



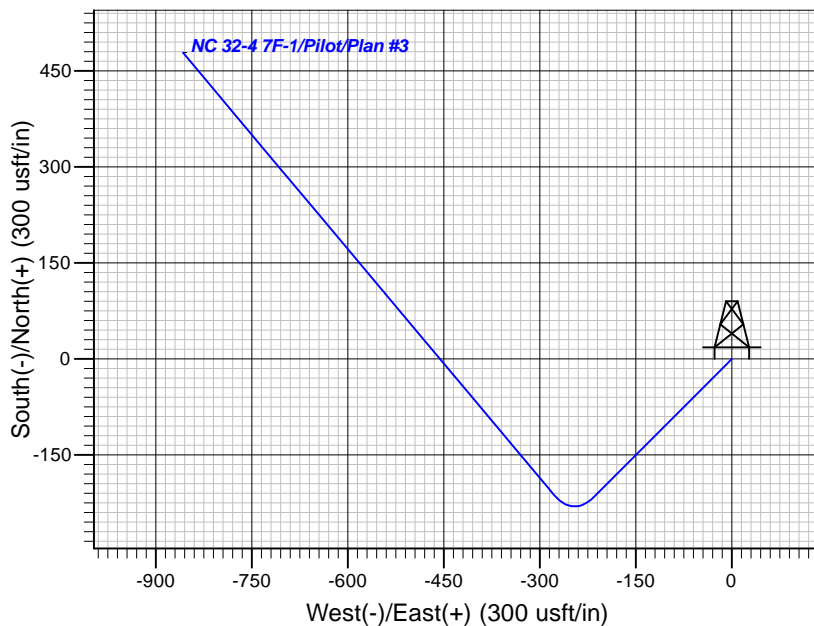
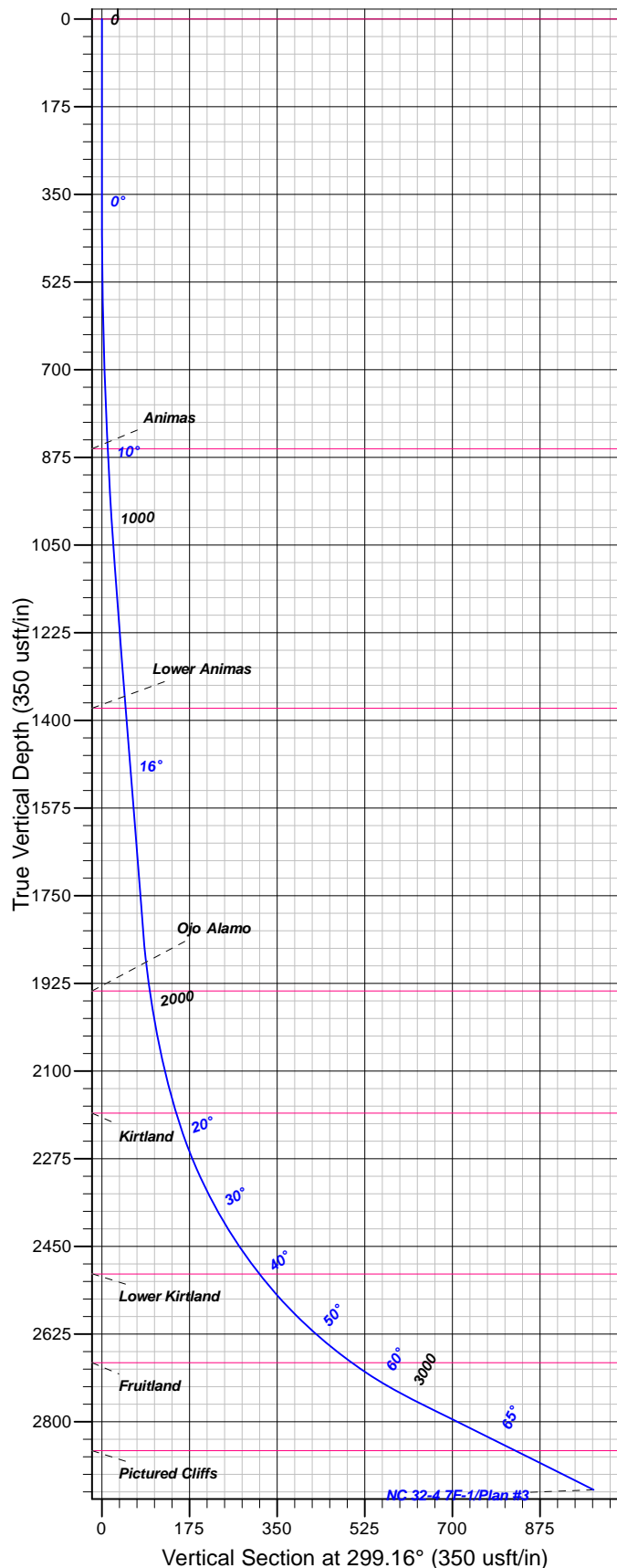
Company: Red Willow Production Co.
Project: Archuleta County, CO NAD83
Site: North Carracas Pad 2
Well: NC 32-4 7F-1



Well Details: NC 32-4 7F-1

+N/-S	+E/-W	Northing	GL 6159.10' & RKB 14' @ 6173.10usft	Easting	Latitude	Longitude	Slot
0.00	0.00	1135994.45		2464727.53	37.0257222	-107.3335757	7F-1

T M Azimuths to True North
Magnetic North: 9.07°
Magnetic Field
Strength: 50078.5snT
Dip Angle: 63.55°
Date: 1/12/2018
Model: HDGM



FORMATION TOP DETAILS

TVDPATH	MDPATH	FORMATION
0.00	0.00	San Jose
858.00	860.48	Animas
1376.00	1395.32	Lower Animas
1940.00	1980.72	Ojo Alamo
2184.00	2231.29	Kirtland
2505.00	2600.66	Lower Kirtland
2682.00	2866.41	Fruitland
2858.00	3258.50	Pictured Cliffs

Plan: Plan #3

11:35, April 30 2018
Created By: Janie Collins

PROJECT DETAILS: Archuleta County, CO NAD83

Geodetic System: US State Plane 1983
Datum: North American Datum 1983
Ellipsoid: GRS 1980
Zone: Colorado Southern Zone

System Datum: Mean Sea Level

CASING DETAILS

No casing data is available

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	364.00	0.00	0.00	364.00	0.00	0.00	0.00	0.00	0.00	
3	1164.00	16.00	225.00	1153.64	-78.47	-78.47	2.00	225.00	30.29	
4	1864.00	16.00	225.00	1826.53	-214.91	-214.91	0.00	0.00	82.96	
5	2199.01	16.00	320.00	2153.13	-212.15	-278.12	7.00	136.37	139.50	
6	3015.68	65.00	320.00	2755.38	181.88	-608.75	6.00	0.00	620.22	
7	3443.00	65.00	320.00	2935.97	478.56	-857.69	0.00	0.00	982.16	

DESIGN TARGET DETAILS

No target data is available.



Red Willow Production Co.

Archuleta County, CO NAD83

North Carracas Pad 2

NC 32-4 7F-1 - Slot 7F-1

Pilot

Plan: Plan #3

Standard Planning Report

30 April, 2018





Scientific Drilling, Intl

Planning Report

Database:	Grand Junction District	Local Co-ordinate Reference:	Well NC 32-4 7F-1 - Slot 7F-1
Company:	Red Willow Production Co.	TVD Reference:	GL 6159.10' & RKB 14' @ 6173.10usft
Project:	Archuleta County, CO NAD83	MD Reference:	GL 6159.10' & RKB 14' @ 6173.10usft
Site:	North Carracas Pad 2	North Reference:	True
Well:	NC 32-4 7F-1	Survey Calculation Method:	Minimum Curvature
Wellbore:	Pilot		
Design:	Plan #3		

Project	Archuleta County, CO NAD83		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	Colorado Southern Zone		

Site	North Carracas Pad 2			
Site Position:		Northing:	1,135,994.45 usft	Latitude: 37.0257222
From: Map		Easting:	2,464,727.53 usft	Longitude: -107.3335758
Position Uncertainty:	0.00 usft	Slot Radius:	13.20 in	Grid Convergence: -1.12 °

Well	NC 32-4 7F-1 - Slot 7F-1			
Well Position	+N/-S	0.00 usft	Northing:	1,135,994.45 usft
	+E/-W	0.00 usft	Easting:	2,464,727.53 usft
Position Uncertainty		0.00 usft	Wellhead Elevation:	0.00 usft
			Ground Level:	6,159.10 usft

Wellbore	Pilot				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	HDGM	1/12/2018	9.07	63.55	50,079

Design	Plan #3			
Audit Notes:				
Version:	Phase:	PLAN	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	0.00	0.00	0.00	299.16

Plan Sections										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	TFO (°)	Target
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
364.00	0.00	0.00	364.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,164.00	16.00	225.00	1,153.64	-78.47	-78.47	2.00	2.00	0.00	225.00	
1,864.00	16.00	225.00	1,826.53	-214.91	-214.91	0.00	0.00	0.00	0.00	
2,199.01	16.00	320.00	2,153.13	-212.15	-278.12	7.00	0.00	28.36	136.37	
3,015.68	65.00	320.00	2,755.38	181.88	-608.75	6.00	6.00	0.00	0.00	
3,443.00	65.00	320.00	2,935.97	478.56	-857.69	0.00	0.00	0.00	0.00	



Scientific Drilling, Intl Planning Report

Database:	Grand Junction District	Local Co-ordinate Reference:	Well NC 32-4 7F-1 - Slot 7F-1
Company:	Red Willow Production Co.	TVD Reference:	GL 6159.10' & RKB 14' @ 6173.10usft
Project:	Archuleta County, CO NAD83	MD Reference:	GL 6159.10' & RKB 14' @ 6173.10usft
Site:	North Carracas Pad 2	North Reference:	True
Well:	NC 32-4 7F-1	Survey Calculation Method:	Minimum Curvature
Wellbore:	Pilot		
Design:	Plan #3		

Planned Survey									
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)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
San Jose									
100.00	0.00	0.00	100.00	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
300.00	0.00	0.00	300.00	0.00	0.00	0.00	0.00	0.00	0.00
364.00	0.00	0.00	364.00	0.00	0.00	0.00	0.00	0.00	0.00
400.00	0.72	225.00	400.00	-0.16	-0.16	0.06	2.00	2.00	0.00
500.00	2.72	225.00	499.95	-2.28	-2.28	0.88	2.00	2.00	0.00
600.00	4.72	225.00	599.73	-6.87	-6.87	2.65	2.00	2.00	0.00
700.00	6.72	225.00	699.23	-13.92	-13.92	5.37	2.00	2.00	0.00
800.00	8.72	225.00	798.32	-23.42	-23.42	9.04	2.00	2.00	0.00
860.48	9.93	225.00	858.00	-30.34	-30.34	11.71	2.00	2.00	0.00
Animas									
900.00	10.72	225.00	896.88	-35.35	-35.35	13.65	2.00	2.00	0.00
1,000.00	12.72	225.00	994.79	-49.72	-49.72	19.19	2.00	2.00	0.00
1,100.00	14.72	225.00	1,091.93	-66.49	-66.49	25.66	2.00	2.00	0.00
1,164.00	16.00	225.00	1,153.64	-78.47	-78.47	30.29	2.00	2.00	0.00
1,200.00	16.00	225.00	1,188.25	-85.49	-85.49	33.00	0.00	0.00	0.00
1,300.00	16.00	225.00	1,284.37	-104.98	-104.98	40.52	0.00	0.00	0.00
1,395.32	16.00	225.00	1,376.00	-123.56	-123.56	47.69	0.00	0.00	0.00
Lower Animas									
1,400.00	16.00	225.00	1,380.50	-124.47	-124.47	48.05	0.00	0.00	0.00
1,500.00	16.00	225.00	1,476.63	-143.96	-143.96	55.57	0.00	0.00	0.00
1,600.00	16.00	225.00	1,572.75	-163.45	-163.45	63.09	0.00	0.00	0.00
1,700.00	16.00	225.00	1,668.88	-182.94	-182.94	70.62	0.00	0.00	0.00
1,800.00	16.00	225.00	1,765.01	-202.43	-202.43	78.14	0.00	0.00	0.00
1,864.00	16.00	225.00	1,826.53	-214.91	-214.91	82.96	0.00	0.00	0.00
1,900.00	14.28	232.07	1,861.28	-221.14	-221.92	86.04	7.00	-4.78	19.63
1,980.72	11.52	254.41	1,940.00	-229.44	-237.54	95.65	7.00	-3.42	27.68
Ojo Alamo									
2,000.00	11.18	261.05	1,958.91	-230.25	-241.25	98.48	7.00	-1.75	34.46
2,100.00	11.95	296.30	2,056.99	-227.16	-260.13	116.48	7.00	0.77	35.25
2,199.01	16.00	320.00	2,153.13	-212.15	-278.12	139.50	7.00	4.09	23.94
2,200.00	16.06	320.00	2,154.08	-211.94	-278.29	139.76	6.00	6.00	0.00
2,231.29	17.94	320.00	2,184.00	-204.93	-284.17	148.30	6.00	6.00	0.00
Kirtland									
2,300.00	22.06	320.00	2,248.56	-186.93	-299.27	170.26	6.00	6.00	0.00
2,400.00	28.06	320.00	2,339.10	-154.50	-326.49	209.83	6.00	6.00	0.00
2,500.00	34.06	320.00	2,424.73	-115.00	-359.63	258.02	6.00	6.00	0.00
2,600.00	40.06	320.00	2,504.49	-68.85	-398.35	314.32	6.00	6.00	0.00
2,600.66	40.10	320.00	2,505.00	-68.53	-398.63	314.72	6.00	6.00	0.00
Lower Kirtland									
2,700.00	46.06	320.00	2,577.52	-16.58	-442.22	378.10	6.00	6.00	0.00
2,800.00	52.06	320.00	2,643.02	41.26	-490.75	448.66	6.00	6.00	0.00
2,866.41	56.04	320.00	2,682.00	82.44	-525.30	498.90	6.00	6.00	0.00
Fruitland									
2,900.00	58.06	320.00	2,700.27	104.03	-543.42	525.24	6.00	6.00	0.00
3,000.00	64.06	320.00	2,748.64	171.04	-599.65	606.99	6.00	6.00	0.00
3,015.68	65.00	320.00	2,755.38	181.88	-608.75	620.22	6.00	6.00	0.00
3,100.00	65.00	320.00	2,791.01	240.42	-657.87	691.64	0.00	0.00	0.00
3,200.00	65.00	320.00	2,833.28	309.85	-716.12	776.34	0.00	0.00	0.00
3,258.50	65.00	320.00	2,858.00	350.47	-750.21	825.89	0.00	0.00	0.00
Pictured Cliffs									



Scientific Drilling, Intl

Planning Report

Database:	Grand Junction District	Local Co-ordinate Reference:	Well NC 32-4 7F-1 - Slot 7F-1
Company:	Red Willow Production Co.	TVD Reference:	GL 6159.10' & RKB 14' @ 6173.10usft
Project:	Archuleta County, CO NAD83	MD Reference:	GL 6159.10' & RKB 14' @ 6173.10usft
Site:	North Carracas Pad 2	North Reference:	True
Well:	NC 32-4 7F-1	Survey Calculation Method:	Minimum Curvature
Wellbore:	Pilot		
Design:	Plan #3		

Planned Survey									
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)
3,300.00	65.00	320.00	2,875.54	379.28	-774.38	861.04	0.00	0.00	0.00
3,400.00	65.00	320.00	2,917.80	448.71	-832.64	945.74	0.00	0.00	0.00
3,443.00	65.00	320.00	2,935.97	478.56	-857.69	982.16	0.00	0.00	0.00
NC 7F-1 Lat 1 ST1 BHL - NC 7F-1 Lat 1 BHL - NC 7F-1 Pilot BHL									

Formations					
Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
0.00	0.00	San Jose		0.00	0.00
860.48	858.00	Animas		0.00	0.00
1,395.32	1,376.00	Lower Animas		0.00	0.00
1,980.72	1,940.00	Ojo Alamo		0.00	0.00
2,231.29	2,184.00	Kirtland		0.00	0.00
2,600.66	2,505.00	Lower Kirtland		0.00	0.00
2,866.41	2,682.00	Fruitland		0.00	0.00
3,258.50	2,858.00	Pictured Cliffs		0.00	0.00