



EXPLORING WHAT'S POSSIBLE

Apache Corporation

Eddy County, NM (NAD 83 NME)

Cedar Lake Federal CA

762H

30-015-44398

OH / Job #61657

Design: Surveys (Trinidad 436)

NM OIL CONSERVATION

ARTESIA DISTRICT

JAN 09 2018

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Standard Survey Report

24 September, 2017



PHOENIX
TECHNOLOGY SERVICES

Company:	Apache Corporation	Local Co-ordinate Reference:	Well 762H
Project:	Eddy County, NM (NAD 83 NME)	TVD Reference:	GL + KB @ 3732.50usft (Trinidad 436)
Site:	Cedar Lake Federal CA	MD Reference:	GL + KB @ 3732.50usft (Trinidad 436)
Well:	762H	North Reference:	Grid
Wellbore:	OH / Job #61657	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (Trinidad 436)	Database:	Compass 5000 GCR

Project	Eddy County, NM (NAD 83 NME)		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	New Mexico Eastern Zone		

Site	Cedar Lake Federal CA				
Site Position:		Northing:	675,068.30 usft	Latitude:	32° 51' 17.46895 N
From:	Map	Easting:	689,764.00 usft	Longitude:	103° 50' 59.94191 W
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "	Grid Convergence:	0.26 °

Well	762H					
Well Position	+N/-S	0.00 usft	Northing:	670,688.70 usft	Latitude:	32° 50' 34.80146 N
	+E/-W	0.00 usft	Easting:	674,202.80 usft	Longitude:	103° 54' 2.57706 W
Position Uncertainty		0.00 usft	Wellhead Elevation:	0.00 usft	Ground Level:	3,716.00 usft

Wellbore	OH / Job #61657				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	HDGM	9/16/2017	7.45	60.77	48,353

Design	Surveys (Trinidad 436)				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)	
	0.00	0.00	0.00	84.60	

Survey Program	Date 9/24/2017			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
100.00	4,780.00	Phoenix Gyro Surveys (OH / Job #61657)	SPT_GTD	Continuous north-seeking gyro
4,829.00	10,250.00	Phoenix MWD Surveys (OH / Job #61657)	MWD+HDGM	OWSG Rev.2 MWD + HDGM

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Buidl 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
100.00	0.48	102.83	100.00	-0.09	0.41	0.40	0.48	0.48	0.00
200.00	0.64	217.67	200.00	-0.63	0.48	0.41	0.95	0.16	114.84
300.00	0.70	279.51	299.99	-0.97	-0.47	-0.56	0.69	0.06	61.84
400.00	0.91	255.21	399.98	-1.07	-1.84	-1.93	0.40	0.21	-24.30
500.00	1.11	246.58	499.97	-1.66	-3.50	-3.64	0.25	0.20	-8.63
600.00	0.94	240.43	599.95	-2.45	-5.10	-5.31	0.20	-0.17	-6.15
700.00	0.78	238.23	699.94	-3.21	-6.39	-6.66	0.16	-0.16	-2.20
800.00	0.68	241.25	799.93	-3.86	-7.49	-7.82	0.11	-0.10	3.02
900.00	0.58	256.99	899.92	-4.25	-8.50	-8.86	0.20	-0.10	15.74

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Wellbore:	OH / Job #61657	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (Trinidad 436)	Database:	Compass 5000 GCR

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)
1,000.00	0.08	224.84	999.92	-4.42	-9.04	-9.42	0.51	-0.50	-32.15
1,100.00	0.49	88.38	1,099.92	-4.46	-8.67	-9.05	0.55	0.41	-136.46
1,200.00	0.58	93.84	1,199.92	-4.48	-7.73	-8.12	0.10	0.09	5.46
1,300.00	0.53	69.00	1,299.91	-4.35	-6.80	-7.18	0.24	-0.05	-24.84
1,400.00	0.61	103.39	1,399.91	-4.30	-5.85	-6.23	0.35	0.08	34.39
1,500.00	0.23	93.64	1,499.90	-4.44	-5.13	-5.52	0.39	-0.38	-9.75
1,600.00	0.39	115.00	1,599.90	-4.60	-4.62	-5.03	0.19	0.16	21.36
1,700.00	0.43	279.64	1,699.90	-4.68	-4.68	-5.10	0.81	0.04	164.64
1,800.00	0.10	319.83	1,799.90	-4.55	-5.11	-5.51	0.36	-0.33	40.19
1,900.00	0.32	257.75	1,899.90	-4.54	-5.44	-5.84	0.29	0.22	-62.08
2,000.00	0.32	0.37	1,999.90	-4.32	-5.71	-6.09	0.50	0.00	102.62
2,100.00	0.54	234.26	2,099.90	-4.32	-6.09	-6.47	0.77	0.22	-126.11
2,200.00	0.23	212.46	2,199.90	-4.76	-6.58	-7.00	0.34	-0.31	-21.80
2,300.00	0.48	247.00	2,299.89	-5.09	-7.07	-7.52	0.32	0.25	34.54
2,400.00	0.35	235.74	2,399.89	-5.43	-7.71	-8.19	0.15	-0.13	-11.26
2,500.00	0.48	243.64	2,499.89	-5.79	-8.34	-8.85	0.14	0.13	7.90
2,600.00	0.55	261.35	2,599.88	-6.05	-9.19	-9.72	0.17	0.07	17.71
2,700.00	0.79	254.11	2,699.88	-6.31	-10.33	-10.87	0.25	0.24	-7.24
2,800.00	0.50	280.16	2,799.87	-6.42	-11.42	-11.97	0.41	-0.29	26.05
2,900.00	0.76	278.19	2,899.87	-6.25	-12.50	-13.04	0.26	0.26	-1.97
3,000.00	0.65	280.91	2,999.86	-6.04	-13.72	-14.23	0.11	-0.11	2.72
3,100.00	0.50	282.30	3,099.85	-5.84	-14.70	-15.19	0.15	-0.15	1.39
3,200.00	0.59	333.80	3,199.85	-5.29	-15.35	-15.78	0.48	0.09	51.50
3,300.00	0.80	322.16	3,299.84	-4.28	-16.01	-16.34	0.25	0.21	-11.64
3,400.00	0.61	312.38	3,399.83	-3.37	-16.83	-17.07	0.22	-0.19	-9.78
3,500.00	0.52	330.94	3,499.83	-2.61	-17.44	-17.61	0.20	-0.09	18.56
3,600.00	0.54	271.66	3,599.83	-2.20	-18.14	-18.26	0.52	0.02	-59.28
3,700.00	0.64	129.39	3,699.82	-2.54	-18.18	-18.33	1.12	0.10	-142.27
3,800.00	0.58	292.40	3,799.82	-2.70	-18.21	-18.39	1.21	-0.06	163.01
3,900.00	0.51	285.12	3,899.82	-2.39	-19.11	-19.25	0.10	-0.07	-7.28
4,000.00	0.59	299.57	3,999.81	-2.02	-19.99	-20.09	0.16	0.08	14.45
4,100.00	0.48	300.87	4,099.81	-1.55	-20.79	-20.85	0.11	-0.11	1.30
4,200.00	0.46	200.23	4,199.81	-1.72	-21.29	-21.36	0.72	-0.02	-100.64
4,300.00	0.38	99.68	4,299.80	-2.15	-21.10	-21.21	0.65	-0.08	-100.55
4,400.00	0.64	329.32	4,399.80	-1.72	-21.06	-21.13	0.93	0.26	-130.36
4,500.00	0.57	273.93	4,499.80	-1.21	-21.84	-21.86	0.57	-0.07	-55.39
4,600.00	0.56	290.07	4,599.79	-1.01	-22.80	-22.79	0.16	-0.01	16.14
4,700.00	0.26	103.83	4,699.79	-0.89	-23.04	-23.02	0.82	-0.30	173.76
4,780.00	0.79	246.34	4,779.79	-1.16	-23.37	-23.37	1.26	0.66	178.14
Tie In									
4,829.00	0.61	256.19	4,828.79	-1.36	-23.93	-23.95	0.44	-0.37	20.10
First Phoenix MWD Survey									
4,892.00	3.15	65.68	4,891.76	-0.72	-22.68	-22.64	5.95	4.03	269.03

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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)
4,955.00	11.13	63.67	4,954.22	2.69	-15.64	-15.32	12.67	12.67	-3.19
5,019.00	21.62	62.54	5,015.54	10.89	0.40	1.43	16.40	16.39	-1.77
5,081.00	30.63	68.18	5,071.15	22.05	25.26	27.22	15.06	14.53	9.10
5,145.00	34.96	76.65	5,124.97	32.36	58.27	61.05	9.84	6.77	13.23
5,208.00	41.33	69.64	5,174.51	43.78	95.39	99.09	12.21	10.11	-11.13
5,271.00	48.71	67.07	5,219.02	60.26	136.75	141.82	12.06	11.71	-4.08
5,334.00	54.28	70.91	5,258.24	77.87	182.76	189.28	10.04	8.84	6.10
5,398.00	60.22	66.60	5,292.85	97.42	232.86	241.00	10.87	9.28	-6.73
5,460.00	66.50	63.26	5,320.65	120.92	283.01	293.14	11.21	10.13	-5.39
5,523.00	73.08	65.65	5,342.40	146.38	336.33	348.62	11.03	10.44	3.79
5,586.00	79.84	64.39	5,357.14	172.24	391.81	406.29	10.90	10.73	-2.00
5,614.00	82.26	65.36	5,361.50	183.98	416.85	432.32	9.30	8.64	3.46
5,655.00	86.32	67.38	5,365.58	200.32	454.22	471.06	11.05	9.90	4.93
5,717.00	87.23	70.28	5,369.07	222.68	511.93	530.63	4.90	1.47	4.68
5,778.00	87.30	72.44	5,371.98	242.15	569.66	589.94	3.54	0.11	3.54
5,840.00	87.50	74.54	5,374.79	259.75	629.04	650.71	3.40	0.32	3.39
5,901.00	87.96	76.72	5,377.21	274.88	688.09	710.91	3.65	0.75	3.57
5,963.00	87.81	77.86	5,379.49	288.51	748.52	772.37	1.85	-0.24	1.84
6,026.00	88.09	78.81	5,381.75	301.24	810.18	834.95	1.57	0.44	1.51
6,090.00	88.85	79.84	5,383.46	313.09	873.05	898.65	2.00	1.19	1.61
6,153.00	89.13	80.53	5,384.57	323.83	935.12	961.46	1.18	0.44	1.10
6,216.00	89.33	80.69	5,385.41	334.10	997.27	1,024.30	0.41	0.32	0.25
6,280.00	89.13	80.26	5,386.27	344.69	1,060.38	1,088.13	0.74	-0.31	-0.67
6,343.00	89.08	80.15	5,387.26	355.41	1,122.46	1,150.93	0.19	-0.08	-0.17
6,406.00	88.43	79.60	5,388.63	366.48	1,184.46	1,213.71	1.35	-1.03	-0.87
6,470.00	88.91	80.20	5,390.11	377.70	1,247.45	1,277.47	1.20	0.75	0.94
6,533.00	89.80	80.99	5,390.82	388.00	1,309.60	1,340.31	1.89	1.41	1.25
6,596.00	90.11	81.14	5,390.87	397.78	1,371.83	1,403.19	0.55	0.49	0.24
6,660.00	90.45	81.69	5,390.56	407.33	1,435.11	1,467.09	1.01	0.53	0.86
6,723.00	90.64	81.91	5,389.96	416.32	1,497.47	1,530.02	0.46	0.30	0.35
6,786.00	90.73	82.64	5,389.21	424.79	1,559.89	1,592.86	1.17	0.14	1.16
6,850.00	89.64	84.49	5,389.00	431.96	1,623.48	1,656.95	3.35	-1.70	2.89
6,912.00	88.88	85.63	5,389.80	437.30	1,685.25	1,718.94	2.21	-1.23	1.84
6,976.00	88.45	87.38	5,391.29	441.20	1,749.11	1,782.88	2.81	-0.67	2.73
7,039.00	87.73	88.56	5,393.39	443.43	1,812.03	1,845.74	2.19	-1.14	1.87
7,102.00	87.90	88.97	5,395.79	444.79	1,874.97	1,908.52	0.70	0.27	0.65
7,166.00	88.06	89.03	5,398.05	445.90	1,938.92	1,972.29	0.27	0.25	0.09
7,229.00	88.32	89.40	5,400.04	446.76	2,001.88	2,035.06	0.72	0.41	0.59
7,293.00	88.74	89.26	5,401.68	447.51	2,065.86	2,098.82	0.69	0.66	-0.22
7,356.00	88.54	88.50	5,403.18	448.74	2,128.83	2,161.62	1.25	-0.32	-1.21
7,419.00	88.48	88.76	5,404.81	450.25	2,191.79	2,224.45	0.42	-0.10	0.41
7,483.00	88.66	89.03	5,406.41	451.48	2,255.76	2,288.25	0.51	0.28	0.42
7,546.00	89.05	89.29	5,407.67	452.41	2,318.74	2,351.04	0.74	0.62	0.41
7,609.00	89.27	89.51	5,408.59	453.07	2,381.73	2,413.81	0.49	0.35	0.35

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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)
7,673.00	88.01	89.12	5,410.11	453.83	2,445.70	2,477.57	2.06	-1.97	-0.61
7,736.00	88.21	89.13	5,412.19	454.79	2,508.66	2,540.34	0.32	0.32	0.02
7,800.00	88.46	89.29	5,414.05	455.68	2,572.63	2,604.11	0.46	0.39	0.25
7,863.00	88.60	89.38	5,415.67	456.41	2,635.60	2,666.87	0.26	0.22	0.14
7,926.00	89.05	89.90	5,416.96	456.80	2,698.59	2,729.61	1.09	0.71	0.83
7,989.00	89.30	90.40	5,417.87	456.64	2,761.58	2,792.31	0.89	0.40	0.79
8,053.00	89.33	90.34	5,418.63	456.22	2,825.58	2,855.98	0.10	0.05	-0.09
8,116.00	88.74	90.43	5,419.69	455.80	2,888.57	2,918.65	0.95	-0.94	0.14
8,179.00	88.82	90.54	5,421.03	455.27	2,951.55	2,981.30	0.22	0.13	0.17
8,242.00	88.40	90.34	5,422.56	454.78	3,014.53	3,043.96	0.74	-0.67	-0.32
8,305.00	88.48	90.30	5,424.28	454.43	3,077.50	3,106.62	0.14	0.13	-0.06
8,369.00	87.50	89.58	5,426.52	454.50	3,141.46	3,170.30	1.90	-1.53	-1.13
8,432.00	87.78	90.01	5,429.12	454.72	3,204.41	3,232.99	0.81	0.44	0.68
8,495.00	88.21	89.71	5,431.32	454.88	3,267.37	3,295.69	0.83	0.68	-0.48
8,558.00	87.98	88.85	5,433.41	455.67	3,330.33	3,358.44	1.41	-0.37	-1.37
8,621.00	88.32	89.42	5,435.45	456.62	3,393.29	3,421.21	1.05	0.54	0.80
8,685.00	88.76	89.81	5,437.08	457.05	3,457.27	3,484.94	0.92	0.69	0.61
8,748.00	87.87	89.02	5,438.93	457.69	3,520.24	3,547.69	1.89	-1.41	-1.25
8,812.00	88.15	89.08	5,441.15	458.75	3,584.19	3,611.46	0.45	0.44	0.09
8,874.00	88.15	89.12	5,443.15	459.73	3,646.15	3,673.24	0.06	0.00	0.06
8,937.00	87.50	88.12	5,445.55	461.24	3,709.08	3,736.03	1.89	-1.03	-1.59
9,000.00	87.78	88.33	5,448.14	463.19	3,772.00	3,798.86	0.56	0.44	0.33
9,064.00	88.06	88.55	5,450.46	464.93	3,835.93	3,862.67	0.56	0.44	0.34
9,127.00	88.09	88.39	5,452.58	466.61	3,898.88	3,925.49	0.26	0.05	-0.25
9,191.00	87.98	88.46	5,454.77	468.37	3,962.81	3,989.31	0.20	-0.17	0.11
9,253.00	88.40	88.66	5,456.73	469.93	4,024.76	4,051.13	0.75	0.68	0.32
9,317.00	89.18	89.27	5,458.08	471.09	4,088.74	4,114.93	1.55	1.22	0.95
9,380.00	89.52	89.72	5,458.80	471.64	4,151.73	4,177.69	0.90	0.54	0.71
9,443.00	89.72	90.13	5,459.22	471.72	4,214.73	4,240.42	0.72	0.32	0.65
9,507.00	89.89	90.02	5,459.43	471.64	4,278.73	4,304.13	0.32	0.27	-0.17
9,570.00	90.14	90.17	5,459.42	471.53	4,341.73	4,366.84	0.46	0.40	0.24
9,633.00	90.36	90.24	5,459.14	471.31	4,404.73	4,429.54	0.37	0.35	0.11
9,697.00	90.67	90.55	5,458.57	470.87	4,468.72	4,493.21	0.68	0.48	0.48
9,760.00	90.87	90.43	5,457.72	470.33	4,531.71	4,555.87	0.37	0.32	-0.19
9,824.00	89.94	89.58	5,457.27	470.32	4,595.71	4,619.58	1.97	-1.45	-1.33
9,886.00	89.80	89.25	5,457.41	470.96	4,657.71	4,681.36	0.58	-0.23	-0.53
9,950.00	89.72	88.97	5,457.68	471.95	4,721.70	4,745.16	0.46	-0.13	-0.44
10,013.00	89.52	89.04	5,458.09	473.04	4,784.69	4,807.97	0.34	-0.32	0.11
10,077.00	89.61	89.36	5,458.58	473.94	4,848.68	4,871.76	0.52	0.14	0.50
10,140.00	89.52	89.51	5,459.06	474.56	4,911.68	4,934.54	0.28	-0.14	0.24
10,189.00	89.44	89.64	5,459.50	474.92	4,960.67	4,983.35	0.31	-0.16	0.27
Final Phoenix MWD Survey									
10,250.00	89.44	89.64	5,460.10	475.31	5,021.67	5,044.11	0.00	0.00	0.00

Company:	Apache Corporation	Local Co-ordinate Reference:	Well 762H
Project:	Eddy County, NM (NAD 83 NME)	TVD Reference:	GL + KB @ 3732.50usft (Trinidad 436)
Site:	Cedar Lake Federal CA	MD Reference:	GL + KB @ 3732.50usft (Trinidad 436)
Well:	762H	North Reference:	Grid
Wellbore:	OH / Job #61657	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (Trinidad 436)	Database:	Compass 5000 GCR

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)
Projection to TD									

Design Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
4,780.00	4,779.79	-1.16	-23.37	Tie In
4,829.00	4,828.79	-1.36	-23.93	First Phoenix MWD Survey
10,189.00	5,459.50	474.92	4,960.67	Final Phoenix MWD Survey
10,250.00	5,460.10	475.31	5,021.67	Projection to TD