

ENSIGN

Directional

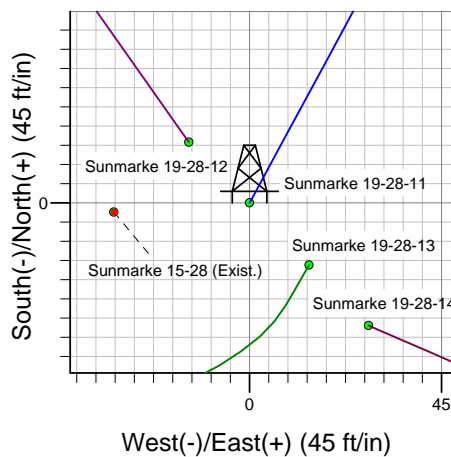
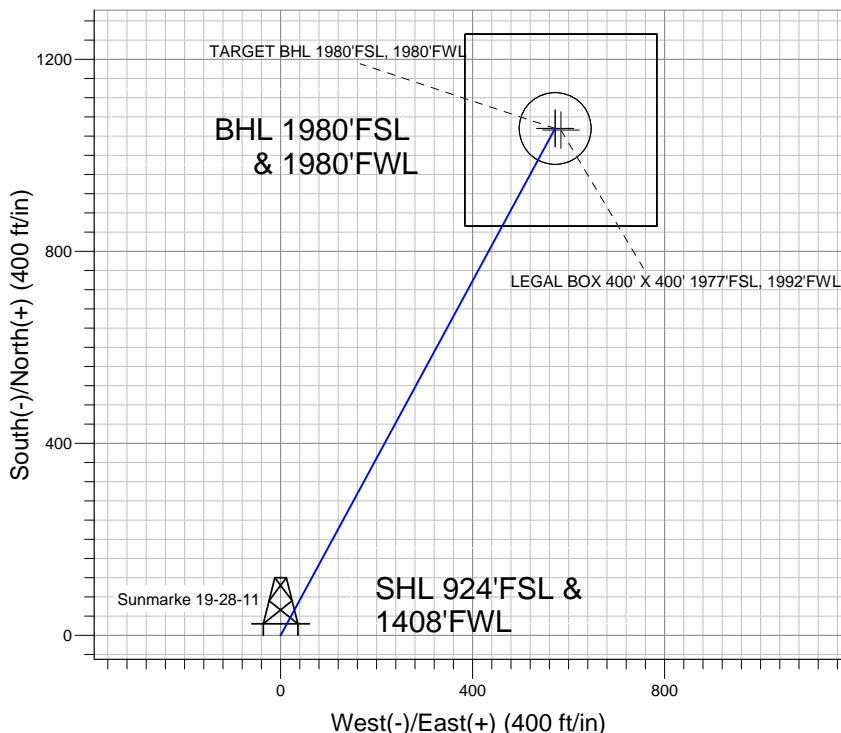
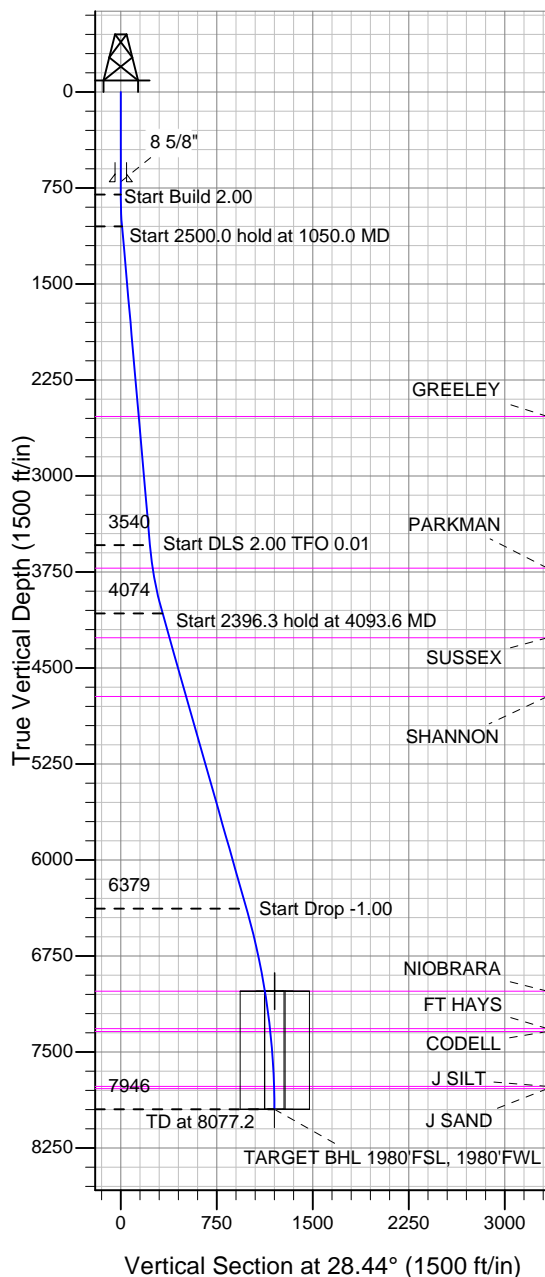
Well Name: Sunmarke 19-28-11

Surface Location: Sunmarke 19-28-11 Pad Sec.28-T4N-R67W
North American Datum 1983 , US State Plane 1983 , Colorado Northern Zone

Ground Elevation: 4975.0

+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Slot
0.0	0.0	1345122.22	3167375.90	40.279206	-104.900096	
Original Well Elev WELL @ 4989.0ft (Original Well Elev)						

KP KAUFFMAN



Sunmarke 19-28-11 Pad Sec.28-T4N-R67W
Sunmarke 19-28-11
Plan #1 (1-11-12)
15:55, January 12 2012



Azimuths to True North
Magnetic North: 8.85°
Magnetic Field
Strength: 52991.5snT
Dip Angle: 66.91°
Date: 1/11/2012
Model: IGRF2010

WELLBORE TARGET DETAILS (LAT/LONG)

Name	TVD	+N/-S	+E/-W	Latitude	Longitude	Shape
LEGAL BOX 400' X 400' 1977'FSL, 1992'FWL	7024.0	1053.0	584.0	40.282096	-104.898003	Rectangle (Sides: L400.0 W400.0)
TARGET CIRCLE 1980'FSL, 1980'FWL	7024.0	1056.0	572.0	40.282105	-104.898046	Circle (Radius: 75.0)
TARGET BHL 1980'FSL, 1980'FWL	7946.0	1056.0	572.0	40.282105	-104.898046	Point

SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	DLeg	TFace	VSec	Target
1	0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.0	
2	800.0	0.00	0.00	800.0	0.0	0.0	0.00	0.00	0.0	
3	1050.0	5.00	28.44	1049.7	9.6	5.2	2.00	28.44	10.9	
4	3550.0	5.00	28.44	3540.2	201.2	109.0	0.00	0.00	228.8	
5	4093.6	15.87	28.44	4074.0	287.6	155.8	2.00	0.01	327.1	
6	6489.9	15.87	28.44	6379.0	863.9	468.0	0.00	0.00	982.5	
7	8077.2	0.00	28.44	7946.0	1056.0	572.0	1.00	180.00	1201.0	TARGET BHL 1980'FSL, 1980'FWL



KP KAUFFMAN

SEC.28-T4N-R67W

Sunmarke 19-28-11 Pad Sec.28-T4N-R67W

Sunmarke 19-28-11

Wellbore #1

Plan: Plan #1 (1-11-12)

Standard Planning Report

12 January, 2012

Plan Sections										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	TFO (°)	Target
0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.00	0.00	
800.0	0.00	0.00	800.0	0.0	0.0	0.00	0.00	0.00	0.00	
1,050.0	5.00	28.44	1,049.7	9.6	5.2	2.00	2.00	0.00	28.44	
3,550.0	5.00	28.44	3,540.2	201.2	109.0	0.00	0.00	0.00	0.00	
4,093.6	15.87	28.44	4,074.0	287.6	155.8	2.00	2.00	0.00	0.01	
6,489.9	15.87	28.44	6,379.0	863.9	468.0	0.00	0.00	0.00	0.00	
8,077.2	0.00	28.44	7,946.0	1,056.0	572.0	1.00	-1.00	0.00	180.00	TARGET BHL 1980

Database:	Landmark	Local Co-ordinate Reference:	Well Sunmarke 19-28-11
Company:	KP KAUFFMAN	TVD Reference:	WELL @ 4989.0ft (Original Well Elev)
Project:	SEC.28-T4N-R67W	MD Reference:	WELL @ 4989.0ft (Original Well Elev)
Site:	Sunmarke 19-28-11 Pad Sec.28-T4N-R67W	North Reference:	True
Well:	Sunmarke 19-28-11	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 (1-11-12)		

Planned Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	0.00
40.0	0.00	0.00	40.0	0.0	0.0	0.0	0.00	0.00	0.00
80.0	0.00	0.00	80.0	0.0	0.0	0.0	0.00	0.00	0.00
120.0	0.00	0.00	120.0	0.0	0.0	0.0	0.00	0.00	0.00
160.0	0.00	0.00	160.0	0.0	0.0	0.0	0.00	0.00	0.00
200.0	0.00	0.00	200.0	0.0	0.0	0.0	0.00	0.00	0.00
240.0	0.00	0.00	240.0	0.0	0.0	0.0	0.00	0.00	0.00
280.0	0.00	0.00	280.0	0.0	0.0	0.0	0.00	0.00	0.00
320.0	0.00	0.00	320.0	0.0	0.0	0.0	0.00	0.00	0.00
360.0	0.00	0.00	360.0	0.0	0.0	0.0	0.00	0.00	0.00
400.0	0.00	0.00	400.0	0.0	0.0	0.0	0.00	0.00	0.00
440.0	0.00	0.00	440.0	0.0	0.0	0.0	0.00	0.00	0.00
480.0	0.00	0.00	480.0	0.0	0.0	0.0	0.00	0.00	0.00
520.0	0.00	0.00	520.0	0.0	0.0	0.0	0.00	0.00	0.00
560.0	0.00	0.00	560.0	0.0	0.0	0.0	0.00	0.00	0.00
600.0	0.00	0.00	600.0	0.0	0.0	0.0	0.00	0.00	0.00
640.0	0.00	0.00	640.0	0.0	0.0	0.0	0.00	0.00	0.00
680.0	0.00	0.00	680.0	0.0	0.0	0.0	0.00	0.00	0.00
700.0	0.00	0.00	700.0	0.0	0.0	0.0	0.00	0.00	0.00
8 5/8"									
720.0	0.00	0.00	720.0	0.0	0.0	0.0	0.00	0.00	0.00
760.0	0.00	0.00	760.0	0.0	0.0	0.0	0.00	0.00	0.00
800.0	0.00	0.00	800.0	0.0	0.0	0.0	0.00	0.00	0.00
840.0	0.80	28.44	840.0	0.2	0.1	0.3	2.00	2.00	0.00
880.0	1.60	28.44	880.0	1.0	0.5	1.1	2.00	2.00	0.00
920.0	2.40	28.44	920.0	2.2	1.2	2.5	2.00	2.00	0.00
960.0	3.20	28.44	959.9	3.9	2.1	4.5	2.00	2.00	0.00
1,000.0	4.00	28.44	999.8	6.1	3.3	7.0	2.00	2.00	0.00
1,040.0	4.80	28.44	1,039.7	8.8	4.8	10.0	2.00	2.00	0.00
1,050.0	5.00	28.44	1,049.7	9.6	5.2	10.9	2.00	2.00	0.00
1,080.0	5.00	28.44	1,079.6	11.9	6.4	13.5	0.00	0.00	0.00
1,120.0	5.00	28.44	1,119.4	15.0	8.1	17.0	0.00	0.00	0.00
1,160.0	5.00	28.44	1,159.3	18.0	9.8	20.5	0.00	0.00	0.00
1,200.0	5.00	28.44	1,199.1	21.1	11.4	24.0	0.00	0.00	0.00
1,240.0	5.00	28.44	1,239.0	24.1	13.1	27.5	0.00	0.00	0.00
1,280.0	5.00	28.44	1,278.8	27.2	14.7	30.9	0.00	0.00	0.00
1,320.0	5.00	28.44	1,318.7	30.3	16.4	34.4	0.00	0.00	0.00
1,360.0	5.00	28.44	1,358.5	33.3	18.1	37.9	0.00	0.00	0.00
1,400.0	5.00	28.44	1,398.4	36.4	19.7	41.4	0.00	0.00	0.00
1,440.0	5.00	28.44	1,438.2	39.5	21.4	44.9	0.00	0.00	0.00
1,480.0	5.00	28.44	1,478.0	42.5	23.0	48.4	0.00	0.00	0.00
1,520.0	5.00	28.44	1,517.9	45.6	24.7	51.9	0.00	0.00	0.00
1,560.0	5.00	28.44	1,557.7	48.7	26.4	55.4	0.00	0.00	0.00
1,600.0	5.00	28.44	1,597.6	51.7	28.0	58.8	0.00	0.00	0.00
1,640.0	5.00	28.44	1,637.4	54.8	29.7	62.3	0.00	0.00	0.00
1,680.0	5.00	28.44	1,677.3	57.9	31.3	65.8	0.00	0.00	0.00
1,720.0	5.00	28.44	1,717.1	60.9	33.0	69.3	0.00	0.00	0.00
1,760.0	5.00	28.44	1,757.0	64.0	34.7	72.8	0.00	0.00	0.00
1,800.0	5.00	28.44	1,796.8	67.1	36.3	76.3	0.00	0.00	0.00
1,840.0	5.00	28.44	1,836.7	70.1	38.0	79.8	0.00	0.00	0.00
1,880.0	5.00	28.44	1,876.5	73.2	39.6	83.2	0.00	0.00	0.00
1,920.0	5.00	28.44	1,916.4	76.3	41.3	86.7	0.00	0.00	0.00
1,960.0	5.00	28.44	1,956.2	79.3	43.0	90.2	0.00	0.00	0.00
2,000.0	5.00	28.44	1,996.1	82.4	44.6	93.7	0.00	0.00	0.00

Database:	Landmark	Local Co-ordinate Reference:	Well Sunmarke 19-28-11
Company:	KP KAUFFMAN	TVD Reference:	WELL @ 4989.0ft (Original Well Elev)
Project:	SEC.28-T4N-R67W	MD Reference:	WELL @ 4989.0ft (Original Well Elev)
Site:	Sunmarke 19-28-11 Pad Sec.28-T4N-R67W	North Reference:	True
Well:	Sunmarke 19-28-11	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 (1-11-12)		

Planned Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
2,040.0	5.00	28.44	2,035.9	85.5	46.3	97.2	0.00	0.00	0.00
2,080.0	5.00	28.44	2,075.8	88.5	47.9	100.7	0.00	0.00	0.00
2,120.0	5.00	28.44	2,115.6	91.6	49.6	104.2	0.00	0.00	0.00
2,160.0	5.00	28.44	2,155.5	94.7	51.3	107.6	0.00	0.00	0.00
2,200.0	5.00	28.44	2,195.3	97.7	52.9	111.1	0.00	0.00	0.00
2,240.0	5.00	28.44	2,235.2	100.8	54.6	114.6	0.00	0.00	0.00
2,280.0	5.00	28.44	2,275.0	103.8	56.2	118.1	0.00	0.00	0.00
2,320.0	5.00	28.44	2,314.9	106.9	57.9	121.6	0.00	0.00	0.00
2,360.0	5.00	28.44	2,354.7	110.0	59.6	125.1	0.00	0.00	0.00
2,400.0	5.00	28.44	2,394.5	113.0	61.2	128.6	0.00	0.00	0.00
2,440.0	5.00	28.44	2,434.4	116.1	62.9	132.0	0.00	0.00	0.00
2,480.0	5.00	28.44	2,474.2	119.2	64.5	135.5	0.00	0.00	0.00
2,520.0	5.00	28.44	2,514.1	122.2	66.2	139.0	0.00	0.00	0.00
2,541.0	5.00	28.44	2,535.0	123.9	67.1	140.8	0.00	0.00	0.00
GREELEY									
2,560.0	5.00	28.44	2,553.9	125.3	67.9	142.5	0.00	0.00	0.00
2,600.0	5.00	28.44	2,593.8	128.4	69.5	146.0	0.00	0.00	0.00
2,640.0	5.00	28.44	2,633.6	131.4	71.2	149.5	0.00	0.00	0.00
2,680.0	5.00	28.44	2,673.5	134.5	72.8	153.0	0.00	0.00	0.00
2,720.0	5.00	28.44	2,713.3	137.6	74.5	156.5	0.00	0.00	0.00
2,760.0	5.00	28.44	2,753.2	140.6	76.2	159.9	0.00	0.00	0.00
2,800.0	5.00	28.44	2,793.0	143.7	77.8	163.4	0.00	0.00	0.00
2,840.0	5.00	28.44	2,832.9	146.8	79.5	166.9	0.00	0.00	0.00
2,880.0	5.00	28.44	2,872.7	149.8	81.1	170.4	0.00	0.00	0.00
2,920.0	5.00	28.44	2,912.6	152.9	82.8	173.9	0.00	0.00	0.00
2,960.0	5.00	28.44	2,952.4	156.0	84.5	177.4	0.00	0.00	0.00
3,000.0	5.00	28.44	2,992.3	159.0	86.1	180.9	0.00	0.00	0.00
3,040.0	5.00	28.44	3,032.1	162.1	87.8	184.3	0.00	0.00	0.00
3,080.0	5.00	28.44	3,072.0	165.2	89.5	187.8	0.00	0.00	0.00
3,120.0	5.00	28.44	3,111.8	168.2	91.1	191.3	0.00	0.00	0.00
3,160.0	5.00	28.44	3,151.7	171.3	92.8	194.8	0.00	0.00	0.00
3,200.0	5.00	28.44	3,191.5	174.4	94.4	198.3	0.00	0.00	0.00
3,240.0	5.00	28.44	3,231.3	177.4	96.1	201.8	0.00	0.00	0.00
3,280.0	5.00	28.44	3,271.2	180.5	97.8	205.3	0.00	0.00	0.00
3,320.0	5.00	28.44	3,311.0	183.6	99.4	208.7	0.00	0.00	0.00
3,360.0	5.00	28.44	3,350.9	186.6	101.1	212.2	0.00	0.00	0.00
3,400.0	5.00	28.44	3,390.7	189.7	102.7	215.7	0.00	0.00	0.00
3,440.0	5.00	28.44	3,430.6	192.7	104.4	219.2	0.00	0.00	0.00
3,480.0	5.00	28.44	3,470.4	195.8	106.1	222.7	0.00	0.00	0.00
3,520.0	5.00	28.44	3,510.3	198.9	107.7	226.2	0.00	0.00	0.00
3,550.0	5.00	28.44	3,540.2	201.2	109.0	228.8	0.00	0.00	0.00
3,560.0	5.20	28.44	3,550.1	202.0	109.4	229.7	2.00	2.00	0.00
3,600.0	6.00	28.44	3,589.9	205.4	111.2	233.6	2.00	2.00	0.00
3,640.0	6.80	28.44	3,629.7	209.3	113.4	238.0	2.00	2.00	0.00
3,680.0	7.60	28.44	3,669.4	213.7	115.8	243.1	2.00	2.00	0.00
3,720.0	8.40	28.44	3,709.0	218.6	118.4	248.6	2.00	2.00	0.00
3,731.1	8.62	28.44	3,720.0	220.1	119.2	250.3	2.00	2.00	0.00
PARKMAN									
3,760.0	9.20	28.44	3,748.5	224.0	121.3	254.7	2.00	2.00	0.00
3,800.0	10.00	28.44	3,788.0	229.9	124.5	261.4	2.00	2.00	0.00
3,840.0	10.80	28.44	3,827.3	236.2	127.9	268.6	2.00	2.00	0.00
3,880.0	11.60	28.44	3,866.5	243.0	131.6	276.4	2.00	2.00	0.00
3,920.0	12.40	28.44	3,905.7	250.4	135.6	284.7	2.00	2.00	0.00
3,960.0	13.20	28.44	3,944.7	258.1	139.8	293.6	2.00	2.00	0.00

Database:	Landmark	Local Co-ordinate Reference:	Well Sunmarke 19-28-11
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Project:	SEC.28-T4N-R67W	MD Reference:	WELL @ 4989.0ft (Original Well Elev)
Site:	Sunmarke 19-28-11 Pad Sec.28-T4N-R67W	North Reference:	True
Well:	Sunmarke 19-28-11	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 (1-11-12)		

Planned Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
4,000.0	14.00	28.44	3,983.5	266.4	144.3	303.0	2.00	2.00	0.00
4,040.0	14.80	28.44	4,022.3	275.2	149.0	312.9	2.00	2.00	0.00
4,080.0	15.60	28.44	4,060.9	284.4	154.0	323.4	2.00	2.00	0.00
4,093.6	15.87	28.44	4,074.0	287.6	155.8	327.1	2.00	2.00	0.00
4,120.0	15.87	28.44	4,099.4	294.0	159.2	334.3	0.00	0.00	0.00
4,160.0	15.87	28.44	4,137.8	303.6	164.4	345.3	0.00	0.00	0.00
4,200.0	15.87	28.44	4,176.3	313.2	169.6	356.2	0.00	0.00	0.00
4,240.0	15.87	28.44	4,214.8	322.8	174.9	367.1	0.00	0.00	0.00
4,280.0	15.87	28.44	4,253.3	332.5	180.1	378.1	0.00	0.00	0.00
4,290.1	15.87	28.44	4,263.0	334.9	181.4	380.9	0.00	0.00	0.00
SUSSEX									
4,320.0	15.87	28.44	4,291.7	342.1	185.3	389.0	0.00	0.00	0.00
4,360.0	15.87	28.44	4,330.2	351.7	190.5	400.0	0.00	0.00	0.00
4,400.0	15.87	28.44	4,368.7	361.3	195.7	410.9	0.00	0.00	0.00
4,440.0	15.87	28.44	4,407.2	370.9	200.9	421.8	0.00	0.00	0.00
4,480.0	15.87	28.44	4,445.6	380.6	206.1	432.8	0.00	0.00	0.00
4,520.0	15.87	28.44	4,484.1	390.2	211.3	443.7	0.00	0.00	0.00
4,560.0	15.87	28.44	4,522.6	399.8	216.5	454.7	0.00	0.00	0.00
4,600.0	15.87	28.44	4,561.1	409.4	221.8	465.6	0.00	0.00	0.00
4,640.0	15.87	28.44	4,599.5	419.0	227.0	476.5	0.00	0.00	0.00
4,680.0	15.87	28.44	4,638.0	428.6	232.2	487.5	0.00	0.00	0.00
4,720.0	15.87	28.44	4,676.5	438.3	237.4	498.4	0.00	0.00	0.00
4,760.0	15.87	28.44	4,715.0	447.9	242.6	509.4	0.00	0.00	0.00
4,767.3	15.87	28.44	4,722.0	449.6	243.5	511.4	0.00	0.00	0.00
SHANNON									
4,800.0	15.87	28.44	4,753.4	457.5	247.8	520.3	0.00	0.00	0.00
4,840.0	15.87	28.44	4,791.9	467.1	253.0	531.2	0.00	0.00	0.00
4,880.0	15.87	28.44	4,830.4	476.7	258.2	542.2	0.00	0.00	0.00
4,920.0	15.87	28.44	4,868.9	486.4	263.4	553.1	0.00	0.00	0.00
4,960.0	15.87	28.44	4,907.3	496.0	268.7	564.1	0.00	0.00	0.00
5,000.0	15.87	28.44	4,945.8	505.6	273.9	575.0	0.00	0.00	0.00
5,040.0	15.87	28.44	4,984.3	515.2	279.1	585.9	0.00	0.00	0.00
5,080.0	15.87	28.44	5,022.8	524.8	284.3	596.9	0.00	0.00	0.00
5,120.0	15.87	28.44	5,061.2	534.5	289.5	607.8	0.00	0.00	0.00
5,160.0	15.87	28.44	5,099.7	544.1	294.7	618.8	0.00	0.00	0.00
5,200.0	15.87	28.44	5,138.2	553.7	299.9	629.7	0.00	0.00	0.00
5,240.0	15.87	28.44	5,176.7	563.3	305.1	640.6	0.00	0.00	0.00
5,280.0	15.87	28.44	5,215.1	572.9	310.3	651.6	0.00	0.00	0.00
5,320.0	15.87	28.44	5,253.6	582.6	315.5	662.5	0.00	0.00	0.00
5,360.0	15.87	28.44	5,292.1	592.2	320.8	673.5	0.00	0.00	0.00
5,400.0	15.87	28.44	5,330.6	601.8	326.0	684.4	0.00	0.00	0.00
5,440.0	15.87	28.44	5,369.0	611.4	331.2	695.3	0.00	0.00	0.00
5,480.0	15.87	28.44	5,407.5	621.0	336.4	706.3	0.00	0.00	0.00
5,520.0	15.87	28.44	5,446.0	630.7	341.6	717.2	0.00	0.00	0.00
5,560.0	15.87	28.44	5,484.5	640.3	346.8	728.2	0.00	0.00	0.00
5,600.0	15.87	28.44	5,522.9	649.9	352.0	739.1	0.00	0.00	0.00
5,640.0	15.87	28.44	5,561.4	659.5	357.2	750.0	0.00	0.00	0.00
5,680.0	15.87	28.44	5,599.9	669.1	362.4	761.0	0.00	0.00	0.00
5,720.0	15.87	28.44	5,638.4	678.8	367.7	771.9	0.00	0.00	0.00
5,760.0	15.87	28.44	5,676.8	688.4	372.9	782.9	0.00	0.00	0.00
5,800.0	15.87	28.44	5,715.3	698.0	378.1	793.8	0.00	0.00	0.00
5,840.0	15.87	28.44	5,753.8	707.6	383.3	804.7	0.00	0.00	0.00
5,880.0	15.87	28.44	5,792.3	717.2	388.5	815.7	0.00	0.00	0.00

Database:	Landmark	Local Co-ordinate Reference:	Well Sunmarke 19-28-11
Company:	KP KAUFFMAN	TVD Reference:	WELL @ 4989.0ft (Original Well Elev)
Project:	SEC.28-T4N-R67W	MD Reference:	WELL @ 4989.0ft (Original Well Elev)
Site:	Sunmarke 19-28-11 Pad Sec.28-T4N-R67W	North Reference:	True
Well:	Sunmarke 19-28-11	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 (1-11-12)		

Planned Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
5,920.0	15.87	28.44	5,830.7	726.8	393.7	826.6	0.00	0.00	0.00
5,960.0	15.87	28.44	5,869.2	736.5	398.9	837.6	0.00	0.00	0.00
6,000.0	15.87	28.44	5,907.7	746.1	404.1	848.5	0.00	0.00	0.00
6,040.0	15.87	28.44	5,946.2	755.7	409.3	859.4	0.00	0.00	0.00
6,080.0	15.87	28.44	5,984.6	765.3	414.6	870.4	0.00	0.00	0.00
6,120.0	15.87	28.44	6,023.1	774.9	419.8	881.3	0.00	0.00	0.00
6,160.0	15.87	28.44	6,061.6	784.6	425.0	892.3	0.00	0.00	0.00
6,200.0	15.87	28.44	6,100.1	794.2	430.2	903.2	0.00	0.00	0.00
6,240.0	15.87	28.44	6,138.5	803.8	435.4	914.1	0.00	0.00	0.00
6,280.0	15.87	28.44	6,177.0	813.4	440.6	925.1	0.00	0.00	0.00
6,320.0	15.87	28.44	6,215.5	823.0	445.8	936.0	0.00	0.00	0.00
6,360.0	15.87	28.44	6,254.0	832.7	451.0	947.0	0.00	0.00	0.00
6,400.0	15.87	28.44	6,292.4	842.3	456.2	957.9	0.00	0.00	0.00
6,440.0	15.87	28.44	6,330.9	851.9	461.4	968.8	0.00	0.00	0.00
6,480.0	15.87	28.44	6,369.4	861.5	466.7	979.8	0.00	0.00	0.00
6,489.9	15.87	28.44	6,379.0	863.9	468.0	982.5	0.00	0.00	0.00
6,520.0	15.57	28.44	6,407.9	871.1	471.8	990.7	1.00	-1.00	0.00
6,560.0	15.17	28.44	6,446.5	880.4	476.9	1,001.3	1.00	-1.00	0.00
6,600.0	14.77	28.44	6,485.1	889.5	481.8	1,011.6	1.00	-1.00	0.00
6,640.0	14.37	28.44	6,523.8	898.3	486.6	1,021.7	1.00	-1.00	0.00
6,680.0	13.97	28.44	6,562.6	906.9	491.3	1,031.4	1.00	-1.00	0.00
6,720.0	13.57	28.44	6,601.4	915.3	495.8	1,041.0	1.00	-1.00	0.00
6,760.0	13.17	28.44	6,640.4	923.5	500.2	1,050.2	1.00	-1.00	0.00
6,800.0	12.77	28.44	6,679.3	931.3	504.5	1,059.2	1.00	-1.00	0.00
6,840.0	12.37	28.44	6,718.4	939.0	508.6	1,067.9	1.00	-1.00	0.00
6,880.0	11.97	28.44	6,757.5	946.4	512.6	1,076.3	1.00	-1.00	0.00
6,920.0	11.57	28.44	6,796.6	953.6	516.5	1,084.5	1.00	-1.00	0.00
6,960.0	11.17	28.44	6,835.8	960.5	520.3	1,092.4	1.00	-1.00	0.00
7,000.0	10.77	28.44	6,875.1	967.2	523.9	1,100.0	1.00	-1.00	0.00
7,040.0	10.37	28.44	6,914.4	973.7	527.4	1,107.3	1.00	-1.00	0.00
7,080.0	9.97	28.44	6,953.8	979.9	530.8	1,114.4	1.00	-1.00	0.00
7,120.0	9.57	28.44	6,993.2	985.9	534.0	1,121.2	1.00	-1.00	0.00
7,151.2	9.26	28.44	7,024.0	990.3	536.4	1,126.3	1.00	-1.00	0.00
NIORARA									
7,160.0	9.17	28.44	7,032.7	991.6	537.1	1,127.7	1.00	-1.00	0.00
7,162.8	9.14	28.44	7,035.5	992.0	537.3	1,128.2	1.00	-1.00	0.00
TARGET CIRCLE 1980'FSL, 1980'FWL									
7,163.3	9.14	28.44	7,036.0	992.0	537.4	1,128.2	1.00	-1.00	0.00
LEGAL BOX 400' X 400' 1977'FSL, 1992'FWL									
7,200.0	8.77	28.44	7,072.2	997.1	540.1	1,133.9	1.00	-1.00	0.00
7,240.0	8.37	28.44	7,111.8	1,002.3	542.9	1,139.9	1.00	-1.00	0.00
7,280.0	7.97	28.44	7,151.4	1,007.3	545.6	1,145.6	1.00	-1.00	0.00
7,320.0	7.57	28.44	7,191.0	1,012.1	548.2	1,151.0	1.00	-1.00	0.00
7,360.0	7.17	28.44	7,230.7	1,016.6	550.7	1,156.1	1.00	-1.00	0.00
7,400.0	6.77	28.44	7,270.4	1,020.8	553.0	1,161.0	1.00	-1.00	0.00
7,440.0	6.37	28.44	7,310.1	1,024.9	555.1	1,165.6	1.00	-1.00	0.00
7,445.9	6.31	28.44	7,316.0	1,025.5	555.5	1,166.2	1.00	-1.00	0.00
FT HAYS									
7,469.1	6.08	28.44	7,339.0	1,027.6	556.6	1,168.7	1.00	-1.00	0.00
CODELL									
7,480.0	5.97	28.44	7,349.9	1,028.7	557.2	1,169.9	1.00	-1.00	0.00
7,520.0	5.57	28.44	7,389.7	1,032.2	559.1	1,173.9	1.00	-1.00	0.00
7,560.0	5.17	28.44	7,429.5	1,035.5	560.9	1,177.6	1.00	-1.00	0.00
7,600.0	4.77	28.44	7,469.3	1,038.5	562.5	1,181.1	1.00	-1.00	0.00

Database:	Landmark	Local Co-ordinate Reference:	Well Sunmarke 19-28-11
Company:	KP KAUFFMAN	TVD Reference:	WELL @ 4989.0ft (Original Well Elev)
Project:	SEC.28-T4N-R67W	MD Reference:	WELL @ 4989.0ft (Original Well Elev)
Site:	Sunmarke 19-28-11 Pad Sec.28-T4N-R67W	North Reference:	True
Well:	Sunmarke 19-28-11	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 (1-11-12)		

Planned Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
7,640.0	4.37	28.44	7,509.2	1,041.3	564.1	1,184.3	1.00	-1.00	0.00
7,680.0	3.97	28.44	7,549.1	1,043.9	565.4	1,187.2	1.00	-1.00	0.00
7,720.0	3.57	28.44	7,589.0	1,046.2	566.7	1,189.8	1.00	-1.00	0.00
7,760.0	3.17	28.44	7,628.9	1,048.3	567.8	1,192.2	1.00	-1.00	0.00
7,800.0	2.77	28.44	7,668.9	1,050.1	568.8	1,194.3	1.00	-1.00	0.00
7,840.0	2.37	28.44	7,708.9	1,051.7	569.7	1,196.1	1.00	-1.00	0.00
7,880.0	1.97	28.44	7,748.8	1,053.0	570.4	1,197.6	1.00	-1.00	0.00
7,899.2	1.78	28.44	7,768.0	1,053.6	570.7	1,198.2	1.00	-1.00	0.00
J SILT									
7,917.2	1.60	28.44	7,786.0	1,054.0	570.9	1,198.7	1.00	-1.00	0.00
J SAND									
7,920.0	1.57	28.44	7,788.8	1,054.1	571.0	1,198.8	1.00	-1.00	0.00
7,960.0	1.17	28.44	7,828.8	1,054.9	571.4	1,199.8	1.00	-1.00	0.00
8,000.0	0.77	28.44	7,868.8	1,055.5	571.8	1,200.4	1.00	-1.00	0.00
8,040.0	0.37	28.44	7,908.8	1,055.9	571.9	1,200.8	1.00	-1.00	0.00
8,077.2	0.00	28.44	7,946.0	1,056.0	572.0	1,201.0	1.00	-1.00	0.00
TARGET BHL 1980'FSL, 1980'FWL									

Targets									
Target Name	- hit/miss target	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (ft)	Easting (ft)	Latitude Longitude
TARGET BHL 1980'F:	- plan hits target center	0.00	0.00	7,946.0	1,056.0	572.0	1,346,182.02	3,167,940.72	40.282105 -104.898046
	- Point								
TARGET CIRCLE 198	- plan misses target center by 73.7ft at 7163.1ft MD (7035.7 TVD, 992.0 N, 537.3 E)	0.00	0.00	7,024.0	1,056.0	572.0	1,346,182.02	3,167,940.72	40.282105 -104.898046
	- Circle (radius 75.0)								
LEGAL BOX 400' X 40	- plan misses target center by 77.7ft at 7163.3ft MD (7036.0 TVD, 992.0 N, 537.4 E)	0.00	0.00	7,024.0	1,053.0	584.0	1,346,179.10	3,167,952.74	40.282096 -104.898003
	- Rectangle (sides W400.0 H400.0 D922.0)								

Casing Points					
Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (")	Hole Diameter (")	
700.0	700.0	8 5/8"	8-5/8	12-1/4	

Database:	Landmark	Local Co-ordinate Reference:	Well Sunmarke 19-28-11
Company:	KP KAUFFMAN	TVD Reference:	WELL @ 4989.0ft (Original Well Elev)
Project:	SEC.28-T4N-R67W	MD Reference:	WELL @ 4989.0ft (Original Well Elev)
Site:	Sunmarke 19-28-11 Pad Sec.28-T4N-R67W	North Reference:	True
Well:	Sunmarke 19-28-11	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 (1-11-12)		

Formations						
	Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
	2,541.0	2,535.0	GREELEY		0.00	
	3,731.1	3,720.0	PARKMAN		0.00	
	4,290.1	4,263.0	SUSSEX		0.00	
	4,767.3	4,722.0	SHANNON		0.00	
	7,151.2	7,024.0	NIOBRARA		0.00	
	7,445.9	7,316.0	FT HAYS		0.00	
	7,469.1	7,339.0	CODELL		0.00	
	7,899.2	7,768.0	J SILT		0.00	
	7,917.2	7,786.0	J SAND		0.00	



KP KAUFFMAN

SEC.28-T4N-R67W

Sunmarke 19-28-11 Pad Sec.28-T4N-R67W

Sunmarke 19-28-11

Wellbore #1

Plan #1 (1-11-12)

Anticollision Report

12 January, 2012

Company:	KP KAUFFMAN	Local Co-ordinate Reference:	Well Sunmarke 19-28-11
Project:	SEC.28-T4N-R67W	TVD Reference:	WELL @ 4989.0ft (Original Well Elev)
Reference Site:	Sunmarke 19-28-11 Pad Sec.28-T4N-R67W	MD Reference:	WELL @ 4989.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	Sunmarke 19-28-11	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #1 (1-11-12)	Offset TVD Reference:	Offset Datum

Reference	Plan #1 (1-11-12)		
Filter type:	NO GLOBAL FILTER: Using user defined selection & filtering criteria		
Interpolation Method:	Stations	Error Model:	ISCWSA
Depth Range:	Unlimited	Scan Method:	Closest Approach 3D
Results Limited by:	Maximum center-center distance of 10,000.0ft	Error Surface:	Elliptical Conic
Warning Levels Evaluated at:	2.00 Sigma		

Survey Tool Program		Date	1/12/2012		
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
0.0	8,077.2	Plan #1 (1-11-12) (Wellbore #1)	MWD	MWD - Standard	

Summary						
Site Name	Reference Measured Depth (ft)	Offset Measured Depth (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Separation Factor	Warning
Offset Well - Wellbore - Design						
Sunmarke 19-28-11 Pad Sec.28-T4N-R67W						
Sunmarke 15-28 (Exist.) - Wellbore #1 - Design #1	800.0	800.0	31.9	28.5	9.457	CC, ES
Sunmarke 15-28 (Exist.) - Wellbore #1 - Design #1	1,000.0	999.8	36.1	31.8	8.467	SF
Sunmarke 19-28-12 - Wellbore #1 - Plan #1 (1-11-12)	200.0	200.0	20.1	19.4	29.822	CC, ES
Sunmarke 19-28-12 - Wellbore #1 - Plan #1 (1-11-12)	2,000.0	1,991.4	151.6	142.4	16.323	SF
Sunmarke 19-28-13 - Wellbore #1 - Plan #1 (1-11-12)	800.0	800.0	20.2	16.8	5.984	CC, ES
Sunmarke 19-28-13 - Wellbore #1 - Plan #1 (1-11-12)	900.0	899.7	21.5	17.7	5.656	SF

Offset Design										Sunmarke 19-28-11 Pad Sec.28-T4N-R67W - Sunmarke 15-28 (Exist.) - Wellbore #1 - Design #1				Offset Site Error:		0.0 ft
Survey Program: 0-MWD														Offset Well Error:		0.0 ft
Reference		Offset		Semi Major Axis			Distance							Warning		
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre		Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor				
							+N/-S (ft)	+E/-W (ft)								
0.0	0.0	0.0	0.0	0.0	0.0	-93.93	-2.2	-31.8	31.9							
100.0	100.0	100.0	100.0	0.1	0.1	-93.93	-2.2	-31.8	31.9	31.7	0.22	141.851				
200.0	200.0	200.0	200.0	0.3	0.3	-93.93	-2.2	-31.8	31.9	31.2	0.67	47.284				
300.0	300.0	300.0	300.0	0.6	0.6	-93.93	-2.2	-31.8	31.9	30.8	1.12	28.370				
400.0	400.0	400.0	400.0	0.8	0.8	-93.93	-2.2	-31.8	31.9	30.3	1.57	20.264				
500.0	500.0	500.0	500.0	1.0	1.0	-93.93	-2.2	-31.8	31.9	29.9	2.02	15.761				
600.0	600.0	600.0	600.0	1.2	1.2	-93.93	-2.2	-31.8	31.9	29.4	2.47	12.896				
700.0	700.0	700.0	700.0	1.5	1.5	-93.93	-2.2	-31.8	31.9	29.0	2.92	10.912				
800.0	800.0	800.0	800.0	1.7	1.7	-93.93	-2.2	-31.8	31.9	28.5	3.37	9.457	CC, ES			
900.0	900.0	900.0	900.0	1.9	1.9	-124.93	-2.2	-31.8	32.9	29.0	3.82	8.603				
1,000.0	999.8	999.8	999.8	2.1	2.1	-131.70	-2.2	-31.8	36.1	31.8	4.26	8.467	SF			
1,050.0	1,049.7	1,049.7	1,049.7	2.3	2.2	-135.98	-2.2	-31.8	38.8	34.3	4.49	8.654				
1,100.0	1,099.5	1,099.5	1,099.5	2.4	2.4	-140.10	-2.2	-31.8	42.1	37.4	4.71	8.932				
1,200.0	1,199.1	1,199.1	1,199.1	2.6	2.6	-146.63	-2.2	-31.8	49.1	43.9	5.16	9.513				
1,300.0	1,298.7	1,298.7	1,298.7	2.8	2.8	-151.49	-2.2	-31.8	56.6	51.0	5.61	10.083				
1,400.0	1,398.4	1,398.4	1,398.4	3.1	3.0	-155.19	-2.2	-31.8	64.4	58.3	6.06	10.619				
1,500.0	1,498.0	1,498.0	1,498.0	3.4	3.3	-158.08	-2.2	-31.8	72.4	65.9	6.51	11.112				
1,600.0	1,597.6	1,597.6	1,597.6	3.6	3.5	-160.40	-2.2	-31.8	80.5	73.6	6.97	11.561				
1,700.0	1,697.2	1,697.2	1,697.2	3.9	3.7	-162.28	-2.2	-31.8	88.8	81.4	7.42	11.970				
1,800.0	1,796.8	1,796.8	1,796.8	4.1	3.9	-163.85	-2.2	-31.8	97.1	89.3	7.87	12.341				
1,900.0	1,896.4	1,896.4	1,896.4	4.4	4.2	-165.16	-2.2	-31.8	105.5	97.2	8.32	12.679				

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

Company:	KP KAUFFMAN	Local Co-ordinate Reference:	Well Sunmarke 19-28-11
Project:	SEC.28-T4N-R67W	TVD Reference:	WELL @ 4989.0ft (Original Well Elev)
Reference Site:	Sunmarke 19-28-11 Pad Sec.28-T4N-R67W	MD Reference:	WELL @ 4989.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	Sunmarke 19-28-11	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #1 (1-11-12)	Offset TVD Reference:	Offset Datum

Offset Design Sunmarke 19-28-11 Pad Sec.28-T4N-R67W - Sunmarke 15-28 (Exist.) - Wellbore #1 - Design #1													Offset Site Error:	0.0ft
Survey Program: 0-MWD													Offset Well Error:	0.0ft
Reference		Offset		Semi Major Axis			Distance							Warning
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor		
2,000.0	1,996.1	1,996.1	1,996.1	4.7	4.4	-166.29	-2.2	-31.8	114.0	105.2	8.78	12.987		
2,100.0	2,095.7	2,095.7	2,095.7	4.9	4.6	-167.25	-2.2	-31.8	122.5	113.3	9.23	13.268		
2,200.0	2,195.3	2,195.3	2,195.3	5.2	4.8	-168.09	-2.2	-31.8	131.0	121.3	9.69	13.526		
2,300.0	2,294.9	2,294.9	2,294.9	5.5	5.0	-168.83	-2.2	-31.8	139.5	129.4	10.14	13.762		
2,400.0	2,394.5	2,394.5	2,394.5	5.7	5.3	-169.48	-2.2	-31.8	148.1	137.5	10.59	13.981		
2,500.0	2,494.2	2,494.2	2,494.2	6.0	5.5	-170.07	-2.2	-31.8	156.7	145.6	11.05	14.182		
2,600.0	2,593.8	2,593.8	2,593.8	6.3	5.7	-170.59	-2.2	-31.8	165.3	153.8	11.50	14.369		
2,700.0	2,693.4	2,693.4	2,693.4	6.5	5.9	-171.06	-2.2	-31.8	173.9	161.9	11.96	14.542		
2,800.0	2,793.0	2,793.0	2,793.0	6.8	6.2	-171.48	-2.2	-31.8	182.5	170.1	12.41	14.704		
2,900.0	2,892.6	2,892.6	2,892.6	7.1	6.4	-171.87	-2.2	-31.8	191.1	178.3	12.87	14.854		
3,000.0	2,992.3	2,992.3	2,992.3	7.3	6.6	-172.22	-2.2	-31.8	199.7	186.4	13.32	14.995		
3,100.0	3,091.9	3,091.9	3,091.9	7.6	6.8	-172.55	-2.2	-31.8	208.4	194.6	13.78	15.127		
3,200.0	3,191.5	3,191.5	3,191.5	7.9	7.1	-172.85	-2.2	-31.8	217.0	202.8	14.23	15.251		
3,300.0	3,291.1	3,291.1	3,291.1	8.1	7.3	-173.12	-2.2	-31.8	225.7	211.0	14.69	15.367		
3,400.0	3,390.7	3,390.7	3,390.7	8.4	7.5	-173.38	-2.2	-31.8	234.3	219.2	15.14	15.477		
3,500.0	3,490.4	3,490.4	3,490.4	8.7	7.7	-173.61	-2.2	-31.8	243.0	227.4	15.60	15.580		
3,550.0	3,540.2	3,540.2	3,540.2	8.8	7.8	-173.73	-2.2	-31.8	247.3	231.5	15.82	15.630		
3,600.0	3,589.9	3,589.9	3,589.9	9.0	8.0	-173.84	-2.2	-31.8	252.1	236.1	16.04	15.719		
3,700.0	3,689.2	3,689.2	3,689.2	9.3	8.2	-174.10	-2.2	-31.8	264.2	247.8	16.45	16.057		
3,800.0	3,788.0	3,788.0	3,788.0	9.6	8.4	-174.39	-2.2	-31.8	279.8	262.9	16.86	16.598		
3,900.0	3,886.1	3,886.1	3,886.1	10.0	8.6	-174.72	-2.2	-31.8	298.8	281.5	17.24	17.328		
4,000.0	3,983.5	3,983.5	3,983.5	10.4	8.8	-175.05	-2.2	-31.8	321.2	303.6	17.61	18.238		
4,093.6	4,074.0	4,074.0	4,074.0	10.8	9.0	-175.35	-2.2	-31.8	345.2	327.3	17.94	19.243		
4,100.0	4,080.1	4,080.1	4,080.1	10.8	9.1	-175.38	-2.2	-31.8	347.0	329.0	17.97	19.308		
4,200.0	4,176.3	4,176.3	4,176.3	11.3	9.3	-175.71	-2.2	-31.8	374.3	355.8	18.44	20.293		
4,300.0	4,272.5	4,272.5	4,272.5	11.8	9.5	-176.01	-2.2	-31.8	401.5	382.6	18.92	21.227		
4,400.0	4,368.7	4,368.7	4,368.7	12.2	9.7	-176.26	-2.2	-31.8	428.8	409.4	19.39	22.114		
4,500.0	4,464.9	4,464.9	4,464.9	12.7	9.9	-176.48	-2.2	-31.8	456.1	436.3	19.87	22.956		
4,600.0	4,561.1	4,561.1	4,561.1	13.2	10.1	-176.68	-2.2	-31.8	483.4	463.1	20.35	23.757		
4,700.0	4,657.3	4,657.3	4,657.3	13.7	10.4	-176.86	-2.2	-31.8	510.7	489.9	20.83	24.520		
4,800.0	4,753.4	4,753.4	4,753.4	14.2	10.6	-177.02	-2.2	-31.8	538.1	516.7	21.31	25.247		
4,900.0	4,849.6	4,849.6	4,849.6	14.7	10.8	-177.16	-2.2	-31.8	565.4	543.6	21.80	25.940		
5,000.0	4,945.8	4,945.8	4,945.8	15.2	11.0	-177.29	-2.2	-31.8	592.7	570.4	22.28	26.602		
5,100.0	5,042.0	5,042.0	5,042.0	15.7	11.2	-177.41	-2.2	-31.8	620.0	597.2	22.77	27.234		
5,200.0	5,138.2	5,138.2	5,138.2	16.3	11.4	-177.52	-2.2	-31.8	647.3	624.1	23.25	27.838		
5,300.0	5,234.4	5,234.4	5,234.4	16.8	11.7	-177.62	-2.2	-31.8	674.7	650.9	23.74	28.417		
5,400.0	5,330.6	5,330.6	5,330.6	17.3	11.9	-177.72	-2.2	-31.8	702.0	677.8	24.23	28.971		
5,500.0	5,426.8	5,426.8	5,426.8	17.8	12.1	-177.80	-2.2	-31.8	729.3	704.6	24.72	29.502		
5,600.0	5,522.9	5,522.9	5,522.9	18.4	12.3	-177.88	-2.2	-31.8	756.7	731.4	25.21	30.012		
5,700.0	5,619.1	5,619.1	5,619.1	18.9	12.5	-177.96	-2.2	-31.8	784.0	758.3	25.70	30.501		
5,800.0	5,715.3	5,715.3	5,715.3	19.4	12.7	-178.02	-2.2	-31.8	811.3	785.1	26.20	30.971		
5,900.0	5,811.5	5,811.5	5,811.5	19.9	12.9	-178.09	-2.2	-31.8	838.7	812.0	26.69	31.422		
6,000.0	5,907.7	5,907.7	5,907.7	20.5	13.2	-178.15	-2.2	-31.8	866.0	838.8	27.18	31.857		
6,100.0	6,003.9	6,003.9	6,003.9	21.0	13.4	-178.21	-2.2	-31.8	893.3	865.7	27.68	32.275		
6,200.0	6,100.1	6,100.1	6,100.1	21.5	13.6	-178.26	-2.2	-31.8	920.7	892.5	28.17	32.678		
6,300.0	6,196.2	6,196.2	6,196.2	22.1	13.8	-178.31	-2.2	-31.8	948.0	919.3	28.67	33.066		
6,400.0	6,292.4	6,292.4	6,292.4	22.6	14.0	-178.36	-2.2	-31.8	975.4	946.2	29.17	33.440		
6,489.9	6,379.0	6,379.0	6,379.0	23.1	14.2	-178.40	-2.2	-31.8	999.9	970.3	29.61	33.766		
6,500.0	6,388.6	6,388.6	6,388.6	23.1	14.2	-178.40	-2.2	-31.8	1,002.7	973.0	29.67	33.795		
6,600.0	6,485.1	6,485.1	6,485.1	23.6	14.5	-178.45	-2.2	-31.8	1,029.0	998.8	30.19	34.083		
6,700.0	6,582.0	6,582.0	6,582.0	24.0	14.7	-178.49	-2.2	-31.8	1,053.7	1,023.0	30.70	34.316		
6,800.0	6,679.3	6,679.3	6,679.3	24.3	14.9	-178.53	-2.2	-31.8	1,076.6	1,045.4	31.21	34.497		

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

Company:	KP KAUFFMAN	Local Co-ordinate Reference:	Well Sunmarke 19-28-11
Project:	SEC.28-T4N-R67W	TVD Reference:	WELL @ 4989.0ft (Original Well Elev)
Reference Site:	Sunmarke 19-28-11 Pad Sec.28-T4N-R67W	MD Reference:	WELL @ 4989.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	Sunmarke 19-28-11	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #1 (1-11-12)	Offset TVD Reference:	Offset Datum

Offset Design Sunmarke 19-28-11 Pad Sec.28-T4N-R67W - Sunmarke 15-28 (Exist.) - Wellbore #1 - Design #1												Offset Site Error:	0.0 ft
Survey Program: 0-MWD												Offset Well Error:	0.0 ft
Reference	Offset	Semi Major Axis		Distance									
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
6,900.0	6,777.0	6,777.0	6,777.0	24.7	15.1	-178.57	-2.2	-31.8	1,097.9	1,066.2	31.70	34.629	
7,000.0	6,875.1	6,875.1	6,875.1	25.1	15.3	-178.60	-2.2	-31.8	1,117.4	1,085.2	32.19	34.716	
7,100.0	6,973.5	6,973.5	6,973.5	25.4	15.6	-178.62	-2.2	-31.8	1,135.2	1,102.6	32.66	34.759	
7,200.0	7,072.2	7,072.2	7,072.2	25.7	15.8	-178.64	-2.2	-31.8	1,151.3	1,118.2	33.12	34.760	
7,300.0	7,171.2	7,171.2	7,171.2	26.0	16.0	-178.66	-2.2	-31.8	1,165.7	1,132.1	33.57	34.721	
7,400.0	7,270.4	7,270.4	7,270.4	26.3	16.2	-178.68	-2.2	-31.8	1,178.4	1,144.4	34.01	34.645	
7,500.0	7,369.8	7,369.8	7,369.8	26.5	16.5	-178.70	-2.2	-31.8	1,189.3	1,154.9	34.44	34.533	
7,600.0	7,469.3	7,469.3	7,469.3	26.7	16.7	-178.71	-2.2	-31.8	1,198.5	1,163.6	34.85	34.385	
7,700.0	7,569.1	7,569.1	7,569.1	26.9	16.9	-178.72	-2.2	-31.8	1,205.9	1,170.7	35.26	34.204	
7,800.0	7,668.9	7,668.9	7,668.9	27.1	17.1	-178.73	-2.2	-31.8	1,211.6	1,176.0	35.65	33.989	
7,900.0	7,768.8	7,768.8	7,768.8	27.3	17.3	-178.73	-2.2	-31.8	1,215.6	1,179.6	36.03	33.743	
8,000.0	7,868.8	7,868.8	7,868.8	27.4	17.6	-178.73	-2.2	-31.8	1,217.8	1,181.4	36.39	33.466	
8,077.2	7,946.0	7,946.0	7,946.0	27.5	17.7	-150.29	-2.2	-31.8	1,218.3	1,181.7	36.66	33.231	

Company:	KP KAUFFMAN	Local Co-ordinate Reference:	Well Sunmarke 19-28-11
Project:	SEC.28-T4N-R67W	TVD Reference:	WELL @ 4989.0ft (Original Well Elev)
Reference Site:	Sunmarke 19-28-11 Pad Sec.28-T4N-R67W	MD Reference:	WELL @ 4989.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	Sunmarke 19-28-11	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #1 (1-11-12)	Offset TVD Reference:	Offset Datum

Offset Design												Offset Site Error:	0.0ft
Survey Program: 0-MWD												Offset Well Error:	0.0ft
Reference		Offset		Semi Major Axis			Distance						
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
0.0	0.0	0.0	0.0	0.0	0.0	-45.04	14.2	-14.2	20.1				
100.0	100.0	100.0	100.0	0.1	0.1	-45.04	14.2	-14.2	20.1	19.9	0.22	89.465	
200.0	200.0	200.0	200.0	0.3	0.3	-45.04	14.2	-14.2	20.1	19.4	0.67	29.822 CC, ES	
300.0	300.0	299.3	299.3	0.6	0.6	-44.27	15.6	-15.2	21.8	20.7	1.12	19.454	
400.0	400.0	398.3	398.2	0.8	0.8	-42.54	19.8	-18.2	27.0	25.4	1.58	17.107	
500.0	500.0	497.4	497.0	1.0	1.0	-40.83	26.5	-22.9	35.2	33.1	2.04	17.244	
600.0	600.0	597.1	596.2	1.2	1.3	-39.72	33.6	-27.9	43.8	41.3	2.50	17.566	
700.0	700.0	696.7	695.4	1.5	1.6	-38.97	40.7	-32.9	52.5	49.6	2.95	17.777	
800.0	800.0	796.3	794.7	1.7	1.8	-38.43	47.8	-37.9	61.2	57.8	3.42	17.925	
900.0	900.0	896.0	894.0	1.9	2.1	-67.65	54.9	-42.9	69.3	65.4	3.84	18.035	
1,000.0	999.8	995.7	993.3	2.1	2.4	-70.70	62.0	-47.9	76.1	71.8	4.29	17.724	
1,050.0	1,049.7	1,045.5	1,042.9	2.3	2.5	-72.93	65.5	-50.4	79.2	74.7	4.52	17.505	
1,100.0	1,099.5	1,095.3	1,092.5	2.4	2.6	-75.33	69.1	-52.9	82.3	77.5	4.76	17.293	
1,200.0	1,199.1	1,194.8	1,191.7	2.6	2.9	-79.61	76.2	-57.9	88.9	83.6	5.24	16.971	
1,300.0	1,298.7	1,294.4	1,290.9	2.8	3.2	-83.28	83.3	-62.9	95.9	90.2	5.73	16.748	
1,400.0	1,398.4	1,394.0	1,390.1	3.1	3.5	-86.45	90.3	-67.9	103.3	97.0	6.22	16.593	
1,500.0	1,498.0	1,493.6	1,489.3	3.4	3.7	-89.18	97.4	-72.9	110.9	104.2	6.73	16.487	
1,600.0	1,597.6	1,593.1	1,588.5	3.6	4.0	-91.57	104.5	-77.9	118.7	111.5	7.23	16.416	
1,700.0	1,697.2	1,692.7	1,687.7	3.9	4.3	-93.65	111.6	-82.9	126.8	119.0	7.74	16.370	
1,800.0	1,796.8	1,792.3	1,786.9	4.1	4.5	-95.48	118.7	-87.9	134.9	126.7	8.26	16.342	
1,900.0	1,896.4	1,891.9	1,886.1	4.4	4.8	-97.10	125.8	-93.0	143.2	134.5	8.77	16.328	
2,000.0	1,996.1	1,991.4	1,985.3	4.7	5.1	-98.55	132.9	-98.0	151.6	142.4	9.29	16.323 SF	
2,100.0	2,095.7	2,091.0	2,084.5	4.9	5.4	-99.84	140.0	-103.0	160.1	150.3	9.81	16.325	
2,200.0	2,195.3	2,190.6	2,183.7	5.2	5.6	-101.00	147.1	-108.0	168.7	158.4	10.33	16.333	
2,300.0	2,294.9	2,290.2	2,282.9	5.5	5.9	-102.05	154.2	-113.0	177.3	166.5	10.85	16.345	
2,400.0	2,394.5	2,389.8	2,382.1	5.7	6.2	-103.00	161.3	-118.0	186.0	174.6	11.37	16.359	
2,500.0	2,494.2	2,489.3	2,481.3	6.0	6.5	-103.87	168.4	-123.0	194.7	182.8	11.89	16.375	
2,600.0	2,593.8	2,588.9	2,580.5	6.3	6.7	-104.66	175.4	-128.0	203.5	191.1	12.41	16.393	
2,700.0	2,693.4	2,688.5	2,679.7	6.5	7.0	-105.39	182.5	-133.0	212.3	199.3	12.93	16.412	
2,800.0	2,793.0	2,788.1	2,778.9	6.8	7.3	-106.06	189.6	-138.0	221.1	207.6	13.46	16.431	
2,900.0	2,892.6	2,887.6	2,878.1	7.1	7.6	-106.68	196.7	-143.0	229.9	216.0	13.98	16.451	
3,000.0	2,992.3	2,987.2	2,977.3	7.3	7.8	-107.25	203.8	-148.0	238.8	224.3	14.50	16.470	
3,100.0	3,091.9	3,086.8	3,076.5	7.6	8.1	-107.78	210.9	-153.0	247.7	232.7	15.02	16.490	
3,200.0	3,191.5	3,186.4	3,175.7	7.9	8.4	-108.27	218.0	-158.0	256.7	241.1	15.55	16.509	
3,300.0	3,291.1	3,286.0	3,274.9	8.1	8.7	-108.73	225.1	-163.0	265.6	249.5	16.07	16.529	
3,400.0	3,390.7	3,385.5	3,374.0	8.4	8.9	-109.16	232.2	-168.0	274.5	258.0	16.59	16.547	
3,500.0	3,490.4	3,482.9	3,471.0	8.7	9.2	-109.53	239.3	-173.0	283.7	266.5	17.11	16.578	
3,550.0	3,540.2	3,529.4	3,517.2	8.8	9.3	-109.58	243.3	-175.9	288.8	271.5	17.37	16.628	
3,600.0	3,589.9	3,575.8	3,563.3	9.0	9.5	-109.48	248.0	-179.1	294.7	277.1	17.63	16.717	
3,700.0	3,689.2	3,668.0	3,654.5	9.3	9.8	-109.37	259.0	-186.9	308.9	290.8	18.18	16.994	
3,800.0	3,788.0	3,759.5	3,744.5	9.6	10.1	-109.34	272.4	-196.3	326.5	307.8	18.77	17.393	
3,900.0	3,886.1	3,850.0	3,833.0	10.0	10.5	-109.38	287.9	-207.3	347.4	328.0	19.41	17.896	
4,000.0	3,983.5	3,939.4	3,919.8	10.4	10.9	-109.44	305.4	-219.6	371.5	351.4	20.10	18.487	
4,093.6	4,074.0	4,023.6	4,000.9	10.8	11.3	-109.53	323.9	-232.7	397.0	376.2	20.78	19.099	
4,100.0	4,080.1	4,029.7	4,006.7	10.8	11.3	-109.58	325.3	-233.7	398.8	377.9	20.84	19.138	
4,200.0	4,176.3	4,125.5	4,098.8	11.3	11.8	-110.29	347.0	-249.0	427.1	405.4	21.66	19.719	
4,300.0	4,272.5	4,221.2	4,190.8	11.8	12.3	-110.91	368.7	-264.3	455.4	432.9	22.49	20.251	
4,400.0	4,368.7	4,317.0	4,282.8	12.2	12.8	-111.46	390.3	-279.6	483.8	460.5	23.33	20.736	
4,500.0	4,464.9	4,412.8	4,374.9	12.7	13.3	-111.95	412.0	-294.9	512.3	488.1	24.19	21.180	
4,600.0	4,561.1	4,508.6	4,466.9	13.2	13.8	-112.38	433.7	-310.2	540.7	515.7	25.05	21.587	
4,700.0	4,657.3	4,604.4	4,558.9	13.7	14.3	-112.77	455.4	-325.5	569.2	543.3	25.92	21.961	
4,800.0	4,753.4	4,700.2	4,651.0	14.2	14.8	-113.13	477.1	-340.8	597.7	570.9	26.80	22.306	

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

Company:	KP KAUFFMAN	Local Co-ordinate Reference:	Well Sunmarke 19-28-11
Project:	SEC.28-T4N-R67W	TVD Reference:	WELL @ 4989.0ft (Original Well Elev)
Reference Site:	Sunmarke 19-28-11 Pad Sec.28-T4N-R67W	MD Reference:	WELL @ 4989.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	Sunmarke 19-28-11	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #1 (1-11-12)	Offset TVD Reference:	Offset Datum

Offset Design Sunmarke 19-28-11 Pad Sec.28-T4N-R67W - Sunmarke 19-28-12 - Wellbore #1 - Plan #1 (1-11-12)												Offset Site Error:	0.0 ft
Survey Program: 0-MWD												Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis			Distance						
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
4,900.0	4,849.6	4,796.0	4,743.0	14.7	15.3	-113.45	498.8	-356.1	626.3	598.6	27.68	22.623	
5,000.0	4,945.8	4,891.7	4,835.0	15.2	15.8	-113.75	520.5	-371.4	654.8	626.3	28.57	22.917	
5,100.0	5,042.0	4,987.5	4,927.1	15.7	16.3	-114.02	542.2	-386.7	683.4	653.9	29.47	23.190	
5,200.0	5,138.2	5,083.3	5,019.1	16.3	16.9	-114.26	563.9	-402.0	712.0	681.6	30.37	23.442	
5,300.0	5,234.4	5,179.1	5,111.1	16.8	17.4	-114.49	585.6	-417.3	740.6	709.3	31.28	23.678	
5,400.0	5,330.6	5,274.9	5,203.2	17.3	17.9	-114.71	607.3	-432.6	769.2	737.0	32.19	23.897	
5,500.0	5,426.8	5,370.7	5,295.2	17.8	18.4	-114.90	628.9	-447.9	797.8	764.7	33.10	24.102	
5,600.0	5,522.9	5,466.5	5,387.2	18.4	19.0	-115.09	650.6	-463.2	826.4	792.4	34.02	24.293	
5,700.0	5,619.1	5,562.2	5,479.3	18.9	19.5	-115.26	672.3	-478.5	855.0	820.1	34.94	24.472	
5,800.0	5,715.3	5,658.0	5,571.3	19.4	20.0	-115.42	694.0	-493.8	883.7	847.8	35.86	24.641	
5,900.0	5,811.5	5,753.8	5,663.3	19.9	20.5	-115.57	715.7	-509.1	912.3	875.5	36.79	24.799	
6,000.0	5,907.7	5,849.6	5,755.4	20.5	21.1	-115.71	737.4	-524.4	940.9	903.2	37.72	24.948	
6,100.0	6,003.9	5,945.4	5,847.4	21.0	21.6	-115.84	759.1	-539.7	969.6	930.9	38.65	25.088	
6,200.0	6,100.1	6,041.2	5,939.4	21.5	22.1	-115.97	780.8	-555.0	998.2	958.7	39.58	25.220	
6,300.0	6,196.2	6,136.9	6,031.5	22.1	22.7	-116.08	802.5	-570.3	1,026.9	986.4	40.52	25.345	
6,400.0	6,292.4	6,232.7	6,123.5	22.6	23.2	-116.19	824.2	-585.6	1,055.6	1,014.1	41.45	25.464	
6,489.9	6,379.0	6,318.9	6,206.3	23.1	23.7	-116.29	843.7	-599.3	1,081.3	1,039.0	42.30	25.565	
6,500.0	6,388.6	6,328.5	6,215.5	23.1	23.7	-116.33	845.9	-600.9	1,084.2	1,041.8	42.39	25.576	
6,600.0	6,485.1	6,424.4	6,307.7	23.6	24.3	-116.64	867.6	-616.2	1,112.4	1,069.2	43.27	25.706	
6,700.0	6,582.0	6,520.6	6,400.1	24.0	24.8	-116.86	889.4	-631.5	1,139.9	1,095.8	44.14	25.823	
6,800.0	6,679.3	6,629.0	6,504.5	24.3	25.3	-117.02	913.2	-648.3	1,166.1	1,121.2	44.99	25.922	
6,900.0	6,777.0	6,739.0	6,611.0	24.7	25.8	-117.15	935.7	-664.2	1,190.6	1,144.8	45.77	26.013	
7,000.0	6,875.1	6,849.9	6,718.9	25.1	26.2	-117.27	956.7	-679.1	1,213.1	1,166.6	46.52	26.079	
7,100.0	6,973.5	6,961.5	6,828.0	25.4	26.6	-117.38	976.1	-692.8	1,233.8	1,186.6	47.23	26.123	
7,200.0	7,072.2	7,073.9	6,938.2	25.7	27.0	-117.47	993.9	-705.3	1,252.6	1,204.7	47.91	26.145	
7,300.0	7,171.2	7,186.9	7,049.5	26.0	27.4	-117.54	1,010.1	-716.7	1,269.5	1,220.9	48.55	26.148	
7,400.0	7,270.4	7,300.5	7,161.7	26.3	27.7	-117.61	1,024.4	-726.8	1,284.4	1,235.2	49.15	26.133	
7,500.0	7,369.8	7,414.7	7,274.8	26.5	28.1	-117.66	1,037.1	-735.7	1,297.4	1,247.7	49.70	26.103	
7,600.0	7,469.3	7,529.3	7,388.6	26.7	28.3	-117.69	1,047.9	-743.4	1,308.4	1,258.2	50.22	26.056	
7,700.0	7,569.1	7,635.1	7,494.0	26.9	28.6	-117.72	1,056.2	-749.2	1,317.5	1,266.8	50.67	26.002	
7,800.0	7,668.9	7,635.1	7,494.0	27.1	28.6	-117.83	1,056.2	-749.2	1,329.6	1,278.7	50.87	26.136	
7,900.0	7,768.8	7,635.1	7,494.0	27.3	28.6	-117.99	1,056.2	-749.2	1,348.2	1,297.2	51.06	26.407	
8,000.0	7,868.8	7,635.1	7,494.0	27.4	28.6	-118.22	1,056.2	-749.2	1,373.1	1,321.9	51.22	26.808	
8,077.2	7,946.0	7,635.1	7,494.0	27.5	28.6	-89.99	1,056.2	-749.2	1,396.4	1,345.1	51.33	27.203	

Company:	KP KAUFFMAN	Local Co-ordinate Reference:	Well Sunmarke 19-28-11
Project:	SEC.28-T4N-R67W	TVD Reference:	WELL @ 4989.0ft (Original Well Elev)
Reference Site:	Sunmarke 19-28-11 Pad Sec.28-T4N-R67W	MD Reference:	WELL @ 4989.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	Sunmarke 19-28-11	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #1 (1-11-12)	Offset TVD Reference:	Offset Datum

Offset Design												Offset Site Error:	0.0ft
Survey Program: 0-MWD												Offset Well Error:	0.0ft
Reference		Offset		Semi Major Axis			Distance						
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
0.0	0.0	0.0	0.0	0.0	0.0	136.25	-14.6	14.0	20.2				
100.0	100.0	100.0	100.0	0.1	0.1	136.25	-14.6	14.0	20.2	19.9	0.22	89.754	
200.0	200.0	200.0	200.0	0.3	0.3	136.25	-14.6	14.0	20.2	19.5	0.67	29.918	
300.0	300.0	300.0	300.0	0.6	0.6	136.25	-14.6	14.0	20.2	19.0	1.12	17.951	
400.0	400.0	400.0	400.0	0.8	0.8	136.25	-14.6	14.0	20.2	18.6	1.57	12.822	
500.0	500.0	500.0	500.0	1.0	1.0	136.25	-14.6	14.0	20.2	18.2	2.02	9.973	
600.0	600.0	600.0	600.0	1.2	1.2	136.25	-14.6	14.0	20.2	17.7	2.47	8.159	
700.0	700.0	700.0	700.0	1.5	1.5	136.25	-14.6	14.0	20.2	17.3	2.92	6.904	
800.0	800.0	800.0	800.0	1.7	1.7	136.25	-14.6	14.0	20.2	16.8	3.37	5.984 CC, ES	
900.0	900.0	899.7	899.7	1.9	1.9	116.69	-16.1	13.1	21.5	17.7	3.79	5.656 SF	
1,000.0	999.8	998.6	998.5	2.1	2.1	136.28	-20.5	10.5	27.7	23.5	4.20	6.579	
1,050.0	1,049.7	1,047.6	1,047.3	2.3	2.2	145.43	-23.8	8.6	33.7	29.3	4.42	7.623	
1,100.0	1,099.5	1,096.9	1,096.4	2.4	2.3	152.97	-27.5	6.1	41.1	36.4	4.63	8.858	
1,200.0	1,199.1	1,195.1	1,194.1	2.6	2.5	164.44	-34.5	-1.5	57.3	52.2	5.07	11.283	
1,300.0	1,298.7	1,292.5	1,290.7	2.8	2.8	173.21	-40.9	-12.2	75.4	69.9	5.52	13.675	
1,400.0	1,398.4	1,389.0	1,385.9	3.1	3.0	-179.63	-46.9	-26.1	95.9	89.9	5.97	16.066	
1,500.0	1,498.0	1,484.6	1,479.9	3.4	3.4	-173.64	-52.3	-42.9	118.6	112.2	6.42	18.470	
1,600.0	1,597.6	1,581.2	1,574.6	3.6	3.7	-169.21	-57.7	-60.7	142.8	135.9	6.88	20.747	
1,700.0	1,697.2	1,677.7	1,669.4	3.9	4.0	-166.06	-63.1	-78.6	167.5	160.1	7.34	22.809	
1,800.0	1,796.8	1,774.3	1,764.1	4.1	4.4	-163.73	-68.5	-96.4	192.5	184.7	7.81	24.660	
1,900.0	1,896.4	1,870.8	1,858.8	4.4	4.8	-161.93	-73.8	-114.3	217.8	209.5	8.28	26.317	
2,000.0	1,996.1	1,967.4	1,953.6	4.7	5.2	-160.51	-79.2	-132.2	243.3	234.5	8.75	27.806	
2,100.0	2,095.7	2,063.9	2,048.3	4.9	5.5	-159.35	-84.6	-150.0	268.8	259.6	9.22	29.146	
2,200.0	2,195.3	2,160.5	2,143.0	5.2	5.9	-158.40	-90.0	-167.9	294.5	284.8	9.70	30.355	
2,300.0	2,294.9	2,257.0	2,237.8	5.5	6.3	-157.60	-95.3	-185.7	320.2	310.0	10.18	31.450	
2,400.0	2,394.5	2,353.6	2,332.5	5.7	6.7	-156.91	-100.7	-203.6	345.9	335.3	10.66	32.446	
2,500.0	2,494.2	2,450.1	2,427.2	6.0	7.1	-156.33	-106.1	-221.5	371.7	360.6	11.14	33.355	
2,600.0	2,593.8	2,546.7	2,522.0	6.3	7.5	-155.81	-111.5	-239.3	397.6	385.9	11.63	34.186	
2,700.0	2,693.4	2,643.2	2,616.7	6.5	8.0	-155.36	-116.8	-257.2	423.4	411.3	12.12	34.950	
2,800.0	2,793.0	2,739.8	2,711.4	6.8	8.4	-154.97	-122.2	-275.0	449.3	436.7	12.60	35.653	
2,900.0	2,892.6	2,836.3	2,806.2	7.1	8.8	-154.61	-127.6	-292.9	475.2	462.1	13.09	36.302	
3,000.0	2,992.3	2,932.9	2,900.9	7.3	9.2	-154.30	-133.0	-310.7	501.1	487.5	13.58	36.903	
3,100.0	3,091.9	3,029.4	2,995.6	7.6	9.6	-154.01	-138.3	-328.6	527.0	513.0	14.07	37.461	
3,200.0	3,191.5	3,126.0	3,090.3	7.9	10.0	-153.75	-143.7	-346.5	553.0	538.4	14.56	37.981	
3,300.0	3,291.1	3,222.5	3,185.1	8.1	10.4	-153.51	-149.1	-364.3	578.9	563.9	15.05	38.465	
3,400.0	3,390.7	3,319.1	3,279.8	8.4	10.8	-153.30	-154.5	-382.2	604.9	589.3	15.54	38.918	
3,500.0	3,490.4	3,415.6	3,374.5	8.7	11.3	-153.10	-159.8	-400.0	630.8	614.8	16.03	39.342	
3,550.0	3,540.2	3,463.9	3,421.9	8.8	11.5	-153.01	-162.5	-409.0	643.8	627.5	16.28	39.544	
3,600.0	3,589.9	3,512.1	3,469.2	9.0	11.7	-152.81	-165.2	-417.9	657.2	640.7	16.50	39.832	
3,700.0	3,689.2	3,607.8	3,563.1	9.3	12.1	-152.50	-170.5	-435.6	686.1	669.2	16.93	40.530	
3,800.0	3,788.0	3,702.5	3,656.1	9.6	12.5	-152.30	-175.8	-453.1	718.0	700.7	17.35	41.382	
3,900.0	3,886.1	3,796.2	3,748.0	10.0	12.9	-152.18	-181.0	-470.4	752.9	735.1	17.77	42.378	
4,000.0	3,983.5	3,888.7	3,838.8	10.4	13.3	-152.14	-186.2	-487.5	790.6	772.4	18.17	43.509	
4,093.6	4,074.0	3,974.2	3,922.6	10.8	13.7	-152.14	-190.9	-503.3	828.5	810.0	18.54	44.682	
4,100.0	4,080.1	3,980.0	3,928.3	10.8	13.7	-152.17	-191.2	-504.4	831.2	812.6	18.58	44.743	
4,200.0	4,176.3	4,070.6	4,017.2	11.3	14.1	-152.61	-196.3	-521.2	873.0	853.9	19.12	45.660	
4,300.0	4,272.5	4,161.2	4,106.1	11.8	14.5	-153.00	-201.3	-537.9	914.9	895.2	19.67	46.521	
4,400.0	4,368.7	4,251.8	4,195.0	12.2	14.9	-153.36	-206.4	-554.7	956.8	936.6	20.22	47.330	
4,500.0	4,464.9	4,342.5	4,283.9	12.7	15.3	-153.69	-211.4	-571.5	998.8	978.0	20.77	48.092	
4,600.0	4,561.1	4,433.1	4,372.9	13.2	15.7	-154.00	-216.5	-588.2	1,040.8	1,019.5	21.32	48.811	
4,700.0	4,657.3	4,523.7	4,461.8	13.7	16.1	-154.28	-221.5	-605.0	1,082.8	1,060.9	21.88	49.489	
4,800.0	4,753.4	4,614.4	4,550.7	14.2	16.5	-154.54	-226.6	-621.7	1,124.8	1,102.4	22.44	50.130	

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

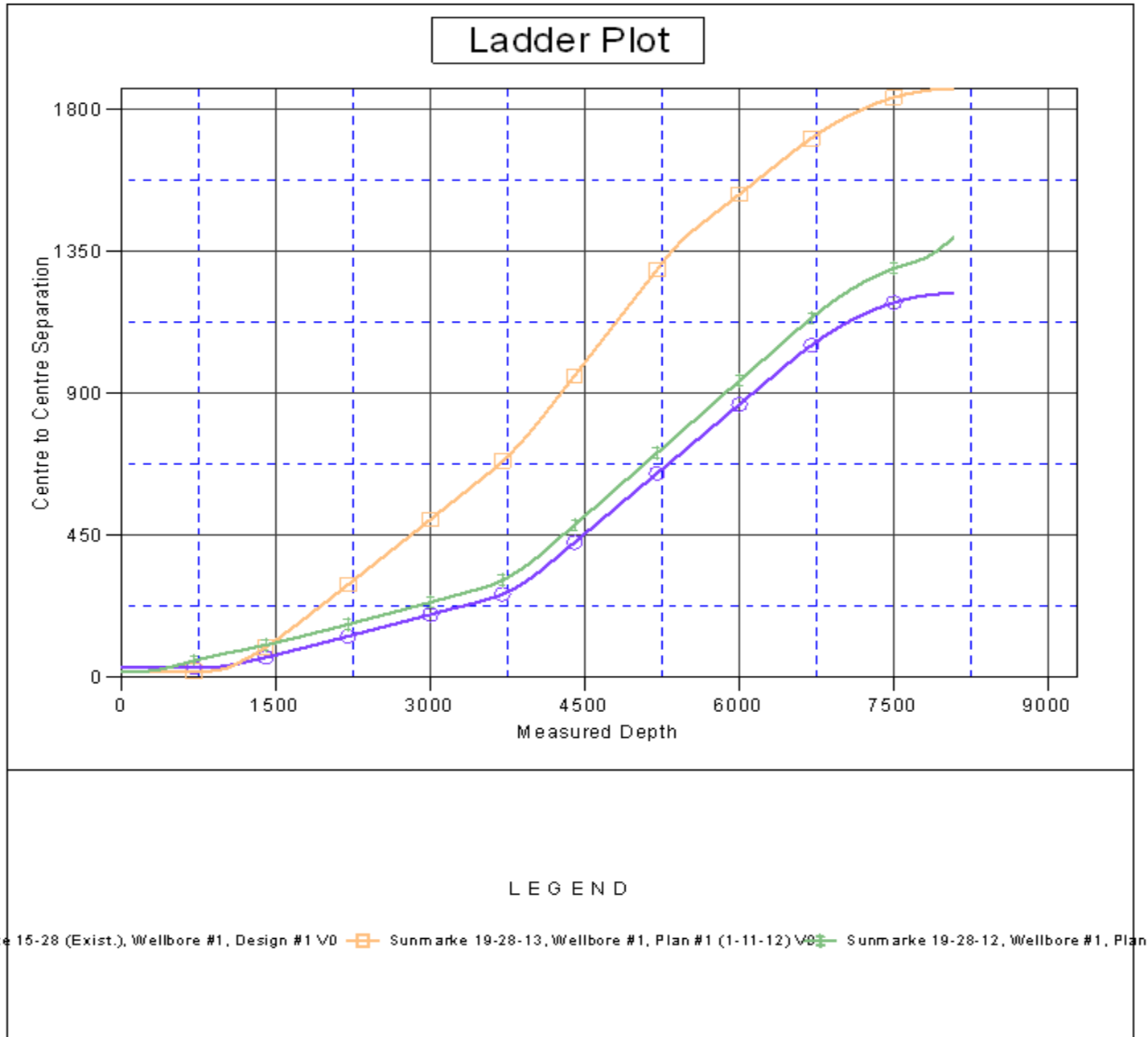
Company:	KP KAUFFMAN	Local Co-ordinate Reference:	Well Sunmarke 19-28-11
Project:	SEC.28-T4N-R67W	TVD Reference:	WELL @ 4989.0ft (Original Well Elev)
Reference Site:	Sunmarke 19-28-11 Pad Sec.28-T4N-R67W	MD Reference:	WELL @ 4989.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	Sunmarke 19-28-11	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #1 (1-11-12)	Offset TVD Reference:	Offset Datum

Offset Design												Offset Site Error:	0.0 ft
Survey Program: 0-MWD												Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis			Distance						
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
4,900.0	4,849.6	4,705.0	4,639.6	14.7	16.9	-154.78	-231.6	-638.5	1,166.8	1,143.8	23.00	50.737	
5,000.0	4,945.8	4,795.6	4,728.6	15.2	17.3	-155.00	-236.6	-655.3	1,208.9	1,185.3	23.56	51.313	
5,100.0	5,042.0	4,886.2	4,817.5	15.7	17.6	-155.21	-241.7	-672.0	1,251.0	1,226.8	24.12	51.859	
5,200.0	5,138.2	4,976.9	4,906.4	16.3	18.0	-155.41	-246.7	-688.8	1,293.1	1,268.4	24.69	52.377	
5,300.0	5,234.4	5,105.2	5,032.5	16.8	18.5	-155.69	-253.5	-711.3	1,334.5	1,309.1	25.33	52.686	
5,400.0	5,330.6	5,270.0	5,195.8	17.3	19.0	-156.15	-259.9	-732.5	1,371.5	1,345.6	25.99	52.774	
5,500.0	5,426.8	5,441.0	5,366.3	17.8	19.3	-156.75	-263.7	-745.1	1,403.6	1,377.0	26.63	52.708	
5,600.0	5,522.9	5,597.7	5,522.9	18.4	19.5	-157.40	-264.6	-748.0	1,430.5	1,403.3	27.22	52.556	
5,700.0	5,619.1	5,693.9	5,619.1	18.9	19.6	-157.81	-264.6	-748.0	1,456.0	1,428.2	27.71	52.542	
5,800.0	5,715.3	5,790.1	5,715.3	19.4	19.7	-158.21	-264.6	-748.0	1,481.4	1,453.2	28.20	52.531	
5,900.0	5,811.5	5,886.2	5,811.5	19.9	19.9	-158.59	-264.6	-748.0	1,507.0	1,478.3	28.69	52.523	
6,000.0	5,907.7	5,982.4	5,907.7	20.5	20.0	-158.96	-264.6	-748.0	1,532.6	1,503.4	29.18	52.518	
6,100.0	6,003.9	6,078.6	6,003.9	21.0	20.1	-159.32	-264.6	-748.0	1,558.3	1,528.6	29.67	52.516	
6,200.0	6,100.1	6,174.8	6,100.1	21.5	20.3	-159.67	-264.6	-748.0	1,584.0	1,553.9	30.16	52.516	
6,300.0	6,196.2	6,271.0	6,196.2	22.1	20.4	-160.01	-264.6	-748.0	1,609.8	1,579.2	30.65	52.518	
6,400.0	6,292.4	6,367.2	6,292.4	22.6	20.5	-160.33	-264.6	-748.0	1,635.7	1,604.5	31.14	52.522	
6,489.9	6,379.0	6,453.7	6,379.0	23.1	20.6	-160.62	-264.6	-748.0	1,659.0	1,627.4	31.58	52.527	
6,500.0	6,388.6	6,463.4	6,388.6	23.1	20.7	-160.66	-264.6	-748.0	1,661.6	1,629.9	31.64	52.514	
6,600.0	6,485.1	6,559.8	6,485.1	23.6	20.8	-161.04	-264.6	-748.0	1,686.5	1,654.4	32.17	52.419	
6,700.0	6,582.0	6,656.8	6,582.0	24.0	20.9	-161.38	-264.6	-748.0	1,709.9	1,677.2	32.70	52.297	
6,800.0	6,679.3	6,754.1	6,679.3	24.3	21.1	-161.70	-264.6	-748.0	1,731.8	1,698.6	33.21	52.148	
6,900.0	6,777.0	6,851.8	6,777.0	24.7	21.2	-161.98	-264.6	-748.0	1,752.0	1,718.3	33.71	51.975	
7,000.0	6,875.1	6,949.9	6,875.1	25.1	21.4	-162.23	-264.6	-748.0	1,770.7	1,736.5	34.20	51.779	
7,100.0	6,973.5	7,048.3	6,973.5	25.4	21.5	-162.46	-264.6	-748.0	1,787.7	1,753.0	34.67	51.560	
7,200.0	7,072.2	7,147.0	7,072.2	25.7	21.6	-162.66	-264.6	-748.0	1,803.1	1,767.9	35.13	51.319	
7,300.0	7,171.2	7,245.9	7,171.2	26.0	21.8	-162.83	-264.6	-748.0	1,816.8	1,781.2	35.58	51.058	
7,400.0	7,270.4	7,345.1	7,270.4	26.3	21.9	-162.99	-264.6	-748.0	1,828.9	1,792.9	36.02	50.776	
7,500.0	7,369.8	7,444.5	7,369.8	26.5	22.1	-163.12	-264.6	-748.0	1,839.4	1,802.9	36.44	50.475	
7,600.0	7,469.3	7,544.1	7,469.3	26.7	22.2	-163.22	-264.6	-748.0	1,848.2	1,811.3	36.85	50.154	
7,700.0	7,569.1	7,643.8	7,569.1	26.9	22.4	-163.31	-264.6	-748.0	1,855.3	1,818.1	37.25	49.813	
7,800.0	7,668.9	7,743.6	7,668.9	27.1	22.6	-163.38	-264.6	-748.0	1,860.8	1,823.2	37.63	49.454	
7,900.0	7,768.8	7,843.6	7,768.8	27.3	22.7	-163.42	-264.6	-748.0	1,864.6	1,826.6	37.99	49.076	
8,000.0	7,868.8	7,943.5	7,868.8	27.4	22.9	-163.45	-264.6	-748.0	1,866.7	1,828.4	38.35	48.679	
8,077.2	7,946.0	8,020.7	7,946.0	27.5	23.0	-135.01	-264.6	-748.0	1,867.2	1,828.6	38.61	48.359	

Company: KP KAUFFMAN
Project: SEC.28-T4N-R67W
Reference Site: Sunmarke 19-28-11 Pad Sec.28-T4N-R67W
Site Error: 0.0ft
Reference Well: Sunmarke 19-28-11
Well Error: 0.0ft
Reference Wellbore: Wellbore #1
Reference Design: Plan #1 (1-11-12)

Local Co-ordinate Reference: Well Sunmarke 19-28-11
TVD Reference: WELL @ 4989.0ft (Original Well Elev)
MD Reference: WELL @ 4989.0ft (Original Well Elev)
North Reference: True
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: Landmark
Offset TVD Reference: Offset Datum

Reference Depths are relative to WELL @ 4989.0ft (Original Well Elev) Coordinates are relative to: Sunmarke 19-28-11
Offset Depths are relative to Offset Datum Coordinate System is US State Plane 1983, Colorado Northern Zone
Central Meridian is -105.500000 ° Grid Convergence at Surface is: 0.39°



Company:	KP KAUFFMAN	Local Co-ordinate Reference:	Well Sunmarke 19-28-11
Project:	SEC.28-T4N-R67W	TVD Reference:	WELL @ 4989.0ft (Original Well Elev)
Reference Site:	Sunmarke 19-28-11 Pad Sec.28-T4N-R67W	MD Reference:	WELL @ 4989.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	Sunmarke 19-28-11	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #1 (1-11-12)	Offset TVD Reference:	Offset Datum

Reference Depths are relative to WELL @ 4989.0ft (Original Well Elev) Coordinates are relative to: Sunmarke 19-28-11
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