

ENSIGN

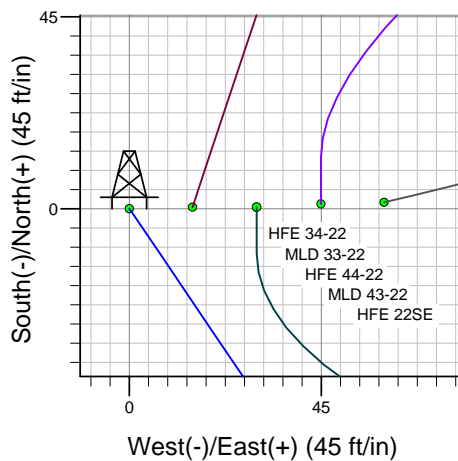
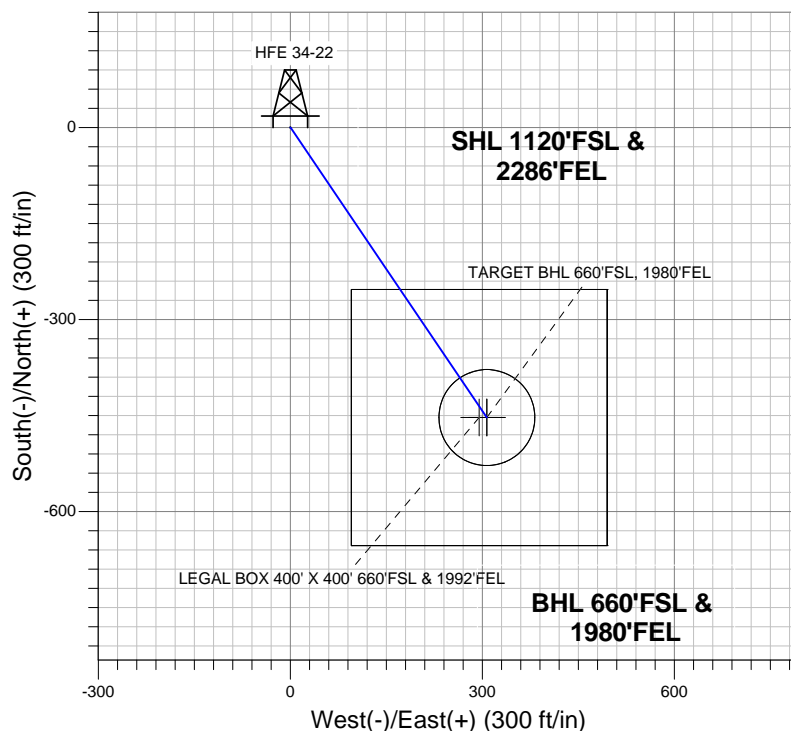
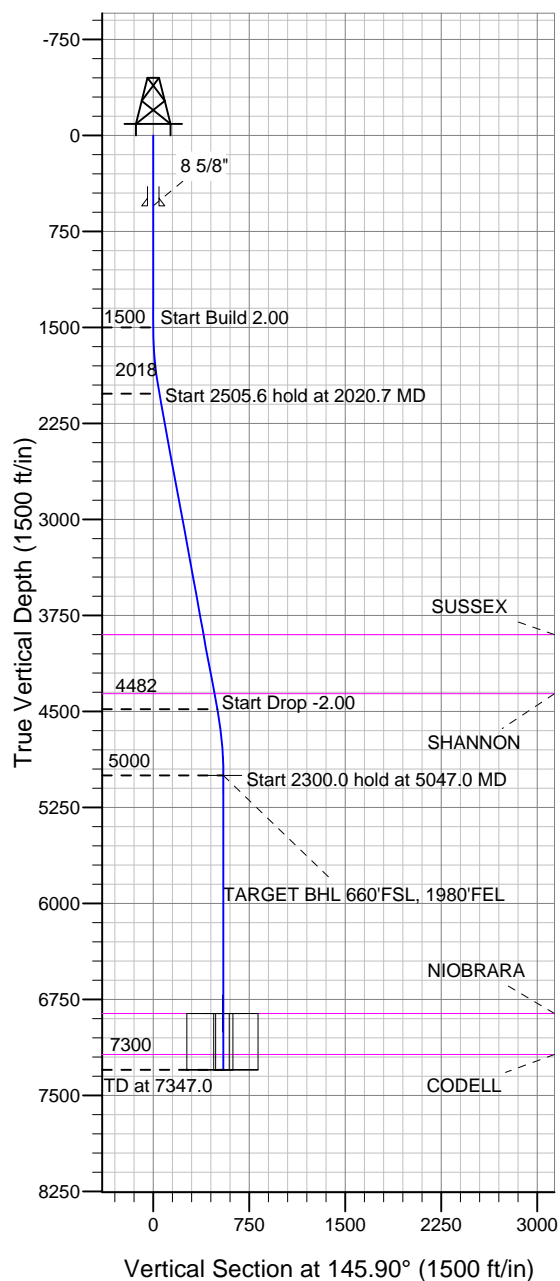
Directional

Well Name: HFE 34-22

Surface Location: HFE 5 Pad Sec.22-T4N-R68W
North American Datum 1983, US State Plane 1983 Colorado Northern Zone
Ground Elevation: 4942.0

+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Slot
0.0	0.0	1350660.88	3142841.99	40.294832	-104.987913	
		Original Well Elev	WELL @ 4955.0ft (Original Well Elev)			

Sundance Energy, Weld County, CO



HFE 5 Pad Sec.22-T4N-R68W
HFE 34-22
Plan #1 (8-02-12)
11:42, August 07 2012



Azimuths to True North
Magnetic North: 8.82°
Magnetic Field
Strength: 52930.3snT
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, 1980'FEL	5000.0	-453.2	306.9	40.293588	-104.986813	Point
LEGAL BOX 400' X 400' 660'FSL & 1992'FEL	6860.0	-453.2	294.9	40.293588	-104.986856	Rectangle (Sides: L400.0 W400.0)
TARGET CIRCLE 660'FSL & 1980'FEL	6860.0	-453.2	306.9	40.293588	-104.986813	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	1500.0	0.00	0.00	1500.0	0.0	0.0	0.00	0.00	0.0	
3	2020.7	10.41	145.90	2017.9	-39.1	26.5	2.00	145.90	47.2	
4	4526.3	10.41	145.90	4482.1	-414.1	280.4	0.00	0.00	500.1	
5	5047.0	0.00	0.00	5000.0	-453.2	306.9	2.00	180.00	547.3	TARGET BHL 660'FSL, 1980'FEL
6	7347.0	0.00	0.00	7300.0	-453.2	306.9	0.00	0.00	547.3	



Sundance Energy, Weld County, CO

SEC.22-T4N-R68W

HFE 5 Pad Sec.22-T4N-R68W

HFE 34-22

Wellbore #1

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

Standard Planning Report

07 August, 2012

Database:	Landmark	Local Co-ordinate Reference:	Well HFE 34-22
Company:	Sundance Energy, Weld County, CO	TVD Reference:	WELL @ 4955.0ft (Original Well Elev)
Project:	SEC.22-T4N-R68W	MD Reference:	WELL @ 4955.0ft (Original Well Elev)
Site:	HFE 5 Pad Sec.22-T4N-R68W	North Reference:	True
Well:	HFE 34-22	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:		1,350,660.89ft	
From:	Lat/Long	Easting:		3,142,841.99ft	
Position Uncertainty:		Slot Radius:		"	
0.0 ft				°	
		Grid Convergence:		0.33	

Well	HFE 34-22					
Well Position	+N-S	0.0 ft	Northing:	1,350,660.88 ft	Latitude:	40.294832
	+E-W	0.0 ft	Easting:	3,142,841.99 ft	Longitude:	-104.987913
Position Uncertainty		0.0 ft	Wellhead Elevation:	ft	Ground Level:	4,942.0 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	145.90

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	
1,500.0	0.00	0.00	1,500.0	0.0	0.0	0.00	0.00	0.00	0.00	
2,020.7	10.41	145.90	2,017.9	-39.1	26.5	2.00	2.00	0.00	145.90	
4,526.3	10.41	145.90	4,482.1	-414.1	280.4	0.00	0.00	0.00	0.00	
5,047.0	0.00	0.00	5,000.0	-453.2	306.9	2.00	-2.00	0.00	180.00	TARGET BHL 660°
7,347.0	0.00	0.00	7,300.0	-453.2	306.9	0.00	0.00	0.00	0.00	

Database:	Landmark	Local Co-ordinate Reference:	Well HFE 34-22
Company:	Sundance Energy, Weld County, CO	TVD Reference:	WELL @ 4955.0ft (Original Well Elev)
Project:	SEC.22-T4N-R68W	MD Reference:	WELL @ 4955.0ft (Original Well Elev)
Site:	HFE 5 Pad Sec.22-T4N-R68W	North Reference:	True
Well:	HFE 34-22	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	0.00	0.00	440.0	0.0	0.0	0.0	0.00	0.00	0.00
480.0	0.00	0.00	480.0	0.0	0.0	0.0	0.00	0.00	0.00
520.0	0.00	0.00	520.0	0.0	0.0	0.0	0.00	0.00	0.00
550.0	0.00	0.00	550.0	0.0	0.0	0.0	0.00	0.00	0.00
8 5/8"									
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
920.0	0.00	0.00	920.0	0.0	0.0	0.0	0.00	0.00	0.00
960.0	0.00	0.00	960.0	0.0	0.0	0.0	0.00	0.00	0.00
1,000.0	0.00	0.00	1,000.0	0.0	0.0	0.0	0.00	0.00	0.00
1,040.0	0.00	0.00	1,040.0	0.0	0.0	0.0	0.00	0.00	0.00
1,080.0	0.00	0.00	1,080.0	0.0	0.0	0.0	0.00	0.00	0.00
1,120.0	0.00	0.00	1,120.0	0.0	0.0	0.0	0.00	0.00	0.00
1,160.0	0.00	0.00	1,160.0	0.0	0.0	0.0	0.00	0.00	0.00
1,200.0	0.00	0.00	1,200.0	0.0	0.0	0.0	0.00	0.00	0.00
1,240.0	0.00	0.00	1,240.0	0.0	0.0	0.0	0.00	0.00	0.00
1,280.0	0.00	0.00	1,280.0	0.0	0.0	0.0	0.00	0.00	0.00
1,320.0	0.00	0.00	1,320.0	0.0	0.0	0.0	0.00	0.00	0.00
1,360.0	0.00	0.00	1,360.0	0.0	0.0	0.0	0.00	0.00	0.00
1,400.0	0.00	0.00	1,400.0	0.0	0.0	0.0	0.00	0.00	0.00
1,440.0	0.00	0.00	1,440.0	0.0	0.0	0.0	0.00	0.00	0.00
1,480.0	0.00	0.00	1,480.0	0.0	0.0	0.0	0.00	0.00	0.00
1,500.0	0.00	0.00	1,500.0	0.0	0.0	0.0	0.00	0.00	0.00
1,520.0	0.40	145.90	1,520.0	-0.1	0.0	0.1	2.00	2.00	0.00
1,560.0	1.20	145.90	1,560.0	-0.5	0.4	0.6	2.00	2.00	0.00
1,600.0	2.00	145.90	1,600.0	-1.4	1.0	1.7	2.00	2.00	0.00
1,640.0	2.80	145.90	1,639.9	-2.8	1.9	3.4	2.00	2.00	0.00
1,680.0	3.60	145.90	1,679.9	-4.7	3.2	5.7	2.00	2.00	0.00
1,720.0	4.40	145.90	1,719.8	-7.0	4.7	8.4	2.00	2.00	0.00
1,760.0	5.20	145.90	1,759.6	-9.8	6.6	11.8	2.00	2.00	0.00
1,800.0	6.00	145.90	1,799.5	-13.0	8.8	15.7	2.00	2.00	0.00
1,840.0	6.80	145.90	1,839.2	-16.7	11.3	20.2	2.00	2.00	0.00
1,880.0	7.60	145.90	1,878.9	-20.8	14.1	25.2	2.00	2.00	0.00
1,920.0	8.40	145.90	1,918.5	-25.4	17.2	30.7	2.00	2.00	0.00
1,960.0	9.20	145.90	1,958.0	-30.5	20.7	36.9	2.00	2.00	0.00
2,000.0	10.00	145.90	1,997.5	-36.0	24.4	43.5	2.00	2.00	0.00

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Company:	Sundance Energy, Weld County, CO	TVD Reference:	WELL @ 4955.0ft (Original Well Elev)
Project:	SEC.22-T4N-R68W	MD Reference:	WELL @ 4955.0ft (Original Well Elev)
Site:	HFE 5 Pad Sec.22-T4N-R68W	North Reference:	True
Well:	HFE 34-22	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)
2,020.7	10.41	145.90	2,017.9	-39.1	26.5	47.2	2.00	2.00	0.00
2,040.0	10.41	145.90	2,036.8	-42.0	28.4	50.7	0.00	0.00	0.00
2,080.0	10.41	145.90	2,076.2	-48.0	32.5	57.9	0.00	0.00	0.00
2,120.0	10.41	145.90	2,115.5	-53.9	36.5	65.1	0.00	0.00	0.00
2,160.0	10.41	145.90	2,154.8	-59.9	40.6	72.4	0.00	0.00	0.00
2,200.0	10.41	145.90	2,194.2	-65.9	44.6	79.6	0.00	0.00	0.00
2,240.0	10.41	145.90	2,233.5	-71.9	48.7	86.8	0.00	0.00	0.00
2,280.0	10.41	145.90	2,272.9	-77.9	52.7	94.1	0.00	0.00	0.00
2,320.0	10.41	145.90	2,312.2	-83.9	56.8	101.3	0.00	0.00	0.00
2,360.0	10.41	145.90	2,351.5	-89.9	60.8	108.5	0.00	0.00	0.00
2,400.0	10.41	145.90	2,390.9	-95.8	64.9	115.8	0.00	0.00	0.00
2,440.0	10.41	145.90	2,430.2	-101.8	69.0	123.0	0.00	0.00	0.00
2,480.0	10.41	145.90	2,469.6	-107.8	73.0	130.2	0.00	0.00	0.00
2,520.0	10.41	145.90	2,508.9	-113.8	77.1	137.4	0.00	0.00	0.00
2,560.0	10.41	145.90	2,548.3	-119.8	81.1	144.7	0.00	0.00	0.00
2,600.0	10.41	145.90	2,587.6	-125.8	85.2	151.9	0.00	0.00	0.00
2,640.0	10.41	145.90	2,626.9	-131.8	89.2	159.1	0.00	0.00	0.00
2,680.0	10.41	145.90	2,666.3	-137.8	93.3	166.4	0.00	0.00	0.00
2,720.0	10.41	145.90	2,705.6	-143.7	97.3	173.6	0.00	0.00	0.00
2,760.0	10.41	145.90	2,745.0	-149.7	101.4	180.8	0.00	0.00	0.00
2,800.0	10.41	145.90	2,784.3	-155.7	105.4	188.1	0.00	0.00	0.00
2,840.0	10.41	145.90	2,823.6	-161.7	109.5	195.3	0.00	0.00	0.00
2,880.0	10.41	145.90	2,863.0	-167.7	113.5	202.5	0.00	0.00	0.00
2,920.0	10.41	145.90	2,902.3	-173.7	117.6	209.8	0.00	0.00	0.00
2,960.0	10.41	145.90	2,941.7	-179.7	121.7	217.0	0.00	0.00	0.00
3,000.0	10.41	145.90	2,981.0	-185.7	125.7	224.2	0.00	0.00	0.00
3,040.0	10.41	145.90	3,020.3	-191.6	129.8	231.4	0.00	0.00	0.00
3,080.0	10.41	145.90	3,059.7	-197.6	133.8	238.7	0.00	0.00	0.00
3,120.0	10.41	145.90	3,099.0	-203.6	137.9	245.9	0.00	0.00	0.00
3,160.0	10.41	145.90	3,138.4	-209.6	141.9	253.1	0.00	0.00	0.00
3,200.0	10.41	145.90	3,177.7	-215.6	146.0	260.4	0.00	0.00	0.00
3,240.0	10.41	145.90	3,217.1	-221.6	150.0	267.6	0.00	0.00	0.00
3,280.0	10.41	145.90	3,256.4	-227.6	154.1	274.8	0.00	0.00	0.00
3,320.0	10.41	145.90	3,295.7	-233.6	158.1	282.1	0.00	0.00	0.00
3,360.0	10.41	145.90	3,335.1	-239.5	162.2	289.3	0.00	0.00	0.00
3,400.0	10.41	145.90	3,374.4	-245.5	166.2	296.5	0.00	0.00	0.00
3,440.0	10.41	145.90	3,413.8	-251.5	170.3	303.7	0.00	0.00	0.00
3,480.0	10.41	145.90	3,453.1	-257.5	174.4	311.0	0.00	0.00	0.00
3,520.0	10.41	145.90	3,492.4	-263.5	178.4	318.2	0.00	0.00	0.00
3,560.0	10.41	145.90	3,531.8	-269.5	182.5	325.4	0.00	0.00	0.00
3,600.0	10.41	145.90	3,571.1	-275.5	186.5	332.7	0.00	0.00	0.00
3,640.0	10.41	145.90	3,610.5	-281.5	190.6	339.9	0.00	0.00	0.00
3,680.0	10.41	145.90	3,649.8	-287.4	194.6	347.1	0.00	0.00	0.00
3,720.0	10.41	145.90	3,689.1	-293.4	198.7	354.4	0.00	0.00	0.00
3,760.0	10.41	145.90	3,728.5	-299.4	202.7	361.6	0.00	0.00	0.00
3,800.0	10.41	145.90	3,767.8	-305.4	206.8	368.8	0.00	0.00	0.00
3,840.0	10.41	145.90	3,807.2	-311.4	210.8	376.1	0.00	0.00	0.00
3,880.0	10.41	145.90	3,846.5	-317.4	214.9	383.3	0.00	0.00	0.00
3,920.0	10.41	145.90	3,885.8	-323.4	218.9	390.5	0.00	0.00	0.00
3,934.4	10.41	145.90	3,900.0	-325.5	220.4	393.1	0.00	0.00	0.00
SUSSEX									
3,960.0	10.41	145.90	3,925.2	-329.4	223.0	397.7	0.00	0.00	0.00
4,000.0	10.41	145.90	3,964.5	-335.3	227.1	405.0	0.00	0.00	0.00

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Company:	Sundance Energy, Weld County, CO	TVD Reference:	WELL @ 4955.0ft (Original Well Elev)
Project:	SEC.22-T4N-R68W	MD Reference:	WELL @ 4955.0ft (Original Well Elev)
Site:	HFE 5 Pad Sec.22-T4N-R68W	North Reference:	True
Well:	HFE 34-22	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)
4,040.0	10.41	145.90	4,003.9	-341.3	231.1	412.2	0.00	0.00	0.00
4,080.0	10.41	145.90	4,043.2	-347.3	235.2	419.4	0.00	0.00	0.00
4,120.0	10.41	145.90	4,082.6	-353.3	239.2	426.7	0.00	0.00	0.00
4,160.0	10.41	145.90	4,121.9	-359.3	243.3	433.9	0.00	0.00	0.00
4,200.0	10.41	145.90	4,161.2	-365.3	247.3	441.1	0.00	0.00	0.00
4,240.0	10.41	145.90	4,200.6	-371.3	251.4	448.4	0.00	0.00	0.00
4,280.0	10.41	145.90	4,239.9	-377.2	255.4	455.6	0.00	0.00	0.00
4,320.0	10.41	145.90	4,279.3	-383.2	259.5	462.8	0.00	0.00	0.00
4,360.0	10.41	145.90	4,318.6	-389.2	263.5	470.1	0.00	0.00	0.00
4,400.0	10.41	145.90	4,357.9	-395.2	267.6	477.3	0.00	0.00	0.00
4,403.1	10.41	145.90	4,361.0	-395.7	267.9	477.8	0.00	0.00	0.00
SHANNON									
4,440.0	10.41	145.90	4,397.3	-401.2	271.7	484.5	0.00	0.00	0.00
4,480.0	10.41	145.90	4,436.6	-407.2	275.7	491.7	0.00	0.00	0.00
4,520.0	10.41	145.90	4,476.0	-413.2	279.8	499.0	0.00	0.00	0.00
4,526.3	10.41	145.90	4,482.1	-414.1	280.4	500.1	0.00	0.00	0.00
4,560.0	9.74	145.90	4,515.3	-419.0	283.7	506.0	2.00	-2.00	0.00
4,600.0	8.94	145.90	4,554.8	-424.4	287.3	512.5	2.00	-2.00	0.00
4,640.0	8.14	145.90	4,594.4	-429.3	290.7	518.4	2.00	-2.00	0.00
4,680.0	7.34	145.90	4,634.0	-433.8	293.7	523.8	2.00	-2.00	0.00
4,720.0	6.54	145.90	4,673.7	-437.8	296.4	528.7	2.00	-2.00	0.00
4,760.0	5.74	145.90	4,713.5	-441.3	298.8	532.9	2.00	-2.00	0.00
4,800.0	4.94	145.90	4,753.3	-444.4	300.9	536.7	2.00	-2.00	0.00
4,840.0	4.14	145.90	4,793.2	-447.0	302.7	539.8	2.00	-2.00	0.00
4,880.0	3.34	145.90	4,833.1	-449.2	304.1	542.4	2.00	-2.00	0.00
4,920.0	2.54	145.90	4,873.0	-450.9	305.3	544.5	2.00	-2.00	0.00
4,960.0	1.74	145.90	4,913.0	-452.1	306.1	546.0	2.00	-2.00	0.00
5,000.0	0.94	145.90	4,953.0	-452.9	306.6	546.9	2.00	-2.00	0.00
5,040.0	0.14	145.90	4,993.0	-453.2	306.9	547.3	2.00	-2.00	0.00
5,047.0	0.00	0.00	5,000.0	-453.2	306.9	547.3	2.00	-2.00	-2,084.09
TARGET BHL 660'FSL, 1980'FEL									
5,080.0	0.00	0.00	5,033.0	-453.2	306.9	547.3	0.00	0.00	0.00
5,120.0	0.00	0.00	5,073.0	-453.2	306.9	547.3	0.00	0.00	0.00
5,160.0	0.00	0.00	5,113.0	-453.2	306.9	547.3	0.00	0.00	0.00
5,200.0	0.00	0.00	5,153.0	-453.2	306.9	547.3	0.00	0.00	0.00
5,240.0	0.00	0.00	5,193.0	-453.2	306.9	547.3	0.00	0.00	0.00
5,280.0	0.00	0.00	5,233.0	-453.2	306.9	547.3	0.00	0.00	0.00
5,320.0	0.00	0.00	5,273.0	-453.2	306.9	547.3	0.00	0.00	0.00
5,360.0	0.00	0.00	5,313.0	-453.2	306.9	547.3	0.00	0.00	0.00
5,400.0	0.00	0.00	5,353.0	-453.2	306.9	547.3	0.00	0.00	0.00
5,440.0	0.00	0.00	5,393.0	-453.2	306.9	547.3	0.00	0.00	0.00
5,480.0	0.00	0.00	5,433.0	-453.2	306.9	547.3	0.00	0.00	0.00
5,520.0	0.00	0.00	5,473.0	-453.2	306.9	547.3	0.00	0.00	0.00
5,560.0	0.00	0.00	5,513.0	-453.2	306.9	547.3	0.00	0.00	0.00
5,600.0	0.00	0.00	5,553.0	-453.2	306.9	547.3	0.00	0.00	0.00
5,640.0	0.00	0.00	5,593.0	-453.2	306.9	547.3	0.00	0.00	0.00
5,680.0	0.00	0.00	5,633.0	-453.2	306.9	547.3	0.00	0.00	0.00
5,720.0	0.00	0.00	5,673.0	-453.2	306.9	547.3	0.00	0.00	0.00
5,760.0	0.00	0.00	5,713.0	-453.2	306.9	547.3	0.00	0.00	0.00
5,800.0	0.00	0.00	5,753.0	-453.2	306.9	547.3	0.00	0.00	0.00
5,840.0	0.00	0.00	5,793.0	-453.2	306.9	547.3	0.00	0.00	0.00
5,880.0	0.00	0.00	5,833.0	-453.2	306.9	547.3	0.00	0.00	0.00
5,920.0	0.00	0.00	5,873.0	-453.2	306.9	547.3	0.00	0.00	0.00
5,960.0	0.00	0.00	5,913.0	-453.2	306.9	547.3	0.00	0.00	0.00

Database:	Landmark	Local Co-ordinate Reference:	Well HFE 34-22
Company:	Sundance Energy, Weld County, CO	TVD Reference:	WELL @ 4955.0ft (Original Well Elev)
Project:	SEC.22-T4N-R68W	MD Reference:	WELL @ 4955.0ft (Original Well Elev)
Site:	HFE 5 Pad Sec.22-T4N-R68W	North Reference:	True
Well:	HFE 34-22	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)
6,000.0	0.00	0.00	5,953.0	-453.2	306.9	547.3	0.00	0.00	0.00
6,040.0	0.00	0.00	5,993.0	-453.2	306.9	547.3	0.00	0.00	0.00
6,080.0	0.00	0.00	6,033.0	-453.2	306.9	547.3	0.00	0.00	0.00
6,120.0	0.00	0.00	6,073.0	-453.2	306.9	547.3	0.00	0.00	0.00
6,160.0	0.00	0.00	6,113.0	-453.2	306.9	547.3	0.00	0.00	0.00
6,200.0	0.00	0.00	6,153.0	-453.2	306.9	547.3	0.00	0.00	0.00
6,240.0	0.00	0.00	6,193.0	-453.2	306.9	547.3	0.00	0.00	0.00
6,280.0	0.00	0.00	6,233.0	-453.2	306.9	547.3	0.00	0.00	0.00
6,320.0	0.00	0.00	6,273.0	-453.2	306.9	547.3	0.00	0.00	0.00
6,360.0	0.00	0.00	6,313.0	-453.2	306.9	547.3	0.00	0.00	0.00
6,400.0	0.00	0.00	6,353.0	-453.2	306.9	547.3	0.00	0.00	0.00
6,440.0	0.00	0.00	6,393.0	-453.2	306.9	547.3	0.00	0.00	0.00
6,480.0	0.00	0.00	6,433.0	-453.2	306.9	547.3	0.00	0.00	0.00
6,520.0	0.00	0.00	6,473.0	-453.2	306.9	547.3	0.00	0.00	0.00
6,560.0	0.00	0.00	6,513.0	-453.2	306.9	547.3	0.00	0.00	0.00
6,600.0	0.00	0.00	6,553.0	-453.2	306.9	547.3	0.00	0.00	0.00
6,640.0	0.00	0.00	6,593.0	-453.2	306.9	547.3	0.00	0.00	0.00
6,680.0	0.00	0.00	6,633.0	-453.2	306.9	547.3	0.00	0.00	0.00
6,720.0	0.00	0.00	6,673.0	-453.2	306.9	547.3	0.00	0.00	0.00
6,760.0	0.00	0.00	6,713.0	-453.2	306.9	547.3	0.00	0.00	0.00
6,800.0	0.00	0.00	6,753.0	-453.2	306.9	547.3	0.00	0.00	0.00
6,840.0	0.00	0.00	6,793.0	-453.2	306.9	547.3	0.00	0.00	0.00
6,880.0	0.00	0.00	6,833.0	-453.2	306.9	547.3	0.00	0.00	0.00
6,907.0	0.00	0.00	6,860.0	-453.2	306.9	547.3	0.00	0.00	0.00
NIOBRARA - TARGET CIRCLE 660'FSL & 1980'FEL - LEGAL BOX 400' X 400' 660'FSL & 1992'FEL									
6,920.0	0.00	0.00	6,873.0	-453.2	306.9	547.3	0.00	0.00	0.00
6,960.0	0.00	0.00	6,913.0	-453.2	306.9	547.3	0.00	0.00	0.00
7,000.0	0.00	0.00	6,953.0	-453.2	306.9	547.3	0.00	0.00	0.00
7,040.0	0.00	0.00	6,993.0	-453.2	306.9	547.3	0.00	0.00	0.00
7,080.0	0.00	0.00	7,033.0	-453.2	306.9	547.3	0.00	0.00	0.00
7,120.0	0.00	0.00	7,073.0	-453.2	306.9	547.3	0.00	0.00	0.00
7,160.0	0.00	0.00	7,113.0	-453.2	306.9	547.3	0.00	0.00	0.00
7,200.0	0.00	0.00	7,153.0	-453.2	306.9	547.3	0.00	0.00	0.00
7,227.0	0.00	0.00	7,180.0	-453.2	306.9	547.3	0.00	0.00	0.00
CODELL									
7,240.0	0.00	0.00	7,193.0	-453.2	306.9	547.3	0.00	0.00	0.00
7,280.0	0.00	0.00	7,233.0	-453.2	306.9	547.3	0.00	0.00	0.00
7,320.0	0.00	0.00	7,273.0	-453.2	306.9	547.3	0.00	0.00	0.00
7,347.0	0.00	0.00	7,300.0	-453.2	306.9	547.3	0.00	0.00	0.00

Database:	Landmark	Local Co-ordinate Reference:	Well HFE 34-22
Company:	Sundance Energy, Weld County, CO	TVD Reference:	WELL @ 4955.0ft (Original Well Elev)
Project:	SEC.22-T4N-R68W	MD Reference:	WELL @ 4955.0ft (Original Well Elev)
Site:	HFE 5 Pad Sec.22-T4N-R68W	North Reference:	True
Well:	HFE 34-22	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 (8-02-12)		

Targets									
Target Name									
- hit/miss target	Dip Angle	Dip Dir.	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
- Shape	(°)	(°)	(ft)	(ft)	(ft)	(ft)	(ft)		
TARGET CIRCLE 66'	0.00	0.00	6,860.0	-453.2	306.9	1,350,209.49	3,143,151.44	40.293588	-104.986813
- plan hits target center									
- Circle (radius 75.0)									
LEGAL BOX 400' X 400'	0.00	0.00	6,860.0	-453.2	294.9	1,350,209.41	3,143,139.49	40.293588	-104.986856
- plan misses target center by 12.0ft at 6907.0ft MD (6860.0 TVD, -453.2 N, 306.9 E)									
- Rectangle (sides W400.0 H400.0 D440.0)									
TARGET BHL 660'FS	0.00	0.00	5,000.0	-453.2	306.9	1,350,209.49	3,143,151.44	40.293588	-104.986813
- plan hits target center									
- Point									

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

Formations						
Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)	
3,934.4	3,900.0	SUSSEX		0.00		
4,403.1	4,361.0	SHANNON		0.00		
6,907.0	6,860.0	NIOBRARA		0.00		
7,227.0	7,180.0	CODELL		0.00		



Sundance Energy, Weld County, CO

SEC.22-T4N-R68W

HFE 5 Pad Sec.22-T4N-R68W

HFE 34-22

Wellbore #1

Plan #1 (8-02-12)

Anticollision Report

07 August, 2012

Company:	Sundance Energy, Weld County, CO	Local Co-ordinate Reference:	Well HFE 34-22
Project:	SEC.22-T4N-R68W	TVD Reference:	WELL @ 4955.0ft (Original Well Elev)
Reference Site:	HFE 5 Pad Sec.22-T4N-R68W	MD Reference:	WELL @ 4955.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	HFE 34-22	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	7,347.0	Plan #1 (8-02-12) (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 5 Pad Sec.22-T4N-R68W						
HFE 44-22 - Wellbore #1 - Plan #1 (8-02-12)	444.4	445.4	29.8	28.1	16.928	CC
HFE 44-22 - Wellbore #1 - Plan #1 (8-02-12)	500.0	501.0	29.9	27.9	14.954	ES
HFE 44-22 - Wellbore #1 - Plan #1 (8-02-12)	700.0	699.7	33.8	30.9	11.844	SF
MLD 33-22 - Wellbore #1 - plan #1 (8-02-12)	735.6	735.6	14.8	11.7	4.799	CC
MLD 33-22 - Wellbore #1 - plan #1 (8-02-12)	800.0	799.9	14.9	11.6	4.433	ES
MLD 33-22 - Wellbore #1 - plan #1 (8-02-12)	900.0	899.6	16.5	12.7	4.330	SF

Offset Design HFE 5 Pad Sec.22-T4N-R68W - HFE 44-22 - 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)	Vertical Depth (ft)	Offset Measured Depth (ft)	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	89.31	0.4	29.8	29.9	29.8	0.00	N/A		
100.0	100.0	101.0	101.0	0.1	0.1	89.31	0.4	29.8	29.9	29.6	0.23	131.491		
200.0	200.0	201.0	201.0	0.3	0.3	89.31	0.4	29.8	29.9	29.2	0.68	44.122		
300.0	300.0	301.0	301.0	0.6	0.6	89.31	0.4	29.8	29.9	28.7	1.13	26.508		
400.0	400.0	401.0	401.0	0.8	0.8	89.31	0.4	29.8	29.9	28.3	1.58	18.948		
444.4	444.4	445.4	445.4	0.9	0.9	90.00	0.0	29.8	29.8	28.1	1.76	16.928	CC	
500.0	500.0	501.0	500.9	1.0	1.0	92.72	-1.4	29.8	29.9	27.9	2.00	14.954	ES	
600.0	600.0	600.7	600.5	1.2	1.2	102.59	-6.7	29.8	30.6	28.2	2.41	12.666		
700.0	700.0	699.7	699.2	1.5	1.4	116.15	-14.9	30.3	33.8	30.9	2.85	11.844	SF	
800.0	800.0	798.2	797.2	1.7	1.6	124.82	-23.4	33.7	41.2	37.9	3.29	12.529		
900.0	900.0	896.3	894.7	1.9	1.9	128.29	-31.9	40.4	51.9	48.2	3.73	13.918		
1,000.0	1,000.0	993.8	991.4	2.1	2.2	128.63	-40.3	50.5	65.3	61.1	4.18	15.629		
1,100.0	1,100.0	1,090.6	1,086.9	2.4	2.5	127.35	-48.6	63.7	81.3	76.7	4.64	17.522		
1,200.0	1,200.0	1,186.4	1,180.9	2.6	2.8	125.37	-56.7	79.9	100.0	94.9	5.12	19.537		
1,300.0	1,300.0	1,280.9	1,273.2	2.8	3.2	123.15	-64.7	99.0	121.5	115.9	5.62	21.632		
1,400.0	1,400.0	1,374.1	1,363.4	3.0	3.6	120.94	-72.5	120.9	145.8	139.7	6.13	23.775		
1,500.0	1,500.0	1,465.8	1,451.5	3.3	4.1	118.85	-80.0	145.2	173.0	166.4	6.67	25.935		
1,600.0	1,600.0	1,556.1	1,537.5	3.5	4.6	-28.91	-87.4	172.0	201.6	194.7	6.92	29.126		
1,700.0	1,699.8	1,645.5	1,621.6	3.6	5.1	-30.96	-94.6	201.1	230.3	222.9	7.34	31.358		
1,800.0	1,799.5	1,739.6	1,709.7	3.8	5.8	-33.19	-102.1	233.6	258.3	250.5	7.79	33.159		
1,900.0	1,898.7	1,835.6	1,799.4	4.0	6.4	-35.38	-109.7	266.8	284.0	275.8	8.25	34.405		

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 HFE 34-22
Project:	SEC.22-T4N-R68W	TVD Reference:	WELL @ 4955.0ft (Original Well Elev)
Reference Site:	HFE 5 Pad Sec.22-T4N-R68W	MD Reference:	WELL @ 4955.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	HFE 34-22	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 44-22 - Wellbore #1 - Plan #1 (8-02-12)													Offset Site Error:	0.0 ft
Survey Program: 0-MWD													Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis			Distance							Warning
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor		
2,000.0	1,997.5	1,932.0	1,889.5	4.3	7.1	-37.56	-117.4	300.1	307.5	298.7	8.75	35.142		
2,100.0	2,095.8	2,028.6	1,979.8	4.5	7.8	-39.89	-125.1	333.6	329.6	320.3	9.29	35.474		
2,200.0	2,194.2	2,125.3	2,070.2	4.8	8.5	-41.99	-132.8	367.0	352.2	342.3	9.87	35.695		
2,300.0	2,292.5	2,221.9	2,160.5	5.1	9.2	-43.84	-140.5	400.5	375.2	364.7	10.47	35.834		
2,400.0	2,390.9	2,318.5	2,250.9	5.4	9.9	-45.47	-148.3	433.9	398.5	387.4	11.10	35.907		
2,500.0	2,489.2	2,415.2	2,341.2	5.8	10.6	-46.93	-156.0	467.3	422.1	410.3	11.75	35.925		
2,600.0	2,587.6	2,511.8	2,431.5	6.1	11.4	-48.23	-163.7	500.8	445.9	433.5	12.42	35.902		
2,700.0	2,685.9	2,608.5	2,521.9	6.5	12.1	-49.40	-171.4	534.2	469.9	456.8	13.11	35.846		
2,800.0	2,784.3	2,705.1	2,612.2	6.8	12.8	-50.45	-179.1	567.6	494.1	480.3	13.81	35.767		
2,900.0	2,882.7	2,801.8	2,702.6	7.2	13.5	-51.41	-186.8	601.1	518.4	503.9	14.53	35.671		
3,000.0	2,981.0	2,898.4	2,792.9	7.6	14.2	-52.29	-194.5	634.5	542.9	527.6	15.27	35.563		
3,100.0	3,079.4	2,995.1	2,883.3	8.0	15.0	-53.08	-202.2	668.0	567.4	551.4	16.01	35.447		
3,200.0	3,177.7	3,091.7	2,973.6	8.3	15.7	-53.82	-209.9	701.4	592.1	575.3	16.76	35.327		
3,300.0	3,276.1	3,188.3	3,064.0	8.7	16.4	-54.49	-217.6	734.8	616.8	599.3	17.52	35.205		
3,400.0	3,374.4	3,285.0	3,154.3	9.1	17.2	-55.11	-225.3	768.3	641.7	623.4	18.29	35.083		
3,500.0	3,472.8	3,381.6	3,244.7	9.5	17.9	-55.69	-233.0	801.7	666.5	647.5	19.07	34.961		
3,600.0	3,571.1	3,478.3	3,335.0	9.9	18.6	-56.22	-240.8	835.1	691.5	671.6	19.85	34.841		
3,700.0	3,669.5	3,574.9	3,425.4	10.3	19.4	-56.72	-248.5	868.6	716.5	695.8	20.63	34.724		
3,800.0	3,767.8	3,671.6	3,515.7	10.7	20.1	-57.18	-256.2	902.0	741.5	720.1	21.42	34.610		
3,900.0	3,866.2	3,768.2	3,606.1	11.1	20.8	-57.62	-263.9	935.5	766.6	744.4	22.22	34.499		
4,000.0	3,964.5	3,864.9	3,696.4	11.5	21.5	-58.02	-271.6	968.9	791.7	768.7	23.02	34.391		
4,100.0	4,062.9	3,961.5	3,786.8	11.9	22.3	-58.41	-279.3	1,002.3	816.9	793.1	23.82	34.287		
4,200.0	4,161.2	4,058.1	3,877.1	12.3	23.0	-58.76	-287.0	1,035.8	842.1	817.4	24.63	34.187		
4,300.0	4,259.6	4,154.8	3,967.5	12.7	23.8	-59.10	-294.7	1,069.2	867.3	841.8	25.44	34.090		
4,400.0	4,357.9	4,251.4	4,057.8	13.1	24.5	-59.42	-302.4	1,102.7	892.5	866.3	26.25	33.997		
4,500.0	4,456.3	4,348.1	4,148.2	13.5	25.2	-59.72	-310.1	1,136.1	917.8	890.7	27.07	33.907		
4,600.0	4,554.8	4,444.6	4,238.4	13.8	26.0	-60.30	-317.8	1,169.5	943.5	915.7	27.88	33.848		
4,700.0	4,653.8	4,540.8	4,328.3	14.1	26.7	-60.84	-325.5	1,202.8	970.9	942.3	28.59	33.964		
4,800.0	4,753.3	4,636.5	4,417.8	14.4	27.4	-61.22	-333.1	1,235.9	999.9	970.7	29.23	34.204		
4,900.0	4,853.1	4,731.5	4,506.6	14.6	28.1	-61.48	-340.7	1,268.8	1,030.5	1,000.7	29.82	34.561		
5,000.0	4,953.0	4,825.8	4,594.8	14.7	28.9	-61.61	-348.2	1,301.4	1,062.8	1,032.4	30.34	35.030		
5,100.0	5,053.0	4,919.4	4,682.3	14.9	29.6	84.58	-355.7	1,333.8	1,096.5	1,065.7	30.75	35.658		
5,200.0	5,153.0	5,012.9	4,769.7	15.0	30.3	85.14	-363.2	1,366.1	1,130.4	1,099.3	31.10	36.353		
5,300.0	5,253.0	5,106.4	4,857.0	15.2	31.0	85.67	-370.6	1,398.5	1,164.5	1,133.0	31.45	37.028		
5,400.0	5,353.0	5,199.9	4,944.4	15.3	31.7	86.18	-378.1	1,430.8	1,198.6	1,166.8	31.81	37.683		
5,500.0	5,453.0	5,300.5	5,067.1	15.5	32.6	86.81	-388.2	1,474.7	1,232.0	1,199.8	32.22	38.243		
5,600.0	5,553.0	5,495.1	5,224.1	15.6	33.4	87.46	-399.2	1,522.6	1,260.8	1,228.2	32.64	38.627		
5,700.0	5,653.0	5,665.2	5,389.1	15.8	34.1	87.96	-408.5	1,562.7	1,284.2	1,251.2	33.07	38.832		
5,800.0	5,753.0	5,839.7	5,560.7	15.9	34.7	88.33	-415.7	1,593.9	1,302.0	1,268.5	33.50	38.862		
5,900.0	5,853.0	6,017.7	5,737.3	16.1	35.1	88.57	-420.6	1,615.1	1,313.9	1,280.0	33.92	38.730		
6,000.0	5,953.0	6,197.7	5,916.9	16.2	35.4	88.69	-423.0	1,625.7	1,319.7	1,285.4	34.33	38.446		
6,100.0	6,053.0	6,334.8	6,054.0	16.4	35.5	88.70	-423.3	1,626.9	1,320.4	1,285.7	34.67	38.082		
6,200.0	6,153.0	6,434.8	6,154.0	16.6	35.6	88.70	-423.3	1,626.9	1,320.4	1,285.4	34.97	37.755		
6,300.0	6,253.0	6,534.8	6,254.0	16.7	35.6	88.70	-423.3	1,626.9	1,320.4	1,285.1	35.28	37.431		
6,400.0	6,353.0	6,634.8	6,354.0	16.9	35.7	88.70	-423.3	1,626.9	1,320.4	1,284.8	35.58	37.108		
6,500.0	6,453.0	6,734.8	6,454.0	17.1	35.8	88.70	-423.3	1,626.9	1,320.4	1,284.5	35.89	36.788		
6,600.0	6,553.0	6,834.8	6,554.0	17.2	35.9	88.70	-423.3	1,626.9	1,320.4	1,284.2	36.20	36.471		
6,700.0	6,653.0	6,934.8	6,654.0	17.4	36.0	88.70	-423.3	1,626.9	1,320.4	1,283.9	36.52	36.157		
6,800.0	6,753.0	7,034.8	6,754.0	17.6	36.1	88.70	-423.3	1,626.9	1,320.4	1,283.5	36.84	35.845		
6,900.0	6,853.0	7,134.8	6,854.0	17.7	36.1	88.70	-423.3	1,626.9	1,320.4	1,283.2	37.16	35.536		
7,000.0	6,953.0	7,234.8	6,954.0	17.9	36.2	88.70	-423.3	1,626.9	1,320.4	1,282.9	37.48	35.229		
7,100.0	7,053.0	7,334.8	7,054.0	18.1	36.3	88.70	-423.3	1,626.9	1,320.4	1,282.6	37.80	34.926		

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 HFE 34-22
Project:	SEC.22-T4N-R68W	TVD Reference:	WELL @ 4955.0ft (Original Well Elev)
Reference Site:	HFE 5 Pad Sec.22-T4N-R68W	MD Reference:	WELL @ 4955.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	HFE 34-22	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 44-22 - Wellbore #1 - Plan #1 (8-02-12)												Offset Site Error:	0.0 ft
Survey Program: 0-MWD												Offset Well Error:	0.0 ft
Reference	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
7,200.0	7,153.0	7,434.8	7,154.0	18.3	36.4	88.70	-423.3	1,626.9	1,320.4	1,282.2	38.13	34.626	
7,300.0	7,253.0	7,534.8	7,254.0	18.4	36.5	88.70	-423.3	1,626.9	1,320.4	1,281.9	38.46	34.328	
7,331.0	7,284.0	7,565.8	7,285.0	18.5	36.5	88.70	-423.3	1,626.9	1,320.4	1,281.8	38.57	34.237	
7,347.0	7,300.0	7,580.8	7,300.0	18.5	36.5	88.70	-423.3	1,626.9	1,320.4	1,281.8	38.62	34.191	

Company:	Sundance Energy, Weld County, CO	Local Co-ordinate Reference:	Well HFE 34-22
Project:	SEC.22-T4N-R68W	TVD Reference:	WELL @ 4955.0ft (Original Well Elev)
Reference Site:	HFE 5 Pad Sec.22-T4N-R68W	MD Reference:	WELL @ 4955.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	HFE 34-22	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		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		
0.0	0.0	0.0	0.0	0.0	0.0	88.64	0.4	14.8	14.8	14.8	0.00	N/A		
100.0	100.0	100.0	100.0	0.1	0.1	88.64	0.4	14.8	14.8	14.6	0.22	65.796		
200.0	200.0	200.0	200.0	0.3	0.3	88.64	0.4	14.8	14.8	14.1	0.67	21.932		
300.0	300.0	300.0	300.0	0.6	0.6	88.64	0.4	14.8	14.8	13.7	1.12	13.159		
400.0	400.0	400.0	400.0	0.8	0.8	88.64	0.4	14.8	14.8	13.2	1.57	9.399		
500.0	500.0	500.0	500.0	1.0	1.0	88.64	0.4	14.8	14.8	12.8	2.02	7.311		
600.0	600.0	600.0	600.0	1.2	1.2	88.64	0.4	14.8	14.8	12.3	2.47	5.981		
700.0	700.0	700.0	700.0	1.5	1.5	88.64	0.4	14.8	14.8	11.9	2.92	5.061		
735.6	735.6	735.6	735.6	1.5	1.5	88.64	0.4	14.8	14.8	11.7	3.08	4.799 CC		
800.0	800.0	799.9	799.9	1.7	1.7	87.07	0.8	14.9	14.9	11.6	3.37	4.433 ES		
900.0	900.0	899.6	899.5	1.9	1.9	75.79	4.1	16.0	16.5	12.7	3.82	4.330 SF		
1,000.0	1,000.0	998.9	998.6	2.1	2.1	59.76	10.6	18.2	21.1	16.8	4.27	4.946		
1,100.0	1,100.0	1,097.7	1,096.8	2.4	2.4	46.50	20.3	21.4	29.7	25.0	4.73	6.288		
1,200.0	1,200.0	1,195.6	1,193.8	2.6	2.6	37.78	33.2	25.7	42.4	37.2	5.20	8.159		
1,300.0	1,300.0	1,292.5	1,289.2	2.8	2.9	32.31	48.9	31.0	58.9	53.2	5.68	10.366		
1,400.0	1,400.0	1,389.3	1,384.1	3.0	3.2	28.83	67.4	37.1	78.6	72.4	6.18	12.712		
1,500.0	1,500.0	1,487.2	1,479.9	3.3	3.6	26.68	86.5	43.4	98.8	92.1	6.68	14.784		
1,600.0	1,600.0	1,584.8	1,575.5	3.5	4.0	-121.00	105.5	49.8	120.1	113.1	7.00	17.159		
1,700.0	1,699.8	1,681.9	1,670.5	3.6	4.3	-123.30	124.4	56.1	143.3	135.9	7.41	19.345		
1,800.0	1,799.5	1,778.3	1,764.8	3.8	4.7	-125.81	143.2	62.3	168.7	160.8	7.82	21.571		
1,900.0	1,898.7	1,873.9	1,858.4	4.0	5.1	-128.35	161.8	68.5	196.5	188.2	8.24	23.844		
2,000.0	1,997.5	1,968.7	1,951.1	4.3	5.5	-130.80	180.2	74.6	226.8	218.1	8.67	26.163		
2,100.0	2,095.8	2,062.7	2,043.1	4.5	5.9	-133.34	198.5	80.7	259.1	250.0	9.13	28.383		
2,200.0	2,194.2	2,156.7	2,135.1	4.8	6.3	-135.42	216.8	86.8	291.9	282.3	9.61	30.372		
2,300.0	2,292.5	2,250.7	2,227.1	5.1	6.7	-137.08	235.1	92.9	325.0	314.9	10.11	32.159		
2,400.0	2,390.9	2,344.7	2,319.1	5.4	7.0	-138.43	253.5	99.0	358.2	347.6	10.61	33.769		
2,500.0	2,489.2	2,438.7	2,411.1	5.8	7.4	-139.56	271.8	105.1	391.6	380.5	11.12	35.221		
2,600.0	2,587.6	2,532.7	2,503.1	6.1	7.8	-140.51	290.1	111.2	425.1	413.5	11.64	36.534		
2,700.0	2,685.9	2,626.7	2,595.1	6.5	8.2	-141.32	308.4	117.3	458.7	446.6	12.16	37.726		
2,800.0	2,784.3	2,720.7	2,687.1	6.8	8.6	-142.02	326.7	123.4	492.4	479.7	12.69	38.811		
2,900.0	2,882.7	2,814.7	2,779.1	7.2	9.1	-142.63	345.0	129.5	526.1	512.9	13.22	39.802		
3,000.0	2,981.0	2,908.7	2,871.1	7.6	9.5	-143.16	363.3	135.6	559.9	546.2	13.75	40.708		
3,100.0	3,079.4	3,002.7	2,963.1	8.0	9.9	-143.64	381.6	141.7	593.7	579.4	14.29	41.541		
3,200.0	3,177.7	3,096.7	3,055.1	8.3	10.3	-144.06	399.9	147.8	627.6	612.8	14.83	42.307		
3,300.0	3,276.1	3,190.7	3,147.1	8.7	10.7	-144.45	418.2	153.8	661.5	646.1	15.38	43.014		
3,400.0	3,374.4	3,284.7	3,239.1	9.1	11.1	-144.79	436.5	159.9	695.4	679.4	15.92	43.669		
3,500.0	3,472.8	3,378.7	3,331.1	9.5	11.5	-145.10	454.8	166.0	729.3	712.8	16.47	44.276		
3,600.0	3,571.1	3,472.7	3,423.1	9.9	11.9	-145.39	473.1	172.1	763.2	746.2	17.02	44.840		
3,700.0	3,669.5	3,566.7	3,515.1	10.3	12.3	-145.65	491.4	178.2	797.2	779.6	17.57	45.366		
3,800.0	3,767.8	3,660.7	3,607.1	10.7	12.7	-145.89	509.7	184.3	831.1	813.0	18.12	45.858		
3,900.0	3,866.2	3,754.7	3,699.1	11.1	13.1	-146.11	528.0	190.4	865.1	846.4	18.68	46.317		
4,000.0	3,964.5	3,848.7	3,791.1	11.5	13.5	-146.31	546.3	196.5	899.1	879.9	19.23	46.748		
4,100.0	4,062.9	3,942.7	3,883.1	11.9	13.9	-146.50	564.7	202.6	933.1	913.3	19.79	47.152		
4,200.0	4,161.2	4,036.7	3,975.1	12.3	14.3	-146.68	583.0	208.7	967.1	946.8	20.35	47.532		
4,300.0	4,259.6	4,130.7	4,067.1	12.7	14.8	-146.84	601.3	214.8	1,001.1	980.2	20.90	47.890		
4,400.0	4,357.9	4,224.7	4,159.1	13.1	15.2	-146.99	619.6	220.9	1,035.1	1,013.7	21.46	48.228		
4,500.0	4,456.3	4,318.7	4,251.1	13.5	15.6	-147.14	637.9	226.9	1,069.2	1,047.1	22.02	48.547		
4,600.0	4,554.8	4,413.0	4,343.4	13.8	16.0	-147.52	656.2	233.1	1,102.4	1,079.8	22.64	48.694		
4,700.0	4,653.8	4,508.2	4,436.6	14.1	16.4	-147.87	674.8	239.2	1,133.0	1,109.8	23.24	48.763		
4,800.0	4,753.3	4,604.2	4,530.6	14.4	16.8	-148.08	693.5	245.5	1,160.8	1,137.0	23.80	48.767		
4,900.0	4,853.1	4,701.0	4,625.3	14.6	17.2	-148.17	712.3	251.7	1,185.7	1,161.4	24.34	48.714		
5,000.0	4,953.0	4,798.4	4,720.6	14.7	17.7	-148.15	731.3	258.0	1,207.7	1,182.9	24.84	48.612		

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 HFE 34-22
Project:	SEC.22-T4N-R68W	TVD Reference:	WELL @ 4955.0ft (Original Well Elev)
Reference Site:	HFE 5 Pad Sec.22-T4N-R68W	MD Reference:	WELL @ 4955.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	HFE 34-22	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												Offset Site Error:	0.0 ft
HFE 5 Pad Sec.22-T4N-R68W - MLD 33-22 - Wellbore #1 - plan #1 (8-02-12)												Offset Well Error:	0.0 ft
Survey Program: 0-MWD													
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	5,053.0	4,896.2	4,816.3	14.9	18.1	-2.02	750.3	264.4	1,227.3	1,202.0	25.31	48.489	
5,200.0	5,153.0	4,994.1	4,912.1	15.0	18.5	-1.69	769.4	270.7	1,246.6	1,220.9	25.76	48.387	
5,300.0	5,253.0	5,091.9	5,007.9	15.2	19.0	-1.37	788.5	277.1	1,266.0	1,239.8	26.22	48.291	
5,400.0	5,353.0	5,189.8	5,103.7	15.3	19.4	-1.07	807.5	283.4	1,285.3	1,258.7	26.67	48.198	
5,500.0	5,453.0	5,355.3	5,266.4	15.5	19.9	-0.63	835.7	292.8	1,302.4	1,275.2	27.20	47.882	
5,600.0	5,553.0	5,530.2	5,440.0	15.6	20.3	-0.32	855.8	299.5	1,313.9	1,286.2	27.72	47.408	
5,700.0	5,653.0	5,707.1	5,616.6	15.8	20.7	-0.17	865.9	302.8	1,319.6	1,291.4	28.20	46.801	
5,800.0	5,753.0	5,843.5	5,753.0	15.9	20.8	-0.16	867.1	303.2	1,320.2	1,291.6	28.60	46.159	
5,900.0	5,853.0	5,943.5	5,853.0	16.1	21.0	-0.16	867.1	303.2	1,320.2	1,291.3	28.97	45.569	
6,000.0	5,953.0	6,043.5	5,953.0	16.2	21.1	-0.16	867.1	303.2	1,320.2	1,290.9	29.34	44.991	
6,100.0	6,053.0	6,143.5	6,053.0	16.4	21.2	-0.16	867.1	303.2	1,320.2	1,290.5	29.72	44.424	
6,200.0	6,153.0	6,243.5	6,153.0	16.6	21.4	-0.16	867.1	303.2	1,320.2	1,290.2	30.10	43.868	
6,300.0	6,253.0	6,343.5	6,253.0	16.7	21.5	-0.16	867.1	303.2	1,320.2	1,289.8	30.47	43.323	
6,400.0	6,353.0	6,443.5	6,353.0	16.9	21.6	-0.16	867.1	303.2	1,320.2	1,289.4	30.86	42.788	
6,500.0	6,453.0	6,543.5	6,453.0	17.1	21.8	-0.16	867.1	303.2	1,320.2	1,289.0	31.24	42.264	
6,600.0	6,553.0	6,643.5	6,553.0	17.2	21.9	-0.16	867.1	303.2	1,320.2	1,288.6	31.62	41.751	
6,700.0	6,653.0	6,743.5	6,653.0	17.4	22.1	-0.16	867.1	303.2	1,320.2	1,288.2	32.01	41.248	
6,800.0	6,753.0	6,843.5	6,753.0	17.6	22.2	-0.16	867.1	303.2	1,320.2	1,287.9	32.40	40.754	
6,900.0	6,853.0	6,943.5	6,853.0	17.7	22.4	-0.16	867.1	303.2	1,320.2	1,287.5	32.78	40.271	
7,000.0	6,953.0	7,043.5	6,953.0	17.9	22.5	-0.16	867.1	303.2	1,320.2	1,287.1	33.17	39.796	
7,100.0	7,053.0	7,143.5	7,053.0	18.1	22.6	-0.16	867.1	303.2	1,320.2	1,286.7	33.57	39.332	
7,200.0	7,153.0	7,243.5	7,153.0	18.3	22.8	-0.16	867.1	303.2	1,320.2	1,286.3	33.96	38.876	
7,300.0	7,253.0	7,343.5	7,253.0	18.4	22.9	-0.16	867.1	303.2	1,320.2	1,285.9	34.36	38.429	
7,347.0	7,300.0	7,390.5	7,300.0	18.5	23.0	-0.16	867.1	303.2	1,320.2	1,285.7	34.54	38.222	

Company:	Sundance Energy, Weld County, CO	Local Co-ordinate Reference:	Well HFE 34-22
Project:	SEC.22-T4N-R68W	TVD Reference:	WELL @ 4955.0ft (Original Well Elev)
Reference Site:	HFE 5 Pad Sec.22-T4N-R68W	MD Reference:	WELL @ 4955.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	HFE 34-22	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 @ 4955.0ft (Original Well Elev) Coordinates are relative to: HFE 34-22

Offset Depths are relative to Offset Datum

Coordinate System is US State Plane 1983, Colorado Northern Zone

Grid Convergence at Surface is: 0.33°



Reference Depths are relative to WELL @ 4955.0ft (Original Well Elev) Coordinates are relative to: HFE 34-22
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°

