

US ROCKIES WATTENBERG PLANNING

WELD-NAD83-UTMFT13N
Wilson Ranch 1-26HZ Pad
WILSON RANCH 4C-27HZ

Plan A

Plan: PERMIT REV-1

Sperry Drilling Services Proposal Report

05 December, 2014

Well Coordinates: 14,632,306.55 N, 1,650,648.15 E (40° 17' 23.68" N, 104° 57' 47.92" W)
Ground Level: 4,951.00 usft

Local Coordinate Origin:	Centered on Well WILSON RANCH 4C-27HZ
Viewing Datum:	RKB = 17' @ 4968.00usft (Drilling Rig)
TVDs to System:	N
North Reference:	True
Unit System:	Dec-Deg - API - US Survey Feet - Custom

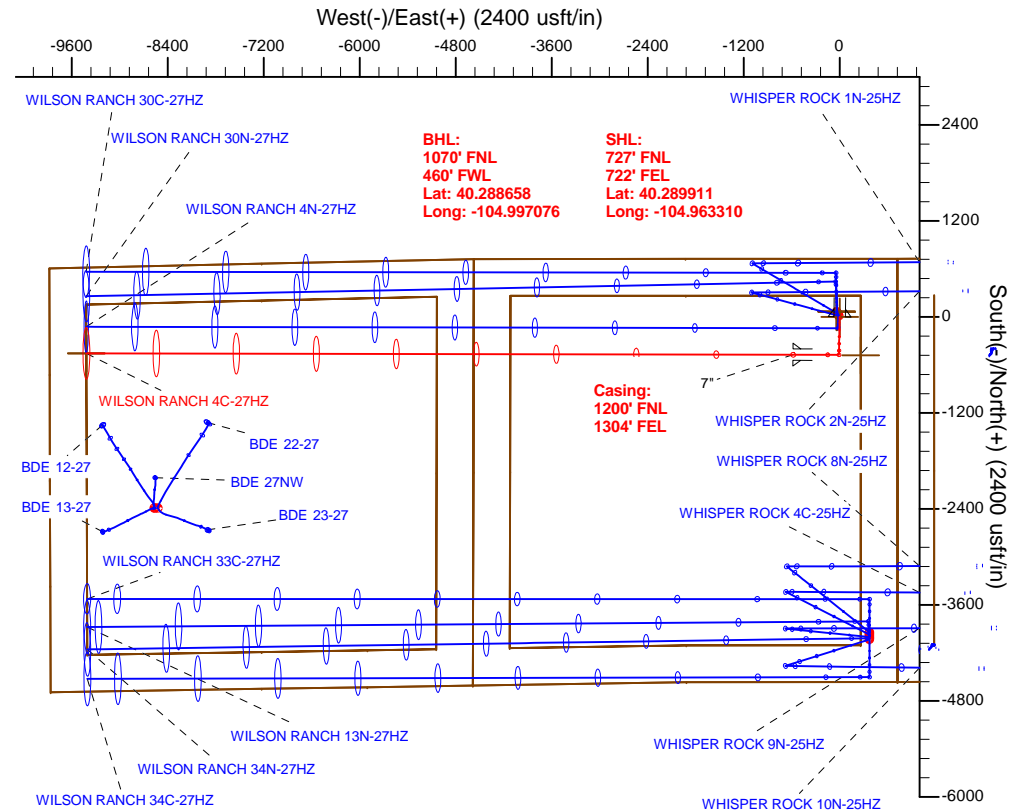
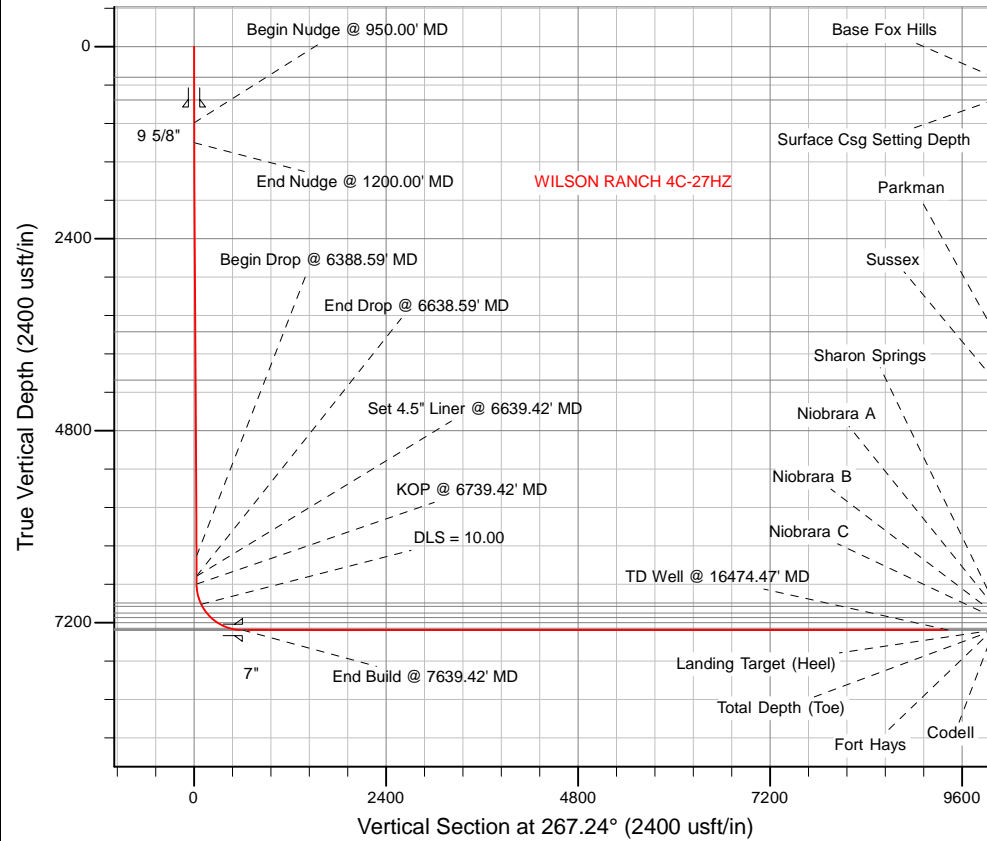
Version: 5000.1 Build: 70

HALLIBURTON

Project: WELD-NAD83-UTMFT13N
Site: Wilson Ranch 1-26HZ Pad
Well: WILSON RANCH 4C-27HZ
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	VSec	Target
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
2	950.00	0.00	0.00	950.00	0.00	0.00	0.00	0.00	0.00	
3	1200.00	5.00	181.00	1199.68	-10.90	-0.19	2.00	181.00	0.72	
4	6388.59	5.00	181.00	6368.53	-463.05	-8.08	0.00	0.00	30.40	
5	6638.59	0.00	0.00	6618.21	-473.95	-8.27	2.00	180.00	31.11	
6	6739.42	0.00	0.00	6719.04	-473.95	-8.27	0.00	0.00	31.11	
7	7639.42	90.00	270.12	7292.00	-472.76	-581.23	10.00	270.12	603.35	
8	16474.47	90.00	270.12	7292.00	-454.50	-9416.26	0.00	0.00	9427.22	WILSON RANCH 4C-27HZ_BHL

WELLBORE TARGET DETAILS (LAT/LONG)

Name	TVD	+N/-S	+E/-W	Latitude	Longitude	Shape
WILSON RANCH 1-26HZ_SEC	0.00	65.55	-36.53	40.290091	-104.963441	Polygon
WILSON RANCH 1-26HZ_SEC 25 SB	0.00	65.55	-36.53	40.290091	-104.963441	Polygon
WILSON RANCH 1-26HZ_SEC 26 SB	0.00	65.55	-36.53	40.290091	-104.963441	Polygon
WILSON RANCH 1-26HZ_SEC 27 SB	0.00	65.55	-36.53	40.290091	-104.963441	Polygon
WILSON RANCH 4C-27HZ_SHL	0.00	0.00	0.00	40.289911	-104.963310	Point
WILSON RANCH 4C-27HZ_BHL	7291.00	-454.50	-9416.26	40.288658	-104.997076	Point
WILSON RANCH 4C-27HZ_HEEL	7291.00	-478.00	262.00	40.288598	-104.962370	Point
WILSON RANCH 4C-27HZ_BHL	7292.00	-454.50	-9416.26	40.288658	-104.997076	Point

WELL DETAILS: WILSON RANCH 4C-27HZ

Ground Level: 4951.00

RKB = 17' @ 4968.00usft (Drilling Rig)

TVD	MD	Annotation
6619.04	6639.42	Set 4.5" Liner @ 6639.42' MD
6719.04	6739.42	KOP @ 6739.42' MD

Plan: PERMIT REV-1 (WILSON RANCH 4C-27HZ/Plan A)

Created By: Katie Benner
Reviewed: _____
Date: 12/5/2014
Date: _____

Plan Report for WILSON RANCH 4C-27HZ - 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
WILSON RANCH 4C-27HZ_SHL - WILSON RANCH 1-26HZ_SEC 27 SB - WILSON RANCH 1-26HZ_SEC - WILSON RANCH 1-26HZ_SEC 26 SB - WILS										
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
381.00	0.00	0.00	381.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Base Fox Hills										
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
666.00	0.00	0.00	666.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Surface Csg Setting Depth										
700.00	0.00	0.00	700.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
754.00	0.00	0.00	754.00	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
950.00	0.00	0.00	950.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Begin Nudge @ 950.00' MD										
1,000.00	1.00	181.00	1,000.00	-0.44	-0.01	0.03	2.00	2.00	0.00	181.00
1,100.00	3.00	181.00	1,099.93	-3.93	-0.07	0.26	2.00	2.00	0.00	0.00
1,200.00	5.00	181.00	1,199.68	-10.90	-0.19	0.72	2.00	2.00	0.00	0.00
End Nudge @ 1200.00' MD										
1,300.00	5.00	181.00	1,299.30	-19.61	-0.34	1.29	0.00	0.00	0.00	0.00
1,400.00	5.00	181.00	1,398.92	-28.33	-0.49	1.86	0.00	0.00	0.00	0.00
1,500.00	5.00	181.00	1,498.54	-37.04	-0.65	2.43	0.00	0.00	0.00	0.00
1,600.00	5.00	181.00	1,598.16	-45.76	-0.80	3.00	0.00	0.00	0.00	0.00
1,700.00	5.00	181.00	1,697.78	-54.47	-0.95	3.58	0.00	0.00	0.00	0.00
1,800.00	5.00	181.00	1,797.40	-63.19	-1.10	4.15	0.00	0.00	0.00	0.00
1,900.00	5.00	181.00	1,897.02	-71.90	-1.26	4.72	0.00	0.00	0.00	0.00
2,000.00	5.00	181.00	1,996.64	-80.61	-1.41	5.29	0.00	0.00	0.00	0.00
2,100.00	5.00	181.00	2,096.26	-89.33	-1.56	5.86	0.00	0.00	0.00	0.00
2,200.00	5.00	181.00	2,195.88	-98.04	-1.71	6.44	0.00	0.00	0.00	0.00
2,300.00	5.00	181.00	2,295.50	-106.76	-1.86	7.01	0.00	0.00	0.00	0.00
2,400.00	5.00	181.00	2,395.12	-115.47	-2.02	7.58	0.00	0.00	0.00	0.00
2,500.00	5.00	181.00	2,494.74	-124.18	-2.17	8.15	0.00	0.00	0.00	0.00
2,600.00	5.00	181.00	2,594.36	-132.90	-2.32	8.72	0.00	0.00	0.00	0.00
2,700.00	5.00	181.00	2,693.97	-141.61	-2.47	9.30	0.00	0.00	0.00	0.00
2,800.00	5.00	181.00	2,793.59	-150.33	-2.62	9.87	0.00	0.00	0.00	0.00
2,900.00	5.00	181.00	2,893.21	-159.04	-2.78	10.44	0.00	0.00	0.00	0.00
3,000.00	5.00	181.00	2,992.83	-167.76	-2.93	11.01	0.00	0.00	0.00	0.00
3,100.00	5.00	181.00	3,092.45	-176.47	-3.08	11.58	0.00	0.00	0.00	0.00
3,200.00	5.00	181.00	3,192.07	-185.18	-3.23	12.16	0.00	0.00	0.00	0.00
3,300.00	5.00	181.00	3,291.69	-193.90	-3.38	12.73	0.00	0.00	0.00	0.00
3,400.00	5.00	181.00	3,391.31	-202.61	-3.54	13.30	0.00	0.00	0.00	0.00
3,500.00	5.00	181.00	3,490.93	-211.33	-3.69	13.87	0.00	0.00	0.00	0.00
3,574.35	5.00	181.00	3,565.00	-217.81	-3.80	14.30	0.00	0.00	0.00	0.00
Parkman										
3,600.00	5.00	181.00	3,590.55	-220.04	-3.84	14.44	0.00	0.00	0.00	0.00
3,700.00	5.00	181.00	3,690.17	-228.76	-3.99	15.02	0.00	0.00	0.00	0.00
3,800.00	5.00	181.00	3,789.79	-237.47	-4.15	15.59	0.00	0.00	0.00	0.00
3,900.00	5.00	181.00	3,889.41	-246.18	-4.30	16.16	0.00	0.00	0.00	0.00
4,000.00	5.00	181.00	3,989.03	-254.90	-4.45	16.73	0.00	0.00	0.00	0.00
4,100.00	5.00	181.00	4,088.65	-263.61	-4.60	17.31	0.00	0.00	0.00	0.00
4,178.65	5.00	181.00	4,167.00	-270.47	-4.72	17.76	0.00	0.00	0.00	0.00
Sussex										
4,200.00	5.00	181.00	4,188.27	-272.33	-4.75	17.88	0.00	0.00	0.00	0.00
4,300.00	5.00	181.00	4,287.89	-281.04	-4.91	18.45	0.00	0.00	0.00	0.00

Plan Report for WILSON RANCH 4C-27HZ - 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	5.00	181.00	4,387.51	-289.76	-5.06	19.02	0.00	0.00	0.00	0.00
4,500.00	5.00	181.00	4,487.13	-298.47	-5.21	19.59	0.00	0.00	0.00	0.00
4,600.00	5.00	181.00	4,586.74	-307.18	-5.36	20.17	0.00	0.00	0.00	0.00
4,700.00	5.00	181.00	4,686.36	-315.90	-5.51	20.74	0.00	0.00	0.00	0.00
4,800.00	5.00	181.00	4,785.98	-324.61	-5.67	21.31	0.00	0.00	0.00	0.00
4,900.00	5.00	181.00	4,885.60	-333.33	-5.82	21.88	0.00	0.00	0.00	0.00
5,000.00	5.00	181.00	4,985.22	-342.04	-5.97	22.45	0.00	0.00	0.00	0.00
5,100.00	5.00	181.00	5,084.84	-350.76	-6.12	23.03	0.00	0.00	0.00	0.00
5,200.00	5.00	181.00	5,184.46	-359.47	-6.27	23.60	0.00	0.00	0.00	0.00
5,300.00	5.00	181.00	5,284.08	-368.18	-6.43	24.17	0.00	0.00	0.00	0.00
5,400.00	5.00	181.00	5,383.70	-376.90	-6.58	24.74	0.00	0.00	0.00	0.00
5,500.00	5.00	181.00	5,483.32	-385.61	-6.73	25.31	0.00	0.00	0.00	0.00
5,600.00	5.00	181.00	5,582.94	-394.33	-6.88	25.89	0.00	0.00	0.00	0.00
5,700.00	5.00	181.00	5,682.56	-403.04	-7.04	26.46	0.00	0.00	0.00	0.00
5,800.00	5.00	181.00	5,782.18	-411.76	-7.19	27.03	0.00	0.00	0.00	0.00
5,900.00	5.00	181.00	5,881.80	-420.47	-7.34	27.60	0.00	0.00	0.00	0.00
6,000.00	5.00	181.00	5,981.42	-429.18	-7.49	28.17	0.00	0.00	0.00	0.00
6,100.00	5.00	181.00	6,081.04	-437.90	-7.64	28.75	0.00	0.00	0.00	0.00
6,200.00	5.00	181.00	6,180.66	-446.61	-7.80	29.32	0.00	0.00	0.00	0.00
6,300.00	5.00	181.00	6,280.28	-455.33	-7.95	29.89	0.00	0.00	0.00	0.00
6,388.59	5.00	181.00	6,368.53	-463.05	-8.08	30.40	0.00	0.00	0.00	0.00
Begin Drop @ 6388.59' MD										
6,400.00	4.77	181.00	6,379.90	-464.02	-8.10	30.46	2.00	-2.00	0.00	-180.00
6,500.00	2.77	181.00	6,479.68	-470.59	-8.21	30.89	2.00	-2.00	0.00	180.00
6,600.00	0.77	181.00	6,579.62	-473.69	-8.27	31.10	2.00	-2.00	0.00	180.00
6,638.59	0.00	0.00	6,618.21	-473.95	-8.27	31.11	2.00	-2.00	0.00	180.00
End Drop @ 6638.59' MD										
6,639.42	0.00	0.00	6,619.04	-473.95	-8.27	31.11	0.00	0.00	0.00	0.00
Set 4.5" Liner @ 6639.42' MD										
6,700.00	0.00	0.00	6,679.62	-473.95	-8.27	31.11	0.00	0.00	0.00	0.00
6,739.42	0.00	0.00	6,719.04	-473.95	-8.27	31.11	0.00	0.00	0.00	0.00
KOP @ 6739.42' MD										
6,800.00	6.06	270.12	6,779.51	-473.94	-11.47	34.31	10.00	10.00	0.00	270.12
6,900.00	16.06	270.12	6,877.53	-473.90	-30.63	53.44	10.00	10.00	0.00	0.00
6,979.33	23.99	270.12	6,952.00	-473.84	-57.77	80.55	10.00	10.00	0.00	0.00
Sharon Springs										
7,000.00	26.06	270.12	6,970.73	-473.83	-66.51	89.28	10.00	10.00	0.00	0.00
DLS = 10.00										
7,029.63	29.02	270.12	6,997.00	-473.80	-80.21	102.96	10.00	10.00	0.00	0.00
Niobrara A										
7,093.45	35.40	270.12	7,050.97	-473.73	-114.21	136.92	10.00	10.00	0.00	0.00
WILSON RANCH 4C-27HZ_HEEL										
7,100.00	36.06	270.12	7,056.29	-473.72	-118.04	140.74	10.00	10.00	0.00	0.00
7,131.20	39.18	270.12	7,081.00	-473.68	-137.08	159.76	10.00	10.00	0.00	0.00
Niobrara B										
7,200.00	46.06	270.12	7,131.60	-473.58	-183.64	206.26	10.00	10.00	0.00	0.00
7,206.38	46.70	270.12	7,136.00	-473.57	-188.26	210.87	10.00	10.00	0.00	0.00
Niobrara C										
7,300.00	56.06	270.12	7,194.37	-473.42	-261.32	283.84	10.00	10.00	0.00	0.00
7,400.00	66.06	270.12	7,242.70	-473.24	-348.72	371.13	10.00	10.00	0.00	0.00
7,476.53	73.71	270.12	7,269.00	-473.09	-420.52	442.84	10.00	10.00	0.00	0.00
Fort Hays										
7,500.00	76.06	270.12	7,275.12	-473.05	-443.18	465.47	10.00	10.00	0.00	0.00
7,580.76	84.13	270.12	7,289.00	-472.88	-522.67	544.86	10.00	10.00	0.00	0.00
Codell										
7,600.00	86.06	270.12	7,290.64	-472.84	-541.84	564.01	10.00	10.00	0.00	0.00
7,638.58	89.92	270.12	7,292.00	-472.76	-580.39	602.51	10.00	10.00	0.00	0.00
Landing Target (Heel) - Total Depth (Toe)										

Plan Report for WILSON RANCH 4C-27HZ - 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 (°)
7,639.42	90.00	270.12	7,292.00	-472.76	-581.23	603.34	10.00	10.00	0.00	0.00
End Build @ 7639.42' MD - 7"										
7,700.00	90.00	270.12	7,292.00	-472.64	-641.81	663.85	0.00	0.00	0.00	0.00
7,800.00	90.00	270.12	7,292.00	-472.43	-741.81	763.72	0.00	0.00	0.00	0.00
7,900.00	90.00	270.12	7,292.00	-472.22	-841.81	863.59	0.00	0.00	0.00	0.00
8,000.00	90.00	270.12	7,292.00	-472.02	-941.81	963.47	0.00	0.00	0.00	0.00
8,100.00	90.00	270.12	7,292.00	-471.81	-1,041.81	1,063.34	0.00	0.00	0.00	0.00
8,200.00	90.00	270.12	7,292.00	-471.60	-1,141.81	1,163.22	0.00	0.00	0.00	0.00
8,300.00	90.00	270.12	7,292.00	-471.40	-1,241.81	1,263.09	0.00	0.00	0.00	0.00
8,400.00	90.00	270.12	7,292.00	-471.19	-1,341.81	1,362.96	0.00	0.00	0.00	0.00
8,500.00	90.00	270.12	7,292.00	-470.98	-1,441.81	1,462.84	0.00	0.00	0.00	0.00
8,600.00	90.00	270.12	7,292.00	-470.78	-1,541.81	1,562.71	0.00	0.00	0.00	0.00
8,700.00	90.00	270.12	7,292.00	-470.57	-1,641.81	1,662.58	0.00	0.00	0.00	0.00
8,800.00	90.00	270.12	7,292.00	-470.36	-1,741.81	1,762.46	0.00	0.00	0.00	0.00
8,900.00	90.00	270.12	7,292.00	-470.16	-1,841.81	1,862.33	0.00	0.00	0.00	0.00
9,000.00	90.00	270.12	7,292.00	-469.95	-1,941.81	1,962.20	0.00	0.00	0.00	0.00
9,100.00	90.00	270.12	7,292.00	-469.74	-2,041.80	2,062.08	0.00	0.00	0.00	0.00
9,200.00	90.00	270.12	7,292.00	-469.54	-2,141.80	2,161.95	0.00	0.00	0.00	0.00
9,300.00	90.00	270.12	7,292.00	-469.33	-2,241.80	2,261.82	0.00	0.00	0.00	0.00
9,400.00	90.00	270.12	7,292.00	-469.12	-2,341.80	2,361.70	0.00	0.00	0.00	0.00
9,500.00	90.00	270.12	7,292.00	-468.92	-2,441.80	2,461.57	0.00	0.00	0.00	0.00
9,600.00	90.00	270.12	7,292.00	-468.71	-2,541.80	2,561.45	0.00	0.00	0.00	0.00
9,700.00	90.00	270.12	7,292.00	-468.50	-2,641.80	2,661.32	0.00	0.00	0.00	0.00
9,800.00	90.00	270.12	7,292.00	-468.29	-2,741.80	2,761.19	0.00	0.00	0.00	0.00
9,900.00	90.00	270.12	7,292.00	-468.09	-2,841.80	2,861.07	0.00	0.00	0.00	0.00
10,000.00	90.00	270.12	7,292.00	-467.88	-2,941.80	2,960.94	0.00	0.00	0.00	0.00
10,100.00	90.00	270.12	7,292.00	-467.67	-3,041.80	3,060.81	0.00	0.00	0.00	0.00
10,200.00	90.00	270.12	7,292.00	-467.47	-3,141.80	3,160.69	0.00	0.00	0.00	0.00
10,300.00	90.00	270.12	7,292.00	-467.26	-3,241.80	3,260.56	0.00	0.00	0.00	0.00
10,400.00	90.00	270.12	7,292.00	-467.05	-3,341.80	3,360.43	0.00	0.00	0.00	0.00
10,500.00	90.00	270.12	7,292.00	-466.85	-3,441.80	3,460.31	0.00	0.00	0.00	0.00
10,600.00	90.00	270.12	7,292.00	-466.64	-3,541.80	3,560.18	0.00	0.00	0.00	0.00
10,700.00	90.00	270.12	7,292.00	-466.43	-3,641.80	3,660.05	0.00	0.00	0.00	0.00
10,800.00	90.00	270.12	7,292.00	-466.23	-3,741.80	3,759.93	0.00	0.00	0.00	0.00
10,900.00	90.00	270.12	7,292.00	-466.02	-3,841.80	3,859.80	0.00	0.00	0.00	0.00
11,000.00	90.00	270.12	7,292.00	-465.81	-3,941.80	3,959.67	0.00	0.00	0.00	0.00
11,100.00	90.00	270.12	7,292.00	-465.61	-4,041.80	4,059.55	0.00	0.00	0.00	0.00
11,200.00	90.00	270.12	7,292.00	-465.40	-4,141.80	4,159.42	0.00	0.00	0.00	0.00
11,300.00	90.00	270.12	7,292.00	-465.19	-4,241.80	4,259.30	0.00	0.00	0.00	0.00
11,400.00	90.00	270.12	7,292.00	-464.99	-4,341.80	4,359.17	0.00	0.00	0.00	0.00
11,500.00	90.00	270.12	7,292.00	-464.78	-4,441.80	4,459.04	0.00	0.00	0.00	0.00
11,600.00	90.00	270.12	7,292.00	-464.57	-4,541.80	4,558.92	0.00	0.00	0.00	0.00
11,700.00	90.00	270.12	7,292.00	-464.37	-4,641.80	4,658.79	0.00	0.00	0.00	0.00
11,800.00	90.00	270.12	7,292.00	-464.16	-4,741.80	4,758.66	0.00	0.00	0.00	0.00
11,900.00	90.00	270.12	7,292.00	-463.95	-4,841.80	4,858.54	0.00	0.00	0.00	0.00
12,000.00	90.00	270.12	7,292.00	-463.75	-4,941.80	4,958.41	0.00	0.00	0.00	0.00
12,100.00	90.00	270.12	7,292.00	-463.54	-5,041.80	5,058.28	0.00	0.00	0.00	0.00
12,200.00	90.00	270.12	7,292.00	-463.33	-5,141.80	5,158.16	0.00	0.00	0.00	0.00
12,300.00	90.00	270.12	7,292.00	-463.13	-5,241.80	5,258.03	0.00	0.00	0.00	0.00
12,400.00	90.00	270.12	7,292.00	-462.92	-5,341.80	5,357.90	0.00	0.00	0.00	0.00
12,500.00	90.00	270.12	7,292.00	-462.71	-5,441.80	5,457.78	0.00	0.00	0.00	0.00
12,600.00	90.00	270.12	7,292.00	-462.51	-5,541.80	5,557.65	0.00	0.00	0.00	0.00
12,700.00	90.00	270.12	7,292.00	-462.30	-5,641.80	5,657.52	0.00	0.00	0.00	0.00
12,800.00	90.00	270.12	7,292.00	-462.09	-5,741.80	5,757.40	0.00	0.00	0.00	0.00
12,900.00	90.00	270.12	7,292.00	-461.89	-5,841.80	5,857.27	0.00	0.00	0.00	0.00
13,000.00	90.00	270.12	7,292.00	-461.68	-5,941.80	5,957.15	0.00	0.00	0.00	0.00
13,100.00	90.00	270.12	7,292.00	-461.47	-6,041.80	6,057.02	0.00	0.00	0.00	0.00
13,200.00	90.00	270.12	7,292.00	-461.27	-6,141.80	6,156.89	0.00	0.00	0.00	0.00
13,300.00	90.00	270.12	7,292.00	-461.06	-6,241.80	6,256.77	0.00	0.00	0.00	0.00

Plan Report for WILSON RANCH 4C-27HZ - 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 (°)
13,400.00	90.00	270.12	7,292.00	-460.85	-6,341.80	6,356.64	0.00	0.00	0.00	0.00
13,500.00	90.00	270.12	7,292.00	-460.65	-6,441.80	6,456.51	0.00	0.00	0.00	0.00
13,600.00	90.00	270.12	7,292.00	-460.44	-6,541.80	6,556.39	0.00	0.00	0.00	0.00
13,700.00	90.00	270.12	7,292.00	-460.23	-6,641.80	6,656.26	0.00	0.00	0.00	0.00
13,800.00	90.00	270.12	7,292.00	-460.03	-6,741.79	6,756.13	0.00	0.00	0.00	0.00
13,900.00	90.00	270.12	7,292.00	-459.82	-6,841.79	6,856.01	0.00	0.00	0.00	0.00
14,000.00	90.00	270.12	7,292.00	-459.61	-6,941.79	6,955.88	0.00	0.00	0.00	0.00
14,100.00	90.00	270.12	7,292.00	-459.41	-7,041.79	7,055.75	0.00	0.00	0.00	0.00
14,200.00	90.00	270.12	7,292.00	-459.20	-7,141.79	7,155.63	0.00	0.00	0.00	0.00
14,300.00	90.00	270.12	7,292.00	-458.99	-7,241.79	7,255.50	0.00	0.00	0.00	0.00
14,400.00	90.00	270.12	7,292.00	-458.79	-7,341.79	7,355.37	0.00	0.00	0.00	0.00
14,500.00	90.00	270.12	7,292.00	-458.58	-7,441.79	7,455.25	0.00	0.00	0.00	0.00
14,600.00	90.00	270.12	7,292.00	-458.37	-7,541.79	7,555.12	0.00	0.00	0.00	0.00
14,700.00	90.00	270.12	7,292.00	-458.16	-7,641.79	7,655.00	0.00	0.00	0.00	0.00
14,800.00	90.00	270.12	7,292.00	-457.96	-7,741.79	7,754.87	0.00	0.00	0.00	0.00
14,900.00	90.00	270.12	7,292.00	-457.75	-7,841.79	7,854.74	0.00	0.00	0.00	0.00
15,000.00	90.00	270.12	7,292.00	-457.54	-7,941.79	7,954.62	0.00	0.00	0.00	0.00
15,100.00	90.00	270.12	7,292.00	-457.34	-8,041.79	8,054.49	0.00	0.00	0.00	0.00
15,200.00	90.00	270.12	7,292.00	-457.13	-8,141.79	8,154.36	0.00	0.00	0.00	0.00
15,300.00	90.00	270.12	7,292.00	-456.92	-8,241.79	8,254.24	0.00	0.00	0.00	0.00
15,400.00	90.00	270.12	7,292.00	-456.72	-8,341.79	8,354.11	0.00	0.00	0.00	0.00
15,500.00	90.00	270.12	7,292.00	-456.51	-8,441.79	8,453.98	0.00	0.00	0.00	0.00
15,600.00	90.00	270.12	7,292.00	-456.30	-8,541.79	8,553.86	0.00	0.00	0.00	0.00
15,700.00	90.00	270.12	7,292.00	-456.10	-8,641.79	8,653.73	0.00	0.00	0.00	0.00
15,800.00	90.00	270.12	7,292.00	-455.89	-8,741.79	8,753.60	0.00	0.00	0.00	0.00
15,900.00	90.00	270.12	7,292.00	-455.68	-8,841.79	8,853.48	0.00	0.00	0.00	0.00
16,000.00	90.00	270.12	7,292.00	-455.48	-8,941.79	8,953.35	0.00	0.00	0.00	0.00
16,100.00	90.00	270.12	7,292.00	-455.27	-9,041.79	9,053.22	0.00	0.00	0.00	0.00
16,200.00	90.00	270.12	7,292.00	-455.06	-9,141.79	9,153.10	0.00	0.00	0.00	0.00
16,300.00	90.00	270.12	7,292.00	-454.86	-9,241.79	9,252.97	0.00	0.00	0.00	0.00
16,400.00	90.00	270.12	7,292.00	-454.65	-9,341.79	9,352.85	0.00	0.00	0.00	0.00
16,474.47	90.00	270.12	7,292.00	-454.50	-9,416.26	9,427.22	0.00	0.00	0.00	0.00

TD Well @ 16474.47' MD - WILSON RANCH 4C-27HZ_BHL - WILSON RANCH 4C-27HZ_BHL

Plan Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates +N/-S (usft)	+E/-W (usft)	Comment
950.00	950.00	0.00	0.00	Begin Nudge @ 950.00' MD
1,200.00	1,199.68	-10.90	-0.19	End Nudge @ 1200.00' MD
6,388.59	6,368.53	-463.05	-8.08	Begin Drop @ 6388.59' MD
6,638.59	6,618.21	-473.95	-8.27	End Drop @ 6638.59' MD
6,639.42	6,619.04	-473.95	-8.27	Set 4.5" Liner @ 6639.42' MD
6,739.42	6,719.04	-473.95	-8.27	KOP @ 6739.42' MD
7,000.00	6,970.73	-473.83	-66.51	DLS = 10.00
7,639.42	7,292.00	-472.76	-581.23	End Build @ 7639.42' MD
16,474.47	7,292.00	-454.50	-9,416.26	TD Well @ 16474.47' MD

Vertical Section Information

Angle Type	Target	Azimuth (°)	Origin Type	Origin +N/_S (usft)	+E/-W (usft)	Start TVD (usft)
TD	No Target (Freehand)	267.24	Slot	0.00	0.00	0.00

Plan Report for WILSON RANCH 4C-27HZ - PERMIT REV-1

Survey tool program

From (usft)	To (usft)	Survey/Plan	Survey Tool
0.00	7,639.42	PERMIT REV-1	MWD+IFR1
7,639.42	16,474.47	PERMIT REV-1	MWD+IFR1

Casing Details

Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
754.00	754.00	9 5/8"	9-5/8	13-1/2
7,639.42	7,292.00	7"	7	8-3/4

Formation Details

Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
381.00	381.00	Base Fox Hills			
666.00	666.00	Surface Csg Setting Depth			
3,574.35	3,565.00	Parkman			
4,178.65	4,167.00	Sussex			
6,979.33	6,952.00	Sharon Springs			
7,029.63	6,997.00	Niobrara A			
7,131.20	7,081.00	Niobrara B			
7,206.38	7,136.00	Niobrara C			
7,476.53	7,269.00	Fort Hays			
7,580.76	7,289.00	Codell			
7,638.58	7,292.00	Landing Target (Heel)			
7,638.58	7,292.00	Total Depth (Toe)			

Targets associated with this wellbore

Target Name	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Shape
WILSON RANCH 4C-27HZ_SHL	0.00	0.00	0.00	Point
WILSON RANCH 1-26HZ_SEC 27 SB	0.00	65.55	-36.53	Polygon
WILSON RANCH 4C-27HZ_BHL	7,291.00	-454.50	-9,416.26	Point
WILSON RANCH 4C-27HZ_BHL	7,292.00	-454.50	-9,416.26	Point
WILSON RANCH 4C-27HZ_HEEL	7,291.00	-478.00	262.00	Point
WILSON RANCH 1-26HZ_SEC	0.00	65.55	-36.53	Polygon
WILSON RANCH 1-26HZ_SEC 26 SB	0.00	65.55	-36.53	Polygon
WILSON RANCH 1-26HZ_SEC 25 SB	0.00	65.55	-36.53	Polygon

North Reference Sheet for Wilson Ranch 1-26HZ Pad - WILSON RANCH 4C-27HZ - 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' @ 4968.00usft (Drilling Rig). Northing and Easting are relative to WILSON RANCH 4C-27HZ

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: 0.99960012

Grid Coordinates of Well: 14,632,306.55 usft N, 1,650,648.15 usft E

Geographical Coordinates of Well: 40° 17' 23.68" N, 104° 57' 47.92" W

Grid Convergence at Surface is: 0.02°

Based upon Minimum Curvature type calculations, at a Measured Depth of 16,474.47usft
the Bottom Hole Displacement is 9,427.22usft in the Direction of 267.24° (True).

Magnetic Convergence at surface is: -8.48° (11 November 2014, , IGRF2010)

