

# Anadarko Petroleum Corp.

Weld County, CO (NAD 83)

Sec. 18-T3N-R67W

Sekich State 16N-17HZ

## Plan A

Plan: Rev A0 Permit

## Sperry Drilling Services

## Proposal Report

27 November, 2013

Well Coordinates: 1,323,759.77 N, 3,156,421.79 E (40° 13' 14.74" N, 104° 56' 23.42" W)

Ground Level: 4,875.00 usft

Local Coordinate Origin:

Viewing Datum:

TVDs to System:

North Reference:

Unit System:

Geodetic Scale Factor Applied

Version: 5000.1 Build: 70

Centered on Well Sekich State 16N-17HZ

RKB = 17' @ 4892.00usft (Drilling Rig)

N

True

API - US Survey Feet - Custom

**HALLIBURTON**

Project: Weld County, CO (NAD 83)  
Site: Sec. 18-T3N-R67W  
Well: Sekich State 16N-17HZ  
Wellbore: Plan A  
Design: Rev A0 Permit

# Anadarko Petroleum Corp.

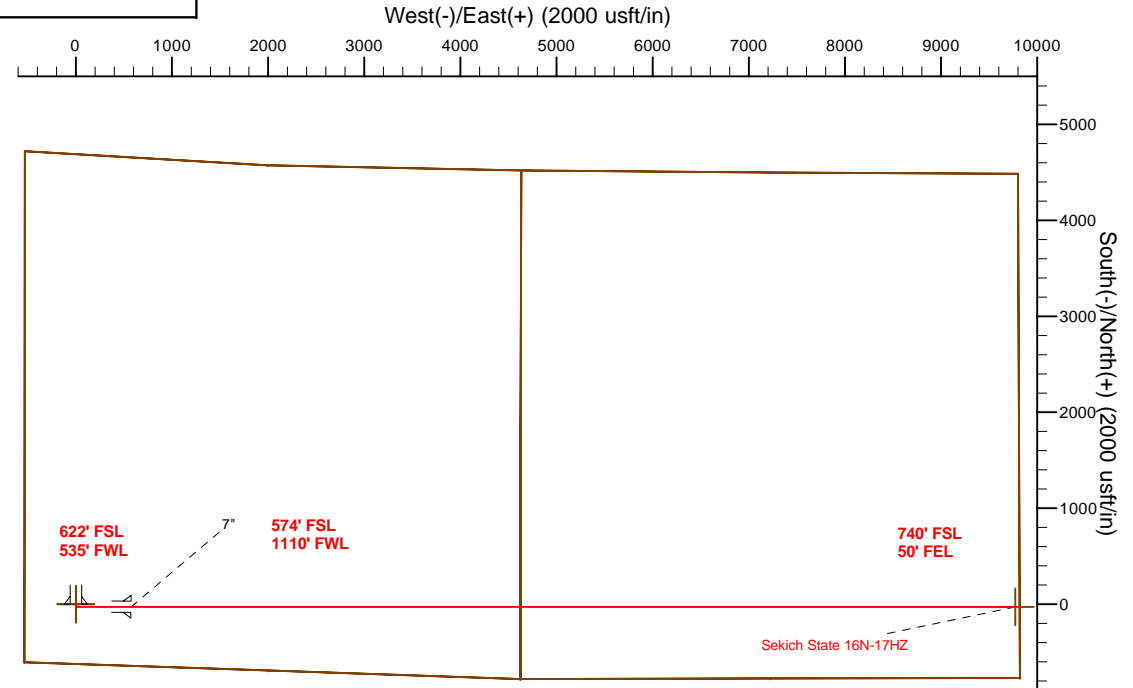
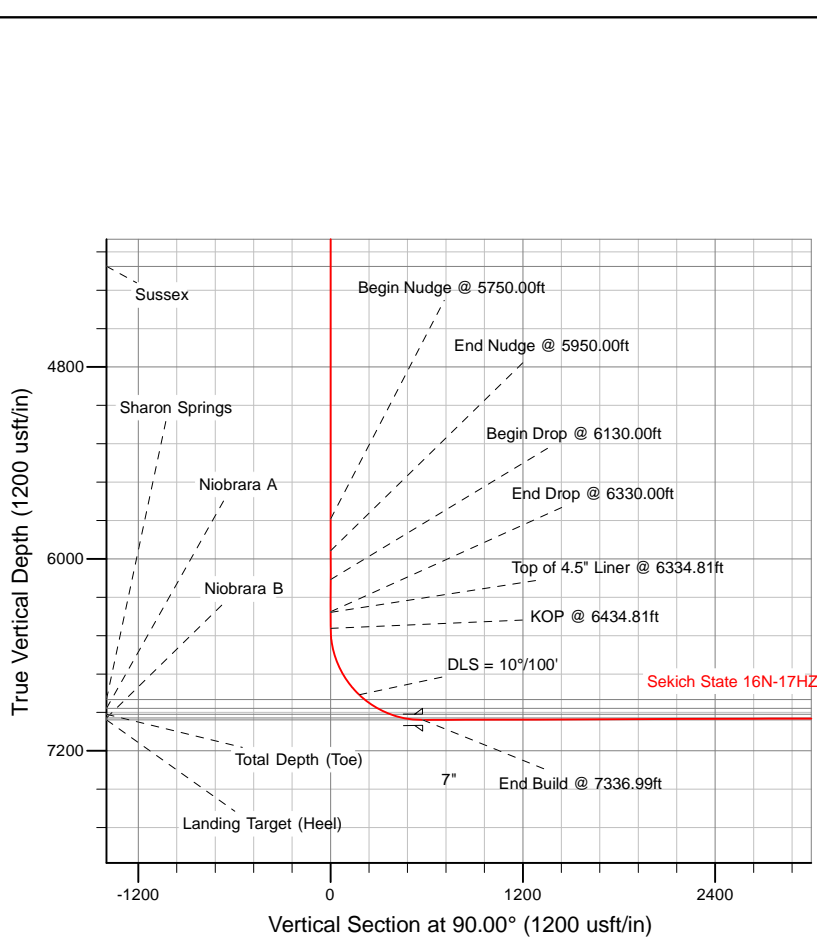
**HALLIBURTON**  
Sperry Drilling

## 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	5750.00	0.00	0.00	5750.00	0.00	0.00	0.00	0.00	0.00	
3	5950.00	4.00	180.00	5949.84	-6.98	0.00	2.00	180.00	0.00	
4	6130.00	4.00	180.00	6129.40	-19.53	0.00	0.00	0.00	0.00	
5	6330.00	0.00	0.00	6329.24	-26.51	0.00	2.00	180.00	0.00	
6	6434.81	0.00	0.00	6434.05	-26.51	0.00	0.00	0.00	0.00	
7	7336.99	90.22	90.00	7007.00	-26.53	575.14	10.00	90.00	575.14	
8	16535.43	90.22	90.00	6972.00	-26.84	9773.51	0.00	0.00	9773.51	Sekich State 16N-17HZ_BHL

## WELLBORE TARGET DETAILS (LAT/LONG)

Name	TVD	+N/-S	+E/-W	Latitude	Longitude	Polygon
Sekich State 16N-17HZ_SEC	0.00	0.00	0.00	40° 13' 14.743 N	104° 56' 23.424 W	Polygon
Sekich State 16N-17HZ_SHL	0.00	0.00	0.00	40° 13' 14.743 N	104° 56' 23.424 W	
Sekich State 16N-17HZ_BHL	6972.00	-26.84	9773.51	40° 13' 14.459 N	104° 54' 17.431 W	



TVD MD

6334.05 6334.81 Top of 4.5" Liner @ 6334.81ft  
6434.05 6434.81 KOP @ 6434.81ft

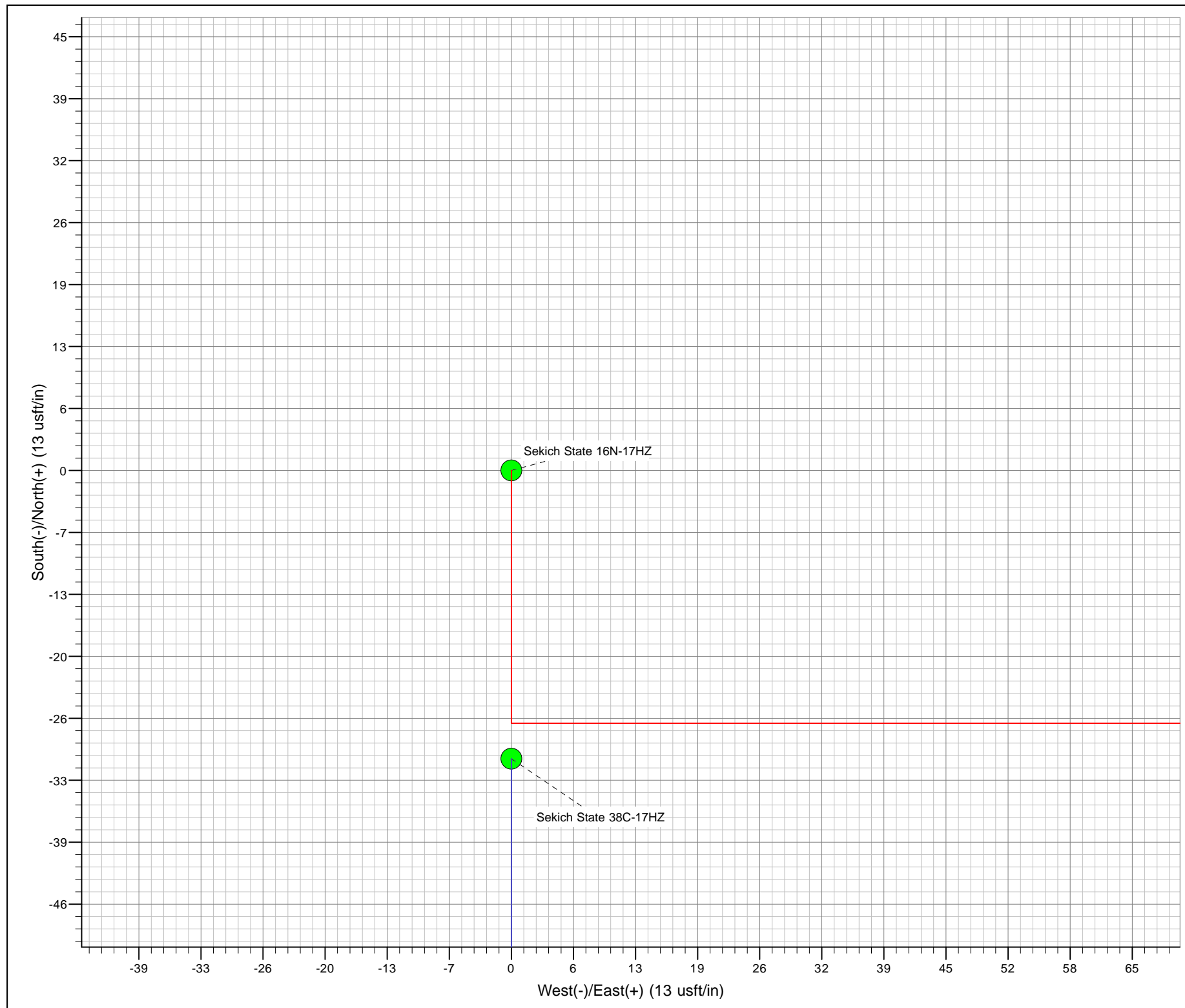
WELL DETAILS: Sekich State 16N-17HZ

Ground Level: 4875.00

RKB = 17' @ 4892.00usft (Drilling Rig)

Plan: Rev A0 Permit (Sekich State 16N-17HZ/Plan A)

Created By: Clint Eshelman Date: 11/27/2013  
Reviewed: Date:



**Plan Report for Sekich State 16N-17HZ - Rev A0 Permit**

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
<b>Sekich State 16N-17HZ_SHL - Sekich State 16N-17HZ_SEC</b>										
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
700.00	0.00	0.00	700.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
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
1,019.00	0.00	0.00	1,019.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>Fox Hills Marker</b>										
1,069.00	0.00	0.00	1,069.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>9 5/8"</b>										
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
1,300.00	0.00	0.00	1,300.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1,400.00	0.00	0.00	1,400.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1,500.00	0.00	0.00	1,500.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1,600.00	0.00	0.00	1,600.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1,700.00	0.00	0.00	1,700.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1,800.00	0.00	0.00	1,800.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1,900.00	0.00	0.00	1,900.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2,000.00	0.00	0.00	2,000.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2,100.00	0.00	0.00	2,100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2,200.00	0.00	0.00	2,200.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2,300.00	0.00	0.00	2,300.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2,400.00	0.00	0.00	2,400.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2,500.00	0.00	0.00	2,500.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2,600.00	0.00	0.00	2,600.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2,700.00	0.00	0.00	2,700.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2,800.00	0.00	0.00	2,800.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2,900.00	0.00	0.00	2,900.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3,000.00	0.00	0.00	3,000.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3,100.00	0.00	0.00	3,100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3,200.00	0.00	0.00	3,200.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3,300.00	0.00	0.00	3,300.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3,400.00	0.00	0.00	3,400.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3,500.00	0.00	0.00	3,500.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3,572.00	0.00	0.00	3,572.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>Parkman</b>										
3,600.00	0.00	0.00	3,600.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3,700.00	0.00	0.00	3,700.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3,800.00	0.00	0.00	3,800.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3,900.00	0.00	0.00	3,900.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4,000.00	0.00	0.00	4,000.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4,100.00	0.00	0.00	4,100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4,171.00	0.00	0.00	4,171.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>Sussex</b>										
4,200.00	0.00	0.00	4,200.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4,300.00	0.00	0.00	4,300.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4,400.00	0.00	0.00	4,400.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4,500.00	0.00	0.00	4,500.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4,600.00	0.00	0.00	4,600.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4,700.00	0.00	0.00	4,700.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4,800.00	0.00	0.00	4,800.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

**Plan Report for Sekich State 16N-17HZ - Rev A0 Permit**

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 (°)
4,900.00	0.00	0.00	4,900.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5,000.00	0.00	0.00	5,000.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5,100.00	0.00	0.00	5,100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5,200.00	0.00	0.00	5,200.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5,300.00	0.00	0.00	5,300.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5,400.00	0.00	0.00	5,400.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5,500.00	0.00	0.00	5,500.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5,600.00	0.00	0.00	5,600.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5,700.00	0.00	0.00	5,700.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5,750.00	0.00	0.00	5,750.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>Begin Nudge @ 5750.00ft</b>										
5,800.00	1.00	180.00	5,800.00	-0.44	0.00	0.00	2.00	2.00	0.00	180.00
5,900.00	3.00	180.00	5,899.93	-3.93	0.00	0.00	2.00	2.00	0.00	0.00
5,950.00	4.00	180.00	5,949.84	-6.98	0.00	0.00	2.00	2.00	0.00	0.00
<b>End Nudge @ 5950.00ft</b>										
6,000.00	4.00	180.00	5,999.72	-10.47	0.00	0.00	0.00	0.00	0.00	0.00
6,100.00	4.00	180.00	6,099.47	-17.44	0.00	0.00	0.00	0.00	0.00	0.00
6,130.00	4.00	180.00	6,129.40	-19.53	0.00	0.00	0.00	0.00	0.00	0.00
<b>Begin Drop @ 6130.00ft</b>										
6,200.00	2.60	180.00	6,199.28	-23.56	0.00	0.00	2.00	-2.00	0.00	180.00
6,300.00	0.60	180.00	6,299.24	-26.36	0.00	0.00	2.00	-2.00	0.00	180.00
6,330.00	0.00	0.00	6,329.24	-26.51	0.00	0.00	2.00	-2.00	0.00	180.00
<b>End Drop @ 6330.00ft</b>										
6,334.81	0.00	0.00	6,334.05	-26.51	0.00	0.00	0.00	0.00	0.00	0.00
<b>Top of 4.5" Liner @ 6334.81ft</b>										
6,400.00	0.00	0.00	6,399.24	-26.51	0.00	0.00	0.00	0.00	0.00	0.00
6,434.81	0.00	0.00	6,434.05	-26.51	0.00	0.00	0.00	0.00	0.00	0.00
<b>KOP @ 6434.81ft</b>										
6,500.00	6.52	90.00	6,499.10	-26.51	3.70	3.70	10.00	10.00	0.00	90.00
6,600.00	16.52	90.00	6,596.96	-26.51	23.65	23.65	10.00	10.00	0.00	0.00
6,700.00	26.52	90.00	6,689.87	-26.52	60.28	60.28	10.00	10.00	0.00	0.00
6,800.00	36.52	90.00	6,775.01	-26.52	112.49	112.49	10.00	10.00	0.00	0.00
6,900.00	46.52	90.00	6,849.79	-26.52	178.70	178.70	10.00	10.00	0.00	0.00
<b>DLS = 10°/100'</b>										
6,944.30	50.95	90.00	6,879.00	-26.52	211.99	211.99	10.00	10.00	0.00	0.00
<b>Sharon Springs</b>										
7,000.00	56.52	90.00	6,911.93	-26.52	256.88	256.88	10.00	10.00	0.00	0.00
7,044.47	60.97	90.00	6,935.00	-26.52	294.88	294.88	10.00	10.00	0.00	0.00
<b>Niobrara A</b>										
7,100.00	66.52	90.00	6,959.56	-26.52	344.67	344.67	10.00	10.00	0.00	0.00
7,200.00	76.52	90.00	6,991.22	-26.53	439.39	439.39	10.00	10.00	0.00	0.00
7,217.32	78.25	90.00	6,995.00	-26.53	456.29	456.29	10.00	10.00	0.00	0.00
<b>Niobrara B</b>										
7,300.00	86.52	90.00	7,005.95	-26.53	538.17	538.17	10.00	10.00	0.00	0.00
7,336.99	90.22	90.00	7,007.00	-26.53	575.14	575.14	10.00	10.00	0.00	0.00
<b>End Build @ 7336.99ft - Landing Target (Heel) - 7"</b>										
7,400.00	90.22	90.00	7,006.76	-26.53	638.15	638.15	0.00	0.00	0.00	0.00
7,500.00	90.22	90.00	7,006.38	-26.54	738.15	738.15	0.00	0.00	0.00	0.00
7,600.00	90.22	90.00	7,006.00	-26.54	838.15	838.15	0.00	0.00	0.00	0.00
7,700.00	90.22	90.00	7,005.62	-26.54	938.15	938.15	0.00	0.00	0.00	0.00
7,800.00	90.22	90.00	7,005.24	-26.55	1,038.14	1,038.14	0.00	0.00	0.00	0.00
7,900.00	90.22	90.00	7,004.86	-26.55	1,138.14	1,138.14	0.00	0.00	0.00	0.00
8,000.00	90.22	90.00	7,004.48	-26.55	1,238.14	1,238.14	0.00	0.00	0.00	0.00
8,100.00	90.22	90.00	7,004.10	-26.56	1,338.14	1,338.14	0.00	0.00	0.00	0.00
8,200.00	90.22	90.00	7,003.72	-26.56	1,438.14	1,438.14	0.00	0.00	0.00	0.00
8,300.00	90.22	90.00	7,003.34	-26.56	1,538.14	1,538.14	0.00	0.00	0.00	0.00
8,400.00	90.22	90.00	7,002.96	-26.57	1,638.14	1,638.14	0.00	0.00	0.00	0.00
8,500.00	90.22	90.00	7,002.58	-26.57	1,738.14	1,738.14	0.00	0.00	0.00	0.00

**Plan Report for Sekich State 16N-17HZ - Rev A0 Permit**

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 (°)
8,600.00	90.22	90.00	7,002.19	-26.58	1,838.14	1,838.14	0.00	0.00	0.00	0.00
8,700.00	90.22	90.00	7,001.81	-26.58	1,938.14	1,938.14	0.00	0.00	0.00	0.00
8,800.00	90.22	90.00	7,001.43	-26.58	2,038.14	2,038.14	0.00	0.00	0.00	0.00
8,900.00	90.22	90.00	7,001.05	-26.59	2,138.14	2,138.14	0.00	0.00	0.00	0.00
9,000.00	90.22	90.00	7,000.67	-26.59	2,238.14	2,238.14	0.00	0.00	0.00	0.00
9,100.00	90.22	90.00	7,000.29	-26.59	2,338.14	2,338.14	0.00	0.00	0.00	0.00
9,200.00	90.22	90.00	6,999.91	-26.60	2,438.13	2,438.13	0.00	0.00	0.00	0.00
9,300.00	90.22	90.00	6,999.53	-26.60	2,538.13	2,538.13	0.00	0.00	0.00	0.00
9,400.00	90.22	90.00	6,999.15	-26.60	2,638.13	2,638.13	0.00	0.00	0.00	0.00
9,500.00	90.22	90.00	6,998.77	-26.61	2,738.13	2,738.13	0.00	0.00	0.00	0.00
9,600.00	90.22	90.00	6,998.39	-26.61	2,838.13	2,838.13	0.00	0.00	0.00	0.00
9,700.00	90.22	90.00	6,998.01	-26.61	2,938.13	2,938.13	0.00	0.00	0.00	0.00
9,800.00	90.22	90.00	6,997.63	-26.62	3,038.13	3,038.13	0.00	0.00	0.00	0.00
9,900.00	90.22	90.00	6,997.25	-26.62	3,138.13	3,138.13	0.00	0.00	0.00	0.00
10,000.00	90.22	90.00	6,996.87	-26.62	3,238.13	3,238.13	0.00	0.00	0.00	0.00
10,100.00	90.22	90.00	6,996.49	-26.63	3,338.13	3,338.13	0.00	0.00	0.00	0.00
10,200.00	90.22	90.00	6,996.11	-26.63	3,438.13	3,438.13	0.00	0.00	0.00	0.00
10,300.00	90.22	90.00	6,995.73	-26.63	3,538.13	3,538.13	0.00	0.00	0.00	0.00
10,400.00	90.22	90.00	6,995.35	-26.64	3,638.13	3,638.13	0.00	0.00	0.00	0.00
10,500.00	90.22	90.00	6,994.96	-26.64	3,738.12	3,738.12	0.00	0.00	0.00	0.00
10,600.00	90.22	90.00	6,994.58	-26.64	3,838.12	3,838.12	0.00	0.00	0.00	0.00
10,700.00	90.22	90.00	6,994.20	-26.65	3,938.12	3,938.12	0.00	0.00	0.00	0.00
10,800.00	90.22	90.00	6,993.82	-26.65	4,038.12	4,038.12	0.00	0.00	0.00	0.00
10,900.00	90.22	90.00	6,993.44	-26.65	4,138.12	4,138.12	0.00	0.00	0.00	0.00
11,000.00	90.22	90.00	6,993.06	-26.66	4,238.12	4,238.12	0.00	0.00	0.00	0.00
11,100.00	90.22	90.00	6,992.68	-26.66	4,338.12	4,338.12	0.00	0.00	0.00	0.00
11,200.00	90.22	90.00	6,992.30	-26.66	4,438.12	4,438.12	0.00	0.00	0.00	0.00
11,300.00	90.22	90.00	6,991.92	-26.67	4,538.12	4,538.12	0.00	0.00	0.00	0.00
11,400.00	90.22	90.00	6,991.54	-26.67	4,638.12	4,638.12	0.00	0.00	0.00	0.00
11,500.00	90.22	90.00	6,991.16	-26.67	4,738.12	4,738.12	0.00	0.00	0.00	0.00
11,600.00	90.22	90.00	6,990.78	-26.68	4,838.12	4,838.12	0.00	0.00	0.00	0.00
11,700.00	90.22	90.00	6,990.40	-26.68	4,938.12	4,938.12	0.00	0.00	0.00	0.00
11,800.00	90.22	90.00	6,990.02	-26.68	5,038.12	5,038.12	0.00	0.00	0.00	0.00
11,900.00	90.22	90.00	6,989.64	-26.69	5,138.11	5,138.11	0.00	0.00	0.00	0.00
12,000.00	90.22	90.00	6,989.26	-26.69	5,238.11	5,238.11	0.00	0.00	0.00	0.00
12,100.00	90.22	90.00	6,988.88	-26.69	5,338.11	5,338.11	0.00	0.00	0.00	0.00
12,200.00	90.22	90.00	6,988.50	-26.70	5,438.11	5,438.11	0.00	0.00	0.00	0.00
12,300.00	90.22	90.00	6,988.12	-26.70	5,538.11	5,538.11	0.00	0.00	0.00	0.00
12,400.00	90.22	90.00	6,987.74	-26.70	5,638.11	5,638.11	0.00	0.00	0.00	0.00
12,500.00	90.22	90.00	6,987.35	-26.71	5,738.11	5,738.11	0.00	0.00	0.00	0.00
12,600.00	90.22	90.00	6,986.97	-26.71	5,838.11	5,838.11	0.00	0.00	0.00	0.00
12,700.00	90.22	90.00	6,986.59	-26.71	5,938.11	5,938.11	0.00	0.00	0.00	0.00
12,800.00	90.22	90.00	6,986.21	-26.72	6,038.11	6,038.11	0.00	0.00	0.00	0.00
12,900.00	90.22	90.00	6,985.83	-26.72	6,138.11	6,138.11	0.00	0.00	0.00	0.00
13,000.00	90.22	90.00	6,985.45	-26.72	6,238.11	6,238.11	0.00	0.00	0.00	0.00
13,100.00	90.22	90.00	6,985.07	-26.73	6,338.11	6,338.11	0.00	0.00	0.00	0.00
13,200.00	90.22	90.00	6,984.69	-26.73	6,438.11	6,438.11	0.00	0.00	0.00	0.00
13,300.00	90.22	90.00	6,984.31	-26.73	6,538.10	6,538.10	0.00	0.00	0.00	0.00
13,400.00	90.22	90.00	6,983.93	-26.74	6,638.10	6,638.10	0.00	0.00	0.00	0.00
13,500.00	90.22	90.00	6,983.55	-26.74	6,738.10	6,738.10	0.00	0.00	0.00	0.00
13,600.00	90.22	90.00	6,983.17	-26.74	6,838.10	6,838.10	0.00	0.00	0.00	0.00
13,700.00	90.22	90.00	6,982.79	-26.75	6,938.10	6,938.10	0.00	0.00	0.00	0.00
13,800.00	90.22	90.00	6,982.41	-26.75	7,038.10	7,038.10	0.00	0.00	0.00	0.00
13,900.00	90.22	90.00	6,982.03	-26.75	7,138.10	7,138.10	0.00	0.00	0.00	0.00
14,000.00	90.22	90.00	6,981.65	-26.76	7,238.10	7,238.10	0.00	0.00	0.00	0.00
14,100.00	90.22	90.00	6,981.27	-26.76	7,338.10	7,338.10	0.00	0.00	0.00	0.00
14,200.00	90.22	90.00	6,980.89	-26.76	7,438.10	7,438.10	0.00	0.00	0.00	0.00
14,300.00	90.22	90.00	6,980.51	-26.77	7,538.10	7,538.10	0.00	0.00	0.00	0.00
14,400.00	90.22	90.00	6,980.13	-26.77	7,638.10	7,638.10	0.00	0.00	0.00	0.00
14,500.00	90.22	90.00	6,979.74	-26.77	7,738.10	7,738.10	0.00	0.00	0.00	0.00

**Plan Report for Sekich State 16N-17HZ - Rev A0 Permit**

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 (°)
14,600.00	90.22	90.00	6,979.36	-26.78	7,838.10	7,838.10	0.00	0.00	0.00	0.00
14,700.00	90.22	90.00	6,978.98	-26.78	7,938.09	7,938.09	0.00	0.00	0.00	0.00
14,800.00	90.22	90.00	6,978.60	-26.78	8,038.09	8,038.09	0.00	0.00	0.00	0.00
14,900.00	90.22	90.00	6,978.22	-26.79	8,138.09	8,138.09	0.00	0.00	0.00	0.00
15,000.00	90.22	90.00	6,977.84	-26.79	8,238.09	8,238.09	0.00	0.00	0.00	0.00
15,100.00	90.22	90.00	6,977.46	-26.79	8,338.09	8,338.09	0.00	0.00	0.00	0.00
15,200.00	90.22	90.00	6,977.08	-26.80	8,438.09	8,438.09	0.00	0.00	0.00	0.00
15,300.00	90.22	90.00	6,976.70	-26.80	8,538.09	8,538.09	0.00	0.00	0.00	0.00
15,400.00	90.22	90.00	6,976.32	-26.80	8,638.09	8,638.09	0.00	0.00	0.00	0.00
15,500.00	90.22	90.00	6,975.94	-26.81	8,738.09	8,738.09	0.00	0.00	0.00	0.00
15,600.00	90.22	90.00	6,975.56	-26.81	8,838.09	8,838.09	0.00	0.00	0.00	0.00
15,700.00	90.22	90.00	6,975.18	-26.81	8,938.09	8,938.09	0.00	0.00	0.00	0.00
15,800.00	90.22	90.00	6,974.80	-26.82	9,038.09	9,038.09	0.00	0.00	0.00	0.00
15,900.00	90.22	90.00	6,974.42	-26.82	9,138.09	9,138.09	0.00	0.00	0.00	0.00
16,000.00	90.22	90.00	6,974.04	-26.82	9,238.09	9,238.09	0.00	0.00	0.00	0.00
16,100.00	90.22	90.00	6,973.66	-26.83	9,338.08	9,338.08	0.00	0.00	0.00	0.00
16,200.00	90.22	90.00	6,973.28	-26.83	9,438.08	9,438.08	0.00	0.00	0.00	0.00
16,300.00	90.22	90.00	6,972.90	-26.83	9,538.08	9,538.08	0.00	0.00	0.00	0.00
16,400.00	90.22	90.00	6,972.52	-26.84	9,638.08	9,638.08	0.00	0.00	0.00	0.00
16,500.00	90.22	90.00	6,972.13	-26.84	9,738.08	9,738.08	0.00	0.00	0.00	0.00
16,535.42	90.22	90.00	6,972.00	-26.84	9,773.50	9,773.50	0.00	0.00	0.00	0.00
<b>Total Depth (Toe)</b>										
16,535.43	90.22	90.00	6,972.00	-26.84	9,773.51	9,773.51	0.00	0.00	0.00	0.00
<b>TD Well @ 16535.43ft - Sekich State 16N-17HZ_BHL</b>										

**Plan Annotations**

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
5,750.00	5,750.00	0.00	0.00	Begin Nudge @ 5750.00ft
5,950.00	5,949.84	-6.98	0.00	End Nudge @ 5950.00ft
6,130.00	6,129.40	-19.53	0.00	Begin Drop @ 6130.00ft
6,330.00	6,329.24	-26.51	0.00	End Drop @ 6330.00ft
6,334.81	6,334.05	-26.51	0.00	Top of 4.5" Liner @ 6334.81ft
6,434.81	6,434.05	-26.51	0.00	KOP @ 6434.81ft
6,900.00	6,849.79	-26.52	178.70	DLS = 10°/100'
7,336.99	7,007.00	-26.53	575.14	End Build @ 7336.99ft
16,535.43	6,972.00	-26.84	9,773.51	TD Well @ 16535.43ft

**Vertical Section Information**

Angle Type	Target	Azimuth (°)	Origin Type	Origin		Start TVD (usft)
				+N/_S (usft)	+E/-W (usft)	
User	No Target (Freehand)	90.00	Slot	0.00	0.00	0.00

**Survey tool program**

From (usft)	To (usft)	Survey/Plan	Survey Tool
0.00	7,336.99	Rev A0 Permit	MWD
7,336.99	16,535.43	Rev A0 Permit	MWD

## Plan Report for Sekich State 16N-17HZ - Rev A0 Permit

**Casing Details**

Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
1,069.00	1,069.00	9 5/8"	9-5/8	13-1/2
7,336.99	7,007.00	7"	7	8-3/4

**Formation Details**

Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
1,019.00	1,019.00	Fox Hills Marker		0.00	
3,572.00	3,572.00	Parkman		0.00	
4,171.00	4,171.00	Sussex		0.00	
6,944.30	6,879.00	Sharon Springs		0.00	
7,044.47	6,935.00	Niobrara A		0.00	
7,217.32	6,995.00	Niobrara B		0.00	
7,336.99	7,007.00	Landing Target (Heel)		0.00	
16,535.42	6,972.00	Total Depth (Toe)		0.00	

**Targets associated with this wellbore**

Target Name	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Shape
Sekich State 16N-17HZ_SHL	0.00	0.00	0.00	Point
Sekich State 16N-17HZ_SEC	0.00	0.00	0.00	Polygon
Sekich State 16N-17HZ_BHL	6,972.00	-26.84	9,773.51	Point

**Directional Difficulty Index**

Average Dogleg over Survey:	0.59 °/100usft	Maximum Dogleg over Survey:	10.00 °/100usft at 7,336.99 usft
Net Tortousity applicable to Plans:	0.59 °/100usft	Directional Difficulty Index:	6.606

**Audit Info**



**North Reference Sheet for Sec. 18-T3N-R67W - Sekich State 16N-17HZ - 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' @ 4892.00usft (Drilling Rig). Northing and Easting are relative to Sekich State 16N-17HZ  
 Coordinate System is US State Plane 1983, Colorado Northern Zone using datum North American Datum 1983, ellipsoid GRS 1980  
 Projection method is Lambert Conformal Conic (2 parallel)  
 Central Meridian is -105.50°, Longitude Origin:0° 0' 0.000 E°, Latitude Origin:40° 47' 0.000 N°  
 False Easting: 3,000,000.00usft, False Northing: 1,000,000.00usft, Scale Reduction: 0.99995698

Grid Coordinates of Well: 1,323,759.77 usft N, 3,156,421.79 usft E  
 Geographical Coordinates of Well: 40° 13' 14.74" N, 104° 56' 23.42" W  
 Grid Convergence at Surface is: 0.36°

Based upon Minimum Curvature type calculations, at a Measured Depth of 16,535.43usft  
 the Bottom Hole Displacement is 9,773.54usft in the Direction of 90.16° ( True).  
 Magnetic Convergence at surface is: -8.29° (26 November 2013, , BGGM2013)

