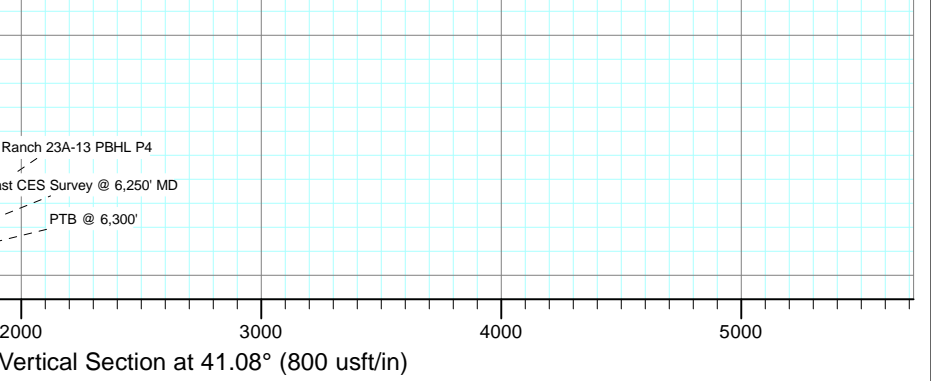


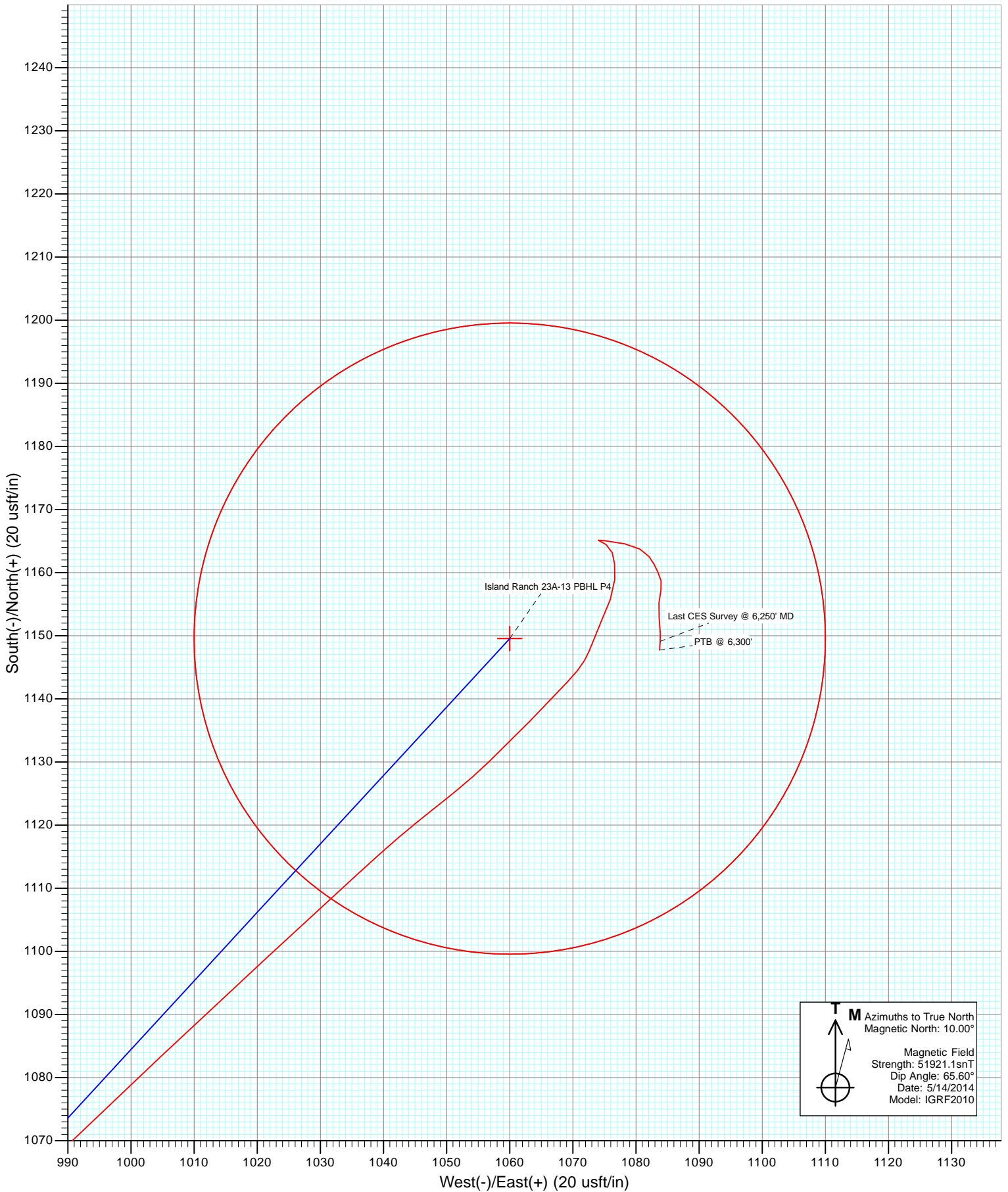
DESIGN TARGET DETAILS

Name	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
Island Ranch 23A-13 TOG P4	1149.6	1060.0	594285.80	1277068.79	39.437150	-108.059897
Island Ranch 23A-13 PBHL P4	1149.6	1060.0	594285.80	1277068.79	39.437150	-108.059897





Project: Garfield County, CO
Site: S13-T7S-R96W (Island Ranch)
Well: Island Ranch 23A-13
Wellbore: DD
Design: FINAL



Cathedral Energy Services

Survey Report

Company: Caerus Oil & Gas (NAD 27)	Local Co-ordinate Reference: Well Island Ranch 23A-13
Project: Garfield County, CO	TVD Reference: KB=24' @ 5079.5usft (Patterson #303)
Site: S13-T7S-R96W (Island Ranch)	MD Reference: KB=24' @ 5079.5usft (Patterson #303)
Well: Island Ranch 23A-13	North Reference: True
Wellbore: DD	Survey Calculation Method: Minimum Curvature
Design: FINAL	Database: USA EDM 5000 Multi Users DB

Project Garfield County, CO		
Map System: US State Plane 1927 (Exact solution)	System Datum:	Mean Sea Level
Geo Datum: NAD 1927 (NADCON CONUS)		
Map Zone: Colorado Central 502		

Site S13-T7S-R96W (Island Ranch)				
Site Position:	Northing:	593,103.71 usft	Latitude:	39.433822
From: Lat/Long	Easting:	1,275,986.01 usft	Longitude:	-108.063611
Position Uncertainty: 0.0 usft	Slot Radius: 13-3/16"		Grid Convergence:	-1.62 °

Well Island Ranch 23A-13				
Well Position	+N/-S	0.0 usft	Northing:	593,166.60 usft
	+E/-W	0.0 usft	Easting:	1,275,976.77 usft
Position Uncertainty		0.0 usft	Wellhead Elevation:	usft
			Latitude:	39.433994
			Longitude:	-108.063650
			Ground Level:	5,055.5 usft

Wellbore DD					
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	5/14/2014	10.00	65.60	51,921

Design FINAL				
Audit Notes:				
Version: 1.0	Phase:	ACTUAL	Tie On Depth:	0.0
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	0.0	0.0	0.0	41.08

Survey Program		Date 6/11/2014
From (usft)	To (usft)	Survey (Wellbore)
142.0	6,300.0	Survey #1 (DD)
		Tool Name
		MWD
		Description
		Geolink MWD

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usf)	Build Rate (°/100u)	Formations / Comments
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	
142.0	0.40	352.20	142.0	0.5	-0.1	0.3	0.28	0.28	
235.0	1.20	27.40	235.0	1.7	0.3	1.5	0.97	0.86	
326.0	2.70	35.40	325.9	4.3	2.0	4.5	1.67	1.65	
418.0	5.80	38.70	417.7	9.7	6.2	11.3	3.38	3.37	
508.0	9.80	38.70	506.8	19.2	13.8	23.5	4.44	4.44	
601.0	13.50	41.50	597.9	33.5	26.0	42.3	4.02	3.98	
692.0	16.80	42.10	685.7	51.2	41.8	66.1	3.63	3.63	
783.0	19.70	42.30	772.1	72.3	61.0	94.6	3.19	3.19	
875.0	21.50	42.40	858.2	96.3	82.8	126.9	1.96	1.96	
971.0	24.10	42.40	946.7	123.7	107.9	164.1	2.71	2.71	
1,073.0	26.30	43.30	1,039.0	155.6	137.4	207.5	2.19	2.16	
1,168.0	27.70	42.50	1,123.7	187.1	166.7	250.6	1.52	1.47	

Cathedral Energy Services

Survey Report

Company:	Caerus Oil & Gas (NAD 27)	Local Co-ordinate Reference:	Well Island Ranch 23A-13
Project:	Garfield County, CO	TVD Reference:	KB=24' @ 5079.5usft (Patterson #303)
Site:	S13-T7S-R96W (Island Ranch)	MD Reference:	KB=24' @ 5079.5usft (Patterson #303)
Well:	Island Ranch 23A-13	North Reference:	True
Wellbore:	DD	Survey Calculation Method:	Minimum Curvature
Design:	FINAL	Database:	USA EDM 5000 Multi Users DB

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usf)	Build Rate (°/100u)	Formations / Comments
1,263.0	30.20	42.50	1,206.8	221.0	197.8	296.6	2.63	2.63	
1,359.0	30.00	41.40	1,289.8	256.9	230.0	344.7	0.61	-0.21	
1,454.0	29.30	39.70	1,372.4	292.6	260.6	391.7	1.15	-0.74	
1,549.0	31.20	41.90	1,454.5	328.8	291.8	439.6	2.32	2.00	
1,644.0	30.30	40.70	1,536.1	365.2	323.9	488.2	1.15	-0.95	
1,739.0	31.30	43.00	1,617.7	401.5	356.4	536.8	1.63	1.05	
1,834.0	30.80	42.80	1,699.1	437.4	389.7	585.8	0.54	-0.53	
1,929.0	30.10	42.50	1,781.0	472.8	422.3	633.9	0.75	-0.74	
2,024.0	30.60	45.70	1,863.0	507.2	455.7	681.8	1.78	0.53	
2,119.0	30.00	45.90	1,945.0	540.6	490.1	729.6	0.64	-0.63	
2,214.0	29.40	46.70	2,027.5	573.2	524.1	776.4	0.76	-0.63	
2,310.0	29.70	46.30	2,111.0	605.7	558.5	823.6	0.37	0.31	
2,404.0	30.20	43.00	2,192.5	639.1	591.4	870.4	1.83	0.53	
2,499.0	29.80	42.80	2,274.8	673.9	623.8	917.9	0.43	-0.42	
2,595.0	29.30	42.50	2,358.3	708.7	655.8	965.2	0.54	-0.52	
2,690.0	28.60	42.90	2,441.4	742.5	687.0	1,011.2	0.76	-0.74	
2,785.0	30.90	41.00	2,523.9	777.6	718.5	1,058.3	2.62	2.42	
2,880.0	30.10	41.70	2,605.7	813.8	750.4	1,106.5	0.92	-0.84	
2,975.0	28.70	41.50	2,688.5	848.7	781.3	1,153.1	1.48	-1.47	
3,070.0	27.30	41.00	2,772.4	882.2	810.7	1,197.7	1.49	-1.47	
3,165.0	25.80	40.50	2,857.4	914.4	838.5	1,240.2	1.60	-1.58	
3,260.0	25.50	44.20	2,943.0	944.8	866.1	1,281.3	1.71	-0.32	
3,355.0	24.20	44.40	3,029.2	973.3	894.0	1,321.2	1.37	-1.37	
3,450.0	22.60	44.50	3,116.4	1,000.3	920.4	1,358.8	1.68	-1.68	
3,545.0	21.30	44.40	3,204.5	1,025.6	945.3	1,394.3	1.37	-1.37	
3,641.0	16.80	46.00	3,295.2	1,047.7	967.5	1,425.5	4.72	-4.69	
3,736.0	15.80	46.20	3,386.4	1,066.2	986.7	1,452.1	1.05	-1.05	
3,831.0	14.40	46.70	3,478.1	1,083.3	1,004.6	1,476.7	1.48	-1.47	
3,926.0	13.40	47.30	3,570.3	1,098.8	1,021.3	1,499.4	1.06	-1.05	
4,021.0	10.90	47.40	3,663.2	1,112.4	1,036.0	1,519.3	2.63	-2.63	
4,116.0	8.00	52.20	3,756.9	1,122.5	1,047.9	1,534.7	3.16	-3.05	
4,211.0	6.10	46.00	3,851.2	1,130.1	1,056.7	1,546.2	2.15	-2.00	
4,306.0	5.20	44.30	3,945.7	1,136.7	1,063.4	1,555.5	0.96	-0.95	
4,401.0	4.80	43.40	4,040.4	1,142.6	1,069.1	1,563.8	0.43	-0.42	
4,496.0	2.80	20.30	4,135.1	1,147.7	1,072.6	1,570.0	2.61	-2.11	
4,591.0	2.70	23.90	4,230.0	1,151.9	1,074.3	1,574.3	0.21	-0.11	
4,686.0	2.30	20.90	4,324.9	1,155.7	1,075.9	1,578.2	0.44	-0.42	
4,781.0	1.70	1.10	4,419.9	1,158.9	1,076.6	1,581.1	0.95	-0.63	
4,876.0	1.30	357.10	4,514.9	1,161.4	1,076.6	1,582.9	0.43	-0.42	
4,971.0	0.90	335.50	4,609.8	1,163.2	1,076.2	1,584.0	0.60	-0.42	
5,066.0	1.10	313.10	4,704.8	1,164.5	1,075.3	1,584.3	0.46	0.21	
5,161.0	0.70	276.30	4,799.8	1,165.2	1,074.0	1,584.0	0.72	-0.42	
5,256.0	2.00	95.30	4,894.8	1,165.1	1,075.1	1,584.7	2.84	1.37	
5,351.0	1.80	102.30	4,989.7	1,164.6	1,078.2	1,586.4	0.32	-0.21	
5,446.0	1.30	119.30	5,084.7	1,163.7	1,080.6	1,587.3	0.71	-0.53	
5,541.0	1.00	141.50	5,179.7	1,162.6	1,082.1	1,587.4	0.56	-0.32	
5,636.0	0.80	152.40	5,274.7	1,161.3	1,082.9	1,587.0	0.28	-0.21	
5,731.0	0.90	156.70	5,369.7	1,160.1	1,083.5	1,586.4	0.12	0.11	
5,826.0	0.80	161.40	5,464.7	1,158.7	1,084.0	1,585.8	0.13	-0.11	
5,921.0	1.10	194.70	5,559.6	1,157.2	1,084.0	1,584.6	0.65	0.32	
6,016.0	1.40	184.40	5,654.6	1,155.2	1,083.7	1,582.9	0.39	0.32	
6,111.0	1.50	174.30	5,749.6	1,152.8	1,083.7	1,581.1	0.29	0.11	
6,205.0	1.50	177.20	5,843.6	1,150.4	1,083.9	1,579.4	0.08	0.00	

Cathedral Energy Services

Survey Report

Company: Caerus Oil & Gas (NAD 27)	Local Co-ordinate Reference: Well Island Ranch 23A-13
Project: Garfield County, CO	TVD Reference: KB=24' @ 5079.5usft (Patterson #303)
Site: S13-T7S-R96W (Island Ranch)	MD Reference: KB=24' @ 5079.5usft (Patterson #303)
Well: Island Ranch 23A-13	North Reference: True
Wellbore: DD	Survey Calculation Method: Minimum Curvature
Design: FINAL	Database: USA EDM 5000 Multi Users DB

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usf)	Build Rate (°/100u)	Formations / Comments
6,250.0	1.60	184.50	5,888.5	1,149.1	1,083.9	1,578.4	0.49	0.22	Last CES Survey @ 6,250' MD
6,300.0	1.60	184.50	5,938.5	1,147.7	1,083.7	1,577.3	0.00	0.00	PTB @ 6,300'

Targets										
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude	
Island Ranch 23A-13 PE - hit/miss target - Shape	0.00	0.00	5,834.5	1,170.1	1,067.6	594,306.12	1,277,077.00	39.437206	-108.059870	
- actual wellpath misses target center by 25.4usft at 6195.4usft MD (5834.0 TVD, 1150.6 N, 1083.9 E)										
- Circle (radius 50.0)										
Island Ranch 23A-13 TC - actual wellpath misses target center by 12.0usft at 4340.8usft MD (3980.3 TVD, 1138.9 N, 1065.5 E) - Point	0.00	0.00	3,980.0	1,149.6	1,060.0	594,285.80	1,277,068.79	39.437150	-108.059897	
Island Ranch 23A-13 TC - actual wellpath misses target center by 359.4usft at 4334.5usft MD (3974.1 TVD, 1138.5 N, 1065.1 E) - Circle (radius 50.0)	0.00	0.00	3,962.5	1,465.3	916.2	594,605.51	1,276,933.99	39.438017	-108.060406	
Island Ranch 23A-13 PE - actual wellpath misses target center by 356.6usft at 6190.4usft MD (5829.0 TVD, 1150.7 N, 1083.9 E) - Circle (radius 50.0)	0.00	0.00	5,837.5	1,465.3	916.2	594,605.51	1,276,933.99	39.438017	-108.060406	
Island Ranch 23A-13 PE - actual wellpath misses target center by 23.9usft at 6216.5usft MD (5855.0 TVD, 1150.0 N, 1083.9 E) - Circle (radius 50.0)	0.00	0.00	5,855.0	1,149.6	1,060.0	594,285.80	1,277,068.79	39.437150	-108.059897	
Island Ranch 23A-13 TC - actual wellpath misses target center by 32.7usft at 4322.1usft MD (3961.7 TVD, 1137.7 N, 1064.4 E) - Point	0.00	0.00	3,959.5	1,170.1	1,067.6	594,306.12	1,277,077.00	39.437206	-108.059870	

Design Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment	
		+N/-S (usft)	+E/-W (usft)		
6,250.0	5,888.5	1,149.1	1,083.9	Last CES Survey @ 6,250' MD	
6,300.0	5,938.5	1,147.7	1,083.7	PTB @ 6,300'	

Checked By: _____ Approved By: _____ Date: _____