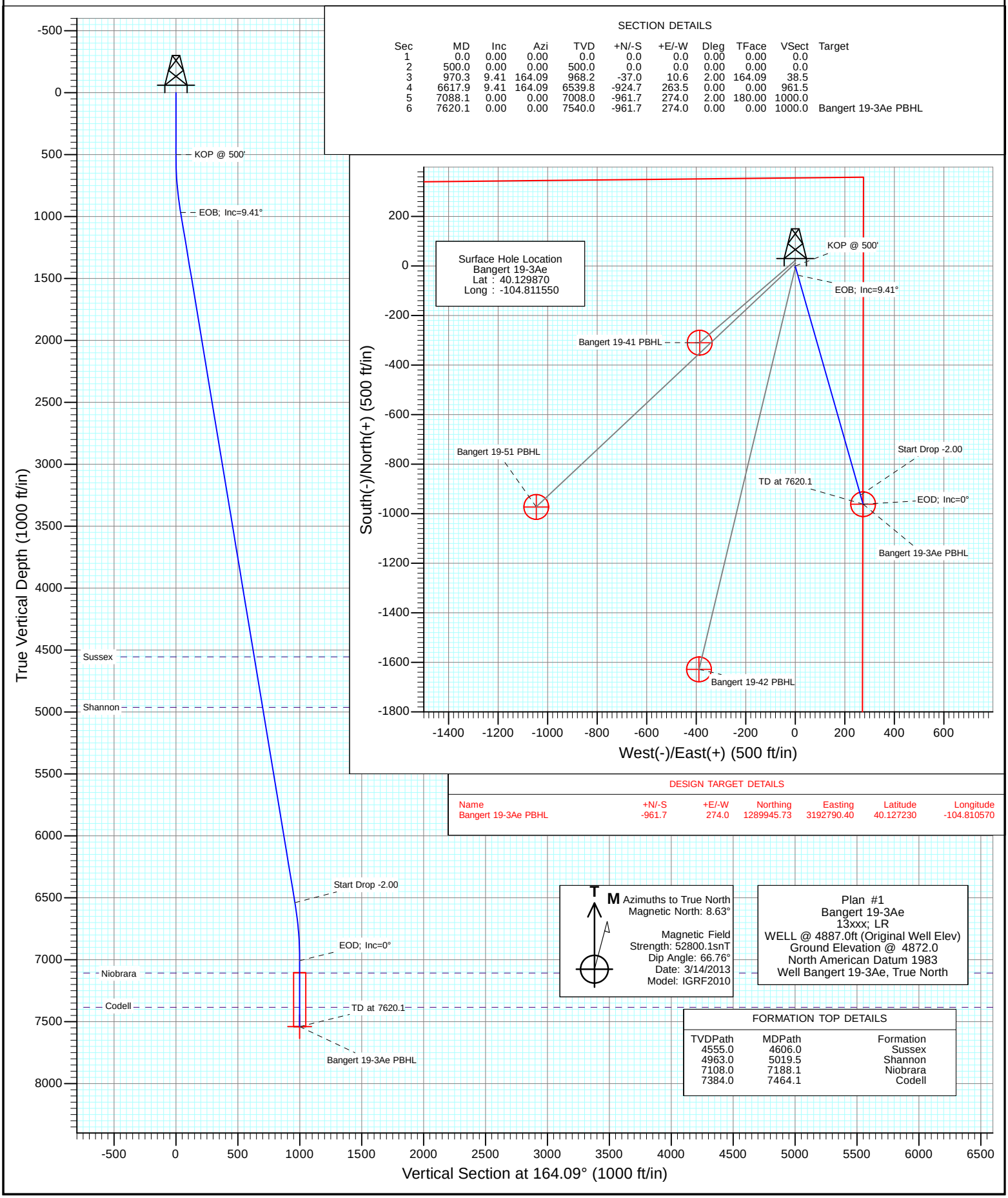
Project: Colorado
Site: SEC 19-T2N-R66W
Well: Bangert 19-3Ae
Wellbore: DD
Design: Plan #1

SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSect	Target
1	0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.0	
2	500.0	0.00	0.00	500.0	0.0	0.0	0.00	0.00	0.0	
3	970.3	9.41	164.09	968.2	-37.0	10.6	2.00	164.09	38.5	
4	6617.9	9.41	164.09	6539.8	-924.7	263.5	0.00	0.00	961.5	
5	7088.1	0.00	0.00	7008.0	-961.7	274.0	2.00	180.00	1000.0	
6	7620.1	0.00	0.00	7540.0	-961.7	274.0	0.00	0.00	1000.0	Bangert 19-3Ae PBHL



DESIGN TARGET DETAILS

Name	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
Bangert 19-3Ae PBHL	-961.7	274.0	1289945.73	3192790.40	40.127230	-104.810570

T M Azimuths to True North
Magnetic North: 8.63°

Magnetic Field
Strength: 52800.1snT
Dip Angle: 66.76°
Date: 3/14/2013
Model: IGRF2010

Plan #1
Bangert 19-3Ae
13xxx; LR
WELL @ 4887.0ft (Original Well Elev)
Ground Elevation @ 4872.0
North American Datum 1983
Well Bangert 19-3Ae, True North

FORMATION TOP DETAILS

TVDPath	MDPath	Formation
4555.0	4606.0	Sussex
4963.0	5019.5	Shannon
7108.0	7188.1	Niobrara
7384.0	7464.1	Codell

Planning Report

Database:	USA EDM 5000 Multi Users DB	**Local Co-ordinate Reference:**	Well Bangert 19-3Ae
Company:	Sundance Energy	**TVD Reference:**	WELL @ 4887.0ft (Original Well Elev)
Project:	Colorado	**MD Reference:**	WELL @ 4887.0ft (Original Well Elev)
Site:	SEC 19-T2N-R66W	**North Reference:**	True
Well:	Bangert 19-3Ae	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	DD		
Design:	Plan #1		

Project Colorado

Map System:	US State Plane 1983	**System Datum:**	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	Colorado Northern Zone		

Site SEC 19-T2N-R66W

Site Position:		**Northing:**	1,290,927.13 ft	**Latitude:**	40.129930
From:	Lat/Long	**Easting:**	3,192,508.73 ft	**Longitude:**	-104.811550
Position Uncertainty:	0.0 ft	**Slot Radius:**	13.200 in	**Grid Convergence:**	0.44 °

Well Bangert 19-3Ae

Well Position	**+N/-S**	0.0 ft	**Northing:**	1,290,905.27 ft	**Latitude:**	40.129870
	+E/-W	0.0 ft	**Easting:**	3,192,508.90 ft	**Longitude:**	-104.811550
Position Uncertainty		0.0 ft	**Wellhead Elevation:**	ft	**Ground Level:**	4,872.0 ft

Wellbore DD

Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	3/14/2013	8.63	66.76	52,800

Design Plan #1

Audit Notes:

Version:		**Phase:**	PLAN	**Tie On Depth:**	0.0

Vertical Section:	Depth From (TVD) (ft)	+N/-S (ft)	+E/-W (ft)	Direction (°)
	0.0	0.0	0.0	164.09

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	
500.0	0.00	0.00	500.0	0.0	0.0	0.00	0.00	0.00	0.00	
970.3	9.41	164.09	968.2	-37.0	10.6	2.00	2.00	0.00	164.09	
6,617.9	9.41	164.09	6,539.8	-924.7	263.5	0.00	0.00	0.00	0.00	
7,088.1	0.00	0.00	7,008.0	-961.7	274.0	2.00	-2.00	0.00	180.00	
7,620.1	0.00	0.00	7,540.0	-961.7	274.0	0.00	0.00	0.00	0.00	Bangert 19-3Ae PBHl

Database:	USA EDM 5000 Multi Users DB	**Local Co-ordinate Reference:**	Well Bangert 19-3Ae
Company:	Sundance Energy	**TVD Reference:**	WELL @ 4887.0ft (Original Well Elev)
Project:	Colorado	**MD Reference:**	WELL @ 4887.0ft (Original Well Elev)
Site:	SEC 19-T2N-R66W	**North Reference:**	True
Well:	Bangert 19-3Ae	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	DD		
Design:	Plan #1		

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)	Comments / Formations
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	
100.0	0.00	0.00	100.0	0.0	0.0	0.0	0.00	0.00	
200.0	0.00	0.00	200.0	0.0	0.0	0.0	0.00	0.00	
300.0	0.00	0.00	300.0	0.0	0.0	0.0	0.00	0.00	
400.0	0.00	0.00	400.0	0.0	0.0	0.0	0.00	0.00	
500.0	0.00	0.00	500.0	0.0	0.0	0.0	0.00	0.00	
600.0	2.00	164.09	600.0	-1.7	0.5	1.7	2.00	2.00	
700.0	4.00	164.09	699.8	-6.7	1.9	7.0	2.00	2.00	
800.0	6.00	164.09	799.5	-15.1	4.3	15.7	2.00	2.00	
900.0	8.00	164.09	898.7	-26.8	7.6	27.9	2.00	2.00	
970.3	9.41	164.09	968.2	-37.0	10.6	38.5	2.00	2.00	
1,000.0	9.41	164.09	997.5	-41.7	11.9	43.4	0.00	0.00	
1,100.0	9.41	164.09	1,096.1	-57.4	16.4	59.7	0.00	0.00	
1,200.0	9.41	164.09	1,194.8	-73.1	20.8	76.1	0.00	0.00	
1,300.0	9.41	164.09	1,293.5	-88.9	25.3	92.4	0.00	0.00	
1,400.0	9.41	164.09	1,392.1	-104.6	29.8	108.7	0.00	0.00	
1,500.0	9.41	164.09	1,490.8	-120.3	34.3	125.1	0.00	0.00	
1,600.0	9.41	164.09	1,589.4	-136.0	38.8	141.4	0.00	0.00	
1,700.0	9.41	164.09	1,688.1	-151.7	43.2	157.8	0.00	0.00	
1,800.0	9.41	164.09	1,786.7	-167.4	47.7	174.1	0.00	0.00	
1,900.0	9.41	164.09	1,885.4	-183.2	52.2	190.5	0.00	0.00	
2,000.0	9.41	164.09	1,984.0	-198.9	56.7	206.8	0.00	0.00	
2,100.0	9.41	164.09	2,082.7	-214.6	61.1	223.1	0.00	0.00	
2,200.0	9.41	164.09	2,181.4	-230.3	65.6	239.5	0.00	0.00	
2,300.0	9.41	164.09	2,280.0	-246.0	70.1	255.8	0.00	0.00	
2,400.0	9.41	164.09	2,378.7	-261.7	74.6	272.2	0.00	0.00	
2,500.0	9.41	164.09	2,477.3	-277.5	79.1	288.5	0.00	0.00	
2,600.0	9.41	164.09	2,576.0	-293.2	83.5	304.8	0.00	0.00	
2,700.0	9.41	164.09	2,674.6	-308.9	88.0	321.2	0.00	0.00	
2,800.0	9.41	164.09	2,773.3	-324.6	92.5	337.5	0.00	0.00	
2,900.0	9.41	164.09	2,871.9	-340.3	97.0	353.9	0.00	0.00	
3,000.0	9.41	164.09	2,970.6	-356.0	101.5	370.2	0.00	0.00	
3,100.0	9.41	164.09	3,069.3	-371.8	105.9	386.6	0.00	0.00	
3,200.0	9.41	164.09	3,167.9	-387.5	110.4	402.9	0.00	0.00	
3,300.0	9.41	164.09	3,266.6	-403.2	114.9	419.2	0.00	0.00	
3,400.0	9.41	164.09	3,365.2	-418.9	119.4	435.6	0.00	0.00	
3,500.0	9.41	164.09	3,463.9	-434.6	123.8	451.9	0.00	0.00	
3,600.0	9.41	164.09	3,562.5	-450.3	128.3	468.3	0.00	0.00	
3,700.0	9.41	164.09	3,661.2	-466.1	132.8	484.6	0.00	0.00	
3,800.0	9.41	164.09	3,759.8	-481.8	137.3	501.0	0.00	0.00	
3,900.0	9.41	164.09	3,858.5	-497.5	141.8	517.3	0.00	0.00	
4,000.0	9.41	164.09	3,957.2	-513.2	146.2	533.6	0.00	0.00	
4,100.0	9.41	164.09	4,055.8	-528.9	150.7	550.0	0.00	0.00	
4,200.0	9.41	164.09	4,154.5	-544.6	155.2	566.3	0.00	0.00	
4,300.0	9.41	164.09	4,253.1	-560.4	159.7	582.7	0.00	0.00	
4,400.0	9.41	164.09	4,351.8	-576.1	164.2	599.0	0.00	0.00	
4,500.0	9.41	164.09	4,450.4	-591.8	168.6	615.4	0.00	0.00	
4,600.0	9.41	164.09	4,549.1	-607.5	173.1	631.7	0.00	0.00	
4,606.0	9.41	164.09	4,555.0	-608.5	173.4	632.7	0.00	0.00	Sussex
4,700.0	9.41	164.09	4,647.7	-623.2	177.6	648.0	0.00	0.00	
4,800.0	9.41	164.09	4,746.4	-638.9	182.1	664.4	0.00	0.00	
4,900.0	9.41	164.09	4,845.1	-654.7	186.5	680.7	0.00	0.00	

Database:	USA EDM 5000 Multi Users DB	**Local Co-ordinate Reference:**	Well Bangert 19-3Ae
Company:	Sundance Energy	**TVD Reference:**	WELL @ 4887.0ft (Original Well Elev)
Project:	Colorado	**MD Reference:**	WELL @ 4887.0ft (Original Well Elev)
Site:	SEC 19-T2N-R66W	**North Reference:**	True
Well:	Bangert 19-3Ae	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	DD		
Design:	Plan #1		

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)	Comments / Formations
5,000.0	9.41	164.09	4,943.7	-670.4	191.0	697.1	0.00	0.00	
5,019.5	9.41	164.09	4,963.0	-673.4	191.9	700.3	0.00	0.00	Shannon
5,100.0	9.41	164.09	5,042.4	-686.1	195.5	713.4	0.00	0.00	
5,200.0	9.41	164.09	5,141.0	-701.8	200.0	729.7	0.00	0.00	
5,300.0	9.41	164.09	5,239.7	-717.5	204.5	746.1	0.00	0.00	
5,400.0	9.41	164.09	5,338.3	-733.2	208.9	762.4	0.00	0.00	
5,500.0	9.41	164.09	5,437.0	-749.0	213.4	778.8	0.00	0.00	
5,600.0	9.41	164.09	5,535.6	-764.7	217.9	795.1	0.00	0.00	
5,700.0	9.41	164.09	5,634.3	-780.4	222.4	811.5	0.00	0.00	
5,800.0	9.41	164.09	5,733.0	-796.1	226.9	827.8	0.00	0.00	
5,900.0	9.41	164.09	5,831.6	-811.8	231.3	844.1	0.00	0.00	
6,000.0	9.41	164.09	5,930.3	-827.5	235.8	860.5	0.00	0.00	
6,100.0	9.41	164.09	6,028.9	-843.3	240.3	876.8	0.00	0.00	
6,200.0	9.41	164.09	6,127.6	-859.0	244.8	893.2	0.00	0.00	
6,300.0	9.41	164.09	6,226.2	-874.7	249.2	909.5	0.00	0.00	
6,400.0	9.41	164.09	6,324.9	-890.4	253.7	925.9	0.00	0.00	
6,500.0	9.41	164.09	6,423.5	-906.1	258.2	942.2	0.00	0.00	
6,600.0	9.41	164.09	6,522.2	-921.8	262.7	958.5	0.00	0.00	
6,617.9	9.41	164.09	6,539.8	-924.7	263.5	961.5	0.00	0.00	
6,700.0	7.76	164.09	6,621.0	-936.4	266.8	973.7	2.00	-2.00	
6,800.0	5.76	164.09	6,720.3	-947.8	270.1	985.5	2.00	-2.00	
6,900.0	3.76	164.09	6,820.0	-955.7	272.3	993.8	2.00	-2.00	
7,000.0	1.76	164.09	6,919.9	-960.4	273.7	998.6	2.00	-2.00	
7,088.1	0.00	0.00	7,008.0	-961.7	274.0	1,000.0	2.00	-2.00	
7,100.0	0.00	0.00	7,019.9	-961.7	274.0	1,000.0	0.00	0.00	
7,188.1	0.00	0.00	7,108.0	-961.7	274.0	1,000.0	0.00	0.00	Niobrara
7,200.0	0.00	0.00	7,119.9	-961.7	274.0	1,000.0	0.00	0.00	
7,300.0	0.00	0.00	7,219.9	-961.7	274.0	1,000.0	0.00	0.00	
7,400.0	0.00	0.00	7,319.9	-961.7	274.0	1,000.0	0.00	0.00	
7,464.1	0.00	0.00	7,384.0	-961.7	274.0	1,000.0	0.00	0.00	Codell
7,500.0	0.00	0.00	7,419.9	-961.7	274.0	1,000.0	0.00	0.00	
7,600.0	0.00	0.00	7,519.9	-961.7	274.0	1,000.0	0.00	0.00	
7,620.1	0.00	0.00	7,540.0	-961.7	274.0	1,000.0	0.00	0.00	

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
Bangert 19-3Ae PBHL - plan hits target center - Circle (radius 50.0)	0.00	0.00	7,540.0	-961.7	274.0	1,289,945.73	3,192,790.40	40.127230	-104.810570

Database:	USA EDM 5000 Multi Users DB	**Local Co-ordinate Reference:**	Well Bangert 19-3Ae
Company:	Sundance Energy	**TVD Reference:**	WELL @ 4887.0ft (Original Well Elev)
Project:	Colorado	**MD Reference:**	WELL @ 4887.0ft (Original Well Elev)
Site:	SEC 19-T2N-R66W	**North Reference:**	True
Well:	Bangert 19-3Ae	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	DD		
Design:	Plan #1		

Formations

Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
4,606.0	4,555.0	Sussex		0.00	
5,019.5	4,963.0	Shannon		0.00	
7,188.1	7,108.0	Niobrara		0.00	
7,464.1	7,384.0	Codell		0.00	

Sundance Energy

Colorado
SEC 19-T2N-R66W
Bangert 19-3Ae
DD
Plan #1

Anticollision Report

14 March, 2013

Company:	Sundance Energy	**Local Co-ordinate Reference:**	Well Bangert 19-3Ae
Project:	Colorado	**TVD Reference:**	WELL @ 4887.0ft (Original Well Elev)
Reference Site:	SEC 19-T2N-R66W	**MD Reference:**	WELL @ 4887.0ft (Original Well Elev)
Site Error:	0.0ft	**North Reference:**	True
Reference Well:	Bangert 19-3Ae	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0ft	**Output errors are at**	2.00 sigma
Reference Wellbore	DD	**Database:**	USA EDM 5000 Multi Users DB
Reference Design:	Plan #1	**Offset TVD Reference:**	Offset Datum

Reference Plan #1

Filter type:	NO GLOBAL FILTER: Using user defined selection & filtering criteria		
Interpolation Method:	MD Interval 100.0ft	**Error Model:**	ISCWSA
Depth Range:	Unlimited	**Scan Method:**	Closest Approach 3D
Results Limited by:	Maximum center-center distance of 1,268.1ft	**Error Surface:**	Elliptical Conic
Warning Levels Evaluated at:	2.00 **Sigma**		

Survey Tool Program **Date** 3/14/2013

From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description
0.0	7,620.1	Plan #1 (DD)	MWD	Geolink MWD

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
SEC 19-T2N-R66W						
Bangert 19-41 - DD - Plan #1	500.0	500.0	21.9	20.2	12.908	CC, ES
Bangert 19-41 - DD - Plan #1	600.0	600.0	23.5	21.5	11.529	SF
Bangert 19-42 - DD - Plan #1	400.0	400.0	7.3	5.9	5.421	CC, ES
Bangert 19-42 - DD - Plan #1	500.0	499.7	9.0	7.3	5.310	SF
Bangert 19-51 - DD - Plan #1	500.0	500.0	10.9	9.2	6.458	CC, ES
Bangert 19-51 - DD - Plan #1	600.0	600.2	11.5	9.5	5.652	SF

Company:	Sundance Energy	**Local Co-ordinate Reference:**	Well Bangert 19-3Ae
Project:	Colorado	**TVD Reference:**	WELL @ 4887.0ft (Original Well Elev)
Reference Site:	SEC 19-T2N-R66W	**MD Reference:**	WELL @ 4887.0ft (Original Well Elev)
Site Error:	0.0ft	**North Reference:**	True
Reference Well:	Bangert 19-3Ae	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0ft	**Output errors are at**	2.00 sigma
Reference Wellbore	DD	**Database:**	USA EDM 5000 Multi Users DB
Reference Design:	Plan #1	**Offset TVD Reference:**	Offset Datum

Offset Design SEC 19-T2N-R66W - Bangert 19-41 - DD - Plan #1 — **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)	Total Uncertainty Axis	Separation Factor	Warning
0.0	0.0	0.0	0.0	0.0	0.0	0.00	21.9	0.0	21.9				
100.0	100.0	100.0	100.0	0.1	0.1	0.00	21.9	0.0	21.9	21.6	0.30	73.651	
200.0	200.0	200.0	200.0	0.3	0.3	0.00	21.9	0.0	21.9	21.2	0.65	33.840	
300.0	300.0	300.0	300.0	0.5	0.5	0.00	21.9	0.0	21.9	20.9	0.99	21.966	
400.0	400.0	400.0	400.0	0.7	0.7	0.00	21.9	0.0	21.9	20.5	1.34	16.261	
500.0	500.0	500.0	500.0	0.8	0.8	0.00	21.9	0.0	21.9	20.2	1.69	12.908	CC, ES
600.0	600.0	600.0	600.0	1.0	1.0	-165.25	21.9	0.0	23.5	21.5	2.04	11.529	SF
700.0	699.8	699.8	699.8	1.2	1.2	-167.90	21.9	0.0	28.6	26.2	2.39	11.988	
800.0	799.5	800.1	800.1	1.4	1.4	-173.00	20.7	-1.3	36.3	33.5	2.73	13.260	
900.0	898.7	900.2	900.0	1.7	1.6	179.55	17.3	-5.3	46.0	42.9	3.08	14.919	
1,000.0	997.5	999.4	998.9	1.9	1.7	172.43	12.1	-11.4	58.6	55.2	3.45	17.007	
1,100.0	1,096.1	1,098.3	1,097.5	2.2	1.9	167.83	6.7	-17.7	72.6	68.8	3.83	18.938	
1,200.0	1,194.8	1,197.2	1,196.0	2.5	2.2	164.73	1.3	-23.9	86.9	82.6	4.23	20.529	
1,300.0	1,293.5	1,296.1	1,294.6	2.8	2.4	162.50	-4.1	-30.2	101.3	96.7	4.64	21.841	
1,400.0	1,392.1	1,395.0	1,393.1	3.2	2.6	160.83	-9.5	-36.5	115.9	110.9	5.06	22.931	
1,500.0	1,490.8	1,493.8	1,491.6	3.5	2.8	159.54	-14.8	-42.7	130.6	125.1	5.48	23.844	
1,600.0	1,589.4	1,592.7	1,590.2	3.8	3.0	158.51	-20.2	-49.0	145.3	139.4	5.90	24.618	
1,700.0	1,688.1	1,691.6	1,688.7	4.1	3.2	157.66	-25.6	-55.2	160.0	153.7	6.33	25.280	
1,800.0	1,786.7	1,790.5	1,787.2	4.5	3.4	156.96	-31.0	-61.5	174.8	168.0	6.76	25.852	
1,900.0	1,885.4	1,889.4	1,885.8	4.8	3.7	156.37	-36.4	-67.8	189.6	182.4	7.19	26.349	
2,000.0	1,984.0	1,988.3	1,984.3	5.1	3.9	155.86	-41.8	-74.0	204.4	196.8	7.63	26.785	
2,100.0	2,082.7	2,087.1	2,082.9	5.4	4.1	155.43	-47.1	-80.3	219.2	211.1	8.07	27.171	
2,200.0	2,181.4	2,186.0	2,181.4	5.8	4.3	155.04	-52.5	-86.6	234.0	225.5	8.51	27.514	
2,300.0	2,280.0	2,284.9	2,279.9	6.1	4.5	154.71	-57.9	-92.8	248.9	239.9	8.95	27.820	
2,400.0	2,378.7	2,383.8	2,378.5	6.4	4.8	154.41	-63.3	-99.1	263.7	254.3	9.39	28.096	
2,500.0	2,477.3	2,482.7	2,477.0	6.8	5.0	154.14	-68.7	-105.4	278.6	268.8	9.83	28.345	
2,600.0	2,576.0	2,581.6	2,575.5	7.1	5.2	153.90	-74.1	-111.6	293.5	283.2	10.27	28.571	
2,700.0	2,674.6	2,680.4	2,674.1	7.4	5.4	153.68	-79.4	-117.9	308.3	297.6	10.71	28.777	
2,800.0	2,773.3	2,779.3	2,772.6	7.7	5.6	153.49	-84.8	-124.2	323.2	312.0	11.16	28.966	
2,900.0	2,871.9	2,878.2	2,871.1	8.1	5.9	153.31	-90.2	-130.4	338.1	326.5	11.60	29.139	
3,000.0	2,970.6	2,977.1	2,969.7	8.4	6.1	153.14	-95.6	-136.7	352.9	340.9	12.05	29.299	
3,100.0	3,069.3	3,076.0	3,068.2	8.7	6.3	152.99	-101.0	-143.0	367.8	355.3	12.49	29.447	
3,200.0	3,167.9	3,174.9	3,166.8	9.1	6.5	152.85	-106.3	-149.2	382.7	369.8	12.94	29.584	
3,300.0	3,266.6	3,273.7	3,265.3	9.4	6.8	152.72	-111.7	-155.5	397.6	384.2	13.38	29.711	
3,400.0	3,365.2	3,372.6	3,363.8	9.7	7.0	152.60	-117.1	-161.8	412.5	398.6	13.83	29.829	
3,500.0	3,463.9	3,471.5	3,462.4	10.1	7.2	152.49	-122.5	-168.0	427.3	413.1	14.27	29.940	
3,600.0	3,562.5	3,570.4	3,560.9	10.4	7.4	152.39	-127.9	-174.3	442.2	427.5	14.72	30.043	
3,700.0	3,661.2	3,669.3	3,659.4	10.7	7.7	152.29	-133.3	-180.6	457.1	442.0	15.17	30.140	
3,800.0	3,759.8	3,768.1	3,758.0	11.1	7.9	152.20	-138.6	-186.8	472.0	456.4	15.61	30.231	
3,900.0	3,858.5	3,867.0	3,856.5	11.4	8.1	152.12	-144.0	-193.1	486.9	470.8	16.06	30.317	
4,000.0	3,957.2	3,965.9	3,955.1	11.7	8.3	152.04	-149.4	-199.4	501.8	485.3	16.51	30.398	
4,100.0	4,055.8	4,064.8	4,053.6	12.1	8.5	151.96	-154.8	-205.6	516.7	499.7	16.95	30.475	
4,200.0	4,154.5	4,163.7	4,152.1	12.4	8.8	151.89	-160.2	-211.9	531.6	514.2	17.40	30.547	
4,300.0	4,253.1	4,262.6	4,250.7	12.7	9.0	151.82	-165.6	-218.2	546.5	528.6	17.85	30.616	
4,400.0	4,351.8	4,361.4	4,349.2	13.1	9.2	151.76	-170.9	-224.4	561.4	543.1	18.30	30.681	
4,500.0	4,450.4	4,460.3	4,447.7	13.4	9.4	151.70	-176.3	-230.7	576.3	557.5	18.75	30.742	
4,600.0	4,549.1	4,559.2	4,546.3	13.7	9.7	151.64	-181.7	-237.0	591.2	572.0	19.19	30.801	
4,700.0	4,647.7	4,658.1	4,644.8	14.1	9.9	151.58	-187.1	-243.2	606.1	586.4	19.64	30.857	
4,800.0	4,746.4	4,757.0	4,743.3	14.4	10.1	151.53	-192.5	-249.5	621.0	600.9	20.09	30.910	
4,900.0	4,845.1	4,855.9	4,841.9	14.7	10.3	151.48	-197.9	-255.8	635.9	615.3	20.54	30.961	
5,000.0	4,943.7	4,954.7	4,940.4	15.1	10.6	151.44	-203.2	-262.0	650.8	629.8	20.99	31.010	
5,100.0	5,042.4	5,053.6	5,039.0	15.4	10.8	151.39	-208.6	-268.3	665.7	644.2	21.43	31.056	

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

Company:	Sundance Energy	**Local Co-ordinate Reference:**	Well Bangert 19-3Ae
Project:	Colorado	**TVD Reference:**	WELL @ 4887.0ft (Original Well Elev)
Reference Site:	SEC 19-T2N-R66W	**MD Reference:**	WELL @ 4887.0ft (Original Well Elev)
Site Error:	0.0ft	**North Reference:**	True
Reference Well:	Bangert 19-3Ae	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0ft	**Output errors are at**	2.00 sigma
Reference Wellbore	DD	**Database:**	USA EDM 5000 Multi Users DB
Reference Design:	Plan #1	**Offset TVD Reference:**	Offset Datum

Offset Design SEC 19-T2N-R66W - Bangert 19-41 - DD - Plan #1

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)	Total Uncertainty Axis	Separation Factor	Warning
5,200.0	5,141.0	5,152.5	5,137.5	15.7	11.0	151.35	-214.0	-274.6	680.6	658.7	21.88	31.101	
5,300.0	5,239.7	5,251.4	5,236.0	16.1	11.2	151.31	-219.4	-280.8	695.5	673.1	22.33	31.143	
5,400.0	5,338.3	5,350.3	5,334.6	16.4	11.5	151.27	-224.8	-287.1	710.4	687.6	22.78	31.184	
5,500.0	5,437.0	5,449.1	5,433.1	16.7	11.7	151.23	-230.1	-293.4	725.3	702.0	23.23	31.223	
5,600.0	5,535.6	5,548.0	5,531.6	17.1	11.9	151.19	-235.5	-299.6	740.2	716.5	23.68	31.261	
5,700.0	5,634.3	5,646.9	5,630.2	17.4	12.1	151.16	-240.9	-305.9	755.1	730.9	24.13	31.297	
5,800.0	5,733.0	5,745.8	5,728.7	17.7	12.4	151.12	-246.3	-312.2	770.0	745.4	24.57	31.332	
5,900.0	5,831.6	5,844.7	5,827.3	18.1	12.6	151.09	-251.7	-318.4	784.9	759.8	25.02	31.366	
6,000.0	5,930.3	5,943.6	5,925.8	18.4	12.8	151.06	-257.1	-324.7	799.8	774.3	25.47	31.398	
6,100.0	6,028.9	6,042.4	6,024.3	18.8	13.0	151.03	-262.4	-331.0	814.7	788.8	25.92	31.429	
6,200.0	6,127.6	6,141.3	6,122.9	19.1	13.3	151.00	-267.8	-337.2	829.6	803.2	26.37	31.459	
6,300.0	6,226.2	6,240.2	6,221.4	19.4	13.5	150.97	-273.2	-343.5	844.5	817.7	26.82	31.488	
6,400.0	6,324.9	6,339.1	6,319.9	19.8	13.7	150.94	-278.6	-349.7	859.4	832.1	27.27	31.516	
6,500.0	6,423.5	6,438.0	6,418.5	20.1	13.9	150.92	-284.0	-356.0	874.3	846.6	27.72	31.544	
6,600.0	6,522.2	6,536.9	6,517.0	20.4	14.2	150.89	-289.4	-362.3	889.2	861.0	28.17	31.570	
6,700.0	6,621.0	6,635.9	6,615.7	20.7	14.4	150.94	-294.7	-368.6	903.1	874.4	28.63	31.541	
6,800.0	6,720.3	6,735.2	6,714.7	21.0	14.6	150.88	-300.2	-374.9	914.0	884.9	29.09	31.420	
6,900.0	6,820.0	6,836.0	6,815.1	21.2	14.8	150.71	-305.4	-381.0	921.8	892.3	29.52	31.229	
7,000.0	6,919.9	6,938.5	6,917.5	21.3	15.0	150.60	-308.7	-384.8	926.4	896.6	29.87	31.015	
7,100.0	7,019.9	7,040.9	7,019.9	21.4	15.2	-45.34	-309.6	-385.9	927.7	897.6	30.15	30.766	
7,200.0	7,119.9	7,140.9	7,119.9	21.5	15.3	-45.34	-309.6	-385.9	927.7	897.3	30.44	30.477	
7,300.0	7,219.9	7,240.9	7,219.9	21.6	15.4	-45.34	-309.6	-385.9	927.7	897.0	30.73	30.192	
7,400.0	7,319.9	7,340.9	7,319.9	21.7	15.6	-45.34	-309.6	-385.9	927.7	896.7	31.02	29.911	
7,500.0	7,419.9	7,440.9	7,419.9	21.8	15.7	-45.34	-309.6	-385.9	927.7	896.4	31.31	29.635	
7,600.0	7,519.9	7,540.9	7,519.9	21.9	15.9	-45.34	-309.6	-385.9	927.7	896.1	31.60	29.362	
7,620.1	7,540.0	7,561.0	7,540.0	21.9	15.9	-45.34	-309.6	-385.9	927.7	896.1	31.65	29.308	

Company:	Sundance Energy	**Local Co-ordinate Reference:**	Well Bangert 19-3Ae
Project:	Colorado	**TVD Reference:**	WELL @ 4887.0ft (Original Well Elev)
Reference Site:	SEC 19-T2N-R66W	**MD Reference:**	WELL @ 4887.0ft (Original Well Elev)
Site Error:	0.0ft	**North Reference:**	True
Reference Well:	Bangert 19-3Ae	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0ft	**Output errors are at**	2.00 sigma
Reference Wellbore	DD	**Database:**	USA EDM 5000 Multi Users DB
Reference Design:	Plan #1	**Offset TVD Reference:**	Offset Datum

Offset Design SEC 19-T2N-R66W - Bangert 19-42 - DD - Plan #1 — **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)	Total Uncertainty Axis	Separation Factor	Warning
0.0	0.0	0.0	0.0	0.0	0.0	-180.00	-7.3	0.0	7.3				
100.0	100.0	100.0	100.0	0.1	0.1	-180.00	-7.3	0.0	7.3	7.0	0.30	24.555	
200.0	200.0	200.0	200.0	0.3	0.3	-180.00	-7.3	0.0	7.3	6.6	0.65	11.282	
300.0	300.0	300.0	300.0	0.5	0.5	-180.00	-7.3	0.0	7.3	6.3	0.99	7.323	
400.0	400.0	400.0	400.0	0.7	0.7	-180.00	-7.3	0.0	7.3	5.9	1.34	5.421	CC, ES
500.0	500.0	499.7	499.7	0.8	0.8	-177.42	-9.0	-0.4	9.0	7.3	1.69	5.310	SF
600.0	600.0	599.3	599.1	1.0	1.0	25.49	-14.0	-1.6	12.6	10.5	2.04	6.150	
700.0	699.8	698.6	698.1	1.2	1.2	35.17	-22.4	-3.6	16.7	14.3	2.39	6.995	
800.0	799.5	797.8	796.5	1.4	1.5	44.94	-34.1	-6.4	22.0	19.3	2.77	7.957	
900.0	898.7	896.7	894.2	1.7	1.8	53.60	-49.0	-10.0	28.7	25.5	3.20	8.980	
1,000.0	997.5	995.2	991.0	1.9	2.1	60.61	-67.2	-14.4	37.2	33.5	3.72	9.997	
1,100.0	1,096.1	1,093.4	1,086.6	2.2	2.5	63.60	-88.5	-19.5	48.4	44.1	4.27	11.317	
1,200.0	1,194.8	1,190.8	1,180.8	2.5	3.0	63.61	-112.8	-25.3	62.4	57.6	4.83	12.913	
1,300.0	1,293.5	1,289.4	1,275.6	2.8	3.4	62.76	-139.2	-31.6	78.1	72.7	5.38	14.506	
1,400.0	1,392.1	1,388.2	1,370.5	3.2	3.9	62.19	-165.7	-38.0	93.8	87.9	5.94	15.784	
1,500.0	1,490.8	1,486.9	1,465.4	3.5	4.4	61.78	-192.3	-44.4	109.6	103.1	6.51	16.825	
1,600.0	1,589.4	1,585.7	1,560.3	3.8	4.9	61.47	-218.8	-50.7	125.3	118.2	7.08	17.688	
1,700.0	1,688.1	1,684.4	1,655.2	4.1	5.4	61.24	-245.3	-57.1	141.1	133.4	7.66	18.414	
1,800.0	1,786.7	1,783.2	1,750.1	4.5	5.9	61.05	-271.8	-63.4	156.8	148.6	8.24	19.031	
1,900.0	1,885.4	1,881.9	1,845.0	4.8	6.4	60.89	-298.3	-69.8	172.6	163.7	8.82	19.562	
2,000.0	1,984.0	1,980.7	1,939.9	5.1	6.9	60.76	-324.9	-76.2	188.3	178.9	9.40	20.024	
2,100.0	2,082.7	2,079.4	2,034.9	5.4	7.4	60.65	-351.4	-82.5	204.1	194.1	9.99	20.428	
2,200.0	2,181.4	2,178.2	2,129.8	5.8	7.9	60.56	-377.9	-88.9	219.8	209.2	10.57	20.786	
2,300.0	2,280.0	2,276.9	2,224.7	6.1	8.4	60.48	-404.4	-95.2	235.6	224.4	11.16	21.103	
2,400.0	2,378.7	2,375.7	2,319.6	6.4	8.9	60.41	-430.9	-101.6	251.3	239.6	11.75	21.388	
2,500.0	2,477.3	2,474.4	2,414.5	6.8	9.4	60.34	-457.5	-107.9	267.1	254.7	12.34	21.643	
2,600.0	2,576.0	2,573.2	2,509.4	7.1	9.9	60.29	-484.0	-114.3	282.8	269.9	12.93	21.875	
2,700.0	2,674.6	2,671.9	2,604.3	7.4	10.4	60.24	-510.5	-120.7	298.6	285.1	13.52	22.085	
2,800.0	2,773.3	2,770.7	2,699.2	7.7	10.9	60.19	-537.0	-127.0	314.3	300.2	14.11	22.277	
2,900.0	2,871.9	2,869.4	2,794.1	8.1	11.4	60.15	-563.6	-133.4	330.1	315.4	14.70	22.452	
3,000.0	2,970.6	2,968.2	2,889.0	8.4	11.9	60.11	-590.1	-139.7	345.8	330.5	15.29	22.614	
3,100.0	3,069.3	3,066.9	2,984.0	8.7	12.4	60.08	-616.6	-146.1	361.6	345.7	15.89	22.763	
3,200.0	3,167.9	3,165.7	3,078.9	9.1	12.9	60.05	-643.1	-152.5	377.3	360.9	16.48	22.900	
3,300.0	3,266.6	3,264.4	3,173.8	9.4	13.4	60.02	-669.6	-158.8	393.1	376.0	17.07	23.028	
3,400.0	3,365.2	3,363.2	3,268.7	9.7	13.9	60.00	-696.2	-165.2	408.8	391.2	17.66	23.147	
3,500.0	3,463.9	3,461.9	3,363.6	10.1	14.4	59.97	-722.7	-171.5	424.6	406.3	18.26	23.258	
3,600.0	3,562.5	3,560.7	3,458.5	10.4	14.9	59.95	-749.2	-177.9	440.4	421.5	18.85	23.362	
3,700.0	3,661.2	3,659.4	3,553.4	10.7	15.4	59.93	-775.7	-184.3	456.1	436.7	19.44	23.459	
3,800.0	3,759.8	3,758.2	3,648.3	11.1	15.9	59.91	-802.2	-190.6	471.9	451.8	20.04	23.550	
3,900.0	3,858.5	3,856.9	3,743.2	11.4	16.4	59.89	-828.8	-197.0	487.6	467.0	20.63	23.636	
4,000.0	3,957.2	3,955.7	3,838.1	11.7	16.9	59.87	-855.3	-203.3	503.4	482.2	21.22	23.716	
4,100.0	4,055.8	4,054.4	3,933.1	12.1	17.5	59.86	-881.8	-209.7	519.1	497.3	21.82	23.793	
4,200.0	4,154.5	4,153.2	4,028.0	12.4	18.0	59.84	-908.3	-216.1	534.9	512.5	22.41	23.865	
4,300.0	4,253.1	4,251.9	4,122.9	12.7	18.5	59.83	-934.9	-222.4	550.6	527.6	23.01	23.933	
4,400.0	4,351.8	4,350.7	4,217.8	13.1	19.0	59.81	-961.4	-228.8	566.4	542.8	23.60	23.997	
4,500.0	4,450.4	4,449.4	4,312.7	13.4	19.5	59.80	-987.9	-235.1	582.1	558.0	24.20	24.059	
4,600.0	4,549.1	4,548.2	4,407.6	13.7	20.0	59.79	-1,014.4	-241.5	597.9	573.1	24.79	24.117	
4,700.0	4,647.7	4,646.9	4,502.5	14.1	20.5	59.78	-1,040.9	-247.9	613.7	588.3	25.39	24.173	
4,800.0	4,746.4	4,745.7	4,597.4	14.4	21.0	59.77	-1,067.5	-254.2	629.4	603.4	25.98	24.226	
4,900.0	4,845.1	4,844.4	4,692.3	14.7	21.5	59.76	-1,094.0	-260.6	645.2	618.6	26.58	24.276	
5,000.0	4,943.7	4,943.2	4,787.2	15.1	22.0	59.75	-1,120.5	-266.9	660.9	633.8	27.17	24.324	
5,100.0	5,042.4	5,041.9	4,882.2	15.4	22.5	59.74	-1,147.0	-273.3	676.7	648.9	27.77	24.370	

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

Company:	Sundance Energy	**Local Co-ordinate Reference:**	Well Bangert 19-3Ae
Project:	Colorado	**TVD Reference:**	WELL @ 4887.0ft (Original Well Elev)
Reference Site:	SEC 19-T2N-R66W	**MD Reference:**	WELL @ 4887.0ft (Original Well Elev)
Site Error:	0.0ft	**North Reference:**	True
Reference Well:	Bangert 19-3Ae	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0ft	**Output errors are at**	2.00 sigma
Reference Wellbore	DD	**Database:**	USA EDM 5000 Multi Users DB
Reference Design:	Plan #1	**Offset TVD Reference:**	Offset Datum

Offset Design SEC 19-T2N-R66W - Bangert 19-42 - DD - Plan #1

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)	Total Uncertainty Axis	Separation Factor	Warning
5,200.0	5,141.0	5,140.7	4,977.1	15.7	23.0	59.73	-1,173.5	-279.7	692.4	664.1	28.36	24.414	
5,300.0	5,239.7	5,239.4	5,072.0	16.1	23.5	59.72	-1,200.1	-286.0	708.2	679.2	28.96	24.457	
5,400.0	5,338.3	5,338.2	5,166.9	16.4	24.0	59.71	-1,226.6	-292.4	723.9	694.4	29.55	24.497	
5,500.0	5,437.0	5,436.9	5,261.8	16.7	24.5	59.70	-1,253.1	-298.7	739.7	709.6	30.15	24.536	
5,600.0	5,535.6	5,535.7	5,356.7	17.1	25.0	59.70	-1,279.6	-305.1	755.5	724.7	30.74	24.573	
5,700.0	5,634.3	5,634.5	5,451.6	17.4	25.6	59.69	-1,306.1	-311.4	771.2	739.9	31.34	24.609	
5,800.0	5,733.0	5,733.2	5,546.5	17.7	26.1	59.68	-1,332.7	-317.8	787.0	755.0	31.93	24.644	
5,900.0	5,831.6	5,832.0	5,641.4	18.1	26.6	59.68	-1,359.2	-324.2	802.7	770.2	32.53	24.677	
6,000.0	5,930.3	5,930.7	5,736.4	18.4	27.1	59.67	-1,385.7	-330.5	818.5	785.3	33.12	24.709	
6,100.0	6,028.9	6,029.5	5,831.3	18.8	27.6	59.66	-1,412.2	-336.9	834.2	800.5	33.72	24.740	
6,200.0	6,127.6	6,128.2	5,926.2	19.1	28.1	59.66	-1,438.8	-343.2	850.0	815.7	34.32	24.769	
6,300.0	6,226.2	6,227.0	6,021.1	19.4	28.6	59.65	-1,465.3	-349.6	865.7	830.8	34.91	24.798	
6,400.0	6,324.9	6,325.7	6,116.0	19.8	29.1	59.65	-1,491.8	-356.0	881.5	846.0	35.51	24.826	
6,500.0	6,423.5	6,424.5	6,210.9	20.1	29.6	59.64	-1,518.3	-362.3	897.2	861.1	36.10	24.853	
6,600.0	6,522.2	6,558.0	6,340.0	20.4	30.2	59.73	-1,551.5	-370.3	911.2	874.4	36.81	24.756	
6,700.0	6,621.0	6,695.0	6,473.9	20.7	30.7	60.08	-1,579.5	-377.0	921.8	884.2	37.54	24.553	
6,800.0	6,720.3	6,832.7	6,609.8	21.0	31.1	60.38	-1,601.3	-382.2	929.9	891.8	38.16	24.372	
6,900.0	6,820.0	6,971.1	6,747.2	21.2	31.5	60.58	-1,616.8	-385.9	935.7	897.1	38.65	24.209	
7,000.0	6,919.9	7,109.8	6,885.6	21.3	31.7	60.70	-1,625.8	-388.1	939.1	900.0	39.02	24.064	
7,100.0	7,019.9	7,244.1	7,019.9	21.4	31.8	-135.17	-1,628.3	-388.7	940.0	900.7	39.28	23.930	
7,200.0	7,119.9	7,344.1	7,119.9	21.5	31.8	-135.17	-1,628.3	-388.7	940.0	900.5	39.51	23.795	
7,300.0	7,219.9	7,444.1	7,219.9	21.6	31.9	-135.17	-1,628.3	-388.7	940.0	900.3	39.73	23.660	
7,400.0	7,319.9	7,544.1	7,319.9	21.7	32.0	-135.17	-1,628.3	-388.7	940.0	900.1	39.96	23.526	
7,500.0	7,419.9	7,644.1	7,419.9	21.8	32.1	-135.17	-1,628.3	-388.7	940.0	899.8	40.18	23.392	
7,600.0	7,519.9	7,744.1	7,519.9	21.9	32.1	-135.17	-1,628.3	-388.7	940.0	899.6	40.41	23.259	
7,620.1	7,540.0	7,764.2	7,540.0	21.9	32.1	-135.17	-1,628.3	-388.7	940.0	899.5	40.46	23.232	

Anticollision Report

Company:	Sundance Energy	**Local Co-ordinate Reference:**	Well Bangert 19-3Ae
Project:	Colorado	**TVD Reference:**	WELL @ 4887.0ft (Original Well Elev)
Reference Site:	SEC 19-T2N-R66W	**MD Reference:**	WELL @ 4887.0ft (Original Well Elev)
Site Error:	0.0ft	**North Reference:**	True
Reference Well:	Bangert 19-3Ae	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0ft	**Output errors are at**	2.00 sigma
Reference Wellbore	DD	**Database:**	USA EDM 5000 Multi Users DB
Reference Design:	Plan #1	**Offset TVD Reference:**	Offset Datum

Offset Design SEC 19-T2N-R66W - Bangert 19-51 - DD - Plan #1 — **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)	Total Uncertainty Axis	Separation Factor	Warning
0.0	0.0	0.0	0.0	0.0	0.0	0.00	10.9	0.0	10.9				
100.0	100.0	100.0	100.0	0.1	0.1	0.00	10.9	0.0	10.9	10.6	0.30	36.846	
200.0	200.0	200.0	200.0	0.3	0.3	0.00	10.9	0.0	10.9	10.3	0.65	16.929	
300.0	300.0	300.0	300.0	0.5	0.5	0.00	10.9	0.0	10.9	9.9	0.99	10.989	
400.0	400.0	400.0	400.0	0.7	0.7	0.00	10.9	0.0	10.9	9.6	1.34	8.135	
500.0	500.0	500.0	500.0	0.8	0.8	0.00	10.9	0.0	10.9	9.2	1.69	6.458	CC, ES
600.0	600.0	600.2	600.2	1.0	1.0	-172.84	9.7	-1.3	11.5	9.5	2.04	5.652	SF
700.0	699.8	700.3	700.1	1.2	1.2	167.28	6.1	-5.1	14.6	12.2	2.40	6.095	
800.0	799.5	799.9	799.3	1.4	1.4	149.93	0.2	-11.4	21.9	19.1	2.79	7.850	
900.0	898.7	898.9	897.7	1.7	1.7	139.42	-8.1	-20.2	33.6	30.3	3.24	10.378	
1,000.0	997.5	997.2	994.7	1.9	1.9	133.30	-18.6	-31.4	49.1	45.4	3.74	13.139	
1,100.0	1,096.1	1,094.8	1,090.5	2.2	2.3	128.09	-31.2	-44.8	66.8	62.5	4.30	15.531	
1,200.0	1,194.8	1,191.5	1,184.8	2.5	2.6	123.10	-46.0	-60.5	86.3	81.4	4.90	17.606	
1,300.0	1,293.5	1,289.0	1,279.5	2.8	3.0	119.13	-62.0	-77.5	107.2	101.7	5.52	19.427	
1,400.0	1,392.1	1,386.6	1,374.2	3.2	3.5	116.45	-78.0	-94.6	128.4	122.3	6.14	20.922	
1,500.0	1,490.8	1,484.2	1,468.9	3.5	3.9	114.54	-94.1	-111.6	149.9	143.1	6.76	22.160	
1,600.0	1,589.4	1,581.8	1,563.7	3.8	4.3	113.10	-110.1	-128.7	171.4	164.0	7.39	23.195	
1,700.0	1,688.1	1,679.3	1,658.4	4.1	4.7	111.98	-126.1	-145.7	193.0	185.0	8.02	24.071	
1,800.0	1,786.7	1,776.9	1,753.1	4.5	5.2	111.09	-142.2	-162.8	214.7	206.0	8.65	24.819	
1,900.0	1,885.4	1,874.5	1,847.9	4.8	5.6	110.36	-158.2	-179.8	236.4	227.1	9.28	25.465	
2,000.0	1,984.0	1,972.1	1,942.6	5.1	6.0	109.76	-174.2	-196.9	258.1	248.2	9.92	26.029	
2,100.0	2,082.7	2,069.6	2,037.3	5.4	6.5	109.25	-190.3	-213.9	279.9	269.3	10.55	26.523	
2,200.0	2,181.4	2,167.2	2,132.0	5.8	6.9	108.81	-206.3	-231.0	301.6	290.5	11.19	26.961	
2,300.0	2,280.0	2,264.8	2,226.8	6.1	7.4	108.43	-222.3	-248.0	323.4	311.6	11.83	27.350	
2,400.0	2,378.7	2,362.4	2,321.5	6.4	7.8	108.10	-238.4	-265.1	345.2	332.8	12.46	27.699	
2,500.0	2,477.3	2,459.9	2,416.2	6.8	8.2	107.81	-254.4	-282.1	367.1	354.0	13.10	28.014	
2,600.0	2,576.0	2,557.5	2,510.9	7.1	8.7	107.55	-270.4	-299.2	388.9	375.1	13.74	28.299	
2,700.0	2,674.6	2,655.1	2,605.7	7.4	9.1	107.32	-286.5	-316.2	410.7	396.3	14.38	28.557	
2,800.0	2,773.3	2,752.7	2,700.4	7.7	9.6	107.11	-302.5	-333.3	432.5	417.5	15.02	28.794	
2,900.0	2,871.9	2,850.2	2,795.1	8.1	10.0	106.92	-318.5	-350.3	454.4	438.7	15.66	29.010	
3,000.0	2,970.6	2,947.8	2,889.9	8.4	10.5	106.75	-334.6	-367.4	476.2	459.9	16.30	29.210	
3,100.0	3,069.3	3,045.4	2,984.6	8.7	10.9	106.60	-350.6	-384.4	498.1	481.1	16.94	29.394	
3,200.0	3,167.9	3,143.0	3,079.3	9.1	11.4	106.45	-366.6	-401.5	519.9	502.3	17.59	29.564	
3,300.0	3,266.6	3,240.5	3,174.0	9.4	11.8	106.32	-382.7	-418.5	541.8	523.5	18.23	29.722	
3,400.0	3,365.2	3,338.1	3,268.8	9.7	12.3	106.20	-398.7	-435.6	563.6	544.8	18.87	29.869	
3,500.0	3,463.9	3,435.7	3,363.5	10.1	12.7	106.09	-414.7	-452.6	585.5	566.0	19.51	30.006	
3,600.0	3,562.5	3,533.3	3,458.2	10.4	13.1	105.98	-430.8	-469.7	607.3	587.2	20.15	30.134	
3,700.0	3,661.2	3,630.9	3,552.9	10.7	13.6	105.89	-446.8	-486.7	629.2	608.4	20.80	30.255	
3,800.0	3,759.8	3,728.4	3,647.7	11.1	14.0	105.80	-462.8	-503.8	651.1	629.6	21.44	30.368	
3,900.0	3,858.5	3,826.0	3,742.4	11.4	14.5	105.71	-478.9	-520.8	672.9	650.9	22.08	30.474	
4,000.0	3,957.2	3,923.6	3,837.1	11.7	14.9	105.63	-494.9	-537.9	694.8	672.1	22.73	30.574	
4,100.0	4,055.8	4,021.2	3,931.9	12.1	15.4	105.56	-510.9	-554.9	716.7	693.3	23.37	30.668	
4,200.0	4,154.5	4,118.7	4,026.6	12.4	15.8	105.49	-527.0	-572.0	738.5	714.5	24.01	30.758	
4,300.0	4,253.1	4,216.3	4,121.3	12.7	16.3	105.42	-543.0	-589.0	760.4	735.8	24.65	30.842	
4,400.0	4,351.8	4,313.9	4,216.0	13.1	16.7	105.36	-559.0	-606.1	782.3	757.0	25.30	30.923	
4,500.0	4,450.4	4,411.5	4,310.8	13.4	17.2	105.30	-575.1	-623.1	804.2	778.2	25.94	30.999	
4,600.0	4,549.1	4,509.0	4,405.5	13.7	17.6	105.25	-591.1	-640.2	826.0	799.4	26.58	31.071	
4,700.0	4,647.7	4,606.6	4,500.2	14.1	18.1	105.19	-607.1	-657.2	847.9	820.7	27.23	31.140	
4,800.0	4,746.4	4,704.2	4,594.9	14.4	18.5	105.14	-623.2	-674.3	869.8	841.9	27.87	31.206	
4,900.0	4,845.1	4,801.8	4,689.7	14.7	19.0	105.10	-639.2	-691.3	891.6	863.1	28.52	31.269	
5,000.0	4,943.7	4,899.3	4,784.4	15.1	19.4	105.05	-655.2	-708.4	913.5	884.4	29.16	31.328	
5,100.0	5,042.4	4,996.9	4,879.1	15.4	19.8	105.01	-671.3	-725.4	935.4	905.6	29.80	31.386	

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

Company:	Sundance Energy	**Local Co-ordinate Reference:**	Well Bangert 19-3Ae
Project:	Colorado	**TVD Reference:**	WELL @ 4887.0ft (Original Well Elev)
Reference Site:	SEC 19-T2N-R66W	**MD Reference:**	WELL @ 4887.0ft (Original Well Elev)
Site Error:	0.0ft	**North Reference:**	True
Reference Well:	Bangert 19-3Ae	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0ft	**Output errors are at**	2.00 sigma
Reference Wellbore	DD	**Database:**	USA EDM 5000 Multi Users DB
Reference Design:	Plan #1	**Offset TVD Reference:**	Offset Datum

Offset Design SEC 19-T2N-R66W - Bangert 19-51 - DD - Plan #1

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)	Total Uncertainty Axis	Separation Factor	Warning
5,200.0	5,141.0	5,094.5	4,973.9	15.7	20.3	104.97	-687.3	-742.5	957.3	926.8	30.45	31.440	
5,300.0	5,239.7	5,192.1	5,068.6	16.1	20.7	104.93	-703.3	-759.5	979.1	948.1	31.09	31.493	
5,400.0	5,338.3	5,289.6	5,163.3	16.4	21.2	104.89	-719.4	-776.6	1,001.0	969.3	31.73	31.543	
5,500.0	5,437.0	5,387.2	5,258.0	16.7	21.6	104.85	-735.4	-793.6	1,022.9	990.5	32.38	31.592	
5,600.0	5,535.6	5,484.8	5,352.8	17.1	22.1	104.82	-751.4	-810.7	1,044.8	1,011.8	33.02	31.638	
5,700.0	5,634.3	5,582.4	5,447.5	17.4	22.5	104.79	-767.5	-827.7	1,066.7	1,033.0	33.67	31.683	
5,800.0	5,733.0	5,679.9	5,542.2	17.7	23.0	104.75	-783.5	-844.8	1,088.5	1,054.2	34.31	31.726	
5,900.0	5,831.6	5,777.5	5,636.9	18.1	23.4	104.72	-799.5	-861.8	1,110.4	1,075.5	34.95	31.767	
6,000.0	5,930.3	5,875.1	5,731.7	18.4	23.9	104.69	-815.6	-878.9	1,132.3	1,096.7	35.60	31.807	
6,100.0	6,028.9	5,972.7	5,826.4	18.8	24.3	104.67	-831.6	-895.9	1,154.2	1,117.9	36.24	31.845	
6,200.0	6,127.6	6,070.2	5,921.1	19.1	24.8	104.64	-847.6	-913.0	1,176.0	1,139.2	36.89	31.882	
6,300.0	6,226.2	6,167.8	6,015.9	19.4	25.2	104.61	-863.7	-930.0	1,197.9	1,160.4	37.53	31.918	
6,400.0	6,324.9	6,265.4	6,110.6	19.8	25.7	104.59	-879.7	-947.1	1,219.8	1,181.6	38.18	31.952	
6,500.0	6,423.5	6,363.0	6,205.3	20.1	26.1	104.56	-895.7	-964.1	1,241.7	1,202.9	38.82	31.986	
6,600.0	6,522.2	6,460.5	6,300.0	20.4	26.6	104.54	-911.8	-981.2	1,263.6	1,224.1	39.46	32.018	

Company:	Sundance Energy	**Local Co-ordinate Reference:**	Well Bangert 19-3Ae
Project:	Colorado	**TVD Reference:**	WELL @ 4887.0ft (Original Well Elev)
Reference Site:	SEC 19-T2N-R66W	**MD Reference:**	WELL @ 4887.0ft (Original Well Elev)
Site Error:	0.0ft	**North Reference:**	True
Reference Well:	Bangert 19-3Ae	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0ft	**Output errors are at**	2.00 sigma
Reference Wellbore	DD	**Database:**	USA EDM 5000 Multi Users DB
Reference Design:	Plan #1	**Offset TVD Reference:**	Offset Datum

Reference Depths are relative to WELL @ 4887.0ft (Original Well Elev)	Coordinates are relative to: Bangert 19-3Ae
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: 0.44°