US ROCKIES WATTENBERG PLANNING

WELD-NAD83-UTMFT13N
MCKINSTRY 1-22HZ PAD
MCKINSTRY 28N-21HZ

Plan A

Plan: PERMIT REV-1

Sperry Drilling Services

Proposal Report

15 December, 2014

Well Coordinates: 14,605,675.68 N, 1,645,610.78 E (40° 13' 00.43" N, 104° 58' 53.02" W)
Ground Level: 4,970.00 usft

Local Coordinate Origin:	Centered on Well MCKINSTRY 28N-21HZ
Viewing Datum:	RKB = 17' @ 4987.00usft (Drilling Rig)
TVDs to System:	N
North Reference:	True
Unit System:	Dec-Deg - API - US Survey Feet - Custom

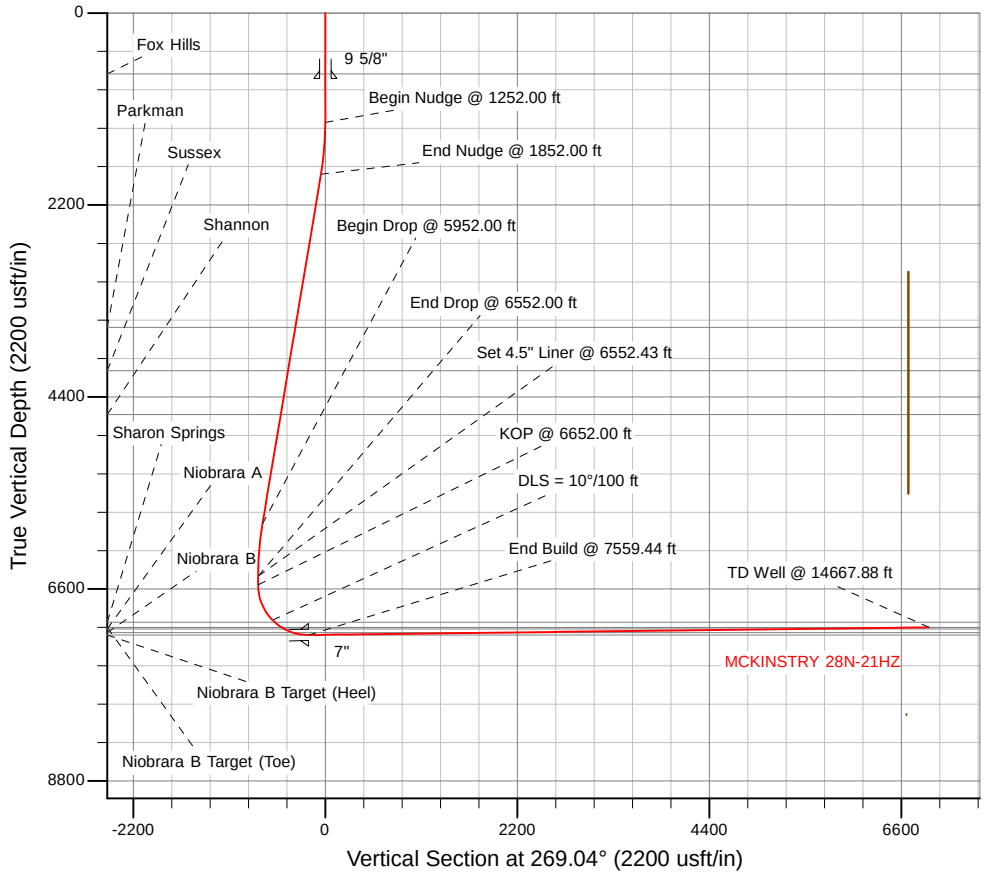
Version: 5000.1 Build: 70

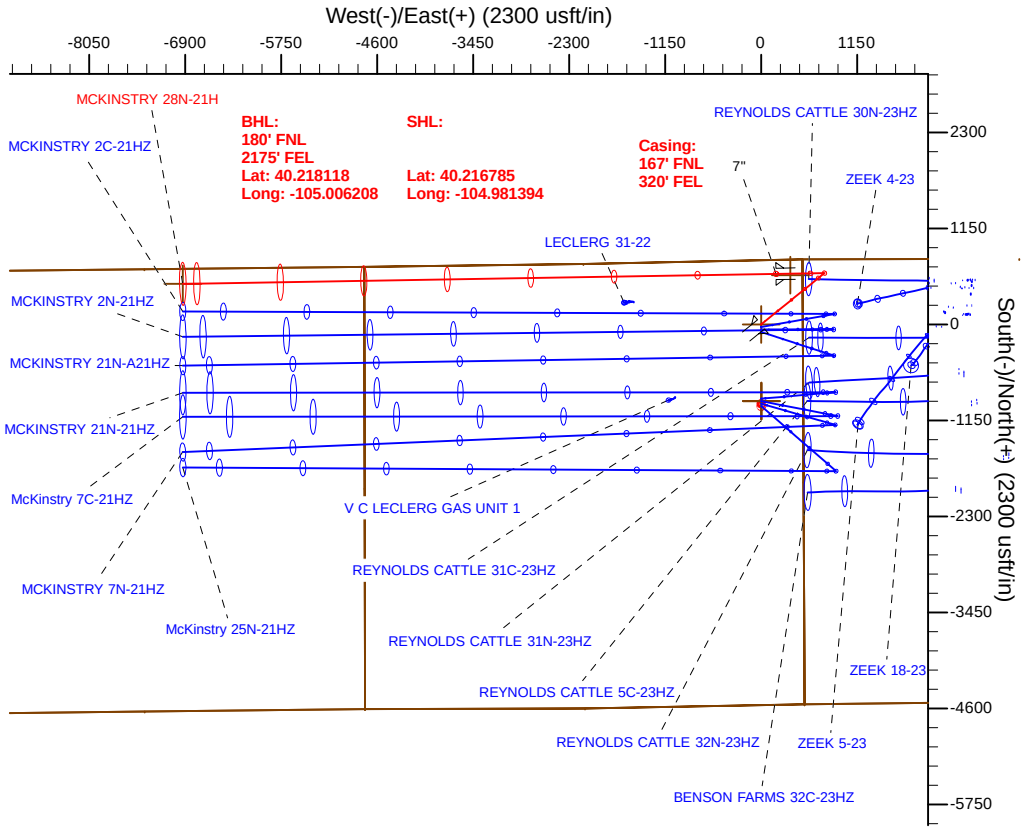
HALLIBURTON

Project: WELD-NAD83-UTMFT13N
Site: MCKINSTRY 1-22HZ PAD
Well: MCKINSTRY 28N-21HZ
Wellbore: Plan A
Design: PERMIT REV-1

US ROCKIES WATTENBERG PLANNING

HALLIBURTON
Sperry Drilling





SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSect	Target
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
2	1252.00	0.00	0.00	1252.00	0.00	0.00	0.00	0.00	0.00	
3	1852.00	12.00	51.00	1847.62	39.40	48.65	2.00	51.00	-49.30	
4	5952.00	12.00	51.00	5858.03	575.85	711.12	0.00	0.00	-720.67	
5	6552.00	0.00	0.00	6453.65	615.25	759.77	2.00	180.00	-769.97	
6	6652.43	0.00	0.00	6554.08	615.25	759.77	0.00	0.00	-769.97	
7	7559.44	90.70	269.04	7127.00	605.53	179.88	10.00	269.04	-190.00	
8	14667.88	90.70	269.04	7040.00	486.39	-6927.02	0.00	0.00	6917.90	MCKINSTRY 28N-21HZ_BHL

WELLBORE TARGET DETAILS (LAT/LONG)

Name	TVD	+N/-S	+E/-W	Latitude	Longitude	Shape
3N-R68W-Sec. 21_Section Lines	-14.00	-919.12	3.35	40.214261	-104.981382	Polygon
3N-R68W-Sec. 22_Section Lines	-14.00	-919.12	3.35	40.214261	-104.981382	Polygon
3N-R68W-Sec. 23_Section Lines	-14.00	-919.12	3.35	40.214261	-104.981382	Polygon
MCKINSTRY 28N-21HZ_SHL	0.00	0.00	0.00	40.216785	-104.981394	Point
MCKINSTRY 28N-21HZ_BHL	7040.00	486.39	-6927.02	40.218118	-105.006208	Point
MCKINSTRY 28N-21HZ_HEEL	7127.00	591.00	350.00	40.218408	-104.980140	Point

TVD	MD	Annotation
6454.08	6552.43	Set 4.5" Liner @ 6552.43 ft
6553.65	6652.00	KOP @ 6652.00 ft
7127.00	7559.44	End Build @ 7559.44 ft

WELL DETAILS: MCKINSTRY 28N-21HZ

Ground Level: 4970.00

RKB = 17' @ 4987.00usft (Drilling Rig)

Plan: PERMIT REV-1 (MCKINSTRY 28N-21HZ/Plan A)

Created By: Katie Benner Date: 12/15/2014
Reviewed: _____ Date: _____

Plan Report for MCKINSTRY 28N-21HZ - PERMIT REV-1

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)	Toolface Azimuth (°)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tie On to Surface @ 0.00 ft - 3N-R68W-Sec. 22_Section Lines - 3N-R68W-Sec. 23_Section Lines - 3N-R68W-Sec. 21_Section Lines - MCKINSTRY 28										
100.00	0.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
200.00	0.00	0.00	200.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
300.00	0.00	0.00	300.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
400.00	0.00	0.00	400.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
500.00	0.00	0.00	500.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
600.00	0.00	0.00	600.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
698.00	0.00	0.00	698.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fox Hills										
700.00	0.00	0.00	700.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
749.00	0.00	0.00	749.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
9 5/8"										
800.00	0.00	0.00	800.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
900.00	0.00	0.00	900.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1,000.00	0.00	0.00	1,000.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1,100.00	0.00	0.00	1,100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1,200.00	0.00	0.00	1,200.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1,252.00	0.00	0.00	1,252.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Begin Nudge @ 1252.00 ft										
1,300.00	0.96	51.00	1,300.00	0.25	0.31	-0.32	2.00	2.00	0.00	51.00
1,400.00	2.96	51.00	1,399.93	2.41	2.97	-3.01	2.00	2.00	0.00	0.00
1,500.00	4.96	51.00	1,499.69	6.75	8.34	-8.45	2.00	2.00	0.00	0.00
1,600.00	6.96	51.00	1,599.14	13.29	16.41	-16.63	2.00	2.00	0.00	0.00
1,700.00	8.96	51.00	1,698.18	22.00	27.17	-27.53	2.00	2.00	0.00	0.00
1,800.00	10.96	51.00	1,796.66	32.88	40.61	-41.15	2.00	2.00	0.00	0.00
1,852.00	12.00	51.00	1,847.62	39.40	48.65	-49.30	2.00	2.00	0.00	0.00
End Nudge @ 1852.00 ft										
1,900.00	12.00	51.00	1,894.57	45.68	56.41	-57.16	0.00	0.00	0.00	0.00
2,000.00	12.00	51.00	1,992.39	58.76	72.56	-73.54	0.00	0.00	0.00	0.00
2,100.00	12.00	51.00	2,090.20	71.85	88.72	-89.91	0.00	0.00	0.00	0.00
2,200.00	12.00	51.00	2,188.02	84.93	104.88	-106.29	0.00	0.00	0.00	0.00
2,300.00	12.00	51.00	2,285.83	98.01	121.04	-122.66	0.00	0.00	0.00	0.00
2,400.00	12.00	51.00	2,383.65	111.10	137.20	-139.04	0.00	0.00	0.00	0.00
2,500.00	12.00	51.00	2,481.46	124.18	153.35	-155.41	0.00	0.00	0.00	0.00
2,600.00	12.00	51.00	2,579.28	137.27	169.51	-171.79	0.00	0.00	0.00	0.00
2,700.00	12.00	51.00	2,677.09	150.35	185.67	-188.16	0.00	0.00	0.00	0.00
2,800.00	12.00	51.00	2,774.91	163.44	201.83	-204.54	0.00	0.00	0.00	0.00
2,900.00	12.00	51.00	2,872.72	176.52	217.98	-220.91	0.00	0.00	0.00	0.00
3,000.00	12.00	51.00	2,970.54	189.60	234.14	-237.29	0.00	0.00	0.00	0.00
3,100.00	12.00	51.00	3,068.35	202.69	250.30	-253.66	0.00	0.00	0.00	0.00
3,200.00	12.00	51.00	3,166.17	215.77	266.46	-270.04	0.00	0.00	0.00	0.00
3,300.00	12.00	51.00	3,263.98	228.86	282.62	-286.41	0.00	0.00	0.00	0.00
3,400.00	12.00	51.00	3,361.80	241.94	298.77	-302.79	0.00	0.00	0.00	0.00
3,500.00	12.00	51.00	3,459.61	255.03	314.93	-319.16	0.00	0.00	0.00	0.00
3,600.00	12.00	51.00	3,557.43	268.11	331.09	-335.53	0.00	0.00	0.00	0.00
3,645.57	12.00	51.00	3,602.00	274.07	338.45	-343.00	0.00	0.00	0.00	0.00
Parkman										
3,700.00	12.00	51.00	3,655.24	281.20	347.25	-351.91	0.00	0.00	0.00	0.00
3,800.00	12.00	51.00	3,753.05	294.28	363.40	-368.28	0.00	0.00	0.00	0.00
3,900.00	12.00	51.00	3,850.87	307.36	379.56	-384.66	0.00	0.00	0.00	0.00
4,000.00	12.00	51.00	3,948.68	320.45	395.72	-401.03	0.00	0.00	0.00	0.00
4,100.00	12.00	51.00	4,046.50	333.53	411.88	-417.41	0.00	0.00	0.00	0.00
4,153.67	12.00	51.00	4,099.00	340.56	420.55	-426.20	0.00	0.00	0.00	0.00
Sussex										
4,200.00	12.00	51.00	4,144.31	346.62	428.04	-433.78	0.00	0.00	0.00	0.00
4,300.00	12.00	51.00	4,242.13	359.70	444.19	-450.16	0.00	0.00	0.00	0.00

Plan Report for MCKINSTRY 28N-21HZ - PERMIT REV-1

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)	Toolface Azimuth (°)
4,400.00	12.00	51.00	4,339.94	372.79	460.35	-466.53	0.00	0.00	0.00	0.00
4,500.00	12.00	51.00	4,437.76	385.87	476.51	-482.91	0.00	0.00	0.00	0.00
4,600.00	12.00	51.00	4,535.57	398.95	492.67	-499.28	0.00	0.00	0.00	0.00
4,667.91	12.00	51.00	4,602.00	407.84	503.64	-510.40	0.00	0.00	0.00	0.00
Shannon										
4,700.00	12.00	51.00	4,633.39	412.04	508.82	-515.66	0.00	0.00	0.00	0.00
4,800.00	12.00	51.00	4,731.20	425.12	524.98	-532.03	0.00	0.00	0.00	0.00
4,900.00	12.00	51.00	4,829.02	438.21	541.14	-548.41	0.00	0.00	0.00	0.00
5,000.00	12.00	51.00	4,926.83	451.29	557.30	-564.78	0.00	0.00	0.00	0.00
5,100.00	12.00	51.00	5,024.65	464.38	573.46	-581.16	0.00	0.00	0.00	0.00
5,200.00	12.00	51.00	5,122.46	477.46	589.61	-597.53	0.00	0.00	0.00	0.00
5,300.00	12.00	51.00	5,220.28	490.54	605.77	-613.91	0.00	0.00	0.00	0.00
5,400.00	12.00	51.00	5,318.09	503.63	621.93	-630.28	0.00	0.00	0.00	0.00
5,500.00	12.00	51.00	5,415.91	516.71	638.09	-646.65	0.00	0.00	0.00	0.00
5,600.00	12.00	51.00	5,513.72	529.80	654.24	-663.03	0.00	0.00	0.00	0.00
5,700.00	12.00	51.00	5,611.54	542.88	670.40	-679.40	0.00	0.00	0.00	0.00
5,800.00	12.00	51.00	5,709.35	555.97	686.56	-695.78	0.00	0.00	0.00	0.00
5,900.00	12.00	51.00	5,807.16	569.05	702.72	-712.15	0.00	0.00	0.00	0.00
5,952.00	12.00	51.00	5,858.03	575.85	711.12	-720.67	0.00	0.00	0.00	0.00
Begin Drop @ 5952.00 ft										
6,000.00	11.04	51.00	5,905.06	581.89	718.57	-728.22	2.00	-2.00	0.00	180.00
6,100.00	9.04	51.00	6,003.52	592.86	732.12	-741.95	2.00	-2.00	0.00	-180.00
6,200.00	7.04	51.00	6,102.54	601.66	742.99	-752.96	2.00	-2.00	0.00	180.00
6,300.00	5.04	51.00	6,201.98	608.28	751.16	-761.25	2.00	-2.00	0.00	180.00
6,400.00	3.04	51.00	6,301.72	612.71	756.64	-766.80	2.00	-2.00	0.00	180.00
6,500.00	1.04	51.00	6,401.65	614.95	759.40	-769.60	2.00	-2.00	0.00	180.00
6,552.00	0.00	0.00	6,453.65	615.25	759.77	-769.97	2.00	-2.00	-98.08	-180.00
End Drop @ 6552.00 ft										
6,552.43	0.00	0.00	6,454.08	615.25	759.77	-769.97	0.00	0.00	0.00	180.00
Set 4.5" Liner @ 6552.43 ft										
6,600.00	0.00	0.00	6,501.65	615.25	759.77	-769.97	0.00	0.00	0.00	0.00
6,652.00	0.00	0.00	6,553.65	615.25	759.77	-769.97	0.00	0.00	0.00	0.00
KOP @ 6652.00 ft										
6,652.43	0.00	0.00	6,554.08	615.25	759.77	-769.97	0.00	0.00	0.00	0.00
6,700.00	4.76	269.04	6,601.60	615.22	757.80	-768.00	10.00	10.00	0.00	269.04
6,800.00	14.76	269.04	6,700.03	614.93	740.87	-751.07	10.00	10.00	0.00	0.00
6,900.00	24.76	269.04	6,794.02	614.37	707.12	-717.31	10.00	10.00	0.00	0.00
7,000.00	34.76	269.04	6,880.72	613.54	657.56	-667.74	10.00	10.00	0.00	0.00
7,100.00	44.76	269.04	6,957.50	612.47	593.69	-603.87	10.00	10.00	0.00	0.00
DLS = 10°/100 ft										
7,134.12	48.17	269.04	6,981.00	612.05	568.97	-579.14	10.00	10.00	0.00	0.00
Sharon Springs										
7,200.00	54.76	269.04	7,022.02	611.19	517.47	-527.64	10.00	10.00	0.00	0.00
7,268.26	61.58	269.04	7,058.00	610.22	459.52	-469.68	10.00	10.00	0.00	0.00
Niobrara A										
7,300.00	64.76	269.04	7,072.33	609.74	431.20	-441.36	10.00	10.00	0.00	0.00
7,379.03	72.66	269.04	7,101.00	608.51	357.64	-367.78	10.00	10.00	0.00	0.00
Niobrara B										
7,393.93	74.15	269.04	7,105.26	608.27	343.35	-353.50	10.00	10.00	0.00	0.00
MCKINSTRY 28N-21HZ_HEEL										
7,400.00	74.76	269.04	7,106.88	608.17	337.51	-347.65	10.00	10.00	0.00	0.00
7,500.00	84.76	269.04	7,124.64	606.52	239.24	-249.37	10.00	10.00	0.00	0.00
7,559.44	90.70	269.04	7,127.00	605.53	179.89	-190.01	10.00	10.00	0.00	0.00
End Build @ 7559.44 ft - Niobrara B Target (Heel) - 7"										
7,600.00	90.70	269.04	7,126.50	604.85	139.33	-149.45	0.00	0.00	0.00	0.00
7,700.00	90.70	269.04	7,125.28	603.17	39.36	-49.46	0.00	0.00	0.00	0.00
7,800.00	90.70	269.04	7,124.05	601.50	-60.62	50.54	0.00	0.00	0.00	0.00
7,900.00	90.70	269.04	7,122.83	599.82	-160.60	150.53	0.00	0.00	0.00	0.00

Plan Report for MCKINSTRY 28N-21HZ - PERMIT REV-1

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)	Toolface Azimuth (°)
8,000.00	90.70	269.04	7,121.60	598.15	-260.58	250.52	0.00	0.00	0.00	0.00
8,100.00	90.70	269.04	7,120.38	596.47	-360.56	350.51	0.00	0.00	0.00	0.00
8,200.00	90.70	269.04	7,119.16	594.79	-460.54	450.51	0.00	0.00	0.00	0.00
8,300.00	90.70	269.04	7,117.93	593.12	-560.52	550.50	0.00	0.00	0.00	0.00
8,400.00	90.70	269.04	7,116.71	591.44	-660.49	650.49	0.00	0.00	0.00	0.00
8,500.00	90.70	269.04	7,115.49	589.76	-760.47	750.48	0.00	0.00	0.00	0.00
8,600.00	90.70	269.04	7,114.26	588.09	-860.45	850.48	0.00	0.00	0.00	0.00
8,700.00	90.70	269.04	7,113.04	586.41	-960.43	950.47	0.00	0.00	0.00	0.00
8,800.00	90.70	269.04	7,111.81	584.74	-1,060.41	1,050.46	0.00	0.00	0.00	0.00
8,900.00	90.70	269.04	7,110.59	583.06	-1,160.39	1,150.45	0.00	0.00	0.00	0.00
9,000.00	90.70	269.04	7,109.37	581.38	-1,260.36	1,250.45	0.00	0.00	0.00	0.00
9,100.00	90.70	269.04	7,108.14	579.71	-1,360.34	1,350.44	0.00	0.00	0.00	0.00
9,200.00	90.70	269.04	7,106.92	578.03	-1,460.32	1,450.43	0.00	0.00	0.00	0.00
9,300.00	90.70	269.04	7,105.69	576.36	-1,560.30	1,550.42	0.00	0.00	0.00	0.00
9,400.00	90.70	269.04	7,104.47	574.68	-1,660.28	1,650.42	0.00	0.00	0.00	0.00
9,500.00	90.70	269.04	7,103.25	573.00	-1,760.26	1,750.41	0.00	0.00	0.00	0.00
9,600.00	90.70	269.04	7,102.02	571.33	-1,860.24	1,850.40	0.00	0.00	0.00	0.00
9,700.00	90.70	269.04	7,100.80	569.65	-1,960.21	1,950.39	0.00	0.00	0.00	0.00
9,800.00	90.70	269.04	7,099.58	567.98	-2,060.19	2,050.39	0.00	0.00	0.00	0.00
9,900.00	90.70	269.04	7,098.35	566.30	-2,160.17	2,150.38	0.00	0.00	0.00	0.00
10,000.00	90.70	269.04	7,097.13	564.62	-2,260.15	2,250.37	0.00	0.00	0.00	0.00
10,100.00	90.70	269.04	7,095.90	562.95	-2,360.13	2,350.36	0.00	0.00	0.00	0.00
10,200.00	90.70	269.04	7,094.68	561.27	-2,460.11	2,450.36	0.00	0.00	0.00	0.00
10,300.00	90.70	269.04	7,093.46	559.60	-2,560.08	2,550.35	0.00	0.00	0.00	0.00
10,400.00	90.70	269.04	7,092.23	557.92	-2,660.06	2,650.34	0.00	0.00	0.00	0.00
10,500.00	90.70	269.04	7,091.01	556.24	-2,760.04	2,750.33	0.00	0.00	0.00	0.00
10,600.00	90.70	269.04	7,089.78	554.57	-2,860.02	2,850.33	0.00	0.00	0.00	0.00
10,700.00	90.70	269.04	7,088.56	552.89	-2,960.00	2,950.32	0.00	0.00	0.00	0.00
10,800.00	90.70	269.04	7,087.34	551.21	-3,059.98	3,050.31	0.00	0.00	0.00	0.00
10,900.00	90.70	269.04	7,086.11	549.54	-3,159.96	3,150.30	0.00	0.00	0.00	0.00
11,000.00	90.70	269.04	7,084.89	547.86	-3,259.93	3,250.30	0.00	0.00	0.00	0.00
11,100.00	90.70	269.04	7,083.67	546.19	-3,359.91	3,350.29	0.00	0.00	0.00	0.00
11,200.00	90.70	269.04	7,082.44	544.51	-3,459.89	3,450.28	0.00	0.00	0.00	0.00
11,300.00	90.70	269.04	7,081.22	542.83	-3,559.87	3,550.27	0.00	0.00	0.00	0.00
11,400.00	90.70	269.04	7,079.99	541.16	-3,659.85	3,650.27	0.00	0.00	0.00	0.00
11,500.00	90.70	269.04	7,078.77	539.48	-3,759.83	3,750.26	0.00	0.00	0.00	0.00
11,600.00	90.70	269.04	7,077.55	537.81	-3,859.80	3,850.25	0.00	0.00	0.00	0.00
11,700.00	90.70	269.04	7,076.32	536.13	-3,959.78	3,950.24	0.00	0.00	0.00	0.00
11,800.00	90.70	269.04	7,075.10	534.45	-4,059.76	4,050.24	0.00	0.00	0.00	0.00
11,900.00	90.70	269.04	7,073.87	532.78	-4,159.74	4,150.23	0.00	0.00	0.00	0.00
12,000.00	90.70	269.04	7,072.65	531.10	-4,259.72	4,250.22	0.00	0.00	0.00	0.00
12,100.00	90.70	269.04	7,071.43	529.43	-4,359.70	4,350.21	0.00	0.00	0.00	0.00
12,200.00	90.70	269.04	7,070.20	527.75	-4,459.68	4,450.21	0.00	0.00	0.00	0.00
12,300.00	90.70	269.04	7,068.98	526.07	-4,559.65	4,550.20	0.00	0.00	0.00	0.00
12,400.00	90.70	269.04	7,067.76	524.40	-4,659.63	4,650.19	0.00	0.00	0.00	0.00
12,500.00	90.70	269.04	7,066.53	522.72	-4,759.61	4,750.18	0.00	0.00	0.00	0.00
12,600.00	90.70	269.04	7,065.31	521.05	-4,859.59	4,850.18	0.00	0.00	0.00	0.00
12,700.00	90.70	269.04	7,064.08	519.37	-4,959.57	4,950.17	0.00	0.00	0.00	0.00
12,800.00	90.70	269.04	7,062.86	517.69	-5,059.55	5,050.16	0.00	0.00	0.00	0.00
12,900.00	90.70	269.04	7,061.64	516.02	-5,159.52	5,150.15	0.00	0.00	0.00	0.00
13,000.00	90.70	269.04	7,060.41	514.34	-5,259.50	5,250.15	0.00	0.00	0.00	0.00
13,100.00	90.70	269.04	7,059.19	512.66	-5,359.48	5,350.14	0.00	0.00	0.00	0.00
13,200.00	90.70	269.04	7,057.96	510.99	-5,459.46	5,450.13	0.00	0.00	0.00	0.00
13,300.00	90.70	269.04	7,056.74	509.31	-5,559.44	5,550.12	0.00	0.00	0.00	0.00
13,400.00	90.70	269.04	7,055.52	507.64	-5,659.42	5,650.12	0.00	0.00	0.00	0.00
13,500.00	90.70	269.04	7,054.29	505.96	-5,759.40	5,750.11	0.00	0.00	0.00	0.00
13,600.00	90.70	269.04	7,053.07	504.28	-5,859.37	5,850.10	0.00	0.00	0.00	0.00
13,700.00	90.70	269.04	7,051.85	502.61	-5,959.35	5,950.09	0.00	0.00	0.00	0.00
13,800.00	90.70	269.04	7,050.62	500.93	-6,059.33	6,050.09	0.00	0.00	0.00	0.00
13,900.00	90.70	269.04	7,049.40	499.26	-6,159.31	6,150.08	0.00	0.00	0.00	0.00

Plan Report for MCKINSTRY 28N-21HZ - PERMIT REV-1

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)	Toolface Azimuth (°)
14,000.00	90.70	269.04	7,048.17	497.58	-6,259.29	6,250.07	0.00	0.00	0.00	0.00
14,100.00	90.70	269.04	7,046.95	495.90	-6,359.27	6,350.06	0.00	0.00	0.00	0.00
14,200.00	90.70	269.04	7,045.73	494.23	-6,459.24	6,450.06	0.00	0.00	0.00	0.00
14,300.00	90.70	269.04	7,044.50	492.55	-6,559.22	6,550.05	0.00	0.00	0.00	0.00
14,400.00	90.70	269.04	7,043.28	490.88	-6,659.20	6,650.04	0.00	0.00	0.00	0.00
14,500.00	90.70	269.04	7,042.05	489.20	-6,759.18	6,750.04	0.00	0.00	0.00	0.00
14,600.00	90.70	269.04	7,040.83	487.52	-6,859.16	6,850.03	0.00	0.00	0.00	0.00
14,667.87	90.70	269.04	7,040.00	486.39	-6,927.01	6,917.89	0.00	0.00	0.00	0.00
Niobrara B Target (Toe)										
14,667.88	90.70	269.04	7,040.00	486.39	-6,927.02	6,917.90	0.00	0.00	0.00	0.00
TD Well @ 14667.88 ft - MCKINSTRY 28N-21HZ_BHL										

Plan Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates +N/-S (usft)	Local Coordinates +E/-W (usft)	Comment
0.00	0.00	0.00	0.00	Tie On to Surface @ 0.00 ft
1,252.00	1,252.00	0.00	0.00	Begin Nudge @ 1252.00 ft
1,852.00	1,847.62	39.40	48.65	End Nudge @ 1852.00 ft
5,952.00	5,858.03	575.85	711.12	Begin Drop @ 5952.00 ft
6,552.00	6,453.65	615.25	759.77	End Drop @ 6552.00 ft
6,552.43	6,454.08	615.25	759.77	Set 4.5" Liner @ 6552.43 ft
6,652.00	6,553.65	615.25	759.77	KOP @ 6652.00 ft
7,100.00	6,957.50	612.47	593.69	DLS = 10°/100 ft
7,559.44	7,127.00	605.53	179.89	End Build @ 7559.44 ft
14,667.88	7,040.00	486.39	-6,927.02	TD Well @ 14667.88 ft

Vertical Section Information

Angle Type	Target	Azimuth (°)	Origin Type	Origin +N/_S (usft)	Origin +E/-W (usft)	Start TVD (usft)
User	No Target (Freehand)	269.04	Slot	0.00	0.00	0.00

Survey tool program

From (usft)	To (usft)	Survey/Plan	Survey Tool
0.00	7,559.44	PERMIT REV-1	MWD+IFR1
7,559.44	14,667.88	PERMIT REV-1	MWD+IFR1

Casing Details

Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
749.00	749.00	9 5/8"	9-5/8	13-1/2
7,559.44	7,127.00	7"	7	8-3/4

Plan Report for MCKINSTRY 28N-21HZ - PERMIT REV-1

Formation Details

Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
698.00	698.00	Fox Hills		0.00	
3,645.57	3,602.00	Parkman		0.00	
4,153.67	4,099.00	Sussex		0.00	
4,667.91	4,602.00	Shannon		0.00	
7,134.12	6,981.00	Sharon Springs		0.00	
7,268.26	7,058.00	Niobrara A		0.00	
7,379.03	7,101.00	Niobrara B		0.00	
7,559.44	7,127.00	Niobrara B Target (Heel)		0.00	
14,667.87	7,040.00	Niobrara B Target (Toe)		0.00	

Targets associated with this wellbore

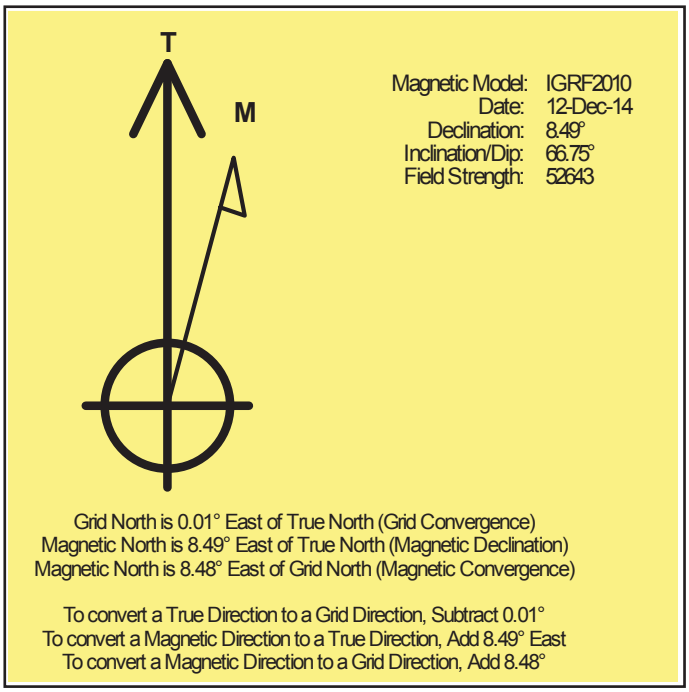
Target Name	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Shape
3N-R68W-Sec. 22_Section Lines	-14.00	-919.12	3.35	Polygon
3N-R68W-Sec. 23_Section Lines	-14.00	-919.12	3.35	Polygon
3N-R68W-Sec. 21_Section Lines	-14.00	-919.12	3.35	Polygon
MCKINSTRY 28N-21HZ_HEEL	7,127.00	591.00	350.00	Point
MCKINSTRY 28N-21HZ_BHL	7,040.00	486.39	-6,927.02	Point
MCKINSTRY 28N-21HZ_SHL	0.00	0.00	0.00	Point

North Reference Sheet for MCKINSTRY 1-22HZ PAD - MCKINSTRY 28N-21HZ - Plan A

All data is in US Feet unless otherwise stated. Directions and Coordinates are relative to True North Reference.
Vertical Depths are relative to RKB = 17' @ 4987.00usft (Drilling Rig). Northing and Easting are relative to MCKINSTRY 28N-21HZ
Coordinate System is Universal Transverse Mercator (US Survey Feet), Zone 13N (108 W to 102 W) using datum North American Datum 1983, ellipsoid

Projection method is Transverse Mercator (Gauss-Kruger)
Central Meridian is -105.00°, Longitude Origin:0.000000°, Latitude Origin:0.000000°
False Easting: 1,640,416.67usft, False Northing: 0.00usft, Scale Reduction: 0.99960003

Grid Coordinates of Well: 14,605,675.68 usft N, 1,645,610.78 usft E
Geographical Coordinates of Well: 40° 13' 00.43" N, 104° 58' 53.02" W
Grid Convergence at Surface is: 0.01°

Based upon Minimum Curvature type calculations, at a Measured Depth of 14,667.88usft
the Bottom Hole Displacement is 6,944.08usft in the Direction of 274.02° (True).

Magnetic Convergence at surface is: -8.48° (12 December 2014, , IGRF2010)