

NM OIL CONSERVATION
ARTESIA DISTRICT

MAR 07 2019

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**NGL WATER SOLUTIONS PERMIAN,
LLC**

EDDY COUNTY, NEW MEXICO (NAD 83)

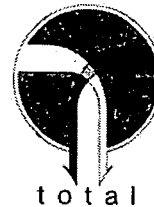
SE SE SEC. 26 T23S R31E

RED ROAD SWD #1 - Slot RED ROAD SWD #1

17 January, 2019

30.015-45235

Survey: FINAL SURVEYS



Survey Report



Company:	NGL WATER SOLUTIONS PERMIAN, LLC	Local Co-ordinate Reference:	Well RED ROAD SWD #1 - Slot RED ROAD SWD #1
Project:	EDDY COUNTY, NEW MEXICO (NAD 83)	TVD Reference:	KB 31.5' @ 3499.50usft (FRONTIER 32)
Site:	SE SE SEC. 26 T23S R31E	MD Reference:	KB 31.5' @ 3499.50usft (FRONTIER 32)
Well:	RED ROAD SWD #1	North Reference:	True
Wellbore:	JOB # 2018-666-032	Survey Calculation Method:	Minimum Curvature
Design:	FINAL SURVEYS	Database:	Database 1

Project:	EDDY COUNTY, NEW MEXICO (NAD 83)	
Map System:	US State Plane 1983	System Datum:
Geo Datum:	North American Datum 1983	Mean Sea Level
Map Zone:	New Mexico Eastern Zone	Using geodetic scale factor

Site:	SE SE SEC. 26 T23S R31E	
Site Position:		Northings:
From:	Map	462,903.53 usft
Position Uncertainty:	0.00 usft	Easting:
		723,649.50 usft
		Slot Radius:
		1.10 ft
		Latitude:
		32.271219°N
		Longitude:
		103.743469°W
		Grid Convergence:
		0.31 °

Well:	RED ROAD SWD #1 - Slot RED ROAD SWD #1	
Well Position	+N/-S	0.00 usft
	+E/-W	0.00 usft
Position Uncertainty	0.00 usft	Wellhead Elevation:
		usft
		Latitude:
		32.271219°N
		Longitude:
		103.743469°W
		Ground Level:
		3,468.00 usft

Wellbore:	JOB # 2018-666-032	
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Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2015	26/10/2018	6.89	60.06	47,808

Design	FINAL SURVEYS			
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	0.00

Survey Program	Date:	17/01/2019	
From	To	Survey (Wellbore)	Tool Name
(usft)	(usft)		
179.00	17,894.00	FINAL SURVEYS (JOB # 2018-666-032)	MWD
			Description
			MWD - Standard

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	Subsea 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	3,499.50	0.00	0.00	0.00	0.00	0.00	0.00
179.00	0.50	206.40	179.00	3,320.50	-0.70	-0.35	-0.70	0.28	0.28	0.00
241.00	0.40	218.60	241.00	3,258.50	-1.11	-0.60	-1.11	0.22	-0.16	19.68
338.00	0.80	222.70	337.99	3,161.51	-1.87	-1.27	-1.87	0.41	0.41	4.23
431.00	1.30	213.90	430.97	3,068.53	-3.23	-2.30	-3.23	0.56	0.54	-9.46
525.00	1.10	223.50	524.95	2,974.55	-4.77	-3.52	-4.77	0.30	-0.21	10.21
617.00	1.10	228.30	616.94	2,882.56	-5.99	-4.78	-5.99	0.10	0.00	5.22
710.00	1.30	232.20	709.92	2,789.58	-7.23	-6.28	-7.23	0.23	0.22	4.19
803.00	1.00	212.30	802.90	2,696.60	-8.57	-7.55	-8.57	0.53	-0.32	-21.40
897.00	0.80	247.90	896.89	2,602.61	-9.51	-8.60	-9.51	0.62	-0.21	37.87
990.00	0.80	251.20	989.88	2,509.62	-9.96	-9.81	-9.96	0.05	0.00	3.55
20" SURFACE CASING PT										
1,065.00	1.04	254.44	1,064.87	2,434.63	-10.31	-10.97	-10.31	0.33	0.32	4.31

Survey Report



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Project:	EDDY COUNTY, NEW MEXICO (NAD 83)	TVD Reference:	KB 31.5' @ 3499.50usft (FRONTIER 32)
Site:	SE SE SEC. 26 T23S R31E	MD Reference:	KB 31.5' @ 3499.50usft (FRONTIER 32)
Well:	RED ROAD SWD #1	North Reference:	True
Wellbore:	JOB # 2018-666-032	Survey Calculation Method:	Minimum Curvature
Design:	FINAL SURVEYS	Database:	Database 1

Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	Subsea Depth (usft)	+N-S (usft)	+E-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
1,083.00	1.10	255.00	1,082.87	2,416.63	-10.40	-11.29	-10.40	0.33	0.32	3.14
1,176.00	1.20	247.40	1,175.85	2,323.65	-11.01	-13.05	-11.01	0.20	0.11	-8.17
1,271.00	1.00	256.50	1,270.83	2,228.67	-11.58	-14.78	-11.58	0.28	-0.21	9.58
1,366.00	0.90	246.90	1,365.82	2,133.68	-12.07	-16.27	-12.07	0.20	-0.11	-10.11
1,461.00	0.80	210.60	1,460.81	2,038.69	-12.93	-17.29	-12.93	0.57	-0.11	-38.21
1,556.00	0.70	233.90	1,555.80	1,943.70	-13.84	-18.10	-13.84	0.34	-0.11	24.53
1,651.00	0.60	235.30	1,650.79	1,848.71	-14.47	-18.98	-14.47	0.11	-0.11	1.47
1,747.00	0.50	227.10	1,746.79	1,752.71	-15.04	-19.70	-15.04	0.13	-0.10	-8.54
1,842.00	0.10	214.00	1,841.79	1,657.71	-15.39	-20.05	-15.39	0.42	-0.42	-13.79
1,937.00	0.30	255.10	1,936.79	1,562.71	-15.52	-20.33	-15.52	0.25	0.21	43.26
2,032.00	0.40	176.40	2,031.78	1,467.72	-15.92	-20.55	-15.92	0.47	0.11	-82.84
2,127.00	0.20	301.10	2,126.78	1,372.72	-16.16	-20.68	-16.16	0.57	-0.21	131.26
2,222.00	0.20	320.50	2,221.78	1,277.72	-15.95	-20.92	-15.95	0.07	0.00	20.42
2,317.00	0.30	31.80	2,316.78	1,182.72	-15.61	-20.90	-15.61	0.32	0.11	75.05
2,412.00	0.30	6.20	2,411.78	1,087.72	-15.15	-20.74	-15.15	0.14	0.00	-26.95
2,507.00	0.20	258.50	2,506.78	992.72	-14.94	-20.87	-14.94	0.43	-0.11	-113.37
2,602.00	0.20	160.40	2,601.78	897.72	-15.13	-20.98	-15.13	0.32	0.00	-103.26
2,698.00	0.20	13.70	2,697.78	801.72	-15.12	-20.89	-15.12	0.40	0.00	-152.81
2,793.00	0.30	328.70	2,792.78	706.72	-14.75	-20.98	-14.75	0.22	0.11	-47.37
2,887.00	0.30	324.90	2,886.78	612.72	-14.34	-21.25	-14.34	0.02	0.00	-4.04
2,982.00	0.10	42.10	2,981.78	517.72	-14.07	-21.33	-14.07	0.31	-0.21	81.26
3,077.00	0.30	307.60	3,076.78	422.72	-13.86	-21.47	-13.86	0.34	0.21	-99.47
3,172.00	0.00	278.10	3,171.78	327.72	-13.71	-21.67	-13.71	0.32	-0.32	0.00
3,267.00	0.10	80.10	3,266.78	232.72	-13.69	-21.59	-13.69	0.11	0.11	0.00
3,362.00	0.10	45.10	3,361.78	137.72	-13.62	-21.45	-13.62	0.06	0.00	-36.84
3,457.00	0.10	60.60	3,456.78	42.72	-13.52	-21.32	-13.52	0.03	0.00	16.32
3,552.00	0.00	349.80	3,551.78	-52.28	-13.48	-21.25	-13.48	0.11	-0.11	0.00
3,647.00	0.20	308.60	3,646.78	-147.28	-13.38	-21.38	-13.38	0.21	0.21	0.00
3,742.00	0.10	111.70	3,741.78	-242.28	-13.30	-21.43	-13.30	0.31	-0.11	171.68
3,837.00	0.50	111.30	3,836.77	-337.27	-13.49	-20.96	-13.49	0.42	0.42	-0.42
3,932.00	0.30	120.70	3,931.77	-432.27	-13.76	-20.36	-13.76	0.22	-0.21	9.89
4,027.00	0.70	118.90	4,026.77	-527.27	-14.17	-19.64	-14.17	0.42	0.42	-1.89
4,122.00	0.90	147.60	4,121.76	-622.26	-15.08	-18.73	-15.08	0.46	0.21	30.21
4,217.00	1.00	130.20	4,216.75	-717.25	-16.25	-17.70	-16.25	0.32	0.11	-18.32
4,312.00	1.00	136.50	4,311.73	-812.23	-17.38	-16.50	-17.38	0.12	0.00	6.63
4,407.00	0.70	137.90	4,406.72	-907.22	-18.41	-15.54	-18.41	0.32	-0.32	1.47
4,497.00	0.40	150.40	4,496.72	-997.22	-19.10	-15.01	-19.10	0.36	-0.33	13.89
4,629.00	0.30	145.30	4,628.71	-1,129.21	-19.78	-14.59	-19.78	0.08	-0.08	-3.86
4,725.00	0.30	132.00	4,724.71	-1,225.21	-20.16	-14.26	-20.16	0.07	0.00	-13.85
4,820.00	0.40	173.70	4,819.71	-1,320.21	-20.65	-14.04	-20.65	0.28	0.11	43.89
4,915.00	0.30	141.20	4,914.71	-1,415.21	-21.17	-13.85	-21.17	0.23	-0.11	-34.21
5,010.00	0.60	177.30	5,009.71	-1,510.21	-21.87	-13.67	-21.87	0.42	0.32	38.00
5,105.00	0.50	197.50	5,104.70	-1,605.20	-22.76	-13.77	-22.76	0.23	-0.11	21.26
5,201.00	0.30	185.60	5,200.70	-1,701.20	-23.41	-13.92	-23.41	0.22	-0.21	-12.40
5,296.00	0.40	194.80	5,295.70	-1,796.20	-23.98	-14.03	-23.98	0.12	0.11	9.68
5,391.00	0.50	183.90	5,390.70	-1,891.20	-24.71	-14.14	-24.71	0.14	0.11	-11.47
5,486.00	0.40	189.20	5,485.69	-1,986.19	-25.45	-14.22	-25.45	0.11	-0.11	5.58
5,581.00	0.50	191.60	5,580.69	-2,081.19	-26.18	-14.36	-26.18	0.11	0.11	2.53
5,676.00	0.60	210.50	5,675.69	-2,176.19	-27.02	-14.69	-27.02	0.22	0.11	19.89
5,771.00	0.40	207.20	5,770.68	-2,271.18	-27.74	-15.10	-27.74	0.21	-0.21	-3.47
5,867.00	0.50	219.90	5,866.68	-2,367.18	-28.36	-15.52	-28.36	0.15	0.10	13.23
5,962.00	0.60	227.10	5,961.67	-2,462.17	-29.02	-16.15	-29.02	0.13	0.11	7.58
6,057.00	0.60	214.60	6,056.67	-2,557.17	-29.77	-16.80	-29.77	0.14	0.00	-13.16

Survey Report



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Well:	RED ROAD SWD #1	North Reference:	True
Wellbore:	JOB # 2018-666-032	Survey Calculation Method:	Minimum Curvature
Design:	FINAL SURVEYS	Database:	Database 1

Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	Subsea Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
6,152.00	0.60	218.10	6,151.66	-2,652.16	-30.57	-17.39	-30.57	0.04	0.00	3.68
6,247.00	0.70	228.80	6,246.66	-2,747.16	-31.34	-18.13	-31.34	0.17	0.11	11.26
6,342.00	0.80	227.00	6,341.65	-2,842.15	-32.17	-19.05	-32.17	0.11	0.11	-1.89
6,437.00	0.70	219.40	6,436.64	-2,937.14	-33.08	-19.91	-33.08	0.15	-0.11	-8.00
6,532.00	0.90	222.80	6,531.63	-3,032.13	-34.07	-20.78	-34.07	0.22	0.21	3.58
LAST MWD SURVEY										
6,627.00	0.90	211.40	6,626.62	-3,127.12	-35.26	-21.68	-35.26	0.19	0.00	-12.00
FIRST WIRELINE SURVEY										
6,700.00	0.80	220.10	6,699.61	-3,200.11	-36.14	-22.30	-36.14	0.22	-0.14	11.92
6,800.00	0.80	221.70	6,799.60	-3,300.10	-37.19	-23.22	-37.19	0.02	0.00	1.60
6,900.00	0.70	227.80	6,899.59	-3,400.09	-38.12	-24.13	-38.12	0.13	-0.10	6.10
7,000.00	0.70	230.50	6,999.59	-3,500.09	-38.92	-25.06	-38.92	0.03	0.00	2.70
7,100.00	0.80	231.30	7,099.58	-3,600.08	-39.75	-26.07	-39.75	0.10	0.10	0.80
7,200.00	0.80	226.50	7,199.57	-3,700.07	-40.66	-27.13	-40.66	0.07	0.00	-4.80
7,300.00	0.80	230.70	7,299.56	-3,800.06	-41.59	-28.17	-41.59	0.06	0.00	4.20
7,400.00	0.70	232.00	7,399.55	-3,900.05	-42.40	-29.19	-42.40	0.10	-0.10	1.30
7,500.00	0.70	232.90	7,499.54	-4,000.04	-43.15	-30.16	-43.15	0.01	0.00	0.90
7,600.00	0.70	233.80	7,599.54	-4,100.04	-43.88	-31.14	-43.88	0.01	0.00	0.90
7,700.00	0.70	233.40	7,699.53	-4,200.03	-44.60	-32.13	-44.60	0.00	0.00	-0.40
7,800.00	0.70	232.80	7,799.52	-4,300.02	-45.34	-33.10	-45.34	0.01	0.00	-0.60
7,900.00	0.60	232.80	7,899.51	-4,400.01	-46.02	-34.01	-46.02	0.10	-0.10	0.00
8,000.00	0.70	233.50	7,999.51	-4,500.01	-46.70	-34.91	-46.70	0.10	0.10	0.70
8,100.00	0.80	232.30	8,099.50	-4,600.00	-47.49	-35.96	-47.49	0.10	0.10	-1.20
8,200.00	0.80	231.80	8,199.49	-4,699.99	-48.35	-37.06	-48.35	0.01	0.00	-0.50
8,300.00	0.90	233.60	8,299.48	-4,799.98	-49.25	-38.24	-49.25	0.10	0.10	1.80
8,400.00	0.90	237.90	8,399.47	-4,899.97	-50.13	-39.54	-50.13	0.07	0.00	4.30
8,500.00	0.70	247.40	8,499.46	-4,999.96	-50.78	-40.77	-50.78	0.24	-0.20	9.50
8,600.00	0.60	255.70	8,599.45	-5,099.95	-51.15	-41.84	-51.15	0.14	-0.10	8.30
8,700.00	0.40	250.70	8,699.45	-5,199.95	-51.39	-42.67	-51.39	0.20	-0.20	-5.00
8,800.00	0.40	243.40	8,799.44	-5,299.94	-51.66	-43.32	-51.66	0.05	0.00	-7.30
8,900.00	0.30	221.80	8,899.44	-5,399.94	-52.02	-43.80	-52.02	0.16	-0.10	-21.60
9,000.00	0.30	213.80	8,999.44	-5,499.94	-52.43	-44.12	-52.43	0.04	0.00	-8.00
9,100.00	0.30	199.00	9,099.44	-5,599.94	-52.89	-44.35	-52.89	0.08	0.00	-14.80
9,200.00	0.30	178.80	9,199.44	-5,699.94	-53.40	-44.43	-53.40	0.11	0.00	-20.20
9,300.00	0.40	175.50	9,299.44	-5,799.94	-54.01	-44.40	-54.01	0.10	0.10	-3.30
9,400.00	0.20	165.70	9,399.43	-5,899.93	-54.53	-44.33	-54.53	0.21	-0.20	-9.80
9,500.00	0.20	176.70	9,499.43	-5,999.93	-54.87	-44.28	-54.87	0.04	0.00	11.00
9,600.00	0.30	188.80	9,599.43	-6,099.93	-55.31	-44.31	-55.31	0.11	0.10	12.10
9,700.00	0.30	199.90	9,699.43	-6,199.93	-55.81	-44.44	-55.81	0.06	0.00	11.10
9,800.00	0.30	212.70	9,799.43	-6,299.93	-56.28	-44.67	-56.28	0.07	0.00	12.80
9,900.00	0.30	215.50	9,899.43	-6,399.93	-56.71	-44.96	-56.71	0.01	0.00	2.80
10,000.00	0.20	203.80	9,999.43	-6,499.93	-57.08	-45.18	-57.08	0.11	-0.10	-11.70
10,100.00	0.20	195.90	10,099.43	-6,599.93	-57.41	-45.30	-57.41	0.03	0.00	-7.90
10,200.00	0.20	203.80	10,199.43	-6,699.93	-57.74	-45.42	-57.74	0.03	0.00	7.90
10,300.00	0.20	214.69	10,299.43	-6,799.93	-58.04	-45.59	-58.04	0.04	0.00	10.89
10,400.00	0.20	232.00	10,399.43	-6,899.93	-58.29	-45.83	-58.29	0.06	0.00	17.31
10,500.00	0.30	240.40	10,499.42	-6,999.92	-58.53	-46.19	-58.53	0.11	0.10	8.40
10,600.00	0.30	248.50	10,599.42	-7,099.92	-58.75	-46.66	-58.75	0.04	0.00	8.10
10,700.00	0.30	249.10	10,699.42	-7,199.92	-58.94	-47.15	-58.94	0.00	0.00	0.60
10,800.00	0.20	235.20	10,799.42	-7,299.92	-59.14	-47.54	-59.14	0.12	-0.10	-13.90
10,900.00	0.30	242.40	10,899.42	-7,399.92	-59.36	-47.91	-59.36	0.10	0.10	7.20
11,000.00	0.50	245.70	10,999.42	-7,499.92	-59.66	-48.54	-59.66	0.20	0.20	3.30
11,100.00	0.80	244.10	11,099.41	-7,599.91	-60.14	-49.57	-60.14	0.30	0.30	-1.60

Survey Report



Company:	NGL WATER SOLUTIONS PERMIAN, LLC	Local Co-ordinate Reference:	Well RED ROAD SWD #1 - Slot RED ROAD SWD #1
Project:	EDDY COUNTY, NEW MEXICO (NAD 83)	TVD Reference:	KB 31.5' @ 3499.50usft (FRONTIER 32)
Site:	SE SE SEC. 26 T23S R31E	MD Reference:	KB 31.5' @ 3499.50usft (FRONTIER 32)
Well:	RED ROAD SWD #1	North Reference:	True
Wellbore:	JOB # 2018-666-032	Survey Calculation Method:	Minimum Curvature
Design:	FINAL SURVEYS	Database:	Database 1

Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	Subsea Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
11,200.00	1.20	246.60	11,199.40	-7,699.90	-60.86	-51.16	-60.86	0.40	0.40	2.50
11,300.00	1.10	251.30	11,299.38	-7,799.88	-61.59	-53.03	-61.59	0.14	-0.10	4.70
11,400.00	1.10	252.50	11,399.36	-7,899.86	-62.18	-54.85	-62.18	0.02	0.00	1.20
11,500.00	1.10	253.80	11,499.34	-7,999.84	-62.74	-56.69	-62.74	0.02	0.00	1.30
LAST WIRELINE SURVEY:										
11,600.00	0.90	254.60	11,599.32	-8,099.82	-63.22	-58.37	-63.22	0.20	-0.20	0.80
MWD SURVEY STARTS:										
11,724.00	0.60	292.60	11,723.31	-8,223.81	-63.23	-59.91	-63.23	0.46	-0.24	30.65
11,819.00	0.70	298.60	11,818.31	-8,318.81	-62.76	-60.88	-62.76	0.13	0.11	6.32
11,914.00	0.50	288.70	11,913.30	-8,413.80	-62.35	-61.78	-62.35	0.24	-0.21	-10.42
12,009.00	0.50	286.90	12,008.30	-8,508.80	-62.09	-62.57	-62.09	0.02	0.00	-1.89
12,103.00	0.70	285.10	12,102.29	-8,602.79	-61.82	-63.51	-61.82	0.21	0.21	-1.91
12,198.00	0.50	233.20	12,197.29	-8,697.79	-61.92	-64.41	-61.92	0.58	-0.21	-54.63
12,293.00	0.50	53.00	12,292.29	-8,792.79	-61.92	-64.41	-61.92	1.05	0.00	189.26
12,388.00	0.90	38.60	12,387.28	-8,887.78	-61.09	-63.61	-61.09	0.46	0.42	-15.16
12,482.00	2.50	57.60	12,481.24	-8,981.74	-59.41	-61.42	-59.41	1.78	1.70	20.21
12,577.00	2.70	55.70	12,576.14	-9,076.64	-57.04	-57.82	-57.04	0.23	0.21	-2.00
12,672.00	2.20	49.60	12,671.05	-9,171.55	-54.60	-54.58	-54.60	0.59	-0.53	-6.42
12,767.00	1.90	38.30	12,765.99	-9,266.49	-52.18	-52.22	-52.18	0.53	-0.32	-11.89
12,862.00	1.70	27.00	12,860.94	-9,361.44	-49.69	-50.60	-49.69	0.43	-0.21	-11.89
12,958.00	1.50	8.60	12,956.91	-9,457.41	-47.18	-49.77	-47.18	0.57	-0.21	-19.17
13,054.00	1.30	352.70	13,052.88	-9,553.38	-44.86	-49.72	-44.86	0.45	-0.21	-16.56
13,148.00	2.00	12.10	13,146.84	-9,647.34	-42.19	-49.51	-42.19	0.94	0.74	20.64
13,243.00	3.20	23.80	13,241.74	-9,742.24	-38.15	-48.09	-38.15	1.37	1.26	12.32
13,338.00	2.80	18.50	13,336.61	-9,837.11	-33.52	-46.29	-33.52	0.51	-0.42	-5.58
13,433.00	2.20	7.10	13,431.52	-9,932.02	-29.51	-45.33	-29.51	0.82	-0.63	-12.00
13,528.00	1.90	0.00	13,526.46	-10,026.96	-26.13	-45.10	-26.13	0.41	-0.32	-7.47
13,623.00	1.90	353.30	13,621.41	-10,121.91	-22.99	-45.28	-22.99	0.23	0.00	-7.05
13,718.00	1.80	346.20	13,716.36	-10,216.86	-19.97	-45.82	-19.97	0.26	-0.11	-7.47
13,814.00	1.70	345.80	13,812.31	-10,312.81	-17.13	-46.53	-17.13	0.10	-0.10	-0.42
13,909.00	1.50	338.00	13,907.28	-10,407.78	-14.61	-47.34	-14.61	0.31	-0.21	-8.21
14,004.00	1.50	326.90	14,002.24	-10,502.74	-12.42	-48.49	-12.42	0.31	0.00	-11.68
14,100.00	1.50	334.70	14,098.21	-10,598.71	-10.23	-49.71	-10.23	0.21	0.00	8.12
14,195.00	1.50	326.80	14,193.18	-10,693.68	-8.06	-50.92	-8.06	0.22	0.00	-8.32
14,290.00	1.40	321.80	14,288.15	-10,788.65	-6.11	-52.32	-6.11	0.17	-0.11	-5.26
14,385.00	1.40	330.90	14,383.12	-10,883.62	-4.18	-53.60	-4.18	0.23	0.00	9.58
14,480.00	1.60	306.80	14,478.09	-10,978.59	-2.38	-55.23	-2.38	0.69	0.21	-25.37
14,575.00	1.50	305.50	14,573.05	-11,073.55	-0.86	-57.31	-0.86	0.11	-0.11	-1.37
14,670.00	1.60	292.70	14,668.02	-11,168.52	0.37	-59.54	0.37	0.38	0.11	-13.47
14,765.00	1.60	287.40	14,762.98	-11,263.48	1.28	-62.03	1.28	0.16	0.00	-5.58
14,860.00	1.70	279.40	14,857.94	-11,358.44	1.91	-64.69	1.91	0.26	0.11	-8.42
14,955.00	1.70	275.50	14,952.90	-11,453.40	2.28	-67.48	2.28	0.12	0.00	-4.11
15,050.00	1.70	271.60	15,047.86	-11,548.36	2.45	-70.29	2.45	0.12	0.00	-4.11
15,145.00	1.70	258.60	15,142.82	-11,643.32	2.21	-73.08	2.21	0.41	0.00	-13.68
15,240.00	1.60	272.80	15,237.78	-11,738.28	2.00	-75.79	2.00	0.44	-0.11	14.95
15,335.00	1.90	269.20	15,332.73	-11,833.23	2.04	-78.69	2.04	0.34	0.32	-3.79
15,431.00	1.90	267.80	15,428.68	-11,929.18	1.96	-81.87	1.96	0.05	0.00	-1.46
15,525.00	2.10	269.20	15,522.62	-12,023.12	1.87	-85.15	1.87	0.22	0.21	1.49
15,621.00	2.10	264.40	15,618.56	-12,119.06	1.68	-88.66	1.68	0.18	0.00	-5.00
15,716.00	1.40	249.50	15,713.52	-12,214.02	1.10	-91.48	1.10	0.87	-0.74	-15.68
15,811.00	0.90	243.90	15,808.50	-12,309.00	0.37	-93.23	0.37	0.54	-0.53	-5.89
15,906.00	0.80	229.30	15,903.49	-12,403.99	-0.40	-94.41	-0.40	0.25	-0.11	-15.37
16,004.00	0.80	218.20	16,001.48	-12,501.98	-1.38	-95.35	-1.38	0.16	0.00	-11.33

Survey Report



Company:	NGL WATER SOLUTIONS PERMIAN, LLC	Local Co-ordinate Reference:	Well RED ROAD SWD #1 - Slot RED ROAD SWD #1
Project:	EDDY COUNTY, NEW MEXICO (NAD 83)	TVD Reference:	KB 31.5' @ 3499.50usft (FRONTIER 32)
Site:	SE SE SEC. 26 T23S R31E	MD Reference:	KB 31.5' @ 3499.50usft (FRONTIER 32)
Well:	RED ROAD SWD #1	North Reference:	True
Wellbore:	JOB # 2018-666-032	Survey Calculation Method:	Minimum Curvature
Design:	FINAL SURVEYS	Database:	Database 1

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	Subsea Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
16,099.00	1.00	217.70	16,096.46	-12,596.96	-2.56	-96.26	-2.56	0.21	0.21	-0.53
16,194.00	0.60	195.00	16,191.46	-12,691.96	-3.69	-96.90	-3.69	0.53	-0.42	-23.89
16,287.00	1.10	211.50	16,284.45	-12,784.95	-4.92	-97.49	-4.92	0.59	0.54	17.74
16,382.00	1.60	226.00	16,379.42	-12,879.92	-6.62	-98.92	-6.62	0.63	0.53	15.26
16,477.00	1.80	238.90	16,474.38	-12,974.88	-8.32	-101.15	-8.32	0.45	0.21	13.58
16,623.00	1.50	244.50	16,620.32	-13,120.82	-10.32	-104.84	-10.32	0.23	-0.21	3.84
16,718.00	0.70	203.90	16,715.30	-13,215.80	-11.39	-106.20	-11.39	1.13	-0.84	-42.74
16,813.00	0.60	276.80	16,810.29	-13,310.79	-11.86	-106.93	-11.86	0.82	-0.11	76.74
16,908.00	2.40	303.40	16,905.26	-13,405.76	-10.71	-109.08	-10.71	1.98	1.89	28.00
17,003.00	2.20	291.30	17,000.18	-13,500.68	-8.95	-112.44	-8.95	0.55	-0.21	-12.74
17,098.00	2.50	281.50	17,095.10	-13,595.60	-7.87	-116.17	-7.87	0.53	0.32	-10.32
17,193.00	2.50	284.20	17,190.01	-13,690.51	-6.95	-120.21	-6.95	0.12	0.00	2.84
17,288.00	2.50	297.60	17,284.92	-13,785.42	-5.48	-124.06	-5.48	0.61	0.00	14.11
17,383.00	3.00	291.60	17,379.81	-13,880.31	-3.61	-128.20	-3.61	0.61	0.53	-6.32
17,477.00	3.00	293.80	17,473.69	-13,974.19	-1.71	-132.74	-1.71	0.12	0.00	2.34
17,571.00	3.00	298.50	17,567.56	-14,068.06	0.46	-137.15	0.46	0.26	0.00	5.00
17,666.00	3.10	302.50	17,662.42	-14,162.92	3.02	-141.50	3.02	0.25	0.11	4.21
17,761.00	2.50	289.50	17,757.31	-14,257.81	5.09	-145.62	5.09	0.92	-0.63	-13.68
LAST SURVEY JAN 17, 2019										
17,842.00	2.60	283.70	17,838.23	-14,338.73	6.12	-149.07	6.12	0.34	0.12	-7.16
PROJECTION TO TD										
17,894.00	2.60	283.70	17,890.18	-14,390.68	6.68	-151.37	6.68	0.00	0.00	0.00

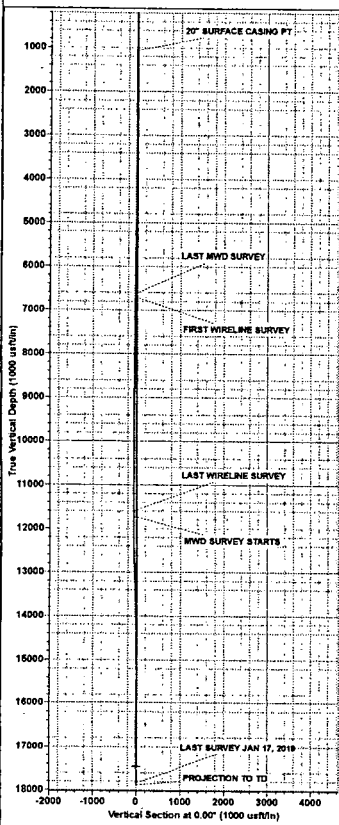
Target Name	hit/miss target	Dip Angle (°)	Dip Dir (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
BHL - RED ROAD SWD		0.00	0.00	17,458.00	0.00	0.00	462,903.53	723,649.50	32.271219°N	103.743469°W
- survey misses target center by 131.85usft at 17454.96usft MD (17451.68 TVD, -2.17 N, -131.68 E)										
- Circle (radius 80.00)										

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
1,065.00	1,064.87	-10.31	-10.97	20" SURFACE CASING PT
6,627.00	6,626.62	-35.26	-21.68	LAST MWD SURVEY
6,700.00	6,699.61	-36.14	-22.30	FIRST WIRELINE SURVEY
11,600.00	11,599.32	-63.22	-58.37	LAST WIRELINE SURVEY
11,724.00	11,723.31	-63.23	-59.91	MWD SURVEY STARTS
17,842.00	17,838.23	6.12	-149.07	LAST SURVEY JAN 17, 2019
17,894.00	17,890.18	6.68	-151.37	PROJECTION TO TD

Checked By: _____ Approved By: _____ Date: _____

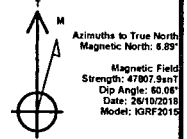


Project: EDDY COUNTY, NEW MEXICO (NAD 83)
Site: SE SE SEC. 26 T23S R31E
Well: RED ROAD SWD #1
Wellbore: JOB # 2018-666-032
Design: FINAL SURVEYS



PROJECT DETAILS: EDDY COUNTY, NEW MEXICO (NAD 83)
Geodetic System: US State Plane 1983
Datum: North American Datum 1983
Ellipsoid: GRS 1980
Zone: New Mexico Eastern Zone
Padsite: SE SE SEC. 26 T23S R31E

WELL DETAILS: RED ROAD SWD #1					
Ground Level: 3488.00					
+N/-S 0.00	+E/-W 0.00	Northing 462903.93	Easting 723648.60	Latitude 32.271219°N	Longitude 103.743469°W
DESIGN TARGET DETAILS					
Name BHL - RED ROAD SWD #1	TVD 17458.00	+N/-S 0.00	+E/-W 0.00	Northing 462903.93	Easting 723648.60



ANNOTATIONS									
TVD	MD	Inc	Azi	+N/-S	+E/-W	Vsect	Departure	Annotation	
1064.87	1065.00	1.04	354.44	-10.31	-10.97	-10.31	15.56	20\" SURFACE CASING PT	
6628.62	6627.00	0.90	211.40	-35.26	-21.89	-30.76	60.95	LAST MWD SURVEY	
6699.61	6700.00	0.80	220.10	-38.14	-22.30	-36.14	62.03	FIRST WIRELINE SURVEY	
11699.32	11600.00	0.90	254.80	-43.22	-40.37	-43.22	109.42	LAST WIRELINE SURVEY	
11723.31	11724.00	0.40	292.80	-43.23	-48.91	-43.23	111.04	MWD SURVEY STARTS	
17838.23	17842.00	2.60	283.70	6.12	-149.07	6.12	291.23	LAST SURVEY JAN 17, 2019	
17890.18	17894.00	2.60	283.70	6.12	-151.37	6.88	293.59	PROJECTION TO TD	

