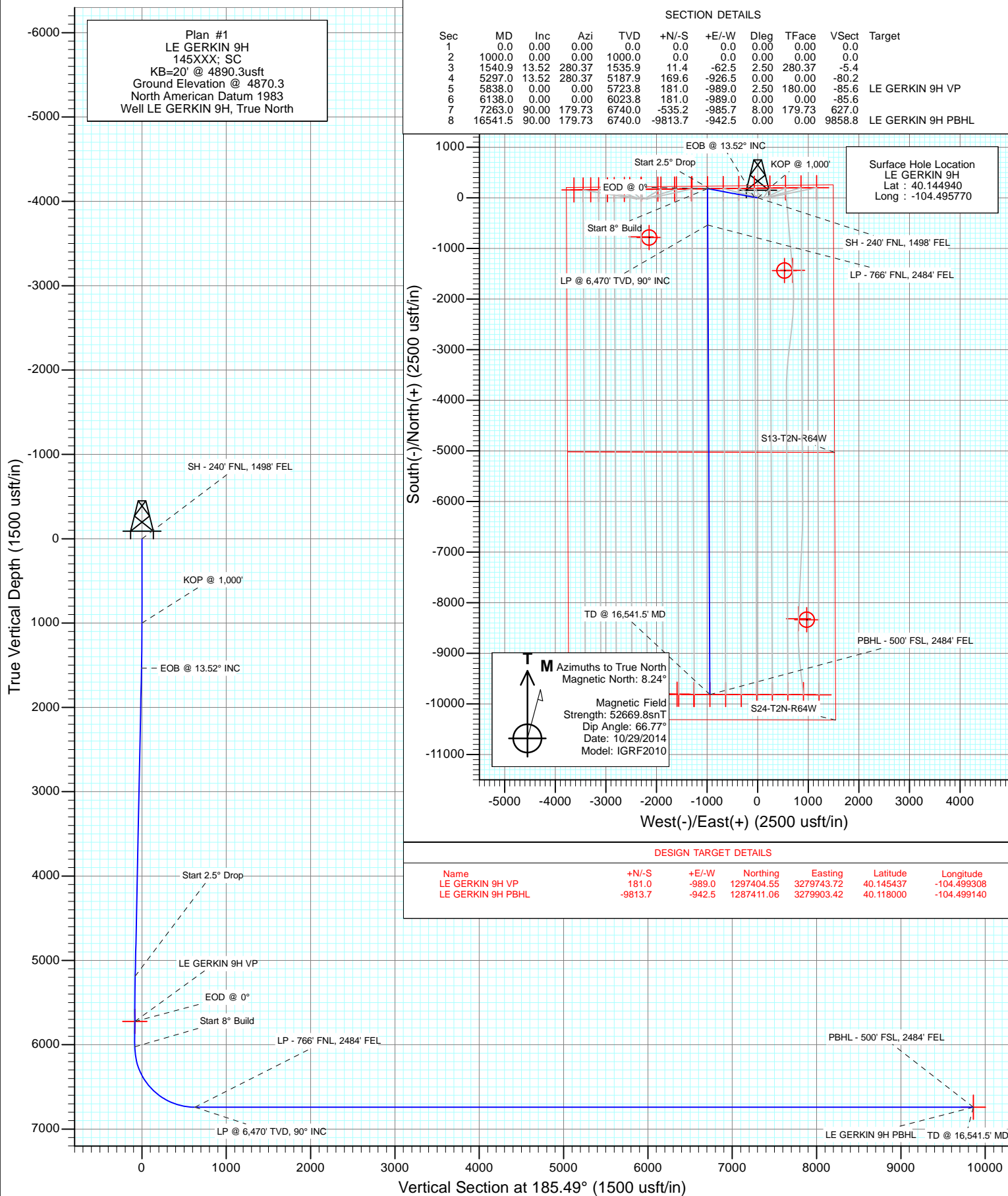
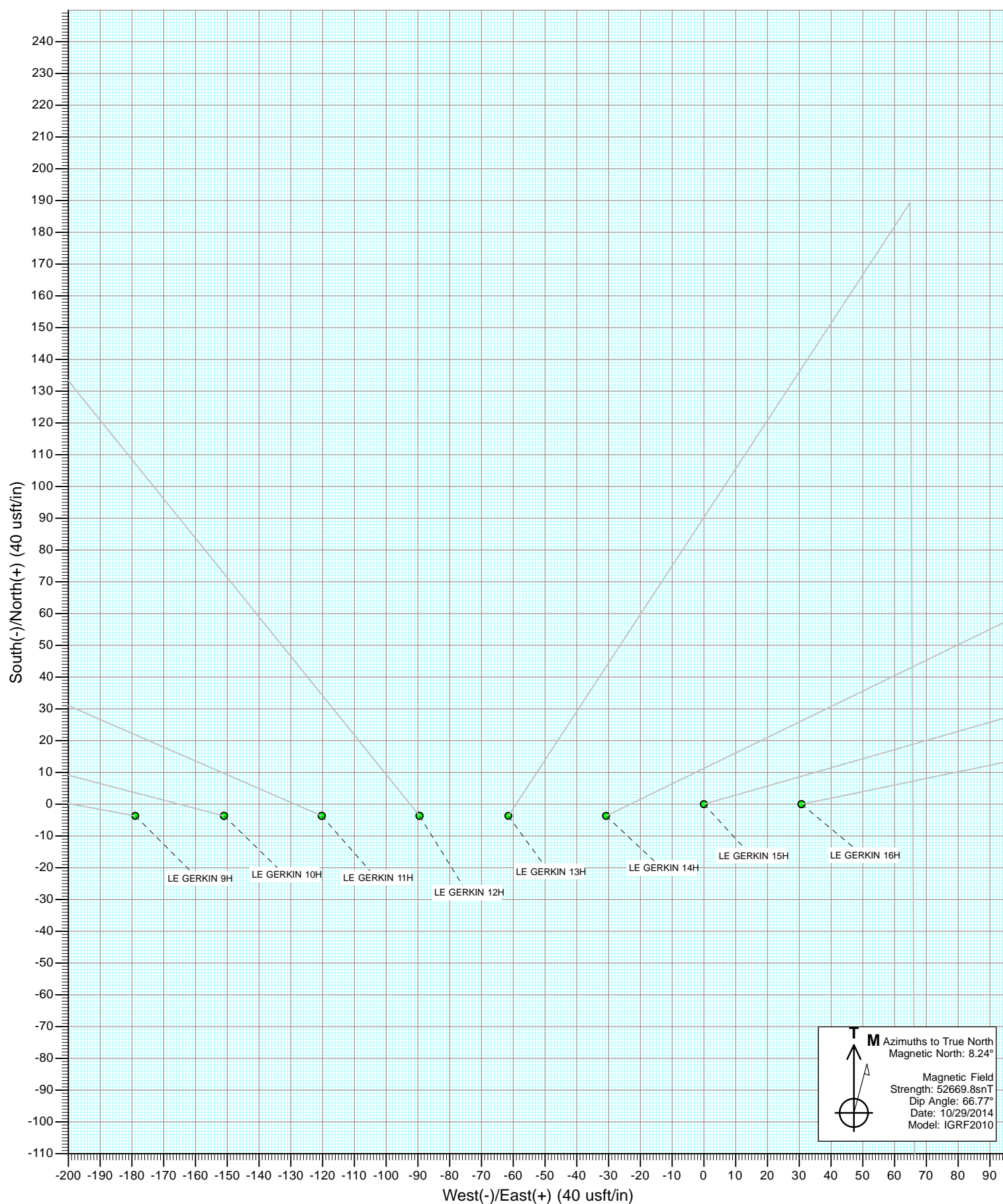
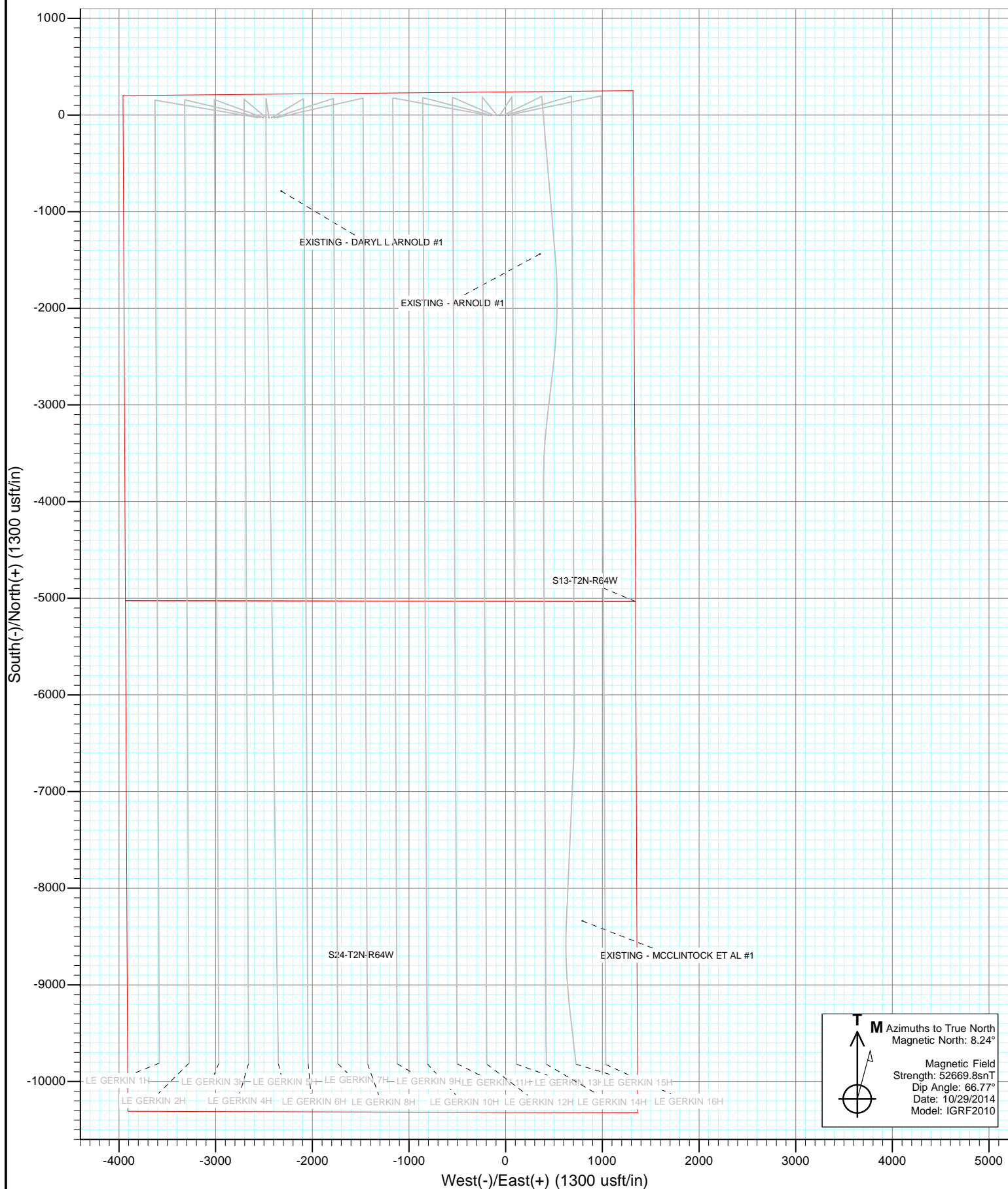




Project: Weld County, Colorado
Site: S13-T2N-R64W (LE GERKIN PADS)
Well: LE GERKIN 9H
Design: Plan #1







Cathedral Energy Services

Planning Report

Database:	USA EDM 5000 Multi Users DB	Local Co-ordinate Reference:	Well LE GERKIN 9H
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 9H	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 9H					
Well Position	+N/-S	0.0 usft	Northing:	1,297,234.76 usft	Latitude:	40.144940
	+E/-W	0.0 usft	Easting:	3,280,734.71 usft	Longitude:	-104.495770
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)	+N/-S	+E/-W	Direction
	(usft)	(usft)	(usft)	(°)
	0.0	0.0	0.0	185.49

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	
1,540.9	13.52	280.37	1,535.9	11.4	-62.5	2.50	2.50	0.00	280.37	
5,297.0	13.52	280.37	5,187.9	169.6	-926.5	0.00	0.00	0.00	0.00	
5,838.0	0.00	0.00	5,723.8	181.0	-989.0	2.50	-2.50	0.00	180.00	LE GERKIN 9H VP
6,138.0	0.00	0.00	6,023.8	181.0	-989.0	0.00	0.00	0.00	0.00	
7,263.0	90.00	179.73	6,740.0	-535.2	-985.7	8.00	8.00	15.98	179.73	
16,541.5	90.00	179.73	6,740.0	-9,813.7	-942.5	0.00	0.00	0.00	0.00	LE GERKIN 9H PBHL

Cathedral Energy Services

Planning Report

Database:	USA EDM 5000 Multi Users DB	Local Co-ordinate Reference:	Well LE GERKIN 9H
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 9H	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, 1498' 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	280.37	1,100.0	0.4	-2.1	-0.2	2.50	2.50	
1,200.0	5.00	280.37	1,199.7	1.6	-8.6	-0.7	2.50	2.50	
1,300.0	7.50	280.37	1,299.1	3.5	-19.3	-1.7	2.50	2.50	
1,400.0	10.00	280.37	1,398.0	6.3	-34.2	-3.0	2.50	2.50	
1,500.0	12.50	280.37	1,496.0	9.8	-53.4	-4.6	2.50	2.50	
1,540.9	13.52	280.37	1,535.9	11.4	-62.5	-5.4	2.50	2.50	EOB @ 13.52° INC
1,600.0	13.52	280.37	1,593.4	13.9	-76.1	-6.6	0.00	0.00	
1,700.0	13.52	280.37	1,690.6	18.1	-99.1	-8.6	0.00	0.00	
1,800.0	13.52	280.37	1,787.8	22.3	-122.1	-10.6	0.00	0.00	
1,900.0	13.52	280.37	1,885.0	26.6	-145.1	-12.6	0.00	0.00	
2,000.0	13.52	280.37	1,982.3	30.8	-168.1	-14.6	0.00	0.00	
2,100.0	13.52	280.37	2,079.5	35.0	-191.1	-16.5	0.00	0.00	
2,200.0	13.52	280.37	2,176.7	39.2	-214.1	-18.5	0.00	0.00	
2,300.0	13.52	280.37	2,273.9	43.4	-237.1	-20.5	0.00	0.00	
2,400.0	13.52	280.37	2,371.2	47.6	-260.1	-22.5	0.00	0.00	
2,500.0	13.52	280.37	2,468.4	51.8	-283.1	-24.5	0.00	0.00	
2,600.0	13.52	280.37	2,565.6	56.0	-306.1	-26.5	0.00	0.00	
2,700.0	13.52	280.37	2,662.9	60.2	-329.1	-28.5	0.00	0.00	
2,800.0	13.52	280.37	2,760.1	64.4	-352.1	-30.5	0.00	0.00	
2,900.0	13.52	280.37	2,857.3	68.7	-375.1	-32.5	0.00	0.00	
3,000.0	13.52	280.37	2,954.5	72.9	-398.1	-34.5	0.00	0.00	
3,100.0	13.52	280.37	3,051.8	77.1	-421.1	-36.5	0.00	0.00	
3,200.0	13.52	280.37	3,149.0	81.3	-444.1	-38.5	0.00	0.00	
3,300.0	13.52	280.37	3,246.2	85.5	-467.1	-40.4	0.00	0.00	
3,400.0	13.52	280.37	3,343.4	89.7	-490.1	-42.4	0.00	0.00	
3,500.0	13.52	280.37	3,440.7	93.9	-513.1	-44.4	0.00	0.00	
3,600.0	13.52	280.37	3,537.9	98.1	-536.1	-46.4	0.00	0.00	
3,700.0	13.52	280.37	3,635.1	102.3	-559.1	-48.4	0.00	0.00	
3,800.0	13.52	280.37	3,732.4	106.5	-582.1	-50.4	0.00	0.00	
3,900.0	13.52	280.37	3,829.6	110.7	-605.1	-52.4	0.00	0.00	
4,000.0	13.52	280.37	3,926.8	115.0	-628.1	-54.4	0.00	0.00	
4,100.0	13.52	280.37	4,024.0	119.2	-651.2	-56.4	0.00	0.00	
4,200.0	13.52	280.37	4,121.3	123.4	-674.2	-58.4	0.00	0.00	
4,300.0	13.52	280.37	4,218.5	127.6	-697.2	-60.4	0.00	0.00	
4,400.0	13.52	280.37	4,315.7	131.8	-720.2	-62.3	0.00	0.00	
4,500.0	13.52	280.37	4,412.9	136.0	-743.2	-64.3	0.00	0.00	
4,600.0	13.52	280.37	4,510.2	140.2	-766.2	-66.3	0.00	0.00	
4,700.0	13.52	280.37	4,607.4	144.4	-789.2	-68.3	0.00	0.00	
4,800.0	13.52	280.37	4,704.6	148.6	-812.2	-70.3	0.00	0.00	
4,900.0	13.52	280.37	4,801.9	152.8	-835.2	-72.3	0.00	0.00	

Cathedral Energy Services

Planning Report

Database:	USA EDM 5000 Multi Users DB	Local Co-ordinate Reference:	Well LE GERKIN 9H
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 9H	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	13.52	280.37	4,899.1	157.1	-858.2	-74.3	0.00	0.00	
5,100.0	13.52	280.37	4,996.3	161.3	-881.2	-76.3	0.00	0.00	
5,200.0	13.52	280.37	5,093.5	165.5	-904.2	-78.3	0.00	0.00	
5,297.0	13.52	280.37	5,187.9	169.6	-926.5	-80.2	0.00	0.00	Start 2.5° Drop
5,300.0	13.45	280.37	5,190.8	169.7	-927.2	-80.3	2.50	-2.50	
5,400.0	10.95	280.37	5,288.5	173.5	-948.0	-82.1	2.50	-2.50	
5,500.0	8.45	280.37	5,387.1	176.5	-964.5	-83.5	2.50	-2.50	
5,600.0	5.95	280.37	5,486.3	178.8	-976.9	-84.6	2.50	-2.50	
5,700.0	3.45	280.37	5,585.9	180.3	-984.9	-85.3	2.50	-2.50	
5,800.0	0.95	280.37	5,685.8	180.9	-988.7	-85.6	2.50	-2.50	
5,838.0	0.00	0.00	5,723.8	181.0	-989.0	-85.6	2.50	-2.50	EOD @ 0°
5,900.0	0.00	0.00	5,785.8	181.0	-989.0	-85.6	0.00	0.00	
6,000.0	0.00	0.00	5,885.8	181.0	-989.0	-85.6	0.00	0.00	
6,100.0	0.00	0.00	5,985.8	181.0	-989.0	-85.6	0.00	0.00	
6,138.0	0.00	0.00	6,023.8	181.0	-989.0	-85.6	0.00	0.00	Start 8° Build
6,150.0	0.96	179.73	6,035.8	180.9	-989.0	-85.5	8.00	8.00	
6,200.0	4.96	179.73	6,085.8	178.3	-989.0	-83.0	8.00	8.00	
6,250.0	8.96	179.73	6,135.4	172.3	-989.0	-76.9	8.00	8.00	
6,300.0	12.96	179.73	6,184.5	162.7	-988.9	-67.5	8.00	8.00	
6,350.0	16.96	179.73	6,232.8	149.8	-988.9	-54.6	8.00	8.00	
6,400.0	20.96	179.73	6,280.0	133.6	-988.8	-38.5	8.00	8.00	
6,450.0	24.96	179.73	6,326.1	114.1	-988.7	-19.1	8.00	8.00	
6,500.0	28.96	179.73	6,370.6	91.4	-988.6	3.5	8.00	8.00	
6,550.0	32.96	179.73	6,413.5	65.7	-988.5	29.1	8.00	8.00	
6,600.0	36.96	179.73	6,454.5	37.1	-988.3	57.6	8.00	8.00	
6,650.0	40.96	179.73	6,493.3	5.6	-988.2	88.9	8.00	8.00	
6,700.0	44.96	179.73	6,529.9	-28.4	-988.0	122.8	8.00	8.00	
6,750.0	48.96	179.73	6,564.0	-65.0	-987.9	159.1	8.00	8.00	
6,800.0	52.96	179.73	6,595.5	-103.8	-987.7	197.8	8.00	8.00	
6,850.0	56.96	179.73	6,624.2	-144.7	-987.5	238.5	8.00	8.00	
6,900.0	60.96	179.73	6,650.0	-187.6	-987.3	281.1	8.00	8.00	
6,950.0	64.96	179.73	6,672.7	-232.1	-987.1	325.4	8.00	8.00	
7,000.0	68.96	179.73	6,692.3	-278.1	-986.9	371.2	8.00	8.00	
7,050.0	72.96	179.73	6,708.6	-325.4	-986.6	418.2	8.00	8.00	
7,100.0	76.96	179.73	6,721.5	-373.6	-986.4	466.2	8.00	8.00	
7,150.0	80.96	179.73	6,731.1	-422.7	-986.2	515.0	8.00	8.00	
7,200.0	84.96	179.73	6,737.2	-472.3	-986.0	564.4	8.00	8.00	
7,250.0	88.96	179.73	6,739.9	-522.2	-985.7	614.1	8.00	8.00	
7,263.0	90.00	179.73	6,740.0	-535.2	-985.7	627.0	7.97	7.97	LP @ 6,470' TVD, 90° INC - LP - 766' FNL, 248
7,300.0	90.00	179.73	6,740.0	-572.2	-985.5	663.8	0.00	0.00	
7,400.0	90.00	179.73	6,740.0	-672.2	-985.0	763.3	0.00	0.00	
7,500.0	90.00	179.73	6,740.0	-772.2	-984.6	862.8	0.00	0.00	
7,600.0	90.00	179.73	6,740.0	-872.2	-984.1	962.3	0.00	0.00	
7,700.0	90.00	179.73	6,740.0	-972.2	-983.6	1,061.8	0.00	0.00	
7,800.0	90.00	179.73	6,740.0	-1,072.2	-983.2	1,161.3	0.00	0.00	
7,900.0	90.00	179.73	6,740.0	-1,172.2	-982.7	1,260.8	0.00	0.00	
8,000.0	90.00	179.73	6,740.0	-1,272.2	-982.2	1,360.3	0.00	0.00	
8,100.0	90.00	179.73	6,740.0	-1,372.2	-981.8	1,459.8	0.00	0.00	
8,200.0	90.00	179.73	6,740.0	-1,472.2	-981.3	1,559.3	0.00	0.00	
8,300.0	90.00	179.73	6,740.0	-1,572.2	-980.8	1,658.8	0.00	0.00	
8,400.0	90.00	179.73	6,740.0	-1,672.2	-980.4	1,758.3	0.00	0.00	
8,500.0	90.00	179.73	6,740.0	-1,772.2	-979.9	1,857.8	0.00	0.00	

Cathedral Energy Services

Planning Report

Database:	USA EDM 5000 Multi Users DB	Local Co-ordinate Reference:	Well LE GERKIN 9H
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 9H	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
8,600.0	90.00	179.73	6,740.0	-1,872.2	-979.4	1,957.3	0.00	0.00	
8,700.0	90.00	179.73	6,740.0	-1,972.2	-979.0	2,056.8	0.00	0.00	
8,800.0	90.00	179.73	6,740.0	-2,072.2	-978.5	2,156.3	0.00	0.00	
8,900.0	90.00	179.73	6,740.0	-2,172.2	-978.0	2,255.8	0.00	0.00	
9,000.0	90.00	179.73	6,740.0	-2,272.2	-977.6	2,355.3	0.00	0.00	
9,100.0	90.00	179.73	6,740.0	-2,372.2	-977.1	2,454.8	0.00	0.00	
9,200.0	90.00	179.73	6,740.0	-2,472.2	-976.7	2,554.3	0.00	0.00	
9,300.0	90.00	179.73	6,740.0	-2,572.2	-976.2	2,653.7	0.00	0.00	
9,400.0	90.00	179.73	6,740.0	-2,672.2	-975.7	2,753.2	0.00	0.00	
9,500.0	90.00	179.73	6,740.0	-2,772.2	-975.3	2,852.7	0.00	0.00	
9,600.0	90.00	179.73	6,740.0	-2,872.2	-974.8	2,952.2	0.00	0.00	
9,700.0	90.00	179.73	6,740.0	-2,972.2	-974.3	3,051.7	0.00	0.00	
9,800.0	90.00	179.73	6,740.0	-3,072.2	-973.9	3,151.2	0.00	0.00	
9,900.0	90.00	179.73	6,740.0	-3,172.2	-973.4	3,250.7	0.00	0.00	
10,000.0	90.00	179.73	6,740.0	-3,272.2	-972.9	3,350.2	0.00	0.00	
10,100.0	90.00	179.73	6,740.0	-3,372.2	-972.5	3,449.7	0.00	0.00	
10,200.0	90.00	179.73	6,740.0	-3,472.2	-972.0	3,549.2	0.00	0.00	
10,300.0	90.00	179.73	6,740.0	-3,572.2	-971.5	3,648.7	0.00	0.00	
10,400.0	90.00	179.73	6,740.0	-3,672.2	-971.1	3,748.2	0.00	0.00	
10,500.0	90.00	179.73	6,740.0	-3,772.2	-970.6	3,847.7	0.00	0.00	
10,600.0	90.00	179.73	6,740.0	-3,872.2	-970.1	3,947.2	0.00	0.00	
10,700.0	90.00	179.73	6,740.0	-3,972.2	-969.7	4,046.7	0.00	0.00	
10,800.0	90.00	179.73	6,740.0	-4,072.2	-969.2	4,146.2	0.00	0.00	
10,900.0	90.00	179.73	6,740.0	-4,172.2	-968.7	4,245.7	0.00	0.00	
11,000.0	90.00	179.73	6,740.0	-4,272.2	-968.3	4,345.2	0.00	0.00	
11,100.0	90.00	179.73	6,740.0	-4,372.2	-967.8	4,444.7	0.00	0.00	
11,200.0	90.00	179.73	6,740.0	-4,472.2	-967.3	4,544.2	0.00	0.00	
11,300.0	90.00	179.73	6,740.0	-4,572.2	-966.9	4,643.7	0.00	0.00	
11,400.0	90.00	179.73	6,740.0	-4,672.2	-966.4	4,743.2	0.00	0.00	
11,500.0	90.00	179.73	6,740.0	-4,772.2	-965.9	4,842.7	0.00	0.00	
11,600.0	90.00	179.73	6,740.0	-4,872.2	-965.5	4,942.2	0.00	0.00	
11,700.0	90.00	179.73	6,740.0	-4,972.2	-965.0	5,041.7	0.00	0.00	
11,800.0	90.00	179.73	6,740.0	-5,072.2	-964.6	5,141.2	0.00	0.00	
11,900.0	90.00	179.73	6,740.0	-5,172.2	-964.1	5,240.7	0.00	0.00	
12,000.0	90.00	179.73	6,740.0	-5,272.2	-963.6	5,340.2	0.00	0.00	
12,100.0	90.00	179.73	6,740.0	-5,372.2	-963.2	5,439.6	0.00	0.00	
12,200.0	90.00	179.73	6,740.0	-5,472.2	-962.7	5,539.1	0.00	0.00	
12,300.0	90.00	179.73	6,740.0	-5,572.2	-962.2	5,638.6	0.00	0.00	
12,400.0	90.00	179.73	6,740.0	-5,672.2	-961.8	5,738.1	0.00	0.00	
12,500.0	90.00	179.73	6,740.0	-5,772.2	-961.3	5,837.6	0.00	0.00	
12,600.0	90.00	179.73	6,740.0	-5,872.2	-960.8	5,937.1	0.00	0.00	
12,700.0	90.00	179.73	6,740.0	-5,972.2	-960.4	6,036.6	0.00	0.00	
12,800.0	90.00	179.73	6,740.0	-6,072.2	-959.9	6,136.1	0.00	0.00	
12,900.0	90.00	179.73	6,740.0	-6,172.2	-959.4	6,235.6	0.00	0.00	
13,000.0	90.00	179.73	6,740.0	-6,272.2	-959.0	6,335.1	0.00	0.00	
13,100.0	90.00	179.73	6,740.0	-6,372.2	-958.5	6,434.6	0.00	0.00	
13,200.0	90.00	179.73	6,740.0	-6,472.2	-958.0	6,534.1	0.00	0.00	
13,300.0	90.00	179.73	6,740.0	-6,572.2	-957.6	6,633.6	0.00	0.00	
13,400.0	90.00	179.73	6,740.0	-6,672.2	-957.1	6,733.1	0.00	0.00	
13,500.0	90.00	179.73	6,740.0	-6,772.2	-956.6	6,832.6	0.00	0.00	
13,600.0	90.00	179.73	6,740.0	-6,872.2	-956.2	6,932.1	0.00	0.00	
13,700.0	90.00	179.73	6,740.0	-6,972.2	-955.7	7,031.6	0.00	0.00	

Cathedral Energy Services

Planning Report

Database:	USA EDM 5000 Multi Users DB	Local Co-ordinate Reference:	Well LE GERKIN 9H
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 9H	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
13,800.0	90.00	179.73	6,740.0	-7,072.2	-955.2	7,131.1	0.00	0.00	
13,900.0	90.00	179.73	6,740.0	-7,172.2	-954.8	7,230.6	0.00	0.00	
14,000.0	90.00	179.73	6,740.0	-7,272.2	-954.3	7,330.1	0.00	0.00	
14,100.0	90.00	179.73	6,740.0	-7,372.2	-953.8	7,429.6	0.00	0.00	
14,200.0	90.00	179.73	6,740.0	-7,472.2	-953.4	7,529.1	0.00	0.00	
14,300.0	90.00	179.73	6,740.0	-7,572.2	-952.9	7,628.6	0.00	0.00	
14,400.0	90.00	179.73	6,740.0	-7,672.2	-952.5	7,728.1	0.00	0.00	
14,500.0	90.00	179.73	6,740.0	-7,772.2	-952.0	7,827.6	0.00	0.00	
14,600.0	90.00	179.73	6,740.0	-7,872.2	-951.5	7,927.1	0.00	0.00	
14,700.0	90.00	179.73	6,740.0	-7,972.2	-951.1	8,026.6	0.00	0.00	
14,800.0	90.00	179.73	6,740.0	-8,072.1	-950.6	8,126.1	0.00	0.00	
14,900.0	90.00	179.73	6,740.0	-8,172.1	-950.1	8,225.5	0.00	0.00	
15,000.0	90.00	179.73	6,740.0	-8,272.1	-949.7	8,325.0	0.00	0.00	
15,100.0	90.00	179.73	6,740.0	-8,372.1	-949.2	8,424.5	0.00	0.00	
15,200.0	90.00	179.73	6,740.0	-8,472.1	-948.7	8,524.0	0.00	0.00	
15,300.0	90.00	179.73	6,740.0	-8,572.1	-948.3	8,623.5	0.00	0.00	
15,400.0	90.00	179.73	6,740.0	-8,672.1	-947.8	8,723.0	0.00	0.00	
15,500.0	90.00	179.73	6,740.0	-8,772.1	-947.3	8,822.5	0.00	0.00	
15,600.0	90.00	179.73	6,740.0	-8,872.1	-946.9	8,922.0	0.00	0.00	
15,700.0	90.00	179.73	6,740.0	-8,972.1	-946.4	9,021.5	0.00	0.00	
15,800.0	90.00	179.73	6,740.0	-9,072.1	-945.9	9,121.0	0.00	0.00	
15,900.0	90.00	179.73	6,740.0	-9,172.1	-945.5	9,220.5	0.00	0.00	
16,000.0	90.00	179.73	6,740.0	-9,272.1	-945.0	9,320.0	0.00	0.00	
16,100.0	90.00	179.73	6,740.0	-9,372.1	-944.5	9,419.5	0.00	0.00	
16,200.0	90.00	179.73	6,740.0	-9,472.1	-944.1	9,519.0	0.00	0.00	
16,300.0	90.00	179.73	6,740.0	-9,572.1	-943.6	9,618.5	0.00	0.00	
16,400.0	90.00	179.73	6,740.0	-9,672.1	-943.1	9,718.0	0.00	0.00	
16,500.0	90.00	179.73	6,740.0	-9,772.1	-942.7	9,817.5	0.00	0.00	
16,541.5	90.00	179.73	6,740.0	-9,813.6	-942.5	9,858.8	0.00	0.00	PBHL - 500' FSL, 2484' FEL

Targets									
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
- hit/miss target									
- Shape									
LE GERKIN 9H VP - plan hits target center - Point	0.00	0.00	5,723.8	181.0	-989.0	1,297,404.55	3,279,743.72	40.145437	-104.499308
LE GERKIN 9H PBHL - plan hits target center - Point	0.00	0.00	6,740.0	-9,813.7	-942.5	1,287,411.06	3,279,903.42	40.118000	-104.499140

Cathedral Energy Services

Planning Report

Database:	USA EDM 5000 Multi Users DB	Local Co-ordinate Reference:	Well LE GERKIN 9H
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 9H	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, 1498' FEL
1,000.0	1,000.0	0.0	0.0	KOP @ 1,000'
1,540.9	1,535.9	11.4	-62.5	EOB @ 13.52° INC
5,297.0	5,187.9	169.6	-926.5	Start 2.5° Drop
5,838.0	5,723.8	181.0	-989.0	EOD @ 0°
6,138.0	6,023.8	181.0	-989.0	Start 8° Build
7,263.0	6,740.0	-535.2	-985.7	LP @ 6,470' TVD, 90° INC
7,263.0	6,740.0	-535.2	-985.7	LP - 766' FNL, 2484' FEL
16,541.5	6,740.0	-9,813.6	-942.5	PBHL - 500' FSL, 2484' FEL
16,541.5	6,740.0	-9,813.7	-942.5	TD @ 16,541.5' MD

Red Hawk Petroleum

Weld County, Colorado

S13-T2N-R64W (LE GERKIN PADS)

LE GERKIN 9H

HZ

Plan #1

Anticollision Report

30 October, 2014

Cathedral Energy Services

Anticollision Report

Company:	Red Hawk Petroleum	Local Co-ordinate Reference:	Well LE GERKIN 9H
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 9H	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	16,541.5	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
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	28.0	24.5	8.172	CC
LE GERKIN 10H - HZ - Plan #1	1,400.0	1,404.5	28.3	23.5	5.886	ES, SF
LE GERKIN 11H - HZ - Plan #1	1,000.0	1,000.0	58.7	55.3	17.162	CC
LE GERKIN 11H - HZ - Plan #1	1,200.0	1,204.8	59.1	55.0	14.346	ES
LE GERKIN 11H - HZ - Plan #1	1,300.0	1,305.5	60.6	56.2	13.566	SF
LE GERKIN 12H - HZ - Plan #1	1,000.0	1,000.0	89.5	86.0	26.151	CC, ES
LE GERKIN 12H - HZ - Plan #1	1,300.0	1,302.5	101.0	96.5	22.611	SF
LE GERKIN 13H - HZ - Plan #1	1,000.0	1,000.0	117.4	114.0	34.323	CC, ES
LE GERKIN 13H - HZ - Plan #1	1,200.0	1,196.2	129.9	125.8	31.631	SF
LE GERKIN 14H - HZ - Plan #1	1,000.0	1,000.0	148.2	144.7	43.313	CC, ES
LE GERKIN 14H - HZ - Plan #1	1,200.0	1,187.8	164.1	160.0	40.125	SF
LE GERKIN 15H - HZ - Plan #1	1,000.0	1,000.0	179.0	175.5	52.313	CC, ES
LE GERKIN 15H - HZ - Plan #1	1,200.0	1,184.7	195.3	191.2	47.821	SF
LE GERKIN 16H - HZ - Plan #1						Out of range
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

Cathedral Energy Services

Anticollision Report

Company:	Red Hawk Petroleum	Local Co-ordinate Reference:	Well LE GERKIN 9H
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 9H	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	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	1,101.2	1,101.2	1.9	1.9	169.29	0.6	25.8	28.0	24.2	3.77	7.418		
1,200.0	1,199.7	1,202.4	1,202.1	2.1	2.1	168.28	2.2	19.3	28.0	23.9	4.12	6.803		
1,300.0	1,299.1	1,303.6	1,302.7	2.3	2.3	166.60	5.1	8.5	28.1	23.6	4.46	6.293		
1,335.8	1,334.6	1,339.8	1,338.5	2.4	2.4	165.84	6.3	3.6	28.1	23.5	4.59	6.131		
1,400.0	1,398.0	1,404.5	1,402.4	2.5	2.5	164.35	8.9	-6.4	28.3	23.5	4.81	5.886 ES, SF		
1,500.0	1,496.0	1,504.4	1,500.9	2.8	2.8	163.67	13.1	-22.4	31.6	26.4	5.17	6.107		
1,600.0	1,593.4	1,604.2	1,599.3	3.2	3.1	164.68	17.3	-38.5	38.2	32.7	5.53	6.917		
1,700.0	1,690.6	1,703.9	1,697.7	3.5	3.4	165.52	21.5	-54.5	45.3	39.4	5.90	7.675		
1,800.0	1,787.8	1,803.7	1,796.1	3.9	3.7	166.13	25.6	-70.5	52.3	46.1	6.27	8.343		
1,900.0	1,885.0	1,903.4	1,894.4	4.3	4.0	166.60	29.8	-86.5	59.4	52.8	6.65	8.936		
2,000.0	1,982.3	2,003.2	1,992.8	4.7	4.3	166.97	34.0	-102.6	66.5	59.4	7.02	9.465		
2,100.0	2,079.5	2,102.9	2,091.2	5.2	4.6	167.27	38.1	-118.6	73.5	66.1	7.40	9.941		
2,200.0	2,176.7	2,202.7	2,189.5	5.6	4.9	167.51	42.3	-134.6	80.6	72.8	7.77	10.370		
2,300.0	2,273.9	2,302.4	2,287.9	6.0	5.2	167.72	46.5	-150.6	87.7	79.5	8.15	10.760		
2,400.0	2,371.2	2,402.2	2,386.3	6.4	5.6	167.89	50.6	-166.6	94.7	86.2	8.52	11.115		
2,500.0	2,468.4	2,501.9	2,484.6	6.9	5.9	168.04	54.8	-182.7	101.8	92.9	8.90	11.440		
2,600.0	2,565.6	2,601.7	2,583.0	7.3	6.2	168.18	59.0	-198.7	108.9	99.6	9.27	11.739		
2,700.0	2,662.9	2,701.4	2,681.4	7.7	6.5	168.29	63.2	-214.7	115.9	106.3	9.65	12.014		
2,800.0	2,760.1	2,801.2	2,779.7	8.2	6.9	168.39	67.3	-230.7	123.0	113.0	10.03	12.268		
2,900.0	2,857.3	2,900.9	2,878.1	8.6	7.2	168.48	71.5	-246.7	130.1	119.7	10.40	12.504		
3,000.0	2,954.5	3,000.7	2,976.5	9.1	7.5	168.57	75.7	-262.8	137.2	126.4	10.78	12.723		
3,100.0	3,051.8	3,100.4	3,074.8	9.5	7.9	168.64	79.8	-278.8	144.2	133.1	11.16	12.927		
3,200.0	3,149.0	3,200.2	3,173.2	10.0	8.2	168.71	84.0	-294.8	151.3	139.8	11.53	13.118		
3,300.0	3,246.2	3,299.9	3,271.6	10.4	8.5	168.77	88.2	-310.8	158.4	146.5	11.91	13.297		
3,400.0	3,343.4	3,399.7	3,369.9	10.8	8.9	168.82	92.3	-326.9	165.4	153.1	12.29	13.464		
3,500.0	3,440.7	3,499.4	3,468.3	11.3	9.2	168.87	96.5	-342.9	172.5	159.8	12.66	13.622		
3,600.0	3,537.9	3,599.2	3,566.7	11.7	9.5	168.92	100.7	-358.9	179.6	166.5	13.04	13.770		
3,700.0	3,635.1	3,698.9	3,665.0	12.2	9.9	168.96	104.8	-374.9	186.7	173.2	13.42	13.910		
3,800.0	3,732.4	3,798.7	3,763.4	12.6	10.2	169.00	109.0	-390.9	193.7	179.9	13.80	14.042		

Cathedral Energy Services

Anticollision Report

Company:	Red Hawk Petroleum	Local Co-ordinate Reference:	Well LE GERKIN 9H
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 9H	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		Highside Toolface (°)	Distance		Total Uncertainty Axis	Separation Factor	Warning			
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)						
0.0	0.0	0.0	0.0	0.0	0.0	90.00	0.0	58.7	58.7					
100.0	100.0	100.0	100.0	0.1	0.1	90.00	0.0	58.7	58.7	58.4	0.28	210.229		
200.0	200.0	200.0	200.0	0.3	0.3	90.00	0.0	58.7	58.7	58.1	0.63	93.435		
300.0	300.0	300.0	300.0	0.5	0.5	90.00	0.0	58.7	58.7	57.7	0.98	60.066		
400.0	400.0	400.0	400.0	0.7	0.7	90.00	0.0	58.7	58.7	57.4	1.33	44.259		
500.0	500.0	500.0	500.0	0.8	0.8	90.00	0.0	58.7	58.7	57.0	1.68	35.038		
600.0	600.0	600.0	600.0	1.0	1.0	90.00	0.0	58.7	58.7	56.7	2.02	28.997		
700.0	700.0	700.0	700.0	1.2	1.2	90.00	0.0	58.7	58.7	56.3	2.37	24.733		
800.0	800.0	800.0	800.0	1.4	1.4	90.00	0.0	58.7	58.7	56.0	2.72	21.562		
900.0	900.0	900.0	900.0	1.5	1.5	90.00	0.0	58.7	58.7	55.6	3.07	19.112		
1,000.0	1,000.0	1,000.0	1,000.0	1.7	1.7	90.00	0.0	58.7	58.7	55.3	3.42	17.162 CC		
1,100.0	1,100.0	1,102.4	1,102.4	1.9	1.9	169.13	0.9	56.6	58.8	55.0	3.77	15.589		
1,200.0	1,199.7	1,204.8	1,204.5	2.1	2.1	167.65	3.6	50.3	59.1	55.0	4.12	14.346 ES		
1,300.0	1,299.1	1,305.5	1,304.7	2.3	2.3	165.70	7.7	40.9	60.6	56.2	4.47	13.566 SF		
1,400.0	1,398.0	1,405.4	1,404.0	2.5	2.5	164.78	11.9	31.4	66.2	61.4	4.82	13.742		
1,500.0	1,496.0	1,504.9	1,503.0	2.8	2.7	164.87	16.0	21.9	75.9	70.8	5.16	14.714		
1,600.0	1,593.4	1,604.0	1,601.6	3.2	2.9	165.57	20.1	12.5	89.2	83.6	5.52	16.157		
1,700.0	1,690.6	1,703.1	1,700.1	3.5	3.2	166.15	24.2	3.0	102.7	96.9	5.89	17.451		
1,800.0	1,787.8	1,802.1	1,798.7	3.9	3.4	166.61	28.3	-6.4	116.3	110.1	6.26	18.590		
1,900.0	1,885.0	1,901.2	1,897.2	4.3	3.6	166.96	32.4	-15.9	129.9	123.3	6.63	19.601		
2,000.0	1,982.3	2,000.3	1,995.7	4.7	3.8	167.25	36.5	-25.3	143.5	136.5	7.00	20.504		
2,100.0	2,079.5	2,099.3	2,094.2	5.2	4.1	167.49	40.6	-34.8	157.1	149.8	7.37	21.314		
2,200.0	2,176.7	2,198.4	2,192.8	5.6	4.3	167.69	44.8	-44.2	170.7	163.0	7.74	22.046		
2,300.0	2,273.9	2,297.5	2,291.3	6.0	4.6	167.86	48.9	-53.7	184.3	176.2	8.12	22.710		
2,400.0	2,371.2	2,396.6	2,389.8	6.4	4.8	168.01	53.0	-63.1	197.9	189.5	8.49	23.315		

Cathedral Energy Services

Anticollision Report

Company:	Red Hawk Petroleum	Local Co-ordinate Reference:	Well LE GERKIN 9H
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 9H	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	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	1,102.5	1,102.5	1.9	1.9	168.75	1.8	88.0	90.2	86.4	3.77	23.909		
1,200.0	1,199.7	1,202.8	1,202.7	2.1	2.1	166.98	5.9	84.7	93.5	89.3	4.12	22.682		
1,300.0	1,299.1	1,302.5	1,302.2	2.3	2.3	165.91	10.0	81.4	101.0	96.5	4.46	22.611	SF	
1,400.0	1,398.0	1,401.8	1,401.4	2.5	2.4	165.52	14.1	78.1	112.7	107.9	4.81	23.441		
1,500.0	1,496.0	1,500.6	1,500.0	2.8	2.6	165.67	18.1	74.8	128.6	123.5	5.15	24.991		
1,600.0	1,593.4	1,598.7	1,597.9	3.2	2.8	166.16	22.2	71.6	148.0	142.5	5.50	26.911		
1,700.0	1,690.6	1,696.7	1,695.8	3.5	3.0	166.60	26.2	68.3	167.7	161.8	5.86	28.597		
1,800.0	1,787.8	1,794.7	1,793.7	3.9	3.2	166.95	30.3	65.0	187.4	181.2	6.23	30.082		

Cathedral Energy Services

Anticollision Report

Company:	Red Hawk Petroleum	Local Co-ordinate Reference:	Well LE GERKIN 9H
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 9H	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							
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	117.4	117.4				
100.0	100.0	100.0	100.0	0.1	0.1	90.00	0.0	117.4	117.4	117.1	0.28	420.459	
200.0	200.0	200.0	200.0	0.3	0.3	90.00	0.0	117.4	117.4	116.8	0.63	186.871	
300.0	300.0	300.0	300.0	0.5	0.5	90.00	0.0	117.4	117.4	116.4	0.98	120.131	
400.0	400.0	400.0	400.0	0.7	0.7	90.00	0.0	117.4	117.4	116.1	1.33	88.518	
500.0	500.0	500.0	500.0	0.8	0.8	90.00	0.0	117.4	117.4	115.7	1.68	70.077	
600.0	600.0	600.0	600.0	1.0	1.0	90.00	0.0	117.4	117.4	115.4	2.02	57.994	
700.0	700.0	700.0	700.0	1.2	1.2	90.00	0.0	117.4	117.4	115.0	2.37	49.466	
800.0	800.0	800.0	800.0	1.4	1.4	90.00	0.0	117.4	117.4	114.7	2.72	43.124	
900.0	900.0	900.0	900.0	1.5	1.5	90.00	0.0	117.4	117.4	114.3	3.07	38.224	
1,000.0	1,000.0	1,000.0	1,000.0	1.7	1.7	90.00	0.0	117.4	117.4	114.0	3.42	34.323 CC, ES	
1,100.0	1,100.0	1,097.1	1,097.1	1.9	1.9	168.98	1.7	118.5	120.7	117.0	3.76	32.077	
1,200.0	1,199.7	1,196.2	1,196.0	2.1	2.1	167.68	5.8	121.2	129.9	125.8	4.11	31.631 SF	
1,300.0	1,299.1	1,295.2	1,294.9	2.3	2.2	166.90	10.0	123.9	143.4	139.0	4.45	32.243	
1,400.0	1,398.0	1,393.6	1,393.2	2.5	2.4	166.59	14.1	126.6	161.1	156.3	4.78	33.675	
1,500.0	1,496.0	1,491.2	1,490.7	2.8	2.6	166.62	18.1	129.3	183.0	177.9	5.12	35.763	

Cathedral Energy Services

Anticollision Report

Company:	Red Hawk Petroleum	Local Co-ordinate Reference:	Well LE GERKIN 9H
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 9H	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							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	148.2	148.2								
100.0	100.0	100.0	100.0	0.1	0.1	90.00	0.0	148.2	148.2	147.9	0.28	530.579					
200.0	200.0	200.0	200.0	0.3	0.3	90.00	0.0	148.2	148.2	147.5	0.63	235.813					
300.0	300.0	300.0	300.0	0.5	0.5	90.00	0.0	148.2	148.2	147.2	0.98	151.594					
400.0	400.0	400.0	400.0	0.7	0.7	90.00	0.0	148.2	148.2	146.8	1.33	111.701					
500.0	500.0	500.0	500.0	0.8	0.8	90.00	0.0	148.2	148.2	146.5	1.68	88.430					
600.0	600.0	600.0	600.0	1.0	1.0	90.00	0.0	148.2	148.2	146.1	2.02	73.183					
700.0	700.0	700.0	700.0	1.2	1.2	90.00	0.0	148.2	148.2	145.8	2.37	62.421					
800.0	800.0	800.0	800.0	1.4	1.4	90.00	0.0	148.2	148.2	145.4	2.72	54.418					
900.0	900.0	900.0	900.0	1.5	1.5	90.00	0.0	148.2	148.2	145.1	3.07	48.235					
1,000.0	1,000.0	1,000.0	1,000.0	1.7	1.7	90.00	0.0	148.2	148.2	144.7	3.42	43.313 CC, ES					
1,100.0	1,100.0	1,094.4	1,094.3	1.9	1.9	169.43	0.8	149.9	152.2	148.4	3.76	40.490					
1,200.0	1,199.7	1,187.8	1,187.6	2.1	2.0	168.89	3.4	155.1	164.1	160.0	4.09	40.125 SF					
1,300.0	1,299.1	1,283.2	1,282.6	2.3	2.2	168.19	7.4	163.3	183.4	178.9	4.42	41.464					

Cathedral Energy Services

Anticollision Report

Company:	Red Hawk Petroleum	Local Co-ordinate Reference:	Well LE GERKIN 9H
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 9H	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							
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	88.83	3.6	178.9	179.0				
100.0	100.0	100.0	100.0	0.1	0.1	88.83	3.6	178.9	179.0	178.7	0.28	640.832	
200.0	200.0	200.0	200.0	0.3	0.3	88.83	3.6	178.9	179.0	178.3	0.63	284.814	
300.0	300.0	300.0	300.0	0.5	0.5	88.83	3.6	178.9	179.0	178.0	0.98	183.095	
400.0	400.0	400.0	400.0	0.7	0.7	88.83	3.6	178.9	179.0	177.6	1.33	134.912	
500.0	500.0	500.0	500.0	0.8	0.8	88.83	3.6	178.9	179.0	177.3	1.68	106.805	
600.0	600.0	600.0	600.0	1.0	1.0	88.83	3.6	178.9	179.0	176.9	2.02	88.391	
700.0	700.0	700.0	700.0	1.2	1.2	88.83	3.6	178.9	179.0	176.6	2.37	75.392	
800.0	800.0	800.0	800.0	1.4	1.4	88.83	3.6	178.9	179.0	176.2	2.72	65.726	
900.0	900.0	900.0	900.0	1.5	1.5	88.83	3.6	178.9	179.0	175.9	3.07	58.258	
1,000.0	1,000.0	1,000.0	1,000.0	1.7	1.7	88.83	3.6	178.9	179.0	175.5	3.42	52.313 CC, ES	
1,100.0	1,100.0	1,092.8	1,092.8	1.9	1.9	168.42	4.2	180.7	183.0	179.3	3.76	48.745	
1,200.0	1,199.7	1,184.7	1,184.5	2.1	2.0	168.29	5.7	186.1	195.3	191.2	4.08	47.821 SF	

Cathedral Energy Services

Anticollision Report

Company:	Red Hawk Petroleum	Local Co-ordinate Reference:	Well LE GERKIN 9H
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 9H	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 9H
Coordinate System is US State Plane 1983, Colorado Northern Zone
Grid Convergence at Surface is: 0.65°

