

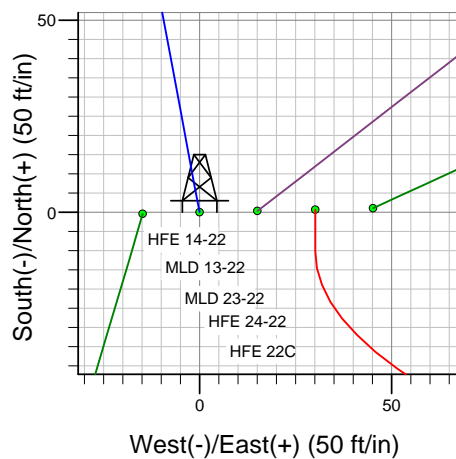
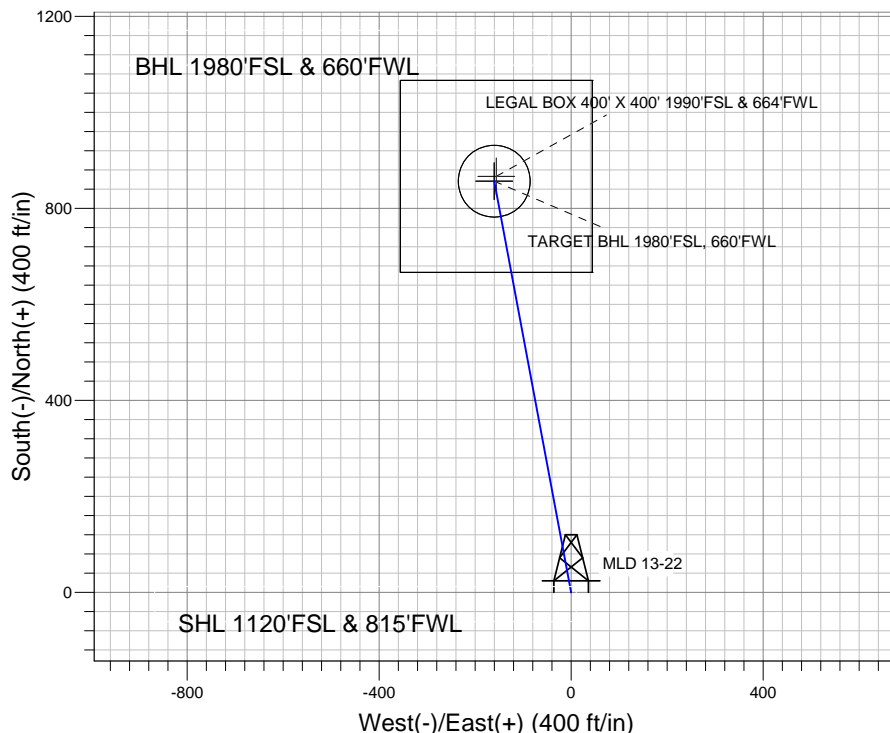
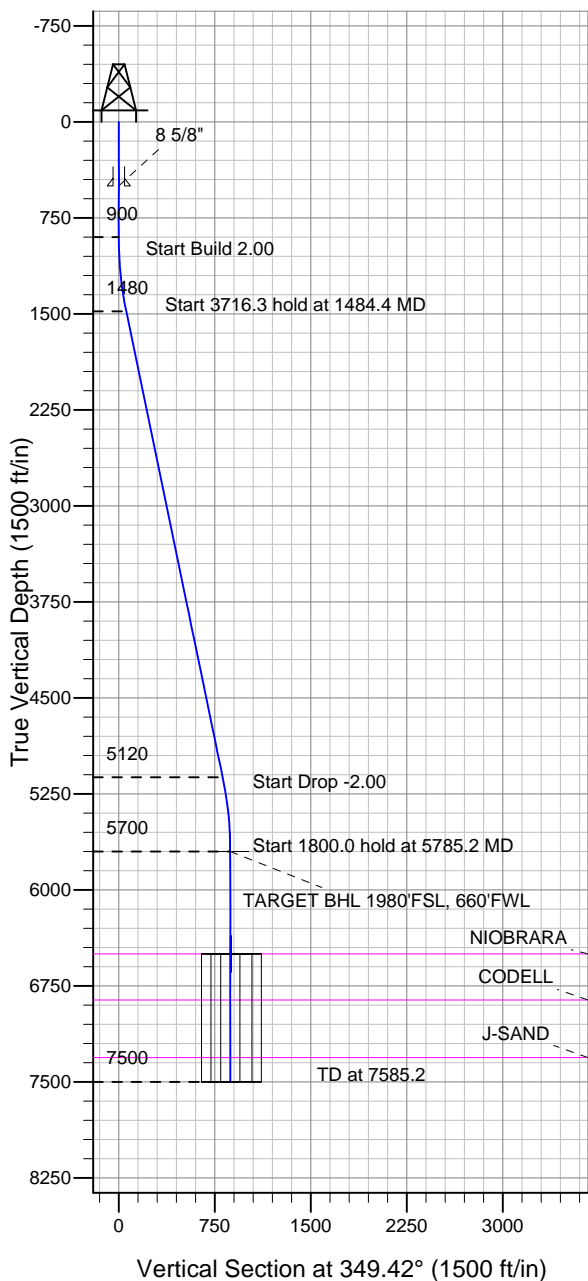
ENSIGN

Directional

Well Name: MLD 13-22

Surface Location: HFE 14-22 Pad Sec.22-T4N-R68W
 North American Datum 1983 US State Plane 1983 Colorado Northern Zone
 Ground Elevation: 4920.0
 +N/-S +E/-W Northing Easting Latitude Longitude Slot
 0.0 0.0 1350597.57 3140631.41 40.294693 -104.995839
 Original Well Elev WELL @ 4933.0ft (Original Well Elev)

Sundance Energy, Weld County, CO



HFE 14-22 Pad Sec.22-T4N-R68W
 MLD 13-22
 Plan #1 (4-10-12)
 11:00, April 11 2012



Azimuths to True North
 Magnetic North: 8.87°

Magnetic Field
 Strength: 52963.5snT
 Dip Angle: 66.90°
 Date: 4/11/2012
 Model: IGRF2010

WELLBORE TARGET DETAILS (LAT/LONG)

Name	TVD	+N/-S	+E/-W	Latitude	Longitude	Shape
TARGET BHL 1980'FSL, 660'FWL	5700.0	856.9	-160.1	40.297045	-104.996413	Point
LEGAL BOX 400' X 400' 1990'FSL & 664'FWL	6500.0	866.9	-156.1	40.297073	-104.996399	Rectangle (Sides: L400.0 W400.0)
TARGET CIRCLE 1980'FSL & 660'FWL	6500.0	856.9	-160.1	40.297045	-104.996413	Circle (Radius: 75.0)

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	900.0	0.00	0.00	900.0	0.0	0.0	0.00	0.00	0.0	
3	1484.4	11.69	349.42	1480.4	58.4	-10.9	2.00	349.42	59.4	
4	5200.7	11.69	349.42	5119.6	798.5	-149.2	0.00	0.00	812.3	
5	5785.2	0.00	0.00	5700.0	856.9	-160.1	2.00	180.00	871.7	TARGET BHL 1980'FSL, 660'FWL
6	7585.2	0.00	0.00	7500.0	856.9	-160.1	0.00	0.00	871.7	



Directional

Sundance Energy, Weld County, CO

SEC.22-T4N-R68W

HFE 14-22 Pad Sec.22-T4N-R68W

MLD 13-22

Wellbore #1

Plan: Plan #1 (4-10-12)

Standard Planning Report

11 April, 2012

Database:	Landmark	Local Co-ordinate Reference:	Well MLD 13-22
Company:	Sundance Energy, Weld County, CO	TVD Reference:	WELL @ 4933.0ft (Original Well Elev)
Project:	SEC.22-T4N-R68W	MD Reference:	WELL @ 4933.0ft (Original Well Elev)
Site:	HFE 14-22 Pad Sec.22-T4N-R68W	North Reference:	True
Well:	MLD 13-22	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 (4-10-12)		

Project	SEC.22-T4N-R68W, Weld County, Colorado		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		Using Well Reference Point
Map Zone:	Colorado Northern Zone		Using geodetic scale factor

Site						HFE 14-22 Pad Sec.22-T4N-R68W											
Site Position:						Northing:			1,350,597.13ft			Latitude:			40.294692		
From:			Lat/Long			Easting:			3,140,616.63ft			Longitude:			-104.995892		
Position Uncertainty:			0.0 ft			Slot Radius:			"			Grid Convergence:			0.33 °		

Well	MLD 13-22					
Well Position	+N-S	0.4 ft	Northing:	1,350,597.57 ft	Latitude:	40.294693
	+E-W	14.8 ft	Easting:	3,140,631.41 ft	Longitude:	-104.995839
Position Uncertainty		0.0 ft	Wellhead Elevation:	ft	Ground Level:	4,920.0 ft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	4/11/2012	8.87	66.90	52,963

Design	Plan #1 (4-10-12)			
Audit Notes:				
Version:	Phase:	PROTOTYPE	Tie On Depth:	0.0
Vertical Section:	Depth From (TVD) (ft)	+N/-S (ft)	+E/-W (ft)	Direction (°)
	0.0	0.0	0.0	349.42

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	
900.0	0.00	0.00	900.0	0.0	0.0	0.00	0.00	0.00	0.00	
1,484.4	11.69	349.42	1,480.4	58.4	-10.9	2.00	2.00	0.00	349.42	
5,200.7	11.69	349.42	5,119.6	798.5	-149.2	0.00	0.00	0.00	0.00	
5,785.2	0.00	0.00	5,700.0	856.9	-160.1	2.00	-2.00	0.00	180.00	TARGET BHL 198C
7,585.2	0.00	0.00	7,500.0	856.9	-160.1	0.00	0.00	0.00	0.00	

Database:	Landmark	Local Co-ordinate Reference:	Well MLD 13-22
Company:	Sundance Energy, Weld County, CO	TVD Reference:	WELL @ 4933.0ft (Original Well Elev)
Project:	SEC.22-T4N-R68W	MD Reference:	WELL @ 4933.0ft (Original Well Elev)
Site:	HFE 14-22 Pad Sec.22-T4N-R68W	North Reference:	True
Well:	MLD 13-22	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 (4-10-12)		

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
500.0	0.00	0.00	500.0	0.0	0.0	0.0	0.00	0.00	0.00
8 5/8"									
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
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	0.00	0.00	840.0	0.0	0.0	0.0	0.00	0.00	0.00
880.0	0.00	0.00	880.0	0.0	0.0	0.0	0.00	0.00	0.00
900.0	0.00	0.00	900.0	0.0	0.0	0.0	0.00	0.00	0.00
920.0	0.40	349.42	920.0	0.1	0.0	0.1	2.00	2.00	0.00
960.0	1.20	349.42	960.0	0.6	-0.1	0.6	2.00	2.00	0.00
1,000.0	2.00	349.42	1,000.0	1.7	-0.3	1.7	2.00	2.00	0.00
1,040.0	2.80	349.42	1,039.9	3.4	-0.6	3.4	2.00	2.00	0.00
1,080.0	3.60	349.42	1,079.9	5.6	-1.0	5.7	2.00	2.00	0.00
1,120.0	4.40	349.42	1,119.8	8.3	-1.6	8.4	2.00	2.00	0.00
1,160.0	5.20	349.42	1,159.6	11.6	-2.2	11.8	2.00	2.00	0.00
1,200.0	6.00	349.42	1,199.5	15.4	-2.9	15.7	2.00	2.00	0.00
1,240.0	6.80	349.42	1,239.2	19.8	-3.7	20.2	2.00	2.00	0.00
1,280.0	7.60	349.42	1,278.9	24.7	-4.6	25.2	2.00	2.00	0.00
1,320.0	8.40	349.42	1,318.5	30.2	-5.6	30.7	2.00	2.00	0.00
1,360.0	9.20	349.42	1,358.0	36.2	-6.8	36.9	2.00	2.00	0.00
1,400.0	10.00	349.42	1,397.5	42.8	-8.0	43.5	2.00	2.00	0.00
1,440.0	10.80	349.42	1,436.8	49.9	-9.3	50.7	2.00	2.00	0.00
1,480.0	11.60	349.42	1,476.0	57.5	-10.7	58.5	2.00	2.00	0.00
1,484.4	11.69	349.42	1,480.4	58.4	-10.9	59.4	2.00	2.00	0.00
1,520.0	11.69	349.42	1,515.2	65.5	-12.2	66.6	0.00	0.00	0.00
1,560.0	11.69	349.42	1,554.4	73.4	-13.7	74.7	0.00	0.00	0.00
1,600.0	11.69	349.42	1,593.6	81.4	-15.2	82.8	0.00	0.00	0.00
1,640.0	11.69	349.42	1,632.7	89.4	-16.7	90.9	0.00	0.00	0.00
1,680.0	11.69	349.42	1,671.9	97.3	-18.2	99.0	0.00	0.00	0.00
1,720.0	11.69	349.42	1,711.1	105.3	-19.7	107.1	0.00	0.00	0.00
1,760.0	11.69	349.42	1,750.2	113.3	-21.2	115.2	0.00	0.00	0.00
1,800.0	11.69	349.42	1,789.4	121.2	-22.7	123.3	0.00	0.00	0.00
1,840.0	11.69	349.42	1,828.6	129.2	-24.1	131.4	0.00	0.00	0.00
1,880.0	11.69	349.42	1,867.8	137.2	-25.6	139.5	0.00	0.00	0.00
1,920.0	11.69	349.42	1,906.9	145.1	-27.1	147.6	0.00	0.00	0.00
1,960.0	11.69	349.42	1,946.1	153.1	-28.6	155.8	0.00	0.00	0.00

Database:	Landmark	Local Co-ordinate Reference:	Well MLD 13-22
Company:	Sundance Energy, Weld County, CO	TVD Reference:	WELL @ 4933.0ft (Original Well Elev)
Project:	SEC.22-T4N-R68W	MD Reference:	WELL @ 4933.0ft (Original Well Elev)
Site:	HFE 14-22 Pad Sec.22-T4N-R68W	North Reference:	True
Well:	MLD 13-22	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 (4-10-12)		

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)
2,000.0	11.69	349.42	1,985.3	161.1	-30.1	163.9	0.00	0.00	0.00
2,040.0	11.69	349.42	2,024.4	169.0	-31.6	172.0	0.00	0.00	0.00
2,080.0	11.69	349.42	2,063.6	177.0	-33.1	180.1	0.00	0.00	0.00
2,120.0	11.69	349.42	2,102.8	185.0	-34.6	188.2	0.00	0.00	0.00
2,160.0	11.69	349.42	2,141.9	192.9	-36.1	196.3	0.00	0.00	0.00
2,200.0	11.69	349.42	2,181.1	200.9	-37.5	204.4	0.00	0.00	0.00
2,240.0	11.69	349.42	2,220.3	208.9	-39.0	212.5	0.00	0.00	0.00
2,280.0	11.69	349.42	2,259.5	216.8	-40.5	220.6	0.00	0.00	0.00
2,320.0	11.69	349.42	2,298.6	224.8	-42.0	228.7	0.00	0.00	0.00
2,360.0	11.69	349.42	2,337.8	232.8	-43.5	236.8	0.00	0.00	0.00
2,400.0	11.69	349.42	2,377.0	240.7	-45.0	244.9	0.00	0.00	0.00
2,440.0	11.69	349.42	2,416.1	248.7	-46.5	253.0	0.00	0.00	0.00
2,480.0	11.69	349.42	2,455.3	256.7	-48.0	261.1	0.00	0.00	0.00
2,520.0	11.69	349.42	2,494.5	264.6	-49.4	269.2	0.00	0.00	0.00
2,560.0	11.69	349.42	2,533.7	272.6	-50.9	277.3	0.00	0.00	0.00
2,600.0	11.69	349.42	2,572.8	280.6	-52.4	285.4	0.00	0.00	0.00
2,640.0	11.69	349.42	2,612.0	288.5	-53.9	293.5	0.00	0.00	0.00
2,680.0	11.69	349.42	2,651.2	296.5	-55.4	301.6	0.00	0.00	0.00
2,720.0	11.69	349.42	2,690.3	304.4	-56.9	309.7	0.00	0.00	0.00
2,760.0	11.69	349.42	2,729.5	312.4	-58.4	317.8	0.00	0.00	0.00
2,800.0	11.69	349.42	2,768.7	320.4	-59.9	325.9	0.00	0.00	0.00
2,840.0	11.69	349.42	2,807.8	328.3	-61.4	334.0	0.00	0.00	0.00
2,880.0	11.69	349.42	2,847.0	336.3	-62.8	342.1	0.00	0.00	0.00
2,920.0	11.69	349.42	2,886.2	344.3	-64.3	350.2	0.00	0.00	0.00
2,960.0	11.69	349.42	2,925.4	352.2	-65.8	358.3	0.00	0.00	0.00
3,000.0	11.69	349.42	2,964.5	360.2	-67.3	366.4	0.00	0.00	0.00
3,040.0	11.69	349.42	3,003.7	368.2	-68.8	374.5	0.00	0.00	0.00
3,080.0	11.69	349.42	3,042.9	376.1	-70.3	382.6	0.00	0.00	0.00
3,120.0	11.69	349.42	3,082.0	384.1	-71.8	390.8	0.00	0.00	0.00
3,160.0	11.69	349.42	3,121.2	392.1	-73.3	398.9	0.00	0.00	0.00
3,200.0	11.69	349.42	3,160.4	400.0	-74.8	407.0	0.00	0.00	0.00
3,240.0	11.69	349.42	3,199.6	408.0	-76.2	415.1	0.00	0.00	0.00
3,280.0	11.69	349.42	3,238.7	416.0	-77.7	423.2	0.00	0.00	0.00
3,320.0	11.69	349.42	3,277.9	423.9	-79.2	431.3	0.00	0.00	0.00
3,360.0	11.69	349.42	3,317.1	431.9	-80.7	439.4	0.00	0.00	0.00
3,400.0	11.69	349.42	3,356.2	439.9	-82.2	447.5	0.00	0.00	0.00
3,440.0	11.69	349.42	3,395.4	447.8	-83.7	455.6	0.00	0.00	0.00
3,480.0	11.69	349.42	3,434.6	455.8	-85.2	463.7	0.00	0.00	0.00
3,520.0	11.69	349.42	3,473.7	463.8	-86.7	471.8	0.00	0.00	0.00
3,560.0	11.69	349.42	3,512.9	471.7	-88.1	479.9	0.00	0.00	0.00
3,600.0	11.69	349.42	3,552.1	479.7	-89.6	488.0	0.00	0.00	0.00
3,640.0	11.69	349.42	3,591.3	487.7	-91.1	496.1	0.00	0.00	0.00
3,680.0	11.69	349.42	3,630.4	495.6	-92.6	504.2	0.00	0.00	0.00
3,720.0	11.69	349.42	3,669.6	503.6	-94.1	512.3	0.00	0.00	0.00
3,760.0	11.69	349.42	3,708.8	511.6	-95.6	520.4	0.00	0.00	0.00
3,800.0	11.69	349.42	3,747.9	519.5	-97.1	528.5	0.00	0.00	0.00
3,840.0	11.69	349.42	3,787.1	527.5	-98.6	536.6	0.00	0.00	0.00
3,880.0	11.69	349.42	3,826.3	535.5	-100.1	544.7	0.00	0.00	0.00
3,920.0	11.69	349.42	3,865.5	543.4	-101.5	552.8	0.00	0.00	0.00
3,960.0	11.69	349.42	3,904.6	551.4	-103.0	560.9	0.00	0.00	0.00
4,000.0	11.69	349.42	3,943.8	559.3	-104.5	569.0	0.00	0.00	0.00
4,040.0	11.69	349.42	3,983.0	567.3	-106.0	577.1	0.00	0.00	0.00
4,080.0	11.69	349.42	4,022.1	575.3	-107.5	585.2	0.00	0.00	0.00
4,120.0	11.69	349.42	4,061.3	583.2	-109.0	593.3	0.00	0.00	0.00

Database:	Landmark	Local Co-ordinate Reference:	Well MLD 13-22
Company:	Sundance Energy, Weld County, CO	TVD Reference:	WELL @ 4933.0ft (Original Well Elev)
Project:	SEC.22-T4N-R68W	MD Reference:	WELL @ 4933.0ft (Original Well Elev)
Site:	HFE 14-22 Pad Sec.22-T4N-R68W	North Reference:	True
Well:	MLD 13-22	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 (4-10-12)		

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)
4,160.0	11.69	349.42	4,100.5	591.2	-110.5	601.4	0.00	0.00	0.00
4,200.0	11.69	349.42	4,139.6	599.2	-112.0	609.5	0.00	0.00	0.00
4,240.0	11.69	349.42	4,178.8	607.1	-113.5	617.7	0.00	0.00	0.00
4,280.0	11.69	349.42	4,218.0	615.1	-114.9	625.8	0.00	0.00	0.00
4,320.0	11.69	349.42	4,257.2	623.1	-116.4	633.9	0.00	0.00	0.00
4,360.0	11.69	349.42	4,296.3	631.0	-117.9	642.0	0.00	0.00	0.00
4,400.0	11.69	349.42	4,335.5	639.0	-119.4	650.1	0.00	0.00	0.00
4,440.0	11.69	349.42	4,374.7	647.0	-120.9	658.2	0.00	0.00	0.00
4,480.0	11.69	349.42	4,413.8	654.9	-122.4	666.3	0.00	0.00	0.00
4,520.0	11.69	349.42	4,453.0	662.9	-123.9	674.4	0.00	0.00	0.00
4,560.0	11.69	349.42	4,492.2	670.9	-125.4	682.5	0.00	0.00	0.00
4,600.0	11.69	349.42	4,531.4	678.8	-126.8	690.6	0.00	0.00	0.00
4,640.0	11.69	349.42	4,570.5	686.8	-128.3	698.7	0.00	0.00	0.00
4,680.0	11.69	349.42	4,609.7	694.8	-129.8	706.8	0.00	0.00	0.00
4,720.0	11.69	349.42	4,648.9	702.7	-131.3	714.9	0.00	0.00	0.00
4,760.0	11.69	349.42	4,688.0	710.7	-132.8	723.0	0.00	0.00	0.00
4,800.0	11.69	349.42	4,727.2	718.7	-134.3	731.1	0.00	0.00	0.00
4,840.0	11.69	349.42	4,766.4	726.6	-135.8	739.2	0.00	0.00	0.00
4,880.0	11.69	349.42	4,805.5	734.6	-137.3	747.3	0.00	0.00	0.00
4,920.0	11.69	349.42	4,844.7	742.6	-138.8	755.4	0.00	0.00	0.00
4,960.0	11.69	349.42	4,883.9	750.5	-140.2	763.5	0.00	0.00	0.00
5,000.0	11.69	349.42	4,923.1	758.5	-141.7	771.6	0.00	0.00	0.00
5,040.0	11.69	349.42	4,962.2	766.5	-143.2	779.7	0.00	0.00	0.00
5,080.0	11.69	349.42	5,001.4	774.4	-144.7	787.8	0.00	0.00	0.00
5,120.0	11.69	349.42	5,040.6	782.4	-146.2	795.9	0.00	0.00	0.00
5,160.0	11.69	349.42	5,079.7	790.4	-147.7	804.0	0.00	0.00	0.00
5,200.0	11.69	349.42	5,118.9	798.3	-149.2	812.1	0.00	0.00	0.00
5,200.7	11.69	349.42	5,119.6	798.5	-149.2	812.3	0.00	0.00	0.00
5,240.0	10.90	349.42	5,158.1	806.0	-150.6	820.0	2.00	-2.00	0.00
5,280.0	10.10	349.42	5,197.5	813.2	-152.0	827.3	2.00	-2.00	0.00
5,320.0	9.30	349.42	5,236.9	819.8	-153.2	834.0	2.00	-2.00	0.00
5,360.0	8.50	349.42	5,276.4	825.9	-154.3	840.2	2.00	-2.00	0.00
5,400.0	7.70	349.42	5,316.0	831.4	-155.4	845.8	2.00	-2.00	0.00
5,440.0	6.90	349.42	5,355.7	836.4	-156.3	850.9	2.00	-2.00	0.00
5,480.0	6.10	349.42	5,395.4	840.9	-157.1	855.5	2.00	-2.00	0.00
5,520.0	5.30	349.42	5,435.2	844.8	-157.9	859.4	2.00	-2.00	0.00
5,560.0	4.50	349.42	5,475.1	848.2	-158.5	862.8	2.00	-2.00	0.00
5,600.0	3.70	349.42	5,515.0	851.0	-159.0	865.7	2.00	-2.00	0.00
5,640.0	2.90	349.42	5,554.9	853.2	-159.4	868.0	2.00	-2.00	0.00
5,680.0	2.10	349.42	5,594.9	855.0	-159.8	869.8	2.00	-2.00	0.00
5,720.0	1.30	349.42	5,634.9	856.1	-160.0	870.9	2.00	-2.00	0.00
5,760.0	0.50	349.42	5,674.8	856.7	-160.1	871.6	2.00	-2.00	0.00
5,785.2	0.00	0.00	5,700.0	856.9	-160.1	871.7	2.00	-2.00	0.00
TARGET BHL 1980'FSL, 660'FWL									
5,800.0	0.00	0.00	5,714.8	856.9	-160.1	871.7	0.00	0.00	0.00
5,840.0	0.00	0.00	5,754.8	856.9	-160.1	871.7	0.00	0.00	0.00
5,880.0	0.00	0.00	5,794.8	856.9	-160.1	871.7	0.00	0.00	0.00
5,920.0	0.00	0.00	5,834.8	856.9	-160.1	871.7	0.00	0.00	0.00
5,960.0	0.00	0.00	5,874.8	856.9	-160.1	871.7	0.00	0.00	0.00
6,000.0	0.00	0.00	5,914.8	856.9	-160.1	871.7	0.00	0.00	0.00
6,040.0	0.00	0.00	5,954.8	856.9	-160.1	871.7	0.00	0.00	0.00
6,080.0	0.00	0.00	5,994.8	856.9	-160.1	871.7	0.00	0.00	0.00
6,120.0	0.00	0.00	6,034.8	856.9	-160.1	871.7	0.00	0.00	0.00
6,160.0	0.00	0.00	6,074.8	856.9	-160.1	871.7	0.00	0.00	0.00

Database:	Landmark	Local Co-ordinate Reference:	Well MLD 13-22
Company:	Sundance Energy, Weld County, CO	TVD Reference:	WELL @ 4933.0ft (Original Well Elev)
Project:	SEC.22-T4N-R68W	MD Reference:	WELL @ 4933.0ft (Original Well Elev)
Site:	HFE 14-22 Pad Sec.22-T4N-R68W	North Reference:	True
Well:	MLD 13-22	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 (4-10-12)		

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)
6,200.0	0.00	0.00	6,114.8	856.9	-160.1	871.7	0.00	0.00	0.00
6,240.0	0.00	0.00	6,154.8	856.9	-160.1	871.7	0.00	0.00	0.00
6,280.0	0.00	0.00	6,194.8	856.9	-160.1	871.7	0.00	0.00	0.00
6,320.0	0.00	0.00	6,234.8	856.9	-160.1	871.7	0.00	0.00	0.00
6,360.0	0.00	0.00	6,274.8	856.9	-160.1	871.7	0.00	0.00	0.00
6,400.0	0.00	0.00	6,314.8	856.9	-160.1	871.7	0.00	0.00	0.00
6,440.0	0.00	0.00	6,354.8	856.9	-160.1	871.7	0.00	0.00	0.00
6,480.0	0.00	0.00	6,394.8	856.9	-160.1	871.7	0.00	0.00	0.00
6,520.0	0.00	0.00	6,434.8	856.9	-160.1	871.7	0.00	0.00	0.00
6,560.0	0.00	0.00	6,474.8	856.9	-160.1	871.7	0.00	0.00	0.00
6,585.2	0.00	0.00	6,500.0	856.9	-160.1	871.7	0.00	0.00	0.00
NIOBRARA - LEGAL BOX 400' X 400' 1990'FSL & 664'FWL - TARGET CIRCLE 1980'FSL & 660'FWL									
6,600.0	0.00	0.00	6,514.8	856.9	-160.1	871.7	0.00	0.00	0.00
6,640.0	0.00	0.00	6,554.8	856.9	-160.1	871.7	0.00	0.00	0.00
6,680.0	0.00	0.00	6,594.8	856.9	-160.1	871.7	0.00	0.00	0.00
6,720.0	0.00	0.00	6,634.8	856.9	-160.1	871.7	0.00	0.00	0.00
6,760.0	0.00	0.00	6,674.8	856.9	-160.1	871.7	0.00	0.00	0.00
6,800.0	0.00	0.00	6,714.8	856.9	-160.1	871.7	0.00	0.00	0.00
6,840.0	0.00	0.00	6,754.8	856.9	-160.1	871.7	0.00	0.00	0.00
6,880.0	0.00	0.00	6,794.8	856.9	-160.1	871.7	0.00	0.00	0.00
6,920.0	0.00	0.00	6,834.8	856.9	-160.1	871.7	0.00	0.00	0.00
6,945.2	0.00	0.00	6,860.0	856.9	-160.1	871.7	0.00	0.00	0.00
CODELL									
6,960.0	0.00	0.00	6,874.8	856.9	-160.1	871.7	0.00	0.00	0.00
7,000.0	0.00	0.00	6,914.8	856.9	-160.1	871.7	0.00	0.00	0.00
7,040.0	0.00	0.00	6,954.8	856.9	-160.1	871.7	0.00	0.00	0.00
7,080.0	0.00	0.00	6,994.8	856.9	-160.1	871.7	0.00	0.00	0.00
7,120.0	0.00	0.00	7,034.8	856.9	-160.1	871.7	0.00	0.00	0.00
7,160.0	0.00	0.00	7,074.8	856.9	-160.1	871.7	0.00	0.00	0.00
7,200.0	0.00	0.00	7,114.8	856.9	-160.1	871.7	0.00	0.00	0.00
7,240.0	0.00	0.00	7,154.8	856.9	-160.1	871.7	0.00	0.00	0.00
7,280.0	0.00	0.00	7,194.8	856.9	-160.1	871.7	0.00	0.00	0.00
7,320.0	0.00	0.00	7,234.8	856.9	-160.1	871.7	0.00	0.00	0.00
7,360.0	0.00	0.00	7,274.8	856.9	-160.1	871.7	0.00	0.00	0.00
7,395.2	0.00	0.00	7,310.0	856.9	-160.1	871.7	0.00	0.00	0.00
J-SAND									
7,400.0	0.00	0.00	7,314.8	856.9	-160.1	871.7	0.00	0.00	0.00
7,440.0	0.00	0.00	7,354.8	856.9	-160.1	871.7	0.00	0.00	0.00
7,480.0	0.00	0.00	7,394.8	856.9	-160.1	871.7	0.00	0.00	0.00
7,520.0	0.00	0.00	7,434.8	856.9	-160.1	871.7	0.00	0.00	0.00
7,560.0	0.00	0.00	7,474.8	856.9	-160.1	871.7	0.00	0.00	0.00
7,585.2	0.00	0.00	7,500.0	856.9	-160.1	871.7	0.00	0.00	0.00

Casing Points				
Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (")	Hole Diameter (")
500.0	500.0	8 5/8"	8-5/8	12-1/4

Database:	Landmark	Local Co-ordinate Reference:	Well MLD 13-22
Company:	Sundance Energy, Weld County, CO	TVD Reference:	WELL @ 4933.0ft (Original Well Elev)
Project:	SEC.22-T4N-R68W	MD Reference:	WELL @ 4933.0ft (Original Well Elev)
Site:	HFE 14-22 Pad Sec.22-T4N-R68W	North Reference:	True
Well:	MLD 13-22	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 (4-10-12)		

Formations						
	Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
	6,585.2	6,500.0	NIOBRARA		0.00	
	6,945.2	6,860.0	CODELL		0.00	
	7,395.2	7,310.0	J-SAND		0.00	



Directional

Sundance Energy, Weld County, CO

SEC.22-T4N-R68W

HFE 14-22 Pad Sec.22-T4N-R68W

MLD 13-22

Wellbore #1

Plan #1 (4-10-12)

Anticollision Report

11 April, 2012

Company:	Sundance Energy, Weld County, CO	Local Co-ordinate Reference:	Well MLD 13-22
Project:	SEC.22-T4N-R68W	TVD Reference:	WELL @ 4933.0ft (Original Well Elev)
Reference Site:	HFE 14-22 Pad Sec.22-T4N-R68W	MD Reference:	WELL @ 4933.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	MLD 13-22	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 (4-10-12)	Offset TVD Reference:	Offset Datum

Reference	Plan #1 (4-10-12)		
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 4/11/2012			
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description
0.0	7,585.2	Plan #1 (4-10-12) (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						
HFE 14-22 Pad Sec.22-T4N-R68W						
HFE 14-22 - Wellbore #1 - Plan #1 (4-10-12)	700.0	700.0	14.8	11.9	5.061	CC, ES
HFE 14-22 - Wellbore #1 - Plan #1 (4-10-12)	800.0	799.8	15.4	12.1	4.611	SF
MLD 23-22 - Wellbore #1 - Plan #1 (4-10-12)	400.0	400.0	15.1	13.5	9.577	CC, ES
MLD 23-22 - Wellbore #1 - Plan #1 (4-10-12)	500.0	499.5	16.5	14.5	8.179	SF

Offset Design		HFE 14-22 Pad Sec.22-T4N-R68W - HFE 14-22 - Wellbore #1 - Plan #1 (4-10-12)										Offset Site Error:		0.0 ft	
Survey Program: 0-MWD												Offset Well Error:		0.0 ft	
Reference		Offset		Semi Major Axis			Distance								
Measured Depth	Vertical Depth	Measured Depth	Vertical Depth	Reference	Offset	Highside Toolface	Offset Wellbore Centre		Between Centres	Between Ellipses	Minimum Separation	Separation Factor	Warning		
(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(°)	+N/-S (ft)	+E/-W (ft)	(ft)	(ft)	(ft)				
0.0	0.0	0.0	0.0	0.0	0.0	-91.40	-0.4	-14.8	14.8	14.8	0.00	N/A			
100.0	100.0	100.0	100.0	0.1	0.1	-91.40	-0.4	-14.8	14.8	14.6	0.22	65.797			
200.0	200.0	200.0	200.0	0.3	0.3	-91.40	-0.4	-14.8	14.8	14.1	0.67	21.932			
300.0	300.0	300.0	300.0	0.6	0.6	-91.40	-0.4	-14.8	14.8	13.7	1.12	13.159			
400.0	400.0	400.0	400.0	0.8	0.8	-91.40	-0.4	-14.8	14.8	13.2	1.57	9.400			
500.0	500.0	500.0	500.0	1.0	1.0	-91.40	-0.4	-14.8	14.8	12.8	2.02	7.311			
600.0	600.0	600.0	600.0	1.2	1.2	-91.40	-0.4	-14.8	14.8	12.3	2.47	5.982			
700.0	700.0	700.0	700.0	1.5	1.5	-91.40	-0.4	-14.8	14.8	11.9	2.92	5.061	CC, ES		
800.0	800.0	799.8	799.8	1.7	1.7	-97.55	-2.0	-15.3	15.4	12.1	3.34	4.611	SF		
900.0	900.0	899.4	899.2	1.9	1.8	-112.69	-7.0	-16.8	18.2	14.4	3.75	4.850			
1,000.0	1,000.0	998.3	997.7	2.1	2.0	-121.16	-15.2	-19.2	25.5	21.3	4.17	6.103			
1,100.0	1,099.8	1,095.8	1,094.5	2.4	2.3	-136.47	-26.5	-22.6	39.9	35.3	4.61	8.665			
1,200.0	1,199.5	1,191.5	1,189.0	2.6	2.5	-145.64	-40.7	-26.8	61.8	56.8	5.05	12.242			
1,300.0	1,298.7	1,287.4	1,283.6	2.8	2.8	-151.09	-56.2	-31.4	89.0	83.5	5.49	16.218			
1,400.0	1,397.5	1,382.4	1,377.2	3.1	3.1	-154.61	-71.7	-36.0	119.5	113.6	5.91	20.218			
1,484.4	1,480.4	1,461.7	1,455.4	3.4	3.4	-156.78	-84.5	-39.8	147.9	141.7	6.27	23.583			
1,500.0	1,495.6	1,476.3	1,469.8	3.4	3.4	-157.16	-86.9	-40.5	153.4	147.1	6.34	24.187			
1,600.0	1,593.6	1,569.8	1,561.9	3.8	3.8	-159.09	-102.1	-45.0	188.6	181.8	6.79	27.762			
1,700.0	1,691.5	1,663.2	1,654.0	4.1	4.1	-160.42	-117.2	-49.5	223.9	216.6	7.25	30.864			
1,800.0	1,789.4	1,756.7	1,746.1	4.5	4.4	-161.38	-132.4	-54.0	259.2	251.5	7.72	33.589			
1,900.0	1,887.3	1,850.1	1,838.2	4.9	4.8	-162.11	-147.6	-58.5	294.6	286.5	8.19	35.984			
2,000.0	1,985.3	1,943.6	1,930.3	5.3	5.1	-162.69	-162.8	-63.0	330.1	321.4	8.66	38.100			
2,100.0	2,083.2	2,037.0	2,022.4	5.7	5.5	-163.15	-177.9	-67.5	365.6	356.4	9.14	39.981			

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

Company:	Sundance Energy, Weld County, CO	Local Co-ordinate Reference:	Well MLD 13-22
Project:	SEC.22-T4N-R68W	TVD Reference:	WELL @ 4933.0ft (Original Well Elev)
Reference Site:	HFE 14-22 Pad Sec.22-T4N-R68W	MD Reference:	WELL @ 4933.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	MLD 13-22	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 (4-10-12)	Offset TVD Reference:	Offset Datum

Offset Design HFE 14-22 Pad Sec.22-T4N-R68W - HFE 14-22 - Wellbore #1 - Plan #1 (4-10-12)													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		
2,200.0	2,181.1	2,130.5	2,114.5	6.1	5.8	-163.53	-193.1	-72.0	401.1	391.4	9.63	41.662		
2,300.0	2,279.0	2,224.0	2,206.7	6.5	6.2	-163.85	-208.3	-76.5	436.6	426.5	10.11	43.170		
2,400.0	2,377.0	2,317.4	2,298.8	6.9	6.5	-164.13	-223.4	-81.0	472.1	461.5	10.60	44.531		
2,500.0	2,474.9	2,410.9	2,390.9	7.3	6.9	-164.36	-238.6	-85.5	507.6	496.5	11.09	45.764		
2,600.0	2,572.8	2,504.3	2,483.0	7.7	7.3	-164.56	-253.8	-90.1	543.1	531.5	11.58	46.884		
2,700.0	2,670.7	2,597.8	2,575.1	8.1	7.6	-164.74	-268.9	-94.6	578.7	566.6	12.08	47.907		
2,800.0	2,768.7	2,691.3	2,667.2	8.6	8.0	-164.90	-284.1	-99.1	614.2	601.6	12.57	48.844		
2,900.0	2,866.6	2,784.7	2,759.3	9.0	8.3	-165.04	-299.3	-103.6	649.7	636.7	13.07	49.705		
3,000.0	2,964.5	2,878.2	2,851.4	9.4	8.7	-165.17	-314.5	-108.1	685.3	671.7	13.57	50.498		
3,100.0	3,062.5	2,971.6	2,943.5	9.8	9.1	-165.28	-329.6	-112.6	720.8	706.8	14.07	51.232		
3,200.0	3,160.4	3,065.1	3,035.6	10.2	9.4	-165.38	-344.8	-117.1	756.4	741.8	14.57	51.911		
3,300.0	3,258.3	3,158.6	3,127.7	10.7	9.8	-165.47	-360.0	-121.6	791.9	776.9	15.07	52.543		
3,400.0	3,356.2	3,252.0	3,219.9	11.1	10.2	-165.56	-375.1	-126.1	827.5	811.9	15.57	53.131		
3,500.0	3,454.2	3,345.5	3,312.0	11.5	10.5	-165.64	-390.3	-130.6	863.1	847.0	16.08	53.680		
3,600.0	3,552.1	3,438.9	3,404.1	12.0	10.9	-165.71	-405.5	-135.1	898.6	882.0	16.58	54.194		
3,700.0	3,650.0	3,532.4	3,496.2	12.4	11.3	-165.78	-420.6	-139.6	934.2	917.1	17.09	54.675		
3,800.0	3,747.9	3,662.3	3,624.6	12.8	11.7	-165.89	-439.7	-145.3	968.3	950.7	17.64	54.897		
3,900.0	3,845.9	3,805.6	3,767.0	13.3	12.0	-166.11	-454.3	-149.6	998.0	979.9	18.19	54.872		
4,000.0	3,943.8	3,952.8	3,914.0	13.7	12.2	-166.41	-462.1	-151.9	1,023.0	1,004.3	18.73	54.627		
4,100.0	4,041.7	4,080.6	4,041.7	14.1	12.4	-166.73	-463.4	-152.3	1,043.6	1,024.4	19.23	54.273		
4,200.0	4,139.6	4,178.5	4,139.6	14.5	12.6	-166.98	-463.4	-152.3	1,063.3	1,043.7	19.67	54.043		
4,300.0	4,237.6	4,276.4	4,237.6	15.0	12.7	-167.22	-463.4	-152.3	1,083.1	1,063.0	20.12	53.833		
4,400.0	4,335.5	4,374.3	4,335.5	15.4	12.8	-167.45	-463.4	-152.3	1,102.9	1,082.3	20.57	53.626		
4,500.0	4,433.4	4,472.3	4,433.4	15.8	13.0	-167.68	-463.4	-152.3	1,122.7	1,101.7	21.01	53.425		
4,600.0	4,531.4	4,570.2	4,531.4	16.3	13.1	-167.89	-463.4	-152.3	1,142.5	1,121.0	21.46	53.230		
4,700.0	4,629.3	4,668.1	4,629.3	16.7	13.2	-168.10	-463.4	-152.3	1,162.3	1,140.4	21.91	53.041		
4,800.0	4,727.2	4,766.0	4,727.2	17.1	13.4	-168.31	-463.4	-152.3	1,182.2	1,159.8	22.37	52.857		
4,900.0	4,825.1	4,864.0	4,825.1	17.6	13.5	-168.50	-463.4	-152.3	1,202.0	1,179.2	22.82	52.679		
5,000.0	4,923.1	4,961.9	4,923.1	18.0	13.7	-168.69	-463.4	-152.3	1,221.9	1,198.6	23.27	52.507		
5,100.0	5,021.0	5,059.8	5,021.0	18.4	13.8	-168.87	-463.4	-152.3	1,241.8	1,218.1	23.73	52.339		
5,200.7	5,119.6	5,158.5	5,119.6	18.9	13.9	-169.05	-463.4	-152.3	1,261.9	1,237.7	24.19	52.175		
5,300.0	5,217.2	5,256.0	5,217.2	19.2	14.1	-169.28	-463.4	-152.3	1,280.0	1,255.3	24.70	51.814		
5,400.0	5,316.0	5,354.8	5,316.0	19.5	14.3	-169.46	-463.4	-152.3	1,294.8	1,269.7	25.17	51.452		
5,500.0	5,415.3	5,454.2	5,415.3	19.8	14.4	-169.59	-463.4	-152.3	1,306.3	1,280.7	25.60	51.034		
5,600.0	5,515.0	5,553.8	5,515.0	20.0	14.6	-169.69	-463.4	-152.3	1,314.4	1,288.4	25.99	50.564		
5,700.0	5,614.9	5,653.7	5,614.9	20.1	14.7	-169.74	-463.4	-152.3	1,319.0	1,292.7	26.36	50.043		
5,785.2	5,700.0	5,738.8	5,700.0	20.3	14.9	179.66	-463.4	-152.3	1,320.3	1,293.6	26.64	49.561		
5,800.0	5,714.8	5,753.7	5,714.8	20.3	14.9	179.66	-463.4	-152.3	1,320.3	1,293.6	26.69	49.459		
5,900.0	5,814.8	5,853.7	5,814.8	20.4	15.1	179.66	-463.4	-152.3	1,320.3	1,293.2	27.09	48.741		
6,000.0	5,914.8	5,953.7	5,914.8	20.5	15.2	179.66	-463.4	-152.3	1,320.3	1,292.8	27.48	48.041		
6,100.0	6,014.8	6,053.7	6,014.8	20.7	15.4	179.66	-463.4	-152.3	1,320.3	1,292.4	27.88	47.358		
6,200.0	6,114.8	6,153.7	6,114.8	20.8	15.6	179.66	-463.4	-152.3	1,320.3	1,292.0	28.28	46.691		
6,300.0	6,214.8	6,253.7	6,214.8	21.0	15.7	179.66	-463.4	-152.3	1,320.3	1,291.6	28.68	46.041		
6,400.0	6,314.8	6,353.7	6,314.8	21.1	15.9	179.66	-463.4	-152.3	1,320.3	1,291.2	29.08	45.406		
6,500.0	6,414.8	6,453.7	6,414.8	21.2	16.1	179.66	-463.4	-152.3	1,320.3	1,290.8	29.48	44.786		
6,600.0	6,514.8	6,553.7	6,514.8	21.4	16.2	179.66	-463.4	-152.3	1,320.3	1,290.4	29.88	44.181		
6,700.0	6,614.8	6,653.7	6,614.8	21.5	16.4	179.66	-463.4	-152.3	1,320.3	1,290.0	30.29	43.590		
6,800.0	6,714.8	6,753.7	6,714.8	21.7	16.6	179.66	-463.4	-152.3	1,320.3	1,289.6	30.69	43.013		
6,900.0	6,814.8	6,853.7	6,814.8	21.8	16.8	179.66	-463.4	-152.3	1,320.3	1,289.2	31.10	42.450		
7,000.0	6,914.8	6,953.7	6,914.8	22.0	17.0	179.66	-463.4	-152.3	1,320.3	1,288.8	31.51	41.899		
7,100.0	7,014.8	7,053.7	7,014.8	22.1	17.1	179.66	-463.4	-152.3	1,320.3	1,288.3	31.92	41.362		
7,200.0	7,114.8	7,153.7	7,114.8	22.3	17.3	179.66	-463.4	-152.3	1,320.3	1,287.9	32.33	40.836		

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

Company:	Sundance Energy, Weld County, CO	Local Co-ordinate Reference:	Well MLD 13-22
Project:	SEC.22-T4N-R68W	TVD Reference:	WELL @ 4933.0ft (Original Well Elev)
Reference Site:	HFE 14-22 Pad Sec.22-T4N-R68W	MD Reference:	WELL @ 4933.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	MLD 13-22	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 (4-10-12)	Offset TVD Reference:	Offset Datum

Offset Design HFE 14-22 Pad Sec.22-T4N-R68W - HFE 14-22 - Wellbore #1 - Plan #1 (4-10-12)												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)	Offset Wellbore Centre +E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
7,300.0	7,214.8	7,253.7	7,214.8	22.4	17.5	179.66	-463.4	-152.3	1,320.3	1,287.5	32.74	40.323	
7,400.0	7,314.8	7,353.7	7,314.8	22.6	17.7	179.66	-463.4	-152.3	1,320.3	1,287.1	33.16	39.821	
7,500.0	7,414.8	7,453.7	7,414.8	22.7	17.9	179.66	-463.4	-152.3	1,320.3	1,286.7	33.57	39.330	
7,585.2	7,500.0	7,538.8	7,500.0	22.9	18.0	179.66	-463.4	-152.3	1,320.3	1,286.3	33.92	38.921	

HFE 14-22 Pad Sec.22-T4N-R68W - MLD 23-22 - Wellbore #1 - Plan #1 (4-10-12)													Offset Site Error:	0.0 ft
Survey Program: 0-MWD													Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis			Distance							
Measured Depth	Vertical Depth	Measured Depth	Vertical Depth	Reference	Offset	Highside Toolface	Offset Wellbore Centre		Between Centres	Between Ellipses	Minimum Separation	Separation Factor	Warning	
(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(°)	+N/-S (ft)	+E/-W (ft)	(ft)	(ft)	(ft)			
0.0	0.0	0.0	0.0	0.0	0.0	88.61	0.4	15.1	15.1	15.1	0.00	N/A		
100.0	100.0	100.0	100.0	0.1	0.1	88.61	0.4	15.1	15.1	14.8	0.22	67.039		
200.0	200.0	200.0	200.0	0.3	0.3	88.61	0.4	15.1	15.1	14.4	0.67	22.346		
300.0	300.0	300.0	300.0	0.6	0.6	88.61	0.4	15.1	15.1	13.9	1.12	13.408		
400.0	400.0	400.0	400.0	0.8	0.8	88.61	0.4	15.1	15.1	13.5	1.57	9.577 CC, ES		
500.0	500.0	499.5	499.5	1.0	1.0	85.05	1.4	16.4	16.5	14.5	2.02	8.179 SF		
600.0	600.0	598.8	598.7	1.2	1.2	77.40	4.6	20.5	21.1	18.6	2.46	8.551		
700.0	700.0	697.7	697.1	1.5	1.5	70.20	9.8	27.3	29.1	26.2	2.92	9.988		
800.0	800.0	795.8	794.5	1.7	1.7	65.02	17.1	36.6	40.8	37.4	3.38	12.083		
900.0	900.0	893.0	890.5	1.9	2.0	61.57	26.3	48.5	56.0	52.1	3.84	14.575		
1,000.0	1,000.0	989.2	985.0	2.1	2.4	70.78	37.3	62.8	74.0	69.7	4.30	17.227		
1,100.0	1,099.8	1,084.3	1,077.8	2.4	2.7	71.48	50.2	79.4	94.2	89.4	4.76	19.770		
1,200.0	1,199.5	1,178.3	1,168.8	2.6	3.2	73.10	64.7	98.2	116.5	111.3	5.25	22.204		
1,300.0	1,298.7	1,271.0	1,257.7	2.8	3.7	75.07	80.8	119.0	141.2	135.4	5.76	24.502		
1,400.0	1,397.5	1,363.5	1,345.5	3.1	4.2	77.16	98.6	141.9	168.2	161.9	6.32	26.591		
1,484.4	1,480.4	1,444.3	1,422.0	3.4	4.7	79.14	114.5	162.5	191.4	184.6	6.85	27.947		
1,500.0	1,495.6	1,459.2	1,436.1	3.4	4.8	79.60	117.5	166.3	195.7	188.7	6.95	28.152		
1,600.0	1,593.6	1,554.9	1,526.7	3.8	5.4	82.12	136.4	190.7	223.4	215.7	7.63	29.259		
1,700.0	1,691.5	1,650.6	1,617.2	4.1	6.0	84.09	155.2	215.1	251.4	243.0	8.35	30.092		
1,800.0	1,789.4	1,746.3	1,707.8	4.5	6.6	85.66	174.1	239.5	279.6	270.5	9.10	30.725		
1,900.0	1,887.3	1,841.9	1,798.4	4.9	7.2	86.95	193.0	263.9	308.0	298.1	9.87	31.211		
2,000.0	1,985.3	1,937.6	1,888.9	5.3	7.8	88.01	211.9	288.3	336.5	325.8	10.65	31.590		
2,100.0	2,083.2	2,033.3	1,979.5	5.7	8.4	88.92	230.8	312.6	365.1	353.6	11.45	31.888		
2,200.0	2,181.1	2,129.0	2,070.1	6.1	9.0	89.69	249.7	337.0	393.7	381.5	12.26	32.126		
2,300.0	2,279.0	2,224.7	2,160.6	6.5	9.7	90.35	268.5	361.4	422.4	409.4	13.07	32.318		
2,400.0	2,377.0	2,320.3	2,251.2	6.9	10.3	90.94	287.4	385.8	451.2	437.3	13.89	32.474		
2,500.0	2,474.9	2,416.0	2,341.8	7.3	10.9	91.45	306.3	410.2	480.0	465.3	14.72	32.603		
2,600.0	2,572.8	2,511.7	2,432.4	7.7	11.5	91.90	325.2	434.6	508.8	493.3	15.56	32.711		
2,700.0	2,670.7	2,607.4	2,522.9	8.1	12.2	92.31	344.1	459.0	537.7	521.3	16.39	32.800		
2,800.0	2,768.7	2,703.1	2,613.5	8.6	12.8	92.67	363.0	483.4	566.6	549.3	17.23	32.876		
2,900.0	2,866.6	2,798.7	2,704.1	9.0	13.4	93.00	381.9	507.8	595.5	577.4	18.08	32.941		
3,000.0	2,964.5	2,894.4	2,794.6	9.4	14.1	93.30	400.7	532.2	624.4	605.5	18.92	32.996		
3,100.0	3,062.5	2,990.1	2,885.2	9.8	14.7	93.57	419.6	556.5	653.3	633.6	19.77	33.043		
3,200.0	3,160.4	3,085.8	2,975.8	10.2	15.3	93.82	438.5	580.9	682.3	661.6	20.62	33.084		
3,300.0	3,258.3	3,181.5	3,066.4	10.7	15.9	94.05	457.4	605.3	711.2	689.7	21.47	33.120		
3,400.0	3,356.2	3,277.1	3,156.9	11.1	16.6	94.26	476.3	629.7	740.2	717.9	22.33	33.151		
3,500.0	3,454.2	3,372.8	3,247.5	11.5	17.2	94.45	495.2	654.1	769.2	746.0	23.18	33.178		
3,600.0	3,552.1	3,468.5	3,338.1	12.0	17.8	94.64	514.0	678.5	798.1	774.1	24.04	33.202		
3,700.0	3,650.0	3,564.2	3,428.6	12.4	18.5	94.80	532.9	702.9	827.1	802.2	24.90	33.223		
3,800.0	3,747.9	3,659.9	3,519.2	12.8	19.1	94.96	551.8	727.3	856.1	830.4	25.75	33.242		
3,900.0	3,845.9	3,755.5	3,609.8	13.3	19.7	95.11	570.7	751.7	885.1	858.5	26.61	33.259		
4,000.0	3,943.8	3,851.2	3,700.3	13.7	20.4	95.24	589.6	776.1	914.1	886.6	27.47	33.274		
4,100.0	4,041.7	3,946.9	3,790.9	14.1	21.0	95.37	608.5	800.5	943.1	914.8	28.33	33.287		
4,200.0	4,139.6	4,042.6	3,881.5	14.5	21.6	95.49	627.4	824.8	972.1	942.9	29.19	33.299		
4,300.0	4,237.6	4,138.3	3,972.1	15.0	22.3	95.61	646.2	849.2	1,001.1	971.1	30.06	33.309		
4,400.0	4,335.5	4,233.9	4,062.6	15.4	22.9	95.72	665.1	873.6	1,030.2	999.2	30.92	33.319		
4,500.0	4,433.4	4,329.6	4,153.2	15.8	23.5	95.82	684.0	898.0	1,059.2	1,027.4	31.78	33.327		
4,600.0	4,531.4	4,425.3	4,243.8	16.3	24.2	95.91	702.9	922.4	1,088.2	1,055.6	32.64	33.335		
4,700.0	4,629.3	4,521.0	4,334.3	16.7	24.8	96.01	721.8	946.8	1,117.2	1,083.7	33.51	33.342		
4,800.0	4,727.2	4,616.7	4,424.9	17.1	25.4	96.09	740.7	971.2	1,146.3	1,111.9	34.37	33.348		
4,900.0	4,825.1	4,712.3	4,515.5	17.6	26.0	96.18	759.6	995.6	1,175.3	1,140.1	35.24	33.354		
5,000.0	4,923.1	4,808.0	4,606.1	18.0	26.7	96.25	778.4	1,020.0	1,204.3	1,168.2	36.10	33.359		

Company:	Sundance Energy, Weld County, CO	Local Co-ordinate Reference:	Well MLD 13-22
Project:	SEC.22-T4N-R68W	TVD Reference:	WELL @ 4933.0ft (Original Well Elev)
Reference Site:	HFE 14-22 Pad Sec.22-T4N-R68W	MD Reference:	WELL @ 4933.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	MLD 13-22	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 (4-10-12)	Offset TVD Reference:	Offset Datum

Offset Design HFE 14-22 Pad Sec.22-T4N-R68W - MLD 23-22 - Wellbore #1 - Plan #1 (4-10-12)												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
5,100.0	5,021.0	4,915.3	4,707.6	18.4	27.4	96.34	799.5	1,047.2	1,233.3	1,196.3	37.00	33.331	
5,200.7	5,119.6	5,065.8	4,851.9	18.9	28.1	96.61	825.9	1,081.3	1,259.6	1,221.6	38.00	33.146	
5,300.0	5,217.2	5,217.2	4,998.9	19.2	28.7	97.39	847.7	1,109.4	1,281.1	1,242.1	39.01	32.844	
5,400.0	5,316.0	5,372.2	5,151.3	19.5	29.2	98.03	865.1	1,131.9	1,298.2	1,258.3	39.85	32.574	
5,500.0	5,415.3	5,529.2	5,307.0	19.8	29.6	98.55	877.6	1,148.0	1,310.4	1,269.9	40.57	32.300	
5,600.0	5,515.0	5,687.5	5,464.8	20.0	29.8	98.95	884.8	1,157.3	1,317.7	1,276.6	41.15	32.022	
5,700.0	5,614.9	5,837.6	5,614.9	20.1	30.0	99.23	886.8	1,159.9	1,320.1	1,278.5	41.58	31.749	
5,785.2	5,700.0	5,922.7	5,700.0	20.3	30.1	88.70	886.8	1,159.9	1,320.3	1,278.5	41.81	31.579	
5,800.0	5,714.8	5,937.6	5,714.8	20.3	30.1	88.70	886.8	1,159.9	1,320.3	1,278.5	41.85	31.552	
5,900.0	5,814.8	6,037.6	5,814.8	20.4	30.2	88.70	886.8	1,159.9	1,320.3	1,278.2	42.10	31.365	
6,000.0	5,914.8	6,137.6	5,914.8	20.5	30.3	88.70	886.8	1,159.9	1,320.3	1,278.0	42.35	31.177	
6,100.0	6,014.8	6,237.6	6,014.8	20.7	30.4	88.70	886.8	1,159.9	1,320.3	1,277.7	42.61	30.989	
6,200.0	6,114.8	6,337.6	6,114.8	20.8	30.5	88.70	886.8	1,159.9	1,320.3	1,277.4	42.87	30.801	
6,300.0	6,214.8	6,437.6	6,214.8	21.0	30.5	88.70	886.8	1,159.9	1,320.3	1,277.2	43.13	30.614	
6,400.0	6,314.8	6,537.6	6,314.8	21.1	30.6	88.70	886.8	1,159.9	1,320.3	1,276.9	43.39	30.426	
6,500.0	6,414.8	6,637.6	6,414.8	21.2	30.7	88.70	886.8	1,159.9	1,320.3	1,276.6	43.66	30.239	
6,600.0	6,514.8	6,737.6	6,514.8	21.4	30.8	88.70	886.8	1,159.9	1,320.3	1,276.4	43.93	30.052	
6,700.0	6,614.8	6,837.6	6,614.8	21.5	30.9	88.70	886.8	1,159.9	1,320.3	1,276.1	44.21	29.865	
6,800.0	6,714.8	6,937.6	6,714.8	21.7	31.0	88.70	886.8	1,159.9	1,320.3	1,275.8	44.49	29.678	
6,900.0	6,814.8	7,037.6	6,814.8	21.8	31.1	88.70	886.8	1,159.9	1,320.3	1,275.5	44.77	29.493	
7,000.0	6,914.8	7,137.6	6,914.8	22.0	31.2	88.70	886.8	1,159.9	1,320.3	1,275.3	45.05	29.307	
7,100.0	7,014.8	7,237.6	7,014.8	22.1	31.4	88.70	886.8	1,159.9	1,320.3	1,275.0	45.34	29.123	
7,200.0	7,114.8	7,337.6	7,114.8	22.3	31.5	88.70	886.8	1,159.9	1,320.3	1,274.7	45.62	28.938	
7,300.0	7,214.8	7,437.6	7,214.8	22.4	31.6	88.70	886.8	1,159.9	1,320.3	1,274.4	45.92	28.755	
7,400.0	7,314.8	7,537.6	7,314.8	22.6	31.7	88.70	886.8	1,159.9	1,320.3	1,274.1	46.21	28.572	
7,500.0	7,414.8	7,637.6	7,414.8	22.7	31.8	88.70	886.8	1,159.9	1,320.3	1,273.8	46.51	28.391	
7,585.2	7,500.0	7,722.7	7,500.0	22.9	31.9	88.70	886.8	1,159.9	1,320.3	1,273.6	46.76	28.236	

Company:	Sundance Energy, Weld County, CO	Local Co-ordinate Reference:	Well MLD 13-22
Project:	SEC.22-T4N-R68W	TVD Reference:	WELL @ 4933.0ft (Original Well Elev)
Reference Site:	HFE 14-22 Pad Sec.22-T4N-R68W	MD Reference:	WELL @ 4933.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	MLD 13-22	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 (4-10-12)	Offset TVD Reference:	Offset Datum

Reference Depths are relative to WELL @ 4933.0ft (Original Well Elev) Coordinates are relative to: MLD 13-22
 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: 0.33°



Company:	Sundance Energy, Weld County, CO	Local Co-ordinate Reference:	Well MLD 13-22
Project:	SEC.22-T4N-R68W	TVD Reference:	WELL @ 4933.0ft (Original Well Elev)
Reference Site:	HFE 14-22 Pad Sec.22-T4N-R68W	MD Reference:	WELL @ 4933.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	MLD 13-22	Survey Calculation Method:	Minimum Curvature
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