

Project: WELD-NAD83-UTMFT13N  
 Site: Wagner 8-22HZ Pad - PD 4€  
 Well: Wagner 1N-W10HZ  
 Wellbore: Original Wellbore  
 Design: Final Surveys



# US ROCKIES WATTENBERG PLANNING

West(-)/East(+) (1200 usft/in)

-1000 0 1000 2000

WELL DETAILS: Wagner 1N-W10HZ		Design: Final Surveys (Wagner 1N-W10HZ/Original Wellbore)	
Ground Level: 4971.00 RKB 21' @ 4992.00usft (Precision 464)		Created By: Jerry Popp Date: 17:21, October 25 2017	

ANNOTATIONS						
MD	Inc	Azi	TVD	+N/-S	+E/-W	Annotation
1831.00	19.20	176.44	1792.08	-276.69	91.41	Tie-On to Last MWD+IFR Surface Survey @ 1831.00' MD
1920.00	19.13	178.02	1876.15	-305.87	92.83	First Sperry MWD+IFR+SC Survey @ 1920.00' MD
7884.00	88.40	359.86	7363.94	-98.35	96.43	Landed Curve @ 7884.00' MD 88.40° INC 7363.94' TVD
7884.00	88.40	359.86	7363.94	-98.35	96.43	Lat: 40.039144° Long: -104.869649°
8731.00	89.33	359.92	7368.32	748.15	117.41	Exit 460' Rad 8731.00' MD 7368.32' TVD
14395.00	90.94	359.59	7351.25	6408.29	26.96	Enter 460' Rad 14395.00' MD 7351.25' TVD
15174.00	88.58	356.05	7376.77	7186.20	4.15	Last Sperry MWD+IFR+SC Survey @ 15174.00' MD
15220.00	88.58	356.05	7377.91	7232.08	0.98	Straight Line Projection to TD @ 15220.00' MD
15220.00	88.58	356.05	7377.91	7232.08	0.98	Lat: 40.059274° Long: -104.869990°

Sec. 10, T1N R67W

~362' FSL, ~739' FEL of Sec 10-T1N-R67W  
 Lat: 40.059274° Long: -104.869990°  
 Straight Line Projection to TD @ 15220.00' MD

~366' FSL, ~737' FEL of Sec 10-T1N-R67W  
 Wagner 1N-W10HZ PBHL\_A4

Last Sperry MWD+IFR+SC Survey @ 15174.00' MD

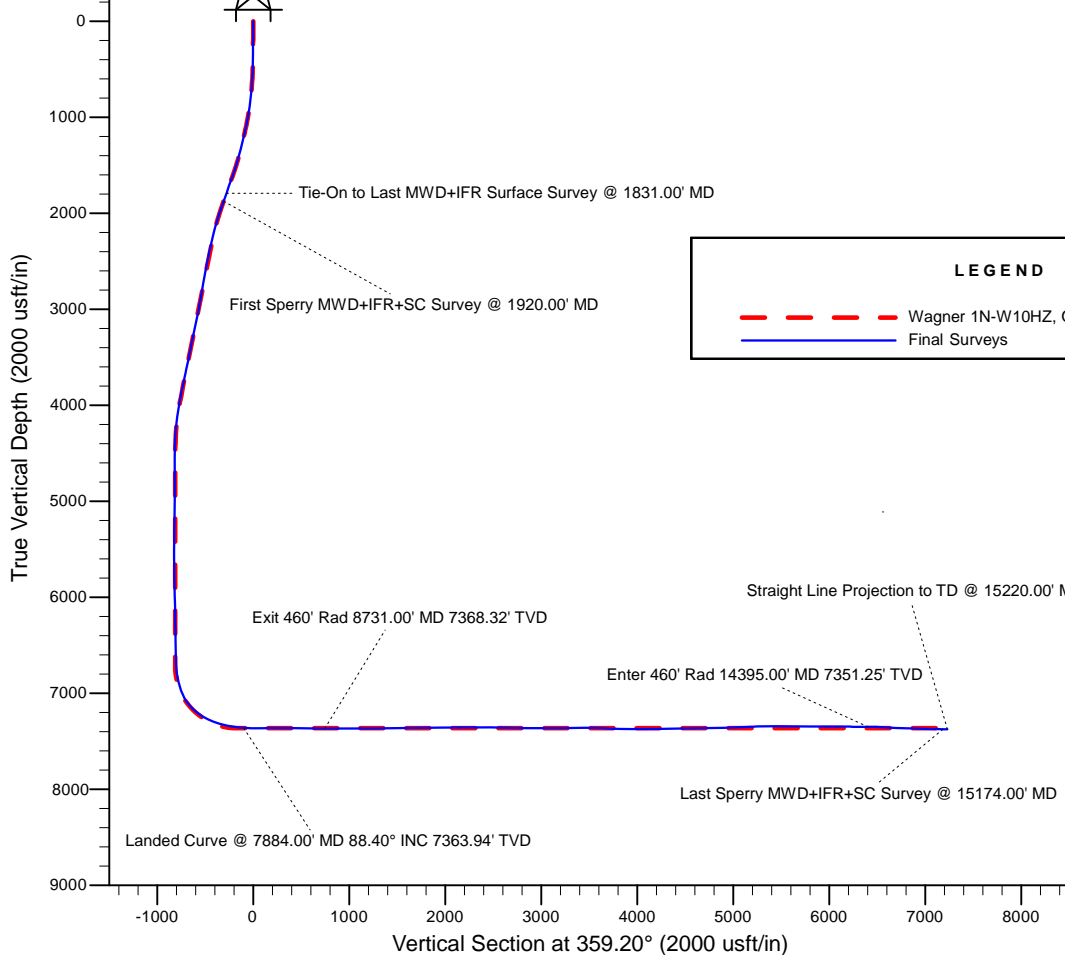
Enter 460' Rad 14395.00' MD 7351.25' TVD  
 ~461' FNL, ~715' FEL of Sec 15-T1N-R67W

Sec. 15, T1N R67W

**LEGEND**

- - - - - Wagner 1N-W10HZ, Original Wellbore, Rev A4 V0

\_ \_ \_ \_ \_ Final Surveys



~860' FNL, ~642' FEL of Sec 22-T1N-R67W  
 Exit 460' Rad 8731.00' MD 7368.32' TVD

Tie-On to Last MWD+IFR Surface Survey @ 1831.00' MD

First Sperry MWD+IFR+SC Survey @ 1920.00' MD

Sec. 22, T1N R67W

1609' FNL & 761' FEL Sec 22  
 Wagner 1N-W10HZ SHL

~1707' FNL, ~664' FEL of Sec 22-T1N-R67W  
 Lat: 40.039144° Long: -104.869649°  
 Landed Curve @ 7884.00' MD 88.40° INC 7363.94' TVD

South(-)/North(+) (1200 usft/in)

8000  
7000  
6000  
5000  
4000  
3000  
2000  
1000  
0  
-1000

Job# 904337676  
Precision 464

# US ROCKIES WATTENBERG PLANNING

WELD-NAD83-UTMFT13N Wagner 8-22HZ Pad - PD 464

API# 05-123-43476

Wagner 1N-W10HZ

Original Wellbore

Design: Final Surveys

## Sperry Drilling Services

### Combo Report

25 October, 2017

Well Coordinates: 40° 02' 21.89" N  
104° 52' 11.98" W

North American Datum 1983  
Zone 13N (108 W to 102 W)  
14,541,112.31 N  
1,676,804.03 E

Ground Level: 4,971.00 usft

Local Coordinate Origin:

Centered on Well Wagner 1N-W10HZ

Viewing Datum:

RKB 21' @ 4992.00usft (Precision 464)

TVDs to System:

N

**North Reference:**

**True**

Unit System:

Dec-Deg - API - US Survey Feet - Custom

Version: 5000.1 Build: 81D

Report Version: Midcon Combo v1.11

**HALLIBURTON**

## Design Report for Wagner 1N-W10HZ - Final Surveys

Measured Depth (usft)	Inclination (°)	True Azimuth (°)	TVD below System (usft)	Vertical Depth (usft)	Local Coordinates (usft)		Map Coordinates (usft)		Dogleg Rate (°/100usft)	Vertical Section (usft)	Comments
					Northing	Easting	Northing	Easting			
0.00	0.00	0.00	-4,992.00	0.00	0.00 N	0.00 E	14,541,112.31	1,676,804.03	0.00	0.00	
133.00	0.18	52.43	-4,859.00	133.00	0.13 N	0.17 E	14,541,112.44	1,676,804.20	0.14	0.13	First Total MWD+IFR Surface Survey @ 132.00' MD (KB 20')
165.00	0.31	125.20	-4,827.00	165.00	0.11 N	0.28 E	14,541,112.42	1,676,804.31	0.97	0.10	
197.00	0.04	98.22	-4,795.00	197.00	0.06 N	0.36 E	14,541,112.37	1,676,804.39	0.86	0.05	
229.00	0.22	210.63	-4,763.00	229.00	0.00 N	0.34 E	14,541,112.31	1,676,804.37	0.74	0.00	
260.00	0.31	162.12	-4,732.00	260.00	0.13 S	0.33 E	14,541,112.18	1,676,804.37	0.75	-0.13	
292.00	0.35	169.68	-4,700.00	292.00	0.31 S	0.38 E	14,541,112.00	1,676,804.41	0.18	-0.31	
324.00	0.57	217.14	-4,668.00	324.00	0.53 S	0.30 E	14,541,111.78	1,676,804.33	1.32	-0.53	
355.00	0.88	191.74	-4,637.00	355.00	0.89 S	0.16 E	14,541,111.42	1,676,804.19	1.42	-0.89	
387.00	1.32	167.21	-4,605.01	386.99	1.49 S	0.19 E	14,541,110.82	1,676,804.22	1.98	-1.49	
419.00	1.41	175.30	-4,573.02	418.98	2.24 S	0.30 E	14,541,110.07	1,676,804.34	0.66	-2.24	
451.00	1.54	164.93	-4,541.03	450.97	3.05 S	0.45 E	14,541,109.27	1,676,804.49	0.93	-3.05	
483.00	1.76	155.79	-4,509.04	482.96	3.91 S	0.76 E	14,541,108.40	1,676,804.80	1.07	-3.92	
514.00	2.24	147.09	-4,478.06	513.94	4.85 S	1.28 E	14,541,107.46	1,676,805.33	1.83	-4.87	
546.00	2.55	142.43	-4,446.09	545.91	5.94 S	2.06 E	14,541,106.37	1,676,806.10	1.14	-5.97	
577.00	3.30	140.41	-4,415.13	576.87	7.18 S	3.05 E	14,541,105.14	1,676,807.09	2.44	-7.22	
609.00	4.31	138.65	-4,383.20	608.80	8.79 S	4.43 E	14,541,103.53	1,676,808.48	3.18	-8.85	
640.00	5.14	140.50	-4,352.31	639.69	10.73 S	6.08 E	14,541,101.59	1,676,810.13	2.72	-10.82	
672.00	5.67	139.53	-4,320.45	671.55	13.04 S	8.02 E	14,541,099.28	1,676,812.07	1.68	-13.15	
704.00	6.50	135.75	-4,288.63	703.37	15.54 S	10.31 E	14,541,096.78	1,676,814.37	2.88	-15.69	
736.00	7.43	135.57	-4,256.87	735.13	18.32 S	13.02 E	14,541,094.01	1,676,817.08	2.91	-18.50	
767.00	8.13	136.01	-4,226.15	765.85	21.33 S	15.95 E	14,541,091.01	1,676,820.01	2.27	-21.55	
799.00	8.57	136.72	-4,194.49	797.51	24.69 S	19.15 E	14,541,087.65	1,676,823.22	1.41	-24.95	
830.00	9.01	136.72	-4,163.86	828.14	28.14 S	22.40 E	14,541,084.21	1,676,826.48	1.42	-28.45	
862.00	9.98	136.63	-4,132.29	859.71	31.98 S	26.02 E	14,541,080.37	1,676,830.10	3.03	-32.34	
894.00	10.37	139.79	-4,100.80	891.20	36.19 S	29.79 E	14,541,076.16	1,676,833.87	2.13	-36.61	
925.00	11.03	143.48	-4,070.34	921.66	40.71 S	33.35 E	14,541,071.65	1,676,837.45	3.07	-41.17	
957.00	11.65	146.47	-4,038.96	953.04	45.86 S	36.96 E	14,541,066.50	1,676,841.06	2.67	-46.37	
988.00	12.08	147.97	-4,008.62	983.38	51.22 S	40.41 E	14,541,061.15	1,676,844.52	1.71	-51.78	
1,020.00	12.44	148.67	-3,977.35	1,014.65	57.00 S	43.98 E	14,541,055.37	1,676,848.09	1.22	-57.61	
1,052.00	12.70	147.97	-3,946.12	1,045.88	62.93 S	47.63 E	14,541,049.45	1,676,851.76	0.94	-63.59	
1,083.00	12.83	147.53	-3,915.89	1,076.11	68.72 S	51.29 E	14,541,043.66	1,676,855.42	0.52	-69.43	
1,115.00	13.01	150.69	-3,884.70	1,107.30	74.86 S	54.96 E	14,541,037.53	1,676,859.10	2.28	-75.62	
1,147.00	13.58	153.59	-3,853.55	1,138.45	81.37 S	58.39 E	14,541,031.03	1,676,862.55	2.74	-82.17	
1,178.00	14.46	155.52	-3,823.48	1,168.52	88.15 S	61.62 E	14,541,024.25	1,676,865.78	3.21	-89.00	
1,210.00	14.90	155.79	-3,792.52	1,199.48	95.54 S	64.96 E	14,541,016.87	1,676,869.13	1.39	-96.43	
1,242.00	14.59	160.53	-3,761.57	1,230.43	103.09 S	67.99 E	14,541,009.32	1,676,872.17	3.89	-104.03	
1,274.00	14.63	160.45	-3,730.61	1,261.39	110.70 S	70.69 E	14,541,001.72	1,676,874.88	0.14	-111.67	
1,305.00	14.46	160.97	-3,700.60	1,291.40	118.05 S	73.26 E	14,540,994.37	1,676,877.46	0.69	-119.06	
1,337.00	14.33	164.14	-3,669.61	1,322.39	125.63 S	75.64 E	14,540,986.79	1,676,879.86	2.50	-126.68	



Design Report for Wagner 1N-W10HZ - Final Surveys

Measured Depth (usft)	Inclination (°)	True Azimuth (°)	TVD below System (usft)	Vertical Depth (usft)	Local Coordinates (usft)		Map Coordinates (usft)		Dogleg Rate (°/100usft)	Vertical Section (usft)	Comments
					Northing	Easting	Northing	Easting			
1,368.00	14.59	165.54	-3,639.59	1,352.41	133.10 S	77.67 E	14,540,979.32	1,676,881.89	1.41	-134.17	
1,400.00	14.99	167.65	-3,608.65	1,383.35	141.05 S	79.56 E	14,540,971.38	1,676,883.80	2.10	-142.15	
1,432.00	15.51	170.03	-3,577.78	1,414.22	149.31 S	81.18 E	14,540,963.12	1,676,885.44	2.54	-150.42	
1,463.00	16.35	173.54	-3,547.97	1,444.03	157.72 S	82.39 E	14,540,954.71	1,676,886.66	4.12	-158.86	
1,495.00	17.05	174.51	-3,517.32	1,474.68	166.87 S	83.35 E	14,540,945.56	1,676,887.63	2.35	-168.02	
1,527.00	17.67	174.51	-3,486.77	1,505.23	176.37 S	84.26 E	14,540,936.06	1,676,888.55	1.94	-177.53	
1,558.00	18.15	173.63	-3,457.28	1,534.72	185.85 S	85.25 E	14,540,926.58	1,676,889.55	1.78	-187.03	
1,590.00	18.94	173.54	-3,426.94	1,565.06	195.97 S	86.38 E	14,540,916.47	1,676,890.70	2.47	-197.16	
1,622.00	19.16	176.35	-3,396.69	1,595.31	206.37 S	87.30 E	14,540,906.07	1,676,891.64	2.95	-207.57	
1,652.00	19.91	176.71	-3,368.42	1,623.58	216.38 S	87.91 E	14,540,896.06	1,676,892.26	2.53	-217.59	
1,684.00	20.17	177.23	-3,338.35	1,653.65	227.33 S	88.49 E	14,540,885.11	1,676,892.86	0.98	-228.55	
1,716.00	20.08	177.41	-3,308.31	1,683.69	238.33 S	89.00 E	14,540,874.11	1,676,893.39	0.34	-239.55	
1,748.00	19.64	176.79	-3,278.21	1,713.79	249.19 S	89.55 E	14,540,863.25	1,676,893.95	1.52	-250.41	
1,780.00	19.38	175.65	-3,248.05	1,743.95	259.85 S	90.26 E	14,540,852.59	1,676,894.67	1.44	-261.09	
1,811.00	19.34	176.18	-3,218.80	1,773.20	270.10 S	90.99 E	14,540,842.34	1,676,895.42	0.58	-271.35	
1,831.00	19.20	176.44	-3,199.92	1,792.08	276.69 S	91.41 E	14,540,835.76	1,676,895.85	0.82	-277.94	Last Total MWD+IFR Surface Survey @ 1830.00' MD (KB 20') - Tie-On to Last MWD+IFR Surface Survey @ 1831.00' MD
1,920.00	19.13	178.02	-3,115.85	1,876.15	305.87 S	92.83 E	14,540,806.58	1,676,897.31	0.59	-307.14	First Sperry MWD+IFR+SC Survey @ 1920.00' MD
2,010.00	19.11	177.73	-3,030.82	1,961.18	335.33 S	93.92 E	14,540,777.12	1,676,898.44	0.11	-336.61	
2,099.00	17.43	178.19	-2,946.31	2,045.69	363.21 S	94.92 E	14,540,749.24	1,676,899.48	1.89	-364.50	
2,189.00	15.66	178.48	-2,860.04	2,131.96	388.83 S	95.67 E	14,540,723.62	1,676,900.27	1.97	-390.13	
2,279.00	13.92	177.96	-2,773.02	2,218.98	411.79 S	96.37 E	14,540,700.66	1,676,901.01	1.94	-413.10	
2,368.00	13.44	176.73	-2,686.55	2,305.45	432.82 S	97.34 E	14,540,679.64	1,676,902.01	0.63	-434.13	
2,458.00	11.95	177.05	-2,598.75	2,393.25	452.56 S	98.42 E	14,540,659.89	1,676,903.12	1.66	-453.89	
2,548.00	11.50	176.19	-2,510.63	2,481.37	470.82 S	99.50 E	14,540,641.64	1,676,904.22	0.54	-472.16	
2,638.00	10.97	174.97	-2,422.35	2,569.65	488.30 S	100.84 E	14,540,624.16	1,676,905.59	0.65	-489.66	
2,727.00	10.56	182.65	-2,334.92	2,657.08	504.89 S	101.21 E	14,540,607.57	1,676,905.98	1.67	-506.25	
2,817.00	9.93	180.82	-2,246.35	2,745.65	520.88 S	100.72 E	14,540,591.57	1,676,905.51	0.79	-522.24	
2,907.00	9.66	182.31	-2,157.66	2,834.34	536.19 S	100.30 E	14,540,576.27	1,676,905.12	0.41	-537.54	
2,997.00	10.62	182.43	-2,069.07	2,922.93	552.02 S	99.65 E	14,540,560.44	1,676,904.48	1.07	-553.36	
3,086.00	9.93	181.17	-1,981.50	3,010.50	567.89 S	99.14 E	14,540,544.57	1,676,904.00	0.82	-569.21	
3,176.00	11.95	181.78	-1,893.14	3,098.86	584.96 S	98.69 E	14,540,527.50	1,676,903.58	2.25	-586.28	
3,266.00	11.30	181.20	-1,804.98	3,187.02	603.09 S	98.22 E	14,540,509.37	1,676,903.13	0.73	-604.40	
3,356.00	12.56	177.66	-1,716.93	3,275.07	621.68 S	98.43 E	14,540,490.77	1,676,903.38	1.62	-623.00	
3,446.00	11.85	175.82	-1,628.96	3,363.04	640.68 S	99.51 E	14,540,471.78	1,676,904.48	0.90	-642.00	
3,535.00	10.76	176.75	-1,541.69	3,450.31	658.08 S	100.64 E	14,540,454.37	1,676,905.64	1.24	-659.43	
3,625.00	12.29	180.10	-1,453.51	3,538.49	676.05 S	101.10 E	14,540,436.41	1,676,906.12	1.85	-677.40	
3,715.00	12.10	180.17	-1,365.54	3,626.46	695.06 S	101.06 E	14,540,417.40	1,676,906.11	0.21	-696.41	
3,805.00	10.94	178.88	-1,277.35	3,714.65	713.04 S	101.20 E	14,540,399.42	1,676,906.27	1.32	-714.38	
3,894.00	12.37	179.63	-1,190.19	3,801.81	731.01 S	101.42 E	14,540,381.45	1,676,906.53	1.62	-732.36	
3,984.00	11.29	179.76	-1,102.10	3,889.90	749.46 S	101.52 E	14,540,363.00	1,676,906.65	1.20	-750.81	

**Design Report for Wagner 1N-W10HZ - Final Surveys**

Measured Depth (usft)	Inclination (°)	True Azimuth (°)	TVD below System (usft)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100usft)	Vertical Section (usft)	Comments
					Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)			
4,164.00	8.66	178.88	-924.84	4,067.16	780.64 S	101.86 E	14,540,331.82	1,676,907.04	1.46	-781.98	
4,254.00	7.62	179.45	-835.75	4,156.25	793.38 S	102.05 E	14,540,319.08	1,676,907.24	1.16	-794.73	
4,343.00	4.95	181.41	-747.29	4,244.71	803.12 S	102.01 E	14,540,309.34	1,676,907.22	3.01	-804.47	
4,433.00	4.36	188.17	-657.59	4,334.41	810.39 S	101.43 E	14,540,302.07	1,676,906.65	0.89	-811.73	
4,523.00	1.36	219.45	-567.70	4,424.30	814.60 S	100.27 E	14,540,297.86	1,676,905.49	3.64	-815.92	
4,613.00	1.31	245.27	-477.73	4,514.27	815.86 S	98.65 E	14,540,296.60	1,676,903.88	0.66	-817.15	
4,702.00	0.41	350.05	-388.74	4,603.26	815.97 S	97.68 E	14,540,296.49	1,676,902.90	1.65	-817.25	
4,792.00	0.58	2.40	-298.74	4,693.26	815.20 S	97.64 E	14,540,297.26	1,676,902.86	0.22	-816.48	
4,882.00	0.56	337.11	-208.74	4,783.26	814.33 S	97.49 E	14,540,298.12	1,676,902.71	0.28	-815.62	
4,972.00	1.28	145.78	-118.75	4,873.25	814.76 S	97.88 E	14,540,297.69	1,676,903.10	2.04	-816.05	
5,061.00	0.98	150.98	-29.77	4,962.23	816.25 S	98.81 E	14,540,296.21	1,676,904.03	0.36	-817.55	
5,151.00	0.70	151.43	60.22	5,052.22	817.40 S	99.45 E	14,540,295.05	1,676,904.67	0.31	-818.71	
5,241.00	0.36	173.89	150.22	5,142.22	818.17 S	99.74 E	14,540,294.29	1,676,904.97	0.44	-819.48	
5,421.00	0.39	179.59	330.22	5,322.22	819.34 S	99.80 E	14,540,293.11	1,676,905.03	0.03	-820.66	
5,510.00	0.55	175.00	419.21	5,411.21	820.07 S	99.84 E	14,540,292.39	1,676,905.07	0.18	-821.39	
5,600.00	0.45	203.29	509.21	5,501.21	820.83 S	99.74 E	14,540,291.63	1,676,904.97	0.29	-822.14	
5,690.00	0.17	347.90	599.21	5,591.21	821.02 S	99.57 E	14,540,291.44	1,676,904.81	0.66	-822.33	
5,780.00	0.63	344.69	689.21	5,681.21	820.41 S	99.41 E	14,540,292.04	1,676,904.65	0.51	-821.72	
5,860.00	0.84	342.09	769.20	5,761.20	819.43 S	99.12 E	14,540,293.03	1,676,904.35	0.27	-820.73	
5,999.00	1.35	330.94	908.17	5,900.17	817.03 S	98.01 E	14,540,295.43	1,676,903.24	0.40	-818.32	
6,089.00	1.76	331.19	998.14	5,990.14	814.89 S	96.83 E	14,540,297.56	1,676,902.05	0.46	-816.16	
6,178.00	1.46	24.16	1,087.11	6,079.11	812.66 S	96.63 E	14,540,299.79	1,676,901.85	1.64	-813.93	
6,268.00	1.60	8.02	1,177.08	6,169.08	810.37 S	97.28 E	14,540,302.08	1,676,902.49	0.50	-811.65	
6,358.00	0.84	60.90	1,267.06	6,259.06	808.80 S	98.03 E	14,540,303.65	1,676,903.24	1.42	-810.09	
6,448.00	0.76	29.50	1,357.05	6,349.05	807.96 S	98.90 E	14,540,304.49	1,676,904.11	0.49	-809.27	
6,538.00	0.89	20.64	1,447.04	6,439.04	806.79 S	99.44 E	14,540,305.67	1,676,904.65	0.20	-808.10	
6,627.00	0.93	9.66	1,536.03	6,528.03	805.43 S	99.81 E	14,540,307.03	1,676,905.01	0.20	-806.75	
6,717.00	1.21	7.00	1,626.01	6,618.01	803.77 S	100.04 E	14,540,308.69	1,676,905.25	0.32	-805.09	
6,807.00	1.83	13.00	1,715.98	6,707.98	801.42 S	100.48 E	14,540,311.03	1,676,905.69	0.71	-802.75	
6,896.00	9.48	9.99	1,804.48	6,796.48	792.81 S	102.08 E	14,540,319.65	1,676,907.27	8.60	-794.16	
6,986.00	13.72	12.60	1,892.63	6,884.63	775.09 S	105.69 E	14,540,337.38	1,676,910.86	4.75	-776.49	
7,076.00	19.91	5.49	1,978.75	6,970.75	749.39 S	109.49 E	14,540,363.08	1,676,914.62	7.24	-750.84	
7,166.00	27.42	3.69	2,061.12	7,053.12	713.40 S	112.29 E	14,540,399.07	1,676,917.37	8.38	-714.90	
7,256.00	40.00	359.65	2,135.85	7,127.85	663.59 S	113.46 E	14,540,448.89	1,676,918.46	14.19	-665.11	
7,345.00	52.18	356.33	2,197.46	7,189.46	599.66 S	111.02 E	14,540,512.82	1,676,915.93	13.94	-601.15	
7,435.00	58.32	355.45	2,248.74	7,240.74	525.94 S	105.70 E	14,540,586.53	1,676,910.50	6.87	-527.36	
7,525.00	66.98	357.70	2,290.05	7,282.05	446.22 S	100.99 E	14,540,666.24	1,676,905.68	9.87	-447.59	
7,615.00	72.86	358.99	2,320.94	7,312.94	361.76 S	98.57 E	14,540,750.69	1,676,903.13	6.67	-363.11	
7,704.00	77.01	359.06	2,344.07	7,336.07	275.85 S	97.11 E	14,540,836.60	1,676,901.55	4.66	-277.18	
7,794.00	79.45	0.10	2,362.42	7,354.42	187.76 S	96.47 E	14,540,924.70	1,676,900.78	2.94	-189.09	



Design Report for Wagner 1N-W10HZ - Final Surveys

Measured Depth (usft)	Inclination (°)	True Azimuth (°)	TVD below System (usft)	Vertical Depth (usft)	Local Coordinates (usft)		Map Coordinates (usft)		Dogleg Rate (°/100usft)	Vertical Section (usft)	Comments
					Northing	Easting	Northing	Easting			
7,884.00	88.40	359.86	2,371.94	7,363.94	98.35 S	96.43 E	14,541,014.10	1,676,900.61	9.95	-99.69	Landed Curve @ 7884.00' MD 88.40° INC 7363.94' TVD - Lat: 40.039144° Long: -104.869649°
7,974.00	89.60	1.18	2,373.51	7,365.51	8.37 S	97.25 E	14,541,104.08	1,676,901.30	1.98	-9.73	
8,063.00	90.62	0.40	2,373.34	7,365.34	80.62 N	98.48 E	14,541,193.07	1,676,902.39	1.44	79.23	
8,153.00	91.57	0.67	2,371.62	7,363.62	170.59 N	99.32 E	14,541,283.05	1,676,903.10	1.10	169.19	
8,243.00	89.01	2.96	2,371.16	7,363.16	260.53 N	102.17 E	14,541,372.99	1,676,905.82	3.82	259.08	
8,333.00	89.54	3.05	2,372.30	7,364.30	350.40 N	106.89 E	14,541,462.87	1,676,910.41	0.60	348.88	
8,423.00	90.77	2.98	2,372.06	7,364.06	440.20 N	111.62 E	14,541,552.75	1,676,915.01	1.37	438.67	
8,517.00	88.64	1.12	2,372.54	7,364.54	534.20 N	114.98 E	14,541,646.68	1,676,918.24	3.01	532.55	
8,611.00	88.98	0.91	2,374.49	7,366.49	628.17 N	116.65 E	14,541,740.65	1,676,919.76	0.43	626.48	
8,705.00	89.20	0.03	2,375.99	7,367.99	722.15 N	117.42 E	14,541,834.64	1,676,920.40	0.96	720.44	
8,731.00	89.33	359.92	2,376.32	7,368.32	748.15 N	117.41 E	14,541,860.63	1,676,920.35	0.66	746.44	Exit 460' Rad 8731.00' MD 7368.32' TVD
8,800.00	89.66	359.61	2,376.93	7,368.93	817.15 N	117.12 E	14,541,929.63	1,676,919.96	0.66	815.43	
8,894.00	90.19	358.82	2,377.06	7,369.06	911.14 N	115.83 E	14,542,023.62	1,676,918.54	1.01	909.43	
8,988.00	90.12	357.43	2,376.80	7,368.80	1,005.09 N	112.76 E	14,542,117.56	1,676,915.32	1.48	1,003.41	
9,082.00	89.94	357.06	2,376.75	7,368.75	1,098.98 N	108.24 E	14,542,211.44	1,676,910.67	0.44	1,097.36	
9,177.00	89.75	356.67	2,377.01	7,369.01	1,193.83 N	103.04 E	14,542,306.29	1,676,905.33	0.46	1,192.28	
9,271.00	90.12	356.36	2,377.12	7,369.12	1,287.66 N	97.33 E	14,542,400.11	1,676,899.48	0.51	1,286.17	
9,365.00	90.34	358.25	2,376.74	7,368.74	1,381.55 N	92.91 E	14,542,494.00	1,676,894.93	2.02	1,380.12	
9,459.00	89.88	357.29	2,376.56	7,368.56	1,475.48 N	89.25 E	14,542,587.92	1,676,891.13	1.13	1,474.09	
9,553.00	91.11	1.40	2,375.75	7,367.75	1,569.45 N	88.18 E	14,542,681.88	1,676,889.92	4.56	1,568.06	
9,648.00	91.36	0.74	2,373.70	7,365.70	1,664.41 N	89.95 E	14,542,776.85	1,676,891.56	0.74	1,662.99	
9,742.00	91.33	359.86	2,371.49	7,363.49	1,758.38 N	90.44 E	14,542,870.82	1,676,891.91	0.94	1,756.94	
9,836.00	91.14	358.29	2,369.47	7,361.47	1,852.34 N	88.93 E	14,542,964.78	1,676,890.26	1.68	1,850.92	
9,926.00	91.26	357.39	2,367.58	7,359.58	1,942.26 N	85.53 E	14,543,054.69	1,676,886.73	1.01	1,940.87	
10,016.00	91.36	358.80	2,365.52	7,357.52	2,032.18 N	82.54 E	14,543,144.61	1,676,883.61	1.57	2,030.83	
10,105.00	89.85	0.96	2,364.58	7,356.58	2,121.17 N	82.36 E	14,543,233.60	1,676,883.29	2.96	2,119.81	
10,195.00	90.31	0.02	2,364.46	7,356.46	2,211.16 N	83.13 E	14,543,323.59	1,676,883.93	1.16	2,209.79	
10,285.00	90.89	359.32	2,363.51	7,355.51	2,301.16 N	82.61 E	14,543,413.59	1,676,883.28	1.01	2,299.78	
10,374.00	88.74	359.96	2,363.80	7,355.80	2,390.15 N	82.05 E	14,543,502.58	1,676,882.59	2.52	2,388.77	
10,464.00	88.64	359.03	2,365.86	7,357.86	2,480.12 N	81.26 E	14,543,592.55	1,676,881.67	1.04	2,478.74	
10,644.00	88.95	357.52	2,369.65	7,361.65	2,659.99 N	75.84 E	14,543,772.41	1,676,875.99	0.86	2,658.68	
10,734.00	89.14	357.24	2,371.15	7,363.15	2,749.89 N	71.73 E	14,543,862.30	1,676,871.75	0.38	2,748.62	
10,823.00	89.20	356.38	2,372.43	7,364.43	2,838.74 N	66.77 E	14,543,951.14	1,676,866.66	0.97	2,837.53	
10,913.00	89.57	357.10	2,373.40	7,365.40	2,928.59 N	61.66 E	14,544,040.99	1,676,861.42	0.90	2,927.44	
11,003.00	89.82	355.84	2,373.88	7,365.88	3,018.41 N	56.11 E	14,544,130.80	1,676,855.74	1.43	3,017.34	
11,093.00	90.52	359.91	2,373.61	7,365.61	3,108.33 N	52.78 E	14,544,220.72	1,676,852.27	4.59	3,107.29	
11,182.00	90.59	359.44	2,372.75	7,364.75	3,197.33 N	52.27 E	14,544,309.71	1,676,851.64	0.53	3,196.28	
11,272.00	92.19	359.28	2,370.57	7,362.57	3,287.29 N	51.27 E	14,544,399.67	1,676,850.50	1.79	3,286.25	
11,362.00	90.37	0.69	2,368.56	7,360.56	3,377.26 N	51.25 E	14,544,489.64	1,676,850.35	2.56	3,376.22	
11,452.00	89.88	1.98	2,368.36	7,360.36	3,467.24 N	53.34 E	14,544,579.62	1,676,852.31	1.53	3,466.15	



Design Report for Wagner 1N-W10HZ - Final Surveys

Measured Depth (usft)	Inclination (°)	True Azimuth (°)	TVD below System (usft)	Vertical Depth (usft)	Local Coordinates (usft)		Map Coordinates (usft)		Dogleg Rate (°/100usft)	Vertical Section (usft)	Comments
					Northing	Easting	Northing	Easting			
11,631.00	86.67	0.48	2,373.75	7,365.75	3,646.08 N	57.18 E	14,544,758.48	1,676,855.90	1.98	3,644.93	
11,721.00	87.69	359.42	2,378.18	7,370.18	3,735.97 N	57.11 E	14,544,848.36	1,676,855.69	1.63	3,734.81	
11,811.00	88.77	358.47	2,380.96	7,372.96	3,825.91 N	55.45 E	14,544,938.30	1,676,853.90	1.60	3,824.77	
11,900.00	88.80	357.34	2,382.84	7,374.84	3,914.83 N	52.20 E	14,545,027.21	1,676,850.52	1.27	3,913.72	
11,990.00	91.42	357.44	2,382.67	7,374.67	4,004.73 N	48.10 E	14,545,117.11	1,676,846.29	2.91	4,003.67	
12,080.00	90.40	359.02	2,381.24	7,373.24	4,094.67 N	45.32 E	14,545,207.04	1,676,843.38	2.09	4,093.64	
12,170.00	90.46	358.12	2,380.57	7,372.57	4,184.64 N	43.07 E	14,545,297.01	1,676,841.00	1.00	4,183.63	
12,260.00	90.86	357.27	2,379.53	7,371.53	4,274.56 N	39.45 E	14,545,386.92	1,676,837.25	1.04	4,273.59	
12,349.00	90.65	359.39	2,378.36	7,370.36	4,363.51 N	36.86 E	14,545,475.87	1,676,834.52	2.39	4,362.57	
12,529.00	91.20	357.37	2,375.45	7,367.45	4,543.40 N	31.77 E	14,545,655.76	1,676,829.17	1.16	4,542.52	
12,619.00	90.86	356.58	2,373.83	7,365.83	4,633.26 N	27.02 E	14,545,745.61	1,676,824.29	0.96	4,632.43	
12,708.00	90.99	359.43	2,372.39	7,364.39	4,722.19 N	23.93 E	14,545,834.53	1,676,821.07	3.21	4,721.39	
12,798.00	90.89	358.14	2,370.92	7,362.92	4,812.15 N	22.02 E	14,545,924.49	1,676,819.03	1.44	4,811.38	
12,888.00	91.30	357.71	2,369.20	7,361.20	4,902.08 N	18.76 E	14,546,014.41	1,676,815.64	0.66	4,901.34	
12,977.00	91.88	358.90	2,366.73	7,358.73	4,991.00 N	16.13 E	14,546,103.33	1,676,812.88	1.49	4,990.29	
13,157.00	92.84	1.89	2,359.32	7,351.32	5,170.82 N	17.37 E	14,546,283.16	1,676,813.85	1.74	5,170.08	
13,247.00	91.39	2.88	2,355.99	7,347.99	5,260.68 N	21.11 E	14,546,373.02	1,676,817.46	1.95	5,259.87	
13,426.00	90.00	1.87	2,353.82	7,345.82	5,439.51 N	28.53 E	14,546,551.85	1,676,824.62	0.96	5,438.58	
13,516.00	88.80	1.91	2,354.77	7,346.77	5,529.45 N	31.49 E	14,546,641.80	1,676,827.46	1.33	5,528.47	
13,606.00	89.63	1.16	2,356.00	7,348.00	5,619.41 N	33.91 E	14,546,731.76	1,676,829.74	1.24	5,618.39	
13,785.00	90.71	359.50	2,355.47	7,347.47	5,798.40 N	34.94 E	14,546,910.75	1,676,830.51	1.11	5,797.34	
13,875.00	89.04	358.96	2,355.66	7,347.66	5,888.39 N	33.73 E	14,547,000.74	1,676,829.16	1.95	5,887.34	
13,965.00	90.15	358.37	2,356.30	7,348.30	5,978.36 N	31.63 E	14,547,090.71	1,676,826.94	1.40	5,977.33	
14,055.00	88.98	359.40	2,356.98	7,348.98	6,068.33 N	29.88 E	14,547,180.68	1,676,825.05	1.73	6,067.33	
14,144.00	90.28	358.70	2,357.56	7,349.56	6,157.32 N	28.40 E	14,547,269.66	1,676,823.45	1.66	6,156.32	
14,234.00	88.52	0.07	2,358.50	7,350.50	6,247.30 N	27.44 E	14,547,359.65	1,676,822.35	2.48	6,246.31	
14,395.00	90.94	359.59	2,359.25	7,351.25	6,408.29 N	26.96 E	14,547,520.63	1,676,821.63	1.54	6,407.29	Enter 460' Rad 14395.00' MD 7351.25' TVD
14,414.00	91.23	359.53	2,358.89	7,350.89	6,427.28 N	26.81 E	14,547,539.63	1,676,821.46	1.54	6,426.28	
14,503.00	86.73	359.97	2,360.48	7,352.48	6,516.25 N	26.42 E	14,547,628.59	1,676,820.94	5.08	6,515.24	
14,683.00	86.89	359.42	2,370.49	7,362.49	6,695.96 N	25.46 E	14,547,808.30	1,676,819.72	0.32	6,694.96	
14,862.00	88.52	357.79	2,377.66	7,369.66	6,874.75 N	21.11 E	14,547,987.09	1,676,815.11	1.29	6,873.79	
14,952.00	88.61	357.22	2,379.92	7,371.92	6,964.64 N	17.19 E	14,548,076.97	1,676,811.06	0.64	6,963.72	
15,042.00	88.86	356.65	2,381.90	7,373.90	7,054.49 N	12.38 E	14,548,166.81	1,676,806.12	0.69	7,053.63	
15,132.00	88.74	356.39	2,383.79	7,375.79	7,144.30 N	6.92 E	14,548,256.62	1,676,800.52	0.32	7,143.51	
15,174.00	88.58	356.05	2,384.77	7,376.77	7,186.20 N	4.15 E	14,548,298.51	1,676,797.69	0.89	7,185.44	Last Sperry MWD+IFR+SC Survey @ 15174.00' MD
15,220.00	88.58	356.05	2,385.91	7,377.91	7,232.08 N	0.98 E	14,548,344.38	1,676,794.46	0.00	7,231.36	Straight Line Projection to TD @ 15220.00' MD - Lat: 40.059274° Long: -104.869990°

## Design Report for Wagner 1N-W10HZ - Final Surveys

### Design Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
133.00	133.00	0.13	0.17	First Total MWD+IFR Surface Survey @ 132.00' MD (KB 20')
1,831.00	1,792.08	-276.69	91.41	Last Total MWD+IFR Surface Survey @ 1830.00' MD (KB 20')
1,831.00	1,792.08	-276.69	91.41	Tie-On to Last MWD+IFR Surface Survey @ 1831.00' MD
1,920.00	1,876.15	-305.87	92.83	First Sperry MWD+IFR+SC Survey @ 1920.00' MD
7,884.00	7,363.94	-98.35	96.43	Landed Curve @ 7884.00' MD 88.40° INC 7363.94' TVD
7,884.00	7,363.94	-98.35	96.43	Lat: 40.039144° Long: -104.869649°
8,731.00	7,368.32	748.15	117.41	Exit 460' Rad 8731.00' MD 7368.32' TVD
14,395.00	7,351.25	6,408.29	26.96	Enter 460' Rad 14395.00' MD 7351.25' TVD
15,174.00	7,376.77	7,186.20	4.15	Last Sperry MWD+IFR+SC Survey @ 15174.00' MD
15,220.00	7,377.91	7,232.08	0.98	Straight Line Projection to TD @ 15220.00' MD
15,220.00	7,377.91	7,232.08	0.98	Lat: 40.059274° Long: -104.869990°

### Vertical Section Information

Angle Type	Target	Azimuth (°)	Origin Type	Origin		Start TVD (usft)
				+N/-S (usft)	+E/-W (usft)	
User	No Target (Freehand)	359.20	Slot	0.00	0.00	0.00

### Survey tool program

From (usft)	To (usft)	Survey/Plan	Survey Tool
133.00	1,831.00	Total MWD+IFR Surface Surveys	APC_ISCWSA REV 2 MWD+IFR1
1,831.00	15,174.00	Sperry MWD+IFR+SC Surveys	APC_ISCWSA REV 2 MWD+IFR1+SC
15,220.00	15,220.00	PTB	APC_BLIND

**Design Report for Wagner 1N-W10HZ - Final Surveys**

**Design Targets**

Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
Wagner 1N-W10HZ PBHL_A4 (366' FSL 737' FEL Sec 10)									
	0.00	0.00	7,365.00	7,235.91	3.00	14,548,348.21	1,676,796.47	40.059285	-104.869983
- actual wellpath misses target center by 13.62usft at 15220.00usft MD (7377.91 TVD, 7232.08 N, 0.98 E)									
- Point									
Wagner 1N-W10HZ SHL ()									
	0.00	0.00	73,065.00	0.00	0.00	14,541,112.31	1,676,804.03	40.039414	-104.869994
- actual wellpath misses target center by 65699.56usft at 7974.00usft MD (7365.51 TVD, -8.37 N, 97.25 E)									
- Point									

**Directional Difficulty Index**

Average Dogleg over Survey:	1.81 °/100usft	Maximum Dogleg over Survey:	14.19 °/100usft at 7,256.00 usft
Net Tortosity applicable to Plans:	0.89 °/100usft	Directional Difficulty Index:	6.706

**Audit Info**

**North Reference Sheet for Wagner 8-22HZ Pad - PD 464 - Wagner 1N-W10HZ - Original Wellbore**

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

Vertical Depths are relative to RKB 21' @ 4992.00usft (Precision 464). Northing and Easting are relative to Wagner 1N-W10HZ

Coordinate System is Universal Transverse Mercator (US Survey Feet), Zone 13N (108 W to 102 W) using datum North American Datum 1983, ellipsoid GRS 1980

Projection method is Transverse Mercator (Gauss-Kruger)

Central Meridian is -105.000000°, Longitude Origin:0.000000°, Latitude Origin:0.000000°

False Easting: 1,640,416.67usft, False Northing: 0.00usft, Scale Reduction: 0.99960151

Grid Coordinates of Well: 14,541,112.31 usft N, 1,676,804.03 usft E

Geographical Coordinates of Well: 40° 02' 21.89" N, 104° 52' 11.98" W

Grid Convergence at Surface is: 0.08°

Based upon Minimum Curvature type calculations, at a Measured Depth of 15,220.00usft

the Bottom Hole Displacement is 7,232.08usft in the Direction of 0.01° ( True).

Magnetic Convergence at surface is: -8.31° (16 October 2017, , BGGM2017)

