ENSIGN
Directional

NOBLE ENERGY INC WELD COUNTY CO

SEC.5-T5N-R67W
Thornton USX N05-09D Pad SEC.5-T5N-R67W
Thornton USX N05-09D

Wellbore #1
Noble Thornton USX N05-09D Plan #1 (1-30-12)

Anticollision Report

01 February, 2012

noble energy

Company:	NOBLE ENERGY INC WELD COUNTY CO	**Local Co-ordinate Reference:**	Well Thornton USX N05-09D
Project:	SEC.5-T5N-R67W	**TVD Reference:**	WELL @ 4896.0ft (Original Well Elev)
Reference Site:	Thornton USX N05-09D Pad SEC.5-T5N-R67W	**MD Reference:**	WELL @ 4896.0ft (Original Well Elev)
Site Error:	0.0ft	**North Reference:**	True
Reference Well:	Thornton USX N05-09D	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0ft	**Output errors are at**	2.00 sigma
Reference Wellbore	Wellbore #1	**Database:**	Landmark
Reference Design:	Noble Thornton USX N05-09D Plan #1 (1-30-12)	**Offset TVD Reference:**	Offset Datum

Reference	Noble Thornton USX N05-09D Plan		
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** 1/31/2012

From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description
0.0	8,036.4	Noble Thornton USX N05-09D Plan #1 (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
Thornton USX N05-09D Pad SEC.5-T5N-R67W						
Thornton USX N05-23D - Wellbore #1 - Noble Thornton I	900.0	900.0	22.6	18.7	5.907	CC
Thornton USX N05-23D - Wellbore #1 - Noble Thornton I	1,000.0	1,000.0	22.8	18.5	5.338	ES
Thornton USX N05-23D - Wellbore #1 - Noble Thornton I	1,100.0	1,099.9	24.8	20.1	5.255	SF

Offset Design Thornton USX N05-09D Pad SEC.5-T5N-R67W - Thornton USX N05-23D - Wellbore #1 - Noble Thorntc — **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	-99.30	-3.6	-22.3	22.6				
100.0	100.0	100.0	100.0	0.1	0.1	-99.30	-3.6	-22.3	22.6	22.3	0.22	100.418	
200.0	200.0	200.0	200.0	0.3	0.3	-99.30	-3.6	-22.3	22.6	21.9	0.67	33.473	
300.0	300.0	300.0	300.0	0.6	0.6	-99.30	-3.6	-22.3	22.6	21.4	1.12	20.084	
400.0	400.0	400.0	400.0	0.8	0.8	-99.30	-3.6	-22.3	22.6	21.0	1.57	14.345	
500.0	500.0	500.0	500.0	1.0	1.0	-99.30	-3.6	-22.3	22.6	20.5	2.02	11.158	
600.0	600.0	600.0	600.0	1.2	1.2	-99.30	-3.6	-22.3	22.6	20.1	2.47	9.129	
700.0	700.0	700.0	700.0	1.5	1.5	-99.30	-3.6	-22.3	22.6	19.6	2.92	7.724	
800.0	800.0	800.0	800.0	1.7	1.7	-99.30	-3.6	-22.3	22.6	19.2	3.37	6.695	
900.0	900.0	900.0	900.0	1.9	1.9	-99.30	-3.6	-22.3	22.6	18.7	3.82	5.907	CC
928.7	928.7	928.7	928.7	2.0	2.0	-120.37	-3.6	-22.3	22.6	18.7	3.95	5.724	
1,000.0	1,000.0	1,000.0	1,000.0	2.1	2.1	-121.16	-3.6	-22.3	22.8	18.5	4.27	5.338	ES
1,100.0	1,099.9	1,099.9	1,099.9	2.4	2.4	-128.04	-3.6	-22.3	24.8	20.1	4.72	5.255	SF
1,200.0	1,199.7	1,199.7	1,199.7	2.6	2.6	-137.84	-3.2	-22.4	29.5	24.4	5.16	5.727	
1,300.0	1,299.1	1,299.6	1,299.5	2.8	2.8	-143.26	0.0	-23.7	37.1	31.5	5.60	6.631	
1,400.0	1,398.2	1,399.4	1,399.1	3.1	3.0	-144.99	6.5	-26.2	47.0	41.0	6.05	7.772	
1,500.0	1,496.6	1,499.1	1,498.2	3.4	3.3	-144.68	16.1	-30.0	59.0	52.4	6.51	9.051	
1,600.0	1,594.4	1,598.6	1,596.7	3.7	3.5	-143.33	29.0	-35.1	73.0	66.0	7.01	10.405	
1,700.0	1,691.5	1,697.7	1,694.4	4.1	3.8	-141.53	44.9	-41.3	89.1	81.6	7.57	11.780	
1,800.0	1,787.6	1,795.9	1,790.9	4.5	4.1	-140.71	61.9	-47.9	107.8	99.6	8.17	13.201	
1,900.0	1,882.7	1,893.6	1,886.9	5.0	4.4	-141.07	78.8	-54.6	129.0	120.2	8.80	14.651	
2,000.0	1,977.7	1,991.2	1,982.8	5.5	4.7	-141.64	95.7	-61.2	150.7	141.2	9.48	15.891	

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

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Reference Well:	Thornton USX N05-09D	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0ft	**Output errors are at**	2.00 sigma
Reference Wellbore	Wellbore #1	**Database:**	Landmark
Reference Design:	Noble Thornton USX N05-09D Plan #1 (1-30-12)	**Offset TVD Reference:**	Offset Datum

Offset Design Thornton USX N05-09D Pad SEC.5-T5N-R67W - Thornton USX N05-23D - Wellbore #1 - Noble Thornto

Offset Site Error: 0.0 ft
Offset Well Error: 0.0 ft

Survey Program: 0-MWD

Reference		Offset		Semi Major Axis			Offset Wellbore Centre		Distance				Warning
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	+N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	
2,100.0	2,072.6	2,088.8	2,078.7	6.0	5.1	-142.07	112.5	-67.8	172.5	162.3	10.19	16.927	
2,200.0	2,167.5	2,186.4	2,174.6	6.6	5.4	-142.40	129.4	-74.4	194.3	183.4	10.91	17.801	
2,300.0	2,262.4	2,284.0	2,270.5	7.2	5.8	-142.67	146.3	-81.0	216.1	204.4	11.65	18.545	
2,400.0	2,357.4	2,381.6	2,366.4	7.8	6.1	-142.89	163.2	-87.6	237.8	225.4	12.40	19.182	
2,500.0	2,452.3	2,479.2	2,462.3	8.3	6.5	-143.07	180.0	-94.2	259.6	246.5	13.16	19.732	
2,600.0	2,547.2	2,576.8	2,558.2	8.9	6.9	-143.22	196.9	-100.8	281.4	267.5	13.93	20.210	
2,700.0	2,642.1	2,674.4	2,654.1	9.5	7.3	-143.35	213.8	-107.4	303.2	288.5	14.70	20.629	
2,800.0	2,737.1	2,772.0	2,750.0	10.1	7.6	-143.47	230.6	-114.0	325.0	309.6	15.48	20.998	
2,900.0	2,832.0	2,869.6	2,845.9	10.7	8.0	-143.56	247.5	-120.6	346.8	330.6	16.26	21.326	
3,000.0	2,926.9	2,967.2	2,941.8	11.3	8.4	-143.65	264.4	-127.2	368.6	351.6	17.05	21.618	
3,100.0	3,021.8	3,064.8	3,037.7	11.9	8.8	-143.73	281.2	-133.9	390.4	372.6	17.84	21.879	
3,200.0	3,116.8	3,162.4	3,133.6	12.5	9.2	-143.80	298.1	-140.5	412.2	393.6	18.64	22.115	
3,300.0	3,211.7	3,259.9	3,229.5	13.2	9.5	-143.86	315.0	-147.1	434.0	414.6	19.44	22.328	
3,400.0	3,306.6	3,357.5	3,325.4	13.8	9.9	-143.92	331.9	-153.7	455.8	435.6	20.24	22.521	
3,500.0	3,401.5	3,455.1	3,421.3	14.4	10.3	-143.97	348.7	-160.3	477.6	456.6	21.04	22.697	
3,600.0	3,496.5	3,552.7	3,517.2	15.0	10.7	-144.02	365.6	-166.9	499.4	477.6	21.85	22.859	
3,700.0	3,591.4	3,650.3	3,613.1	15.6	11.1	-144.06	382.5	-173.5	521.2	498.6	22.66	23.007	
3,800.0	3,686.3	3,747.9	3,709.0	16.2	11.5	-144.10	399.3	-180.1	543.0	519.6	23.46	23.143	
3,900.0	3,781.2	3,845.5	3,804.8	16.9	11.9	-144.13	416.2	-186.7	564.8	540.6	24.27	23.269	
4,000.0	3,876.2	3,943.1	3,900.7	17.5	12.3	-144.17	433.1	-193.3	586.7	561.6	25.09	23.385	
4,100.0	3,971.1	4,040.7	3,996.6	18.1	12.7	-144.20	449.9	-199.9	608.5	582.6	25.90	23.494	
4,200.0	4,066.0	4,138.3	4,092.5	18.7	13.1	-144.23	466.8	-206.5	630.3	603.5	26.71	23.594	
4,300.0	4,160.9	4,235.9	4,188.4	19.3	13.5	-144.26	483.7	-213.1	652.1	624.5	27.53	23.688	
4,400.0	4,255.9	4,333.5	4,284.3	20.0	13.8	-144.28	500.6	-219.7	673.9	645.5	28.34	23.776	
4,500.0	4,350.8	4,431.1	4,380.2	20.6	14.2	-144.31	517.4	-226.4	695.7	666.5	29.16	23.858	
4,600.0	4,445.7	4,528.2	4,475.7	21.2	14.6	-144.33	534.2	-232.9	717.5	687.5	29.97	23.940	
4,700.0	4,540.6	4,620.3	4,566.5	21.8	14.9	-144.48	548.6	-238.5	739.7	709.0	30.68	24.114	
4,800.0	4,635.6	4,711.9	4,657.2	22.4	15.2	-144.85	560.1	-243.1	762.7	731.4	31.28	24.381	
4,900.0	4,730.5	4,800.0	4,744.8	23.1	15.4	-145.38	568.7	-246.4	786.4	754.6	31.81	24.719	
5,000.0	4,825.4	4,892.8	4,837.4	23.7	15.6	-146.12	575.0	-248.9	811.0	778.8	32.28	25.126	
5,100.0	4,920.3	4,981.8	4,926.3	24.3	15.7	-146.97	578.4	-250.2	836.6	803.9	32.67	25.605	
5,200.0	5,015.3	5,070.8	5,015.3	24.9	15.9	-148.01	579.3	-250.6	863.2	830.2	33.01	26.149	
5,300.0	5,110.9	5,166.4	5,110.9	25.4	16.0	-149.27	579.3	-250.6	888.4	855.1	33.30	26.677	
5,400.0	5,207.5	5,263.0	5,207.5	25.8	16.1	-150.32	579.3	-250.6	911.0	877.4	33.60	27.111	
5,500.0	5,304.9	5,360.4	5,304.9	26.2	16.3	-151.20	579.3	-250.6	930.7	896.8	33.90	27.458	
5,600.0	5,403.1	5,458.6	5,403.1	26.5	16.4	-151.91	579.3	-250.6	947.5	913.3	34.18	27.720	
5,700.0	5,501.9	5,557.4	5,501.9	26.8	16.6	-152.48	579.3	-250.6	961.4	926.9	34.46	27.902	
5,800.0	5,601.1	5,656.6	5,601.1	27.0	16.8	-152.91	579.3	-250.6	972.2	937.5	34.72	28.005	
5,900.0	5,700.7	5,756.2	5,700.7	27.3	16.9	-153.21	579.3	-250.6	980.0	945.0	34.96	28.032	
6,000.0	5,800.6	5,856.1	5,800.6	27.4	17.1	-153.39	579.3	-250.6	984.6	949.4	35.18	27.985	
6,100.0	5,900.6	5,956.1	5,900.6	27.5	17.2	-132.54	579.3	-250.6	986.2	950.8	35.39	27.864	
6,200.0	6,000.6	6,056.1	6,000.6	27.6	17.4	-132.54	579.3	-250.6	986.2	950.5	35.70	27.626	
6,300.0	6,100.6	6,156.1	6,100.6	27.7	17.6	-132.54	579.3	-250.6	986.2	950.1	36.02	27.382	
6,400.0	6,200.6	6,256.1	6,200.6	27.8	17.7	-132.54	579.3	-250.6	986.2	949.8	36.34	27.140	
6,500.0	6,300.6	6,356.1	6,300.6	27.9	17.9	-132.54	579.3	-250.6	986.2	949.5	36.66	26.901	
6,600.0	6,400.6	6,456.1	6,400.6	28.0	18.1	-132.54	579.3	-250.6	986.2	949.2	36.98	26.664	
6,700.0	6,500.6	6,556.1	6,500.6	28.1	18.2	-132.54	579.3	-250.6	986.2	948.9	37.31	26.429	
6,800.0	6,600.6	6,656.1	6,600.6	28.2	18.4	-132.54	579.3	-250.6	986.2	948.5	37.64	26.197	
6,900.0	6,700.6	6,756.1	6,700.6	28.3	18.6	-132.54	579.3	-250.6	986.2	948.2	37.98	25.967	
7,000.0	6,800.6	6,856.1	6,800.6	28.4	18.8	-132.54	579.3	-250.6	986.2	947.9	38.31	25.740	
7,100.0	6,900.6	6,956.1	6,900.6	28.6	18.9	-132.54	579.3	-250.6	986.2	947.5	38.65	25.515	

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Reference Site:	Thornton USX N05-09D Pad SEC.5-T5N-R67W	**MD Reference:**	WELL @ 4896.0ft (Original Well Elev)
Site Error:	0.0ft	**North Reference:**	True
Reference Well:	Thornton USX N05-09D	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0ft	**Output errors are at**	2.00 sigma
Reference Wellbore	Wellbore #1	**Database:**	Landmark
Reference Design:	Noble Thornton USX N05-09D Plan #1 (1-30-12)	**Offset TVD Reference:**	Offset Datum

Offset Design Thornton USX N05-09D Pad SEC.5-T5N-R67W - Thornton USX N05-23D - Wellbore #1 - Noble Thorntc — **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
7,200.0	7,000.6	7,056.1	7,000.6	28.7	19.1	-132.54	579.3	-250.6	986.2	947.2	38.99	25.292	
7,300.0	7,100.6	7,156.1	7,100.6	28.8	19.3	-132.54	579.3	-250.6	986.2	946.8	39.33	25.072	
7,400.0	7,200.6	7,256.1	7,200.6	28.9	19.5	-132.54	579.3	-250.6	986.2	946.5	39.68	24.854	
7,500.0	7,300.6	7,356.1	7,300.6	29.0	19.6	-132.54	579.3	-250.6	986.2	946.1	40.02	24.639	
7,600.0	7,400.6	7,456.1	7,400.6	29.1	19.8	-132.54	579.3	-250.6	986.2	945.8	40.37	24.426	
7,700.0	7,500.6	7,556.1	7,500.6	29.3	20.0	-132.54	579.3	-250.6	986.2	945.4	40.72	24.216	
7,800.0	7,600.6	7,656.1	7,600.6	29.4	20.2	-132.54	579.3	-250.6	986.2	945.1	41.08	24.009	
7,900.0	7,700.6	7,756.1	7,700.6	29.5	20.4	-132.54	579.3	-250.6	986.2	944.7	41.43	23.803	
8,000.0	7,800.6	7,856.1	7,800.6	29.6	20.6	-132.54	579.3	-250.6	986.2	944.4	41.79	23.600	
8,022.4	7,822.9	7,878.4	7,822.9	29.6	20.6	-132.54	579.3	-250.6	986.2	944.3	41.87	23.555	
8,036.4	7,837.0	7,887.5	7,832.0	29.7	20.6	-132.54	579.3	-250.6	986.2	944.3	41.91	23.533	

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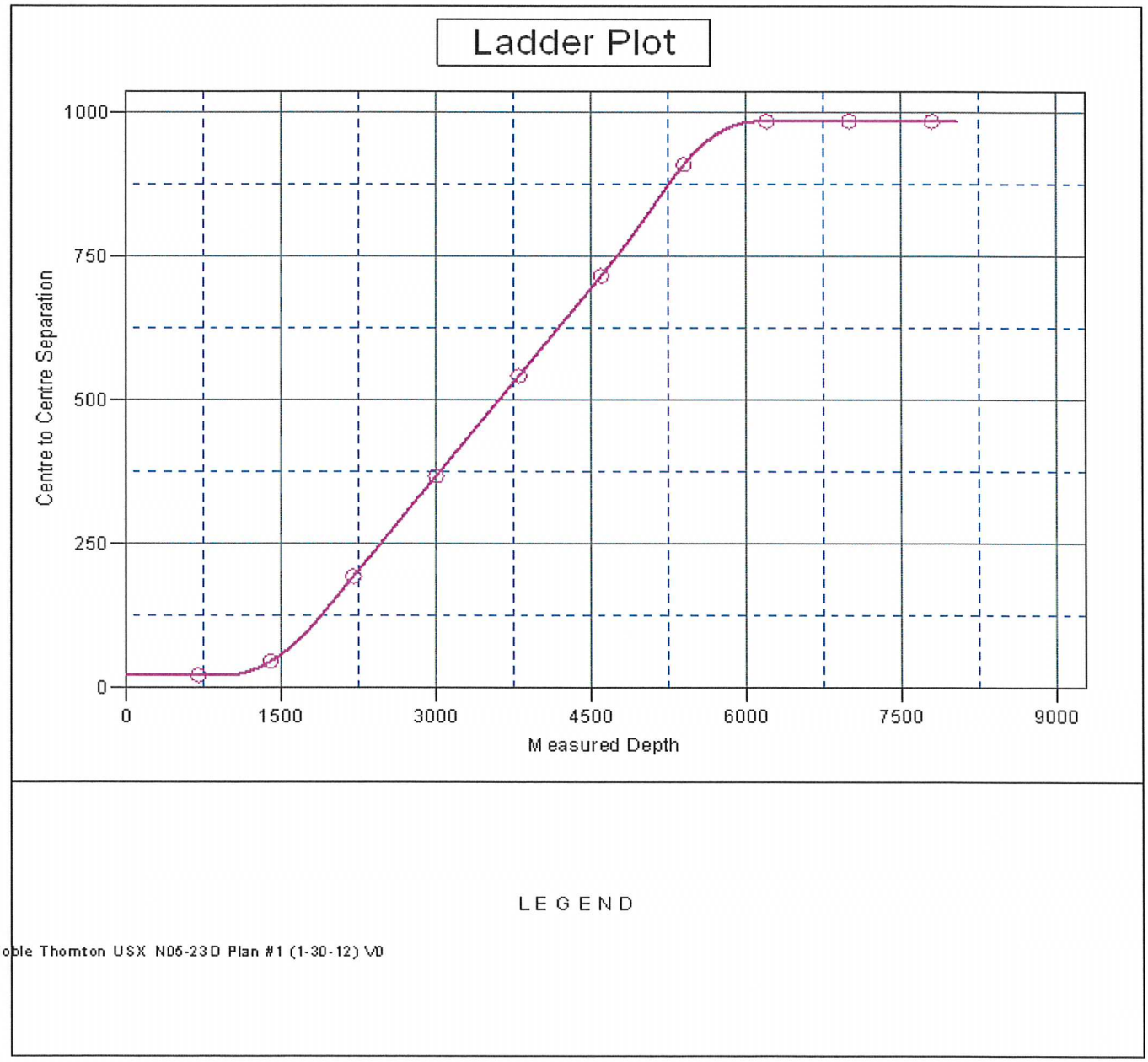
Reference Well:	Thornton USX N05-09D	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.0ft	**Output errors are at**	2.00 sigma
Reference Wellbore	Wellbore #1	**Database:**	Landmark
Reference Design:	Noble Thornton USX N05-09D Plan #1 (1-30-12)	**Offset TVD Reference:**	Offset Datum

Reference Depths are relative to WELL @ 4896.0ft (Original Well Elev)	Coordinates are relative to: Thornton USX N05-09D
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: 0.38°



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Reference Design:	Noble Thornton USX N05-09D Plan #1 (1-30-12)	**Offset TVD Reference:**	Offset Datum

Reference Depths are relative to WELL @ 4896.0ft (Original Well Elev) Coordinates are relative to: Thornton USX N05-09D
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: 0.38°