

# HILCORP ENERGY COMPANY

Project: Weld County, CO  
 Site: State  
 Well: 14-9BH  
 Wellbore: OH  
 Design: Plan #2a



Azimuths to True North  
 Magnetic North: 8.49°

Magnetic Field  
 Strength: 53028.5snT  
 Dip Angle: 66.95°  
 Date: 05/29/2012  
 Model: IGRF2010

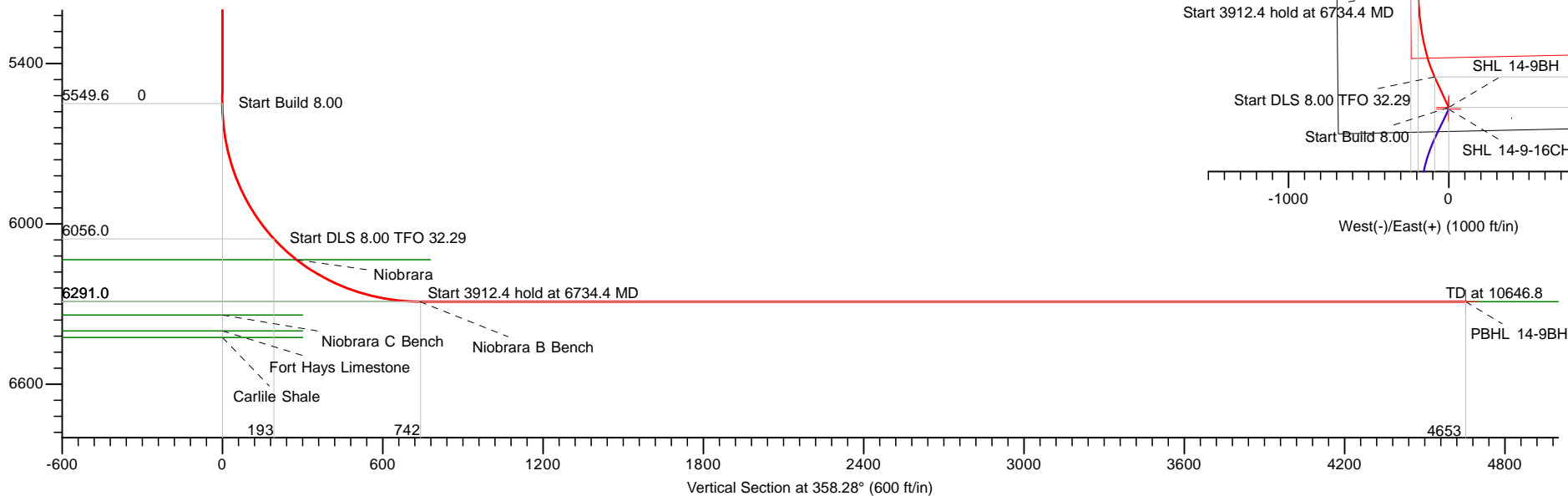
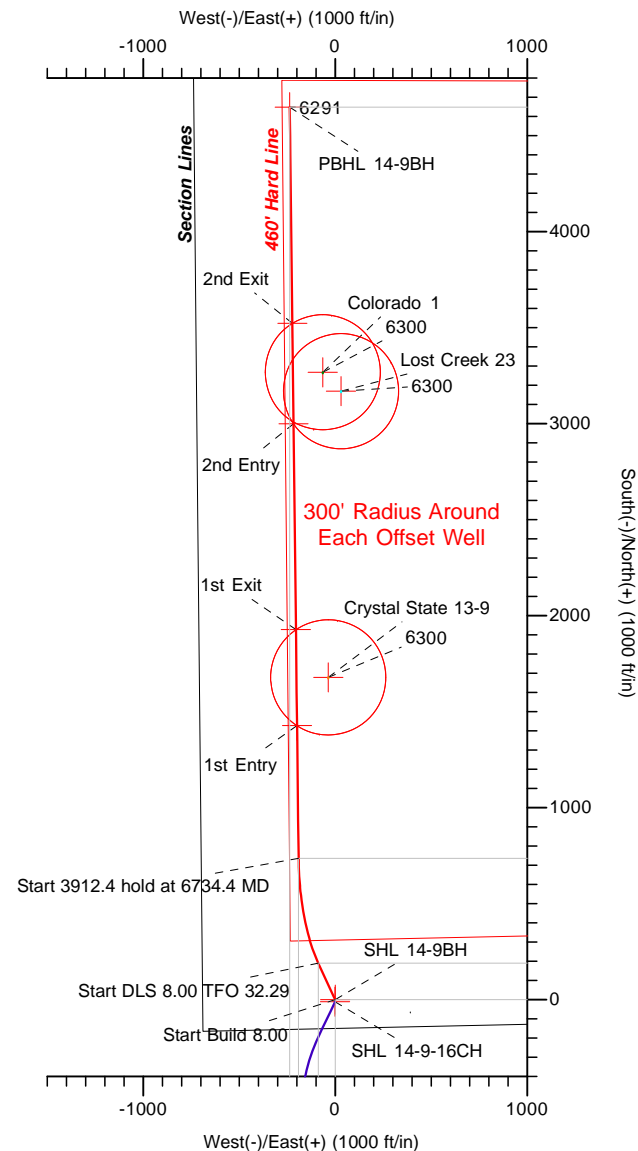


## DESIGN TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
1st Entry	0.0	1427.9	-198.6	405814.65	1013407.33	40° 14' 14.170 N	104° 20' 11.332 W
1st Exit	0.0	1927.4	-204.4	405966.88	1013403.56	40° 14' 19.107 N	104° 20' 11.407 W
2nd Entry	0.0	2999.8	-216.8	406293.67	1013395.47	40° 14' 29.705 N	104° 20' 11.568 W
2nd Exit	0.0	3522.2	-222.9	406452.86	1013391.53	40° 14' 34.868 N	104° 20' 11.647 W
SHL 14-9-16CH	0.0	-10.9	0.0	405376.94	1013473.60	40° 13' 59.952 N	104° 20' 8.772 W
SHL 14-9BH	0.0	0.0	0.0	405380.27	1013473.56	40° 14' 0.060 N	104° 20' 8.772 W
SHL CO 1	0.0	3267.7	-64.2	406375.91	1013440.91	40° 14' 32.352 N	104° 20' 9.600 W
SHL CS 13-9	0.0	1678.7	-35.4	405891.74	1013456.04	40° 14' 16.649 N	104° 20' 9.229 W
SHL LC 23	0.0	3169.3	30.7	406346.31	1013470.24	40° 14' 31.380 N	104° 20' 8.376 W
PBHL 14-9BH	6291.0	4648.4	-236.0	406796.03	1013383.03	40° 14' 45.997 N	104° 20' 11.816 W

## SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VFace	Target
1	0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.0	
2	5549.6	0.00	0.00	5549.6	0.0	0.0	0.00	0.00	0.0	
3	6112.1	45.00	335.25	6056.0	190.5	-87.8	8.00	335.25	193.1	
4	6734.4	90.00	359.33	6291.0	736.3	-190.1	8.00	32.29	741.7	
5	10646.8	90.00	359.33	6291.0	4648.4	-236.0	0.00	0.00	4653.4	PBHL 14-9BH



LEAM DRILLING SYSTEMS, INC.  
 2010 East Davis, Conroe, Texas 77301  
 Phone: 936/756-7577, Fax 936/756-7595

Plan: Plan #2a (14-9BH/OH)  
 State  
 Created By: Justin Andoe  
 Date: 11:48, May 30 2012  
 Approved: \_\_\_\_\_  
 Date: \_\_\_\_\_

## Planning Report

<b>Database:</b>	EDM 5000.1 Multi_User Db	<b>Local Co-ordinate Reference:</b>	Well 14-9BH
<b>Company:</b>	HILCORP ENERGY COMPANY	<b>TVD Reference:</b>	GL 4629.8+KB 12.2' @ 4642.00usft
<b>Project:</b>	Weld County, CO	<b>MD Reference:</b>	GL 4629.8+KB 12.2' @ 4642.00usft
<b>Site:</b>	State	<b>North Reference:</b>	True
<b>Well:</b>	14-9BH	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	OH		
<b>Design:</b>	Plan #2a		

<b>Project</b>	Weld County, CO		
<b>Map System:</b>	US State Plane 1983	<b>System Datum:</b>	Mean Sea Level
<b>Geo Datum:</b>	North American Datum 1983		
<b>Map Zone:</b>	Colorado Northern Zone		

Site		State			
Site Position:		Northing:	1,329,974.18 usft	Latitude:	40° 13' 59.952 N
From:	Lat/Long	Easting:	3,325,037.98 usft	Longitude:	104° 20' 8.772 W
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "	Grid Convergence:	0.75 °

Well	14-9BH					
Well Position	+N/-S	10.92 usft	Northing:	1,329,985.10 usft	Latitude:	40° 14' 0.060 N
	+E/-W	0.00 usft	Easting:	3,325,037.84 usft	Longitude:	104° 20' 8.772 W
Position Uncertainty		0.00 usft	Wellhead Elevation:		Ground Level:	4,629.80 usft

<b>Wellbore</b>	OH				
<b>Magnetics</b>	<b>Model Name</b>	<b>Sample Date</b>	<b>Declination (°)</b>	<b>Dip Angle (°)</b>	<b>Field Strength (nT)</b>
	IGRF2010	05/29/12	8.49	66.95	53,028

<b>Design</b>	Plan #2a			
<b>Audit Notes:</b>				
<b>Version:</b>	<b>Phase:</b>	PROTOTYPE	<b>Tie On Depth:</b>	0.00
<b>Vertical Section:</b>	<b>Depth From (TVD) (usft)</b>	<b>+N/-S (usft)</b>	<b>+E/-W (usft)</b>	<b>Direction (°)</b>
	0.00	0.00	0.00	358.28

<b>Plan Sections</b>										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	TFO (°)	Target
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
5,549.55	0.00	0.00	5,549.55	0.00	0.00	0.00	0.00	0.00	0.00	
6,112.05	45.00	335.25	6,055.98	190.50	-87.82	8.00	8.00	0.00	335.25	
6,734.43	90.00	359.33	6,291.00	736.29	-190.12	8.00	7.23	3.87	32.29	
10,646.79	90.00	359.33	6,291.00	4,648.38	-236.00	0.00	0.00	0.00	0.00	PBHL 14-9BH

# Planning Report

<b>Database:</b>	EDM 5000.1 Multi_User Db	<b>Local Co-ordinate Reference:</b>	Well 14-9BH
<b>Company:</b>	HILCORP ENERGY COMPANY	<b>TVD Reference:</b>	GL 4629.8+KB 12.2' @ 4642.00usft
<b>Project:</b>	Weld County, CO	<b>MD Reference:</b>	GL 4629.8+KB 12.2' @ 4642.00usft
<b>Site:</b>	State	<b>North Reference:</b>	True
<b>Well:</b>	14-9BH	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	OH		
<b>Design:</b>	Plan #2a		

Planned Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
5,549.55	0.00	0.00	5,549.55	0.00	0.00	0.00	0.00	0.00	0.00
5,600.00	4.04	335.25	5,599.96	1.61	-0.74	1.63	8.00	8.00	0.00
5,650.00	8.04	335.25	5,649.67	6.39	-2.94	6.47	8.00	8.00	0.00
5,700.00	12.04	335.25	5,698.90	14.30	-6.59	14.49	8.00	8.00	0.00
5,750.00	16.04	335.25	5,747.39	25.31	-11.67	25.65	8.00	8.00	0.00
5,800.00	20.04	335.25	5,794.93	39.36	-18.15	39.89	8.00	8.00	0.00
5,850.00	24.04	335.25	5,841.26	56.40	-26.00	57.15	8.00	8.00	0.00
5,900.00	28.04	335.25	5,886.18	76.32	-35.19	77.35	8.00	8.00	0.00
5,950.00	32.04	335.25	5,929.46	99.05	-45.66	100.37	8.00	8.00	0.00
6,000.00	36.04	335.25	5,970.88	124.46	-57.38	126.12	8.00	8.00	0.00
6,050.00	40.04	335.25	6,010.26	152.43	-70.27	154.47	8.00	8.00	0.00
6,100.00	44.04	335.25	6,047.39	182.83	-84.29	185.28	8.00	8.00	0.00
6,112.05	45.00	335.25	6,055.98	190.50	-87.82	193.05	8.00	8.00	0.00
6,150.00	47.59	337.45	6,082.20	215.63	-98.82	218.50	8.00	6.82	5.79
6,200.00	51.06	340.08	6,114.79	250.97	-112.53	254.24	8.00	6.94	5.26
6,231.32	53.26	341.59	6,134.00	274.33	-120.64	277.83	8.00	7.02	4.85
Niobrara									
6,250.00	54.58	342.46	6,145.00	288.69	-125.30	292.32	8.00	7.07	4.63
6,300.00	58.14	344.64	6,172.70	328.61	-137.07	332.57	8.00	7.13	4.36
6,350.00	61.74	346.66	6,197.74	370.53	-147.78	374.80	8.00	7.20	4.04
6,400.00	65.37	348.55	6,220.01	414.24	-157.37	418.78	8.00	7.25	3.77
6,450.00	69.01	350.32	6,239.39	459.54	-165.81	464.31	8.00	7.30	3.56
6,500.00	72.68	352.02	6,255.79	506.21	-173.05	511.17	8.00	7.33	3.39
6,550.00	76.36	353.65	6,269.14	554.01	-179.06	559.13	8.00	7.36	3.26
6,600.00	80.05	355.22	6,279.36	602.71	-183.80	607.96	8.00	7.38	3.16
6,650.00	83.75	356.77	6,286.40	652.08	-187.25	657.41	8.00	7.39	3.08
6,700.00	87.45	358.29	6,290.24	701.88	-189.40	707.25	8.00	7.40	3.04
6,732.52	89.86	359.27	6,291.00	734.38	-190.09	739.76	8.00	7.41	3.02
Niobrara B Bench									
6,734.43	90.00	359.33	6,291.00	736.29	-190.12	741.67	8.00	7.41	3.02
6,800.00	90.00	359.33	6,291.00	801.85	-190.88	807.22	0.00	0.00	0.00
6,900.00	90.00	359.33	6,291.00	901.85	-192.06	907.21	0.00	0.00	0.00
7,000.00	90.00	359.33	6,291.00	1,001.84	-193.23	1,007.19	0.00	0.00	0.00
7,100.00	90.00	359.33	6,291.00	1,101.83	-194.40	1,107.17	0.00	0.00	0.00
7,200.00	90.00	359.33	6,291.00	1,201.83	-195.58	1,207.16	0.00	0.00	0.00
7,300.00	90.00	359.33	6,291.00	1,301.82	-196.75	1,307.14	0.00	0.00	0.00
7,400.00	90.00	359.33	6,291.00	1,401.81	-197.92	1,407.12	0.00	0.00	0.00
7,500.00	90.00	359.33	6,291.00	1,501.81	-199.09	1,507.11	0.00	0.00	0.00
7,600.00	90.00	359.33	6,291.00	1,601.80	-200.27	1,607.09	0.00	0.00	0.00
7,700.00	90.00	359.33	6,291.00	1,701.79	-201.44	1,707.07	0.00	0.00	0.00
7,800.00	90.00	359.33	6,291.00	1,801.79	-202.61	1,807.06	0.00	0.00	0.00
7,900.00	90.00	359.33	6,291.00	1,901.78	-203.79	1,907.04	0.00	0.00	0.00
8,000.00	90.00	359.33	6,291.00	2,001.77	-204.96	2,007.02	0.00	0.00	0.00
8,100.00	90.00	359.33	6,291.00	2,101.77	-206.13	2,107.01	0.00	0.00	0.00
8,200.00	90.00	359.33	6,291.00	2,201.76	-207.30	2,206.99	0.00	0.00	0.00
8,300.00	90.00	359.33	6,291.00	2,301.75	-208.48	2,306.97	0.00	0.00	0.00
8,400.00	90.00	359.33	6,291.00	2,401.74	-209.65	2,406.96	0.00	0.00	0.00
8,500.00	90.00	359.33	6,291.00	2,501.74	-210.82	2,506.94	0.00	0.00	0.00
8,600.00	90.00	359.33	6,291.00	2,601.73	-212.00	2,606.92	0.00	0.00	0.00
8,700.00	90.00	359.33	6,291.00	2,701.72	-213.17	2,706.91	0.00	0.00	0.00
8,800.00	90.00	359.33	6,291.00	2,801.72	-214.34	2,806.89	0.00	0.00	0.00
8,900.00	90.00	359.33	6,291.00	2,901.71	-215.51	2,906.87	0.00	0.00	0.00
9,000.00	90.00	359.33	6,291.00	3,001.70	-216.69	3,006.85	0.00	0.00	0.00
9,100.00	90.00	359.33	6,291.00	3,101.70	-217.86	3,106.84	0.00	0.00	0.00

## Planning Report

<b>Database:</b>	EDM 5000.1 Multi_User Db	<b>Local Co-ordinate Reference:</b>	Well 14-9BH
<b>Company:</b>	HILCORP ENERGY COMPANY	<b>TVD Reference:</b>	GL 4629.8+KB 12.2' @ 4642.00usft
<b>Project:</b>	Weld County, CO	<b>MD Reference:</b>	GL 4629.8+KB 12.2' @ 4642.00usft
<b>Site:</b>	State	<b>North Reference:</b>	True
<b>Well:</b>	14-9BH	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	OH		
<b>Design:</b>	Plan #2a		

Planned Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
9,200.00	90.00	359.33	6,291.00	3,201.69	-219.03	3,206.82	0.00	0.00	0.00
9,300.00	90.00	359.33	6,291.00	3,301.68	-220.20	3,306.80	0.00	0.00	0.00
9,400.00	90.00	359.33	6,291.00	3,401.68	-221.38	3,406.79	0.00	0.00	0.00
9,500.00	90.00	359.33	6,291.00	3,501.67	-222.55	3,506.77	0.00	0.00	0.00
9,600.00	90.00	359.33	6,291.00	3,601.66	-223.72	3,606.75	0.00	0.00	0.00
9,700.00	90.00	359.33	6,291.00	3,701.66	-224.90	3,706.74	0.00	0.00	0.00
9,800.00	90.00	359.33	6,291.00	3,801.65	-226.07	3,806.72	0.00	0.00	0.00
9,900.00	90.00	359.33	6,291.00	3,901.64	-227.24	3,906.70	0.00	0.00	0.00
10,000.00	90.00	359.33	6,291.00	4,001.63	-228.41	4,006.69	0.00	0.00	0.00
10,100.00	90.00	359.33	6,291.00	4,101.63	-229.59	4,106.67	0.00	0.00	0.00
10,200.00	90.00	359.33	6,291.00	4,201.62	-230.76	4,206.65	0.00	0.00	0.00
10,300.00	90.00	359.33	6,291.00	4,301.61	-231.93	4,306.64	0.00	0.00	0.00
10,400.00	90.00	359.33	6,291.00	4,401.61	-233.11	4,406.62	0.00	0.00	0.00
10,500.00	90.00	359.33	6,291.00	4,501.60	-234.28	4,506.60	0.00	0.00	0.00
10,600.00	90.00	359.33	6,291.00	4,601.59	-235.45	4,606.59	0.00	0.00	0.00
10,646.79	90.00	359.33	6,291.00	4,648.38	-236.00	4,653.37	0.00	0.00	0.00
PBHL 14-9BH									

## Planning Report

<b>Database:</b>	EDM 5000.1 Multi_User Db	<b>Local Co-ordinate Reference:</b>	Well 14-9BH
<b>Company:</b>	HILCORP ENERGY COMPANY	<b>TVD Reference:</b>	GL 4629.8+KB 12.2' @ 4642.00usft
<b>Project:</b>	Weld County, CO	<b>MD Reference:</b>	GL 4629.8+KB 12.2' @ 4642.00usft
<b>Site:</b>	State	<b>North Reference:</b>	True
<b>Well:</b>	14-9BH	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	OH		
<b>Design:</b>	Plan #2a		

Design Targets									
Target Name									
- hit/miss target	Dip Angle	Dip Dir.	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
- Shape	(°)	(°)	(usft)	(usft)	(usft)	(usft)	(usft)		
SHL 14-9BH	0.00	0.00	0.00	0.00	0.00	1,329,985.10	3,325,037.84	40° 14' 0.060 N	104° 20' 8.772 W
- plan misses target center by 5549.55usft at 5549.55usft MD (5549.55 TVD, 0.00 N, 0.00 E)									
- Point									
2nd Exit	0.00	0.00	0.00	3,522.24	-222.91	1,333,504.11	3,324,768.71	40° 14' 34.868 N	104° 20' 11.647 W
- plan misses target center by 6291.00usft at 9520.57usft MD (6291.00 TVD, 3522.24 N, -222.79 E)									
- Point									
SHL 14-9-16CH	0.00	0.00	0.00	-10.92	0.00	1,329,974.18	3,325,037.98	40° 13' 59.952 N	104° 20' 8.772 W
- plan misses target center by 5549.56usft at 5549.55usft MD (5549.55 TVD, 0.00 N, 0.00 E)									
- Point									
1st Entry	0.00	0.00	0.00	1,427.86	-198.56	1,331,410.23	3,324,820.55	40° 14' 14.170 N	104° 20' 11.332 W
- plan misses target center by 5733.73usft at 5549.55usft MD (5549.55 TVD, 0.00 N, 0.00 E)									
- Point									
2nd Entry	0.00	0.00	0.00	2,999.83	-216.84	1,332,981.82	3,324,781.64	40° 14' 29.705 N	104° 20' 11.568 W
- plan misses target center by 6291.00usft at 8998.13usft MD (6291.00 TVD, 2999.84 N, -216.66 E)									
- Point									
SHL CO 1	0.00	0.75	0.00	3,267.65	-64.21	1,333,251.63	3,324,930.74	40° 14' 32.352 N	104° 20' 9.600 W
- plan misses target center by 6292.92usft at 9264.15usft MD (6291.00 TVD, 3265.83 N, -219.78 E)									
- Circle (radius 300.00)									
SHL CS 13-9	0.00	0.00	0.00	1,678.66	-35.44	1,331,663.15	3,324,980.36	40° 14' 16.649 N	104° 20' 9.229 W
- plan misses target center by 5797.99usft at 5549.55usft MD (5549.55 TVD, 0.00 N, 0.00 E)									
- Circle (radius 300.00)									
1st Exit	0.00	0.00	0.00	1,927.43	-204.37	1,331,909.68	3,324,808.18	40° 14' 19.107 N	104° 20' 11.407 W
- plan misses target center by 5878.29usft at 5549.55usft MD (5549.55 TVD, 0.00 N, 0.00 E)									
- Point									
SHL LC 23	0.00	0.75	0.00	3,169.30	30.71	1,333,154.52	3,325,026.94	40° 14' 31.380 N	104° 20' 8.376 W
- plan misses target center by 6295.94usft at 9164.68usft MD (6291.00 TVD, 3166.37 N, -218.62 E)									
- Circle (radius 300.00)									
PBHL 14-9BH	0.00	0.00	6,291.00	4,648.38	-236.00	1,334,629.98	3,324,740.83	40° 14' 45.997 N	104° 20' 11.816 W
- plan hits target center									
- Point									

Formations						
	Measured Depth	Vertical Depth			Dip	Dip Direction
	(usft)	(usft)	Name	Lithology	(°)	(°)
	12.00	12.00	Parkman		0.00	
	3,945.00	3,945.00	Sussex		0.00	
	6,231.32	6,134.00	Niobrara		0.00	
	6,732.52	6,291.00	Niobrara B Bench		0.00	