

30-015-41740

March 27, 2015

Concho Resources, Inc.
One Concho Center
600 W. Illinois Avenue
Midland, Texas 79701

NM OIL CONSERVATION
ARTESIA DISTRICT

JUL 06 2015

RECEIVED

Attn: Kanicia Castillo

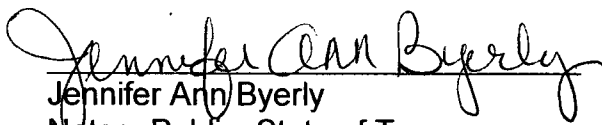
RE: **SRO State Com 29H**

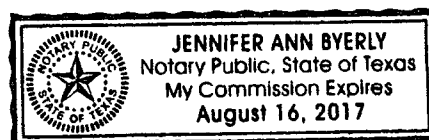
Please find enclosed a copy of the survey from 0' to 6143' ran on the above referenced well.

Sincerely, 
Keith Havelka
Operations

STATE OF TEXAS §
 §
COUNTY OF NUECES §

This instrument was acknowledged before me on the 27 day of March
A.D., 2015, by Keith Havelka.


Jennifer Ann Byerly
Notary Public, State of Texas





Company: CONCHO
Lease/Well: SRO STATE COM/29H

Rig Name: SCAN FREEDOM
State/County: NEW MEXICO/EDDY
Latitude: 32.08, Longitude: -104.08
GRID North is 0.14 Degrees East of True North
VS-Azi: 0.00 Degrees



NM OIL CONSERVATION
ARTESIA DISTRICT
JUL 06 2015
RECEIVED

Depth Reference : RKB: 27 FEET

DRILLOG HA GYRO SURVEY CALCULATIONS

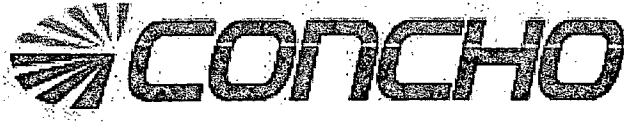
Filename: gyro survey.ut
Minimum Curvature Method
Report Date/Time: 3/27/2015 / 14:32

VES Survey International
West Texas
(432) 563-5444
Surveyor: Jordan Shelleby
SRO State Com 29H / API 30-015-41740

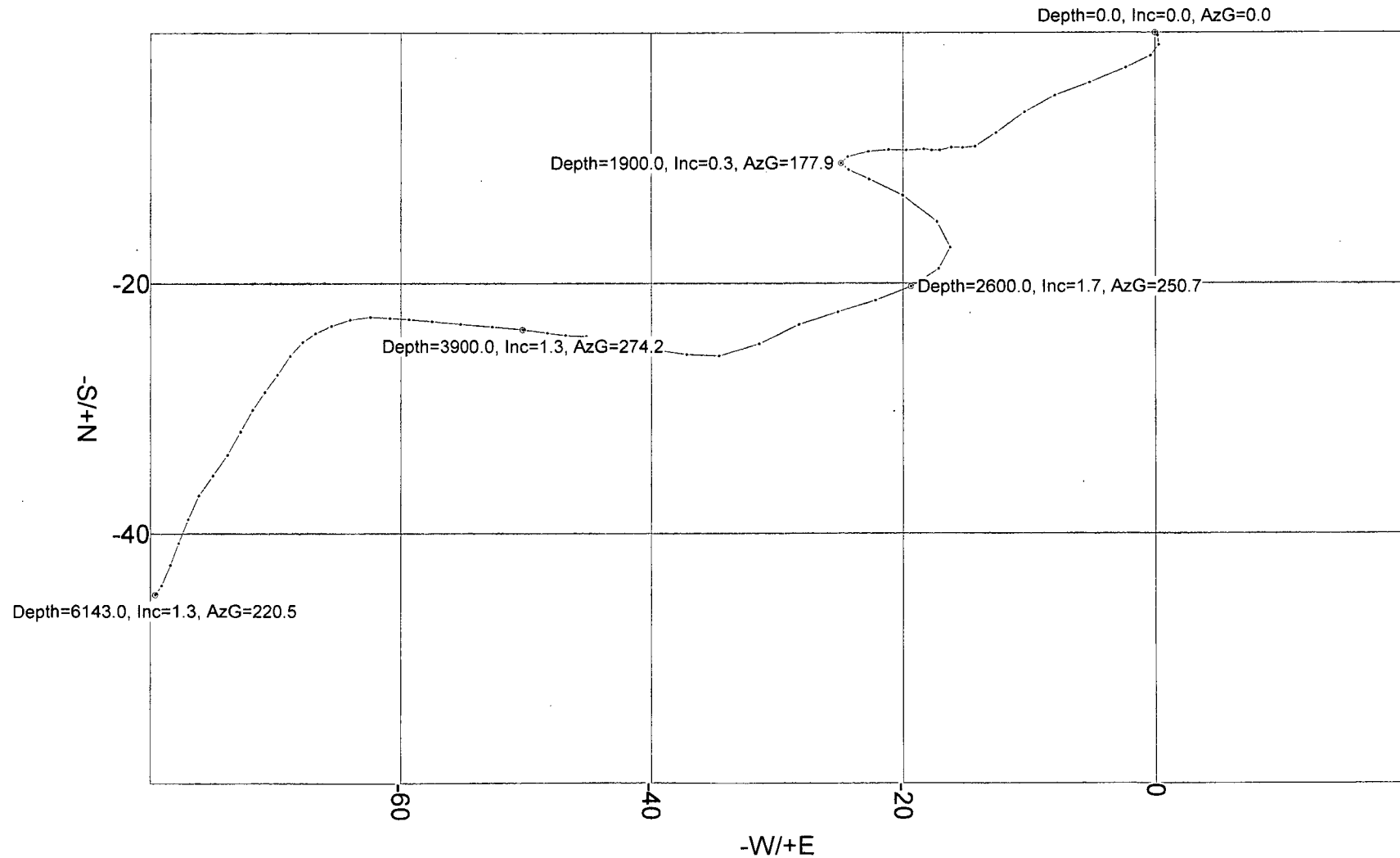
Measured Depth FT	Incl Angle Deg	Drift Direction Deg	TVD FT	+N/-S FT	+E/-W FT	Vertical Section FT	Closure Distance FT	Closure Direction Deg	Dogleg Severity Deg/100
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	****
100.00	0.32	141.04	100.00	-0.22	0.18	-0.22	0.28	141.04	0.32
200.00	0.63	187.67	200.00	-0.99	0.28	-0.99	1.03	164.09	0.47
300.00	0.75	242.52	299.99	-1.84	-0.37	-1.84	1.87	191.41	0.64
400.00	1.75	244.16	399.96	-2.80	-2.32	-2.80	3.64	219.64	1.00
500.00	1.81	250.72	499.92	-3.99	-5.18	-3.99	6.54	232.42	0.21
600.00	1.58	248.29	599.87	-5.02	-7.95	-5.02	9.40	237.74	0.24
700.00	1.58	233.67	699.84	-6.35	-10.34	-6.35	12.13	238.47	0.40
800.00	1.63	233.83	799.80	-8.00	-12.60	-8.00	14.92	237.58	0.04
900.00	0.64	244.11	899.78	-9.08	-14.24	-9.08	16.89	237.48	1.00
1000.00	0.57	286.52	999.77	-9.18	-15.22	-9.18	17.78	238.91	0.44
1100.00	0.51	253.39	1099.77	-9.17	-16.13	-9.17	18.55	240.39	0.31
1200.00	0.59	261.13	1199.76	-9.38	-17.07	-9.38	19.48	241.23	0.11
1300.00	0.17	304.60	1299.76	-9.37	-17.71	-9.37	20.03	242.12	0.48
1400.00	0.58	268.27	1399.76	-9.30	-18.34	-9.30	20.56	243.12	0.45
1500.00	1.01	266.84	1499.75	-9.36	-19.73	-9.36	21.84	244.62	0.43
1600.00	0.61	276.79	1599.74	-9.35	-21.14	-9.35	23.12	246.15	0.43
1700.00	1.25	260.28	1699.72	-9.47	-22.75	-9.47	24.64	247.40	0.69
1800.00	0.68	246.11	1799.71	-9.90	-24.37	-9.90	26.30	247.90	0.62

Measured Depth FT	Incl Angle Deg	Drift Direction Deg	TVD FT	+N/-S FT	+E/-W FT	Vertical Section FT	Closure Distance FT	Closure Direction Deg	Dogleg Severity Deg/100
1900.00	0.29	177.92	1899.71	-10.39	-24.90	-10.39	26.98	247.35	0.63
2000.00	0.75	115.17	1999.70	-10.93	-24.30	-10.93	26.65	245.79	0.67
2100.00	1.30	114.94	2099.69	-11.68	-22.68	-11.68	25.52	242.75	0.55
2200.00	2.08	116.84	2199.64	-12.98	-20.04	-12.98	23.88	237.08	0.78
2300.00	1.97	138.30	2299.58	-15.08	-17.28	-15.08	22.93	228.90	0.76
2400.00	0.90	186.56	2399.55	-17.14	-16.23	-17.14	23.60	223.45	1.52
2500.00	1.41	221.59	2499.53	-18.84	-17.14	-18.84	25.47	222.30	0.85
2600.00	1.70	250.66	2599.50	-20.25	-19.36	-20.25	28.02	223.71	0.83
2700.00	1.80	246.37	2699.45	-21.37	-22.20	-21.37	30.82	226.08	0.16
2800.00	1.81	258.93	2799.40	-22.31	-25.18	-22.31	33.64	228.47	0.39
2900.00	1.97	246.03	2899.35	-23.31	-28.30	-23.31	36.66	230.53	0.45
3000.00	2.05	242.46	2999.29	-24.83	-31.46	-24.83	40.08	231.71	0.15
3100.00	1.80	265.21	3099.23	-25.79	-34.61	-25.79	43.16	233.31	0.80
3200.00	1.16	283.54	3199.20	-25.68	-37.17	-25.68	45.18	235.35	0.79
3300.00	1.07	273.02	3299.18	-25.40	-39.08	-25.40	46.61	236.98	0.23
3400.00	1.28	277.61	3399.16	-25.20	-41.13	-25.20	48.23	238.50	0.23
3500.00	1.16	290.82	3499.13	-24.69	-43.18	-24.69	49.74	240.24	0.31
3600.00	1.19	274.45	3599.11	-24.25	-45.16	-24.25	51.26	241.77	0.34
3700.00	0.74	270.44	3699.10	-24.16	-46.84	-24.16	52.71	242.71	0.46
3800.00	0.94	283.47	3799.09	-23.97	-48.28	-23.97	53.90	243.60	0.28
3900.00	1.33	274.19	3899.07	-23.69	-50.23	-23.69	55.54	244.75	0.43
4000.00	1.48	275.92	3999.04	-23.48	-52.67	-23.48	57.67	245.98	0.16
4100.00	1.44	274.42	4099.01	-23.25	-55.21	-23.25	59.90	247.17	0.06
4200.00	1.19	276.34	4198.98	-23.03	-57.49	-23.03	61.94	248.17	0.25
4300.00	0.96	272.81	4298.96	-22.88	-59.37	-22.88	63.62	248.92	0.24
4400.00	0.80	275.36	4398.95	-22.77	-60.90	-22.77	65.02	249.50	0.17
4500.00	0.99	271.38	4498.94	-22.69	-62.45	-22.69	66.45	250.04	0.20
4600.00	0.91	252.17	4598.92	-22.91	-64.07	-22.91	68.05	250.33	0.33
4700.00	0.90	251.17	4698.91	-23.41	-65.58	-23.41	69.63	250.36	0.02
4800.00	0.73	238.53	4798.90	-23.99	-66.86	-23.99	71.04	250.26	0.25
4900.00	0.71	233.23	4898.89	-24.69	-67.90	-24.69	72.25	250.02	0.07
5000.00	1.02	215.44	4998.88	-25.79	-68.91	-25.79	73.57	249.48	0.41
5100.00	1.07	214.00	5098.87	-27.28	-69.95	-27.28	75.08	248.69	0.05
5200.00	0.93	218.03	5198.85	-28.70	-70.97	-28.70	76.55	247.98	0.15
5300.00	1.04	210.81	5298.84	-30.12	-71.93	-30.12	77.98	247.28	0.16
5400.00	1.24	208.20	5398.82	-31.84	-72.90	-31.84	79.56	246.41	0.21
5500.00	1.18	209.46	5498.79	-33.69	-73.92	-33.69	81.24	245.50	0.06
5600.00	1.14	220.54	5598.77	-35.35	-75.08	-35.35	82.98	244.79	0.23
5700.00	1.10	207.83	5698.75	-36.95	-76.17	-36.95	84.66	244.12	0.25

Measured Depth FT	Incl Angle Deg	Drift Direction Deg	TVD FT	+N/-S FT	+E/-W FT	Vertical Section FT	Closure Distance FT	Closure Direction Deg	Dogleg Severity Deg/100
5800.00	1.27	200.12	5798.73	-38.84	-77.00	-38.84	86.24	243.23	0.23
5900.00	1.10	202.91	5898.71	-40.76	-77.75	-40.76	87.79	242.33	0.18
6000.00	1.05	198.17	5998.69	-42.52	-78.41	-42.52	89.20	241.53	0.10
6100.00	1.01	206.76	6098.68	-44.17	-79.09	-44.17	90.59	240.82	0.16
6143.00	1.29	220.48	6141.67	-44.88	-79.58	-44.88	91.36	240.58	0.92



VES Survey International
West Texas
(432) 563-5444
Surveyor: Jordan Shelleby
SRO State Com 29H / API 30-015-41740



V.E.S. Survey Date: 3/24/2015



COG Operating, LLC

Eddy County, NM (NAD 27)

Sec 3, T26-S, R28-E

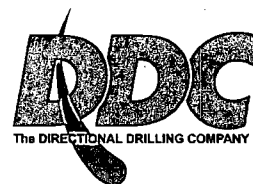
SRO State Com #29H

Wellbore #1

Design: Wellbore #1

Survey Report - Geographic

06 April, 2015





Survey Report - Geographic



Company:	COG Operating, LLC	Local Co-ordinate Reference:	Well SRO State Com #29H
Project:	Eddy County, NM (NAD 27)	TVD Reference:	Well @ 2980.0usft (Scandrill Freedom)
Site:	Sec 3, T26-S, R28-E	MD Reference:	Well @ 2980.0usft (Scandrill Freedom)
Well:	SRO State Com #29H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	Compass

Project	Eddy County, NM (NAD 27)		
Map System:	US State Plane 1927 (Exact solution)	System Datum:	Mean Sea Level
Geo Datum:	NAD 1927 (NADCON CONUS)		
Map Zone:	New Mexico East 3001		

Site	Sec 3, T26-S, R28-E		
Site Position:		Northing:	392,295.70 usft
From:	Map	Easting:	579,141.10 usft
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16 "
		Latitude:	32° 4' 41.804 N
		Longitude:	104° 4' 40.145 W
		Grid Convergence:	0.14 °

Well	SRO State Com #29H		
Well Position	+N/-S	0.0 usft	Northing:
	+E/-W	0.0 usft	Easting:
Position Uncertainty	0.0 usft	Wellhead Elevation:	0.0 usft
		Latitude:	32° 4' 41.804 N
		Longitude:	104° 4' 40.145 W
		Ground Level:	2,954.0 usft

Wellbore	Wellbore #1		
Magnetics	Model Name	Sample Date	Declination
			(°)
	IGRF2010	2/27/2015	7.35
			Dip Angle
			(°)
			59.87
			Field Strength
			(nT)
			48,107

Design	Wellbore #1		
Audit Notes:			
Version:	1.0	Phase:	ACTUAL
		Tie On Depth:	0.0
Vertical Section:	Depth From (TVD)	+N/-S	+E/-W
	(usft)	(usft)	(usft)
	0.0	0.0	0.0
			Direction
			(°)
			179.18

Survey Program	Date 4/6/2015		
From	To	Survey (Wellbore)	Tool Name
(usft)	(usft)		
100.0	6,143.0	Gyro (Wellbore #1)	Good_gyro
6,248.0	17,828.0	MWD (Wellbore #1)	MWD default
			Description
			Good Gyro
			MWD - Standard

Survey									
Measured	Inclination	Azimuth	Vertical	+N/-S	+E/-W	Map	Map	Latitude	Longitude
Depth	(°)	(°)	Depth	(usft)	(usft)	Northing	Easting		
(usft)			(usft)			(usft)	(usft)		
0.0	0.00	0.00	0.0	0.0	0.0	392,295.69	579,141.10	32° 4' 41.804 N	104° 4' 40.145 W
100.0	0.32	141.04	100.0	-0.2	0.2	392,295.47	579,141.28	32° 4' 41.802 N	104° 4' 40.143 W
200.0	0.63	187.67	200.0	-1.0	0.3	392,294.71	579,141.38	32° 4' 41.794 N	104° 4' 40.142 W
300.0	0.75	242.52	300.0	-1.8	-0.4	392,293.87	579,140.73	32° 4' 41.786 N	104° 4' 40.150 W
400.0	1.75	244.16	400.0	-2.8	-2.3	392,292.90	579,138.77	32° 4' 41.776 N	104° 4' 40.172 W
500.0	1.81	250.72	499.9	-4.0	-5.2	392,291.71	579,135.91	32° 4' 41.765 N	104° 4' 40.206 W
600.0	1.58	248.29	599.9	-5.0	-8.0	392,290.68	579,133.14	32° 4' 41.754 N	104° 4' 40.238 W
700.0	1.58	233.67	699.8	-6.3	-10.4	392,289.35	579,130.74	32° 4' 41.741 N	104° 4' 40.266 W
800.0	1.63	233.83	799.8	-8.0	-12.6	392,287.70	579,128.49	32° 4' 41.725 N	104° 4' 40.292 W
900.0	0.64	244.11	899.8	-9.1	-14.3	392,286.61	579,126.83	32° 4' 41.714 N	104° 4' 40.311 W
1,000.0	0.57	286.52	999.8	-9.2	-15.2	392,286.51	579,125.86	32° 4' 41.713 N	104° 4' 40.323 W



Survey Report - Geographic



Company:	COG Operating, LLC	Local Co-ordinate Reference:	Well SRO State Com #29H
Project:	Eddy County, NM (NAD 27)	TVD Reference:	Well @ 2980.0usft (Scandril Freedom)
Site:	Sec 3, T26-S, R28-E	MD Reference:	Well @ 2980.0usft (Scandril Freedom)
Well:	SRO State Com #29H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	Compass

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
1,100.0	0.51	253.39	1,099.8	-9.2	-16.2	392,286.53	579,124.95	32° 4' 41.714 N	104° 4' 40.333 W
1,200.0	0.59	261.13	1,199.8	-9.4	-17.1	392,286.32	579,124.02	32° 4' 41.712 N	104° 4' 40.344 W
1,300.0	0.17	304.60	1,299.8	-9.4	-17.7	392,286.32	579,123.39	32° 4' 41.712 N	104° 4' 40.351 W
1,400.0	0.58	268.27	1,399.8	-9.3	-18.3	392,286.39	579,122.76	32° 4' 41.712 N	104° 4' 40.359 W
1,500.0	1.01	266.84	1,499.7	-9.4	-19.7	392,286.33	579,121.37	32° 4' 41.712 N	104° 4' 40.375 W
1,600.0	0.61	276.79	1,599.7	-9.3	-21.1	392,286.34	579,119.96	32° 4' 41.712 N	104° 4' 40.391 W
1,700.0	1.25	260.28	1,699.7	-9.5	-22.7	392,286.22	579,118.36	32° 4' 41.711 N	104° 4' 40.410 W
1,800.0	0.68	246.11	1,799.7	-9.9	-24.4	392,285.80	579,116.74	32° 4' 41.707 N	104° 4' 40.429 W
1,900.0	0.29	177.92	1,899.7	-10.4	-24.9	392,285.30	579,116.21	32° 4' 41.702 N	104° 4' 40.435 W
2,000.0	0.75	115.17	1,999.7	-10.9	-24.3	392,284.77	579,116.81	32° 4' 41.696 N	104° 4' 40.428 W
2,100.0	1.30	114.94	2,099.7	-11.7	-22.7	392,284.02	579,118.43	32° 4' 41.689 N	104° 4' 40.409 W
2,200.0	2.08	116.84	2,199.6	-13.0	-20.0	392,282.72	579,121.08	32° 4' 41.676 N	104° 4' 40.378 W
2,300.0	1.97	138.30	2,299.6	-15.1	-17.3	392,280.62	579,123.84	32° 4' 41.655 N	104° 4' 40.346 W
2,400.0	0.90	186.56	2,399.6	-17.1	-16.2	392,278.55	579,124.90	32° 4' 41.635 N	104° 4' 40.334 W
2,500.0	1.41	221.59	2,499.5	-18.8	-17.1	392,276.85	579,123.99	32° 4' 41.618 N	104° 4' 40.345 W
2,600.0	1.70	250.66	2,599.5	-20.3	-19.3	392,275.44	579,121.77	32° 4' 41.604 N	104° 4' 40.371 W
2,700.0	1.80	246.37	2,699.4	-21.4	-22.2	392,274.32	579,118.93	32° 4' 41.593 N	104° 4' 40.404 W
2,800.0	1.81	258.93	2,799.4	-22.3	-25.2	392,273.39	579,115.95	32° 4' 41.584 N	104° 4' 40.438 W
2,900.0	1.97	246.03	2,899.3	-23.3	-28.3	392,272.39	579,112.82	32° 4' 41.574 N	104° 4' 40.475 W
3,000.0	2.05	242.46	2,999.3	-24.8	-31.4	392,270.86	579,109.67	32° 4' 41.559 N	104° 4' 40.511 W
3,100.0	1.80	265.21	3,099.2	-25.8	-34.6	392,269.90	579,106.52	32° 4' 41.549 N	104° 4' 40.548 W
3,200.0	1.16	283.54	3,199.2	-25.7	-37.1	392,270.01	579,103.97	32° 4' 41.551 N	104° 4' 40.578 W
3,300.0	1.07	273.02	3,299.2	-25.4	-39.1	392,270.29	579,102.05	32° 4' 41.553 N	104° 4' 40.600 W
3,400.0	1.28	277.61	3,399.2	-25.2	-41.1	392,270.49	579,100.01	32° 4' 41.555 N	104° 4' 40.624 W
3,500.0	1.16	290.82	3,499.1	-24.7	-43.1	392,271.00	579,097.96	32° 4' 41.561 N	104° 4' 40.647 W
3,600.0	1.19	274.45	3,599.1	-24.3	-45.1	392,271.44	579,095.98	32° 4' 41.565 N	104° 4' 40.670 W
3,700.0	0.74	270.44	3,699.1	-24.2	-46.8	392,271.52	579,094.30	32° 4' 41.566 N	104° 4' 40.690 W
3,800.0	0.94	283.47	3,799.1	-24.0	-48.2	392,271.72	579,092.85	32° 4' 41.568 N	104° 4' 40.707 W
3,900.0	1.33	274.19	3,899.1	-23.7	-50.2	392,272.00	579,090.90	32° 4' 41.571 N	104° 4' 40.729 W
4,000.0	1.48	275.92	3,999.0	-23.5	-52.6	392,272.21	579,088.46	32° 4' 41.573 N	104° 4' 40.758 W
4,100.0	1.44	274.42	4,099.0	-23.2	-55.2	392,272.44	579,085.92	32° 4' 41.575 N	104° 4' 40.787 W
4,200.0	1.19	276.34	4,199.0	-23.0	-57.5	392,272.66	579,083.63	32° 4' 41.577 N	104° 4' 40.814 W
4,300.0	0.96	272.81	4,299.0	-22.9	-59.3	392,272.81	579,081.77	32° 4' 41.579 N	104° 4' 40.836 W
4,400.0	0.80	275.36	4,398.9	-22.8	-60.9	392,272.92	579,080.23	32° 4' 41.580 N	104° 4' 40.853 W
4,500.0	0.99	271.38	4,498.9	-22.7	-62.4	392,273.00	579,078.67	32° 4' 41.581 N	104° 4' 40.872 W
4,600.0	0.91	252.17	4,598.9	-22.9	-64.0	392,272.78	579,077.05	32° 4' 41.579 N	104° 4' 40.890 W
4,700.0	0.90	251.17	4,698.9	-23.4	-65.5	392,272.29	579,075.56	32° 4' 41.574 N	104° 4' 40.908 W
4,800.0	0.73	238.53	4,798.9	-24.0	-66.8	392,271.70	579,074.27	32° 4' 41.568 N	104° 4' 40.923 W
4,900.0	0.71	233.23	4,898.9	-24.7	-67.9	392,271.00	579,073.23	32° 4' 41.561 N	104° 4' 40.935 W
5,000.0	1.02	215.44	4,998.9	-25.8	-68.9	392,269.90	579,072.22	32° 4' 41.550 N	104° 4' 40.947 W
5,100.0	1.07	214.00	5,098.9	-27.3	-69.9	392,268.40	579,071.18	32° 4' 41.535 N	104° 4' 40.959 W
5,200.0	0.93	218.03	5,198.8	-28.7	-70.9	392,266.99	579,070.16	32° 4' 41.521 N	104° 4' 40.971 W
5,300.0	1.04	210.81	5,298.8	-30.1	-71.9	392,265.57	579,069.19	32° 4' 41.507 N	104° 4' 40.982 W
5,400.0	1.24	208.20	5,398.8	-31.9	-72.9	392,263.84	579,068.22	32° 4' 41.490 N	104° 4' 40.993 W
5,500.0	1.18	209.46	5,498.8	-33.7	-73.9	392,261.99	579,067.20	32° 4' 41.472 N	104° 4' 41.005 W
5,600.0	1.14	220.54	5,598.8	-35.4	-75.1	392,260.33	579,066.05	32° 4' 41.456 N	104° 4' 41.019 W
5,700.0	1.10	207.83	5,698.8	-37.0	-76.2	392,258.73	579,064.95	32° 4' 41.440 N	104° 4' 41.031 W
5,800.0	1.27	200.12	5,798.7	-38.9	-77.0	392,256.84	579,064.12	32° 4' 41.421 N	104° 4' 41.041 W
5,900.0	1.10	202.91	5,898.7	-40.8	-77.7	392,254.91	579,063.37	32° 4' 41.402 N	104° 4' 41.050 W
6,000.0	1.05	198.17	5,998.7	-42.5	-78.4	392,253.16	579,062.71	32° 4' 41.385 N	104° 4' 41.058 W
6,100.0	1.01	206.76	6,098.7	-44.2	-79.1	392,251.50	579,062.02	32° 4' 41.368 N	104° 4' 41.066 W
6,143.0	1.29	220.48	6,141.7	-44.9	-79.6	392,250.79	579,061.54	32° 4' 41.361 N	104° 4' 41.071 W
Tie In @ 6143' MD / 6142' TVD									
6,248.0	1.80	225.50	6,246.6	-47.0	-81.5	392,248.74	579,059.60	32° 4' 41.341 N	104° 4' 41.094 W
6,437.0	2.90	171.20	6,435.5	-53.8	-82.9	392,241.93	579,058.21	32° 4' 41.274 N	104° 4' 41.110 W

Company:	COG Operating, LLC	Local Co-ordinate Reference:	Well SRO State Com #29H
Project:	Eddy County, NM (NAD 27)	TVD Reference:	Well @ 2980.0usft (Scandril Freedom)
Site:	Sec 3, T26-S, R28-E	MD Reference:	Well @ 2980.0usft (Scandril Freedom)
Well:	SRO State Com #29H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	Compass

Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude	
6,626.0	1.10	203.70	6,624.4	-60.1	-82.9	392,235.55	579,058.21	32° 4' 41.211 N	104° 4' 41.110 W	
6,816.0	1.00	215.50	6,814.3	-63.2	-84.6	392,232.53	579,056.52	32° 4' 41.181 N	104° 4' 41.130 W	
7,005.0	0.50	192.80	7,003.3	-65.3	-85.7	392,230.38	579,055.38	32° 4' 41.160 N	104° 4' 41.143 W	
7,193.0	1.10	193.20	7,191.3	-67.9	-86.3	392,227.82	579,054.78	32° 4' 41.134 N	104° 4' 41.150 W	
7,382.0	1.00	180.00	7,380.3	-71.3	-86.7	392,224.41	579,054.37	32° 4' 41.100 N	104° 4' 41.155 W	
7,459.0	1.40	182.60	7,457.3	-72.9	-86.8	392,222.80	579,054.33	32° 4' 41.085 N	104° 4' 41.156 W	
7,505.0	2.10	156.80	7,503.2	-74.2	-86.5	392,221.46	579,054.63	32° 4' 41.071 N	104° 4' 41.152 W	
7,536.0	6.70	135.50	7,534.1	-76.0	-85.0	392,219.65	579,056.12	32° 4' 41.053 N	104° 4' 41.135 W	
7,568.0	11.10	130.10	7,565.7	-79.4	-81.3	392,216.33	579,059.79	32° 4' 41.020 N	104° 4' 41.093 W	
7,599.0	15.10	130.40	7,595.9	-83.9	-76.0	392,211.79	579,065.15	32° 4' 40.975 N	104° 4' 41.030 W	
7,631.0	17.50	137.80	7,626.6	-90.2	-69.5	392,205.52	579,071.56	32° 4' 40.913 N	104° 4' 40.956 W	
7,662.0	20.10	142.90	7,656.0	-97.9	-63.2	392,197.82	579,077.90	32° 4' 40.837 N	104° 4' 40.883 W	
7,694.0	23.60	146.40	7,685.7	-107.6	-56.3	392,188.09	579,084.77	32° 4' 40.740 N	104° 4' 40.803 W	
7,725.0	26.70	149.60	7,713.7	-118.8	-49.4	392,176.92	579,091.73	32° 4' 40.630 N	104° 4' 40.722 W	
7,756.0	27.90	151.50	7,741.3	-131.2	-42.4	392,164.53	579,098.71	32° 4' 40.507 N	104° 4' 40.642 W	
7,788.0	29.90	152.20	7,769.3	-144.8	-35.1	392,150.90	579,106.01	32° 4' 40.372 N	104° 4' 40.557 W	
7,820.0	33.40	154.30	7,796.5	-159.8	-27.6	392,135.90	579,113.55	32° 4' 40.223 N	104° 4' 40.470 W	
7,851.0	37.10	157.70	7,821.9	-176.1	-20.3	392,119.56	579,120.80	32° 4' 40.061 N	104° 4' 40.386 W	
7,882.0	40.40	162.60	7,846.0	-194.4	-13.7	392,101.31	579,127.35	32° 4' 39.881 N	104° 4' 40.310 W	
7,914.0	42.20	165.90	7,870.1	-214.7	-8.0	392,080.99	579,133.07	32° 4' 39.679 N	104° 4' 40.245 W	
7,945.0	43.40	169.80	7,892.8	-235.3	-3.6	392,060.40	579,137.50	32° 4' 39.475 N	104° 4' 40.194 W	
7,977.0	44.90	172.40	7,915.8	-257.3	-0.2	392,038.38	579,140.94	32° 4' 39.257 N	104° 4' 40.154 W	
8,008.0	46.60	171.90	7,937.4	-279.3	2.9	392,016.39	579,143.97	32° 4' 39.040 N	104° 4' 40.120 W	
8,013.5	46.77	171.78	7,941.2	-283.3	3.4	392,012.43	579,144.54	32° 4' 39.000 N	104° 4' 40.113 W	
Crossed 330' Hard Line @ 8014' MD / 7941' TVD										
8,040.0	47.60	171.20	7,959.2	-302.5	6.3	391,993.20	579,147.42	32° 4' 38.810 N	104° 4' 40.080 W	
8,071.0	50.00	170.70	7,979.6	-325.5	10.0	391,970.17	579,151.09	32° 4' 38.582 N	104° 4' 40.038 W	
8,103.0	53.80	169.80	7,999.4	-350.3	14.3	391,945.36	579,155.36	32° 4' 38.336 N	104° 4' 39.989 W	
8,134.0	56.80	169.80	8,017.0	-375.4	18.8	391,920.28	579,159.87	32° 4' 38.088 N	104° 4' 39.938 W	
8,165.0	59.60	171.40	8,033.3	-401.4	23.1	391,894.29	579,164.17	32° 4' 37.831 N	104° 4' 39.888 W	
8,197.0	62.90	172.30	8,048.7	-429.2	27.0	391,866.52	579,168.14	32° 4' 37.556 N	104° 4' 39.843 W	
8,228.0	65.90	173.50	8,062.1	-456.9	30.5	391,838.78	579,171.59	32° 4' 37.281 N	104° 4' 39.804 W	
8,259.0	69.10	174.00	8,074.0	-485.4	33.6	391,810.31	579,174.71	32° 4' 37.000 N	104° 4' 39.768 W	
8,291.0	71.60	174.40	8,084.8	-515.4	36.6	391,780.33	579,177.75	32° 4' 36.703 N	104° 4' 39.734 W	
8,322.0	74.70	174.40	8,093.7	-544.9	39.5	391,750.81	579,180.65	32° 4' 36.411 N	104° 4' 39.701 W	
8,354.0	77.70	174.70	8,101.4	-575.8	42.5	391,719.88	579,183.60	32° 4' 36.104 N	104° 4' 39.667 W	
8,385.0	80.20	175.80	8,107.3	-606.1	45.0	391,689.56	579,186.12	32° 4' 35.804 N	104° 4' 39.639 W	
8,417.0	83.30	178.40	8,111.9	-637.8	46.6	391,657.94	579,187.72	32° 4' 35.491 N	104° 4' 39.621 W	
8,448.0	86.70	180.90	8,114.6	-668.6	46.8	391,627.06	579,187.90	32° 4' 35.186 N	104° 4' 39.620 W	
8,566.0	91.00	180.40	8,117.0	-786.6	45.5	391,509.12	579,186.56	32° 4' 34.019 N	104° 4' 39.639 W	
8,660.0	90.00	180.20	8,116.2	-880.6	45.0	391,415.13	579,186.07	32° 4' 33.088 N	104° 4' 39.647 W	
8,755.0	90.00	179.80	8,116.2	-975.6	45.0	391,320.13	579,186.07	32° 4' 32.148 N	104° 4' 39.649 W	
8,850.0	90.50	179.60	8,115.7	-1,070.6	45.5	391,225.13	579,186.57	32° 4' 31.208 N	104° 4' 39.646 W	
8,944.0	91.40	179.10	8,114.2	-1,164.5	46.5	391,131.15	579,187.64	32° 4' 30.278 N	104° 4' 39.637 W	
9,038.0	90.20	179.30	8,112.9	-1,258.5	47.8	391,037.17	579,188.95	32° 4' 29.348 N	104° 4' 39.624 W	
9,133.0	90.80	180.70	8,112.0	-1,353.5	47.8	390,942.18	579,188.95	32° 4' 28.408 N	104° 4' 39.626 W	
9,226.0	91.80	181.10	8,109.9	-1,446.5	46.4	390,849.21	579,187.49	32° 4' 27.488 N	104° 4' 39.646 W	
9,320.0	90.40	180.00	8,108.1	-1,540.5	45.5	390,755.24	579,186.59	32° 4' 26.558 N	104° 4' 39.659 W	
9,414.0	89.10	180.40	8,108.5	-1,634.4	45.2	390,661.24	579,186.26	32° 4' 25.627 N	104° 4' 39.665 W	
9,509.0	89.10	179.10	8,110.0	-1,729.4	45.6	390,566.26	579,186.67	32° 4' 24.687 N	104° 4' 39.663 W	
9,603.0	89.40	178.90	8,111.3	-1,823.4	47.2	390,472.28	579,188.31	32° 4' 23.757 N	104° 4' 39.647 W	
9,698.0	90.10	178.90	8,111.7	-1,918.4	49.0	390,377.30	579,190.14	32° 4' 22.817 N	104° 4' 39.628 W	
9,792.0	90.80	178.60	8,110.9	-2,012.4	51.1	390,283.33	579,192.19	32° 4' 21.887 N	104° 4' 39.607 W	
9,887.0	91.30	178.30	8,109.2	-2,107.3	53.7	390,188.38	579,194.76	32° 4' 20.948 N	104° 4' 39.580 W	
9,981.0	89.90	178.60	8,108.2	-2,201.3	56.2	390,094.42	579,197.30	32° 4' 20.018 N	104° 4' 39.553 W	

Company:	COG Operating, LLC	Local Co-ordinate Reference:	Well SRO State Com #29H
Project:	Eddy County, NM (NAD 27)	TVD Reference:	Well @ 2980.0usft (Scandril Freedom)
Site:	Sec 3, T26-S, R28-E	MD Reference:	Well @ 2980.0usft (Scandril Freedom)
Well:	SRO State Com #29H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	Compass

Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude	
10,076.0	91.00	180.90	8,107.5	-2,296.3	56.6	389,999.43	579,197.71	32° 4' 19.078 N	104° 4' 39.551 W	
10,171.0	90.10	180.00	8,106.5	-2,391.3	55.9	389,904.44	579,196.97	32° 4' 18.138 N	104° 4' 39.562 W	
10,265.0	89.80	179.80	8,106.6	-2,485.3	56.0	389,810.44	579,197.13	32° 4' 17.207 N	104° 4' 39.563 W	
10,359.0	89.20	178.80	8,107.4	-2,579.2	57.2	389,716.45	579,198.28	32° 4' 16.277 N	104° 4' 39.552 W	
10,454.0	89.50	178.30	8,108.5	-2,674.2	59.6	389,621.49	579,200.68	32° 4' 15.337 N	104° 4' 39.526 W	
10,548.0	90.10	178.40	8,108.9	-2,768.2	62.3	389,527.53	579,203.39	32° 4' 14.407 N	104° 4' 39.498 W	
10,643.0	90.80	178.80	8,108.1	-2,863.1	64.6	389,432.56	579,205.71	32° 4' 13.467 N	104° 4' 39.473 W	
10,737.0	91.60	178.80	8,106.1	-2,957.1	66.6	389,338.60	579,207.68	32° 4' 12.537 N	104° 4' 39.453 W	
10,832.0	90.10	179.60	8,104.7	-3,052.1	67.9	389,243.63	579,209.01	32° 4' 11.597 N	104° 4' 39.440 W	
10,926.0	90.90	179.80	8,103.9	-3,146.1	68.4	389,149.63	579,209.50	32° 4' 10.667 N	104° 4' 39.437 W	
11,020.0	91.90	179.60	8,101.6	-3,240.0	68.9	389,055.66	579,209.99	32° 4' 9.737 N	104° 4' 39.434 W	
11,115.0	90.20	179.50	8,099.9	-3,335.0	69.6	388,960.69	579,210.74	32° 4' 8.797 N	104° 4' 39.428 W	
11,209.0	91.40	179.30	8,098.6	-3,429.0	70.6	388,866.70	579,211.72	32° 4' 7.867 N	104° 4' 39.419 W	
11,303.0	90.20	180.00	8,097.2	-3,523.0	71.2	388,772.71	579,212.29	32° 4' 6.937 N	104° 4' 39.415 W	
11,398.0	88.60	179.80	8,098.2	-3,618.0	71.4	388,677.72	579,212.46	32° 4' 5.997 N	104° 4' 39.416 W	
11,492.0	89.20	179.10	8,100.0	-3,711.9	72.3	388,583.75	579,213.36	32° 4' 5.067 N	104° 4' 39.408 W	
11,587.0	89.70	178.60	8,101.0	-3,806.9	74.2	388,488.77	579,215.27	32° 4' 4.127 N	104° 4' 39.388 W	
11,680.0	90.80	178.40	8,100.6	-3,899.9	76.6	388,395.80	579,217.70	32° 4' 3.207 N	104° 4' 39.362 W	
11,775.0	91.00	177.90	8,099.1	-3,994.8	79.7	388,300.87	579,220.77	32° 4' 2.267 N	104° 4' 39.329 W	
11,869.0	90.70	178.80	8,097.7	-4,088.8	82.4	388,206.92	579,223.48	32° 4' 1.337 N	104° 4' 39.301 W	
11,963.0	91.40	178.90	8,095.9	-4,182.7	84.3	388,112.95	579,225.36	32° 4' 0.407 N	104° 4' 39.281 W	
12,057.0	90.30	178.60	8,094.6	-4,276.7	86.3	388,018.99	579,227.41	32° 3' 59.477 N	104° 4' 39.260 W	
12,151.0	90.80	179.30	8,093.6	-4,370.7	88.0	387,925.01	579,229.13	32° 3' 58.547 N	104° 4' 39.243 W	
12,245.0	92.00	179.60	8,091.4	-4,464.7	88.9	387,831.04	579,230.04	32° 3' 57.617 N	104° 4' 39.235 W	
12,339.0	90.90	180.40	8,089.0	-4,558.6	88.9	387,737.07	579,230.04	32° 3' 56.687 N	104° 4' 39.237 W	
12,433.0	89.60	180.70	8,088.6	-4,652.6	88.0	387,643.08	579,229.13	32° 3' 55.757 N	104° 4' 39.250 W	
12,528.0	89.10	180.40	8,089.6	-4,747.6	87.1	387,548.09	579,228.22	32° 3' 54.817 N	104° 4' 39.264 W	
12,622.0	89.70	180.50	8,090.6	-4,841.6	86.4	387,454.10	579,227.48	32° 3' 53.887 N	104° 4' 39.275 W	
12,716.0	89.20	179.50	8,091.5	-4,935.6	86.4	387,360.11	579,227.48	32° 3' 52.957 N	104° 4' 39.277 W	
12,810.0	90.30	180.00	8,091.9	-5,029.6	86.8	387,266.11	579,227.89	32° 3' 52.026 N	104° 4' 39.275 W	
12,878.0	90.37	178.84	8,091.5	-5,097.6	87.5	387,198.12	579,228.58	32° 3' 51.354 N	104° 4' 39.269 W	
Crossed Section Line @ 12878' MD / 8092' TVD										
12,904.0	90.40	178.40	8,091.4	-5,123.6	88.1	387,172.12	579,229.21	32° 3' 51.096 N	104° 4' 39.262 W	
12,998.0	91.30	178.30	8,090.0	-5,217.5	90.8	387,078.17	579,231.91	32° 3' 50.166 N	104° 4' 39.234 W	
13,092.0	89.50	178.40	8,089.3	-5,311.5	93.5	386,984.22	579,234.62	32° 3' 49.237 N	104° 4' 39.205 W	
13,186.0	90.30	177.70	8,089.5	-5,405.4	96.7	386,890.27	579,237.82	32° 3' 48.307 N	104° 4' 39.170 W	
13,280.0	90.50	179.30	8,088.8	-5,499.4	99.2	386,796.31	579,240.28	32° 3' 47.377 N	104° 4' 39.144 W	
13,374.0	91.40	179.10	8,087.3	-5,593.4	100.5	386,702.34	579,241.59	32° 3' 46.447 N	104° 4' 39.131 W	
13,468.0	90.90	180.70	8,085.4	-5,687.3	100.7	386,608.36	579,241.75	32° 3' 45.517 N	104° 4' 39.132 W	
13,562.0	89.90	180.50	8,084.7	-5,781.3	99.7	386,514.37	579,240.77	32° 3' 44.587 N	104° 4' 39.146 W	
13,656.0	90.80	180.20	8,084.1	-5,875.3	99.1	386,420.37	579,240.20	32° 3' 43.656 N	104° 4' 39.155 W	
13,750.0	91.70	180.20	8,082.1	-5,969.3	98.8	386,326.39	579,239.87	32° 3' 42.726 N	104° 4' 39.162 W	
13,845.0	90.20	180.50	8,080.5	-6,064.3	98.2	386,231.41	579,239.29	32° 3' 41.786 N	104° 4' 39.171 W	
13,939.0	91.20	181.10	8,079.4	-6,158.3	96.9	386,137.43	579,237.98	32° 3' 40.856 N	104° 4' 39.189 W	
14,033.0	90.00	181.20	8,078.4	-6,252.2	95.0	386,043.46	579,236.09	32° 3' 39.926 N	104° 4' 39.214 W	
14,127.0	91.00	179.60	8,077.6	-6,346.2	94.3	385,949.47	579,235.43	32° 3' 38.996 N	104° 4' 39.224 W	
14,221.0	92.10	179.10	8,075.0	-6,440.2	95.4	385,855.51	579,236.50	32° 3' 38.066 N	104° 4' 39.214 W	
14,315.0	90.30	179.30	8,073.1	-6,534.1	96.7	385,761.54	579,237.81	32° 3' 37.136 N	104° 4' 39.201 W	
14,410.0	89.20	179.50	8,073.5	-6,629.1	97.7	385,666.55	579,238.81	32° 3' 36.196 N	104° 4' 39.192 W	
14,504.0	90.00	179.30	8,074.1	-6,723.1	98.7	385,572.56	579,239.79	32° 3' 35.266 N	104° 4' 39.183 W	
14,598.0	91.10	179.10	8,073.2	-6,817.1	100.0	385,478.57	579,241.10	32° 3' 34.336 N	104° 4' 39.171 W	
14,692.0	90.00	180.70	8,072.3	-6,911.1	100.2	385,384.58	579,241.27	32° 3' 33.406 N	104° 4' 39.172 W	
14,786.0	91.20	181.10	8,071.3	-7,005.1	98.7	385,290.60	579,239.79	32° 3' 32.475 N	104° 4' 39.191 W	
14,880.0	90.00	181.10	8,070.4	-7,099.1	96.9	385,196.62	579,237.99	32° 3' 31.545 N	104° 4' 39.215 W	
14,974.0	89.50	179.30	8,070.8	-7,193.1	96.6	385,102.63	579,237.66	32° 3' 30.615 N	104° 4' 39.221 W	



Survey Report - Geographic



Company:	COG Operating, LLC	Local Co-ordinate Reference:	Well SRO State Com #29H
Project:	Eddy County, NM (NAD 27)	TVD Reference:	Well @ 2980.0usft (Scandril Freedom)
Site:	Sec 3, T26-S, R28-E	MD Reference:	Well @ 2980.0usft (Scandril Freedom)
Well:	SRO State Com #29H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	Compass

Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
15,068.0	90.50	179.10	8,070.8	-7,287.1	97.9	385,008.64	579,238.97	32° 3' 29.685 N	104° 4' 39.209 W
15,163.0	91.50	178.80	8,069.1	-7,382.0	99.6	384,913.67	579,240.71	32° 3' 28.745 N	104° 4' 39.191 W
15,257.0	90.40	179.10	8,067.5	-7,476.0	101.3	384,819.70	579,242.43	32° 3' 27.815 N	104° 4' 39.174 W
15,351.0	89.10	178.90	8,068.0	-7,570.0	103.0	384,725.72	579,244.07	32° 3' 26.885 N	104° 4' 39.157 W
15,445.0	90.20	178.80	8,068.5	-7,663.9	104.9	384,631.74	579,245.96	32° 3' 25.955 N	104° 4' 39.138 W
15,539.0	91.70	178.80	8,067.0	-7,757.9	106.8	384,537.78	579,247.93	32° 3' 25.025 N	104° 4' 39.117 W
15,633.0	90.60	178.90	8,065.1	-7,851.9	108.7	384,443.82	579,249.81	32° 3' 24.095 N	104° 4' 39.098 W
15,727.0	89.20	177.90	8,065.2	-7,945.8	111.3	384,349.86	579,252.44	32° 3' 23.165 N	104° 4' 39.070 W
15,821.0	90.40	176.80	8,065.6	-8,039.7	115.7	384,255.96	579,256.78	32° 3' 22.236 N	104° 4' 39.022 W
15,915.0	90.40	178.60	8,064.9	-8,133.6	119.5	384,162.04	579,260.56	32° 3' 21.306 N	104° 4' 38.981 W
16,009.0	91.60	179.10	8,063.3	-8,227.6	121.3	384,068.08	579,262.44	32° 3' 20.376 N	104° 4' 38.962 W
16,103.0	90.60	179.80	8,061.5	-8,321.6	122.2	383,974.10	579,263.34	32° 3' 19.446 N	104° 4' 38.954 W
16,197.0	89.00	179.80	8,061.8	-8,415.6	122.6	383,880.11	579,263.67	32° 3' 18.516 N	104° 4' 38.953 W
16,291.0	89.50	179.80	8,063.0	-8,509.6	122.9	383,786.12	579,264.00	32° 3' 17.586 N	104° 4' 38.951 W
16,385.0	90.30	179.50	8,063.2	-8,603.6	123.5	383,692.12	579,264.57	32° 3' 16.655 N	104° 4' 38.947 W
16,479.0	91.20	178.80	8,062.0	-8,697.6	124.9	383,598.14	579,265.97	32° 3' 15.725 N	104° 4' 38.934 W
16,573.0	90.10	179.10	8,060.9	-8,791.5	126.6	383,504.16	579,267.69	32° 3' 14.795 N	104° 4' 38.916 W
16,667.0	90.60	177.90	8,060.3	-8,885.5	129.0	383,410.20	579,270.15	32° 3' 13.865 N	104° 4' 38.890 W
16,761.0	91.10	175.30	8,058.9	-8,979.3	134.6	383,316.38	579,275.73	32° 3' 12.937 N	104° 4' 38.828 W
16,855.0	91.40	177.20	8,056.9	-9,073.1	140.8	383,222.61	579,281.87	32° 3' 12.009 N	104° 4' 38.759 W
16,949.0	90.30	178.10	8,055.5	-9,167.0	144.6	383,128.70	579,285.73	32° 3' 11.079 N	104° 4' 38.717 W
17,043.0	90.60	179.60	8,054.7	-9,261.0	146.5	383,034.73	579,287.61	32° 3' 10.149 N	104° 4' 38.698 W
17,137.0	89.40	180.50	8,054.7	-9,355.0	146.4	382,940.73	579,287.53	32° 3' 9.219 N	104° 4' 38.701 W
17,231.0	90.30	180.90	8,055.0	-9,449.0	145.3	382,846.74	579,286.38	32° 3' 8.289 N	104° 4' 38.717 W
17,326.0	89.00	180.50	8,055.6	-9,543.9	144.1	382,751.75	579,285.22	32° 3' 7.349 N	104° 4' 38.733 W
17,419.0	89.50	180.40	8,056.8	-9,636.9	143.4	382,658.76	579,284.49	32° 3' 6.428 N	104° 4' 38.744 W
17,514.0	91.60	180.40	8,055.9	-9,731.9	142.7	382,563.77	579,283.83	32° 3' 5.488 N	104° 4' 38.755 W
17,608.0	90.20	180.20	8,054.4	-9,825.9	142.2	382,469.79	579,283.34	32° 3' 4.558 N	104° 4' 38.763 W
17,702.0	90.40	180.00	8,053.9	-9,919.9	142.1	382,375.79	579,283.17	32° 3' 3.628 N	104° 4' 38.767 W
17,774.0	90.30	180.00	8,053.5	-9,991.9	142.1	382,303.79	579,283.17	32° 3' 2.915 N	104° 4' 38.769 W
17,828.0	90.30	180.00	8,053.2	-10,045.9	142.1	382,249.79	579,283.17	32° 3' 2.381 N	104° 4' 38.771 W

TD @ 17828' MD / 8053' TVD

Design Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
6,143.0	6,141.7	-44.9	-79.6	Tie In @ 6143' MD / 6142' TVD
8,013.5	7,941.2	-283.3	3.4	Crossed 330' Hard Line @ 8014' MD / 7941' TVD
12,878.0	8,091.5	-5,097.6	87.5	Crossed Section Line @ 12878' MD / 8092' TVD
17,828.0	8,053.2	-10,045.9	142.1	TD @ 17828' MD / 8053' TVD

Checked By: _____

Approved By: _____

Date: _____