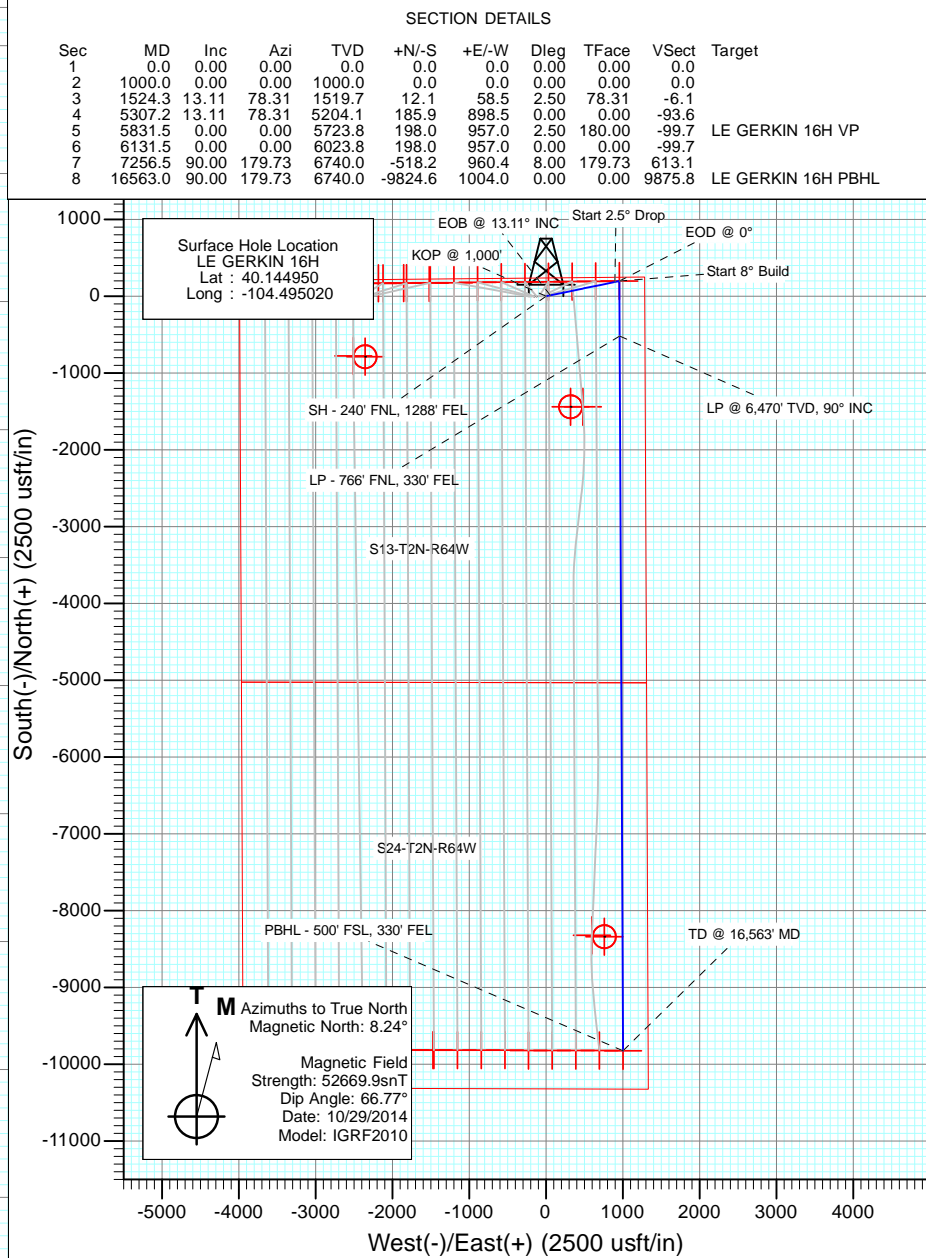
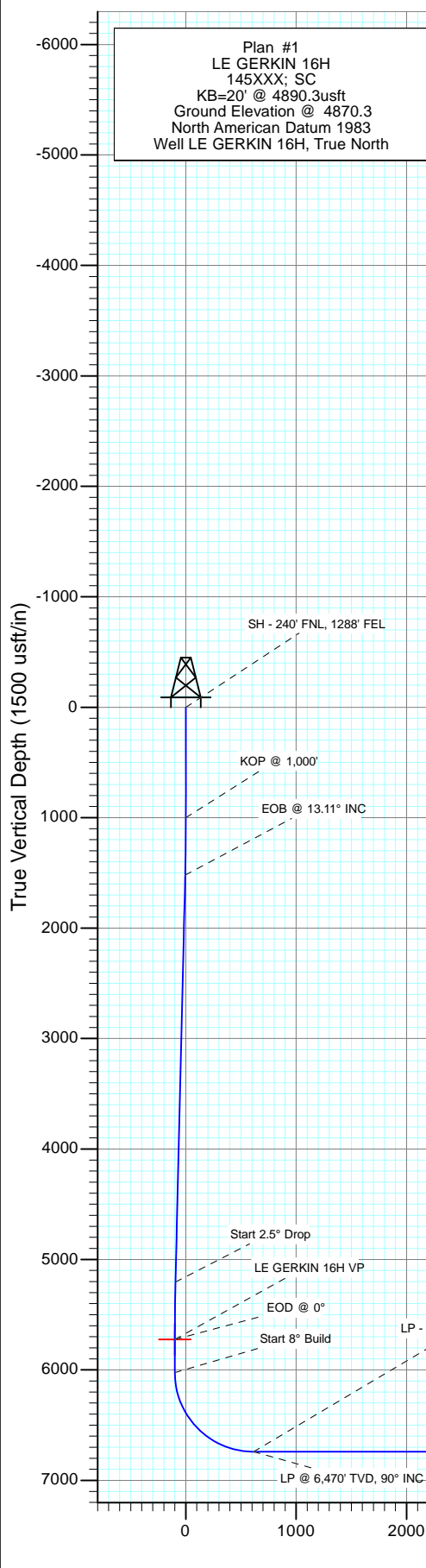


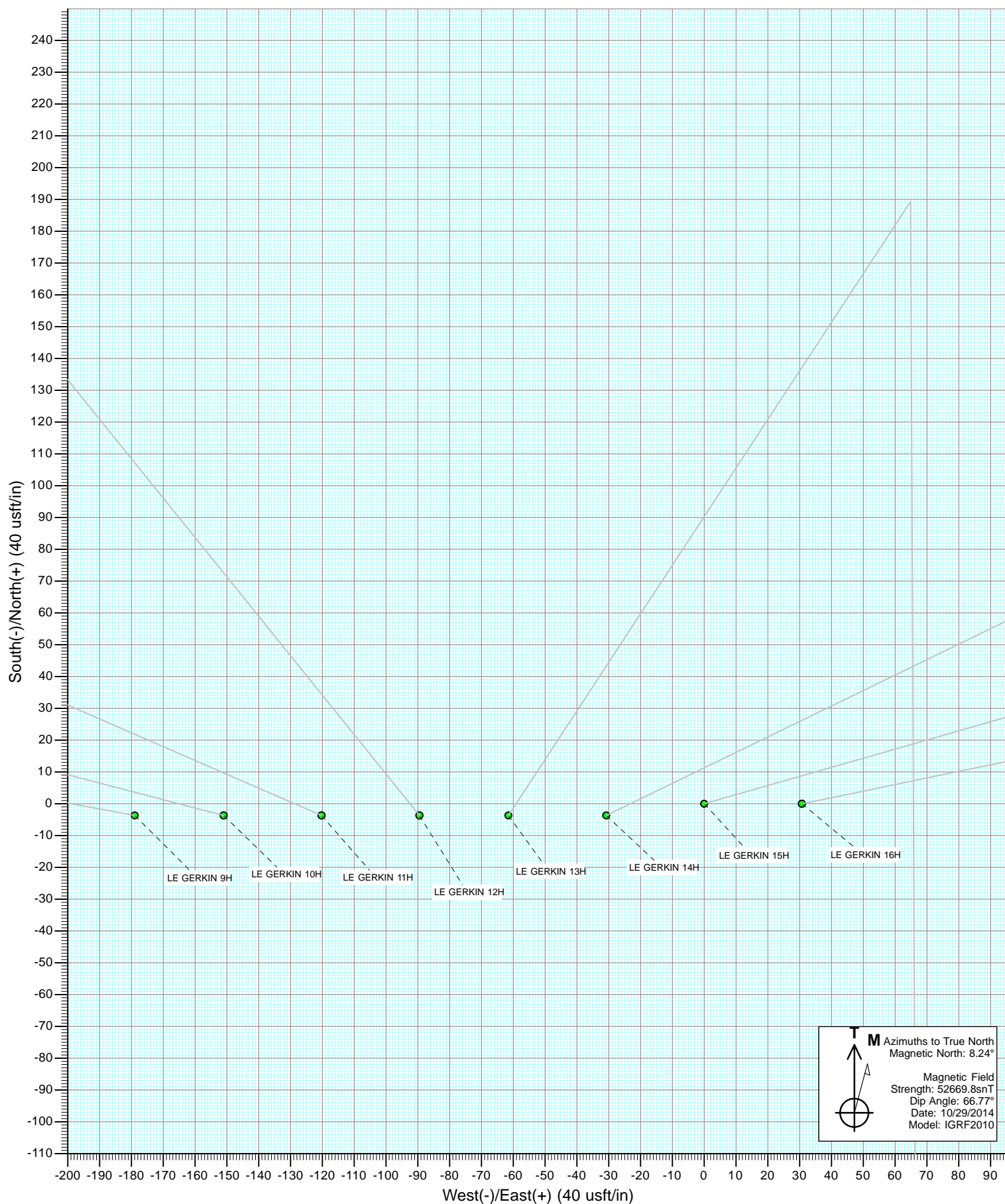


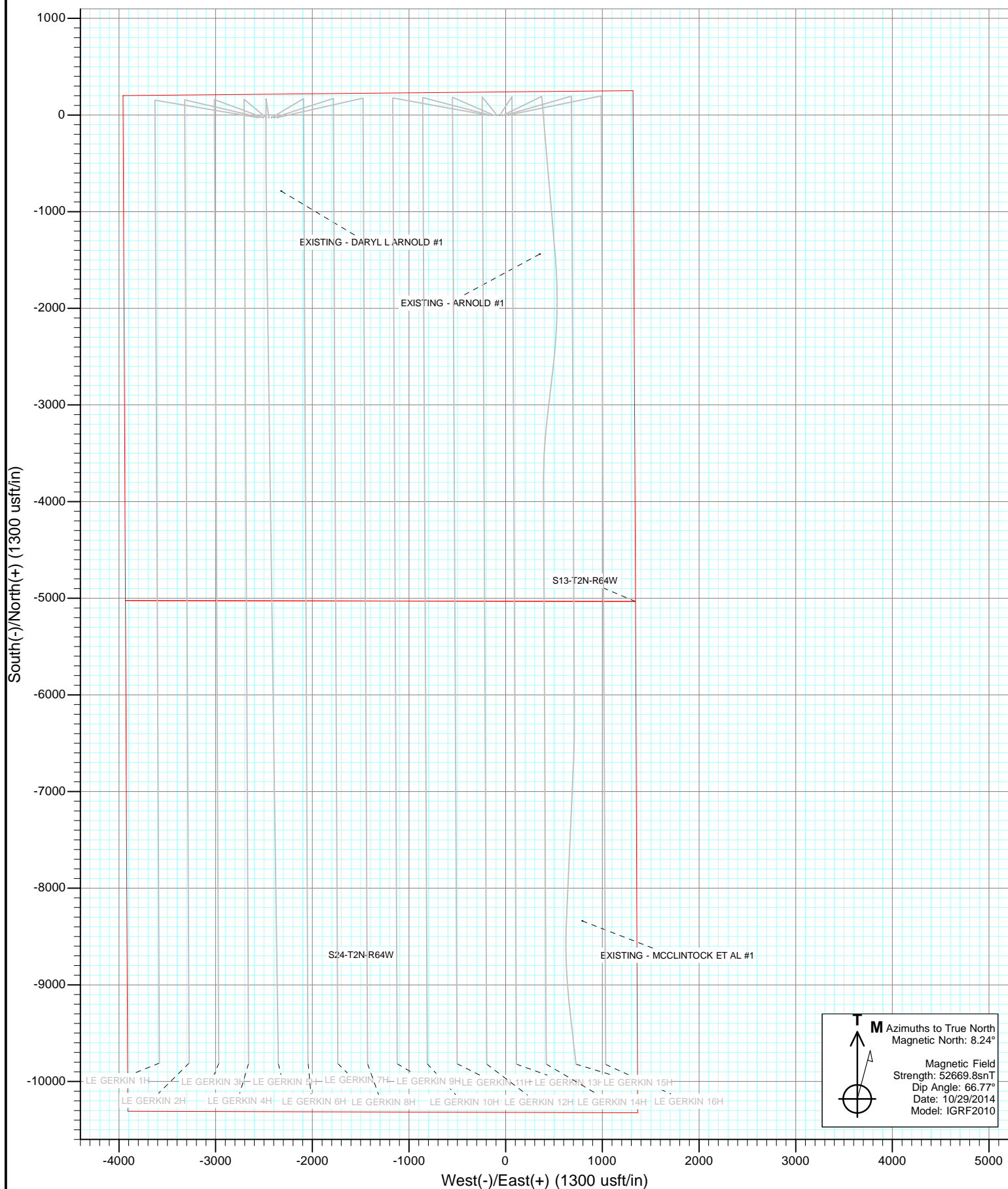
Project: Weld County, Colorado
Site: S13-T2N-R64W (LE GERKIN PADS)
Well: LE GERKIN 16H
Wellbore: HZ
Design: Plan #1



DESIGN TARGET DETAILS

Name	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
LE GERKIN 16H VP	198.0	957.0	1297449.61	3281899.02	40.145493	-104.491597
LE GERKIN 16H PBHL	-9824.6	1004.0	1287428.20	3282059.61	40.117980	-104.491430





Cathedral Energy Services

Planning Report

Database:	USA EDM 5000 Multi Users DB	Local Co-ordinate Reference:	Well LE GERKIN 16H
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 16H	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 16H					
Well Position	+N/-S	0.0 usft	Northing:	1,297,240.78 usft	Latitude:	40.144950
	+E/-W	0.0 usft	Easting:	3,280,944.32 usft	Longitude:	-104.495020
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	174.16

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	
1,524.3	13.11	78.31	1,519.7	12.1	58.5	2.50	2.50	0.00	78.31	
5,307.2	13.11	78.31	5,204.1	185.9	898.5	0.00	0.00	0.00	0.00	
5,831.5	0.00	0.00	5,723.8	198.0	957.0	2.50	-2.50	0.00	180.00	LE GERKIN 16H VP
6,131.5	0.00	0.00	6,023.8	198.0	957.0	0.00	0.00	0.00	0.00	
7,256.5	90.00	179.73	6,740.0	-518.2	960.4	8.00	8.00	15.98	179.73	
16,563.0	90.00	179.73	6,740.0	-9,824.6	1,004.0	0.00	0.00	0.00	0.00	LE GERKIN 16H PBH

Cathedral Energy Services

Planning Report

Database:	USA EDM 5000 Multi Users DB	Local Co-ordinate Reference:	Well LE GERKIN 16H
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 16H	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, 1288' 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	78.31	1,100.0	0.4	2.1	-0.2	2.50	2.50	
1,200.0	5.00	78.31	1,199.7	1.8	8.5	-0.9	2.50	2.50	
1,300.0	7.50	78.31	1,299.1	4.0	19.2	-2.0	2.50	2.50	
1,400.0	10.00	78.31	1,398.0	7.1	34.1	-3.6	2.50	2.50	
1,500.0	12.50	78.31	1,496.0	11.0	53.2	-5.5	2.50	2.50	
1,524.3	13.11	78.31	1,519.7	12.1	58.5	-6.1	2.50	2.50	EOB @ 13.11° INC
1,600.0	13.11	78.31	1,593.5	15.6	75.3	-7.8	0.00	0.00	
1,700.0	13.11	78.31	1,690.9	20.2	97.5	-10.2	0.00	0.00	
1,800.0	13.11	78.31	1,788.3	24.8	119.7	-12.5	0.00	0.00	
1,900.0	13.11	78.31	1,885.7	29.4	141.9	-14.8	0.00	0.00	
2,000.0	13.11	78.31	1,983.0	34.0	164.1	-17.1	0.00	0.00	
2,100.0	13.11	78.31	2,080.4	38.5	186.3	-19.4	0.00	0.00	
2,200.0	13.11	78.31	2,177.8	43.1	208.5	-21.7	0.00	0.00	
2,300.0	13.11	78.31	2,275.2	47.7	230.7	-24.0	0.00	0.00	
2,400.0	13.11	78.31	2,372.6	52.3	252.9	-26.3	0.00	0.00	
2,500.0	13.11	78.31	2,470.0	56.9	275.1	-28.7	0.00	0.00	
2,600.0	13.11	78.31	2,567.4	61.5	297.4	-31.0	0.00	0.00	
2,700.0	13.11	78.31	2,664.8	66.1	319.6	-33.3	0.00	0.00	
2,800.0	13.11	78.31	2,762.2	70.7	341.8	-35.6	0.00	0.00	
2,900.0	13.11	78.31	2,859.6	75.3	364.0	-37.9	0.00	0.00	
3,000.0	13.11	78.31	2,957.0	79.9	386.2	-40.2	0.00	0.00	
3,100.0	13.11	78.31	3,054.4	84.5	408.4	-42.5	0.00	0.00	
3,200.0	13.11	78.31	3,151.8	89.1	430.6	-44.9	0.00	0.00	
3,300.0	13.11	78.31	3,249.2	93.7	452.8	-47.2	0.00	0.00	
3,400.0	13.11	78.31	3,346.6	98.3	475.0	-49.5	0.00	0.00	
3,500.0	13.11	78.31	3,444.0	102.9	497.2	-51.8	0.00	0.00	
3,600.0	13.11	78.31	3,541.4	107.5	519.4	-54.1	0.00	0.00	
3,700.0	13.11	78.31	3,638.8	112.1	541.6	-56.4	0.00	0.00	
3,800.0	13.11	78.31	3,736.2	116.7	563.8	-58.7	0.00	0.00	
3,900.0	13.11	78.31	3,833.5	121.2	586.0	-61.0	0.00	0.00	
4,000.0	13.11	78.31	3,930.9	125.8	608.2	-63.4	0.00	0.00	
4,100.0	13.11	78.31	4,028.3	130.4	630.5	-65.7	0.00	0.00	
4,200.0	13.11	78.31	4,125.7	135.0	652.7	-68.0	0.00	0.00	
4,300.0	13.11	78.31	4,223.1	139.6	674.9	-70.3	0.00	0.00	
4,400.0	13.11	78.31	4,320.5	144.2	697.1	-72.6	0.00	0.00	
4,500.0	13.11	78.31	4,417.9	148.8	719.3	-74.9	0.00	0.00	
4,600.0	13.11	78.31	4,515.3	153.4	741.5	-77.2	0.00	0.00	
4,700.0	13.11	78.31	4,612.7	158.0	763.7	-79.5	0.00	0.00	
4,800.0	13.11	78.31	4,710.1	162.6	785.9	-81.9	0.00	0.00	
4,900.0	13.11	78.31	4,807.5	167.2	808.1	-84.2	0.00	0.00	

Cathedral Energy Services

Planning Report

Database:	USA EDM 5000 Multi Users DB	Local Co-ordinate Reference:	Well LE GERKIN 16H
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 16H	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	13.11	78.31	4,904.9	171.8	830.3	-86.5	0.00	0.00	
5,100.0	13.11	78.31	5,002.3	176.4	852.5	-88.8	0.00	0.00	
5,200.0	13.11	78.31	5,099.7	181.0	874.7	-91.1	0.00	0.00	
5,307.2	13.11	78.31	5,204.1	185.9	898.5	-93.6	0.00	0.00	Start 2.5° Drop
5,400.0	10.79	78.31	5,294.9	189.8	917.3	-95.6	2.50	-2.50	
5,500.0	8.29	78.31	5,393.5	193.2	933.6	-97.2	2.50	-2.50	
5,600.0	5.79	78.31	5,492.7	195.6	945.6	-98.5	2.50	-2.50	
5,700.0	3.29	78.31	5,592.4	197.2	953.3	-99.3	2.50	-2.50	
5,800.0	0.79	78.31	5,692.3	198.0	956.8	-99.7	2.50	-2.50	
5,831.5	0.00	0.00	5,723.8	198.0	957.0	-99.7	2.50	-2.50	EOD @ 0°
5,900.0	0.00	0.00	5,792.3	198.0	957.0	-99.7	0.00	0.00	
6,000.0	0.00	0.00	5,892.3	198.0	957.0	-99.7	0.00	0.00	
6,100.0	0.00	0.00	5,992.3	198.0	957.0	-99.7	0.00	0.00	
6,131.5	0.00	0.00	6,023.8	198.0	957.0	-99.7	0.00	0.00	Start 8° Build
6,150.0	1.48	179.73	6,042.3	197.8	957.0	-99.4	8.00	8.00	
6,200.0	5.48	179.73	6,092.2	194.7	957.0	-96.4	8.00	8.00	
6,250.0	9.48	179.73	6,141.8	188.2	957.0	-89.9	8.00	8.00	
6,300.0	13.48	179.73	6,190.8	178.3	957.1	-80.0	8.00	8.00	
6,350.0	17.48	179.73	6,239.0	164.9	957.2	-66.8	8.00	8.00	
6,400.0	21.48	179.73	6,286.1	148.2	957.2	-50.2	8.00	8.00	
6,450.0	25.48	179.73	6,331.9	128.3	957.3	-30.3	8.00	8.00	
6,500.0	29.48	179.73	6,376.3	105.3	957.4	-7.4	8.00	8.00	
6,550.0	33.48	179.73	6,418.9	79.2	957.6	18.6	8.00	8.00	
6,600.0	37.48	179.73	6,459.6	50.1	957.7	47.5	8.00	8.00	
6,650.0	41.48	179.73	6,498.2	18.4	957.8	79.1	8.00	8.00	
6,700.0	45.48	179.73	6,534.5	-16.0	958.0	113.4	8.00	8.00	
6,750.0	49.48	179.73	6,568.3	-52.9	958.2	150.0	8.00	8.00	
6,800.0	53.48	179.73	6,599.4	-92.0	958.4	189.0	8.00	8.00	
6,850.0	57.48	179.73	6,627.7	-133.2	958.6	230.0	8.00	8.00	
6,900.0	61.48	179.73	6,653.1	-176.3	958.8	272.8	8.00	8.00	
6,950.0	65.48	179.73	6,675.4	-221.0	959.0	317.3	8.00	8.00	
7,000.0	69.48	179.73	6,694.6	-267.2	959.2	363.3	8.00	8.00	
7,050.0	73.48	179.73	6,710.4	-314.6	959.4	410.5	8.00	8.00	
7,100.0	77.48	179.73	6,723.0	-363.0	959.6	458.6	8.00	8.00	
7,150.0	81.48	179.73	6,732.1	-412.1	959.9	507.6	8.00	8.00	
7,200.0	85.48	179.73	6,737.8	-461.8	960.1	557.0	8.00	8.00	
7,250.0	89.48	179.73	6,740.0	-511.7	960.3	606.7	8.00	8.00	
7,256.5	90.00	179.73	6,740.0	-518.2	960.4	613.2	7.97	7.97	LP @ 6,470' TVD, 90° INC - LP - 766' FNL, 330
7,300.0	90.00	179.73	6,740.0	-561.7	960.6	656.5	0.00	0.00	
7,400.0	90.00	179.73	6,740.0	-661.7	961.0	756.0	0.00	0.00	
7,500.0	90.00	179.73	6,740.0	-761.7	961.5	855.5	0.00	0.00	
7,600.0	90.00	179.73	6,740.0	-861.7	962.0	955.0	0.00	0.00	
7,700.0	90.00	179.73	6,740.0	-961.7	962.4	1,054.6	0.00	0.00	
7,800.0	90.00	179.73	6,740.0	-1,061.7	962.9	1,154.1	0.00	0.00	
7,900.0	90.00	179.73	6,740.0	-1,161.7	963.4	1,253.6	0.00	0.00	
8,000.0	90.00	179.73	6,740.0	-1,261.7	963.8	1,353.2	0.00	0.00	
8,100.0	90.00	179.73	6,740.0	-1,361.7	964.3	1,452.7	0.00	0.00	
8,200.0	90.00	179.73	6,740.0	-1,461.7	964.8	1,552.2	0.00	0.00	
8,300.0	90.00	179.73	6,740.0	-1,561.7	965.3	1,651.7	0.00	0.00	
8,400.0	90.00	179.73	6,740.0	-1,661.7	965.7	1,751.3	0.00	0.00	
8,500.0	90.00	179.73	6,740.0	-1,761.7	966.2	1,850.8	0.00	0.00	
8,600.0	90.00	179.73	6,740.0	-1,861.7	966.7	1,950.3	0.00	0.00	

Cathedral Energy Services

Planning Report

Database:	USA EDM 5000 Multi Users DB	Local Co-ordinate Reference:	Well LE GERKIN 16H
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 16H	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
8,700.0	90.00	179.73	6,740.0	-1,961.7	967.1	2,049.9	0.00	0.00	
8,800.0	90.00	179.73	6,740.0	-2,061.7	967.6	2,149.4	0.00	0.00	
8,900.0	90.00	179.73	6,740.0	-2,161.7	968.1	2,248.9	0.00	0.00	
9,000.0	90.00	179.73	6,740.0	-2,261.7	968.5	2,348.4	0.00	0.00	
9,100.0	90.00	179.73	6,740.0	-2,361.7	969.0	2,448.0	0.00	0.00	
9,200.0	90.00	179.73	6,740.0	-2,461.7	969.5	2,547.5	0.00	0.00	
9,300.0	90.00	179.73	6,740.0	-2,561.7	969.9	2,647.0	0.00	0.00	
9,400.0	90.00	179.73	6,740.0	-2,661.7	970.4	2,746.6	0.00	0.00	
9,500.0	90.00	179.73	6,740.0	-2,761.7	970.9	2,846.1	0.00	0.00	
9,600.0	90.00	179.73	6,740.0	-2,861.7	971.4	2,945.6	0.00	0.00	
9,700.0	90.00	179.73	6,740.0	-2,961.7	971.8	3,045.1	0.00	0.00	
9,800.0	90.00	179.73	6,740.0	-3,061.7	972.3	3,144.7	0.00	0.00	
9,900.0	90.00	179.73	6,740.0	-3,161.7	972.8	3,244.2	0.00	0.00	
10,000.0	90.00	179.73	6,740.0	-3,261.7	973.2	3,343.7	0.00	0.00	
10,100.0	90.00	179.73	6,740.0	-3,361.7	973.7	3,443.3	0.00	0.00	
10,200.0	90.00	179.73	6,740.0	-3,461.7	974.2	3,542.8	0.00	0.00	
10,300.0	90.00	179.73	6,740.0	-3,561.7	974.6	3,642.3	0.00	0.00	
10,400.0	90.00	179.73	6,740.0	-3,661.7	975.1	3,741.8	0.00	0.00	
10,500.0	90.00	179.73	6,740.0	-3,761.7	975.6	3,841.4	0.00	0.00	
10,600.0	90.00	179.73	6,740.0	-3,861.7	976.0	3,940.9	0.00	0.00	
10,700.0	90.00	179.73	6,740.0	-3,961.7	976.5	4,040.4	0.00	0.00	
10,800.0	90.00	179.73	6,740.0	-4,061.7	977.0	4,140.0	0.00	0.00	
10,900.0	90.00	179.73	6,740.0	-4,161.7	977.4	4,239.5	0.00	0.00	
11,000.0	90.00	179.73	6,740.0	-4,261.7	977.9	4,339.0	0.00	0.00	
11,100.0	90.00	179.73	6,740.0	-4,361.7	978.4	4,438.5	0.00	0.00	
11,200.0	90.00	179.73	6,740.0	-4,461.7	978.9	4,538.1	0.00	0.00	
11,300.0	90.00	179.73	6,740.0	-4,561.7	979.3	4,637.6	0.00	0.00	
11,400.0	90.00	179.73	6,740.0	-4,661.7	979.8	4,737.1	0.00	0.00	
11,500.0	90.00	179.73	6,740.0	-4,761.7	980.3	4,836.7	0.00	0.00	
11,600.0	90.00	179.73	6,740.0	-4,861.7	980.7	4,936.2	0.00	0.00	
11,700.0	90.00	179.73	6,740.0	-4,961.7	981.2	5,035.7	0.00	0.00	
11,800.0	90.00	179.73	6,740.0	-5,061.7	981.7	5,135.2	0.00	0.00	
11,900.0	90.00	179.73	6,740.0	-5,161.7	982.1	5,234.8	0.00	0.00	
12,000.0	90.00	179.73	6,740.0	-5,261.7	982.6	5,334.3	0.00	0.00	
12,100.0	90.00	179.73	6,740.0	-5,361.7	983.1	5,433.8	0.00	0.00	
12,200.0	90.00	179.73	6,740.0	-5,461.7	983.5	5,533.4	0.00	0.00	
12,300.0	90.00	179.73	6,740.0	-5,561.7	984.0	5,632.9	0.00	0.00	
12,400.0	90.00	179.73	6,740.0	-5,661.7	984.5	5,732.4	0.00	0.00	
12,500.0	90.00	179.73	6,740.0	-5,761.7	985.0	5,831.9	0.00	0.00	
12,600.0	90.00	179.73	6,740.0	-5,861.7	985.4	5,931.5	0.00	0.00	
12,700.0	90.00	179.73	6,740.0	-5,961.7	985.9	6,031.0	0.00	0.00	
12,800.0	90.00	179.73	6,740.0	-6,061.7	986.4	6,130.5	0.00	0.00	
12,900.0	90.00	179.73	6,740.0	-6,161.7	986.8	6,230.1	0.00	0.00	
13,000.0	90.00	179.73	6,740.0	-6,261.7	987.3	6,329.6	0.00	0.00	
13,100.0	90.00	179.73	6,740.0	-6,361.7	987.8	6,429.1	0.00	0.00	
13,200.0	90.00	179.73	6,740.0	-6,461.7	988.2	6,528.6	0.00	0.00	
13,300.0	90.00	179.73	6,740.0	-6,561.6	988.7	6,628.2	0.00	0.00	
13,400.0	90.00	179.73	6,740.0	-6,661.6	989.2	6,727.7	0.00	0.00	
13,500.0	90.00	179.73	6,740.0	-6,761.6	989.6	6,827.2	0.00	0.00	
13,600.0	90.00	179.73	6,740.0	-6,861.6	990.1	6,926.8	0.00	0.00	
13,700.0	90.00	179.73	6,740.0	-6,961.6	990.6	7,026.3	0.00	0.00	
13,800.0	90.00	179.73	6,740.0	-7,061.6	991.1	7,125.8	0.00	0.00	

Cathedral Energy Services

Planning Report

Database:	USA EDM 5000 Multi Users DB	Local Co-ordinate Reference:	Well LE GERKIN 16H
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 16H	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
13,900.0	90.00	179.73	6,740.0	-7,161.6	991.5	7,225.3	0.00	0.00	
14,000.0	90.00	179.73	6,740.0	-7,261.6	992.0	7,324.9	0.00	0.00	
14,100.0	90.00	179.73	6,740.0	-7,361.6	992.5	7,424.4	0.00	0.00	
14,200.0	90.00	179.73	6,740.0	-7,461.6	992.9	7,523.9	0.00	0.00	
14,300.0	90.00	179.73	6,740.0	-7,561.6	993.4	7,623.5	0.00	0.00	
14,400.0	90.00	179.73	6,740.0	-7,661.6	993.9	7,723.0	0.00	0.00	
14,500.0	90.00	179.73	6,740.0	-7,761.6	994.3	7,822.5	0.00	0.00	
14,600.0	90.00	179.73	6,740.0	-7,861.6	994.8	7,922.0	0.00	0.00	
14,700.0	90.00	179.73	6,740.0	-7,961.6	995.3	8,021.6	0.00	0.00	
14,800.0	90.00	179.73	6,740.0	-8,061.6	995.7	8,121.1	0.00	0.00	
14,900.0	90.00	179.73	6,740.0	-8,161.6	996.2	8,220.6	0.00	0.00	
15,000.0	90.00	179.73	6,740.0	-8,261.6	996.7	8,320.2	0.00	0.00	
15,100.0	90.00	179.73	6,740.0	-8,361.6	997.1	8,419.7	0.00	0.00	
15,200.0	90.00	179.73	6,740.0	-8,461.6	997.6	8,519.2	0.00	0.00	
15,300.0	90.00	179.73	6,740.0	-8,561.6	998.1	8,618.7	0.00	0.00	
15,400.0	90.00	179.73	6,740.0	-8,661.6	998.6	8,718.3	0.00	0.00	
15,500.0	90.00	179.73	6,740.0	-8,761.6	999.0	8,817.8	0.00	0.00	
15,600.0	90.00	179.73	6,740.0	-8,861.6	999.5	8,917.3	0.00	0.00	
15,700.0	90.00	179.73	6,740.0	-8,961.6	1,000.0	9,016.9	0.00	0.00	
15,800.0	90.00	179.73	6,740.0	-9,061.6	1,000.4	9,116.4	0.00	0.00	
15,900.0	90.00	179.73	6,740.0	-9,161.6	1,000.9	9,215.9	0.00	0.00	
16,000.0	90.00	179.73	6,740.0	-9,261.6	1,001.4	9,315.4	0.00	0.00	
16,100.0	90.00	179.73	6,740.0	-9,361.6	1,001.8	9,415.0	0.00	0.00	
16,200.0	90.00	179.73	6,740.0	-9,461.6	1,002.3	9,514.5	0.00	0.00	
16,300.0	90.00	179.73	6,740.0	-9,561.6	1,002.8	9,614.0	0.00	0.00	
16,400.0	90.00	179.73	6,740.0	-9,661.6	1,003.2	9,713.6	0.00	0.00	
16,500.0	90.00	179.73	6,740.0	-9,761.6	1,003.7	9,813.1	0.00	0.00	
16,563.0	90.00	179.73	6,740.0	-9,824.6	1,004.0	9,875.8	0.00	0.00	TD @ 16,563' MD - PBHL - 500' FSL, 330' FEL

Targets									
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
LE GERKIN 16H PBHL - hit/miss target - Shape - Point	0.00	0.00	6,740.0	-9,824.6	1,004.0	1,287,428.20	3,282,059.61	40.117980	-104.491430
LE GERKIN 16H VP - plan hits target center - Point	0.00	0.00	5,723.8	198.0	957.0	1,297,449.61	3,281,899.02	40.145493	-104.491597

Cathedral Energy Services

Planning Report

Database:	USA EDM 5000 Multi Users DB	Local Co-ordinate Reference:	Well LE GERKIN 16H
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 16H	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, 1288' FEL
1,000.0	1,000.0	0.0	0.0	KOP @ 1,000'
1,524.3	1,519.7	12.1	58.5	EOB @ 13.11° INC
5,307.2	5,204.1	185.9	898.5	Start 2.5° Drop
5,831.5	5,723.8	198.0	957.0	EOD @ 0°
6,131.5	6,023.8	198.0	957.0	Start 8° Build
7,256.5	6,740.0	-518.2	960.4	LP @ 6,470' TVD, 90° INC
7,256.5	6,740.0	-518.2	960.4	LP - 766' FNL, 330' FEL
16,563.0	6,740.0	-9,824.6	1,004.0	TD @ 16,563' MD
16,563.0	6,740.0	-9,824.6	1,004.0	PBHL - 500' FSL, 330' FEL

Red Hawk Petroleum

Weld County, Colorado

S13-T2N-R64W (LE GERKIN PADS)

LE GERKIN 16H

HZ

Plan #1

Anticollision Report

30 October, 2014

Cathedral Energy Services

Anticollision Report

Company:	Red Hawk Petroleum	Local Co-ordinate Reference:	Well LE GERKIN 16H
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 16H	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	10/29/2014		
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
0.0	16,563.0	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 10H - HZ - Plan #1	1,000.0	1,000.0	181.7	178.3	53.130	CC, ES
LE GERKIN 10H - HZ - Plan #1	1,200.0	1,184.6	198.1	194.0	48.507	SF
LE GERKIN 11H - HZ - Plan #1	1,000.0	1,000.0	151.0	147.6	44.143	CC, ES
LE GERKIN 11H - HZ - Plan #1	1,200.0	1,187.5	167.0	162.9	40.839	SF
LE GERKIN 12H - HZ - Plan #1	1,000.0	1,000.0	120.3	116.8	35.157	CC, ES
LE GERKIN 12H - HZ - Plan #1	1,200.0	1,195.5	133.3	129.2	32.468	SF
LE GERKIN 13H - HZ - Plan #1	900.0	900.0	92.3	89.3	30.056	CC
LE GERKIN 13H - HZ - Plan #1	1,000.0	1,000.0	92.3	88.9	26.989	ES
LE GERKIN 13H - HZ - Plan #1	1,300.0	1,302.2	104.8	100.4	23.483	SF
LE GERKIN 14H - HZ - Plan #1	1,000.0	1,000.0	61.6	58.2	18.010	CC
LE GERKIN 14H - HZ - Plan #1	1,200.0	1,205.1	62.0	57.9	15.047	ES
LE GERKIN 14H - HZ - Plan #1	1,300.0	1,305.6	63.8	59.4	14.290	SF
LE GERKIN 15H - HZ - Plan #1	1,000.0	1,000.0	30.8	27.3	8.989	CC
LE GERKIN 15H - HZ - Plan #1	1,300.0	1,303.9	30.9	26.4	6.921	ES
LE GERKIN 15H - HZ - Plan #1	1,400.0	1,404.7	31.3	26.5	6.502	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						Out of range

Cathedral Energy Services

Anticollision Report

Company:	Red Hawk Petroleum	Local Co-ordinate Reference:	Well LE GERKIN 16H
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 16H	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 10H - 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	-91.15	-3.6	-181.7	181.7				
100.0	100.0	100.0	100.0	0.1	0.1	-91.15	-3.6	-181.7	181.7	181.5	0.28	650.841	
200.0	200.0	200.0	200.0	0.3	0.3	-91.15	-3.6	-181.7	181.7	181.1	0.63	289.263	
300.0	300.0	300.0	300.0	0.5	0.5	-91.15	-3.6	-181.7	181.7	180.8	0.98	185.955	
400.0	400.0	400.0	400.0	0.7	0.7	-91.15	-3.6	-181.7	181.7	180.4	1.33	137.019	
500.0	500.0	500.0	500.0	0.8	0.8	-91.15	-3.6	-181.7	181.7	180.1	1.68	108.474	
600.0	600.0	600.0	600.0	1.0	1.0	-91.15	-3.6	-181.7	181.7	179.7	2.02	89.771	
700.0	700.0	700.0	700.0	1.2	1.2	-91.15	-3.6	-181.7	181.7	179.4	2.37	76.570	
800.0	800.0	800.0	800.0	1.4	1.4	-91.15	-3.6	-181.7	181.7	179.0	2.72	66.753	
900.0	900.0	900.0	900.0	1.5	1.5	-91.15	-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	-91.15	-3.6	-181.7	181.7	178.3	3.42	53.130 CC, ES	
1,100.0	1,100.0	1,092.8	1,092.7	1.9	1.9	-169.40	-3.2	-183.5	185.8	182.1	3.76	49.490	
1,200.0	1,199.7	1,184.6	1,184.4	2.1	2.0	-169.22	-1.8	-188.9	198.1	194.0	4.08	48.507 SF	

Cathedral Energy Services

Anticollision Report

Company:	Red Hawk Petroleum	Local Co-ordinate Reference:	Well LE GERKIN 16H
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 16H	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						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	-91.38	-3.6	-151.0	151.0				
100.0	100.0	100.0	100.0	0.1	0.1	-91.38	-3.6	-151.0	151.0	150.7	0.28	540.747	
200.0	200.0	200.0	200.0	0.3	0.3	-91.38	-3.6	-151.0	151.0	150.4	0.63	240.332	
300.0	300.0	300.0	300.0	0.5	0.5	-91.38	-3.6	-151.0	151.0	150.0	0.98	154.499	
400.0	400.0	400.0	400.0	0.7	0.7	-91.38	-3.6	-151.0	151.0	149.7	1.33	113.842	
500.0	500.0	500.0	500.0	0.8	0.8	-91.38	-3.6	-151.0	151.0	149.3	1.68	90.125	
600.0	600.0	600.0	600.0	1.0	1.0	-91.38	-3.6	-151.0	151.0	149.0	2.02	74.586	
700.0	700.0	700.0	700.0	1.2	1.2	-91.38	-3.6	-151.0	151.0	148.6	2.37	63.617	
800.0	800.0	800.0	800.0	1.4	1.4	-91.38	-3.6	-151.0	151.0	148.3	2.72	55.461	
900.0	900.0	900.0	900.0	1.5	1.5	-91.38	-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	-91.38	-3.6	-151.0	151.0	147.6	3.42	44.143 CC, ES	
1,100.0	1,100.0	1,094.2	1,094.2	1.9	1.9	-169.51	-2.9	-152.7	155.0	151.3	3.76	41.252	
1,200.0	1,199.7	1,187.5	1,187.3	2.1	2.0	-169.01	-0.6	-158.0	167.0	162.9	4.09	40.839 SF	
1,300.0	1,299.1	1,282.0	1,281.4	2.3	2.2	-168.34	3.1	-166.5	186.5	182.1	4.42	42.205	

Cathedral Energy Services

Anticollision Report

Company:	Red Hawk Petroleum	Local Co-ordinate Reference:	Well LE GERKIN 16H
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 16H	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	-91.74	-3.6	-120.2	120.3				
100.0	100.0	100.0	100.0	0.1	0.1	-91.74	-3.6	-120.2	120.3	120.0	0.28	430.667	
200.0	200.0	200.0	200.0	0.3	0.3	-91.74	-3.6	-120.2	120.3	119.6	0.63	191.408	
300.0	300.0	300.0	300.0	0.5	0.5	-91.74	-3.6	-120.2	120.3	119.3	0.98	123.048	
400.0	400.0	400.0	400.0	0.7	0.7	-91.74	-3.6	-120.2	120.3	118.9	1.33	90.667	
500.0	500.0	500.0	500.0	0.8	0.8	-91.74	-3.6	-120.2	120.3	118.6	1.68	71.778	
600.0	600.0	600.0	600.0	1.0	1.0	-91.74	-3.6	-120.2	120.3	118.2	2.02	59.402	
700.0	700.0	700.0	700.0	1.2	1.2	-91.74	-3.6	-120.2	120.3	117.9	2.37	50.667	
800.0	800.0	800.0	800.0	1.4	1.4	-91.74	-3.6	-120.2	120.3	117.5	2.72	44.171	
900.0	900.0	900.0	900.0	1.5	1.5	-91.74	-3.6	-120.2	120.3	117.2	3.07	39.152	
1,000.0	1,000.0	1,000.0	1,000.0	1.7	1.7	-91.74	-3.6	-120.2	120.3	116.8	3.42	35.157 CC, ES	
1,100.0	1,100.0	1,096.8	1,096.8	1.9	1.9	-169.44	-2.1	-121.5	123.7	119.9	3.76	32.872	
1,200.0	1,199.7	1,195.5	1,195.3	2.1	2.1	-168.17	1.9	-124.7	133.3	129.2	4.11	32.468 SF	
1,300.0	1,299.1	1,294.5	1,294.2	2.3	2.2	-167.36	6.0	-128.0	147.3	142.8	4.45	33.126	
1,400.0	1,398.0	1,392.8	1,392.3	2.5	2.4	-167.01	10.0	-131.3	165.5	160.7	4.78	34.601	
1,500.0	1,496.0	1,490.2	1,489.7	2.8	2.6	-166.98	14.1	-134.5	187.8	182.7	5.11	36.730	

Cathedral Energy Services

Anticollision Report

Company:	Red Hawk Petroleum	Local Co-ordinate Reference:	Well LE GERKIN 16H
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 16H	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			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	-92.26	-3.6	-92.3	92.3					
100.0	100.0	100.0	100.0	0.1	0.1	-92.26	-3.6	-92.3	92.3	92.0	0.28	330.618		
200.0	200.0	200.0	200.0	0.3	0.3	-92.26	-3.6	-92.3	92.3	91.7	0.63	146.941		
300.0	300.0	300.0	300.0	0.5	0.5	-92.26	-3.6	-92.3	92.3	91.3	0.98	94.462		
400.0	400.0	400.0	400.0	0.7	0.7	-92.26	-3.6	-92.3	92.3	91.0	1.33	69.604		
500.0	500.0	500.0	500.0	0.8	0.8	-92.26	-3.6	-92.3	92.3	90.7	1.68	55.103		
600.0	600.0	600.0	600.0	1.0	1.0	-92.26	-3.6	-92.3	92.3	90.3	2.02	45.603		
700.0	700.0	700.0	700.0	1.2	1.2	-92.26	-3.6	-92.3	92.3	90.0	2.37	38.896		
800.0	800.0	800.0	800.0	1.4	1.4	-92.26	-3.6	-92.3	92.3	89.6	2.72	33.910		
900.0	900.0	900.0	900.0	1.5	1.5	-92.26	-3.6	-92.3	92.3	89.3	3.07	30.056 CC		
1,000.0	1,000.0	1,000.0	1,000.0	1.7	1.7	-92.26	-3.6	-92.3	92.3	88.9	3.42	26.989 ES		
1,100.0	1,100.0	1,102.4	1,102.3	1.9	1.9	-169.65	-1.7	-91.0	93.2	89.4	3.77	24.700		
1,200.0	1,199.7	1,202.5	1,202.4	2.1	2.1	-167.90	2.4	-88.3	96.9	92.7	4.12	23.511		
1,300.0	1,299.1	1,302.2	1,301.9	2.3	2.3	-166.81	6.6	-85.5	104.8	100.4	4.46	23.483 SF		
1,400.0	1,398.0	1,401.4	1,401.0	2.5	2.4	-166.36	10.7	-82.8	117.0	112.2	4.80	24.356		
1,500.0	1,496.0	1,500.1	1,499.5	2.8	2.6	-166.41	14.9	-80.1	133.4	128.3	5.14	25.948		
1,600.0	1,593.5	1,598.2	1,597.5	3.2	2.8	-166.78	19.0	-77.4	152.8	147.3	5.50	27.794		
1,700.0	1,690.9	1,696.2	1,695.5	3.5	3.0	-167.10	23.1	-74.8	172.3	166.5	5.86	29.395		
1,800.0	1,788.3	1,794.3	1,793.4	3.9	3.2	-167.35	27.2	-72.1	191.8	185.6	6.23	30.804		

Cathedral Energy Services

Anticollision Report

Company:	Red Hawk Petroleum	Local Co-ordinate Reference:	Well LE GERKIN 16H
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 16H	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					Separation Factor	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		
0.0	0.0	0.0	0.0	0.0	0.0	-93.39	-3.6	-61.5	61.6				
100.0	100.0	100.0	100.0	0.1	0.1	-93.39	-3.6	-61.5	61.6	61.3	0.28	220.626	
200.0	200.0	200.0	200.0	0.3	0.3	-93.39	-3.6	-61.5	61.6	61.0	0.63	98.056	
300.0	300.0	300.0	300.0	0.5	0.5	-93.39	-3.6	-61.5	61.6	60.6	0.98	63.036	
400.0	400.0	400.0	400.0	0.7	0.7	-93.39	-3.6	-61.5	61.6	60.3	1.33	46.448	
500.0	500.0	500.0	500.0	0.8	0.8	-93.39	-3.6	-61.5	61.6	59.9	1.68	36.771	
600.0	600.0	600.0	600.0	1.0	1.0	-93.39	-3.6	-61.5	61.6	59.6	2.02	30.431	
700.0	700.0	700.0	700.0	1.2	1.2	-93.39	-3.6	-61.5	61.6	59.2	2.37	25.956	
800.0	800.0	800.0	800.0	1.4	1.4	-93.39	-3.6	-61.5	61.6	58.9	2.72	22.628	
900.0	900.0	900.0	900.0	1.5	1.5	-93.39	-3.6	-61.5	61.6	58.5	3.07	20.057	
1,000.0	1,000.0	1,000.0	1,000.0	1.7	1.7	-93.39	-3.6	-61.5	61.6	58.2	3.42	18.010 CC	
1,100.0	1,100.0	1,102.5	1,102.5	1.9	1.9	-171.18	-2.6	-59.4	61.7	57.9	3.77	16.357	
1,200.0	1,199.7	1,205.1	1,204.8	2.1	2.1	-169.65	0.4	-53.3	62.0	57.9	4.12	15.047 ES	
1,300.0	1,299.1	1,305.6	1,304.8	2.3	2.3	-167.72	4.7	-44.4	63.8	59.4	4.47	14.290 SF	
1,400.0	1,398.0	1,405.4	1,404.1	2.5	2.5	-166.71	9.0	-35.5	69.9	65.1	4.81	14.521	
1,500.0	1,496.0	1,504.8	1,503.1	2.8	2.7	-166.60	13.3	-26.6	80.1	75.0	5.15	15.550	
1,600.0	1,593.5	1,604.0	1,601.7	3.2	2.9	-166.98	17.6	-17.8	93.4	87.9	5.51	16.945	
1,700.0	1,690.9	1,703.1	1,700.3	3.5	3.1	-167.30	21.9	-8.9	106.8	100.9	5.88	18.166	
1,800.0	1,788.3	1,802.1	1,798.9	3.9	3.4	-167.55	26.2	-0.1	120.2	114.0	6.25	19.240	
1,900.0	1,885.7	1,901.2	1,897.5	4.3	3.6	-167.75	30.5	8.8	133.7	127.0	6.62	20.191	
2,000.0	1,983.0	2,000.3	1,996.1	4.7	3.8	-167.91	34.8	17.6	147.1	140.1	6.99	21.040	
2,100.0	2,080.4	2,099.4	2,094.8	5.1	4.0	-168.05	39.1	26.5	160.5	153.1	7.36	21.801	
2,200.0	2,177.8	2,198.5	2,193.4	5.5	4.3	-168.16	43.4	35.3	173.9	166.2	7.73	22.488	
2,300.0	2,275.2	2,297.6	2,292.0	5.9	4.5	-168.26	47.7	44.2	187.3	179.2	8.11	23.111	

Cathedral Energy Services

Anticollision Report

Company:	Red Hawk Petroleum	Local Co-ordinate Reference:	Well LE GERKIN 16H
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 16H	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	Vertical Depth	Measured Depth	Vertical Depth	Reference	Offset	Highside Toolface	Offset Wellbore Centre		Between Centres	Between Ellipses	Total Uncertainty	Separation		
(usft)	(usft)	(usft)	(usft)	(usft)	(usft)	(°)	+N/-S (usft)	+E/-W (usft)	(usft)	(usft)	Axis	Factor		
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	1,101.3	1,101.3	1.9	1.9	-168.00	0.6	-28.6	30.8	27.0	3.77	8.160		
1,200.0	1,199.7	1,202.6	1,202.3	2.1	2.1	-167.05	2.5	-22.1	30.8	26.7	4.12	7.483		
1,300.0	1,299.1	1,303.9	1,303.0	2.3	2.3	-165.49	5.5	-11.4	30.9	26.4	4.46	6.921 ES		
1,400.0	1,398.0	1,404.7	1,402.7	2.5	2.5	-163.51	9.7	3.3	31.3	26.5	4.82	6.502 SF		
1,500.0	1,496.0	1,504.6	1,501.3	2.8	2.8	-163.25	14.2	18.7	35.1	29.9	5.17	6.787		
1,600.0	1,593.5	1,604.4	1,599.8	3.2	3.1	-164.30	18.6	34.0	41.8	36.3	5.53	7.558		
1,700.0	1,690.9	1,704.2	1,698.2	3.5	3.3	-165.10	23.0	49.4	48.7	42.8	5.91	8.247		
1,800.0	1,788.3	1,803.9	1,796.7	3.9	3.6	-165.70	27.4	64.8	55.6	49.3	6.28	8.854		
1,900.0	1,885.7	1,903.7	1,895.2	4.3	3.9	-166.17	31.8	80.2	62.5	55.8	6.65	9.393		
2,000.0	1,983.0	2,003.5	1,993.7	4.7	4.2	-166.55	36.2	95.6	69.4	62.4	7.03	9.875		
2,100.0	2,080.4	2,103.2	2,092.1	5.1	4.5	-166.86	40.6	110.9	76.3	68.9	7.40	10.307		
2,200.0	2,177.8	2,203.0	2,190.6	5.5	4.9	-167.11	45.0	126.3	83.2	75.4	7.78	10.698		
2,300.0	2,275.2	2,302.7	2,289.1	5.9	5.2	-167.33	49.4	141.7	90.1	82.0	8.15	11.053		
2,400.0	2,372.6	2,402.5	2,387.5	6.3	5.5	-167.52	53.9	157.1	97.0	88.5	8.53	11.377		
2,500.0	2,470.0	2,502.3	2,486.0	6.8	5.8	-167.68	58.3	172.5	103.9	95.0	8.90	11.673		
2,600.0	2,567.4	2,602.0	2,584.5	7.2	6.1	-167.82	62.7	187.9	110.8	101.5	9.28	11.945		
2,700.0	2,664.8	2,701.8	2,682.9	7.6	6.4	-167.95	67.1	203.2	117.7	108.1	9.65	12.196		
2,800.0	2,762.2	2,801.5	2,781.4	8.0	6.8	-168.06	71.5	218.6	124.6	114.6	10.03	12.428		
2,900.0	2,859.6	2,901.3	2,879.9	8.5	7.1	-168.16	75.9	234.0	131.5	121.1	10.40	12.643		
3,000.0	2,957.0	3,001.1	2,978.3	8.9	7.4	-168.25	80.3	249.4	138.5	127.7	10.78	12.843		
3,100.0	3,054.4	3,100.8	3,076.8	9.3	7.7	-168.33	84.7	264.8	145.4	134.2	11.16	13.030		
3,200.0	3,151.8	3,200.6	3,175.3	9.8	8.1	-168.40	89.1	280.1	152.3	140.7	11.53	13.204		
3,300.0	3,249.2	3,300.3	3,273.8	10.2	8.4	-168.47	93.6	295.5	159.2	147.3	11.91	13.367		
3,400.0	3,346.6	3,400.1	3,372.2	10.6	8.7	-168.53	98.0	310.9	166.1	153.8	12.28	13.521		
3,500.0	3,444.0	3,499.9	3,470.7	11.1	9.0	-168.59	102.4	326.3	173.0	160.3	12.66	13.665		
3,600.0	3,541.4	3,599.6	3,569.2	11.5	9.4	-168.64	106.8	341.7	179.9	166.9	13.04	13.800		
3,700.0	3,638.8	3,699.4	3,667.6	11.9	9.7	-168.69	111.2	357.1	186.8	173.4	13.41	13.929		
3,800.0	3,736.2	3,799.2	3,766.1	12.4	10.0	-168.74	115.6	372.4	193.7	179.9	13.79	14.050		

Cathedral Energy Services

Anticollision Report

Company:	Red Hawk Petroleum	Local Co-ordinate Reference:	Well LE GERKIN 16H
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 16H	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 16H
Coordinate System is US State Plane 1983, Colorado Northern Zone
Grid Convergence at Surface is: 0.65°

