00	0.00	0.00	0.00	0.00	
3	6387.54	90.00	337.33	6115.00	440.58	-184.02	12.00	337.33	477.47	
4	10424.97	90.00	337.33	6115.00	4166.08	-1740.13	0.00	0.00	4514.90	Windmill 5-23H (BHL)
TARGET DETAILS										
Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Shape		
Windmill 5-23H (BHL)	6115.00	4166.08	-1740.13	387673.40	2337117.68	40° 23' 28.568 N	104° 17' 22.988 W	Point		