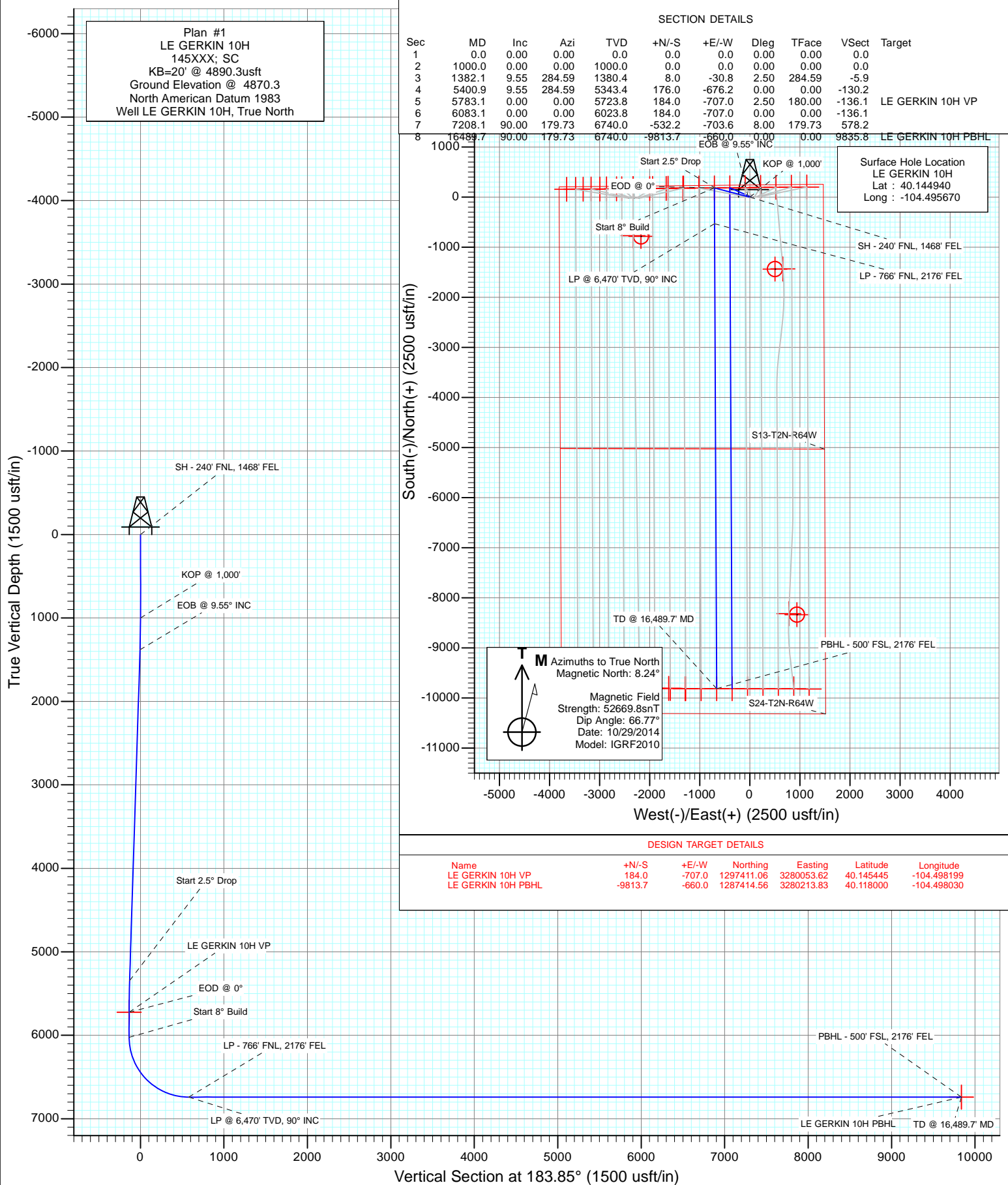
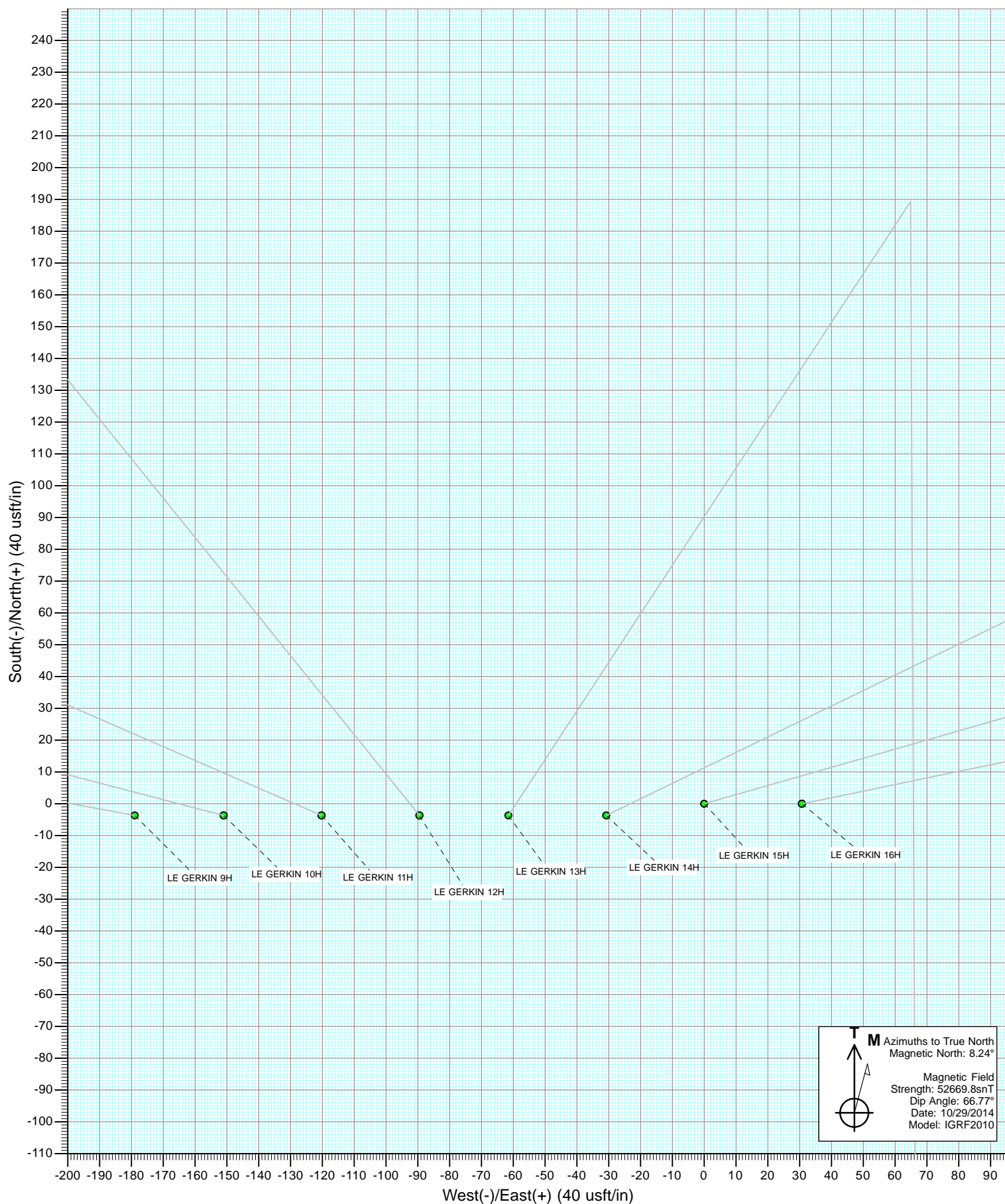
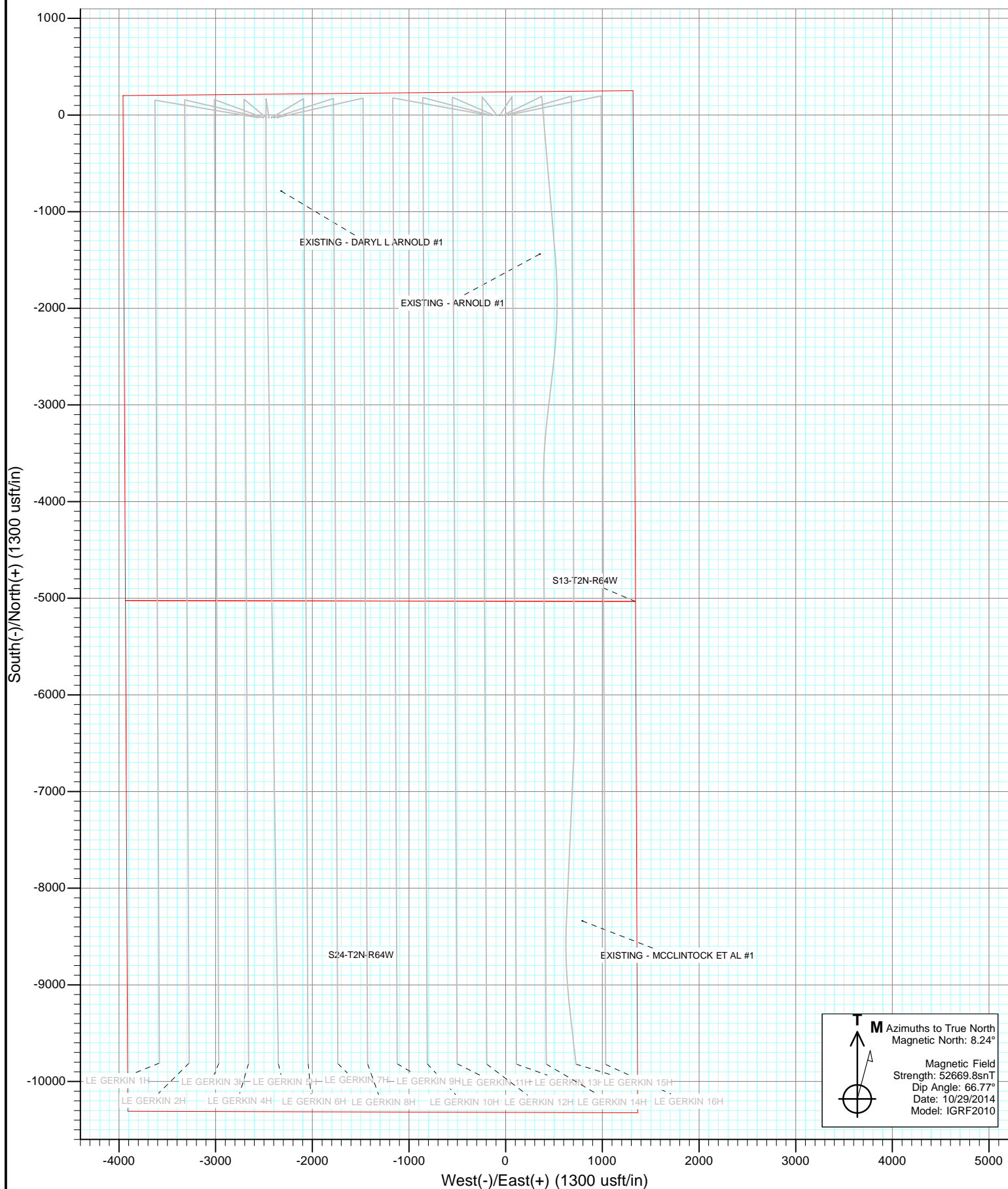




Project: Weld County, Colorado
Site: S13-T2N-R64W (LE GERKIN PADS)
Well: LE GERKIN 10H
Ibore: HZ
Design: Plan #1







Cathedral Energy Services

Planning Report

Database:	USA EDM 5000 Multi Users DB	Local Co-ordinate Reference:	Well LE GERKIN 10H
Company:	Red Hawk Petroleum	TVD Reference:	KB=20' @ 4890.3usft
Project:	Weld County, Colorado	MD Reference:	KB=20' @ 4890.3usft
Site:	S13-T2N-R64W (LE GERKIN PADS)	North Reference:	True
Well:	LE GERKIN 10H	Survey Calculation Method:	Minimum Curvature
Wellbore:	HZ		
Design:	Plan #1		

Project	Weld County, Colorado		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	Colorado Northern Zone		

Site		S13-T2N-R64W (LE GERKIN PADS)			
Site Position:		Northing:	1,297,185.96 usft	Latitude:	40.144880
From:	Lat/Long	Easting:	3,278,344.88 usft	Longitude:	-104.504320
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16 "	Grid Convergence:	0.64 °

Well	LE GERKIN 10H					
Well Position	+N/-S	0.0 usft	Northing:	1,297,235.08 usft	Latitude:	40.144940
	+E/-W	0.0 usft	Easting:	3,280,762.66 usft	Longitude:	-104.495670
Position Uncertainty		0.0 usft	Wellhead Elevation:	0.0 usft	Ground Level:	4,870.3 usft

Wellbore	HZ				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	10/29/2014	8.24	66.77	52,670

Design	Plan #1			
Audit Notes:				
Version:	Phase:	PLAN	Tie On Depth:	0.0
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	0.0	0.0	0.0	183.85

Plan Sections										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	TFO (°)	Target
0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.00	0.00	
1,000.0	0.00	0.00	1,000.0	0.0	0.0	0.00	0.00	0.00	0.00	
1,382.1	9.55	284.59	1,380.4	8.0	-30.8	2.50	2.50	0.00	284.59	
5,400.9	9.55	284.59	5,343.4	176.0	-676.2	0.00	0.00	0.00	0.00	
5,783.1	0.00	0.00	5,723.8	184.0	-707.0	2.50	-2.50	0.00	180.00	LE GERKIN 10H VP
6,083.1	0.00	0.00	6,023.8	184.0	-707.0	0.00	0.00	0.00	0.00	
7,208.1	90.00	179.73	6,740.0	-532.2	-703.6	8.00	8.00	15.98	179.73	
16,489.7	90.00	179.73	6,740.0	-9,813.7	-660.0	0.00	0.00	0.00	0.00	LE GERKIN 10H PBH

Cathedral Energy Services

Planning Report

Database:	USA EDM 5000 Multi Users DB	Local Co-ordinate Reference:	Well LE GERKIN 10H
Company:	Red Hawk Petroleum	TVD Reference:	KB=20' @ 4890.3usft
Project:	Weld County, Colorado	MD Reference:	KB=20' @ 4890.3usft
Site:	S13-T2N-R64W (LE GERKIN PADS)	North Reference:	True
Well:	LE GERKIN 10H	Survey Calculation Method:	Minimum Curvature
Wellbore:	HZ		
Design:	Plan #1		

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100u)	Comments / Formations
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	
0.5	0.00	0.00	0.5	0.0	0.0	0.0	0.00	0.00	SH - 240' FNL, 1468' FEL
100.0	0.00	0.00	100.0	0.0	0.0	0.0	0.00	0.00	
200.0	0.00	0.00	200.0	0.0	0.0	0.0	0.00	0.00	
300.0	0.00	0.00	300.0	0.0	0.0	0.0	0.00	0.00	
400.0	0.00	0.00	400.0	0.0	0.0	0.0	0.00	0.00	
500.0	0.00	0.00	500.0	0.0	0.0	0.0	0.00	0.00	
600.0	0.00	0.00	600.0	0.0	0.0	0.0	0.00	0.00	
700.0	0.00	0.00	700.0	0.0	0.0	0.0	0.00	0.00	
800.0	0.00	0.00	800.0	0.0	0.0	0.0	0.00	0.00	
900.0	0.00	0.00	900.0	0.0	0.0	0.0	0.00	0.00	
1,000.0	0.00	0.00	1,000.0	0.0	0.0	0.0	0.00	0.00	KOP @ 1,000'
1,100.0	2.50	284.59	1,100.0	0.5	-2.1	-0.4	2.50	2.50	
1,200.0	5.00	284.59	1,199.7	2.2	-8.4	-1.6	2.50	2.50	
1,300.0	7.50	284.59	1,299.1	4.9	-19.0	-3.7	2.50	2.50	
1,382.1	9.55	284.59	1,380.4	8.0	-30.8	-5.9	2.50	2.50	EOB @ 9.55° INC
1,400.0	9.55	284.59	1,398.0	8.8	-33.6	-6.5	0.00	0.00	
1,500.0	9.55	284.59	1,496.6	12.9	-49.7	-9.6	0.00	0.00	
1,600.0	9.55	284.59	1,595.2	17.1	-65.8	-12.7	0.00	0.00	
1,700.0	9.55	284.59	1,693.8	21.3	-81.8	-15.8	0.00	0.00	
1,800.0	9.55	284.59	1,792.4	25.5	-97.9	-18.8	0.00	0.00	
1,900.0	9.55	284.59	1,891.0	29.7	-113.9	-21.9	0.00	0.00	
2,000.0	9.55	284.59	1,989.7	33.8	-130.0	-25.0	0.00	0.00	
2,100.0	9.55	284.59	2,088.3	38.0	-146.1	-28.1	0.00	0.00	
2,200.0	9.55	284.59	2,186.9	42.2	-162.1	-31.2	0.00	0.00	
2,300.0	9.55	284.59	2,285.5	46.4	-178.2	-34.3	0.00	0.00	
2,400.0	9.55	284.59	2,384.1	50.6	-194.2	-37.4	0.00	0.00	
2,500.0	9.55	284.59	2,482.7	54.7	-210.3	-40.5	0.00	0.00	
2,600.0	9.55	284.59	2,581.3	58.9	-226.4	-43.6	0.00	0.00	
2,700.0	9.55	284.59	2,680.0	63.1	-242.4	-46.7	0.00	0.00	
2,800.0	9.55	284.59	2,778.6	67.3	-258.5	-49.8	0.00	0.00	
2,900.0	9.55	284.59	2,877.2	71.5	-274.6	-52.9	0.00	0.00	
3,000.0	9.55	284.59	2,975.8	75.6	-290.6	-56.0	0.00	0.00	
3,100.0	9.55	284.59	3,074.4	79.8	-306.7	-59.1	0.00	0.00	
3,200.0	9.55	284.59	3,173.0	84.0	-322.7	-62.1	0.00	0.00	
3,300.0	9.55	284.59	3,271.6	88.2	-338.8	-65.2	0.00	0.00	
3,400.0	9.55	284.59	3,370.2	92.4	-354.9	-68.3	0.00	0.00	
3,500.0	9.55	284.59	3,468.9	96.5	-370.9	-71.4	0.00	0.00	
3,600.0	9.55	284.59	3,567.5	100.7	-387.0	-74.5	0.00	0.00	
3,700.0	9.55	284.59	3,666.1	104.9	-403.0	-77.6	0.00	0.00	
3,800.0	9.55	284.59	3,764.7	109.1	-419.1	-80.7	0.00	0.00	
3,900.0	9.55	284.59	3,863.3	113.3	-435.2	-83.8	0.00	0.00	
4,000.0	9.55	284.59	3,961.9	117.4	-451.2	-86.9	0.00	0.00	
4,100.0	9.55	284.59	4,060.5	121.6	-467.3	-90.0	0.00	0.00	
4,200.0	9.55	284.59	4,159.2	125.8	-483.4	-93.1	0.00	0.00	
4,300.0	9.55	284.59	4,257.8	130.0	-499.4	-96.2	0.00	0.00	
4,400.0	9.55	284.59	4,356.4	134.2	-515.5	-99.3	0.00	0.00	
4,500.0	9.55	284.59	4,455.0	138.3	-531.5	-102.4	0.00	0.00	
4,600.0	9.55	284.59	4,553.6	142.5	-547.6	-105.4	0.00	0.00	
4,700.0	9.55	284.59	4,652.2	146.7	-563.7	-108.5	0.00	0.00	
4,800.0	9.55	284.59	4,750.8	150.9	-579.7	-111.6	0.00	0.00	
4,900.0	9.55	284.59	4,849.4	155.1	-595.8	-114.7	0.00	0.00	

Cathedral Energy Services

Planning Report

Database:	USA EDM 5000 Multi Users DB	Local Co-ordinate Reference:	Well LE GERKIN 10H
Company:	Red Hawk Petroleum	TVD Reference:	KB=20' @ 4890.3usft
Project:	Weld County, Colorado	MD Reference:	KB=20' @ 4890.3usft
Site:	S13-T2N-R64W (LE GERKIN PADS)	North Reference:	True
Well:	LE GERKIN 10H	Survey Calculation Method:	Minimum Curvature
Wellbore:	HZ		
Design:	Plan #1		

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100u)	Comments / Formations
5,000.0	9.55	284.59	4,948.1	159.2	-611.8	-117.8	0.00	0.00	
5,100.0	9.55	284.59	5,046.7	163.4	-627.9	-120.9	0.00	0.00	
5,200.0	9.55	284.59	5,145.3	167.6	-644.0	-124.0	0.00	0.00	
5,300.0	9.55	284.59	5,243.9	171.8	-660.0	-127.1	0.00	0.00	
5,400.9	9.55	284.59	5,343.4	176.0	-676.2	-130.2	0.00	0.00	Start 2.5° Drop
5,500.0	7.08	284.59	5,441.4	179.6	-690.1	-132.9	2.50	-2.50	
5,600.0	4.58	284.59	5,540.9	182.2	-699.9	-134.8	2.50	-2.50	
5,700.0	2.08	284.59	5,640.7	183.6	-705.5	-135.9	2.50	-2.50	
5,783.1	0.00	0.00	5,723.8	184.0	-707.0	-136.1	2.50	-2.50	EOD @ 0°
5,800.0	0.00	0.00	5,740.7	184.0	-707.0	-136.1	0.00	0.00	
5,900.0	0.00	0.00	5,840.7	184.0	-707.0	-136.1	0.00	0.00	
6,000.0	0.00	0.00	5,940.7	184.0	-707.0	-136.1	0.00	0.00	
6,083.1	0.00	0.00	6,023.8	184.0	-707.0	-136.1	0.00	0.00	Start 8° Build
6,100.0	1.35	179.73	6,040.7	183.8	-707.0	-135.9	8.00	8.00	
6,150.0	5.35	179.73	6,090.6	180.9	-707.0	-133.0	8.00	8.00	
6,200.0	9.35	179.73	6,140.2	174.5	-707.0	-126.6	8.00	8.00	
6,250.0	13.35	179.73	6,189.2	164.6	-706.9	-116.8	8.00	8.00	
6,300.0	17.35	179.73	6,237.4	151.4	-706.8	-103.6	8.00	8.00	
6,350.0	21.35	179.73	6,284.6	134.8	-706.8	-87.1	8.00	8.00	
6,400.0	25.35	179.73	6,330.5	115.0	-706.7	-67.3	8.00	8.00	
6,450.0	29.35	179.73	6,374.9	92.0	-706.6	-44.4	8.00	8.00	
6,500.0	33.35	179.73	6,417.6	66.0	-706.4	-18.5	8.00	8.00	
6,550.0	37.35	179.73	6,458.3	37.1	-706.3	10.4	8.00	8.00	
6,600.0	41.35	179.73	6,497.0	5.4	-706.2	42.0	8.00	8.00	
6,650.0	45.35	179.73	6,533.4	-28.9	-706.0	76.2	8.00	8.00	
6,700.0	49.35	179.73	6,567.2	-65.7	-705.8	112.9	8.00	8.00	
6,750.0	53.35	179.73	6,598.4	-104.7	-705.6	151.8	8.00	8.00	
6,800.0	57.35	179.73	6,626.9	-145.8	-705.4	192.9	8.00	8.00	
6,850.0	61.35	179.73	6,652.3	-188.9	-705.2	235.8	8.00	8.00	
6,900.0	65.35	179.73	6,674.8	-233.5	-705.0	280.3	8.00	8.00	
6,950.0	69.35	179.73	6,694.0	-279.7	-704.8	326.3	8.00	8.00	
7,000.0	73.35	179.73	6,710.0	-327.0	-704.6	373.6	8.00	8.00	
7,050.0	77.35	179.73	6,722.6	-375.4	-704.4	421.8	8.00	8.00	
7,100.0	81.35	179.73	6,731.9	-424.5	-704.1	470.8	8.00	8.00	
7,150.0	85.35	179.73	6,737.6	-474.2	-703.9	520.3	8.00	8.00	
7,200.0	89.35	179.73	6,740.0	-524.1	-703.7	570.2	8.00	8.00	
7,208.1	90.00	179.73	6,740.0	-532.2	-703.6	578.2	7.97	7.97	LP @ 6,470' TVD, 90° INC - LP - 766' FNL, 217
7,300.0	90.00	179.73	6,740.0	-624.1	-703.2	669.9	0.00	0.00	
7,400.0	90.00	179.73	6,740.0	-724.1	-702.7	769.6	0.00	0.00	
7,500.0	90.00	179.73	6,740.0	-824.1	-702.3	869.4	0.00	0.00	
7,600.0	90.00	179.73	6,740.0	-924.1	-701.8	969.1	0.00	0.00	
7,700.0	90.00	179.73	6,740.0	-1,024.1	-701.3	1,068.9	0.00	0.00	
7,800.0	90.00	179.73	6,740.0	-1,124.1	-700.9	1,168.6	0.00	0.00	
7,900.0	90.00	179.73	6,740.0	-1,224.1	-700.4	1,268.3	0.00	0.00	
8,000.0	90.00	179.73	6,740.0	-1,324.1	-699.9	1,368.1	0.00	0.00	
8,100.0	90.00	179.73	6,740.0	-1,424.1	-699.4	1,467.8	0.00	0.00	
8,200.0	90.00	179.73	6,740.0	-1,524.1	-699.0	1,567.6	0.00	0.00	
8,300.0	90.00	179.73	6,740.0	-1,624.1	-698.5	1,667.3	0.00	0.00	
8,400.0	90.00	179.73	6,740.0	-1,724.1	-698.0	1,767.1	0.00	0.00	
8,500.0	90.00	179.73	6,740.0	-1,824.1	-697.6	1,866.8	0.00	0.00	
8,600.0	90.00	179.73	6,740.0	-1,924.1	-697.1	1,966.5	0.00	0.00	
8,700.0	90.00	179.73	6,740.0	-2,024.1	-696.6	2,066.3	0.00	0.00	

Cathedral Energy Services

Planning Report

Database:	USA EDM 5000 Multi Users DB	Local Co-ordinate Reference:	Well LE GERKIN 10H
Company:	Red Hawk Petroleum	TVD Reference:	KB=20' @ 4890.3usft
Project:	Weld County, Colorado	MD Reference:	KB=20' @ 4890.3usft
Site:	S13-T2N-R64W (LE GERKIN PADS)	North Reference:	True
Well:	LE GERKIN 10H	Survey Calculation Method:	Minimum Curvature
Wellbore:	HZ		
Design:	Plan #1		

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100u)	Comments / Formations
8,800.0	90.00	179.73	6,740.0	-2,124.1	-696.2	2,166.0	0.00	0.00	
8,900.0	90.00	179.73	6,740.0	-2,224.1	-695.7	2,265.8	0.00	0.00	
9,000.0	90.00	179.73	6,740.0	-2,324.1	-695.2	2,365.5	0.00	0.00	
9,100.0	90.00	179.73	6,740.0	-2,424.1	-694.7	2,465.3	0.00	0.00	
9,200.0	90.00	179.73	6,740.0	-2,524.1	-694.3	2,565.0	0.00	0.00	
9,300.0	90.00	179.73	6,740.0	-2,624.1	-693.8	2,664.7	0.00	0.00	
9,400.0	90.00	179.73	6,740.0	-2,724.1	-693.3	2,764.5	0.00	0.00	
9,500.0	90.00	179.73	6,740.0	-2,824.1	-692.9	2,864.2	0.00	0.00	
9,600.0	90.00	179.73	6,740.0	-2,924.1	-692.4	2,964.0	0.00	0.00	
9,700.0	90.00	179.73	6,740.0	-3,024.1	-691.9	3,063.7	0.00	0.00	
9,800.0	90.00	179.73	6,740.0	-3,124.1	-691.5	3,163.4	0.00	0.00	
9,900.0	90.00	179.73	6,740.0	-3,224.1	-691.0	3,263.2	0.00	0.00	
10,000.0	90.00	179.73	6,740.0	-3,324.1	-690.5	3,362.9	0.00	0.00	
10,100.0	90.00	179.73	6,740.0	-3,424.1	-690.0	3,462.7	0.00	0.00	
10,200.0	90.00	179.73	6,740.0	-3,524.1	-689.6	3,562.4	0.00	0.00	
10,300.0	90.00	179.73	6,740.0	-3,624.1	-689.1	3,662.2	0.00	0.00	
10,400.0	90.00	179.73	6,740.0	-3,724.1	-688.6	3,761.9	0.00	0.00	
10,500.0	90.00	179.73	6,740.0	-3,824.1	-688.2	3,861.6	0.00	0.00	
10,600.0	90.00	179.73	6,740.0	-3,924.1	-687.7	3,961.4	0.00	0.00	
10,700.0	90.00	179.73	6,740.0	-4,024.1	-687.2	4,061.1	0.00	0.00	
10,800.0	90.00	179.73	6,740.0	-4,124.1	-686.8	4,160.9	0.00	0.00	
10,900.0	90.00	179.73	6,740.0	-4,224.1	-686.3	4,260.6	0.00	0.00	
11,000.0	90.00	179.73	6,740.0	-4,324.1	-685.8	4,360.4	0.00	0.00	
11,100.0	90.00	179.73	6,740.0	-4,424.1	-685.3	4,460.1	0.00	0.00	
11,200.0	90.00	179.73	6,740.0	-4,524.1	-684.9	4,559.8	0.00	0.00	
11,300.0	90.00	179.73	6,740.0	-4,624.1	-684.4	4,659.6	0.00	0.00	
11,400.0	90.00	179.73	6,740.0	-4,724.1	-683.9	4,759.3	0.00	0.00	
11,500.0	90.00	179.73	6,740.0	-4,824.1	-683.5	4,859.1	0.00	0.00	
11,600.0	90.00	179.73	6,740.0	-4,924.1	-683.0	4,958.8	0.00	0.00	
11,700.0	90.00	179.73	6,740.0	-5,024.1	-682.5	5,058.5	0.00	0.00	
11,800.0	90.00	179.73	6,740.0	-5,124.1	-682.1	5,158.3	0.00	0.00	
11,900.0	90.00	179.73	6,740.0	-5,224.1	-681.6	5,258.0	0.00	0.00	
12,000.0	90.00	179.73	6,740.0	-5,324.1	-681.1	5,357.8	0.00	0.00	
12,100.0	90.00	179.73	6,740.0	-5,424.1	-680.6	5,457.5	0.00	0.00	
12,200.0	90.00	179.73	6,740.0	-5,524.1	-680.2	5,557.3	0.00	0.00	
12,300.0	90.00	179.73	6,740.0	-5,624.1	-679.7	5,657.0	0.00	0.00	
12,400.0	90.00	179.73	6,740.0	-5,724.1	-679.2	5,756.7	0.00	0.00	
12,500.0	90.00	179.73	6,740.0	-5,824.1	-678.8	5,856.5	0.00	0.00	
12,600.0	90.00	179.73	6,740.0	-5,924.1	-678.3	5,956.2	0.00	0.00	
12,700.0	90.00	179.73	6,740.0	-6,024.1	-677.8	6,056.0	0.00	0.00	
12,800.0	90.00	179.73	6,740.0	-6,124.1	-677.4	6,155.7	0.00	0.00	
12,900.0	90.00	179.73	6,740.0	-6,224.1	-676.9	6,255.4	0.00	0.00	
13,000.0	90.00	179.73	6,740.0	-6,324.1	-676.4	6,355.2	0.00	0.00	
13,100.0	90.00	179.73	6,740.0	-6,424.1	-675.9	6,454.9	0.00	0.00	
13,200.0	90.00	179.73	6,740.0	-6,524.1	-675.5	6,554.7	0.00	0.00	
13,300.0	90.00	179.73	6,740.0	-6,624.1	-675.0	6,654.4	0.00	0.00	
13,400.0	90.00	179.73	6,740.0	-6,724.1	-674.5	6,754.2	0.00	0.00	
13,500.0	90.00	179.73	6,740.0	-6,824.0	-674.1	6,853.9	0.00	0.00	
13,600.0	90.00	179.73	6,740.0	-6,924.0	-673.6	6,953.6	0.00	0.00	
13,700.0	90.00	179.73	6,740.0	-7,024.0	-673.1	7,053.4	0.00	0.00	
13,800.0	90.00	179.73	6,740.0	-7,124.0	-672.7	7,153.1	0.00	0.00	
13,900.0	90.00	179.73	6,740.0	-7,224.0	-672.2	7,252.9	0.00	0.00	

Cathedral Energy Services

Planning Report

Database:	USA EDM 5000 Multi Users DB	Local Co-ordinate Reference:	Well LE GERKIN 10H
Company:	Red Hawk Petroleum	TVD Reference:	KB=20' @ 4890.3usft
Project:	Weld County, Colorado	MD Reference:	KB=20' @ 4890.3usft
Site:	S13-T2N-R64W (LE GERKIN PADS)	North Reference:	True
Well:	LE GERKIN 10H	Survey Calculation Method:	Minimum Curvature
Wellbore:	HZ		
Design:	Plan #1		

Planned Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100u)	Comments / Formations
14,000.0	90.00	179.73	6,740.0	-7,324.0	-671.7	7,352.6	0.00	0.00	
14,100.0	90.00	179.73	6,740.0	-7,424.0	-671.2	7,452.4	0.00	0.00	
14,200.0	90.00	179.73	6,740.0	-7,524.0	-670.8	7,552.1	0.00	0.00	
14,300.0	90.00	179.73	6,740.0	-7,624.0	-670.3	7,651.8	0.00	0.00	
14,400.0	90.00	179.73	6,740.0	-7,724.0	-669.8	7,751.6	0.00	0.00	
14,500.0	90.00	179.73	6,740.0	-7,824.0	-669.4	7,851.3	0.00	0.00	
14,600.0	90.00	179.73	6,740.0	-7,924.0	-668.9	7,951.1	0.00	0.00	
14,700.0	90.00	179.73	6,740.0	-8,024.0	-668.4	8,050.8	0.00	0.00	
14,800.0	90.00	179.73	6,740.0	-8,124.0	-668.0	8,150.5	0.00	0.00	
14,900.0	90.00	179.73	6,740.0	-8,224.0	-667.5	8,250.3	0.00	0.00	
15,000.0	90.00	179.73	6,740.0	-8,324.0	-667.0	8,350.0	0.00	0.00	
15,100.0	90.00	179.73	6,740.0	-8,424.0	-666.5	8,449.8	0.00	0.00	
15,200.0	90.00	179.73	6,740.0	-8,524.0	-666.1	8,549.5	0.00	0.00	
15,300.0	90.00	179.73	6,740.0	-8,624.0	-665.6	8,649.3	0.00	0.00	
15,400.0	90.00	179.73	6,740.0	-8,724.0	-665.1	8,749.0	0.00	0.00	
15,500.0	90.00	179.73	6,740.0	-8,824.0	-664.7	8,848.7	0.00	0.00	
15,600.0	90.00	179.73	6,740.0	-8,924.0	-664.2	8,948.5	0.00	0.00	
15,700.0	90.00	179.73	6,740.0	-9,024.0	-663.7	9,048.2	0.00	0.00	
15,800.0	90.00	179.73	6,740.0	-9,124.0	-663.3	9,148.0	0.00	0.00	
15,900.0	90.00	179.73	6,740.0	-9,224.0	-662.8	9,247.7	0.00	0.00	
16,000.0	90.00	179.73	6,740.0	-9,324.0	-662.3	9,347.4	0.00	0.00	
16,100.0	90.00	179.73	6,740.0	-9,424.0	-661.8	9,447.2	0.00	0.00	
16,200.0	90.00	179.73	6,740.0	-9,524.0	-661.4	9,546.9	0.00	0.00	
16,300.0	90.00	179.73	6,740.0	-9,624.0	-660.9	9,646.7	0.00	0.00	
16,400.0	90.00	179.73	6,740.0	-9,724.0	-660.4	9,746.4	0.00	0.00	
16,489.7	90.00	179.73	6,740.0	-9,813.7	-660.0	9,835.8	0.00	0.00	PBHL - 500' FSL, 2176' FEL - TD @ 16,489.7' M

Targets									
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
LE GERKIN 10H VP - hit/miss target - Shape - plan hits target center - Point	0.00	0.00	5,723.8	184.0	-707.0	1,297,411.06	3,280,053.62	40.145445	-104.498199
LE GERKIN 10H PBHL - plan hits target center - Point	0.00	0.00	6,740.0	-9,813.7	-660.0	1,287,414.56	3,280,213.83	40.118000	-104.498030

Cathedral Energy Services

Planning Report

Database:	USA EDM 5000 Multi Users DB	Local Co-ordinate Reference:	Well LE GERKIN 10H
Company:	Red Hawk Petroleum	TVD Reference:	KB=20' @ 4890.3usft
Project:	Weld County, Colorado	MD Reference:	KB=20' @ 4890.3usft
Site:	S13-T2N-R64W (LE GERKIN PADS)	North Reference:	True
Well:	LE GERKIN 10H	Survey Calculation Method:	Minimum Curvature
Wellbore:	HZ		
Design:	Plan #1		

Plan Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
0.5	0.5	0.0	0.0	SH - 240' FNL, 1468' FEL
1,000.0	1,000.0	0.0	0.0	KOP @ 1,000'
1,382.1	1,380.4	8.0	-30.8	EOB @ 9.55° INC
5,400.9	5,343.4	176.0	-676.2	Start 2.5° Drop
5,783.1	5,723.8	184.0	-707.0	EOD @ 0°
6,083.1	6,023.8	184.0	-707.0	Start 8° Build
7,208.1	6,740.0	-532.2	-703.6	LP @ 6,470' TVD, 90° INC
7,208.1	6,740.0	-532.2	-703.6	LP - 766' FNL, 2176' FEL
16,489.7	6,740.0	-9,813.7	-660.0	PBHL - 500' FSL, 2176' FEL
16,489.7	6,740.0	-9,813.7	-660.0	TD @ 16,489.7' MD

Red Hawk Petroleum

Weld County, Colorado

S13-T2N-R64W (LE GERKIN PADS)

LE GERKIN 10H

HZ

Plan #1

Anticollision Report

30 October, 2014

Cathedral Energy Services

Anticollision Report

Company:	Red Hawk Petroleum	Local Co-ordinate Reference:	Well LE GERKIN 10H
Project:	Weld County, Colorado	TVD Reference:	KB=20' @ 4890.3usft
Reference Site:	S13-T2N-R64W (LE GERKIN PADS)	MD Reference:	KB=20' @ 4890.3usft
Site Error:	0.0usft	North Reference:	True
Reference Well:	LE GERKIN 10H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0usft	Output errors are at	2.00 sigma
Reference Wellbore	HZ	Database:	USA EDM 5000 Multi Users DB
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Reference	Plan #1		
Filter type:	NO GLOBAL FILTER: Using user defined selection & filtering criteria		
Interpolation Method:	MD Interval 100.0usft	Error Model:	ISCWSA
Depth Range:	Unlimited	Scan Method:	Closest Approach 3D
Results Limited by:	Maximum center-center distance of 200.0usft	Error Surface:	Elliptical Conic
Warning Levels Evaluated at:	2.00 Sigma		

Survey Tool Program		Date	10/30/2014		
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
0.0	16,489.7	Plan #1 (HZ)	Geolink MWD	Geolink MWD	

Summary						
Site Name	Reference Measured Depth (usft)	Offset Measured Depth (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Separation Factor	Warning
Offset Well - Wellbore - Design						
S13-T2N-R64W (LE GERKIN PADS)						
EXISTING - ARNOLD #1 - EXISTING - EXISTING - NO S						Out of range
EXISTING - DARYL L ARNOLD #1 - EXISTING - EXISTI						Out of range
EXISTING - MCCLINTOCK ET AL #1 - EXISTING - EXIS						Out of range
LE GERKIN 11H - HZ - Plan #1	1,000.0	1,000.0	30.8	27.3	8.989	CC
LE GERKIN 11H - HZ - Plan #1	1,200.0	1,202.5	31.1	27.0	7.557	ES
LE GERKIN 11H - HZ - Plan #1	1,300.0	1,302.9	32.5	28.0	7.265	SF
LE GERKIN 12H - HZ - Plan #1	1,000.0	1,000.0	61.5	58.1	17.979	CC, ES
LE GERKIN 12H - HZ - Plan #1	1,200.0	1,201.9	65.4	61.3	15.870	SF
LE GERKIN 13H - HZ - Plan #1	1,000.0	1,000.0	89.5	86.0	26.151	CC, ES
LE GERKIN 13H - HZ - Plan #1	1,100.0	1,097.8	92.7	89.0	24.634	SF
LE GERKIN 14H - HZ - Plan #1	1,000.0	1,000.0	120.2	116.8	35.140	CC, ES
LE GERKIN 14H - HZ - Plan #1	1,100.0	1,095.3	124.2	120.4	33.030	SF
LE GERKIN 15H - HZ - Plan #1	1,000.0	1,000.0	151.0	147.6	44.143	CC, ES
LE GERKIN 15H - HZ - Plan #1	1,200.0	1,186.8	167.3	163.2	40.917	SF
LE GERKIN 16H - HZ - Plan #1	1,000.0	1,000.0	181.7	178.3	53.130	CC, ES
LE GERKIN 16H - HZ - Plan #1	1,200.0	1,184.3	198.0	194.0	48.501	SF
LE GERKIN 1H - HZ - Plan #3						Out of range
LE GERKIN 2H - HZ - Plan #3						Out of range
LE GERKIN 3H - HZ - Plan #3						Out of range
LE GERKIN 4H - HZ - Plan #3						Out of range
LE GERKIN 5H - HZ - Plan #3						Out of range
LE GERKIN 6H - HZ - Plan #3						Out of range
LE GERKIN 7H - HZ - Plan #3						Out of range
LE GERKIN 8H - HZ - Plan #3						Out of range
LE GERKIN 9H - HZ - Plan #1	1,000.0	1,000.0	28.0	24.5	8.172	CC
LE GERKIN 9H - HZ - Plan #1	1,400.0	1,395.3	28.3	23.5	5.891	ES, SF

Cathedral Energy Services

Anticollision Report

Company:	Red Hawk Petroleum	Local Co-ordinate Reference:	Well LE GERKIN 10H
Project:	Weld County, Colorado	TVD Reference:	KB=20' @ 4890.3usft
Reference Site:	S13-T2N-R64W (LE GERKIN PADS)	MD Reference:	KB=20' @ 4890.3usft
Site Error:	0.0usft	North Reference:	True
Reference Well:	LE GERKIN 10H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0usft	Output errors are at	2.00 sigma
Reference Wellbore	HZ	Database:	USA EDM 5000 Multi Users DB
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design S13-T2N-R64W (LE GERKIN PADS) - LE GERKIN 11H - HZ - Plan #1													Offset Site Error:	0.0 usft
Survey Program: 0-Geolink MWD													Offset Well Error:	0.0 usft
Reference		Offset		Semi Major Axis		Distance		Total		Separation		Warning		
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Uncertainty Axis			
0.0	0.0	0.0	0.0	0.0	0.0	90.00	0.0	30.8	30.8					
100.0	100.0	100.0	100.0	0.1	0.1	90.00	0.0	30.8	30.8	30.5	0.28	110.120		
200.0	200.0	200.0	200.0	0.3	0.3	90.00	0.0	30.8	30.8	30.1	0.63	48.942		
300.0	300.0	300.0	300.0	0.5	0.5	90.00	0.0	30.8	30.8	29.8	0.98	31.463		
400.0	400.0	400.0	400.0	0.7	0.7	90.00	0.0	30.8	30.8	29.4	1.33	23.183		
500.0	500.0	500.0	500.0	0.8	0.8	90.00	0.0	30.8	30.8	29.1	1.68	18.353		
600.0	600.0	600.0	600.0	1.0	1.0	90.00	0.0	30.8	30.8	28.7	2.02	15.189		
700.0	700.0	700.0	700.0	1.2	1.2	90.00	0.0	30.8	30.8	28.4	2.37	12.955		
800.0	800.0	800.0	800.0	1.4	1.4	90.00	0.0	30.8	30.8	28.0	2.72	11.294		
900.0	900.0	900.0	900.0	1.5	1.5	90.00	0.0	30.8	30.8	27.7	3.07	10.011		
1,000.0	1,000.0	1,000.0	1,000.0	1.7	1.7	90.00	0.0	30.8	30.8	27.3	3.42	8.989 CC		
1,100.0	1,100.0	1,101.2	1,101.2	1.9	1.9	164.79	0.9	28.7	30.8	27.1	3.77	8.179		
1,200.0	1,199.7	1,202.5	1,202.2	2.1	2.1	162.94	3.6	22.6	31.1	27.0	4.12	7.557 ES		
1,300.0	1,299.1	1,302.9	1,302.1	2.3	2.3	160.74	7.6	13.2	32.5	28.0	4.47	7.265 SF		
1,400.0	1,398.0	1,402.8	1,401.4	2.5	2.5	160.86	11.8	3.7	37.6	32.8	4.82	7.805		
1,500.0	1,496.6	1,502.5	1,500.7	2.8	2.7	161.59	15.9	-5.8	44.2	39.0	5.19	8.517		
1,600.0	1,595.2	1,602.3	1,599.9	3.1	2.9	162.14	20.0	-15.3	50.7	45.2	5.56	9.133		
1,700.0	1,693.8	1,702.1	1,699.2	3.4	3.2	162.56	24.2	-24.8	57.3	51.4	5.92	9.670		
1,800.0	1,792.4	1,801.9	1,798.4	3.7	3.4	162.90	28.3	-34.4	63.9	57.6	6.30	10.144		
1,900.0	1,891.0	1,901.7	1,897.7	4.0	3.6	163.17	32.4	-43.9	70.4	63.8	6.67	10.564		
2,000.0	1,989.7	2,001.5	1,996.9	4.3	3.8	163.39	36.6	-53.4	77.0	70.0	7.04	10.938		
2,100.0	2,088.3	2,101.2	2,096.1	4.6	4.1	163.58	40.7	-62.9	83.6	76.2	7.41	11.274		
2,200.0	2,186.9	2,201.0	2,195.4	4.9	4.3	163.75	44.9	-72.4	90.1	82.3	7.79	11.578		
2,300.0	2,285.5	2,300.8	2,294.6	5.2	4.6	163.89	49.0	-81.9	96.7	88.5	8.16	11.853		
2,400.0	2,384.1	2,400.6	2,393.9	5.6	4.8	164.01	53.1	-91.5	103.3	94.7	8.53	12.104		
2,500.0	2,482.7	2,500.4	2,493.1	5.9	5.0	164.12	57.3	-101.0	109.8	100.9	8.91	12.333		
2,600.0	2,581.3	2,600.2	2,592.3	6.2	5.3	164.21	61.4	-110.5	116.4	107.1	9.28	12.543		
2,700.0	2,680.0	2,699.9	2,691.6	6.5	5.5	164.30	65.6	-120.0	123.0	113.3	9.66	12.737		
2,800.0	2,778.6	2,799.7	2,790.8	6.9	5.8	164.38	69.7	-129.5	129.6	119.5	10.03	12.916		
2,900.0	2,877.2	2,899.5	2,890.1	7.2	6.0	164.45	73.8	-139.0	136.1	125.7	10.41	13.082		
3,000.0	2,975.8	2,999.3	2,989.3	7.5	6.3	164.51	78.0	-148.6	142.7	131.9	10.78	13.237		
3,100.0	3,074.4	3,099.1	3,088.6	7.9	6.5	164.57	82.1	-158.1	149.3	138.1	11.16	13.380		
3,200.0	3,173.0	3,198.9	3,187.8	8.2	6.8	164.62	86.2	-167.6	155.9	144.3	11.53	13.515		
3,300.0	3,271.6	3,298.7	3,287.0	8.5	7.0	164.67	90.4	-177.1	162.4	150.5	11.91	13.640		
3,400.0	3,370.2	3,398.4	3,386.3	8.9	7.3	164.71	94.5	-186.6	169.0	156.7	12.28	13.758		
3,500.0	3,468.9	3,498.2	3,485.5	9.2	7.5	164.75	98.7	-196.2	175.6	162.9	12.66	13.869		
3,600.0	3,567.5	3,598.0	3,584.8	9.5	7.8	164.79	102.8	-205.7	182.1	169.1	13.04	13.973		
3,700.0	3,666.1	3,697.8	3,684.0	9.9	8.0	164.83	106.9	-215.2	188.7	175.3	13.41	14.072		
3,800.0	3,764.7	3,797.6	3,783.3	10.2	8.3	164.86	111.1	-224.7	195.3	181.5	13.79	14.165		

Cathedral Energy Services

Anticollision Report

Company:	Red Hawk Petroleum	Local Co-ordinate Reference:	Well LE GERKIN 10H
Project:	Weld County, Colorado	TVD Reference:	KB=20' @ 4890.3usft
Reference Site:	S13-T2N-R64W (LE GERKIN PADS)	MD Reference:	KB=20' @ 4890.3usft
Site Error:	0.0usft	North Reference:	True
Reference Well:	LE GERKIN 10H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0usft	Output errors are at	2.00 sigma
Reference Wellbore	HZ	Database:	USA EDM 5000 Multi Users DB
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design S13-T2N-R64W (LE GERKIN PADS) - LE GERKIN 12H - HZ - Plan #1												Offset Site Error: 0.0 usft	
Survey Program: 0-Geolink MWD												Offset Well Error: 0.0 usft	
Reference		Offset		Semi Major Axis			Distance						Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Total Uncertainty Axis	Separation Factor	
0.0	0.0	0.0	0.0	0.0	0.0	90.00	0.0	61.5	61.5				
100.0	100.0	100.0	100.0	0.1	0.1	90.00	0.0	61.5	61.5	61.2	0.28	220.240	
200.0	200.0	200.0	200.0	0.3	0.3	90.00	0.0	61.5	61.5	60.9	0.63	97.885	
300.0	300.0	300.0	300.0	0.5	0.5	90.00	0.0	61.5	61.5	60.5	0.98	62.926	
400.0	400.0	400.0	400.0	0.7	0.7	90.00	0.0	61.5	61.5	60.2	1.33	46.366	
500.0	500.0	500.0	500.0	0.8	0.8	90.00	0.0	61.5	61.5	59.8	1.68	36.707	
600.0	600.0	600.0	600.0	1.0	1.0	90.00	0.0	61.5	61.5	59.5	2.02	30.378	
700.0	700.0	700.0	700.0	1.2	1.2	90.00	0.0	61.5	61.5	59.1	2.37	25.911	
800.0	800.0	800.0	800.0	1.4	1.4	90.00	0.0	61.5	61.5	58.8	2.72	22.589	
900.0	900.0	900.0	900.0	1.5	1.5	90.00	0.0	61.5	61.5	58.4	3.07	20.022	
1,000.0	1,000.0	1,000.0	1,000.0	1.7	1.7	90.00	0.0	61.5	61.5	58.1	3.42	17.979	CC, ES
1,100.0	1,100.0	1,101.7	1,101.7	1.9	1.9	164.31	1.8	60.1	62.2	58.5	3.77	16.499	
1,200.0	1,199.7	1,201.9	1,201.8	2.1	2.1	162.22	5.8	56.8	65.4	61.3	4.12	15.870	SF
1,300.0	1,299.1	1,301.7	1,301.4	2.3	2.3	161.39	9.9	53.5	72.7	68.2	4.47	16.271	
1,400.0	1,398.0	1,401.0	1,400.6	2.5	2.4	161.66	14.0	50.2	84.0	79.2	4.81	17.451	
1,500.0	1,496.6	1,500.2	1,499.6	2.8	2.6	162.20	18.1	46.9	96.8	91.6	5.18	18.686	
1,600.0	1,595.2	1,599.4	1,598.6	3.1	2.8	162.61	22.2	43.6	109.5	104.0	5.54	19.754	
1,700.0	1,693.8	1,698.6	1,697.7	3.4	3.0	162.93	26.3	40.3	122.3	116.4	5.91	20.685	
1,800.0	1,792.4	1,797.7	1,796.7	3.7	3.2	163.19	30.4	37.0	135.0	128.7	6.28	21.503	
1,900.0	1,891.0	1,896.9	1,895.8	4.0	3.4	163.41	34.5	33.7	147.8	141.1	6.65	22.229	
2,000.0	1,989.7	1,996.1	1,994.8	4.3	3.6	163.59	38.6	30.4	160.5	153.5	7.02	22.876	
2,100.0	2,088.3	2,095.3	2,093.9	4.6	3.8	163.75	42.7	27.1	173.3	165.9	7.39	23.456	
2,200.0	2,186.9	2,194.5	2,192.9	4.9	3.9	163.88	46.7	23.8	186.1	178.3	7.76	23.980	
2,300.0	2,285.5	2,293.6	2,291.9	5.2	4.1	164.00	50.8	20.5	198.8	190.7	8.13	24.455	

Cathedral Energy Services

Anticollision Report

Company:	Red Hawk Petroleum	Local Co-ordinate Reference:	Well LE GERKIN 10H
Project:	Weld County, Colorado	TVD Reference:	KB=20' @ 4890.3usft
Reference Site:	S13-T2N-R64W (LE GERKIN PADS)	MD Reference:	KB=20' @ 4890.3usft
Site Error:	0.0usft	North Reference:	True
Reference Well:	LE GERKIN 10H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0usft	Output errors are at	2.00 sigma
Reference Wellbore	HZ	Database:	USA EDM 5000 Multi Users DB
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design S13-T2N-R64W (LE GERKIN PADS) - LE GERKIN 13H - HZ - Plan #1													Offset Site Error: 0.0 usft
Survey Program: 0-Geolink MWD													Offset Well Error: 0.0 usft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Distance		Total Uncertainty Axis	Separation Factor	Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)			
0.0	0.0	0.0	0.0	0.0	0.0	90.00	0.0	89.5	89.5				
100.0	100.0	100.0	100.0	0.1	0.1	90.00	0.0	89.5	89.5	89.2	0.28	320.350	
200.0	200.0	200.0	200.0	0.3	0.3	90.00	0.0	89.5	89.5	88.8	0.63	142.378	
300.0	300.0	300.0	300.0	0.5	0.5	90.00	0.0	89.5	89.5	88.5	0.98	91.529	
400.0	400.0	400.0	400.0	0.7	0.7	90.00	0.0	89.5	89.5	88.1	1.33	67.442	
500.0	500.0	500.0	500.0	0.8	0.8	90.00	0.0	89.5	89.5	87.8	1.68	53.392	
600.0	600.0	600.0	600.0	1.0	1.0	90.00	0.0	89.5	89.5	87.4	2.02	44.186	
700.0	700.0	700.0	700.0	1.2	1.2	90.00	0.0	89.5	89.5	87.1	2.37	37.688	
800.0	800.0	800.0	800.0	1.4	1.4	90.00	0.0	89.5	89.5	86.7	2.72	32.856	
900.0	900.0	900.0	900.0	1.5	1.5	90.00	0.0	89.5	89.5	86.4	3.07	29.123	
1,000.0	1,000.0	1,000.0	1,000.0	1.7	1.7	90.00	0.0	89.5	89.5	86.0	3.42	26.151 CC, ES	
1,100.0	1,100.0	1,097.8	1,097.8	1.9	1.9	164.64	1.7	90.6	92.7	89.0	3.76	24.634 SF	
1,200.0	1,199.7	1,197.0	1,196.8	2.1	2.1	163.26	5.8	93.3	101.8	97.7	4.11	24.779	
1,300.0	1,299.1	1,296.1	1,295.8	2.3	2.2	162.69	10.0	96.0	115.1	110.7	4.45	25.859	
1,400.0	1,398.0	1,394.5	1,394.1	2.5	2.4	162.79	14.1	98.7	132.5	127.7	4.80	27.627	
1,500.0	1,496.6	1,492.8	1,492.2	2.8	2.6	163.11	18.2	101.4	151.2	146.1	5.16	29.334	
1,600.0	1,595.2	1,591.0	1,590.3	3.1	2.8	163.36	22.3	104.1	170.0	164.5	5.52	30.807	
1,700.0	1,693.8	1,689.2	1,688.4	3.4	3.0	163.56	26.4	106.8	188.7	182.8	5.88	32.091	

Cathedral Energy Services

Anticollision Report

Company:	Red Hawk Petroleum	Local Co-ordinate Reference:	Well LE GERKIN 10H
Project:	Weld County, Colorado	TVD Reference:	KB=20' @ 4890.3usft
Reference Site:	S13-T2N-R64W (LE GERKIN PADS)	MD Reference:	KB=20' @ 4890.3usft
Site Error:	0.0usft	North Reference:	True
Reference Well:	LE GERKIN 10H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0usft	Output errors are at	2.00 sigma
Reference Wellbore	HZ	Database:	USA EDM 5000 Multi Users DB
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design S13-T2N-R64W (LE GERKIN PADS) - LE GERKIN 14H - HZ - Plan #1													Offset Site Error: 0.0 usft
Survey Program: 0-Geolink MWD													Offset Well Error: 0.0 usft
Reference		Offset		Semi Major Axis		Distance							
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Total Uncertainty Axis	Separation Factor	Warning
0.0	0.0	0.0	0.0	0.0	0.0	90.00	0.0	120.2	120.2				
100.0	100.0	100.0	100.0	0.1	0.1	90.00	0.0	120.2	120.2	119.9	0.28	430.470	
200.0	200.0	200.0	200.0	0.3	0.3	90.00	0.0	120.2	120.2	119.6	0.63	191.320	
300.0	300.0	300.0	300.0	0.5	0.5	90.00	0.0	120.2	120.2	119.2	0.98	122.992	
400.0	400.0	400.0	400.0	0.7	0.7	90.00	0.0	120.2	120.2	118.9	1.33	90.625	
500.0	500.0	500.0	500.0	0.8	0.8	90.00	0.0	120.2	120.2	118.5	1.68	71.745	
600.0	600.0	600.0	600.0	1.0	1.0	90.00	0.0	120.2	120.2	118.2	2.02	59.375	
700.0	700.0	700.0	700.0	1.2	1.2	90.00	0.0	120.2	120.2	117.8	2.37	50.644	
800.0	800.0	800.0	800.0	1.4	1.4	90.00	0.0	120.2	120.2	117.5	2.72	44.151	
900.0	900.0	900.0	900.0	1.5	1.5	90.00	0.0	120.2	120.2	117.1	3.07	39.134	
1,000.0	1,000.0	1,000.0	1,000.0	1.7	1.7	90.00	0.0	120.2	120.2	116.8	3.42	35.140 CC, ES	
1,100.0	1,100.0	1,095.3	1,095.3	1.9	1.9	165.23	0.9	122.0	124.2	120.4	3.76	33.030 SF	
1,200.0	1,199.7	1,189.8	1,189.6	2.1	2.1	164.74	3.4	127.3	136.1	132.0	4.09	33.240	
1,300.0	1,299.1	1,285.8	1,285.2	2.3	2.2	164.16	7.5	135.6	155.2	150.8	4.43	35.038	
1,400.0	1,398.0	1,383.0	1,381.9	2.5	2.4	164.02	11.7	144.2	178.6	173.9	4.77	37.469	

Cathedral Energy Services

Anticollision Report

Company:	Red Hawk Petroleum	Local Co-ordinate Reference:	Well LE GERKIN 10H
Project:	Weld County, Colorado	TVD Reference:	KB=20' @ 4890.3usft
Reference Site:	S13-T2N-R64W (LE GERKIN PADS)	MD Reference:	KB=20' @ 4890.3usft
Site Error:	0.0usft	North Reference:	True
Reference Well:	LE GERKIN 10H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0usft	Output errors are at	2.00 sigma
Reference Wellbore	HZ	Database:	USA EDM 5000 Multi Users DB
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design S13-T2N-R64W (LE GERKIN PADS) - LE GERKIN 15H - HZ - Plan #1													Offset Site Error: 0.0 usft	
Survey Program: 0-Geolink MWD													Offset Well Error: 0.0 usft	
Reference		Offset		Semi Major Axis			Distance							Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Total Uncertainty Axis	Separation Factor		
0.0	0.0	0.0	0.0	0.0	0.0	88.62	3.6	151.0	151.0					
100.0	100.0	100.0	100.0	0.1	0.1	88.62	3.6	151.0	151.0	150.7	0.28	540.747		
200.0	200.0	200.0	200.0	0.3	0.3	88.62	3.6	151.0	151.0	150.4	0.63	240.332		
300.0	300.0	300.0	300.0	0.5	0.5	88.62	3.6	151.0	151.0	150.0	0.98	154.499		
400.0	400.0	400.0	400.0	0.7	0.7	88.62	3.6	151.0	151.0	149.7	1.33	113.842		
500.0	500.0	500.0	500.0	0.8	0.8	88.62	3.6	151.0	151.0	149.3	1.68	90.125		
600.0	600.0	600.0	600.0	1.0	1.0	88.62	3.6	151.0	151.0	149.0	2.02	74.586		
700.0	700.0	700.0	700.0	1.2	1.2	88.62	3.6	151.0	151.0	148.6	2.37	63.617		
800.0	800.0	800.0	800.0	1.4	1.4	88.62	3.6	151.0	151.0	148.3	2.72	55.461		
900.0	900.0	900.0	900.0	1.5	1.5	88.62	3.6	151.0	151.0	147.9	3.07	49.159		
1,000.0	1,000.0	1,000.0	1,000.0	1.7	1.7	88.62	3.6	151.0	151.0	147.6	3.42	44.143 CC, ES		
1,100.0	1,100.0	1,093.9	1,093.8	1.9	1.9	164.03	4.2	152.8	155.1	151.3	3.76	41.276		
1,200.0	1,199.7	1,186.8	1,186.6	2.1	2.0	164.03	5.7	158.3	167.3	163.2	4.09	40.917 SF		
1,300.0	1,299.1	1,277.9	1,277.2	2.3	2.2	164.01	8.3	167.1	187.4	183.0	4.41	42.478		

Cathedral Energy Services

Anticollision Report

Company:	Red Hawk Petroleum	Local Co-ordinate Reference:	Well LE GERKIN 10H
Project:	Weld County, Colorado	TVD Reference:	KB=20' @ 4890.3usft
Reference Site:	S13-T2N-R64W (LE GERKIN PADS)	MD Reference:	KB=20' @ 4890.3usft
Site Error:	0.0usft	North Reference:	True
Reference Well:	LE GERKIN 10H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0usft	Output errors are at	2.00 sigma
Reference Wellbore	HZ	Database:	USA EDM 5000 Multi Users DB
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design													S13-T2N-R64W (LE GERKIN PADS) - LE GERKIN 16H - HZ - Plan #1		Offset Site Error:		0.0 usft
Survey Program:													0-Geolink MWD		Offset Well Error:		0.0 usft
Reference		Offset		Semi Major Axis			Distance							Warning			
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Total Uncertainty Axis	Separation Factor					
0.0	0.0	0.0	0.0	0.0	0.0	88.85	3.6	181.7	181.7								
100.0	100.0	100.0	100.0	0.1	0.1	88.85	3.6	181.7	181.7	181.5	0.28	650.841					
200.0	200.0	200.0	200.0	0.3	0.3	88.85	3.6	181.7	181.7	181.1	0.63	289.263					
300.0	300.0	300.0	300.0	0.5	0.5	88.85	3.6	181.7	181.7	180.8	0.98	185.955					
400.0	400.0	400.0	400.0	0.7	0.7	88.85	3.6	181.7	181.7	180.4	1.33	137.019					
500.0	500.0	500.0	500.0	0.8	0.8	88.85	3.6	181.7	181.7	180.1	1.68	108.474					
600.0	600.0	600.0	600.0	1.0	1.0	88.85	3.6	181.7	181.7	179.7	2.02	89.771					
700.0	700.0	700.0	700.0	1.2	1.2	88.85	3.6	181.7	181.7	179.4	2.37	76.570					
800.0	800.0	800.0	800.0	1.4	1.4	88.85	3.6	181.7	181.7	179.0	2.72	66.753					
900.0	900.0	900.0	900.0	1.5	1.5	88.85	3.6	181.7	181.7	178.7	3.07	59.167					
1,000.0	1,000.0	1,000.0	1,000.0	1.7	1.7	88.85	3.6	181.7	181.7	178.3	3.42	53.130 CC, ES					
1,100.0	1,100.0	1,092.6	1,092.6	1.9	1.9	164.30	4.0	183.5	185.8	182.1	3.75	49.490					
1,200.0	1,199.7	1,184.3	1,184.1	2.1	2.0	164.39	5.1	189.0	198.0	194.0	4.08	48.501 SF					

Cathedral Energy Services

Anticollision Report

Company:	Red Hawk Petroleum	Local Co-ordinate Reference:	Well LE GERKIN 10H
Project:	Weld County, Colorado	TVD Reference:	KB=20' @ 4890.3usft
Reference Site:	S13-T2N-R64W (LE GERKIN PADS)	MD Reference:	KB=20' @ 4890.3usft
Site Error:	0.0usft	North Reference:	True
Reference Well:	LE GERKIN 10H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0usft	Output errors are at	2.00 sigma
Reference Wellbore	HZ	Database:	USA EDM 5000 Multi Users DB
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design S13-T2N-R64W (LE GERKIN PADS) - LE GERKIN 9H - HZ - Plan #1													Offset Site Error:	0.0 usft
Survey Program: O-Geolink MWD													Offset Well Error:	0.0 usft
Reference		Offset		Semi Major Axis		Distance		Total		Separation		Warning		
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Uncertainty Axis			
0.0	0.0	0.0	0.0	0.0	0.0	-90.00	0.0	-28.0	28.0					
100.0	100.0	100.0	100.0	0.1	0.1	-90.00	0.0	-28.0	28.0	27.7	0.28	100.109		
200.0	200.0	200.0	200.0	0.3	0.3	-90.00	0.0	-28.0	28.0	27.3	0.63	44.493		
300.0	300.0	300.0	300.0	0.5	0.5	-90.00	0.0	-28.0	28.0	27.0	0.98	28.603		
400.0	400.0	400.0	400.0	0.7	0.7	-90.00	0.0	-28.0	28.0	26.6	1.33	21.076		
500.0	500.0	500.0	500.0	0.8	0.8	-90.00	0.0	-28.0	28.0	26.3	1.68	16.685		
600.0	600.0	600.0	600.0	1.0	1.0	-90.00	0.0	-28.0	28.0	25.9	2.02	13.808		
700.0	700.0	700.0	700.0	1.2	1.2	-90.00	0.0	-28.0	28.0	25.6	2.37	11.778		
800.0	800.0	800.0	800.0	1.4	1.4	-90.00	0.0	-28.0	28.0	25.2	2.72	10.268		
900.0	900.0	900.0	900.0	1.5	1.5	-90.00	0.0	-28.0	28.0	24.9	3.07	9.101		
1,000.0	1,000.0	1,000.0	1,000.0	1.7	1.7	-90.00	0.0	-28.0	28.0	24.5	3.42	8.172 CC		
1,100.0	1,100.0	1,098.8	1,098.8	1.9	1.9	-14.91	0.4	-30.1	28.0	24.2	3.77	7.426		
1,200.0	1,199.7	1,197.6	1,197.4	2.1	2.1	-15.89	1.5	-36.3	28.0	23.9	4.11	6.816		
1,300.0	1,299.1	1,296.4	1,295.6	2.3	2.3	-17.51	3.4	-46.8	28.1	23.6	4.45	6.309		
1,400.0	1,398.0	1,395.3	1,393.3	2.5	2.5	-19.71	6.1	-61.4	28.3	23.5	4.80	5.891 ES, SF		
1,500.0	1,496.6	1,494.0	1,490.2	2.8	2.8	-20.50	9.5	-80.1	31.3	26.1	5.18	6.045		
1,600.0	1,595.2	1,593.1	1,586.7	3.1	3.1	-19.51	13.6	-102.5	37.9	32.3	5.55	6.825		
1,700.0	1,693.8	1,692.9	1,683.7	3.4	3.5	-18.65	17.8	-125.4	44.9	39.0	5.92	7.586		
1,800.0	1,792.4	1,792.6	1,780.6	3.7	3.9	-18.03	22.0	-148.4	52.0	45.7	6.29	8.257		
1,900.0	1,891.0	1,892.4	1,877.6	4.0	4.3	-17.56	26.2	-171.3	59.0	52.3	6.67	8.853		
2,000.0	1,989.7	1,992.1	1,974.6	4.3	4.7	-17.18	30.4	-194.2	66.1	59.0	7.04	9.386		
2,100.0	2,088.3	2,091.9	2,071.6	4.6	5.1	-16.88	34.6	-217.2	73.1	65.7	7.41	9.864		
2,200.0	2,186.9	2,191.6	2,168.6	4.9	5.5	-16.63	38.8	-240.1	80.2	72.4	7.79	10.297		
2,300.0	2,285.5	2,291.4	2,265.6	5.2	6.0	-16.43	43.0	-263.1	87.3	79.1	8.16	10.689		
2,400.0	2,384.1	2,391.1	2,362.5	5.6	6.4	-16.25	47.2	-286.0	94.3	85.8	8.54	11.046		
2,500.0	2,482.7	2,490.9	2,459.5	5.9	6.8	-16.10	51.4	-309.0	101.4	92.5	8.92	11.374		
2,600.0	2,581.3	2,590.6	2,556.5	6.2	7.3	-15.96	55.6	-331.9	108.5	99.2	9.29	11.674		
2,700.0	2,680.0	2,690.4	2,653.5	6.5	7.7	-15.85	59.8	-354.9	115.5	105.9	9.67	11.951		
2,800.0	2,778.6	2,790.1	2,750.5	6.9	8.1	-15.75	64.0	-377.8	122.6	112.6	10.04	12.208		
2,900.0	2,877.2	2,889.9	2,847.5	7.2	8.6	-15.65	68.2	-400.7	129.7	119.3	10.42	12.445		
3,000.0	2,975.8	2,989.6	2,944.4	7.5	9.0	-15.57	72.4	-423.7	136.8	126.0	10.80	12.666		
3,100.0	3,074.4	3,089.4	3,041.4	7.9	9.5	-15.50	76.6	-446.6	143.8	132.7	11.17	12.872		
3,200.0	3,173.0	3,189.1	3,138.4	8.2	9.9	-15.43	80.8	-469.6	150.9	139.4	11.55	13.064		
3,300.0	3,271.6	3,288.9	3,235.4	8.5	10.4	-15.37	85.0	-492.5	158.0	146.0	11.93	13.244		
3,400.0	3,370.2	3,388.6	3,332.4	8.9	10.8	-15.31	89.2	-515.5	165.0	152.7	12.30	13.413		
3,500.0	3,468.9	3,488.4	3,429.4	9.2	11.2	-15.26	93.4	-538.4	172.1	159.4	12.68	13.572		
3,600.0	3,567.5	3,588.1	3,526.4	9.5	11.7	-15.22	97.6	-561.4	179.2	166.1	13.06	13.722		
3,700.0	3,666.1	3,687.9	3,623.3	9.9	12.1	-15.17	101.8	-584.3	186.3	172.8	13.44	13.863		
3,800.0	3,764.7	3,787.6	3,720.3	10.2	12.6	-15.13	106.0	-607.3	193.3	179.5	13.81	13.997		

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

Cathedral Energy Services

Anticollision Report

Company:	Red Hawk Petroleum	Local Co-ordinate Reference:	Well LE GERKIN 10H
Project:	Weld County, Colorado	TVD Reference:	KB=20' @ 4890.3usft
Reference Site:	S13-T2N-R64W (LE GERKIN PADS)	MD Reference:	KB=20' @ 4890.3usft
Site Error:	0.0usft	North Reference:	True
Reference Well:	LE GERKIN 10H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0usft	Output errors are at	2.00 sigma
Reference Wellbore	HZ	Database:	USA EDM 5000 Multi Users DB
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Reference Depths are relative to KB=20' @ 4890.3usft
Offset Depths are relative to Offset Datum
Central Meridian is -105.500000 °

Coordinates are relative to: LE GERKIN 10H
Coordinate System is US State Plane 1983, Colorado Northern Zone
Grid Convergence at Surface is: 0.65°

