ENSIGN Directional

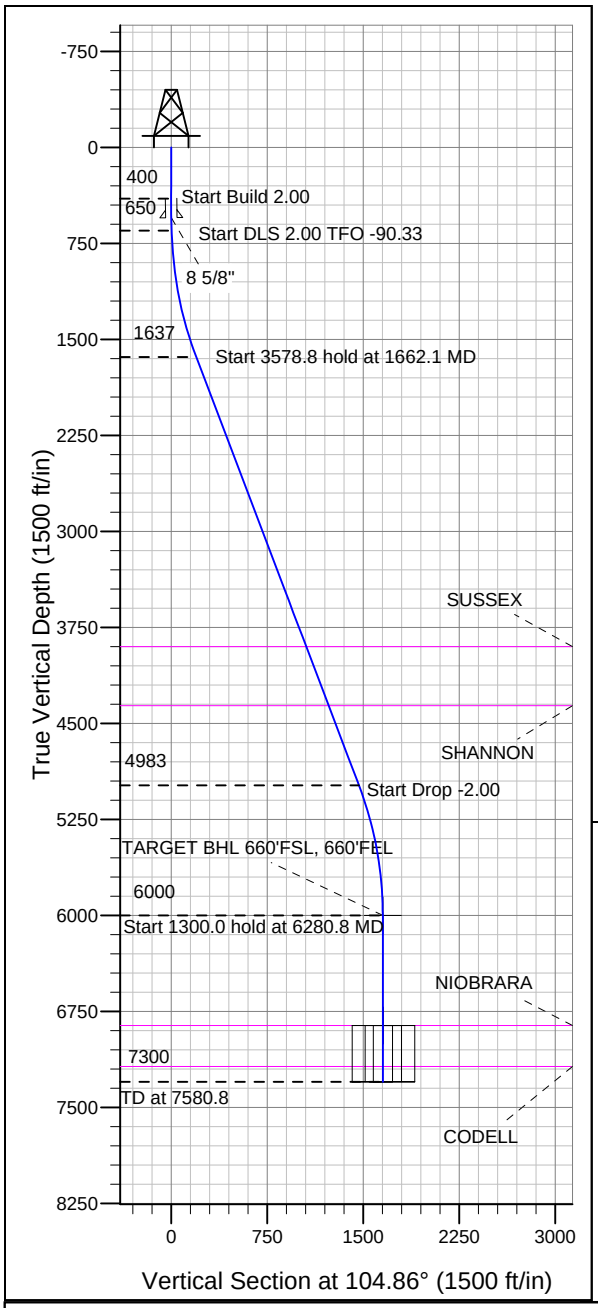
Well Name: HFE 44-22

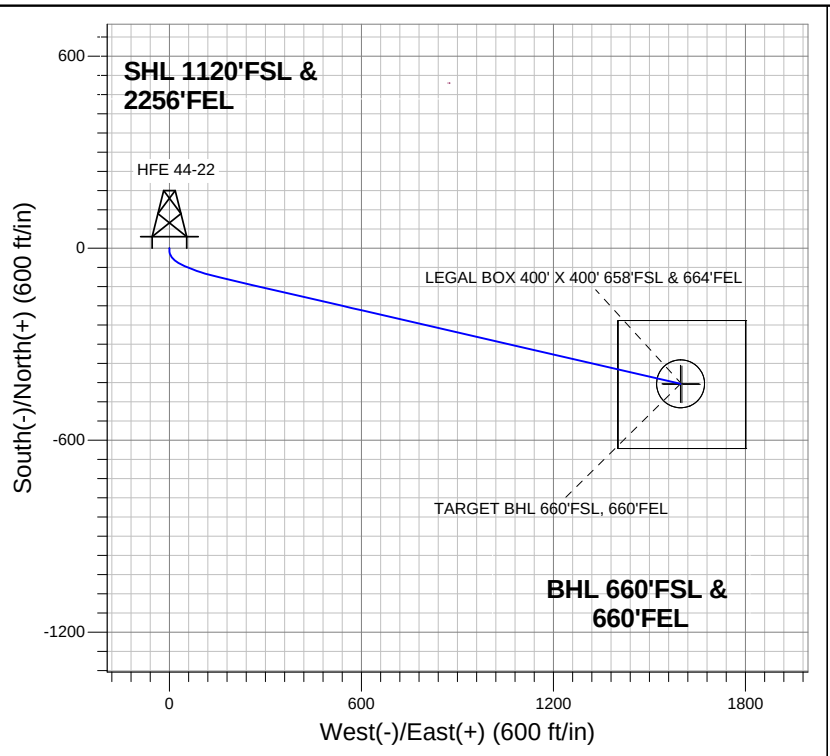
Surface Location: HFE 5 Pad Sec.22-T4N-R68W
North American Datum 1983 , US State Plane 1983Colorado Northern Zone
Ground Elevation: 4943.0

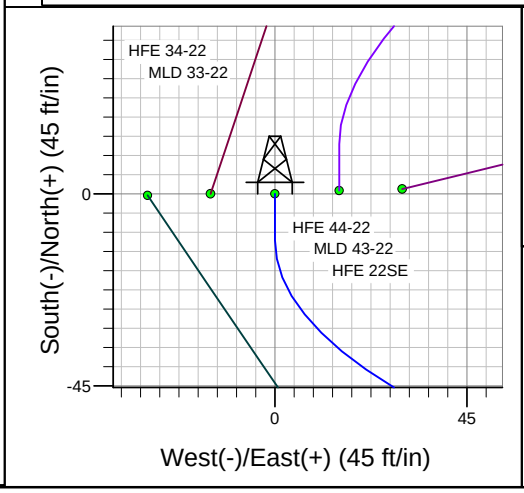
+N/-S	+E/-W	Northing	Easting	Latittude	Longitude	Slot
0.0	0.0	1350661.41	3142871.83	40.294833	-104.987806	

Original Well Elev — WELL @ 4956.0ft (Original Well Elev)

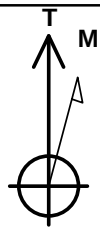
Sundance Energy, Weld County, CO







HFE 5 Pad Sec.22-T4N-R68W
HFE 44-22
Plan #1 (8-02-12)
12:40, August 07 2012



Azimuths to True North
Magnetic North: 8.82°

Magnetic Field
Strength: 52930.4snT
Dip Angle: 66.89°
Date: 8/7/2012
Model: IGRF2010

WELLBORE TARGET DETAILS (LAT/LONG)

Name	TVD	+N/-S	+E/-W	Latitude	Longitude	Shape
TARGET BHL 660'FSL, 660'FEL	6000.0	-423.6	1597.0	40.293670	-104.982081	Point
LEGAL BOX 400' X 400' 658'FSL & 664'FEL	6860.0	-425.6	1601.0	40.293665	-104.982067	Rectangle (Sides: L400.0 W400.0)
TARGET CIRCLE 660'FSL & 660'FEL	6860.0	-423.6	1597.0	40.293670	-104.982081	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	400.0	0.00	0.00	400.0	0.0	0.0	0.00	0.00	0.0	
3	650.0	5.00	180.00	649.7	-10.9	0.0	2.00	180.00	2.8	
4	1662.1	20.80	102.98	1637.2	-96.3	176.9	2.00	-90.33	195.7	
5	5240.9	20.80	102.98	4982.8	-381.7	1415.2	0.00	0.00	1465.7	
6	6280.8	0.00	0.00	6000.0	-423.6	1597.0	2.00	180.00	1652.3	TARGET BHL 660'FSL, 660'FEL
7	7580.8	0.00	0.00	7300.0	-423.6	1597.0	0.00	0.00	1652.3	

Sundance Energy, Weld County, CO

SEC.22-T4N-R68W
HFE 5 Pad Sec.22-T4N-R68W
HFE 44-22

Wellbore #1

Plan: Plan #1 (8-02-12)

Standard Planning Report

07 August, 2012

Database:	Landmark	**Local Co-ordinate Reference:**	Well HFE 44-22
Company:	Sundance Energy, Weld County, CO	**TVD Reference:**	WELL @ 4956.0ft (Original Well Elev)
Project:	SEC.22-T4N-R68W	**MD Reference:**	WELL @ 4956.0ft (Original Well Elev)
Site:	HFE 5 Pad Sec.22-T4N-R68W	**North Reference:**	True
Well:	HFE 44-22	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 (8-02-12)		

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 5 Pad Sec.22-T4N-R68W

Site Position:		**Northing:**	1,350,660.89 ft	**Latitude:**	40.294832
From:	Lat/Long	**Easting:**	3,142,841.99 ft	**Longitude:**	-104.987913
Position Uncertainty:	0.0 ft	**Slot Radius:**	"	**Grid Convergence:**	0.33 °

Well HFE 44-22

Well Position	**+N/-S**	0.4 ft	**Northing:**	1,350,661.41 ft	**Latitude:**	40.294833
	+E/-W	29.8 ft	**Easting:**	3,142,871.83 ft	**Longitude:**	-104.987806
Position Uncertainty		0.0 ft	**Wellhead Elevation:**	ft	**Ground Level:**	4,943.0 ft

Wellbore Wellbore #1

Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	8/7/2012	8.82	66.89	52,930

Design Plan #1 (8-02-12)

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	104.86

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	
400.0	0.00	0.00	400.0	0.0	0.0	0.00	0.00	0.00	0.00	
650.0	5.00	180.00	649.7	-10.9	0.0	2.00	2.00	0.00	180.00	
1,662.1	20.80	102.98	1,637.2	-96.3	176.9	2.00	1.56	-7.61	-90.33	
5,240.9	20.80	102.98	4,982.8	-381.7	1,415.2	0.00	0.00	0.00	0.00	
6,280.8	0.00	0.00	6,000.0	-423.6	1,597.0	2.00	-2.00	0.00	180.00	TARGET BHL 660'I
7,580.8	0.00	0.00	7,300.0	-423.6	1,597.0	0.00	0.00	0.00	0.00	

Database:	Landmark	**Local Co-ordinate Reference:**	Well HFE 44-22
Company:	Sundance Energy, Weld County, CO	**TVD Reference:**	WELL @ 4956.0ft (Original Well Elev)
Project:	SEC.22-T4N-R68W	**MD Reference:**	WELL @ 4956.0ft (Original Well Elev)
Site:	HFE 5 Pad Sec.22-T4N-R68W	**North Reference:**	True
Well:	HFE 44-22	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 (8-02-12)		

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	0.80	180.00	440.0	-0.3	0.0	0.1	2.00	2.00	0.00
480.0	1.60	180.00	480.0	-1.1	0.0	0.3	2.00	2.00	0.00
520.0	2.40	180.00	520.0	-2.5	0.0	0.6	2.00	2.00	0.00
550.1	3.00	180.00	550.0	-3.9	0.0	1.0	2.00	2.00	0.00
8 5/8"									
560.0	3.20	180.00	559.9	-4.5	0.0	1.1	2.00	2.00	0.00
600.0	4.00	180.00	599.8	-7.0	0.0	1.8	2.00	2.00	0.00
640.0	4.80	180.00	639.7	-10.0	0.0	2.6	2.00	2.00	0.00
650.0	5.00	180.00	649.7	-10.9	0.0	2.8	2.00	2.00	0.00
680.0	5.03	173.14	679.6	-13.5	0.2	3.6	2.00	0.11	-22.85
720.0	5.18	164.31	719.4	-17.0	0.9	5.2	2.00	0.38	-22.08
760.0	5.45	156.16	759.2	-20.5	2.1	7.3	2.00	0.66	-20.38
800.0	5.81	148.89	799.0	-23.9	3.9	9.9	2.00	0.91	-18.17
840.0	6.26	142.57	838.8	-27.4	6.3	13.1	2.00	1.11	-15.81
880.0	6.77	137.13	878.6	-30.9	9.2	16.8	2.00	1.28	-13.58
920.0	7.33	132.50	918.3	-34.3	12.7	21.1	2.00	1.41	-11.60
960.0	7.94	128.54	957.9	-37.8	16.8	25.9	2.00	1.51	-9.90
1,000.0	8.57	125.15	997.5	-41.2	21.4	31.2	2.00	1.59	-8.48
1,040.0	9.23	122.23	1,037.0	-44.6	26.5	37.1	2.00	1.65	-7.29
1,080.0	9.91	119.70	1,076.5	-48.1	32.2	43.5	2.00	1.70	-6.31
1,120.0	10.61	117.50	1,115.8	-51.5	38.5	50.4	2.00	1.74	-5.50
1,160.0	11.32	115.57	1,155.1	-54.9	45.3	57.8	2.00	1.78	-4.82
1,200.0	12.04	113.87	1,194.3	-58.2	52.6	65.8	2.00	1.81	-4.26
1,240.0	12.77	112.36	1,233.3	-61.6	60.5	74.3	2.00	1.83	-3.78
1,280.0	13.51	111.01	1,272.3	-65.0	69.0	83.3	2.00	1.85	-3.37
1,320.0	14.26	109.80	1,311.1	-68.3	78.0	92.9	2.00	1.86	-3.03
1,360.0	15.01	108.71	1,349.8	-71.6	87.5	103.0	2.00	1.88	-2.73
1,400.0	15.77	107.72	1,388.4	-75.0	97.6	113.6	2.00	1.89	-2.48
1,440.0	16.53	106.81	1,426.8	-78.3	108.2	124.7	2.00	1.90	-2.26
1,480.0	17.29	105.99	1,465.1	-81.5	119.4	136.3	2.00	1.91	-2.06
1,520.0	18.05	105.23	1,503.2	-84.8	131.1	148.5	2.00	1.92	-1.89
1,560.0	18.82	104.53	1,541.1	-88.1	143.3	161.1	2.00	1.92	-1.74
1,600.0	19.59	103.89	1,578.9	-91.3	156.1	174.3	2.00	1.93	-1.61
1,640.0	20.37	103.29	1,616.5	-94.5	169.4	187.9	2.00	1.93	-1.49
1,662.1	20.80	102.98	1,637.2	-96.3	176.9	195.7	2.00	1.94	-1.41
1,680.0	20.80	102.98	1,653.9	-97.7	183.1	202.0	0.00	0.00	0.00
1,720.0	20.80	102.98	1,691.3	-100.9	197.0	216.2	0.00	0.00	0.00
1,760.0	20.80	102.98	1,728.7	-104.1	210.8	230.4	0.00	0.00	0.00
1,800.0	20.80	102.98	1,766.1	-107.3	224.6	244.6	0.00	0.00	0.00
1,840.0	20.80	102.98	1,803.5	-110.4	238.5	258.8	0.00	0.00	0.00
1,880.0	20.80	102.98	1,840.9	-113.6	252.3	273.0	0.00	0.00	0.00
1,920.0	20.80	102.98	1,878.3	-116.8	266.2	287.2	0.00	0.00	0.00
1,960.0	20.80	102.98	1,915.7	-120.0	280.0	301.4	0.00	0.00	0.00

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Company:	Sundance Energy, Weld County, CO	**TVD Reference:**	WELL @ 4956.0ft (Original Well Elev)
Project:	SEC.22-T4N-R68W	**MD Reference:**	WELL @ 4956.0ft (Original Well Elev)
Site:	HFE 5 Pad Sec.22-T4N-R68W	**North Reference:**	True
Well:	HFE 44-22	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 (8-02-12)		

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	20.80	102.98	1,953.1	-123.2	293.8	315.6	0.00	0.00	0.00
2,040.0	20.80	102.98	1,990.5	-126.4	307.7	329.8	0.00	0.00	0.00
2,080.0	20.80	102.98	2,027.8	-129.6	321.5	344.0	0.00	0.00	0.00
2,120.0	20.80	102.98	2,065.2	-132.8	335.4	358.2	0.00	0.00	0.00
2,160.0	20.80	102.98	2,102.6	-136.0	349.2	372.4	0.00	0.00	0.00
2,200.0	20.80	102.98	2,140.0	-139.2	363.0	386.6	0.00	0.00	0.00
2,240.0	20.80	102.98	2,177.4	-142.3	376.9	400.8	0.00	0.00	0.00
2,280.0	20.80	102.98	2,214.8	-145.5	390.7	415.0	0.00	0.00	0.00
2,320.0	20.80	102.98	2,252.2	-148.7	404.6	429.2	0.00	0.00	0.00
2,360.0	20.80	102.98	2,289.6	-151.9	418.4	443.4	0.00	0.00	0.00
2,400.0	20.80	102.98	2,327.0	-155.1	432.2	457.6	0.00	0.00	0.00
2,440.0	20.80	102.98	2,364.4	-158.3	446.1	471.7	0.00	0.00	0.00
2,480.0	20.80	102.98	2,401.8	-161.5	459.9	485.9	0.00	0.00	0.00
2,520.0	20.80	102.98	2,439.2	-164.7	473.7	500.1	0.00	0.00	0.00
2,560.0	20.80	102.98	2,476.6	-167.9	487.6	514.3	0.00	0.00	0.00
2,600.0	20.80	102.98	2,514.0	-171.1	501.4	528.5	0.00	0.00	0.00
2,640.0	20.80	102.98	2,551.4	-174.3	515.3	542.7	0.00	0.00	0.00
2,680.0	20.80	102.98	2,588.8	-177.4	529.1	556.9	0.00	0.00	0.00
2,720.0	20.80	102.98	2,626.1	-180.6	542.9	571.1	0.00	0.00	0.00
2,760.0	20.80	102.98	2,663.5	-183.8	556.8	585.3	0.00	0.00	0.00
2,800.0	20.80	102.98	2,700.9	-187.0	570.6	599.5	0.00	0.00	0.00
2,840.0	20.80	102.98	2,738.3	-190.2	584.5	613.7	0.00	0.00	0.00
2,880.0	20.80	102.98	2,775.7	-193.4	598.3	627.9	0.00	0.00	0.00
2,920.0	20.80	102.98	2,813.1	-196.6	612.1	642.1	0.00	0.00	0.00
2,960.0	20.80	102.98	2,850.5	-199.8	626.0	656.3	0.00	0.00	0.00
3,000.0	20.80	102.98	2,887.9	-203.0	639.8	670.5	0.00	0.00	0.00
3,040.0	20.80	102.98	2,925.3	-206.2	653.7	684.7	0.00	0.00	0.00
3,080.0	20.80	102.98	2,962.7	-209.3	667.5	698.9	0.00	0.00	0.00
3,120.0	20.80	102.98	3,000.1	-212.5	681.3	713.1	0.00	0.00	0.00
3,160.0	20.80	102.98	3,037.5	-215.7	695.2	727.3	0.00	0.00	0.00
3,200.0	20.80	102.98	3,074.9	-218.9	709.0	741.4	0.00	0.00	0.00
3,240.0	20.80	102.98	3,112.3	-222.1	722.9	755.6	0.00	0.00	0.00
3,280.0	20.80	102.98	3,149.7	-225.3	736.7	769.8	0.00	0.00	0.00
3,320.0	20.80	102.98	3,187.1	-228.5	750.5	784.0	0.00	0.00	0.00
3,360.0	20.80	102.98	3,224.4	-231.7	764.4	798.2	0.00	0.00	0.00
3,400.0	20.80	102.98	3,261.8	-234.9	778.2	812.4	0.00	0.00	0.00
3,440.0	20.80	102.98	3,299.2	-238.1	792.1	826.6	0.00	0.00	0.00
3,480.0	20.80	102.98	3,336.6	-241.2	805.9	840.8	0.00	0.00	0.00
3,520.0	20.80	102.98	3,374.0	-244.4	819.7	855.0	0.00	0.00	0.00
3,560.0	20.80	102.98	3,411.4	-247.6	833.6	869.2	0.00	0.00	0.00
3,600.0	20.80	102.98	3,448.8	-250.8	847.4	883.4	0.00	0.00	0.00
3,640.0	20.80	102.98	3,486.2	-254.0	861.3	897.6	0.00	0.00	0.00
3,680.0	20.80	102.98	3,523.6	-257.2	875.1	911.8	0.00	0.00	0.00
3,720.0	20.80	102.98	3,561.0	-260.4	888.9	926.0	0.00	0.00	0.00
3,760.0	20.80	102.98	3,598.4	-263.6	902.8	940.2	0.00	0.00	0.00
3,800.0	20.80	102.98	3,635.8	-266.8	916.6	954.4	0.00	0.00	0.00
3,840.0	20.80	102.98	3,673.2	-270.0	930.5	968.6	0.00	0.00	0.00
3,880.0	20.80	102.98	3,710.6	-273.2	944.3	982.8	0.00	0.00	0.00
3,920.0	20.80	102.98	3,748.0	-276.3	958.1	997.0	0.00	0.00	0.00
3,960.0	20.80	102.98	3,785.4	-279.5	972.0	1,011.1	0.00	0.00	0.00
4,000.0	20.80	102.98	3,822.7	-282.7	985.8	1,025.3	0.00	0.00	0.00
4,040.0	20.80	102.98	3,860.1	-285.9	999.6	1,039.5	0.00	0.00	0.00
4,080.0	20.80	102.98	3,897.5	-289.1	1,013.5	1,053.7	0.00	0.00	0.00
4,082.6	20.80	102.98	3,900.0	-289.3	1,014.4	1,054.7	0.00	0.00	0.00

Database:	Landmark	**Local Co-ordinate Reference:**	Well HFE 44-22
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Project:	SEC.22-T4N-R68W	**MD Reference:**	WELL @ 4956.0ft (Original Well Elev)
Site:	HFE 5 Pad Sec.22-T4N-R68W	**North Reference:**	True
Well:	HFE 44-22	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 (8-02-12)		

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)
SUSSEX									
4,120.0	20.80	102.98	3,934.9	-292.3	1,027.3	1,067.9	0.00	0.00	0.00
4,160.0	20.80	102.98	3,972.3	-295.5	1,041.2	1,082.1	0.00	0.00	0.00
4,200.0	20.80	102.98	4,009.7	-298.7	1,055.0	1,096.3	0.00	0.00	0.00
4,240.0	20.80	102.98	4,047.1	-301.9	1,068.8	1,110.5	0.00	0.00	0.00
4,280.0	20.80	102.98	4,084.5	-305.1	1,082.7	1,124.7	0.00	0.00	0.00
4,320.0	20.80	102.98	4,121.9	-308.2	1,096.5	1,138.9	0.00	0.00	0.00
4,360.0	20.80	102.98	4,159.3	-311.4	1,110.4	1,153.1	0.00	0.00	0.00
4,400.0	20.80	102.98	4,196.7	-314.6	1,124.2	1,167.3	0.00	0.00	0.00
4,440.0	20.80	102.98	4,234.1	-317.8	1,138.0	1,181.5	0.00	0.00	0.00
4,480.0	20.80	102.98	4,271.5	-321.0	1,151.9	1,195.7	0.00	0.00	0.00
4,520.0	20.80	102.98	4,308.9	-324.2	1,165.7	1,209.9	0.00	0.00	0.00
4,560.0	20.80	102.98	4,346.3	-327.4	1,179.6	1,224.1	0.00	0.00	0.00
4,575.8	20.80	102.98	4,361.0	-328.6	1,185.0	1,229.7	0.00	0.00	0.00
SHANNON									
4,600.0	20.80	102.98	4,383.7	-330.6	1,193.4	1,238.3	0.00	0.00	0.00
4,640.0	20.80	102.98	4,421.0	-333.8	1,207.2	1,252.5	0.00	0.00	0.00
4,680.0	20.80	102.98	4,458.4	-337.0	1,221.1	1,266.7	0.00	0.00	0.00
4,720.0	20.80	102.98	4,495.8	-340.1	1,234.9	1,280.9	0.00	0.00	0.00
4,760.0	20.80	102.98	4,533.2	-343.3	1,248.8	1,295.0	0.00	0.00	0.00
4,800.0	20.80	102.98	4,570.6	-346.5	1,262.6	1,309.2	0.00	0.00	0.00
4,840.0	20.80	102.98	4,608.0	-349.7	1,276.4	1,323.4	0.00	0.00	0.00
4,880.0	20.80	102.98	4,645.4	-352.9	1,290.3	1,337.6	0.00	0.00	0.00
4,920.0	20.80	102.98	4,682.8	-356.1	1,304.1	1,351.8	0.00	0.00	0.00
4,960.0	20.80	102.98	4,720.2	-359.3	1,318.0	1,366.0	0.00	0.00	0.00
5,000.0	20.80	102.98	4,757.6	-362.5	1,331.8	1,380.2	0.00	0.00	0.00
5,040.0	20.80	102.98	4,795.0	-365.7	1,345.6	1,394.4	0.00	0.00	0.00
5,080.0	20.80	102.98	4,832.4	-368.9	1,359.5	1,408.6	0.00	0.00	0.00
5,120.0	20.80	102.98	4,869.8	-372.1	1,373.3	1,422.8	0.00	0.00	0.00
5,160.0	20.80	102.98	4,907.2	-375.2	1,387.2	1,437.0	0.00	0.00	0.00
5,200.0	20.80	102.98	4,944.6	-378.4	1,401.0	1,451.2	0.00	0.00	0.00
5,240.0	20.80	102.98	4,982.0	-381.6	1,414.8	1,465.4	0.00	0.00	0.00
5,240.9	20.80	102.98	4,982.8	-381.7	1,415.2	1,465.7	0.00	0.00	0.00
5,280.0	20.02	102.98	5,019.4	-384.8	1,428.4	1,479.3	2.00	-2.00	0.00
5,320.0	19.22	102.98	5,057.1	-387.8	1,441.5	1,492.7	2.00	-2.00	0.00
5,360.0	18.42	102.98	5,095.0	-390.7	1,454.1	1,505.6	2.00	-2.00	0.00
5,400.0	17.62	102.98	5,133.0	-393.5	1,466.1	1,518.0	2.00	-2.00	0.00
5,440.0	16.82	102.98	5,171.2	-396.1	1,477.7	1,529.8	2.00	-2.00	0.00
5,480.0	16.02	102.98	5,209.6	-398.6	1,488.7	1,541.1	2.00	-2.00	0.00
5,520.0	15.22	102.98	5,248.1	-401.1	1,499.2	1,551.9	2.00	-2.00	0.00
5,560.0	14.42	102.98	5,286.8	-403.4	1,509.2	1,562.1	2.00	-2.00	0.00
5,600.0	13.62	102.98	5,325.6	-405.5	1,518.6	1,571.8	2.00	-2.00	0.00
5,640.0	12.82	102.98	5,364.5	-407.6	1,527.5	1,580.9	2.00	-2.00	0.00
5,680.0	12.02	102.98	5,403.6	-409.5	1,535.9	1,589.5	2.00	-2.00	0.00
5,720.0	11.22	102.98	5,442.8	-411.3	1,543.7	1,597.6	2.00	-2.00	0.00
5,760.0	10.42	102.98	5,482.1	-413.0	1,551.0	1,605.1	2.00	-2.00	0.00
5,800.0	9.62	102.98	5,521.5	-414.6	1,557.8	1,612.0	2.00	-2.00	0.00
5,840.0	8.82	102.98	5,560.9	-416.0	1,564.1	1,618.4	2.00	-2.00	0.00
5,880.0	8.02	102.98	5,600.5	-417.3	1,569.8	1,624.3	2.00	-2.00	0.00
5,920.0	7.22	102.98	5,640.2	-418.5	1,574.9	1,629.6	2.00	-2.00	0.00
5,960.0	6.42	102.98	5,679.9	-419.6	1,579.6	1,634.3	2.00	-2.00	0.00
6,000.0	5.62	102.98	5,719.7	-420.5	1,583.6	1,638.5	2.00	-2.00	0.00
6,040.0	4.82	102.98	5,759.5	-421.4	1,587.2	1,642.2	2.00	-2.00	0.00
6,080.0	4.02	102.98	5,799.4	-422.0	1,590.2	1,645.2	2.00	-2.00	0.00

Database:	Landmark	**Local Co-ordinate Reference:**	Well HFE 44-22
Company:	Sundance Energy, Weld County, CO	**TVD Reference:**	WELL @ 4956.0ft (Original Well Elev)
Project:	SEC.22-T4N-R68W	**MD Reference:**	WELL @ 4956.0ft (Original Well Elev)
Site:	HFE 5 Pad Sec.22-T4N-R68W	**North Reference:**	True
Well:	HFE 44-22	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 (8-02-12)		

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)
6,120.0	3.22	102.98	5,839.3	-422.6	1,592.6	1,647.8	2.00	-2.00	0.00
6,160.0	2.42	102.98	5,879.2	-423.1	1,594.6	1,649.7	2.00	-2.00	0.00
6,200.0	1.62	102.98	5,919.2	-423.4	1,595.9	1,651.1	2.00	-2.00	0.00
6,240.0	0.82	102.98	5,959.2	-423.6	1,596.8	1,652.0	2.00	-2.00	0.00
6,280.0	0.02	102.98	5,999.2	-423.6	1,597.0	1,652.3	2.00	-2.00	0.00
6,280.8	0.00	0.00	6,000.0	-423.6	1,597.0	1,652.3	2.00	-2.00	0.00
TARGET BHL 660'FSL, 660'FEL									
6,320.0	0.00	0.00	6,039.2	-423.6	1,597.0	1,652.3	0.00	0.00	0.00
6,360.0	0.00	0.00	6,079.2	-423.6	1,597.0	1,652.3	0.00	0.00	0.00
6,400.0	0.00	0.00	6,119.2	-423.6	1,597.0	1,652.3	0.00	0.00	0.00
6,440.0	0.00	0.00	6,159.2	-423.6	1,597.0	1,652.3	0.00	0.00	0.00
6,480.0	0.00	0.00	6,199.2	-423.6	1,597.0	1,652.3	0.00	0.00	0.00
6,520.0	0.00	0.00	6,239.2	-423.6	1,597.0	1,652.3	0.00	0.00	0.00
6,560.0	0.00	0.00	6,279.2	-423.6	1,597.0	1,652.3	0.00	0.00	0.00
6,600.0	0.00	0.00	6,319.2	-423.6	1,597.0	1,652.3	0.00	0.00	0.00
6,640.0	0.00	0.00	6,359.2	-423.6	1,597.0	1,652.3	0.00	0.00	0.00
6,680.0	0.00	0.00	6,399.2	-423.6	1,597.0	1,652.3	0.00	0.00	0.00
6,720.0	0.00	0.00	6,439.2	-423.6	1,597.0	1,652.3	0.00	0.00	0.00
6,760.0	0.00	0.00	6,479.2	-423.6	1,597.0	1,652.3	0.00	0.00	0.00
6,800.0	0.00	0.00	6,519.2	-423.6	1,597.0	1,652.3	0.00	0.00	0.00
6,840.0	0.00	0.00	6,559.2	-423.6	1,597.0	1,652.3	0.00	0.00	0.00
6,880.0	0.00	0.00	6,599.2	-423.6	1,597.0	1,652.3	0.00	0.00	0.00
6,920.0	0.00	0.00	6,639.2	-423.6	1,597.0	1,652.3	0.00	0.00	0.00
6,960.0	0.00	0.00	6,679.2	-423.6	1,597.0	1,652.3	0.00	0.00	0.00
7,000.0	0.00	0.00	6,719.2	-423.6	1,597.0	1,652.3	0.00	0.00	0.00
7,040.0	0.00	0.00	6,759.2	-423.6	1,597.0	1,652.3	0.00	0.00	0.00
7,080.0	0.00	0.00	6,799.2	-423.6	1,597.0	1,652.3	0.00	0.00	0.00
7,120.0	0.00	0.00	6,839.2	-423.6	1,597.0	1,652.3	0.00	0.00	0.00
7,140.8	0.00	0.00	6,860.0	-423.6	1,597.0	1,652.3	0.00	0.00	0.00
NIOBRARA - LEGAL BOX 400' X 400' 658'FSL & 664'FEL - TARGET CIRCLE 660'FSL & 660'FEL									
7,160.0	0.00	0.00	6,879.2	-423.6	1,597.0	1,652.3	0.00	0.00	0.00
7,200.0	0.00	0.00	6,919.2	-423.6	1,597.0	1,652.3	0.00	0.00	0.00
7,240.0	0.00	0.00	6,959.2	-423.6	1,597.0	1,652.3	0.00	0.00	0.00
7,280.0	0.00	0.00	6,999.2	-423.6	1,597.0	1,652.3	0.00	0.00	0.00
7,320.0	0.00	0.00	7,039.2	-423.6	1,597.0	1,652.3	0.00	0.00	0.00
7,360.0	0.00	0.00	7,079.2	-423.6	1,597.0	1,652.3	0.00	0.00	0.00
7,400.0	0.00	0.00	7,119.2	-423.6	1,597.0	1,652.3	0.00	0.00	0.00
7,440.0	0.00	0.00	7,159.2	-423.6	1,597.0	1,652.3	0.00	0.00	0.00
7,460.8	0.00	0.00	7,180.0	-423.6	1,597.0	1,652.3	0.00	0.00	0.00
CODELL									
7,480.0	0.00	0.00	7,199.2	-423.6	1,597.0	1,652.3	0.00	0.00	0.00
7,520.0	0.00	0.00	7,239.2	-423.6	1,597.0	1,652.3	0.00	0.00	0.00
7,560.0	0.00	0.00	7,279.2	-423.6	1,597.0	1,652.3	0.00	0.00	0.00
7,580.8	0.00	0.00	7,300.0	-423.6	1,597.0	1,652.3	0.00	0.00	0.00

Database:	Landmark	**Local Co-ordinate Reference:**	Well HFE 44-22
Company:	Sundance Energy, Weld County, CO	**TVD Reference:**	WELL @ 4956.0ft (Original Well Elev)
Project:	SEC.22-T4N-R68W	**MD Reference:**	WELL @ 4956.0ft (Original Well Elev)
Site:	HFE 5 Pad Sec.22-T4N-R68W	**North Reference:**	True
Well:	HFE 44-22	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 (8-02-12)		

Targets

Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (ft)	Easting (ft)	Latitude	Longitude
LEGAL BOX 400' X 4(- plan misses target center by 4.4ft at 7140.8ft MD (6860.0 TVD, -423.6 N, 1597.0 E) - Rectangle (sides W400.0 H400.0 D440.0)	0.00	0.00	6,860.0	-425.6	1,601.0	1,350,245.09	3,144,475.19	40.293665	-104.982067
TARGET CIRCLE 66(- plan hits target center - Circle (radius 75.0)	0.00	0.00	6,860.0	-423.6	1,597.0	1,350,247.04	3,144,471.22	40.293670	-104.982081
TARGET BHL 660'FS - plan hits target center - Point	0.00	0.00	6,000.0	-423.6	1,597.0	1,350,247.04	3,144,471.22	40.293670	-104.982081

Casing Points

Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (")	Hole Diameter (")
550.1	550.0	8 5/8"	8-5/8	12-1/4

Formations

Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
4,082.6	3,900.0	SUSSEX		0.00	
4,575.8	4,361.0	SHANNON		0.00	
7,140.8	6,860.0	NIOBRARA		0.00	
7,460.8	7,180.0	CODELL		0.00	

ENSIGN
Directional

Sundance Energy, Weld County, CO

SEC.22-T4N-R68W
HFE 5 Pad Sec.22-T4N-R68W
HFE 44-22

Wellbore #1
Plan #1 (8-02-12)

Anticollision Report

07 August, 2012

Company:	Sundance Energy, Weld County, CO	**Local Co-ordinate Reference:**	Well HFE 44-22
Project:	SEC.22-T4N-R68W	**TVD Reference:**	WELL @ 4956.0ft (Original Well Elev)
Reference Site:	HFE 5 Pad Sec.22-T4N-R68W	**MD Reference:**	WELL @ 4956.0ft (Original Well Elev)
Site Error:	0.0ft	**North Reference:**	True
Reference Well:	HFE 44-22	**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 (8-02-12)	**Offset TVD Reference:**	Offset Datum

Reference Plan #1 (8-02-12)

Filter type:	NO GLOBAL FILTER: Using user defined selection & filtering criteria		
Interpolation Method:	MD Interval 100.0ft	**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** 8/2/2012

From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description
0.0	7,580.8	Plan #1 (8-02-12) (Wellbore #1)	MWD	MWD - Standard

Summary

Site Name / Offset Well - Wellbore - Design	Reference Measured Depth (ft)	Offset Measured Depth (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Separation Factor	Warning
HFE 5 Pad Sec.22-T4N-R68W						
HFE 22SE - Wellbore #1 - Plan #1 (8-02-12)	400.0	401.0	29.9	28.3	18.957	CC
HFE 22SE - Wellbore #1 - Plan #1 (8-02-12)	500.0	501.0	30.0	28.0	15.006	ES
HFE 22SE - Wellbore #1 - Plan #1 (8-02-12)	900.0	898.5	39.8	36.1	10.567	SF
HFE 34-22 - Wellbore #1 - Plan #1 (8-02-12)	445.5	444.5	29.8	28.1	16.928	CC
HFE 34-22 - Wellbore #1 - Plan #1 (8-02-12)	500.0	499.0	29.9	27.9	14.989	ES
HFE 34-22 - Wellbore #1 - Plan #1 (8-02-12)	700.0	698.5	33.7	30.9	11.841	SF
MLD 33-22 - Wellbore #1 - plan #1 (8-02-12)	400.0	399.0	15.1	13.5	9.588	CC
MLD 33-22 - Wellbore #1 - plan #1 (8-02-12)	500.0	499.0	15.2	13.2	7.606	ES
MLD 33-22 - Wellbore #1 - plan #1 (8-02-12)	600.0	598.8	16.6	14.2	6.890	SF
MLD 43-22 - Wellbore #1 - Plan #1 (8-02-12)	200.0	200.0	15.1	14.4	22.366	CC
MLD 43-22 - Wellbore #1 - Plan #1 (8-02-12)	300.0	299.9	15.3	14.1	13.587	ES
MLD 43-22 - Wellbore #1 - Plan #1 (8-02-12)	400.0	399.6	16.9	15.3	10.703	SF

Offset Design HFE 5 Pad Sec.22-T4N-R68W - HFE 22SE - Wellbore #1 - Plan #1 (8-02-12)

Offset Site Error: 0.0 ft

Survey Program: 0-MWD **Offset Well Error:** 0.0 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
0.0	0.0	1.0	1.0	0.0	0.0	87.90	1.1	29.8	29.9	29.9	0.00	N/A	
100.0	100.0	101.0	101.0	0.1	0.1	87.90	1.1	29.8	29.9	29.6	0.23	131.570	
200.0	200.0	201.0	201.0	0.3	0.3	87.90	1.1	29.8	29.9	29.2	0.68	44.148	
300.0	300.0	301.0	301.0	0.6	0.6	87.90	1.1	29.8	29.9	28.7	1.13	26.524	
400.0	400.0	401.0	401.0	0.8	0.8	87.90	1.1	29.8	29.9	28.3	1.58	18.957	CC
500.0	500.0	501.0	501.0	1.0	1.0	-95.43	1.1	29.8	30.0	28.0	2.00	15.006	ES
600.0	599.8	600.8	600.8	1.2	1.2	-105.10	1.1	29.8	30.9	28.5	2.41	12.813	
700.0	699.5	700.5	700.5	1.4	1.5	-107.67	1.1	29.8	33.7	30.8	2.85	11.789	
800.0	799.0	800.0	800.0	1.6	1.7	-102.83	1.1	29.8	36.0	32.7	3.31	10.876	
900.0	898.4	898.5	898.5	1.9	1.9	-103.33	1.5	31.5	39.8	36.1	3.77	10.567	SF
1,000.0	997.5	996.9	996.8	2.2	2.1	-105.72	2.7	36.4	46.4	42.2	4.24	10.963	
1,100.0	1,096.1	1,095.4	1,094.9	2.5	2.3	-108.13	4.7	44.6	55.3	50.6	4.73	11.679	
1,200.0	1,194.3	1,193.9	1,192.6	2.9	2.6	-109.97	7.5	56.1	65.9	60.6	5.28	12.473	
1,300.0	1,291.7	1,292.4	1,289.9	3.3	2.9	-111.23	11.1	70.9	77.8	71.9	5.89	13.199	
1,400.0	1,388.4	1,390.9	1,386.7	3.7	3.2	-112.04	15.5	88.8	90.9	84.3	6.59	13.781	
1,500.0	1,484.1	1,489.6	1,483.2	4.3	3.5	-113.07	20.4	109.2	104.8	97.4	7.38	14.210	

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

Company:	Sundance Energy, Weld County, CO	**Local Co-ordinate Reference:**	Well HFE 44-22
Project:	SEC.22-T4N-R68W	**TVD Reference:**	WELL @ 4956.0ft (Original Well Elev)
Reference Site:	HFE 5 Pad Sec.22-T4N-R68W	**MD Reference:**	WELL @ 4956.0ft (Original Well Elev)
Site Error:	0.0ft	**North Reference:**	True
Reference Well:	HFE 44-22	**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 (8-02-12)	**Offset TVD Reference:**	Offset Datum

Offset Design HFE 5 Pad Sec.22-T4N-R68W - HFE 22SE - Wellbore #1 - Plan #1 (8-02-12)

Offset Site Error: 0.0 ft

Survey Program: 0-MWD

Offset Well Error: 0.0 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
1,600.0	1,578.9	1,588.2	1,579.5	4.8	3.9	-115.32	25.4	129.5	119.6	111.4	8.20	14.588	
1,700.0	1,672.6	1,686.4	1,675.4	5.5	4.3	-118.83	30.3	149.8	135.7	126.7	9.04	15.008	
1,800.0	1,766.1	1,784.5	1,771.3	6.2	4.7	-122.66	35.2	170.0	152.6	142.8	9.88	15.445	
1,900.0	1,859.6	1,882.5	1,867.2	6.9	5.1	-125.72	40.2	190.3	170.1	159.4	10.73	15.857	
2,000.0	1,953.1	1,980.6	1,963.0	7.6	5.5	-128.21	45.1	210.6	188.0	176.4	11.58	16.239	
2,100.0	2,046.5	2,078.7	2,058.9	8.3	6.0	-130.26	50.0	230.8	206.1	193.7	12.43	16.590	
2,200.0	2,140.0	2,176.8	2,154.7	9.0	6.4	-131.99	55.0	251.1	224.5	211.2	13.28	16.911	
2,300.0	2,233.5	2,274.9	2,250.6	9.8	6.8	-133.45	59.9	271.3	243.0	228.9	14.13	17.203	
2,400.0	2,327.0	2,373.0	2,346.4	10.5	7.3	-134.70	64.8	291.6	261.7	246.7	14.98	17.470	
2,500.0	2,420.5	2,471.1	2,442.3	11.3	7.7	-135.79	69.7	311.9	280.5	264.6	15.83	17.714	
2,600.0	2,514.0	2,569.2	2,538.1	12.0	8.1	-136.74	74.7	332.1	299.3	282.6	16.69	17.938	
2,700.0	2,607.5	2,667.3	2,634.0	12.8	8.6	-137.58	79.6	352.4	318.2	300.7	17.54	18.143	
2,800.0	2,700.9	2,765.4	2,729.8	13.5	9.0	-138.32	84.5	372.6	337.2	318.8	18.40	18.331	
2,900.0	2,794.4	2,863.5	2,825.7	14.3	9.5	-138.99	89.5	392.9	356.3	337.0	19.25	18.505	
3,000.0	2,887.9	2,961.6	2,921.5	15.0	9.9	-139.58	94.4	413.2	375.3	355.2	20.11	18.666	
3,100.0	2,981.4	3,059.7	3,017.4	15.8	10.4	-140.12	99.3	433.4	394.4	373.5	20.96	18.814	
3,200.0	3,074.9	3,157.8	3,113.2	16.5	10.8	-140.61	104.3	453.7	413.6	391.8	21.82	18.952	
3,300.0	3,168.4	3,255.8	3,209.1	17.3	11.3	-141.06	109.2	473.9	432.7	410.1	22.68	19.081	
3,400.0	3,261.8	3,353.9	3,304.9	18.0	11.7	-141.47	114.1	494.2	451.9	428.4	23.54	19.201	
3,500.0	3,355.3	3,452.0	3,400.8	18.8	12.2	-141.85	119.1	514.5	471.1	446.7	24.40	19.313	
3,600.0	3,448.8	3,550.1	3,496.6	19.5	12.6	-142.19	124.0	534.7	490.4	465.1	25.25	19.418	
3,700.0	3,542.3	3,648.2	3,592.5	20.3	13.1	-142.51	128.9	555.0	509.6	483.5	26.11	19.516	
3,800.0	3,635.8	3,746.3	3,688.3	21.1	13.5	-142.81	133.9	575.2	528.9	501.9	26.97	19.608	
3,900.0	3,729.3	3,844.4	3,784.2	21.8	14.0	-143.08	138.8	595.5	548.1	520.3	27.83	19.695	
4,000.0	3,822.7	3,942.5	3,880.0	22.6	14.4	-143.34	143.7	615.8	567.4	538.7	28.69	19.777	
4,100.0	3,916.2	4,040.6	3,975.9	23.3	14.9	-143.58	148.7	636.0	586.7	557.2	29.55	19.855	
4,200.0	4,009.7	4,138.7	4,071.7	24.1	15.3	-143.81	153.6	656.3	606.0	575.6	30.41	19.928	
4,300.0	4,103.2	4,236.8	4,167.6	24.9	15.8	-144.02	158.5	676.5	625.3	594.1	31.27	19.997	
4,400.0	4,196.7	4,334.9	4,263.4	25.6	16.2	-144.21	163.5	696.8	644.6	612.5	32.13	20.063	
4,500.0	4,290.2	4,433.0	4,359.3	26.4	16.7	-144.40	168.4	717.0	664.0	631.0	32.99	20.125	
4,600.0	4,383.7	4,531.1	4,455.1	27.1	17.1	-144.58	173.3	737.3	683.3	649.4	33.85	20.185	
4,700.0	4,477.1	4,629.1	4,551.0	27.9	17.6	-144.74	178.2	757.6	702.6	667.9	34.71	20.241	
4,800.0	4,570.6	4,727.2	4,646.8	28.7	18.0	-144.90	183.2	777.8	722.0	686.4	35.57	20.295	
4,900.0	4,664.1	4,825.3	4,742.7	29.4	18.5	-145.05	188.1	798.1	741.3	704.9	36.44	20.346	
5,000.0	4,757.6	4,923.4	4,838.5	30.2	19.0	-145.19	193.0	818.3	760.7	723.4	37.30	20.395	
5,100.0	4,851.1	5,021.5	4,934.4	30.9	19.4	-145.33	198.0	838.6	780.0	741.9	38.16	20.442	
5,200.0	4,944.6	5,119.6	5,030.2	31.7	19.9	-145.46	202.9	858.9	799.4	760.4	39.02	20.487	
5,300.0	5,038.3	5,213.3	5,121.8	32.4	20.3	-145.69	207.6	878.1	818.4	778.5	39.83	20.549	
5,400.0	5,133.0	5,300.0	5,207.0	32.9	20.6	-146.00	211.4	893.8	835.9	795.5	40.45	20.668	
5,500.0	5,228.8	5,385.2	5,291.1	33.4	20.8	-146.32	214.6	906.8	852.1	811.1	40.97	20.797	
5,600.0	5,325.6	5,471.1	5,376.3	33.9	21.0	-146.65	217.2	917.5	866.9	825.5	41.42	20.932	
5,700.0	5,423.2	5,556.8	5,461.6	34.2	21.2	-147.00	219.2	925.7	880.4	838.6	41.78	21.074	
5,800.0	5,521.5	5,642.4	5,547.0	34.6	21.4	-147.36	220.6	931.4	892.5	850.4	42.05	21.224	
5,900.0	5,620.3	5,727.9	5,632.4	34.8	21.5	-147.74	221.3	934.6	903.2	860.9	42.24	21.383	
6,000.0	5,719.7	5,816.1	5,720.7	35.1	21.6	-148.14	221.5	935.3	912.4	870.1	42.35	21.546	
6,100.0	5,819.3	5,915.8	5,820.3	35.2	21.7	-148.47	221.5	935.3	919.3	876.8	42.45	21.656	
6,200.0	5,919.2	6,015.7	5,920.2	35.4	21.9	-148.66	221.5	935.3	923.2	880.6	42.57	21.689	
6,300.0	6,019.2	6,115.7	6,020.2	35.4	22.0	-45.73	221.5	935.3	924.2	881.4	42.72	21.634	
6,400.0	6,119.2	6,215.7	6,120.2	35.5	22.1	-45.73	221.5	935.3	924.2	881.2	42.97	21.506	
6,500.0	6,219.2	6,315.7	6,220.2	35.6	22.2	-45.73	221.5	935.3	924.2	880.9	43.23	21.378	
6,600.0	6,319.2	6,415.7	6,320.2	35.7	22.4	-45.73	221.5	935.3	924.2	880.7	43.49	21.250	
6,700.0	6,419.2	6,515.7	6,420.2	35.8	22.5	-45.73	221.5	935.3	924.2	880.4	43.75	21.122	

Company:	Sundance Energy, Weld County, CO	**Local Co-ordinate Reference:**	Well HFE 44-22
Project:	SEC.22-T4N-R68W	**TVD Reference:**	WELL @ 4956.0ft (Original Well Elev)
Reference Site:	HFE 5 Pad Sec.22-T4N-R68W	**MD Reference:**	WELL @ 4956.0ft (Original Well Elev)
Site Error:	0.0ft	**North Reference:**	True
Reference Well:	HFE 44-22	**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 (8-02-12)	**Offset TVD Reference:**	Offset Datum

Offset Design HFE 5 Pad Sec.22-T4N-R68W - HFE 22SE - Wellbore #1 - Plan #1 (8-02-12)

Offset Site Error: 0.0 ft

Survey Program: 0-MWD

Offset Well Error: 0.0 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
6,800.0	6,519.2	6,615.7	6,520.2	35.9	22.6	-45.73	221.5	935.3	924.2	880.1	44.02	20.994	
6,900.0	6,619.2	6,715.7	6,620.2	35.9	22.8	-45.73	221.5	935.3	924.2	879.9	44.29	20.867	
7,000.0	6,719.2	6,815.7	6,720.2	36.0	22.9	-45.73	221.5	935.3	924.2	879.6	44.56	20.739	
7,100.0	6,819.2	6,915.7	6,820.2	36.1	23.1	-45.73	221.5	935.3	924.2	879.3	44.84	20.612	
7,200.0	6,919.2	7,015.7	6,920.2	36.2	23.2	-45.73	221.5	935.3	924.2	879.1	45.11	20.485	
7,300.0	7,019.2	7,115.7	7,020.2	36.3	23.4	-45.73	221.5	935.3	924.2	878.8	45.39	20.358	
7,400.0	7,119.2	7,215.7	7,120.2	36.4	23.5	-45.73	221.5	935.3	924.2	878.5	45.68	20.232	
7,500.0	7,219.2	7,315.7	7,220.2	36.5	23.6	-45.73	221.5	935.3	924.2	878.2	45.96	20.106	
7,553.5	7,272.7	7,369.2	7,273.7	36.5	23.7	-45.73	221.5	935.3	924.2	878.1	46.12	20.039	
7,580.8	7,300.0	7,395.5	7,300.0	36.5	23.8	-45.73	221.5	935.3	924.2	878.0	46.20	20.006	

Company:	Sundance Energy, Weld County, CO	**Local Co-ordinate Reference:**	Well HFE 44-22
Project:	SEC.22-T4N-R68W	**TVD Reference:**	WELL @ 4956.0ft (Original Well Elev)
Reference Site:	HFE 5 Pad Sec.22-T4N-R68W	**MD Reference:**	WELL @ 4956.0ft (Original Well Elev)
Site Error:	0.0ft	**North Reference:**	True
Reference Well:	HFE 44-22	**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 (8-02-12)	**Offset TVD Reference:**	Offset Datum

Offset Design HFE 5 Pad Sec.22-T4N-R68W - HFE 34-22 - Wellbore #1 - Plan #1 (8-02-12) — **Offset Site Error:** 0.0 ft

Survey Program: 0-MWD — **Offset Well Error:** 0.0 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
0.0	0.0	0.0	0.0	0.0	0.0	-90.69	-0.4	-29.8	29.9				
100.0	100.0	99.0	99.0	0.1	0.1	-90.69	-0.4	-29.8	29.9	29.6	0.22	133.473	
200.0	200.0	199.0	199.0	0.3	0.3	-90.69	-0.4	-29.8	29.9	29.2	0.67	44.417	
300.0	300.0	299.0	299.0	0.6	0.6	-90.69	-0.4	-29.8	29.9	28.7	1.12	26.614	
400.0	400.0	399.0	399.0	0.8	0.8	-90.69	-0.4	-29.8	29.9	28.3	1.57	18.999	
445.5	445.5	444.5	444.5	0.9	0.9	90.00	-0.4	-29.8	29.8	28.1	1.76	16.928	CC
500.0	500.0	499.0	499.0	1.0	1.0	92.66	-0.4	-29.8	29.9	27.9	1.99	14.989	ES
600.0	599.8	598.8	598.8	1.2	1.2	102.47	-0.4	-29.8	30.6	28.2	2.41	12.694	
700.0	699.5	698.5	698.5	1.4	1.5	127.42	-0.4	-29.8	33.7	30.9	2.85	11.841	SF
800.0	799.0	798.0	798.0	1.6	1.7	155.93	-0.4	-29.8	41.2	37.9	3.30	12.485	
900.0	898.4	897.4	897.4	1.9	1.9	173.58	-0.4	-29.8	52.0	48.2	3.74	13.882	
1,000.0	997.5	996.5	996.5	2.2	2.1	-176.53	-0.4	-29.8	65.5	61.3	4.18	15.657	
1,100.0	1,096.1	1,095.1	1,095.1	2.5	2.3	-171.25	-0.4	-29.8	81.7	77.1	4.62	17.682	
1,200.0	1,194.3	1,193.3	1,193.3	2.9	2.6	-168.57	-0.4	-29.8	100.8	95.7	5.06	19.909	
1,300.0	1,291.7	1,290.7	1,290.7	3.3	2.8	-167.34	-0.4	-29.8	122.7	117.2	5.50	22.311	
1,400.0	1,388.4	1,387.4	1,387.4	3.7	3.0	-166.90	-0.4	-29.8	147.7	141.7	5.94	24.867	
1,500.0	1,484.1	1,483.1	1,483.1	4.3	3.2	-166.89	-0.4	-29.8	175.8	169.4	6.38	27.555	
1,600.0	1,578.9	1,583.1	1,583.1	4.8	3.4	-167.39	-1.4	-29.2	206.0	199.2	6.80	30.273	
1,700.0	1,672.6	1,684.6	1,684.5	5.5	3.6	-169.03	-5.3	-26.5	236.4	229.2	7.22	32.723	
1,800.0	1,766.1	1,787.4	1,786.9	6.2	3.8	-171.61	-12.3	-21.8	265.0	257.3	7.69	34.464	
1,900.0	1,859.6	1,891.5	1,890.3	6.9	4.0	-174.13	-22.5	-14.9	291.1	282.9	8.18	35.584	
2,000.0	1,953.1	1,996.6	1,994.1	7.6	4.3	-176.68	-35.9	-5.8	314.9	306.2	8.71	36.151	
2,100.0	2,046.5	2,095.3	2,091.2	8.3	4.5	-179.01	-50.6	4.2	337.2	328.0	9.27	36.387	
2,200.0	2,140.0	2,192.0	2,186.3	9.0	4.8	178.98	-65.1	14.0	360.0	350.1	9.86	36.517	
2,300.0	2,233.5	2,288.6	2,281.3	9.8	5.1	177.21	-79.5	23.8	383.1	372.6	10.47	36.573	
2,400.0	2,327.0	2,385.2	2,376.4	10.5	5.4	175.64	-94.0	33.6	406.5	395.3	11.12	36.569	
2,500.0	2,420.5	2,481.9	2,471.4	11.3	5.7	174.24	-108.5	43.4	430.1	418.4	11.78	36.514	
2,600.0	2,514.0	2,578.5	2,566.5	12.0	6.1	172.99	-122.9	53.1	454.0	441.6	12.46	36.426	
2,700.0	2,607.5	2,675.2	2,661.5	12.8	6.4	171.86	-137.4	62.9	478.1	464.9	13.17	36.313	
2,800.0	2,700.9	2,771.8	2,756.6	13.5	6.7	170.84	-151.9	72.7	502.3	488.4	13.88	36.182	
2,900.0	2,794.4	2,868.5	2,851.6	14.3	7.1	169.91	-166.3	82.5	526.7	512.1	14.61	36.041	
3,000.0	2,887.9	2,965.1	2,946.7	15.0	7.4	169.06	-180.8	92.3	551.2	535.8	15.36	35.892	
3,100.0	2,981.4	3,061.8	3,041.7	15.8	7.8	168.29	-195.3	102.1	575.8	559.7	16.11	35.741	
3,200.0	3,074.9	3,158.4	3,136.8	16.5	8.2	167.58	-209.7	111.9	600.5	583.6	16.87	35.589	
3,300.0	3,168.4	3,255.1	3,231.9	17.3	8.5	166.92	-224.2	121.7	625.2	607.6	17.64	35.438	
3,400.0	3,261.8	3,351.7	3,326.9	18.0	8.9	166.32	-238.7	131.5	650.1	631.7	18.42	35.289	
3,500.0	3,355.3	3,448.3	3,422.0	18.8	9.3	165.75	-253.1	141.3	675.0	655.8	19.21	35.145	
3,600.0	3,448.8	3,545.0	3,517.0	19.5	9.7	165.23	-267.6	151.1	700.0	680.0	20.00	35.004	
3,700.0	3,542.3	3,641.6	3,612.1	20.3	10.1	164.75	-282.1	160.9	725.0	704.2	20.79	34.868	
3,800.0	3,635.8	3,738.3	3,707.1	21.1	10.4	164.29	-296.5	170.7	750.0	728.4	21.59	34.736	
3,900.0	3,729.3	3,834.9	3,802.2	21.8	10.8	163.87	-311.0	180.5	775.1	752.7	22.40	34.610	
4,000.0	3,822.7	3,931.6	3,897.2	22.6	11.2	163.47	-325.5	190.3	800.2	777.0	23.20	34.488	
4,100.0	3,916.2	4,028.2	3,992.3	23.3	11.6	163.10	-339.9	200.1	825.4	801.4	24.02	34.371	
4,200.0	4,009.7	4,124.9	4,087.3	24.1	12.0	162.75	-354.4	209.9	850.6	825.8	24.83	34.258	
4,300.0	4,103.2	4,221.5	4,182.4	24.9	12.4	162.42	-368.9	219.7	875.8	850.2	25.65	34.150	
4,400.0	4,196.7	4,318.1	4,277.4	25.6	12.8	162.10	-383.3	229.5	901.1	874.6	26.47	34.047	
4,500.0	4,290.2	4,414.8	4,372.5	26.4	13.1	161.81	-397.8	239.2	926.4	899.1	27.29	33.947	
4,600.0	4,383.7	4,511.4	4,467.5	27.1	13.5	161.53	-412.2	249.0	951.7	923.6	28.11	33.852	
4,700.0	4,477.1	4,600.0	4,554.8	27.9	13.8	161.33	-424.7	257.5	977.5	948.6	28.85	33.879	
4,800.0	4,570.6	4,678.7	4,632.7	28.7	14.1	161.29	-434.0	263.7	1,004.6	975.2	29.47	34.095	
4,900.0	4,664.1	4,760.3	4,713.8	29.4	14.3	161.36	-441.7	269.0	1,033.2	1,003.1	30.04	34.393	
5,000.0	4,757.6	4,841.1	4,794.3	30.2	14.4	161.53	-447.4	272.9	1,063.0	1,032.4	30.56	34.781	

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

Company:	Sundance Energy, Weld County, CO	**Local Co-ordinate Reference:**	Well HFE 44-22
Project:	SEC.22-T4N-R68W	**TVD Reference:**	WELL @ 4956.0ft (Original Well Elev)
Reference Site:	HFE 5 Pad Sec.22-T4N-R68W	**MD Reference:**	WELL @ 4956.0ft (Original Well Elev)
Site Error:	0.0ft	**North Reference:**	True
Reference Well:	HFE 44-22	**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 (8-02-12)	**Offset TVD Reference:**	Offset Datum

Offset Design HFE 5 Pad Sec.22-T4N-R68W - HFE 34-22 - Wellbore #1 - Plan #1 (8-02-12)

Offset Site Error: 0.0 ft

Survey Program: 0-MWD

Offset Well Error: 0.0 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
5,100.0	4,851.1	4,921.0	4,874.0	30.9	14.6	161.81	-451.3	275.5	1,094.2	1,063.2	31.04	35.255	
5,200.0	4,944.6	5,000.0	4,953.0	31.7	14.7	162.17	-453.2	276.8	1,126.7	1,095.3	31.46	35.809	
5,300.0	5,038.3	5,084.3	5,037.3	32.4	14.9	162.75	-453.6	277.0	1,160.0	1,128.1	31.87	36.392	
5,400.0	5,133.0	5,179.0	5,132.0	32.9	15.0	163.39	-453.6	277.0	1,190.6	1,158.4	32.24	36.928	
5,500.0	5,228.8	5,274.8	5,227.8	33.4	15.1	163.93	-453.6	277.0	1,218.2	1,185.6	32.59	37.374	
5,600.0	5,325.6	5,371.6	5,324.6	33.9	15.3	164.39	-453.6	277.0	1,242.5	1,209.6	32.93	37.734	
5,700.0	5,423.2	5,469.2	5,422.2	34.2	15.4	164.77	-453.6	277.0	1,263.6	1,230.4	33.24	38.015	
5,800.0	5,521.5	5,567.5	5,520.5	34.6	15.6	165.08	-453.6	277.0	1,281.4	1,247.9	33.53	38.221	
5,900.0	5,620.3	5,666.3	5,619.3	34.8	15.7	165.32	-453.6	277.0	1,295.9	1,262.1	33.79	38.356	
6,000.0	5,719.7	5,765.7	5,718.7	35.1	15.9	165.50	-453.6	277.0	1,307.1	1,273.0	34.02	38.424	
6,100.0	5,819.3	5,865.3	5,818.3	35.2	16.0	165.63	-453.6	277.0	1,314.8	1,280.6	34.22	38.426	
6,200.0	5,919.2	5,965.2	5,918.2	35.4	16.2	165.70	-453.6	277.0	1,319.3	1,284.9	34.39	38.363	
6,300.0	6,019.2	6,065.2	6,018.2	35.4	16.3	-91.30	-453.6	277.0	1,320.4	1,285.8	34.57	38.197	
6,400.0	6,119.2	6,165.2	6,118.2	35.5	16.5	-91.30	-453.6	277.0	1,320.4	1,285.5	34.87	37.869	
6,500.0	6,219.2	6,265.2	6,218.2	35.6	16.7	-91.30	-453.6	277.0	1,320.4	1,285.2	35.17	37.543	
6,600.0	6,319.2	6,365.2	6,318.2	35.7	16.8	-91.30	-453.6	277.0	1,320.4	1,284.9	35.47	37.220	
6,700.0	6,419.2	6,465.2	6,418.2	35.8	17.0	-91.30	-453.6	277.0	1,320.4	1,284.6	35.78	36.899	
6,800.0	6,519.2	6,565.2	6,518.2	35.9	17.2	-91.30	-453.6	277.0	1,320.4	1,284.3	36.09	36.581	
6,900.0	6,619.2	6,665.2	6,618.2	35.9	17.3	-91.30	-453.6	277.0	1,320.4	1,284.0	36.41	36.266	
7,000.0	6,719.2	6,765.2	6,718.2	36.0	17.5	-91.30	-453.6	277.0	1,320.4	1,283.7	36.73	35.953	
7,100.0	6,819.2	6,865.2	6,818.2	36.1	17.7	-91.30	-453.6	277.0	1,320.4	1,283.3	37.04	35.643	
7,200.0	6,919.2	6,965.2	6,918.2	36.2	17.9	-91.30	-453.6	277.0	1,320.4	1,283.0	37.37	35.336	
7,300.0	7,019.2	7,065.2	7,018.2	36.3	18.0	-91.30	-453.6	277.0	1,320.4	1,282.7	37.69	35.031	
7,400.0	7,119.2	7,165.2	7,118.2	36.4	18.2	-91.30	-453.6	277.0	1,320.4	1,282.4	38.02	34.730	
7,500.0	7,219.2	7,265.2	7,218.2	36.5	18.4	-91.30	-453.6	277.0	1,320.4	1,282.0	38.35	34.431	
7,580.8	7,300.0	7,346.0	7,299.0	36.5	18.5	-91.30	-453.6	277.0	1,320.4	1,281.8	38.62	34.193	

Company:	Sundance Energy, Weld County, CO	**Local Co-ordinate Reference:**	Well HFE 44-22
Project:	SEC.22-T4N-R68W	**TVD Reference:**	WELL @ 4956.0ft (Original Well Elev)
Reference Site:	HFE 5 Pad Sec.22-T4N-R68W	**MD Reference:**	WELL @ 4956.0ft (Original Well Elev)
Site Error:	0.0ft	**North Reference:**	True
Reference Well:	HFE 44-22	**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 (8-02-12)	**Offset TVD Reference:**	Offset Datum

Offset Design HFE 5 Pad Sec.22-T4N-R68W - MLD 33-22 - Wellbore #1 - plan #1 (8-02-12) — **Offset Site Error:** 0.0 ft

Survey Program: 0-MWD — **Offset Well Error:** 0.0 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
0.0	0.0	0.0	0.0	0.0	0.0	-90.03	0.0	-15.1	15.1	15.1	0.00	N/A	
100.0	100.0	99.0	99.0	0.1	0.1	-90.03	0.0	-15.1	15.1	14.8	0.22	67.355	
200.0	200.0	199.0	199.0	0.3	0.3	-90.03	0.0	-15.1	15.1	14.4	0.67	22.414	
300.0	300.0	299.0	299.0	0.6	0.6	-90.03	0.0	-15.1	15.1	13.9	1.12	13.431	
400.0	400.0	399.0	399.0	0.8	0.8	-90.03	0.0	-15.1	15.1	13.5	1.57	9.588	CC
427.9	427.9	426.9	426.9	0.8	0.8	90.48	0.0	-15.1	15.1	13.4	1.69	8.920	
500.0	500.0	499.0	499.0	1.0	1.0	96.57	0.0	-15.1	15.2	13.2	1.99	7.606	ES
600.0	599.8	598.8	598.8	1.2	1.2	114.78	0.0	-15.1	16.6	14.2	2.41	6.890	SF
700.0	699.5	698.5	698.5	1.4	1.5	145.76	0.0	-15.1	21.7	18.9	2.85	7.639	
800.0	799.0	797.8	797.8	1.6	1.7	173.26	0.4	-14.9	30.8	27.5	3.29	9.364	
900.0	898.4	896.1	896.1	1.9	1.9	-169.06	3.5	-13.9	43.8	40.1	3.73	11.766	
1,000.0	997.5	993.6	993.3	2.2	2.1	-157.77	9.8	-11.8	60.9	56.8	4.17	14.608	
1,100.0	1,096.1	1,089.8	1,089.0	2.5	2.4	-150.36	19.1	-8.7	81.9	77.3	4.63	17.697	
1,200.0	1,194.3	1,184.7	1,183.0	2.9	2.6	-145.26	31.2	-4.7	106.7	101.6	5.11	20.871	
1,300.0	1,291.7	1,278.1	1,275.1	3.3	2.9	-141.55	46.0	0.3	135.3	129.6	5.64	23.998	
1,400.0	1,388.4	1,370.7	1,365.9	3.7	3.2	-138.78	63.4	6.0	167.3	161.1	6.21	26.945	
1,500.0	1,484.1	1,464.6	1,457.8	4.3	3.5	-137.13	81.7	12.1	201.5	194.7	6.83	29.522	
1,600.0	1,578.9	1,557.8	1,549.0	4.8	3.9	-136.33	99.8	18.2	237.5	230.0	7.48	31.728	
1,700.0	1,672.6	1,650.2	1,639.4	5.5	4.2	-136.75	117.8	24.2	275.1	266.9	8.19	33.605	
1,800.0	1,766.1	1,742.3	1,729.6	6.2	4.6	-138.15	135.8	30.1	313.3	304.4	8.92	35.139	
1,900.0	1,859.6	1,834.5	1,819.8	6.9	4.9	-139.25	153.7	36.1	351.6	342.0	9.67	36.379	
2,000.0	1,953.1	1,926.7	1,910.1	7.6	5.3	-140.13	171.7	42.1	390.0	379.6	10.43	37.395	
2,100.0	2,046.5	2,018.9	2,000.3	8.3	5.7	-140.86	189.6	48.1	428.5	417.3	11.21	38.238	
2,200.0	2,140.0	2,111.1	2,090.5	9.0	6.1	-141.46	207.6	54.0	467.0	455.0	11.99	38.946	
2,300.0	2,233.5	2,203.3	2,180.7	9.8	6.5	-141.98	225.5	60.0	505.5	492.8	12.78	39.546	
2,400.0	2,327.0	2,295.4	2,270.9	10.5	6.8	-142.42	243.5	66.0	544.1	530.5	13.58	40.060	
2,500.0	2,420.5	2,387.6	2,361.2	11.3	7.2	-142.80	261.5	71.9	582.7	568.3	14.39	40.504	
2,600.0	2,514.0	2,479.8	2,451.4	12.0	7.6	-143.14	279.4	77.9	621.3	606.2	15.20	40.891	
2,700.0	2,607.5	2,572.0	2,541.6	12.8	8.0	-143.43	297.4	83.9	660.0	644.0	16.01	41.230	
2,800.0	2,700.9	2,664.2	2,631.8	13.5	8.4	-143.69	315.3	89.9	698.6	681.8	16.82	41.530	
2,900.0	2,794.4	2,756.4	2,722.0	14.3	8.8	-143.93	333.3	95.8	737.3	719.7	17.64	41.796	
3,000.0	2,887.9	2,848.5	2,812.3	15.0	9.2	-144.14	351.2	101.8	776.0	757.5	18.46	42.033	
3,100.0	2,981.4	2,940.7	2,902.5	15.8	9.6	-144.33	369.2	107.8	814.7	795.4	19.28	42.247	
3,200.0	3,074.9	3,032.9	2,992.7	16.5	10.0	-144.51	387.1	113.8	853.3	833.2	20.11	42.439	
3,300.0	3,168.4	3,125.1	3,082.9	17.3	10.4	-144.67	405.1	119.7	892.0	871.1	20.93	42.614	
3,400.0	3,261.8	3,217.3	3,173.1	18.0	10.8	-144.82	423.0	125.7	930.7	909.0	21.76	42.773	
3,500.0	3,355.3	3,309.5	3,263.4	18.8	11.2	-144.95	441.0	131.7	969.4	946.9	22.59	42.917	
3,600.0	3,448.8	3,401.6	3,353.6	19.5	11.6	-145.07	458.9	137.7	1,008.1	984.7	23.42	43.050	
3,700.0	3,542.3	3,493.8	3,443.8	20.3	12.0	-145.19	476.9	143.6	1,046.9	1,022.6	24.25	43.172	
3,800.0	3,635.8	3,586.0	3,534.0	21.1	12.4	-145.30	494.8	149.6	1,085.6	1,060.5	25.08	43.284	
3,900.0	3,729.3	3,678.2	3,624.2	21.8	12.8	-145.40	512.8	155.6	1,124.3	1,098.4	25.91	43.388	
4,000.0	3,822.7	3,770.4	3,714.5	22.6	13.2	-145.49	530.7	161.6	1,163.0	1,136.3	26.75	43.484	
4,100.0	3,916.2	3,862.6	3,804.7	23.3	13.6	-145.58	548.7	167.5	1,201.7	1,174.2	27.58	43.574	
4,200.0	4,009.7	3,954.7	3,894.9	24.1	14.0	-145.66	566.6	173.5	1,240.5	1,212.1	28.41	43.657	
4,300.0	4,103.2	4,046.9	3,985.1	24.9	14.4	-145.73	584.6	179.5	1,279.2	1,249.9	29.25	43.734	
4,400.0	4,196.7	4,139.1	4,075.3	25.6	14.8	-145.81	602.5	185.5	1,317.9	1,287.8	30.08	43.807	
4,500.0	4,290.2	4,231.3	4,165.6	26.4	15.2	-145.87	620.5	191.4	1,356.7	1,325.7	30.92	43.875	
4,600.0	4,383.7	4,323.5	4,255.8	27.1	15.6	-145.94	638.5	197.4	1,395.4	1,363.6	31.76	43.938	
4,700.0	4,477.1	4,415.7	4,346.0	27.9	16.0	-146.00	656.4	203.4	1,434.1	1,401.5	32.60	43.998	
4,800.0	4,570.6	4,507.8	4,436.2	28.7	16.4	-146.06	674.4	209.4	1,472.9	1,439.4	33.43	44.055	
4,900.0	4,664.1	4,600.0	4,526.5	29.4	16.8	-146.11	692.3	215.3	1,511.6	1,477.3	34.27	44.108	
5,000.0	4,757.6	4,692.2	4,616.7	30.2	17.2	-146.16	710.3	221.3	1,550.3	1,515.2	35.11	44.158	

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

Company:	Sundance Energy, Weld County, CO	**Local Co-ordinate Reference:**	Well HFE 44-22
Project:	SEC.22-T4N-R68W	**TVD Reference:**	WELL @ 4956.0ft (Original Well Elev)
Reference Site:	HFE 5 Pad Sec.22-T4N-R68W	**MD Reference:**	WELL @ 4956.0ft (Original Well Elev)
Site Error:	0.0ft	**North Reference:**	True
Reference Well:	HFE 44-22	**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 (8-02-12)	**Offset TVD Reference:**	Offset Datum

Offset Design HFE 5 Pad Sec.22-T4N-R68W - MLD 33-22 - Wellbore #1 - plan #1 (8-02-12)

Offset Site Error: 0.0 ft

Survey Program: 0-MWD

Offset Well Error: 0.0 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
5,100.0	4,851.1	4,784.4	4,706.9	30.9	17.6	-146.21	728.2	227.3	1,589.1	1,553.1	35.95	44.205	
5,200.0	4,944.6	4,876.6	4,797.1	31.7	18.0	-146.26	746.2	233.3	1,627.8	1,591.0	36.79	44.250	
5,300.0	5,038.3	4,968.9	4,887.5	32.4	18.4	-146.56	764.2	239.2	1,666.1	1,628.4	37.65	44.255	
5,400.0	5,133.0	5,062.3	4,978.9	32.9	18.8	-146.95	782.3	245.3	1,701.9	1,663.4	38.47	44.237	
5,500.0	5,228.8	5,156.6	5,071.2	33.4	19.2	-147.23	800.7	251.4	1,734.9	1,695.7	39.28	44.174	
5,600.0	5,325.6	5,271.9	5,184.2	33.9	19.7	-147.40	822.3	258.6	1,764.9	1,724.8	40.06	44.055	
5,700.0	5,423.2	5,405.2	5,315.8	34.2	20.1	-147.58	842.1	265.2	1,790.3	1,749.5	40.77	43.911	
5,800.0	5,521.5	5,540.8	5,450.6	34.6	20.4	-147.80	856.4	269.9	1,810.8	1,769.4	41.35	43.786	
5,900.0	5,620.3	5,678.2	5,587.7	34.8	20.6	-148.07	864.6	272.7	1,826.3	1,784.5	41.82	43.673	
6,000.0	5,719.7	5,809.2	5,718.7	35.1	20.8	-148.37	866.7	273.4	1,836.8	1,794.6	42.15	43.582	
6,100.0	5,819.3	5,908.8	5,818.3	35.2	20.9	-148.57	866.7	273.4	1,843.7	1,801.3	42.40	43.483	
6,200.0	5,919.2	6,008.7	5,918.2	35.4	21.1	-148.68	866.7	273.4	1,847.6	1,804.9	42.62	43.350	
6,300.0	6,019.2	6,108.7	6,018.2	35.4	21.2	-45.73	866.7	273.4	1,848.5	1,805.7	42.82	43.166	
6,400.0	6,119.2	6,208.7	6,118.2	35.5	21.3	-45.73	866.7	273.4	1,848.5	1,805.4	43.08	42.908	
6,500.0	6,219.2	6,308.7	6,218.2	35.6	21.5	-45.73	866.7	273.4	1,848.5	1,805.2	43.34	42.651	
6,600.0	6,319.2	6,408.7	6,318.2	35.7	21.6	-45.73	866.7	273.4	1,848.5	1,804.9	43.60	42.394	
6,700.0	6,419.2	6,508.7	6,418.2	35.8	21.7	-45.73	866.7	273.4	1,848.5	1,804.7	43.87	42.137	
6,800.0	6,519.2	6,608.7	6,518.2	35.9	21.9	-45.73	866.7	273.4	1,848.5	1,804.4	44.14	41.880	
6,900.0	6,619.2	6,708.7	6,618.2	35.9	22.0	-45.73	866.7	273.4	1,848.5	1,804.1	44.41	41.624	
7,000.0	6,719.2	6,808.7	6,718.2	36.0	22.2	-45.73	866.7	273.4	1,848.5	1,803.8	44.69	41.368	
7,100.0	6,819.2	6,908.7	6,818.2	36.1	22.3	-45.73	866.7	273.4	1,848.5	1,803.6	44.96	41.112	
7,200.0	6,919.2	7,008.7	6,918.2	36.2	22.4	-45.73	866.7	273.4	1,848.5	1,803.3	45.24	40.858	
7,300.0	7,019.2	7,108.7	7,018.2	36.3	22.6	-45.73	866.7	273.4	1,848.5	1,803.0	45.53	40.604	
7,400.0	7,119.2	7,208.7	7,118.2	36.4	22.7	-45.73	866.7	273.4	1,848.5	1,802.7	45.81	40.351	
7,500.0	7,219.2	7,308.7	7,218.2	36.5	22.9	-45.73	866.7	273.4	1,848.5	1,802.4	46.10	40.098	
7,580.8	7,300.0	7,389.5	7,299.0	36.5	23.0	-45.73	866.7	273.4	1,848.5	1,802.2	46.33	39.895	

Company:	Sundance Energy, Weld County, CO	**Local Co-ordinate Reference:**	Well HFE 44-22
Project:	SEC.22-T4N-R68W	**TVD Reference:**	WELL @ 4956.0ft (Original Well Elev)
Reference Site:	HFE 5 Pad Sec.22-T4N-R68W	**MD Reference:**	WELL @ 4956.0ft (Original Well Elev)
Site Error:	0.0ft	**North Reference:**	True
Reference Well:	HFE 44-22	**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 (8-02-12)	**Offset TVD Reference:**	Offset Datum

Offset Design HFE 5 Pad Sec.22-T4N-R68W - MLD 43-22 - Wellbore #1 - Plan #1 (8-02-12) — **Offset Site Error:** 0.0 ft

Survey Program: 0-MWD — **Offset Well Error:** 0.0 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
0.0	0.0	0.0	0.0	0.0	0.0	87.23	0.7	15.1	15.1	15.1	0.00	N/A	
100.0	100.0	100.0	100.0	0.1	0.1	87.23	0.7	15.1	15.1	14.9	0.22	67.097	
200.0	200.0	200.0	200.0	0.3	0.3	87.23	0.7	15.1	15.1	14.4	0.67	22.366	CC
200.0	200.0	200.0	200.0	0.3	0.3	87.23	0.7	15.1	15.1	14.4	0.67	22.363	
300.0	300.0	299.9	299.9	0.6	0.6	80.68	2.5	15.1	15.3	14.1	1.12	13.587	ES
400.0	400.0	399.6	399.5	0.8	0.8	62.98	7.7	15.1	16.9	15.3	1.58	10.703	SF
500.0	500.0	498.6	498.1	1.0	1.0	-138.78	16.0	15.5	23.6	21.6	2.03	11.617	
600.0	599.8	596.6	595.6	1.2	1.3	-149.78	25.4	18.7	37.6	35.2	2.45	15.348	
700.0	699.5	693.6	691.8	1.4	1.6	-142.38	35.7	25.0	57.1	54.2	2.88	19.818	
800.0	799.0	789.9	787.0	1.6	1.9	-124.68	46.7	34.4	77.9	74.6	3.33	23.434	
900.0	898.4	885.6	881.2	1.9	2.2	-111.92	58.6	46.8	99.5	95.7	3.80	26.156	
1,000.0	997.5	980.9	974.3	2.2	2.6	-103.41	71.2	62.2	121.8	117.5	4.33	28.110	
1,100.0	1,096.1	1,075.6	1,066.3	2.5	3.0	-97.69	84.5	80.4	144.8	139.8	4.93	29.384	
1,200.0	1,194.3	1,169.8	1,157.1	2.9	3.5	-93.72	98.6	101.5	168.4	162.8	5.60	30.064	
1,300.0	1,291.7	1,263.5	1,246.5	3.3	4.0	-90.86	113.3	125.3	192.6	186.3	6.37	30.245	
1,400.0	1,388.4	1,356.7	1,334.5	3.7	4.5	-88.73	128.7	151.8	217.5	210.2	7.24	30.032	
1,500.0	1,484.1	1,449.5	1,421.1	4.3	5.2	-87.10	144.7	180.9	242.9	234.6	8.22	29.537	
1,600.0	1,578.9	1,545.3	1,509.8	4.8	5.9	-86.06	161.7	212.8	268.3	259.0	9.34	28.727	
1,700.0	1,672.6	1,642.0	1,599.3	5.5	6.6	-86.41	178.9	245.1	292.9	282.3	10.57	27.706	
1,800.0	1,766.1	1,738.7	1,688.8	6.2	7.3	-87.80	196.1	277.4	317.4	305.6	11.86	26.762	
1,900.0	1,859.6	1,835.3	1,778.3	6.9	8.0	-88.99	213.2	309.7	342.1	328.9	13.18	25.953	
2,000.0	1,953.1	1,932.0	1,867.8	7.6	8.8	-90.02	230.4	342.0	366.9	352.4	14.53	25.260	
2,100.0	2,046.5	2,028.7	1,957.3	8.3	9.5	-90.92	247.6	374.3	391.9	376.0	15.89	24.665	
2,200.0	2,140.0	2,125.3	2,046.8	9.0	10.2	-91.71	264.8	406.5	416.9	399.6	17.26	24.150	
2,300.0	2,233.5	2,222.0	2,136.3	9.8	11.0	-92.42	282.0	438.8	441.9	423.3	18.64	23.703	
2,400.0	2,327.0	2,318.7	2,225.7	10.5	11.7	-93.05	299.2	471.1	467.0	447.0	20.03	23.311	
2,500.0	2,420.5	2,415.4	2,315.2	11.3	12.5	-93.61	316.3	503.4	492.2	470.8	21.43	22.966	
2,600.0	2,514.0	2,512.0	2,404.7	12.0	13.2	-94.12	333.5	535.7	517.4	494.6	22.83	22.660	
2,700.0	2,607.5	2,608.7	2,494.2	12.8	14.0	-94.58	350.7	568.0	542.7	518.4	24.24	22.387	
2,800.0	2,700.9	2,705.4	2,583.7	13.5	14.7	-95.00	367.9	600.2	567.9	542.3	25.65	22.143	
2,900.0	2,794.4	2,802.1	2,673.2	14.3	15.5	-95.39	385.1	632.5	593.2	566.2	27.06	21.922	
3,000.0	2,887.9	2,898.7	2,762.7	15.0	16.2	-95.74	402.3	664.8	618.5	590.1	28.47	21.723	
3,100.0	2,981.4	2,995.4	2,852.2	15.8	17.0	-96.07	419.4	697.1	643.9	614.0	29.89	21.542	
3,200.0	3,074.9	3,092.1	2,941.7	16.5	17.8	-96.37	436.6	729.4	669.3	637.9	31.31	21.376	
3,300.0	3,168.4	3,188.8	3,031.1	17.3	18.5	-96.65	453.8	761.7	694.6	661.9	32.73	21.225	
3,400.0	3,261.8	3,285.4	3,120.6	18.0	19.3	-96.91	471.0	794.0	720.0	685.9	34.15	21.085	
3,500.0	3,355.3	3,382.1	3,210.1	18.8	20.0	-97.15	488.2	826.2	745.4	709.9	35.57	20.957	
3,600.0	3,448.8	3,478.8	3,299.6	19.5	20.8	-97.38	505.4	858.5	770.8	733.8	36.99	20.838	
3,700.0	3,542.3	3,575.4	3,389.1	20.3	21.5	-97.59	522.5	890.8	796.3	757.8	38.41	20.728	
3,800.0	3,635.8	3,672.1	3,478.6	21.1	22.3	-97.79	539.7	923.1	821.7	781.9	39.84	20.626	
3,900.0	3,729.3	3,768.8	3,568.1	21.8	23.1	-97.97	556.9	955.4	847.1	805.9	41.26	20.531	
4,000.0	3,822.7	3,865.5	3,657.6	22.6	23.8	-98.15	574.1	987.7	872.6	829.9	42.69	20.442	
4,100.0	3,916.2	3,962.1	3,747.0	23.3	24.6	-98.31	591.3	1,019.9	898.1	853.9	44.11	20.358	
4,200.0	4,009.7	4,058.8	3,836.5	24.1	25.3	-98.47	608.5	1,052.2	923.5	878.0	45.54	20.280	
4,300.0	4,103.2	4,155.5	3,926.0	24.9	26.1	-98.62	625.6	1,084.5	949.0	902.0	46.96	20.207	
4,400.0	4,196.7	4,252.2	4,015.5	25.6	26.8	-98.76	642.8	1,116.8	974.5	926.1	48.39	20.137	
4,500.0	4,290.2	4,348.8	4,105.0	26.4	27.6	-98.89	660.0	1,149.1	1,000.0	950.1	49.82	20.072	
4,600.0	4,383.7	4,445.5	4,194.5	27.1	28.4	-99.02	677.2	1,181.4	1,025.4	974.2	51.25	20.010	
4,700.0	4,477.1	4,542.2	4,284.0	27.9	29.1	-99.14	694.4	1,213.6	1,050.9	998.3	52.67	19.952	
4,800.0	4,570.6	4,638.8	4,373.5	28.7	29.9	-99.25	711.6	1,245.9	1,076.4	1,022.3	54.10	19.897	
4,900.0	4,664.1	4,735.5	4,463.0	29.4	30.6	-99.36	728.7	1,278.2	1,101.9	1,046.4	55.53	19.844	
5,000.0	4,757.6	4,832.2	4,552.4	30.2	31.4	-99.47	745.9	1,310.5	1,127.4	1,070.5	56.96	19.795	

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

Company:	Sundance Energy, Weld County, CO	**Local Co-ordinate Reference:**	Well HFE 44-22
Project:	SEC.22-T4N-R68W	**TVD Reference:**	WELL @ 4956.0ft (Original Well Elev)
Reference Site:	HFE 5 Pad Sec.22-T4N-R68W	**MD Reference:**	WELL @ 4956.0ft (Original Well Elev)
Site Error:	0.0ft	**North Reference:**	True
Reference Well:	HFE 44-22	**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 (8-02-12)	**Offset TVD Reference:**	Offset Datum

Offset Design HFE 5 Pad Sec.22-T4N-R68W - MLD 43-22 - Wellbore #1 - Plan #1 (8-02-12)

Offset Site Error: 0.0 ft

Survey Program: 0-MWD

Offset Well Error: 0.0 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
5,100.0	4,851.1	4,928.9	4,641.9	30.9	32.2	-99.57	763.1	1,342.8	1,152.9	1,094.6	58.39	19.747	
5,200.0	4,944.6	5,025.5	4,731.4	31.7	32.9	-99.66	780.3	1,375.1	1,178.5	1,118.6	59.81	19.702	
5,300.0	5,038.3	5,123.5	4,822.1	32.4	33.7	-100.03	797.7	1,407.8	1,203.9	1,142.6	61.25	19.655	
5,400.0	5,133.0	5,245.3	4,935.9	32.9	34.5	-100.52	818.1	1,446.1	1,227.6	1,165.1	62.57	19.620	
5,500.0	5,228.8	5,368.4	5,052.7	33.4	35.1	-100.96	836.4	1,480.5	1,248.8	1,185.1	63.73	19.596	
5,600.0	5,325.6	5,492.7	5,172.2	33.9	35.7	-101.37	852.5	1,510.6	1,267.3	1,202.6	64.77	19.568	
5,700.0	5,423.2	5,618.0	5,294.0	34.2	36.2	-101.73	866.2	1,536.4	1,283.1	1,217.5	65.67	19.538	
5,800.0	5,521.5	5,744.2	5,417.9	34.6	36.6	-102.07	877.4	1,557.5	1,296.1	1,229.7	66.45	19.505	
5,900.0	5,620.3	5,870.9	5,543.3	34.8	36.9	-102.37	886.1	1,573.9	1,306.4	1,239.3	67.11	19.467	
6,000.0	5,719.7	5,998.2	5,669.8	35.1	37.2	-102.64	892.3	1,585.4	1,313.7	1,246.1	67.64	19.424	
6,100.0	5,819.3	6,125.6	5,797.0	35.2	37.4	-102.88	895.7	1,592.0	1,318.3	1,250.2	68.03	19.377	
6,200.0	5,919.2	6,247.8	5,919.2	35.4	37.5	-103.08	896.6	1,593.6	1,320.0	1,251.7	68.31	19.324	
6,300.0	6,019.2	6,347.8	6,019.2	35.4	37.6	-0.15	896.6	1,593.6	1,320.2	1,251.8	68.49	19.277	
6,400.0	6,119.2	6,447.8	6,119.2	35.5	37.6	-0.15	896.6	1,593.6	1,320.2	1,251.6	68.65	19.231	
6,500.0	6,219.2	6,547.8	6,219.2	35.6	37.7	-0.15	896.6	1,593.6	1,320.2	1,251.4	68.82	19.184	
6,600.0	6,319.2	6,647.8	6,319.2	35.7	37.8	-0.15	896.6	1,593.6	1,320.2	1,251.3	68.99	19.136	
6,700.0	6,419.2	6,747.8	6,419.2	35.8	37.9	-0.15	896.6	1,593.6	1,320.2	1,251.1	69.16	19.088	
6,800.0	6,519.2	6,847.8	6,519.2	35.9	38.0	-0.15	896.6	1,593.6	1,320.2	1,250.9	69.34	19.040	
6,900.0	6,619.2	6,947.8	6,619.2	35.9	38.0	-0.15	896.6	1,593.6	1,320.2	1,250.7	69.52	18.991	
7,000.0	6,719.2	7,047.8	6,719.2	36.0	38.1	-0.15	896.6	1,593.6	1,320.2	1,250.5	69.70	18.942	
7,100.0	6,819.2	7,147.8	6,819.2	36.1	38.2	-0.15	896.6	1,593.6	1,320.2	1,250.4	69.88	18.893	
7,200.0	6,919.2	7,247.8	6,919.2	36.2	38.3	-0.15	896.6	1,593.6	1,320.2	1,250.2	70.07	18.843	
7,300.0	7,019.2	7,347.8	7,019.2	36.3	38.4	-0.15	896.6	1,593.6	1,320.2	1,250.0	70.25	18.793	
7,400.0	7,119.2	7,447.8	7,119.2	36.4	38.5	-0.15	896.6	1,593.6	1,320.2	1,249.8	70.44	18.742	
7,500.0	7,219.2	7,547.8	7,219.2	36.5	38.6	-0.15	896.6	1,593.6	1,320.2	1,249.6	70.64	18.691	
7,580.8	7,300.0	7,628.6	7,300.0	36.5	38.6	-0.15	896.6	1,593.6	1,320.2	1,249.5	70.79	18.649	

Company:	Sundance Energy, Weld County, CO	**Local Co-ordinate Reference:**	Well HFE 44-22
Project:	SEC.22-T4N-R68W	**TVD Reference:**	WELL @ 4956.0ft (Original Well Elev)
Reference Site:	HFE 5 Pad Sec.22-T4N-R68W	**MD Reference:**	WELL @ 4956.0ft (Original Well Elev)
Site Error:	0.0ft	**North Reference:**	True
Reference Well:	HFE 44-22	**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 (8-02-12)	**Offset TVD Reference:**	Offset Datum

Reference Depths are relative to WELL @ 4956.0ft (Original Well Elev) Coordinates are relative to: HFE 44-22
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 HFE 44-22
Project:	SEC.22-T4N-R68W	**TVD Reference:**	WELL @ 4956.0ft (Original Well Elev)
Reference Site:	HFE 5 Pad Sec.22-T4N-R68W	**MD Reference:**	WELL @ 4956.0ft (Original Well Elev)
Site Error:	0.0ft	**North Reference:**	True
Reference Well:	HFE 44-22	**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 (8-02-12)	**Offset TVD Reference:**	Offset Datum

Reference Depths are relative to WELL @ 4956.0ft (Original Well Elev) Coordinates are relative to: HFE 44-22
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°