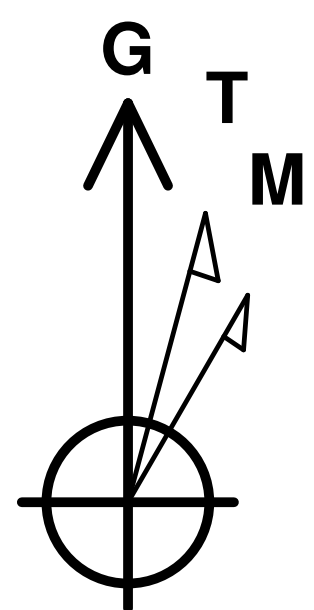




Project: Loving County, TX (NAD27 TXC)
Site: Helga 19-0-4-40
Well: Helga 19-0-4-40 A 11H
Wellbore: OH
Design: P2
Riq: H&P 396



Azimuths to Grid North
 True North: 1.60°
 Magnetic North: 8.01°

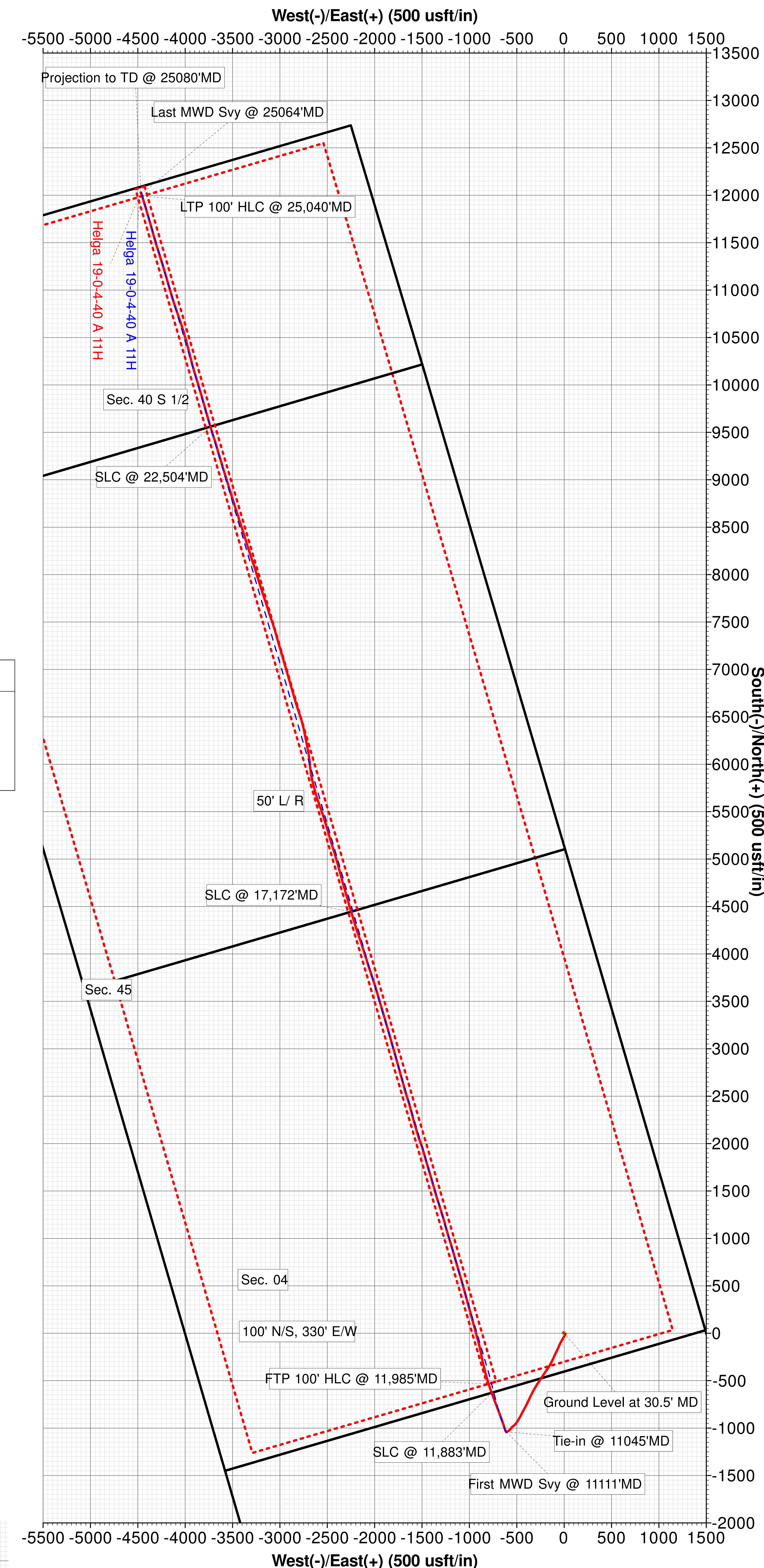
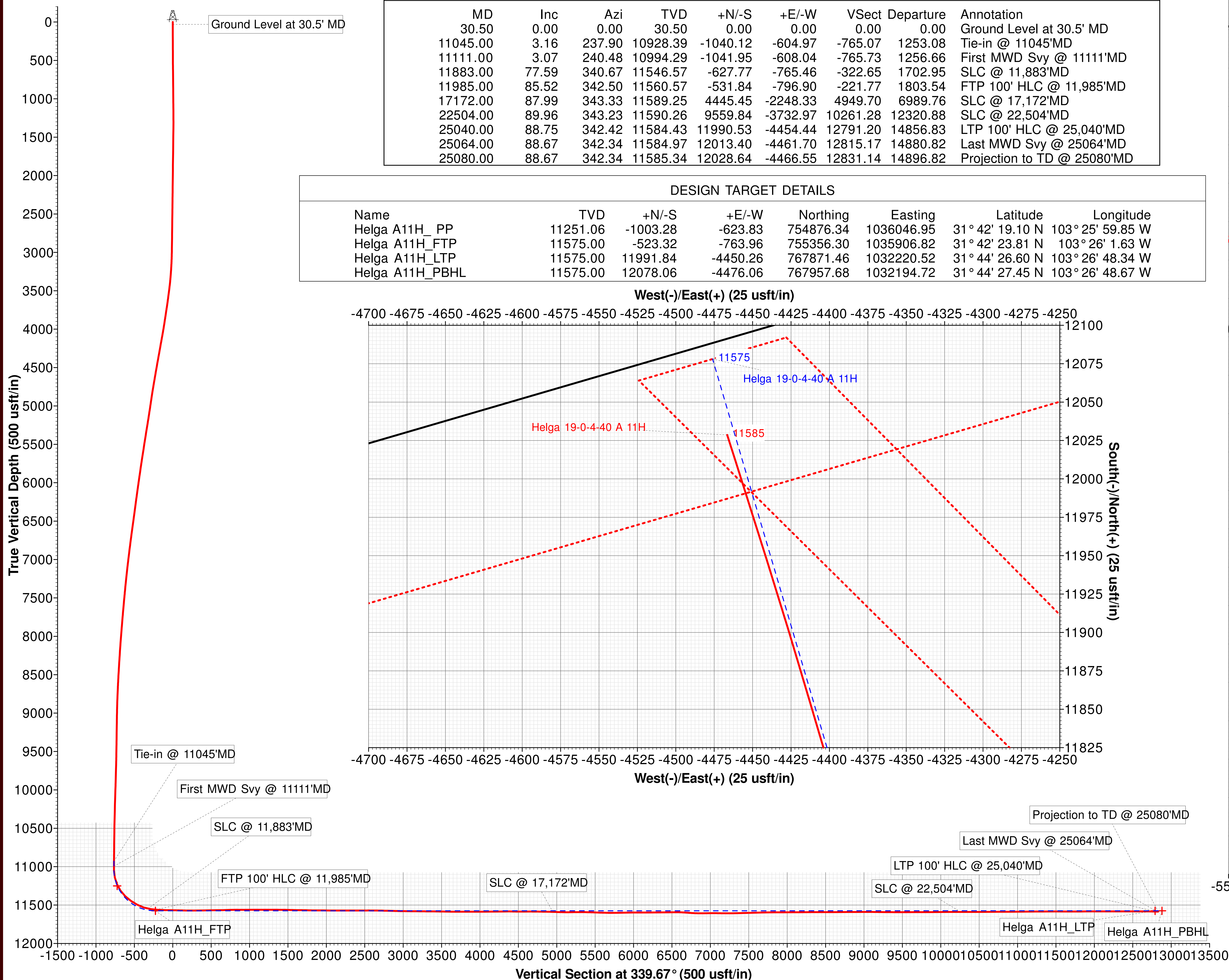
**Magnetic Field
Strength: 46906.1nT
Dip Angle: 59.28°
Date: 3/19/2024
Model: IFR**

Map System: US State Plane 1927 (Exact solution)
Datum: NAD 1927 (NADCON CONUS)
Ellipsoid: Clarke 1866
Zone Name: Texas Central 4203

WELL DETAILS						
GL 2739.40' + KB 30.5' @ 2769.90usft (H&P 396)						
+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	
0.00	0.00	755879.62	1036670.78	31° 42' 29.20 N	103° 25' 52.96 W	

FINAL SURVEY ANNOTATIONS									
MD	Inc	Azi	TVD	+N/-S	+E/-W	Vsect	Departure	Annotation	
30.50	0.00	0.00	30.50	0.00	0.00	0.00	0.00	Ground Level at 30.5' MD	
11045.00	3.16	237.90	10928.39	-1040.12	-604.97	-765.07	1253.08	Tie-in @ 11045'MD	
11111.00	3.07	240.48	10994.29	-1041.95	-608.04	-765.73	1256.66	First MWD Svy @ 11111'MD	
11883.00	77.59	340.67	11546.57	-627.77	-765.46	-322.65	1702.95	SLC @ 11,883'MD	
11985.00	85.52	342.50	11560.57	-531.84	-796.90	-221.77	1803.54	FTP 100' HLC @ 11,985'MD	
17172.00	87.99	343.33	11589.25	4445.45	-2248.33	4949.70	6989.76	SLC @ 17,172'MD	
22504.00	89.96	343.23	11590.26	9559.84	-3732.97	10261.28	12320.88	SLC @ 22,504'MD	
25040.00	88.75	342.42	11584.43	11990.53	-4454.44	12791.20	14856.83	LTP 100' HLC @ 25,040'MD	
25064.00	88.67	342.34	11584.97	12013.40	-4461.70	12815.17	14880.82	Last MWD Svy @ 25064'MD	
25080.00	88.67	342.34	11585.34	12028.64	-4466.55	12831.14	14896.82	Projection to TD @ 25080'MD	

DESIGN TARGET DETAILS							
Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
Helga A11H_PP	11251.06	-1003.28	-623.83	754876.34	1036046.95	31° 42' 19.10 N	103° 25' 59.85 W
Helga A11H_FTP	11575.00	-523.32	-763.96	755356.30	1035906.82	31° 42' 23.81 N	103° 26' 1.63 W
Helga A11H_LTP	11575.00	11991.84	-4450.26	767871.46	1032220.52	31° 44' 26.60 N	103° 26' 48.34 W
Helga A11H_PBHL	11575.00	12078.06	-4476.06	767957.68	1032194.72	31° 44' 27.45 N	103° 26' 48.67 W



Target Center Line
11,575' TVD @ 0' VS; 90.0°INC

Created By: Bo Siwoniku
Date: 17:30. March 29 2024

HALLIBURTON | Sperry Drilling

H&P 396

Occidental Petroleum Corporation

Loving County, TX (NAD27 TXC) Helga 19-0-4-40

API# 42-301-36699

Helga 19-0-4-40 A 11H

OH

Design: Final Surveys

Sperry Drilling Services

Combo Report

29 March, 2024

Well Coordinates: 31° 42' 29.20 N
103° 25' 52.96 W

NAD 1927 (NADCON CONUS)
Texas Central 4203
755,879.62 N
1,036,670.78 E

Ground Level: 2,739.40 usft

Local Coordinate Origin:

Centered on Well Helga 19-0-4-40 A 11H

Viewing Datum:

GL 2739.40' + KB 30.5' @ 2769.90usft (H&P 396)

TVDs to System:

N

North Reference:

Grid

Unit System:

API-US Survey Feet

Compass Version: 5000.17 Build:

Report Version: Midcon Combo v1.15

HALLIBURTON

Design Report for Helga 19-0-4-40 A 11H - Final Surveys

Measured	Grid		Vertical	Local Coordinates		Map Coordinates		Dogleg	Vertical	Toolface	Comments
Depth (usft)	Inclination (°)	Azimuth (°)	Depth (usft)	Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)	Rate (°/100ft)	Section (usft)	Angle (°)	
0.00	0.00	0.00	0.00	0.00 N	0.00 E	755,879.62	1,036,670.78	0.00	0.00	0.00	Ground Level at 30.5' MD
30.50	0.00	0.00	30.50	0.00 N	0.00 E	755,879.62	1,036,670.78	0.00	0.00	0.00	
175.50	0.38	273.53	175.50	0.03 N	0.48 W	755,879.65	1,036,670.30	0.26	0.19	273.53	
260.50	0.45	309.86	260.50	0.26 N	1.02 W	755,879.88	1,036,669.76	0.31	0.60	93.75	
354.50	0.56	317.94	354.49	0.84 N	1.61 W	755,880.46	1,036,669.17	0.14	1.35	37.00	
446.50	0.22	319.94	446.49	1.31 N	2.02 W	755,880.93	1,036,668.76	0.37	1.93	178.71	
541.50	0.43	292.48	541.49	1.58 N	2.47 W	755,881.20	1,036,668.31	0.27	2.34	-50.83	
635.50	0.63	315.51	635.49	2.09 N	3.16 W	755,881.71	1,036,667.62	0.31	3.05	58.71	
729.50	0.67	313.06	729.48	2.83 N	3.92 W	755,882.45	1,036,666.86	0.05	4.02	-36.02	
824.50	0.69	327.40	824.47	3.69 N	4.64 W	755,883.31	1,036,666.14	0.18	5.07	90.50	
918.50	0.52	336.76	918.47	4.56 N	5.11 W	755,884.18	1,036,665.67	0.21	6.05	154.45	
1,013.50	0.62	323.05	1,013.46	5.37 N	5.59 W	755,884.99	1,036,665.19	0.18	6.98	-60.74	
1,107.50	0.46	303.40	1,107.46	5.98 N	6.21 W	755,885.60	1,036,664.57	0.26	7.77	-140.37	
1,201.50	0.59	298.74	1,201.45	6.42 N	6.95 W	755,886.04	1,036,663.83	0.15	8.44	-20.52	
1,298.50	0.36	294.92	1,298.45	6.79 N	7.66 W	755,886.41	1,036,663.12	0.24	9.03	-174.07	
1,393.50	0.77	137.42	1,393.45	6.45 N	7.50 W	755,886.07	1,036,663.28	1.17	8.65	-164.62	
1,487.50	0.82	131.76	1,487.44	5.53 N	6.57 W	755,885.15	1,036,664.21	0.10	7.47	-60.37	
1,581.50	0.63	143.70	1,581.43	4.67 N	5.76 W	755,884.29	1,036,665.02	0.26	6.38	147.38	
1,676.50	0.97	138.29	1,676.42	3.65 N	4.92 W	755,883.27	1,036,665.86	0.37	5.13	-15.24	
1,770.50	0.88	137.73	1,770.41	2.52 N	3.91 W	755,882.14	1,036,666.87	0.10	3.72	-174.54	
1,864.50	0.79	129.19	1,864.40	1.58 N	2.92 W	755,881.20	1,036,667.86	0.16	2.49	-130.09	
1,940.50	0.86	131.83	1,940.39	0.86 N	2.09 W	755,880.48	1,036,668.69	0.10	1.54	29.83	
2,103.00	0.84	123.31	2,102.88	0.60 S	0.18 W	755,879.02	1,036,670.60	0.08	-0.50	-103.24	
2,197.00	0.72	133.96	2,196.87	1.39 S	0.82 E	755,878.23	1,036,671.60	0.20	-1.59	134.86	
2,292.00	0.83	112.75	2,291.86	2.07 S	1.88 E	755,877.55	1,036,672.66	0.32	-2.60	-79.85	
2,386.00	0.96	121.85	2,385.85	2.75 S	3.18 E	755,876.87	1,036,673.96	0.20	-3.68	52.16	
2,481.00	1.13	111.60	2,480.83	3.52 S	4.73 E	755,876.10	1,036,675.51	0.27	-4.94	-52.92	
2,575.00	1.21	107.22	2,574.81	4.15 S	6.54 E	755,875.47	1,036,677.32	0.13	-6.16	-50.39	
2,669.00	1.24	110.88	2,668.79	4.81 S	8.43 E	755,874.81	1,036,679.21	0.09	-7.44	70.86	
2,763.00	1.32	105.13	2,762.77	5.45 S	10.43 E	755,874.17	1,036,681.21	0.16	-8.74	-60.98	
2,858.00	1.19	103.40	2,857.74	5.97 S	12.45 E	755,873.65	1,036,683.23	0.14	-9.92	-164.61	
2,952.00	1.13	115.84	2,951.72	6.60 S	14.23 E	755,873.02	1,036,685.01	0.27	-11.13	109.57	
3,046.00	1.70	176.90	3,045.70	8.39 S	15.14 E	755,871.23	1,036,685.92	1.62	-13.13	101.66	
3,235.00	6.31	212.08	3,234.21	20.00 S	9.77 E	755,859.62	1,036,680.55	2.65	-22.15	46.40	
3,330.00	8.65	216.04	3,328.39	30.20 S	2.79 E	755,849.42	1,036,673.57	2.52	-29.29	14.39	
3,424.00	10.43	211.53	3,421.09	43.17 S	5.81 W	755,836.45	1,036,664.97	2.05	-38.46	-25.01	

Design Report for Helga 19-0-4-40 A 11H - Final Surveys

Measured		Grid	Vertical	Local Coordinates		Map Coordinates		Dogleg	Vertical	Toolface	Comments
Depth (usft)	Inclination (°)	Azimuth (°)	Depth (usft)	Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)	Rate (°/100ft)	Section (usft)	Angle (°)	
3,518.00	11.57	209.74	3,513.36	58.61 S	14.94 W	755,821.01	1,036,655.84	1.27	-49.76	-17.56	
3,613.00	11.34	208.85	3,606.47	75.06 S	24.17 W	755,804.56	1,036,646.61	0.31	-61.98	-142.89	
3,707.00	12.93	208.70	3,698.37	92.38 S	33.68 W	755,787.24	1,036,637.10	1.69	-74.92	-1.21	
3,801.00	12.41	206.22	3,790.08	110.67 S	43.20 W	755,768.95	1,036,627.58	0.80	-88.76	-134.92	
3,896.00	11.88	203.78	3,882.95	128.77 S	51.65 W	755,750.85	1,036,619.13	0.78	-102.80	-137.10	
3,990.00	12.62	202.70	3,974.81	147.10 S	59.51 W	755,732.52	1,036,611.27	0.82	-117.25	-17.73	
4,085.00	14.15	204.82	4,067.23	167.22 S	68.39 W	755,712.40	1,036,602.39	1.69	-133.03	18.82	
4,179.00	14.90	206.25	4,158.22	188.48 S	78.56 W	755,691.14	1,036,592.22	0.88	-149.44	26.25	
4,273.00	14.58	205.68	4,249.13	209.99 S	89.03 W	755,669.63	1,036,581.75	0.37	-165.96	-155.89	
4,368.00	14.36	205.39	4,341.12	231.41 S	99.27 W	755,648.21	1,036,571.51	0.24	-182.49	-161.91	
4,462.00	13.91	203.53	4,432.27	252.30 S	108.78 W	755,627.32	1,036,562.00	0.68	-198.77	-135.63	
4,556.00	13.78	204.67	4,523.54	272.83 S	117.96 W	755,606.79	1,036,552.82	0.32	-214.83	116.03	
4,650.00	14.33	207.92	4,614.73	293.28 S	128.08 W	755,586.34	1,036,542.70	1.02	-230.50	56.71	
4,744.00	14.08	206.46	4,705.85	313.80 S	138.62 W	755,565.82	1,036,532.16	0.46	-246.07	-125.61	
4,838.00	14.29	210.66	4,796.99	334.01 S	149.63 W	755,545.61	1,036,521.15	1.12	-261.20	80.51	
4,932.00	14.32	213.12	4,888.07	353.73 S	161.90 W	755,525.89	1,036,508.88	0.65	-275.42	88.37	
5,027.00	13.88	213.13	4,980.21	373.11 S	174.55 W	755,506.51	1,036,496.23	0.46	-289.20	179.69	
5,121.00	14.52	213.60	5,071.34	392.37 S	187.23 W	755,487.25	1,036,483.55	0.69	-302.85	10.44	
5,215.00	15.03	213.77	5,162.23	412.31 S	200.53 W	755,467.31	1,036,470.25	0.54	-316.94	4.94	
5,309.00	15.45	214.27	5,252.93	432.79 S	214.35 W	755,446.83	1,036,456.43	0.47	-331.33	17.62	
5,403.00	15.74	214.06	5,343.47	453.70 S	228.54 W	755,425.92	1,036,442.24	0.31	-346.01	-11.12	
5,498.00	15.15	213.79	5,435.03	474.69 S	242.66 W	755,404.93	1,036,428.12	0.63	-360.79	-173.18	
5,592.00	14.16	213.13	5,525.97	494.53 S	255.78 W	755,385.09	1,036,415.00	1.07	-374.83	-170.75	
5,686.00	14.70	213.30	5,617.01	514.13 S	268.61 W	755,365.49	1,036,402.17	0.58	-388.75	4.57	
5,780.00	14.63	213.53	5,707.95	533.99 S	281.72 W	755,345.63	1,036,389.06	0.10	-402.82	140.36	
5,875.00	12.91	211.08	5,800.21	553.08 S	293.82 W	755,326.54	1,036,376.96	1.91	-416.51	-162.46	
5,969.00	13.01	210.76	5,891.82	571.17 S	304.66 W	755,308.45	1,036,366.12	0.13	-429.71	-35.82	
6,063.00	12.57	209.54	5,983.49	589.16 S	315.11 W	755,290.46	1,036,355.67	0.55	-442.94	-149.05	
6,158.00	11.55	207.23	6,076.39	606.61 S	324.56 W	755,273.01	1,036,346.22	1.19	-456.02	-155.80	
6,252.00	11.75	208.28	6,168.45	623.41 S	333.40 W	755,256.21	1,036,337.38	0.31	-468.70	47.19	
6,346.00	11.32	207.00	6,260.55	640.06 S	342.12 W	755,239.56	1,036,328.66	0.53	-481.28	-149.86	
6,441.00	10.86	205.99	6,353.78	656.41 S	350.28 W	755,223.21	1,036,320.50	0.53	-493.78	-157.60	
6,629.00	11.15	205.41	6,538.32	688.75 S	365.84 W	755,190.87	1,036,304.94	0.17	-518.70	-21.18	
6,723.00	11.13	205.62	6,630.55	705.14 S	373.66 W	755,174.48	1,036,297.12	0.05	-531.35	116.34	
6,818.00	10.81	206.27	6,723.82	721.39 S	381.57 W	755,158.23	1,036,289.21	0.36	-543.84	159.19	
6,913.00	10.61	207.10	6,817.16	737.17 S	389.50 W	755,142.45	1,036,281.28	0.27	-555.88	142.77	
7,007.00	10.28	206.76	6,909.60	752.36 S	397.21 W	755,127.26	1,036,273.57	0.36	-567.44	-169.59	

Design Report for Helga 19-0-4-40 A 11H - Final Surveys

Measured		Grid	Vertical	Local Coordinates		Map Coordinates		Dogleg	Vertical	Toolface	Comments
Depth (usft)	Inclination (°)	Azimuth (°)	Depth (usft)	Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)	Rate (°/100ft)	Section (usft)	Angle (°)	
7,101.00	10.15	207.49	7,002.11	767.20 S	404.81 W	755,112.42	1,036,265.97	0.20	-578.71	135.48	
7,195.00	9.70	207.90	7,094.71	781.54 S	412.34 W	755,098.08	1,036,258.44	0.48	-589.55	171.28	
7,289.00	9.18	208.01	7,187.43	795.16 S	419.57 W	755,084.46	1,036,251.21	0.55	-599.81	178.07	
7,384.00	8.95	209.07	7,281.25	808.31 S	426.72 W	755,071.31	1,036,244.06	0.30	-609.65	144.54	
7,478.00	8.17	208.71	7,374.20	820.56 S	433.48 W	755,059.06	1,036,237.30	0.83	-618.79	-176.25	
7,572.00	7.89	205.99	7,467.28	832.22 S	439.52 W	755,047.40	1,036,231.26	0.50	-627.62	-127.73	
7,666.00	7.58	206.79	7,560.42	843.55 S	445.14 W	755,036.07	1,036,225.64	0.35	-636.30	161.24	
7,761.00	7.39	207.08	7,654.61	854.59 S	450.74 W	755,025.03	1,036,220.04	0.20	-644.70	168.90	
7,854.00	7.09	206.96	7,746.87	865.03 S	456.07 W	755,014.59	1,036,214.71	0.32	-652.64	-177.17	
7,949.00	7.22	208.35	7,841.13	875.51 S	461.56 W	755,004.11	1,036,209.22	0.23	-660.55	53.79	
8,043.00	6.92	209.13	7,934.42	885.65 S	467.12 W	754,993.97	1,036,203.66	0.34	-668.13	162.64	
8,137.00	6.69	209.47	8,027.75	895.36 S	472.57 W	754,984.26	1,036,198.21	0.25	-675.35	170.23	
8,232.00	6.51	211.21	8,122.12	904.79 S	478.09 W	754,974.83	1,036,192.69	0.28	-682.27	132.85	
8,326.00	6.39	212.74	8,215.53	913.75 S	483.68 W	754,965.87	1,036,187.10	0.22	-688.72	125.68	
8,420.00	6.11	212.98	8,308.97	922.34 S	489.23 W	754,957.28	1,036,181.55	0.30	-694.86	174.79	
8,515.00	5.89	214.51	8,403.45	930.60 S	494.74 W	754,949.02	1,036,176.04	0.29	-700.68	144.74	
8,609.00	5.56	214.67	8,496.98	938.32 S	500.07 W	754,941.30	1,036,170.71	0.35	-706.07	177.31	
8,703.00	4.96	214.93	8,590.58	945.40 S	504.98 W	754,934.22	1,036,165.80	0.64	-711.00	177.85	
8,798.00	4.45	214.41	8,685.26	951.80 S	509.42 W	754,927.82	1,036,161.36	0.54	-715.47	-175.48	
8,892.00	4.08	217.80	8,779.00	957.45 S	513.53 W	754,922.17	1,036,157.25	0.48	-719.34	147.41	
8,986.00	3.89	220.35	8,872.78	962.53 S	517.64 W	754,917.09	1,036,153.14	0.28	-722.66	138.26	
9,080.00	3.42	226.27	8,966.59	966.89 S	521.73 W	754,912.73	1,036,149.05	0.64	-725.34	144.17	
9,174.00	3.30	231.95	9,060.42	970.50 S	525.89 W	754,909.12	1,036,144.89	0.38	-727.27	112.64	
9,268.00	3.10	233.92	9,154.28	973.67 S	530.07 W	754,905.95	1,036,140.71	0.24	-728.79	152.18	
9,363.00	2.98	234.07	9,249.14	976.63 S	534.15 W	754,902.99	1,036,136.63	0.13	-730.15	176.28	
9,457.00	2.96	234.67	9,343.02	979.46 S	538.11 W	754,900.16	1,036,132.67	0.04	-731.43	123.05	
9,551.00	2.74	234.14	9,436.90	982.18 S	541.91 W	754,897.44	1,036,128.87	0.24	-732.66	-173.43	
9,646.00	2.74	229.22	9,531.79	985.00 S	545.47 W	754,894.62	1,036,125.31	0.25	-734.06	-92.46	
9,740.00	3.17	219.84	9,625.67	988.46 S	548.83 W	754,891.16	1,036,121.95	0.69	-736.14	-53.10	
9,834.00	3.30	220.16	9,719.52	992.52 S	552.24 W	754,887.10	1,036,118.54	0.14	-738.77	8.07	
9,928.00	3.10	220.87	9,813.37	996.51 S	555.65 W	754,883.11	1,036,115.13	0.22	-741.32	169.15	
10,022.00	3.15	219.11	9,907.23	1,000.44 S	558.94 W	754,879.18	1,036,111.84	0.12	-743.86	-63.36	
10,117.00	3.50	215.15	10,002.07	1,004.84 S	562.26 W	754,874.78	1,036,108.52	0.44	-746.83	-35.26	
10,211.00	3.38	218.57	10,095.90	1,009.35 S	565.64 W	754,870.27	1,036,105.14	0.25	-749.89	122.02	
10,305.00	3.35	222.61	10,189.74	1,013.54 S	569.23 W	754,866.08	1,036,101.55	0.25	-752.57	99.22	
10,399.00	3.43	225.66	10,283.58	1,017.52 S	573.10 W	754,862.10	1,036,097.68	0.21	-754.96	67.61	
10,494.00	3.48	229.43	10,378.40	1,021.38 S	577.32 W	754,858.24	1,036,093.46	0.24	-757.11	79.47	

Design Report for Helga 19-0-4-40 A 11H - Final Surveys

Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
10,588.00	3.53	230.77	10,472.23	1,025.07 S	581.73 W	754,854.55	1,036,089.05	0.10	-759.04	59.27	
10,682.00	3.57	235.14	10,566.05	1,028.57 S	586.37 W	754,851.05	1,036,084.41	0.29	-760.71	83.78	
10,776.00	3.63	238.20	10,659.86	1,031.81 S	591.30 W	754,847.81	1,036,079.48	0.21	-762.03	74.19	
10,871.00	3.50	238.62	10,754.68	1,034.91 S	596.33 W	754,844.71	1,036,074.45	0.14	-763.19	168.85	
10,965.00	3.30	239.48	10,848.51	1,037.78 S	601.11 W	754,841.84	1,036,069.67	0.22	-764.22	166.12	
11,045.00	3.16	237.90	10,928.39	1,040.12 S	604.97 W	754,839.50	1,036,065.81	0.21	-765.07	-148.34	Tie-in @ 11045'MD
11,111.00	3.07	240.48	10,994.29	1,041.95 S	608.04 W	754,837.67	1,036,062.74	0.25	-765.73	123.98	First MWD Svy @ 11111'MD
11,114.00	2.98	242.72	10,997.28	1,042.03 S	608.18 W	754,837.59	1,036,062.60	4.96	-765.75	128.66	9 5/8" Casing
11,166.00	2.53	297.88	11,049.23	1,042.11 S	610.40 W	754,837.51	1,036,060.38	4.96	-765.06	126.43	
11,260.00	12.30	333.52	11,142.36	1,032.15 S	616.71 W	754,847.47	1,036,054.07	11.01	-753.52	43.71	
11,354.00	23.26	341.10	11,231.75	1,005.55 S	627.22 W	754,874.07	1,036,043.56	11.89	-724.92	15.59	
11,449.00	34.87	342.68	11,314.64	961.72 S	641.43 W	754,917.90	1,036,029.35	12.25	-678.89	4.48	
11,543.00	46.42	340.05	11,385.85	903.87 S	661.12 W	754,975.75	1,036,009.66	12.42	-617.80	-9.46	
11,638.00	55.23	339.39	11,445.80	834.87 S	686.64 W	755,044.75	1,035,984.14	9.29	-544.23	-3.54	
11,732.00	62.28	338.89	11,494.53	759.82 S	715.26 W	755,119.80	1,035,955.52	7.51	-463.92	-3.60	
11,826.00	71.50	338.78	11,531.38	679.28 S	746.44 W	755,200.34	1,035,924.34	9.81	-377.56	-0.65	
11,883.00	77.59	340.67	11,546.57	627.77 S	765.46 W	755,251.85	1,035,905.32	11.14	-322.65	16.93	SLC @ 11,883'MD
11,921.00	81.65	341.88	11,553.42	592.38 S	777.45 W	755,287.24	1,035,893.33	11.14	-285.30	16.43	
11,985.00	85.52	342.50	11,560.57	531.84 S	796.90 W	755,347.78	1,035,873.88	6.12	-221.77	9.11	FTP 100' HLC @ 11,985'MD
12,015.00	87.33	342.79	11,562.44	503.26 S	805.83 W	755,376.36	1,035,864.95	6.12	-191.87	9.04	
12,110.00	88.18	344.32	11,566.16	412.22 S	832.70 W	755,467.40	1,035,838.08	1.84	-97.17	60.96	
12,204.00	89.64	347.96	11,567.95	320.99 S	855.21 W	755,558.63	1,035,815.57	4.17	-3.80	68.18	
12,298.00	88.42	349.67	11,569.54	228.80 S	873.44 W	755,650.82	1,035,797.34	2.23	88.98	125.52	
12,392.00	89.60	345.81	11,571.17	136.97 S	893.39 W	755,742.65	1,035,777.39	4.29	182.02	-73.04	
12,487.00	90.50	344.55	11,571.08	45.14 S	917.69 W	755,834.48	1,035,753.09	1.63	276.57	-54.46	
12,581.00	89.65	345.05	11,570.96	45.58 N	942.34 W	755,925.20	1,035,728.44	1.05	370.20	149.53	
12,676.00	92.61	344.80	11,569.09	137.28 N	967.04 W	756,016.90	1,035,703.74	3.13	464.77	-4.82	
12,770.00	89.60	344.75	11,567.27	227.95 N	991.71 W	756,107.57	1,035,679.07	3.20	558.37	-179.05	
12,865.00	91.77	344.14	11,566.14	319.46 N	1,017.19 W	756,199.08	1,035,653.59	2.37	653.02	-15.70	
12,960.00	91.83	344.83	11,563.15	410.95 N	1,042.59 W	756,290.57	1,035,628.19	0.73	747.64	85.02	
13,054.00	89.60	344.75	11,561.98	501.65 N	1,067.24 W	756,381.27	1,035,603.54	2.37	841.25	-177.94	
13,149.00	90.12	343.78	11,562.21	593.08 N	1,093.01 W	756,472.70	1,035,577.77	1.16	935.94	-61.81	
13,243.00	90.18	343.33	11,561.97	683.24 N	1,119.62 W	756,562.86	1,035,551.16	0.48	1,029.73	-82.40	
13,337.00	90.56	343.41	11,561.36	773.30 N	1,146.52 W	756,652.92	1,035,524.26	0.41	1,123.53	11.89	
13,432.00	89.54	344.39	11,561.28	864.58 N	1,172.86 W	756,744.20	1,035,497.92	1.49	1,218.26	136.14	
13,526.00	89.80	342.41	11,561.82	954.65 N	1,199.71 W	756,834.27	1,035,471.07	2.12	1,312.06	-82.53	

Design Report for Helga 19-0-4-40 A 11H - Final Surveys

Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
13,620.00	89.93	343.41	11,562.04	1,044.50 N	1,227.34 W	756,924.12	1,035,443.44	1.07	1,405.91	82.59	
13,715.00	88.10	345.19	11,563.67	1,135.94 N	1,253.04 W	757,015.56	1,035,417.74	2.69	1,500.57	135.81	
13,807.00	89.15	342.71	11,565.88	1,224.32 N	1,278.47 W	757,103.94	1,035,392.31	2.93	1,592.28	-67.08	
13,899.00	89.47	342.55	11,566.99	1,312.11 N	1,305.93 W	757,191.73	1,035,364.85	0.39	1,684.15	-26.56	
13,990.00	88.29	342.29	11,568.77	1,398.85 N	1,333.41 W	757,278.47	1,035,337.37	1.33	1,775.03	-167.58	
14,083.00	90.30	343.85	11,569.91	1,487.80 N	1,360.49 W	757,367.42	1,035,310.29	2.74	1,867.85	37.83	
14,175.00	89.33	344.49	11,570.21	1,576.31 N	1,385.58 W	757,455.93	1,035,285.20	1.26	1,959.56	146.58	
14,267.00	89.38	343.05	11,571.24	1,664.64 N	1,411.29 W	757,544.26	1,035,259.49	1.57	2,051.32	-88.02	
14,358.00	90.50	343.29	11,571.34	1,751.74 N	1,437.64 W	757,631.36	1,035,233.14	1.26	2,142.15	12.10	
14,450.00	89.87	344.25	11,571.04	1,840.07 N	1,463.35 W	757,719.69	1,035,207.43	1.25	2,233.91	123.27	
14,541.00	89.33	343.93	11,571.68	1,927.58 N	1,488.30 W	757,807.20	1,035,182.48	0.69	2,324.64	-149.35	
14,633.00	90.57	338.99	11,571.76	2,014.78 N	1,517.54 W	757,894.40	1,035,153.24	5.54	2,416.56	-75.92	
14,724.00	90.29	343.46	11,571.08	2,100.91 N	1,546.82 W	757,980.53	1,035,123.96	4.92	2,507.50	93.57	
14,816.00	89.55	343.77	11,571.20	2,189.17 N	1,572.77 W	758,068.79	1,035,098.01	0.87	2,599.28	157.27	
14,910.00	89.07	345.10	11,572.34	2,279.72 N	1,598.00 W	758,159.34	1,035,072.78	1.50	2,692.95	109.85	
15,005.00	88.53	345.09	11,574.33	2,371.50 N	1,622.43 W	758,251.12	1,035,048.35	0.57	2,787.50	-178.94	
15,099.00	88.49	341.98	11,576.77	2,461.60 N	1,649.06 W	758,341.22	1,035,021.72	3.31	2,881.24	-90.78	
15,194.00	89.00	344.62	11,578.85	2,552.57 N	1,676.35 W	758,432.19	1,034,994.43	2.83	2,976.02	79.09	
15,288.00	89.30	344.25	11,580.25	2,643.11 N	1,701.57 W	758,522.73	1,034,969.21	0.51	3,069.68	-50.96	
15,382.00	89.96	344.28	11,580.85	2,733.58 N	1,727.06 W	758,613.20	1,034,943.72	0.70	3,163.38	2.60	
15,477.00	89.15	344.48	11,581.59	2,825.07 N	1,752.64 W	758,704.69	1,034,918.14	0.88	3,258.05	166.13	
15,571.00	89.62	344.32	11,582.60	2,915.60 N	1,777.91 W	758,795.22	1,034,892.87	0.53	3,351.73	-18.80	
15,666.00	89.49	344.36	11,583.34	3,007.07 N	1,803.55 W	758,886.69	1,034,867.23	0.14	3,446.41	162.90	
15,760.00	89.00	343.89	11,584.58	3,097.48 N	1,829.26 W	758,977.10	1,034,841.52	0.72	3,540.11	-136.20	
15,855.00	89.17	343.72	11,586.09	3,188.70 N	1,855.76 W	759,068.32	1,034,815.02	0.25	3,634.85	-45.00	
15,949.00	90.39	343.95	11,586.45	3,278.98 N	1,881.93 W	759,158.60	1,034,788.85	1.32	3,728.60	10.68	
16,137.00	89.47	343.41	11,586.68	3,459.40 N	1,934.75 W	759,339.02	1,034,736.03	0.57	3,916.14	-149.59	
16,232.00	90.71	343.68	11,586.53	3,550.51 N	1,961.66 W	759,430.13	1,034,709.12	1.34	4,010.92	12.28	
16,326.00	90.21	343.16	11,585.78	3,640.60 N	1,988.49 W	759,520.22	1,034,682.29	0.77	4,104.71	-133.88	
16,420.00	90.20	341.32	11,585.44	3,730.11 N	2,017.16 W	759,609.73	1,034,653.62	1.96	4,198.61	-90.31	
16,515.00	91.72	341.03	11,583.85	3,820.02 N	2,047.81 W	759,699.64	1,034,622.97	1.63	4,293.57	-10.80	
16,609.00	89.37	343.59	11,582.96	3,909.55 N	2,076.36 W	759,789.17	1,034,594.42	3.70	4,387.45	132.53	
16,703.00	88.28	341.75	11,584.89	3,999.26 N	2,104.36 W	759,878.88	1,034,566.42	2.27	4,481.29	-120.66	
16,798.00	91.76	342.91	11,584.85	4,089.77 N	2,133.19 W	759,969.39	1,034,537.59	3.86	4,576.17	18.44	
16,892.00	88.90	339.40	11,584.31	4,178.70 N	2,163.54 W	760,058.32	1,034,507.24	4.82	4,670.12	-129.15	
16,987.00	89.65	342.78	11,585.51	4,268.55 N	2,194.32 W	760,148.17	1,034,476.46	3.64	4,765.06	77.51	
17,081.00	88.85	342.99	11,586.74	4,358.38 N	2,221.98 W	760,238.00	1,034,448.80	0.88	4,858.91	165.29	

Design Report for Helga 19-0-4-40 A 11H - Final Surveys

Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
17,172.00	87.99	343.33	11,589.25	4,445.45 N	2,248.33 W	760,325.07	1,034,422.45	1.02	4,949.70	158.21	SLC @ 17,172'MD
17,176.00	87.95	343.35	11,589.40	4,449.28 N	2,249.48 W	760,328.90	1,034,421.30	1.02	4,953.69	158.20	
17,270.00	88.42	344.13	11,592.37	4,539.47 N	2,275.78 W	760,419.09	1,034,395.00	0.97	5,047.41	58.93	
17,364.00	89.99	343.78	11,593.68	4,629.80 N	2,301.76 W	760,509.42	1,034,369.02	1.71	5,141.13	-12.57	
17,459.00	90.87	344.17	11,592.96	4,721.10 N	2,327.99 W	760,600.72	1,034,342.79	1.01	5,235.86	23.90	
17,553.00	89.71	345.35	11,592.49	4,811.79 N	2,352.69 W	760,691.41	1,034,318.09	1.76	5,329.48	134.51	
17,648.00	88.50	344.45	11,593.97	4,903.50 N	2,377.44 W	760,783.12	1,034,293.34	1.59	5,424.07	-143.37	
17,742.00	87.65	343.86	11,597.13	4,993.87 N	2,403.09 W	760,873.49	1,034,267.69	1.10	5,517.73	-145.26	
17,837.00	88.91	342.88	11,599.98	5,084.86 N	2,430.26 W	760,964.48	1,034,240.52	1.68	5,612.48	-37.88	
17,931.00	89.24	342.41	11,601.50	5,174.57 N	2,458.30 W	761,054.19	1,034,212.48	0.61	5,706.34	-54.93	
18,026.00	91.72	344.22	11,600.70	5,265.55 N	2,485.57 W	761,145.17	1,034,185.21	3.23	5,801.14	36.12	
18,120.00	90.82	343.36	11,598.62	5,355.79 N	2,511.80 W	761,235.41	1,034,158.98	1.32	5,894.87	-136.30	
18,214.00	90.63	342.36	11,597.43	5,445.61 N	2,539.50 W	761,325.23	1,034,131.28	1.08	5,988.71	-100.75	
18,309.00	88.98	339.61	11,597.75	5,535.41 N	2,570.45 W	761,415.03	1,034,100.33	3.38	6,083.68	-120.96	
18,404.00	91.08	341.90	11,597.70	5,625.09 N	2,601.76 W	761,504.71	1,034,069.02	3.27	6,178.65	47.48	
18,498.00	90.75	344.28	11,596.20	5,715.01 N	2,629.10 W	761,594.63	1,034,041.68	2.56	6,272.46	97.87	
18,593.00	89.91	346.61	11,595.66	5,806.95 N	2,652.97 W	761,686.57	1,034,017.81	2.61	6,366.97	109.82	
18,687.00	90.92	350.83	11,594.97	5,899.11 N	2,671.35 W	761,778.73	1,033,999.43	4.62	6,459.77	76.53	
18,781.00	90.28	355.06	11,593.99	5,992.37 N	2,682.89 W	761,871.99	1,033,987.89	4.55	6,551.23	98.58	
18,876.00	86.95	351.93	11,596.29	6,086.71 N	2,693.65 W	761,966.33	1,033,977.13	4.81	6,643.43	-136.81	
18,970.00	85.69	348.45	11,602.32	6,179.13 N	2,709.63 W	762,058.75	1,033,961.15	3.93	6,735.64	-110.05	
19,058.00	88.42	349.11	11,606.84	6,265.32 N	2,726.72 W	762,144.94	1,033,944.06	3.19	6,822.40	13.59	
19,152.00	91.03	347.86	11,607.29	6,357.42 N	2,745.49 W	762,237.04	1,033,925.29	3.08	6,915.28	-25.60	
19,246.00	90.82	344.48	11,605.78	6,448.67 N	2,767.95 W	762,328.29	1,033,902.83	3.60	7,008.65	-93.53	
19,341.00	88.60	340.65	11,606.26	6,539.28 N	2,796.41 W	762,418.90	1,033,874.37	4.66	7,103.51	-120.10	
19,435.00	89.28	343.47	11,608.00	6,628.69 N	2,825.35 W	762,508.31	1,033,845.43	3.09	7,197.40	76.47	
19,529.00	91.51	343.56	11,607.35	6,718.82 N	2,852.02 W	762,598.44	1,033,818.76	2.37	7,291.18	2.31	
19,624.00	91.58	343.89	11,604.79	6,809.98 N	2,878.64 W	762,689.60	1,033,792.14	0.35	7,385.90	78.02	
19,718.00	91.56	344.05	11,602.21	6,900.29 N	2,904.59 W	762,779.91	1,033,766.19	0.17	7,479.60	97.13	
19,813.00	91.51	343.65	11,599.67	6,991.50 N	2,931.00 W	762,871.12	1,033,739.78	0.42	7,574.32	-97.12	
19,907.00	91.52	344.14	11,597.18	7,081.78 N	2,957.07 W	762,961.40	1,033,713.71	0.52	7,668.03	88.82	
20,001.00	90.49	343.55	11,595.53	7,172.06 N	2,983.22 W	763,051.68	1,033,687.56	1.26	7,761.76	-150.19	
20,096.00	90.23	343.74	11,594.93	7,263.21 N	3,009.97 W	763,142.83	1,033,660.81	0.34	7,856.53	143.84	
20,190.00	90.07	344.07	11,594.69	7,353.52 N	3,036.03 W	763,233.14	1,033,634.75	0.39	7,950.27	115.87	
20,285.00	90.55	342.88	11,594.17	7,444.60 N	3,063.05 W	763,324.22	1,033,607.73	1.35	8,045.06	-68.03	
20,379.00	90.23	340.11	11,593.53	7,533.73 N	3,092.88 W	763,413.35	1,033,577.90	2.97	8,139.00	-96.58	
20,474.00	90.21	342.80	11,593.17	7,623.78 N	3,123.09 W	763,503.40	1,033,547.69	2.83	8,233.94	90.42	

Design Report for Helga 19-0-4-40 A 11H - Final Surveys

Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)								
20,568.00	90.17	341.40	11,592.86	7,713.23 N	3,151.98 W	763,592.85	1,033,518.80	1.49	8,327.86	-91.63	
20,662.00	90.11	341.89	11,592.63	7,802.45 N	3,181.58 W	763,682.07	1,033,489.20	0.53	8,421.80	96.98	
20,757.00	90.00	342.31	11,592.54	7,892.85 N	3,210.78 W	763,772.47	1,033,460.00	0.46	8,516.71	104.68	
20,851.00	90.32	342.99	11,592.27	7,982.57 N	3,238.81 W	763,862.19	1,033,431.97	0.80	8,610.58	64.80	
20,945.00	90.54	342.59	11,591.57	8,072.36 N	3,266.62 W	763,951.98	1,033,404.16	0.49	8,704.44	-61.19	
21,039.00	90.17	340.81	11,590.99	8,161.60 N	3,296.14 W	764,041.22	1,033,374.64	1.93	8,798.38	-101.74	
21,134.00	90.27	342.70	11,590.62	8,251.82 N	3,325.88 W	764,131.44	1,033,344.90	1.99	8,893.31	86.97	
21,228.00	90.05	342.78	11,590.36	8,341.59 N	3,353.77 W	764,221.21	1,033,317.01	0.25	8,987.17	160.02	
21,323.00	89.96	342.41	11,590.35	8,432.24 N	3,382.18 W	764,311.86	1,033,288.60	0.40	9,082.05	-103.67	
21,417.00	89.26	342.06	11,590.99	8,521.75 N	3,410.86 W	764,401.37	1,033,259.92	0.83	9,175.95	-153.44	
21,511.00	89.45	342.42	11,592.05	8,611.27 N	3,439.53 W	764,490.89	1,033,231.25	0.43	9,269.85	62.18	
21,605.00	89.49	341.86	11,592.92	8,700.73 N	3,468.36 W	764,580.35	1,033,202.42	0.60	9,363.76	-85.92	
21,699.00	89.92	342.28	11,593.40	8,790.17 N	3,497.30 W	764,669.79	1,033,173.48	0.64	9,457.67	44.33	
21,794.00	90.21	343.27	11,593.29	8,880.90 N	3,525.43 W	764,760.52	1,033,145.35	1.09	9,552.53	73.67	
21,888.00	90.27	342.99	11,592.90	8,970.86 N	3,552.71 W	764,850.48	1,033,118.07	0.30	9,646.36	-77.90	
21,982.00	89.95	342.18	11,592.72	9,060.55 N	3,580.84 W	764,940.17	1,033,089.94	0.93	9,740.24	-111.56	
22,076.00	90.44	344.02	11,592.40	9,150.48 N	3,608.17 W	765,030.10	1,033,062.61	2.03	9,834.06	75.09	
22,170.00	90.34	342.32	11,591.76	9,240.45 N	3,635.38 W	765,120.07	1,033,035.40	1.81	9,927.88	-93.36	
22,264.00	90.60	344.53	11,590.99	9,330.54 N	3,662.20 W	765,210.16	1,033,008.58	2.37	10,021.67	83.28	
22,358.00	90.01	341.64	11,590.49	9,420.46 N	3,689.54 W	765,300.08	1,032,981.24	3.14	10,115.49	-101.53	
22,453.00	90.19	343.19	11,590.32	9,511.02 N	3,718.24 W	765,390.64	1,032,952.54	1.64	10,210.38	83.38	
22,504.00	89.96	343.23	11,590.26	9,559.84 N	3,732.97 W	765,439.46	1,032,937.81	0.47	10,261.28	169.46	SLC @ 22,504'MD
22,547.00	89.76	343.27	11,590.36	9,601.02 N	3,745.36 W	765,480.64	1,032,925.42	0.47	10,304.20	169.46	
22,641.00	90.21	344.47	11,590.39	9,691.32 N	3,771.48 W	765,570.94	1,032,899.30	1.36	10,397.94	69.44	
22,735.00	90.55	344.14	11,589.77	9,781.81 N	3,796.91 W	765,661.43	1,032,873.87	0.50	10,491.63	-44.14	
22,829.00	90.61	344.02	11,588.81	9,872.20 N	3,822.69 W	765,751.82	1,032,848.09	0.14	10,585.35	-63.43	
23,017.00	90.22	342.87	11,587.45	10,052.40 N	3,876.25 W	765,932.02	1,032,794.53	0.65	10,772.93	-108.73	
23,112.00	90.25	343.11	11,587.06	10,143.24 N	3,904.05 W	766,022.86	1,032,766.73	0.25	10,867.77	82.87	
23,206.00	90.39	345.89	11,586.54	10,233.81 N	3,929.16 W	766,113.43	1,032,741.62	2.96	10,961.43	87.11	
23,300.00	90.43	345.21	11,585.86	10,324.84 N	3,952.62 W	766,204.46	1,032,718.16	0.72	11,054.93	-86.63	
23,394.00	90.60	345.57	11,585.02	10,415.79 N	3,976.33 W	766,295.41	1,032,694.45	0.42	11,148.45	64.72	
23,488.00	90.24	343.88	11,584.33	10,506.47 N	4,001.09 W	766,386.09	1,032,669.69	1.84	11,242.08	-102.02	
23,582.00	90.56	342.65	11,583.67	10,596.48 N	4,028.16 W	766,476.10	1,032,642.62	1.35	11,335.89	-75.41	
23,676.00	90.05	341.45	11,583.17	10,685.90 N	4,057.12 W	766,565.52	1,032,613.66	1.39	11,429.81	-113.02	
23,771.00	89.80	341.22	11,583.30	10,775.91 N	4,087.53 W	766,655.53	1,032,583.25	0.36	11,524.77	-137.39	
23,865.00	89.82	341.56	11,583.61	10,864.99 N	4,117.53 W	766,744.61	1,032,553.25	0.36	11,618.72	86.63	

Design Report for Helga 19-0-4-40 A 11H - Final Surveys

Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100ft)	Vertical Section (usft)	Toolface Angle (°)	Comments
				Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)				
23,959.00	89.86	342.94	11,583.87	10,954.51 N	4,146.18 W	766,834.13	1,032,524.60	1.47	11,712.63	88.34	
24,053.00	90.56	344.31	11,583.53	11,044.70 N	4,172.68 W	766,924.32	1,032,498.10	1.64	11,806.40	62.93	
24,148.00	90.40	343.73	11,582.73	11,136.02 N	4,198.83 W	767,015.64	1,032,471.95	0.63	11,901.12	-105.42	
24,242.00	90.19	343.02	11,582.25	11,226.09 N	4,225.73 W	767,105.71	1,032,445.05	0.79	11,994.92	-106.48	
24,336.00	89.87	342.73	11,582.20	11,315.92 N	4,253.41 W	767,195.54	1,032,417.37	0.46	12,088.77	-137.82	
24,430.00	89.80	342.58	11,582.47	11,405.65 N	4,281.43 W	767,285.27	1,032,389.35	0.18	12,182.64	-115.02	
24,524.00	89.87	342.83	11,582.74	11,495.40 N	4,309.38 W	767,375.02	1,032,361.40	0.28	12,276.51	74.36	
24,618.00	90.33	345.05	11,582.58	11,585.72 N	4,335.38 W	767,465.34	1,032,335.40	2.41	12,370.24	78.29	
24,712.00	90.17	344.02	11,582.17	11,676.32 N	4,360.44 W	767,555.94	1,032,310.34	1.11	12,463.90	-98.83	
24,806.00	89.76	343.55	11,582.22	11,766.58 N	4,386.69 W	767,646.20	1,032,284.09	0.66	12,557.66	-131.10	
24,900.00	89.91	343.61	11,582.49	11,856.74 N	4,413.26 W	767,736.36	1,032,257.52	0.17	12,651.44	21.80	
24,994.00	88.89	342.57	11,583.48	11,946.67 N	4,440.60 W	767,826.29	1,032,230.18	1.55	12,745.26	-134.45	
25,040.00	88.75	342.42	11,584.43	11,990.53 N	4,454.44 W	767,870.15	1,032,216.34	0.45	12,791.20	-133.74	LTP 100' HLC @ 25,040'MD
25,064.00	88.67	342.34	11,584.97	12,013.40 N	4,461.70 W	767,893.02	1,032,209.08	0.45	12,815.17	-133.73	Last MWD Svy @ 25064'MD
25,080.00	88.67	342.34	11,585.34	12,028.64 N	4,466.55 W	767,908.26	1,032,204.23	0.00	12,831.14	0.00	Projection to TD @ 25080'MD - 5 1/2" Casing

Design Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
30.50	30.50	0.00	0.00	Ground Level at 30.5' MD
11,045.00	10,928.39	-1,040.12	-604.97	Tie-in @ 11045'MD
11,111.00	10,994.29	-1,041.95	-608.04	First MWD Svy @ 11111'MD
11,883.00	11,546.57	-627.77	-765.46	SLC @ 11,883'MD
11,985.00	11,560.57	-531.84	-796.90	FTP 100' HLC @ 11,985'MD
17,172.00	11,589.25	4,445.45	-2,248.33	SLC @ 17,172'MD
22,504.00	11,590.26	9,559.84	-3,732.97	SLC @ 22,504'MD
25,040.00	11,584.43	11,990.53	-4,454.44	LTP 100' HLC @ 25,040'MD
25,064.00	11,584.97	12,013.40	-4,461.70	Last MWD Svy @ 25064'MD
25,080.00	11,585.34	12,028.64	-4,466.55	Projection to TD @ 25080'MD

Vertical Section Information

Angle Type	Target	Azimuth (°)	Origin Type	Origin		Start TVD (usft)
				+N/-S (usft)	+E/-W (usft)	
Target	Helga A11H_PBHL	339.67	Slot	0.00	0.00	0.00

Design Report for Helga 19-0-4-40 A 11H - Final Surveys

Survey tool program

From (usft)	To (usft)	Survey/Plan	Survey Tool
30.50	1,993.00	1 Surface Adjusted +16.5 ft	Superior
2,103.00	11,045.00	2 Intermediate	MWD+HRGM+SAG+FDIR
11,111.00	25,064.00	3 Production	Superior
25,080.00	25,080.00	Projection to TD	MWD+IFR1+SAG+FDIR
			3_Blind

Casing Details

Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (in)	Hole Diameter (in)
11,114.00	10,997.28	9 5/8" Casing	9.625	12.250
25,080.00		5 1/2" Casing	5.500	8.500

Design Targets

Target Name	Dip Angle	Dip Dir.	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
- hit/miss target	()	()	()	()	()	()	()		
- Shape									
()									

Directional Difficulty Index

Average Dogleg over Survey:	1.42 °/100ft	Maximum Dogleg over Survey:	12.42 °/100ft at 11,543.00 usft
Net Tortousity applicable to Plans:	0.83 °/100ft	Directional Difficulty Index:	7.059

Audit Info

North Reference Sheet for Helga 19-0-4-40 - Helga 19-0-4-40 A 11H - OH

All data is in US Feet unless otherwise stated. Directions and Coordinates are relative to Grid North Reference.

Vertical Depths are relative to GL 2739.40' + KB 30.5' @ 2769.90usft (H&P 396). Northing and Easting are relative to Helga 19-0-4-40 A 11H

Coordinate System is US State Plane 1927 (Exact solution), Texas Central 4203 using datum NAD 1927 (NADCON CONUS), ellipsoid Clarke 1866

Projection method is Lambert Conformal Conic (2 parallel)

Central Meridian is 100° 20' 0.00 W°, Longitude Origin:0° 0' 0.00 E°, Latitude Origin:31° 53' 0.00 N°

False Easting: 2,000,000.00usft, False Northing: 0.00usft, Scale Reduction: 0.99995763

Grid Coordinates of Well: 755,879.62 usft N, 1,036,670.78 usft E

Geographical Coordinates of Well: 31° 42' 29.20 N, 103° 25' 52.96 W

Grid Convergence at Surface is: -1.60°

Based upon Minimum Curvature type calculations, at a Measured Depth of 25,080.00usft
the Bottom Hole Displacement is 12,831.15usft in the Direction of 339.63° (Grid).

Magnetic Convergence at surface is: -8.01° (19 March 2024, , IFR)

