

DISTRICT I
1825 N. French Dr., Hobbs, N.M. 88240
Phone: (575) 393-8181 Fax: (575) 393-0720

DISTRICT II
811 S. First St., Artesia, N.M. 88210
Phone: (575) 748-1283 Fax: (575) 748-9720

DISTRICT III
1000 Rio Branos Rd., Aztec, N.M. 87410
Phone: (505) 334-6178 Fax: (505) 334-6170

DISTRICT IV
1220 S. St. Francis Dr., Santa Fe, NM 87505
Phone: (505) 476-3480 Fax: (505) 476-3482

State of New Mexico
Energy, Minerals & Natural Resources Department

Form C-102
Revised August 1, 2011

OIL CONSERVATION DIVISION

1220 South St. Francis Dr.
Santa Fe, NM 87505

Submit one copy to appropriate
District Office

☒ AMENDED REPORT
☒ AS-DRILLED

WELL LOCATION AND ACREAGE DEDICATION PLAT

¹ API Number 30-039-31309		² Pool Code 39189	³ Pool Name WEST LINDRITH GALLUP DAKOTA
⁴ Property Code 314743	⁵ Property Name Many Canyons 24-03 8		⁶ Well Number 4H
⁷ OGRID No. 162928	⁸ Operator Name ENERGEN RESOURCES CORPORATION		⁹ Elevation 6877.9

¹⁰ Surface Location

UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
P	8	24N	3W		1230'	SOUTH	716'	EAST	RIO ARriba

¹¹ Bottom Hole Location If Different From Surface

UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
M	8	24N	3W		410'	SOUTH	244'	WEST	RIO ARriba

¹² Dedicated Acres S/2 SEC 8 320 ACRES	PROJECT AREA	¹³ Joint or Infill	¹⁴ Consolidation Code	¹⁵ Order No. N/A
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NO ALLOWABLE WILL BE ASSIGNED TO THIS COMPLETION UNTIL ALL INTERESTS HAVE BEEN CONSOLIDATED
OR A NON-STANDARD UNIT HAS BEEN APPROVED BY THE DIVISION

¹⁷ OPERATOR CERTIFICATION

I hereby certify that the information contained herein is true and complete to the best of my knowledge and belief, and that this organization either owns a working interest or unleased mineral interest in the land including the proposed bottom hole location or has a right to drill this well at this location pursuant to a contract with an owner of such a mineral or working interest, or to a voluntary pooling agreement or a compulsory pooling order heretofore entered by the division.

Anna Stotts 10/09/15
Signature Date

Anna Stotts

Printed Name

astotts@energen.com

E-mail Address

SURVEYOR CERTIFICATION

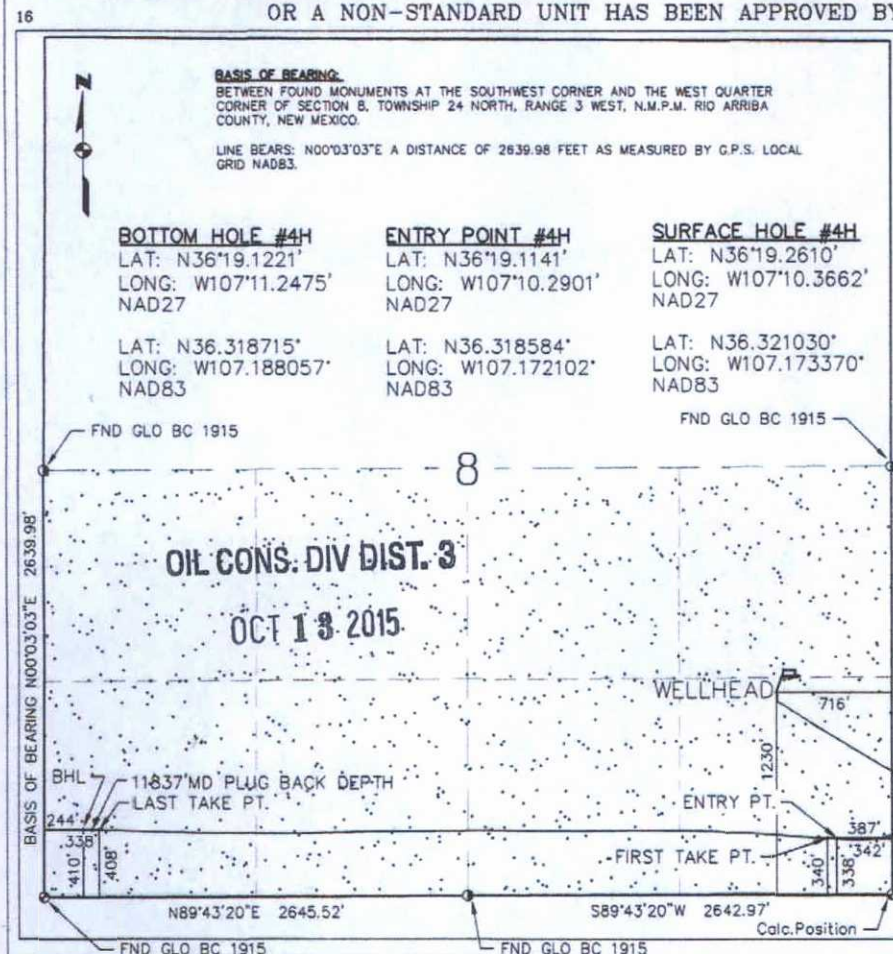
I hereby certify that the well location shown on this plat was plotted from field notes of actual surveys made by me or under my supervision, and that the same is true and correct to the best of my belief.

OCTOBER 9, 2015
Date of Survey

Signature and Seal of Professional Surveyor:



Certificate Number 15703



DISTRICT I
1625 N. French Dr., Hobbs, N.M. 88240
Phone: (575) 393-6161 Fax: (575) 393-0720

DISTRICT II
811 S. First St., Artesia, N.M. 88210
Phone: (575) 748-1263 Fax: (575) 748-9720

DISTRICT III
1000 Rio Brazos Rd., Aztec, N.M. 87410
Phone: (505) 334-6178 Fax: (505) 334-6170

DISTRICT IV
1220 S. St. Francis Dr., Santa Fe, NM 87505
Phone: (505) 476-3460 Fax: (505) 476-3462

State of New Mexico
Energy, Minerals & Natural Resources Department

OIL CONSERVATION DIVISION
1220 South St. Francis Dr.
Santa Fe, NM 87505

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⁴ Property Code 314743		⁵ Property Name Many Canyons 24-03 8			⁶ Well Number 4H
⁷ OGRID No. 162928		⁸ Operator Name ENERGEN RESOURCES CORPORATION			⁹ Elevation 6877.9

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P	8	24N	3W		1230'	SOUTH	716'	EAST	RIO ARRIBA

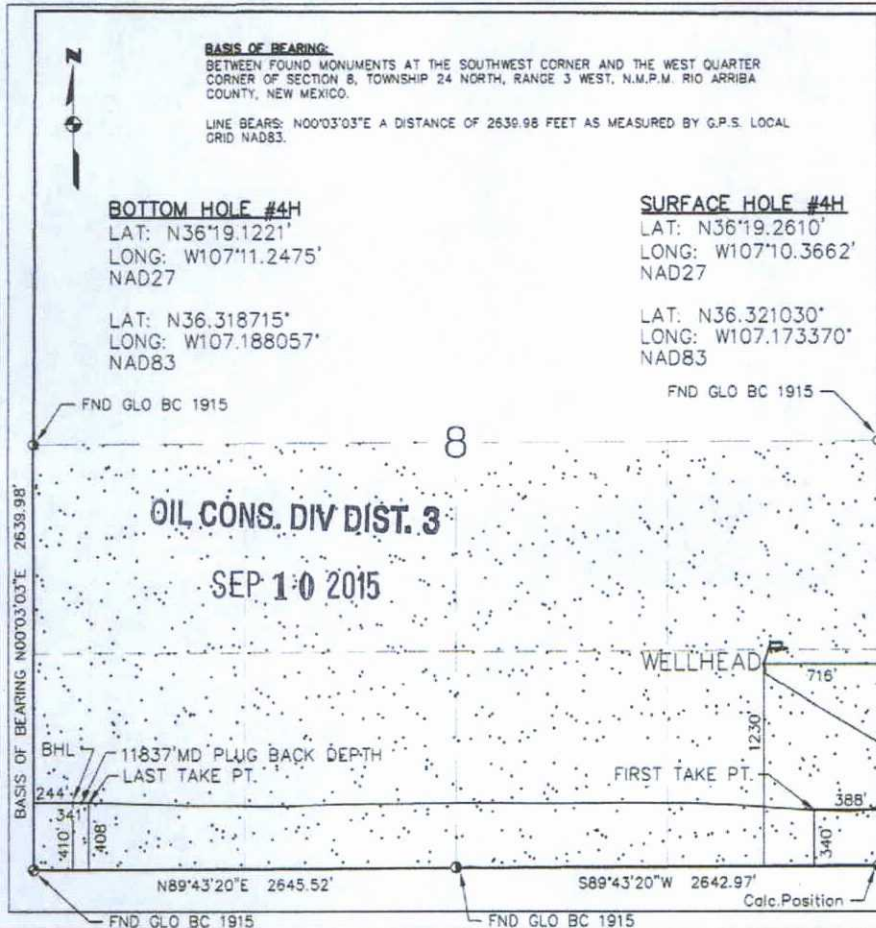
¹¹ Bottom Hole Location If Different From Surface

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NO ALLOWABLE WILL BE ASSIGNED TO THIS COMPLETION UNTIL ALL INTERESTS HAVE BEEN CONSOLIDATED
OR A NON-STANDARD UNIT HAS BEEN APPROVED BY THE DIVISION

16



¹⁷ OPERATOR CERTIFICATION

I hereby certify that the information contained herein is true and complete to the best of my knowledge and belief, and that this organization either owns a working interest or unleased mineral interest in the land including the proposed bottom hole location or has a right to drill this well at this location pursuant to a contract with an owner of such a mineral or working interest, or to a voluntary pooling agreement or a compulsory pooling order heretofore entered by the division.

Anna Stotts 9/3/15
Signature Date

ANNA STOTTS
Printed Name

astotts@energen.com
E-mail Address

SURVEYOR CERTIFICATION

I hereby certify that the well location shown on this plat was plotted from field notes of actual surveys made by me or under my supervision, and that the same is true and correct to the best of my belief.

SEPTEMBER 3, 2015
Date of Survey

Signature and Seal of Professional Surveyor



Glen W. Russell
Certificate Number 15703

AV

30-039-31309



D & D Services

P. O. Box 336

Flora Vista, NM 87415

505-215-4600 Fax: 505-334-9508

nowdrilling@yahoo.com

CONFIDENTIAL
TIGHT HOLE

OIL CONS. DIV DIST. 3

SEP 10 2015

DEVIATION REPORT

Energen Resources

Many Canyons

24-03 8 #4H

S8 T24N R03W

Depth 200'

¼

To the best of my knowledge I believe these numbers to be true and accurate.

Glen Davis

Sworn to and subscribed before me

this 20 day of July, 2015.

Kia Cordell

My commission expires: 4-10-17



30-039-31309

CONFIDENTIAL
TIGHT HOLE



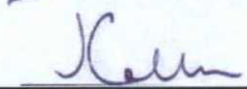
Scientific Drilling

Directional Survey Certification

2948 I-70 Business Loop
Grand Junction, CO 81504
(970)-245-9447 Fax (970)-245-9454

Operator	<u>Energen</u>
Well Name & No.	<u>Many Canyons 24-03 8 #4H</u>
County & State	<u>Rio Arriba County, NM</u>
SDI Job No.	<u>330715HEF294587</u>
Rig	<u>Key 881</u>

I, Janie Collins, having personal knowledge of all the facts, hereby certify that the attached directional survey run from a measured depth of 266 feet to a measured depth of 11,890 feet is true and correct as determined from all available records.


Signature

14-Aug-15
Date

Janie Collins
Colorado District Well Planner
Scientific Drilling International

Company:	Energen Resources Corp.	Local Co-ordinate Reference:	Well Many Canyons 24-03 8 #4H
Project:	Rio Arriba County, NM NAD27	TVD Reference:	GL 6877.90' & RKB 17' @ 6894.89usft
Site:	Many Canyons	MD Reference:	GL 6877.90' & RKB 17' @ 6894.89usft
Well:	Many Canyons 24-03 8 #4H	North Reference:	True
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	Grand Junction District

Project	Rio Arriba County, NM NAD27		OIL CONS. DIV DIST. 3
Map System:	US State Plane 1927 (Exact solution)	System Datum:	Mean Sea Level
Geo Datum:	NAD 1927 (NADCON CONUS)		SEP 10 2015
Map Zone:	New Mexico West 3003		

Site	Many Canyons				
Site Position:		Northing:	1,936,757.53 usft	Latitude:	36.3210166
From:	Lat/Long	Easting:	694,597.03 usft	Longitude:	-107.1727710
Position Uncertainty:	0.00 usft	Slot Radius:	13.20 in	Grid Convergence:	0.39 °

Well	Many Canyons 24-03 8 #4H					
Well Position	+N/-S	0.00 usft	Northing:	1,936,757.53 usft	Latitude:	36.3210166
	+E/-W	0.00 usft	Easting:	694,597.03 usft	Longitude:	-107.1727710
Position Uncertainty		0.00 usft	Wellhead Elevation:	0.00 usft	Ground Level:	6,877.89 usft

Wellbore	OH				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	HDGM	7/28/2015	9.15	62.98	49,854

Design	OH				
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	258.52

Survey Program	Date 8/14/2015				
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
266.00	3,436.99	Survey #1 - Surface MWD Survey (OH)	SDI MWD	SDI MWD - Standard ver 1.0.1	
3,471.99	7,175.00	Survey #2 - Curve MWD Survey (OH)	SDI MWD	SDI MWD - Standard ver 1.0.1	
7,249.00	11,890.00	Survey #3 - Lateral MWD Survey (OH)	SDI MWD	SDI MWD - Standard ver 1.0.1	

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	
266.00	0.90	148.15	265.99	-1.77	1.10	-0.73	0.34	0.34	0.00	
First SDI Surface MWD Survey										
327.00	0.99	150.58	326.98	-2.64	1.61	-1.06	0.16	0.15	3.98	
393.00	1.08	148.00	392.97	-3.66	2.22	-1.45	0.15	0.14	-3.91	
456.00	1.28	144.14	455.96	-4.74	2.95	-1.95	0.34	0.32	-6.13	
519.00	1.13	147.03	518.94	-5.83	3.70	-2.47	0.26	-0.24	4.59	
582.00	1.06	157.00	581.93	-6.89	4.27	-2.81	0.32	-0.11	15.83	
645.00	1.31	153.00	644.92	-8.07	4.82	-3.12	0.42	0.40	-6.35	

Company:	Energen Resources Corp.	Local Co-ordinate Reference:	Well Many Canyons 24-03 8 #4H
Project:	Rio Arriba County, NM NAD27	TVD Reference:	GL 6877.90' & RKB 17' @ 6894.89usft
Site:	Many Canyons	MD Reference:	GL 6877.90' & RKB 17' @ 6894.89usft
Well:	Many Canyons 24-03 8 #4H	North Reference:	True
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	Grand Junction District

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)	
707.00	1.09	157.48	706.90	-9.24	5.37	-3.42	0.39	-0.35	7.23	
770.00	1.22	160.27	769.89	-10.43	5.82	-3.63	0.22	0.21	4.43	
833.00	1.10	157.94	832.88	-11.62	6.28	-3.84	0.20	-0.19	-3.70	
896.00	1.26	166.00	895.87	-12.85	6.67	-3.98	0.37	0.25	12.79	
957.00	1.29	162.29	956.85	-14.16	7.04	-4.09	0.14	0.05	-6.08	
1,020.00	1.06	163.18	1,019.84	-15.39	7.43	-4.22	0.37	-0.37	1.41	
1,083.00	1.23	168.90	1,082.82	-16.61	7.73	-4.27	0.32	0.27	9.08	
1,146.00	1.37	169.93	1,145.81	-18.02	7.99	-4.24	0.23	0.22	1.63	
1,209.00	1.25	167.57	1,208.79	-19.43	8.27	-4.24	0.21	-0.19	-3.75	
1,271.00	1.15	175.62	1,270.78	-20.71	8.46	-4.17	0.32	-0.16	12.98	
1,334.00	1.12	180.61	1,333.77	-21.95	8.50	-3.96	0.16	-0.05	7.92	
1,396.00	1.25	177.74	1,395.75	-23.24	8.52	-3.73	0.23	0.21	-4.63	
1,459.00	1.25	180.34	1,458.74	-24.61	8.55	-3.48	0.09	0.00	4.13	
1,522.00	1.34	178.49	1,521.72	-26.03	8.56	-3.21	0.16	0.14	-2.94	
1,585.00	1.16	178.49	1,584.71	-27.41	8.60	-2.97	0.29	-0.29	0.00	
1,648.00	1.21	183.79	1,647.69	-28.71	8.57	-2.69	0.19	0.08	8.41	
1,710.00	1.27	180.19	1,709.68	-30.05	8.53	-2.38	0.16	0.10	-5.81	
1,772.00	1.06	196.91	1,771.67	-31.28	8.36	-1.96	0.64	-0.34	26.97	
1,834.00	1.14	186.27	1,833.65	-32.45	8.12	-1.50	0.35	0.13	-17.16	
1,897.00	1.05	192.82	1,896.64	-33.63	7.93	-1.07	0.24	-0.14	10.40	
1,959.00	1.14	183.00	1,958.63	-34.80	7.77	-0.69	0.34	0.15	-15.84	
2,022.00	0.84	179.33	2,021.62	-35.89	7.74	-0.44	0.49	-0.48	-5.83	
2,085.00	1.04	172.24	2,084.61	-36.92	7.82	-0.32	0.37	0.32	-11.25	
2,148.00	0.78	172.02	2,147.61	-37.91	7.96	-0.26	0.41	-0.41	-0.35	
2,210.00	0.67	193.56	2,209.60	-38.68	7.93	-0.08	0.47	-0.18	34.74	
2,272.00	0.60	199.65	2,271.60	-39.34	7.74	0.24	0.16	-0.11	9.82	
2,336.00	0.49	173.71	2,335.59	-39.93	7.66	0.44	0.42	-0.17	-40.53	
2,399.00	0.57	191.89	2,398.59	-40.50	7.62	0.59	0.29	0.13	28.86	
2,462.00	0.80	184.63	2,461.59	-41.24	7.52	0.84	0.39	0.37	-11.52	
2,525.00	0.81	181.99	2,524.58	-42.13	7.47	1.06	0.06	0.02	-4.19	
2,588.00	0.74	194.30	2,587.57	-42.97	7.35	1.34	0.29	-0.11	19.54	
2,651.00	0.66	189.64	2,650.57	-43.72	7.19	1.65	0.16	-0.13	-7.40	
2,714.00	0.93	182.70	2,713.56	-44.59	7.11	1.91	0.45	0.43	-11.02	
2,776.00	0.74	193.00	2,775.56	-45.48	6.99	2.20	0.39	-0.31	16.61	
2,839.00	0.87	202.55	2,838.55	-46.32	6.72	2.63	0.30	0.21	15.16	
2,902.00	0.98	196.72	2,901.54	-47.28	6.38	3.15	0.23	0.17	-9.25	
2,965.00	0.76	195.79	2,964.54	-48.19	6.11	3.60	0.35	-0.35	-1.48	
3,028.00	1.01	201.87	3,027.53	-49.11	5.79	4.10	0.42	0.40	9.65	
3,091.00	0.96	195.70	3,090.52	-50.14	5.44	4.64	0.19	-0.08	-9.79	
3,154.00	1.13	201.47	3,153.51	-51.22	5.07	5.22	0.32	0.27	9.16	
3,218.00	1.00	203.60	3,217.50	-52.32	4.62	5.89	0.21	-0.20	3.33	
3,311.00	1.02	201.53	3,310.48	-53.83	3.99	6.80	0.04	0.02	-2.23	
3,374.00	0.91	192.12	3,373.47	-54.84	3.68	7.31	0.31	-0.17	-14.94	

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Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	Grand Junction District

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)
3,437.00	0.11	314.91	3,436.47	-55.29	3.53	7.54	1.55	-1.27	194.90
Last SDI Surface MWD Survey									
3,466.00	0.83	133.84	3,465.47	-55.42	3.66	7.44	3.25	2.49	616.99
KOP (3466' MD / 3465.47' TVD / 0.83° Inc / 133.84° Az)									
3,502.00	2.00	133.91	3,501.46	-56.03	4.30	6.93	3.25	3.25	0.20
First SDI Curve MWD Survey									
3,532.00	2.63	126.20	3,531.43	-56.80	5.24	6.17	2.34	2.10	-25.70
3,562.00	3.86	125.66	3,561.39	-57.80	6.61	5.02	4.10	4.10	-1.80
3,593.00	4.81	120.26	3,592.30	-59.06	8.58	3.34	3.33	3.06	-17.42
3,655.00	7.40	117.43	3,653.94	-62.21	14.37	-1.70	4.20	4.18	-4.56
3,716.00	9.67	118.52	3,714.26	-66.47	22.36	-8.69	3.73	3.72	1.79
3,776.00	12.12	117.33	3,773.17	-71.77	32.39	-17.46	4.10	4.08	-1.98
3,838.00	13.78	120.94	3,833.60	-78.55	44.50	-27.98	2.98	2.68	5.82
3,900.00	15.47	121.63	3,893.59	-86.69	57.88	-39.47	2.74	2.73	1.11
3,961.00	17.76	122.35	3,952.03	-95.93	72.67	-52.12	3.77	3.75	1.18
4,022.00	20.00	122.12	4,009.75	-106.46	89.36	-66.39	3.67	3.67	-0.38
4,084.00	21.71	120.59	4,067.69	-117.93	108.21	-82.58	2.89	2.76	-2.47
4,146.00	23.30	120.95	4,124.96	-130.07	128.60	-100.15	2.57	2.56	0.58
4,207.00	26.13	120.76	4,180.37	-143.15	150.50	-119.00	4.64	4.64	-0.31
4,268.00	27.96	120.95	4,234.70	-157.38	174.31	-139.50	3.00	3.00	0.31
4,330.00	29.72	122.72	4,289.01	-173.16	199.70	-161.25	3.15	2.84	2.85
4,391.00	31.78	123.03	4,341.43	-190.09	225.89	-183.55	3.39	3.38	0.51
4,453.00	33.08	121.12	4,393.76	-207.74	254.07	-207.65	2.67	2.10	-3.08
4,514.00	32.75	121.76	4,444.97	-225.02	282.35	-231.92	0.79	-0.54	1.05
4,575.00	32.53	120.38	4,496.33	-242.00	310.53	-256.16	1.27	-0.36	-2.26
4,636.00	33.45	120.86	4,547.50	-258.92	339.11	-280.80	1.57	1.51	0.79
4,696.00	33.46	121.03	4,597.56	-275.93	367.48	-305.22	0.16	0.02	0.28
4,757.00	32.97	120.63	4,648.59	-293.06	396.17	-329.93	0.88	-0.80	-0.66
4,818.00	32.66	120.92	4,699.86	-309.97	424.57	-354.40	0.57	-0.51	0.48
4,879.00	34.24	121.04	4,750.75	-327.28	453.40	-379.20	2.59	2.59	0.20
4,941.00	33.41	119.72	4,802.26	-344.74	483.17	-404.90	1.79	-1.34	-2.13
5,002.00	32.01	119.82	4,853.58	-361.10	511.78	-429.69	2.30	-2.30	0.16
5,063.00	32.22	120.61	4,905.25	-377.42	539.80	-453.90	0.77	0.34	1.30
5,124.00	33.41	120.68	4,956.51	-394.27	568.25	-478.42	1.95	1.95	0.11
5,185.00	33.13	120.74	5,007.52	-411.36	597.02	-503.21	0.46	-0.46	0.10
5,246.00	32.59	119.46	5,058.76	-427.96	625.65	-527.97	1.44	-0.89	-2.10
5,307.00	33.14	119.72	5,109.99	-444.31	654.43	-552.93	0.93	0.90	0.43
5,368.00	32.17	119.46	5,161.35	-460.56	683.05	-577.74	1.61	-1.59	-0.43
5,428.00	32.20	120.28	5,212.13	-476.48	710.77	-601.73	0.73	0.05	1.37
5,489.00	34.00	122.26	5,263.23	-493.78	739.23	-626.18	3.44	2.95	3.25
5,550.00	34.54	122.45	5,313.64	-512.16	768.24	-650.96	0.90	0.89	0.31
5,610.00	33.19	122.61	5,363.46	-530.14	796.43	-675.01	2.25	-2.25	0.27
5,671.00	31.68	120.61	5,414.94	-547.29	824.28	-698.89	3.04	-2.48	-3.28
5,733.00	31.33	120.70	5,467.81	-563.81	852.16	-722.91	0.57	-0.56	0.15

Company:	Energen Resources Corp.	Local Co-ordinate Reference:	Well Many Canyons 24-03 8 #4H
Project:	Rio Arriba County, NM NAD27	TVD Reference:	GL 6877.90' & RKB 17' @ 6894.89usft
Site:	Many Canyons	MD Reference:	GL 6877.90' & RKB 17' @ 6894.89usft
Well:	Many Canyons 24-03 8 #4H	North Reference:	True
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	Grand Junction District

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)
5,794.00	30.90	122.89	5,520.03	-580.42	878.95	-745.86	1.98	-0.70	3.59
5,855.00	30.67	122.54	5,572.44	-597.29	905.21	-768.25	0.48	-0.38	-0.57
5,916.00	29.46	123.80	5,625.23	-614.00	930.80	-789.99	2.24	-1.98	2.07
5,977.00	25.50	137.90	5,679.39	-632.12	952.09	-807.26	12.45	-6.49	23.11
6,040.00	20.66	153.15	5,737.38	-652.12	966.23	-817.13	12.15	-7.68	24.21
6,103.00	16.58	164.38	5,797.09	-670.71	973.67	-820.73	8.59	-6.48	17.83
6,167.00	16.10	176.37	5,858.53	-688.37	976.69	-820.18	5.31	-0.75	18.73
6,229.00	16.95	188.20	5,917.98	-705.90	975.95	-815.96	5.59	1.37	19.08
6,292.00	19.20	208.96	5,977.93	-724.07	969.62	-806.13	10.76	3.57	32.95
6,355.00	20.93	220.38	6,037.13	-741.72	957.30	-790.56	6.79	2.75	18.13
6,418.00	23.92	228.09	6,095.37	-758.83	940.50	-770.69	6.65	4.75	12.24
6,481.00	27.92	235.10	6,152.03	-775.81	918.89	-746.12	7.99	6.35	11.13
6,544.00	30.14	238.95	6,207.12	-792.41	893.23	-717.68	4.60	3.52	6.11
6,607.00	36.40	243.91	6,259.78	-808.81	862.86	-684.65	10.83	9.94	7.87
6,670.00	45.81	247.94	6,307.20	-825.55	825.05	-644.26	15.51	14.94	6.40
6,733.00	52.18	248.92	6,348.52	-843.00	780.85	-597.48	10.18	10.11	1.56
6,767.00	55.30	249.43	6,368.63	-852.74	755.23	-570.43	9.26	9.18	1.50
6,829.00	60.06	252.49	6,401.77	-869.79	705.71	-518.51	8.74	7.68	4.94
6,892.00	63.07	258.27	6,431.79	-883.73	652.13	-463.23	9.37	4.78	9.17
6,955.00	66.77	264.46	6,458.51	-892.24	595.76	-406.29	10.66	5.87	9.83
7,018.00	72.25	268.96	6,480.56	-895.59	536.88	-347.92	10.97	8.70	7.14
7,081.00	79.76	271.62	6,495.79	-895.25	475.80	-288.13	12.60	11.92	4.22
7,144.00	84.98	272.71	6,504.15	-892.89	413.43	-227.48	8.46	8.29	1.73
7,175.00	88.12	272.88	6,506.02	-891.38	382.53	-197.49	10.14	10.13	0.55
Last SDI Curve MWD Survey									
7,184.00	88.40	272.85	6,506.29	-890.93	373.54	-188.78	3.10	3.08	-0.30
POE (7184' MD / 6506.29' TVD / 88.40° Inc / 272.85° Az)									
7,249.00	90.40	272.66	6,506.97	-887.81	308.62	-125.78	3.10	3.08	-0.30
First SDI Lateral MWD Survey									
7,310.00	91.31	273.33	6,506.06	-884.62	247.71	-66.72	1.85	1.49	1.10
7,372.00	91.78	273.08	6,504.39	-881.15	185.83	-6.77	0.86	0.76	-0.40
7,432.00	92.59	273.82	6,502.10	-877.55	125.99	51.16	1.83	1.35	1.23
7,494.00	92.66	274.02	6,499.26	-873.31	64.20	110.88	0.34	0.11	0.32
7,556.00	91.38	274.50	6,497.08	-868.71	2.41	170.51	2.20	-2.06	0.77
7,617.00	91.88	274.21	6,495.34	-864.08	-58.39	229.17	0.95	0.82	-0.48
7,678.00	91.85	272.78	6,493.36	-860.36	-119.24	288.07	2.34	-0.05	-2.34
7,740.00	91.51	272.53	6,491.54	-857.49	-181.15	348.17	0.68	-0.55	-0.40
7,801.00	91.61	272.74	6,489.88	-854.69	-242.06	407.30	0.38	0.16	0.34
7,863.00	92.39	272.87	6,487.71	-851.66	-303.95	467.35	1.28	1.26	0.21
7,924.00	92.45	272.43	6,485.14	-848.84	-364.83	526.45	0.73	0.10	-0.72
7,985.00	92.01	271.02	6,482.76	-847.00	-425.76	585.79	2.42	-0.72	-2.31
8,046.00	91.98	270.47	6,480.64	-846.21	-486.71	645.37	0.90	-0.05	-0.90
8,106.00	92.09	270.17	6,478.51	-845.88	-546.67	704.07	0.53	0.18	-0.50
8,167.00	91.48	270.66	6,476.61	-845.44	-607.64	763.73	1.28	-1.00	0.80

Company:	Energen Resources Corp.	Local Co-ordinate Reference:	Well Many Canyons 24-03 8 #4H
Project:	Rio Arriba County, NM NAD27	TVD Reference:	GL 6877.90' & RKB 17' @ 6894.89usft
Site:	Many Canyons	MD Reference:	GL 6877.90' & RKB 17' @ 6894.89usft
Well:	Many Canyons 24-03 8 #4H	North Reference:	True
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	Grand Junction District

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)
8,228.00	91.63	270.48	6,474.96	-844.83	-668.62	823.36	0.38	0.25	-0.30
8,289.00	90.61	270.82	6,473.76	-844.14	-729.60	882.99	1.76	-1.67	0.56
8,351.00	91.38	270.72	6,472.69	-843.30	-791.58	943.57	1.25	1.24	-0.16
8,412.00	93.23	269.90	6,470.23	-842.97	-852.53	1,003.23	3.32	3.03	-1.34
8,473.00	92.76	268.47	6,467.05	-843.84	-913.44	1,063.09	2.46	-0.77	-2.34
8,534.00	92.69	268.67	6,464.15	-845.36	-974.35	1,123.09	0.35	-0.11	0.33
8,595.00	91.71	269.24	6,461.80	-846.47	-1,035.30	1,183.04	1.86	-1.61	0.93
8,656.00	91.18	269.20	6,460.27	-847.30	-1,096.27	1,242.96	0.87	-0.87	-0.07
8,717.00	91.28	269.46	6,458.96	-848.02	-1,157.25	1,302.86	0.46	0.16	0.43
8,780.00	91.55	269.50	6,457.40	-848.59	-1,220.23	1,364.69	0.43	0.43	0.06
8,843.00	92.05	269.81	6,455.42	-848.97	-1,283.20	1,426.48	0.93	0.79	0.49
8,906.00	92.66	270.14	6,452.83	-848.99	-1,346.14	1,488.17	1.10	0.97	0.52
8,968.00	91.04	270.13	6,450.83	-848.85	-1,408.11	1,548.87	2.61	-2.61	-0.02
9,031.00	91.65	270.68	6,449.35	-848.40	-1,471.09	1,610.50	1.30	0.97	0.87
9,094.00	92.25	270.67	6,447.21	-847.66	-1,534.05	1,672.05	0.95	0.95	-0.02
9,157.00	92.11	270.67	6,444.81	-846.93	-1,597.00	1,733.60	0.22	-0.22	0.00
9,220.00	92.22	270.72	6,442.43	-846.16	-1,659.95	1,795.14	0.19	0.17	0.08
9,283.00	92.42	271.04	6,439.88	-845.19	-1,722.89	1,856.63	0.60	0.32	0.51
9,346.00	92.32	270.06	6,437.28	-844.59	-1,785.83	1,918.19	1.56	-0.16	-1.56
9,408.00	92.25	269.33	6,434.81	-844.92	-1,847.78	1,978.96	1.18	-0.11	-1.18
9,471.00	92.39	269.28	6,432.25	-845.68	-1,910.73	2,040.80	0.24	0.22	-0.08
9,534.00	92.69	269.56	6,429.46	-846.32	-1,973.66	2,102.60	0.65	0.48	0.44
9,596.00	92.22	269.70	6,426.81	-846.72	-2,035.60	2,163.39	0.79	-0.76	0.23
9,659.00	92.62	269.76	6,424.15	-847.02	-2,098.55	2,225.13	0.64	0.63	0.10
9,722.00	92.09	269.30	6,421.56	-847.53	-2,161.49	2,286.92	1.11	-0.84	-0.73
9,784.00	92.52	269.73	6,419.06	-848.06	-2,223.44	2,347.73	0.98	0.69	0.69
9,847.00	91.01	269.59	6,417.12	-848.43	-2,286.40	2,409.51	2.41	-2.40	-0.22
9,910.00	91.28	269.81	6,415.87	-848.76	-2,349.39	2,471.31	0.55	0.43	0.35
9,974.00	91.71	269.71	6,414.20	-849.03	-2,413.37	2,534.06	0.69	0.67	-0.16
10,037.00	92.25	269.40	6,412.02	-849.52	-2,476.33	2,595.85	0.99	0.86	-0.49
10,099.00	93.03	269.50	6,409.16	-850.11	-2,538.26	2,656.67	1.27	1.26	0.16
10,162.00	91.89	268.71	6,406.46	-851.10	-2,601.19	2,718.53	2.20	-1.81	-1.25
10,224.00	91.78	268.23	6,404.47	-852.75	-2,663.14	2,779.57	0.79	-0.18	-0.77
10,288.00	90.44	268.56	6,403.23	-854.54	-2,727.10	2,842.61	2.16	-2.09	0.52
10,351.00	90.04	268.44	6,402.97	-856.19	-2,790.08	2,904.66	0.66	-0.63	-0.19
10,414.00	91.21	268.16	6,402.28	-858.06	-2,853.04	2,966.74	1.91	1.86	-0.44
10,477.00	91.45	268.03	6,400.82	-860.16	-2,915.99	3,028.84	0.43	0.38	-0.21
10,540.00	91.95	268.76	6,398.95	-861.92	-2,978.94	3,090.88	1.40	0.79	1.16
10,603.00	91.82	269.99	6,396.88	-862.61	-3,041.90	3,152.72	1.96	-0.21	1.95
10,666.00	90.91	270.36	6,395.38	-862.41	-3,104.88	3,214.40	1.56	-1.44	0.59
10,729.00	91.38	270.92	6,394.12	-861.71	-3,167.86	3,275.99	1.16	0.75	0.89
10,792.00	91.85	271.74	6,392.34	-860.25	-3,230.82	3,337.39	1.50	0.75	1.30
10,855.00	92.02	271.42	6,390.22	-858.51	-3,293.76	3,398.73	0.57	0.27	-0.51

Company:	Energen Resources Corp.	Local Co-ordinate Reference:	Well Many Canyons 24-03 8 #4H
Project:	Rio Arriba County, NM NAD27	TVD Reference:	GL 6877.90' & RKB 17' @ 6894.89usft
Site:	Many Canyons	MD Reference:	GL 6877.90' & RKB 17' @ 6894.89usft
Well:	Many Canyons 24-03 8 #4H	North Reference:	True
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	Grand Junction District

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)
10,918.00	91.49	269.92	6,388.29	-857.78	-3,356.73	3,460.29	2.52	-0.84	-2.38
10,981.00	91.72	270.05	6,386.52	-857.79	-3,419.70	3,522.01	0.42	0.37	0.21
11,044.00	92.66	269.96	6,384.12	-857.79	-3,482.65	3,583.70	1.50	1.49	-0.14
11,107.00	91.55	269.92	6,381.80	-857.85	-3,545.61	3,645.41	1.76	-1.76	-0.06
11,170.00	91.99	270.38	6,379.86	-857.69	-3,608.58	3,707.09	1.01	0.70	0.73
11,233.00	92.39	271.36	6,377.45	-856.73	-3,671.53	3,768.58	1.68	0.63	1.56
11,296.00	91.68	271.59	6,375.21	-855.11	-3,734.47	3,829.94	1.18	-1.13	0.37
11,360.00	90.10	271.82	6,374.22	-853.21	-3,798.43	3,892.24	2.49	-2.47	0.36
11,423.00	90.51	271.89	6,373.88	-851.17	-3,861.39	3,953.55	0.66	0.65	0.11
11,486.00	90.84	271.89	6,373.14	-849.09	-3,924.35	4,014.83	0.52	0.52	0.00
11,549.00	90.24	271.20	6,372.55	-847.39	-3,987.33	4,076.21	1.45	-0.95	-1.10
11,611.00	90.74	271.06	6,372.02	-846.17	-4,049.31	4,136.71	0.84	0.81	-0.23
11,675.00	93.20	270.87	6,369.82	-845.09	-4,113.26	4,199.17	3.86	3.84	-0.30
11,738.00	93.70	270.98	6,366.02	-844.08	-4,176.14	4,260.59	0.81	0.79	0.17
11,791.00	94.50	271.64	6,362.24	-842.87	-4,228.99	4,312.14	1.95	1.51	1.24
Planned Liner Set Depth @ 11,791' MD									
11,801.00	94.65	271.76	6,361.44	-842.58	-4,238.95	4,321.84	1.95	1.51	1.24
11,814.00	94.91	270.76	6,360.35	-842.29	-4,251.90	4,334.48	7.92	2.00	-7.69
Last SDI Lateral MWD Survey									
11,816.00	94.91	270.76	6,360.18	-842.26	-4,253.90	4,336.43	0.00	0.00	0.00
Crossed 330' Setback (11,816' MD / 6360.18' TVD / 94.91° Inc / 270.76° Az)									
11,890.00	94.91	270.76	6,353.85	-841.29	-4,327.62	4,408.48	0.00	0.00	0.00
TD (11,890' MD / 6353.85' TVD / 94.91° Inc / 270.76° Az) - Projection to TD									

Design Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
266.00	265.99	-1.77	1.10	First SDI Surface MWD Survey
3,437.00	3,436.47	-55.29	3.53	Last SDI Surface MWD Survey
3,466.00	3,465.47	-55.42	3.66	KOP (3466' MD / 3465.47' TVD / 0.83° Inc / 133.84° Az)
3,502.00	3,501.46	-56.03	4.30	First SDI Curve MWD Survey
7,175.00	6,506.02	-891.38	382.53	Last SDI Curve MWD Survey
7,184.00	6,506.29	-890.93	373.54	POE (7184' MD / 6506.29' TVD / 88.40° Inc / 272.85° Az)
7,249.00	6,506.97	-887.81	308.62	First SDI Lateral MWD Survey
11,791.00	6,362.24	-842.87	-4,228.99	Planned Liner Set Depth @ 11,791' MD
11,814.00	6,360.35	-842.29	-4,251.90	Last SDI Lateral MWD Survey
11,816.00	6,360.18	-842.26	-4,253.90	Crossed 330' Setback (11,816' MD / 6360.18' TVD / 94.91° Inc / 270.76° Az)
11,890.00	6,353.85	-841.29	-4,327.62	TD (11,890' MD / 6353.85' TVD / 94.91° Inc / 270.76° Az)
11,890.00	6,353.85	-841.29	-4,327.62	Projection to TD

Checked By: _____

Approved By: _____

Date: _____

CONFIDENTIAL
TIGHT HOLE

ENERGEN

Energen Resources Corp.

Rio Arriba County, NM NAD27

Many Canyons

Many Canyons 24-03 8 #4H

OH

Design: OH

Standard Survey Report

17 August, 2015

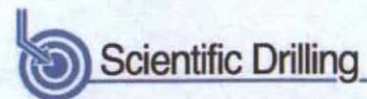


www.scientificdrilling.com





Company Name: Energen Resources Corp.
Project: Rio Arriba County, NM NAD27
Site: Many Canyons
Well: Many Canyons 24-03 8 #4H



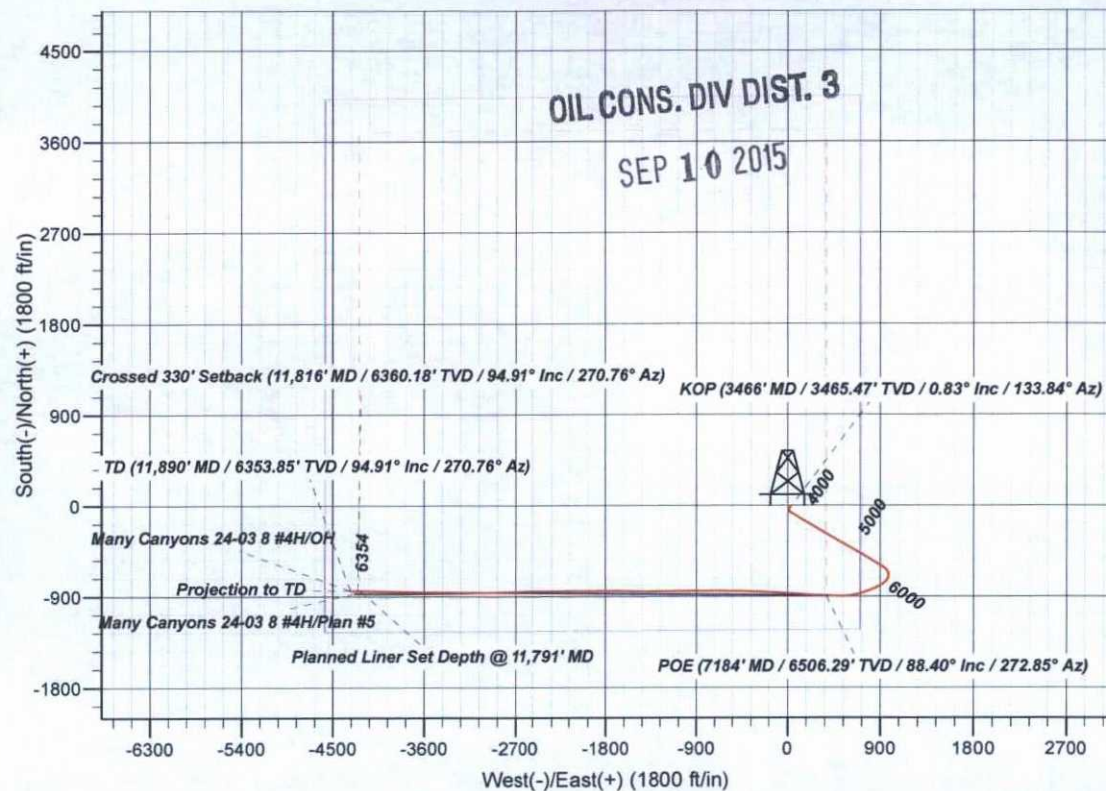
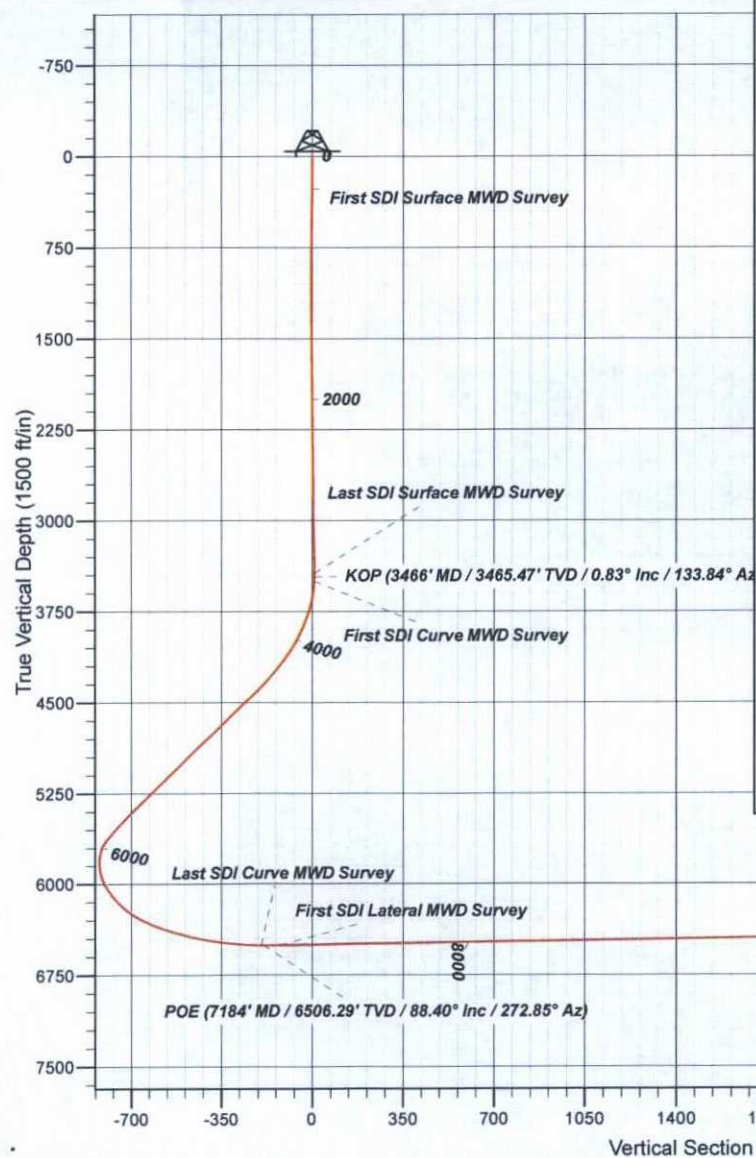
Azimuths to True North
Magnetic North: 9.15°

Magnetic Field
Strength: 49854.1nT
Dip Angle: 62.98°
Date: 7/28/2015
Model: HDGM

WELL DETAILS: Many Canyons 24-03 8 #4H

	+N/-S	+E/-W	GL 6877.90' & RKB 17' @ 6894.90ft	6877.90		
			Northing	Easting	Latitude	Longitude
	0.00	0.00	1936757.53	694597.03	36.3210166	-107.1727710

CONFIDENTIAL
TIGHT HOLE



OIL CONS. DIV DIST. 3
SEP 10 2015

Design: OH (Many Canyons 24-03 8 #4H/OH)
Created By: Janie Collins Date: 11:23, August 17 2015
PROJECT DETAILS: Rio Arriba County, NM NAD27
Geodetic System: US State Plane 1927 (Exact solution) Datum: NAD 1927 (NADCON CONUS) Ellipsoid: Clarke 1886 Zone: New Mexico West 3003
System Datum: Mean Sea Level Local North: True

Company:	Energen Resources Corp.	Local Co-ordinate Reference:	Well Many Canyons 24-03 8 #4H
Project:	Rio Arriba County, NM NAD27	TVD Reference:	GL 6877.90' & RKB 17' @ 6894.89usft
Site:	Many Canyons	MD Reference:	GL 6877.90' & RKB 17' @ 6894.89usft
Well:	Many Canyons 24-03 8 #4H	North Reference:	True
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	Grand Junction District

Project	Rio Arriba County, NM NAD27		
Map System:	US State Plane 1927 (Exact solution)	System Datum:	Mean Sea Level
Geo Datum:	NAD 1927 (NADCON CONUS)		
Map Zone:	New Mexico West 3003		

Site	Many Canyons		
Site Position:		Northing:	1,936,757.53 usft
From:	Lat/Long	Easting:	694,597.03 usft
Position Uncertainty:	0.00 usft	Slot Radius:	13.20 in
		Latitude:	36.3210166
		Longitude:	-107.1727710
		Grid Convergence:	0.39 °

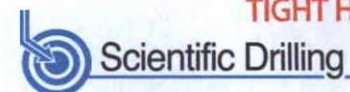
Well	Many Canyons 24-03 8 #4H					
Well Position	+N/-S	0.00 usft	Northing:	1,936,757.53 usft	Latitude:	36.3210166
	+E/-W	0.00 usft	Easting:	694,597.03 usft	Longitude:	-107.1727710
Position Uncertainty		0.00 usft	Wellhead Elevation:	0.00 usft	Ground Level:	6,877.89 usft

Wellbore	OH				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	HDGM	7/28/2015	9.15	62.98	49,854

Design	OH				
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	258.52	

Survey Program	Date	8/14/2015			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
266.00	3,436.99	Survey #1 - Surface MWD Survey (OH)	SDI MWD	SDI MWD - Standard ver 1.0.1	
3,471.99	7,175.00	Survey #2 - Curve MWD Survey (OH)	SDI MWD	SDI MWD - Standard ver 1.0.1	
7,249.00	11,890.00	Survey #3 - Lateral MWD Survey (OH)	SDI MWD	SDI MWD - Standard ver 1.0.1	

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
266.00	0.90	148.15	265.99	-1.77	1.10	-0.73	0.34	0.34	0.00
First SDI Surface MWD Survey									
327.00	0.99	150.58	326.98	-2.64	1.61	-1.06	0.16	0.15	3.98
393.00	1.08	148.00	392.97	-3.66	2.22	-1.45	0.15	0.14	-3.91
456.00	1.28	144.14	455.96	-4.74	2.95	-1.95	0.34	0.32	-6.13
519.00	1.13	147.03	518.94	-5.83	3.70	-2.47	0.26	-0.24	4.59
582.00	1.06	157.00	581.93	-6.89	4.27	-2.81	0.32	-0.11	15.83
645.00	1.31	153.00	644.92	-8.07	4.82	-3.12	0.42	0.40	-6.35



ENERGEN

Survey Report

Company:	Energen Resources Corp.	Local Co-ordinate Reference:	Well Many Canyons 24-03 8 #4H
Project:	Rio Arriba County, NM NAD27	TVD Reference:	GL 6877.90' & RKB 17' @ 6894.89usft
Site:	Many Canyons	MD Reference:	GL 6877.90' & RKB 17' @ 6894.89usft
Well:	Many Canyons 24-03 8 #4H	North Reference:	True
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	Grand Junction District

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)	
707.00	1.09	157.48	706.90	-9.24	5.37	-3.42	0.39	-0.35	7.23	
770.00	1.22	160.27	769.89	-10.43	5.82	-3.63	0.22	0.21	4.43	
833.00	1.10	157.94	832.88	-11.62	6.28	-3.84	0.20	-0.19	-3.70	
896.00	1.26	166.00	895.87	-12.85	6.67	-3.98	0.37	0.25	12.79	
957.00	1.29	162.29	956.85	-14.16	7.04	-4.09	0.14	0.05	-6.08	
1,020.00	1.06	163.18	1,019.84	-15.39	7.43	-4.22	0.37	-0.37	1.41	
1,083.00	1.23	168.90	1,082.82	-16.61	7.73	-4.27	0.32	0.27	9.08	
1,146.00	1.37	169.93	1,145.81	-18.02	7.99	-4.24	0.23	0.22	1.63	
1,209.00	1.25	167.57	1,208.79	-19.43	8.27	-4.24	0.21	-0.19	-3.75	
1,271.00	1.15	175.62	1,270.78	-20.71	8.46	-4.17	0.32	-0.16	12.98	
1,334.00	1.12	180.61	1,333.77	-21.95	8.50	-3.96	0.16	-0.05	7.92	
1,396.00	1.25	177.74	1,395.75	-23.24	8.52	-3.73	0.23	0.21	-4.63	
1,459.00	1.25	180.34	1,458.74	-24.61	8.55	-3.48	0.09	0.00	4.13	
1,522.00	1.34	178.49	1,521.72	-26.03	8.56	-3.21	0.16	0.14	-2.94	
1,585.00	1.16	178.49	1,584.71	-27.41	8.60	-2.97	0.29	-0.29	0.00	
1,648.00	1.21	183.79	1,647.69	-28.71	8.57	-2.69	0.19	0.08	8.41	
1,710.00	1.27	180.19	1,709.68	-30.05	8.53	-2.38	0.16	0.10	-5.81	
1,772.00	1.06	196.91	1,771.67	-31.28	8.36	-1.96	0.64	-0.34	26.97	
1,834.00	1.14	186.27	1,833.65	-32.45	8.12	-1.50	0.35	0.13	-17.16	
1,897.00	1.05	192.82	1,896.64	-33.63	7.93	-1.07	0.24	-0.14	10.40	
1,959.00	1.14	183.00	1,958.63	-34.80	7.77	-0.69	0.34	0.15	-15.84	
2,022.00	0.84	179.33	2,021.62	-35.89	7.74	-0.44	0.49	-0.48	-5.83	
2,085.00	1.04	172.24	2,084.61	-36.92	7.82	-0.32	0.37	0.32	-11.25	
2,148.00	0.78	172.02	2,147.61	-37.91	7.96	-0.26	0.41	-0.41	-0.35	
2,210.00	0.67	193.56	2,209.60	-38.68	7.93	-0.08	0.47	-0.18	34.74	
2,272.00	0.60	199.65	2,271.60	-39.34	7.74	0.24	0.16	-0.11	9.82	
2,336.00	0.49	173.71	2,335.59	-39.93	7.66	0.44	0.42	-0.17	-40.53	
2,399.00	0.57	191.89	2,398.59	-40.50	7.62	0.59	0.29	0.13	28.86	
2,462.00	0.80	184.63	2,461.59	-41.24	7.52	0.84	0.39	0.37	-11.52	
2,525.00	0.81	181.99	2,524.58	-42.13	7.47	1.06	0.06	0.02	-4.19	
2,588.00	0.74	194.30	2,587.57	-42.97	7.35	1.34	0.29	-0.11	19.54	
2,651.00	0.66	189.64	2,650.57	-43.72	7.19	1.65	0.16	-0.13	-7.40	
2,714.00	0.93	182.70	2,713.56	-44.59	7.11	1.91	0.45	0.43	-11.02	
2,776.00	0.74	193.00	2,775.56	-45.48	6.99	2.20	0.39	-0.31	16.61	
2,839.00	0.87	202.55	2,838.55	-46.32	6.72	2.63	0.30	0.21	15.16	
2,902.00	0.98	196.72	2,901.54	-47.28	6.38	3.15	0.23	0.17	-9.25	
2,965.00	0.76	195.79	2,964.54	-48.19	6.11	3.60	0.35	-0.35	-1.48	
3,028.00	1.01	201.87	3,027.53	-49.11	5.79	4.10	0.42	0.40	9.65	
3,091.00	0.96	195.70	3,090.52	-50.14	5.44	4.64	0.19	-0.08	-9.79	
3,154.00	1.13	201.47	3,153.51	-51.22	5.07	5.22	0.32	0.27	9.16	
3,218.00	1.00	203.60	3,217.50	-52.32	4.62	5.89	0.21	-0.20	3.33	
3,311.00	1.02	201.53	3,310.48	-53.83	3.99	6.80	0.04	0.02	-2.23	
3,374.00	0.91	192.12	3,373.47	-54.84	3.68	7.31	0.31	-0.17	-14.94	

Company:	Energen Resources Corp.	Local Co-ordinate Reference:	Well Many Canyons 24-03 8 #4H
Project:	Rio Arriba County, NM NAD27	TVD Reference:	GL 6877.90' & RKB 17' @ 6894.89usft
Site:	Many Canyons	MD Reference:	GL 6877.90' & RKB 17' @ 6894.89usft
Well:	Many Canyons 24-03 8 #4H	North Reference:	True
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	Grand Junction District

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)
3,437.00	0.11	314.91	3,436.47	-55.29	3.53	7.54	1.55	-1.27	194.90
Last SDI Surface MWD Survey									
3,466.00	0.83	133.84	3,465.47	-55.42	3.66	7.44	3.25	2.49	616.99
KOP (3466' MD / 3465.47' TVD / 0.83° Inc / 133.84° Az)									
3,502.00	2.00	133.91	3,501.46	-56.03	4.30	6.93	3.25	3.25	0.20
First SDI Curve MWD Survey									
3,532.00	2.63	126.20	3,531.43	-56.80	5.24	6.17	2.34	2.10	-25.70
3,562.00	3.86	125.66	3,561.39	-57.80	6.61	5.02	4.10	4.10	-1.80
3,593.00	4.81	120.26	3,592.30	-59.06	8.58	3.34	3.33	3.06	-17.42
3,655.00	7.40	117.43	3,653.94	-62.21	14.37	-1.70	4.20	4.18	-4.56
3,716.00	9.67	118.52	3,714.26	-66.47	22.36	-8.69	3.73	3.72	1.79
3,776.00	12.12	117.33	3,773.17	-71.77	32.39	-17.46	4.10	4.08	-1.98
3,838.00	13.78	120.94	3,833.60	-78.55	44.50	-27.98	2.98	2.68	5.82
3,900.00	15.47	121.63	3,893.59	-86.69	57.88	-39.47	2.74	2.73	1.11
3,961.00	17.76	122.35	3,952.03	-95.93	72.67	-52.12	3.77	3.75	1.18
4,022.00	20.00	122.12	4,009.75	-106.46	89.36	-66.39	3.67	3.67	-0.38
4,084.00	21.71	120.59	4,067.69	-117.93	108.21	-82.58	2.89	2.76	-2.47
4,146.00	23.30	120.95	4,124.96	-130.07	128.60	-100.15	2.57	2.56	0.58
4,207.00	26.13	120.76	4,180.37	-143.15	150.50	-119.00	4.64	4.64	-0.31
4,268.00	27.96	120.95	4,234.70	-157.38	174.31	-139.50	3.00	3.00	0.31
4,330.00	29.72	122.72	4,289.01	-173.16	199.70	-161.25	3.15	2.84	2.85
4,391.00	31.78	123.03	4,341.43	-190.09	225.89	-183.55	3.39	3.38	0.51
4,453.00	33.08	121.12	4,393.76	-207.74	254.07	-207.65	2.67	2.10	-3.08
4,514.00	32.75	121.76	4,444.97	-225.02	282.35	-231.92	0.79	-0.54	1.05
4,575.00	32.53	120.38	4,496.33	-242.00	310.53	-256.16	1.27	-0.36	-2.26
4,636.00	33.45	120.86	4,547.50	-258.92	339.11	-280.80	1.57	1.51	0.79
4,696.00	33.46	121.03	4,597.56	-275.93	367.48	-305.22	0.16	0.02	0.28
4,757.00	32.97	120.63	4,648.59	-293.06	396.17	-329.93	0.88	-0.80	-0.66
4,818.00	32.86	120.92	4,699.86	-309.97	424.57	-354.40	0.57	-0.51	0.48
4,879.00	34.24	121.04	4,750.75	-327.28	453.40	-379.20	2.59	2.59	0.20
4,941.00	33.41	119.72	4,802.26	-344.74	483.17	-404.90	1.79	-1.34	-2.13
5,002.00	32.01	119.82	4,853.58	-361.10	511.78	-429.69	2.30	-2.30	0.16
5,063.00	32.22	120.61	4,905.25	-377.42	539.80	-453.90	0.77	0.34	1.30
5,124.00	33.41	120.68	4,956.51	-394.27	568.25	-478.42	1.95	1.95	0.11
5,185.00	33.13	120.74	5,007.52	-411.36	597.02	-503.21	0.46	-0.46	0.10
5,246.00	32.59	119.46	5,058.76	-427.96	625.65	-527.97	1.44	-0.89	-2.10
5,307.00	33.14	119.72	5,109.99	-444.31	654.43	-552.93	0.93	0.90	0.43
5,368.00	32.17	119.46	5,161.35	-460.56	683.05	-577.74	1.61	-1.59	-0.43
5,428.00	32.20	120.28	5,212.13	-476.48	710.77	-601.73	0.73	0.05	1.37
5,489.00	34.00	122.26	5,263.23	-493.78	739.23	-626.18	3.44	2.95	3.25
5,550.00	34.54	122.45	5,313.64	-512.16	768.24	-650.96	0.90	0.89	0.31
5,610.00	33.19	122.61	5,363.46	-530.14	796.43	-675.01	2.25	-2.25	0.27
5,671.00	31.68	120.61	5,414.94	-547.29	824.28	-698.89	3.04	-2.48	-3.28
5,733.00	31.33	120.70	5,467.81	-563.81	852.16	-722.91	0.57	-0.56	0.15



Company:	Energen Resources Corp.	Local Co-ordinate Reference:	Well Many Canyons 24-03 8 #4H
Project:	Rio Arriba County, NM NAD27	TVD Reference:	GL 6877.90' & RKB 17' @ 6894.89usft
Site:	Many Canyons	MD Reference:	GL 6877.90' & RKB 17' @ 6894.89usft
Well:	Many Canyons 24-03 8 #4H	North Reference:	True
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	Grand Junction District

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)
5,794.00	30.90	122.89	5,520.03	-580.42	878.95	-745.86	1.98	-0.70	3.59
5,855.00	30.67	122.54	5,572.44	-597.29	905.21	-768.25	0.48	-0.38	-0.57
5,916.00	29.46	123.80	5,625.23	-614.00	930.80	-789.99	2.24	-1.98	2.07
5,977.00	25.50	137.90	5,679.39	-632.12	952.09	-807.26	12.45	-6.49	23.11
6,040.00	20.66	153.15	5,737.38	-652.12	966.23	-817.13	12.15	-7.68	24.21
6,103.00	16.58	164.38	5,797.09	-670.71	973.67	-820.73	8.59	-6.48	17.83
6,167.00	16.10	176.37	5,858.53	-688.37	976.69	-820.18	5.31	-0.75	18.73
6,229.00	16.95	188.20	5,917.98	-705.90	975.95	-815.96	5.59	1.37	19.08
6,292.00	19.20	208.96	5,977.93	-724.07	969.62	-806.13	10.76	3.57	32.95
6,355.00	20.93	220.38	6,037.13	-741.72	957.30	-790.56	6.79	2.75	18.13
6,418.00	23.92	228.09	6,095.37	-758.83	940.50	-770.69	6.65	4.75	12.24
6,481.00	27.92	235.10	6,152.03	-775.81	918.89	-746.12	7.99	6.35	11.13
6,544.00	30.14	238.95	6,207.12	-792.41	893.23	-717.68	4.60	3.52	6.11
6,607.00	36.40	243.91	6,259.78	-808.81	862.86	-684.65	10.83	9.94	7.87
6,670.00	45.81	247.94	6,307.20	-825.55	825.05	-644.26	15.51	14.94	6.40
6,733.00	52.18	248.92	6,348.52	-843.00	780.85	-597.48	10.18	10.11	1.56
6,767.00	55.30	249.43	6,368.63	-852.74	755.23	-570.43	9.26	9.18	1.50
6,829.00	60.06	252.49	6,401.77	-869.79	705.71	-518.51	8.74	7.68	4.94
6,892.00	63.07	258.27	6,431.79	-883.73	652.13	-463.23	9.37	4.78	9.17
6,955.00	66.77	264.46	6,458.51	-892.24	595.76	-406.29	10.66	5.87	9.83
7,018.00	72.25	268.96	6,480.56	-895.59	536.88	-347.92	10.97	8.70	7.14
7,081.00	79.76	271.62	6,495.79	-895.25	475.80	-288.13	12.60	11.92	4.22
7,144.00	84.98	272.71	6,504.15	-892.89	413.43	-227.48	8.46	8.29	1.73
7,175.00	88.12	272.88	6,506.02	-891.38	382.53	-197.49	10.14	10.13	0.55
Last SDI Curve MWD Survey									
7,184.00	88.40	272.85	6,506.29	-890.93	373.54	-188.78	3.10	3.08	-0.30
POE (7184' MD / 6506.29' TVD / 88.40° Inc / 272.85° Az)									
7,249.00	90.40	272.66	6,506.97	-887.81	308.62	-125.78	3.10	3.08	-0.30
First SDI Lateral MWD Survey									
7,310.00	91.31	273.33	6,506.06	-884.62	247.71	-66.72	1.85	1.49	1.10
7,372.00	91.78	273.08	6,504.39	-881.15	185.83	-6.77	0.86	0.76	-0.40
7,432.00	92.59	273.82	6,502.10	-877.55	125.99	51.16	1.83	1.35	1.23
7,494.00	92.66	274.02	6,499.26	-873.31	64.20	110.88	0.34	0.11	0.32
7,556.00	91.38	274.50	6,497.08	-868.71	2.41	170.51	2.20	-2.06	0.77
7,617.00	91.88	274.21	6,495.34	-864.08	-58.39	229.17	0.95	0.82	-0.48
7,678.00	91.85	272.78	6,493.36	-860.36	-119.24	288.07	2.34	-0.05	-2.34
7,740.00	91.51	272.53	6,491.54	-857.49	-181.15	348.17	0.68	-0.55	-0.40
7,801.00	91.61	272.74	6,489.88	-854.69	-242.06	407.30	0.38	0.16	0.34
7,863.00	92.39	272.87	6,487.71	-851.66	-303.95	467.35	1.28	1.26	0.21
7,924.00	92.45	272.43	6,485.14	-848.84	-364.83	526.45	0.73	0.10	-0.72
7,985.00	92.01	271.02	6,482.76	-847.00	-425.76	585.79	2.42	-0.72	-2.31
8,046.00	91.98	270.47	6,480.64	-846.21	-486.71	645.37	0.90	-0.05	-0.90
8,106.00	92.09	270.17	6,478.51	-845.88	-546.67	704.07	0.53	0.18	-0.50
8,167.00	91.48	270.66	6,476.61	-845.44	-607.64	763.73	1.28	-1.00	0.80

Company:	Energen Resources Corp.	Local Co-ordinate Reference:	Well Many Canyons 24-03 8 #4H
Project:	Rio Arriba County, NM NAD27	TVD Reference:	GL 6877.90' & RKB 17' @ 6894.89usft
Site:	Many Canyons	MD Reference:	GL 6877.90' & RKB 17' @ 6894.89usft
Well:	Many Canyons 24-03 8 #4H	North Reference:	True
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	Grand Junction District

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)
8,228.00	91.63	270.48	6,474.96	-844.83	-668.62	823.36	0.38	0.25	-0.30
8,289.00	90.61	270.82	6,473.76	-844.14	-729.60	882.99	1.76	-1.67	0.56
8,351.00	91.38	270.72	6,472.69	-843.30	-791.58	943.57	1.25	1.24	-0.16
8,412.00	93.23	269.90	6,470.23	-842.97	-852.53	1,003.23	3.32	3.03	-1.34
8,473.00	92.76	268.47	6,467.05	-843.84	-913.44	1,063.09	2.46	-0.77	-2.34
8,534.00	92.69	268.67	6,464.15	-845.36	-974.35	1,123.09	0.35	-0.11	0.33
8,595.00	91.71	269.24	6,461.80	-846.47	-1,035.30	1,183.04	1.86	-1.61	0.93
8,656.00	91.18	269.20	6,460.27	-847.30	-1,096.27	1,242.96	0.87	-0.87	-0.07
8,717.00	91.28	269.46	6,458.96	-848.02	-1,157.25	1,302.86	0.46	0.16	0.43
8,780.00	91.55	269.50	6,457.40	-848.59	-1,220.23	1,364.69	0.43	0.43	0.06
8,843.00	92.05	269.81	6,455.42	-848.97	-1,283.20	1,426.48	0.93	0.79	0.49
8,906.00	92.66	270.14	6,452.83	-848.99	-1,346.14	1,488.17	1.10	0.97	0.52
8,968.00	91.04	270.13	6,450.83	-848.85	-1,408.11	1,548.87	2.61	-2.61	-0.02
9,031.00	91.65	270.68	6,449.35	-848.40	-1,471.09	1,610.50	1.30	0.97	0.87
9,094.00	92.25	270.67	6,447.21	-847.66	-1,534.05	1,672.05	0.95	0.95	-0.02
9,157.00	92.11	270.67	6,444.81	-846.93	-1,597.00	1,733.60	0.22	-0.22	0.00
9,220.00	92.22	270.72	6,442.43	-846.16	-1,659.95	1,795.14	0.19	0.17	0.08
9,283.00	92.42	271.04	6,439.88	-845.19	-1,722.89	1,856.63	0.60	0.32	0.51
9,346.00	92.32	270.06	6,437.28	-844.59	-1,785.83	1,918.19	1.56	-0.16	-1.56
9,408.00	92.25	269.33	6,434.81	-844.92	-1,847.78	1,978.96	1.18	-0.11	-1.18
9,471.00	92.39	269.28	6,432.25	-845.68	-1,910.73	2,040.80	0.24	0.22	-0.08
9,534.00	92.69	269.56	6,429.46	-846.32	-1,973.66	2,102.60	0.65	0.48	0.44
9,596.00	92.22	269.70	6,426.81	-846.72	-2,035.60	2,163.39	0.79	-0.76	0.23
9,659.00	92.62	269.76	6,424.15	-847.02	-2,098.55	2,225.13	0.64	0.63	0.10
9,722.00	92.09	269.30	6,421.56	-847.53	-2,161.49	2,286.92	1.11	-0.84	-0.73
9,784.00	92.52	269.73	6,419.06	-848.06	-2,223.44	2,347.73	0.98	0.69	0.69
9,847.00	91.01	269.59	6,417.12	-848.43	-2,286.40	2,409.51	2.41	-2.40	-0.22
9,910.00	91.28	269.81	6,415.87	-848.76	-2,349.39	2,471.31	0.55	0.43	0.35
9,974.00	91.71	269.71	6,414.20	-849.03	-2,413.37	2,534.06	0.69	0.67	-0.16
10,037.00	92.25	269.40	6,412.02	-849.52	-2,476.33	2,595.85	0.99	0.86	-0.49
10,099.00	93.03	269.50	6,409.16	-850.11	-2,538.26	2,656.67	1.27	1.26	0.16
10,162.00	91.89	268.71	6,406.46	-851.10	-2,601.19	2,718.53	2.20	-1.81	-1.25
10,224.00	91.78	268.23	6,404.47	-852.75	-2,663.14	2,779.57	0.79	-0.18	-0.77
10,288.00	90.44	268.56	6,403.23	-854.54	-2,727.10	2,842.61	2.16	-2.09	0.52
10,351.00	90.04	268.44	6,402.97	-856.19	-2,790.08	2,904.66	0.66	-0.63	-0.19
10,414.00	91.21	268.16	6,402.28	-858.06	-2,853.04	2,966.74	1.91	1.86	-0.44
10,477.00	91.45	268.03	6,400.82	-860.16	-2,915.99	3,028.84	0.43	0.38	-0.21
10,540.00	91.95	268.76	6,398.95	-861.92	-2,978.94	3,090.88	1.40	0.79	1.16
10,603.00	91.82	269.99	6,396.88	-862.61	-3,041.90	3,152.72	1.96	-0.21	1.95
10,666.00	90.91	270.36	6,395.38	-862.41	-3,104.88	3,214.40	1.56	-1.44	0.59
10,729.00	91.38	270.92	6,394.12	-861.71	-3,167.86	3,275.99	1.16	0.75	0.89
10,792.00	91.85	271.74	6,392.34	-860.25	-3,230.82	3,337.39	1.50	0.75	1.30
10,855.00	92.02	271.42	6,390.22	-858.51	-3,293.76	3,398.73	0.57	0.27	-0.51

Company:	Energen Resources Corp.	Local Co-ordinate Reference:	Well Many Canyons 24-03 8 #4H
Project:	Rio Arriba County, NM NAD27	TVD Reference:	GL 6877.90' & RKB 17' @ 6894.89usft
Site:	Many Canyons	MD Reference:	GL 6877.90' & RKB 17' @ 6894.89usft
Well:	Many Canyons 24-03 8 #4H	North Reference:	True
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	Grand Junction District

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)
10,918.00	91.49	269.92	6,388.29	-857.78	-3,356.73	3,460.29	2.52	-0.84	-2.38
10,981.00	91.72	270.05	6,386.52	-857.79	-3,419.70	3,522.01	0.42	0.37	0.21
11,044.00	92.66	269.96	6,384.12	-857.79	-3,482.65	3,583.70	1.50	1.49	-0.14
11,107.00	91.55	269.92	6,381.80	-857.85	-3,545.61	3,645.41	1.76	-1.76	-0.06
11,170.00	91.99	270.38	6,379.86	-857.69	-3,608.58	3,707.09	1.01	0.70	0.73
11,233.00	92.39	271.36	6,377.45	-856.73	-3,671.53	3,768.58	1.68	0.63	1.56
11,296.00	91.68	271.59	6,375.21	-855.11	-3,734.47	3,829.94	1.18	-1.13	0.37
11,360.00	90.10	271.82	6,374.22	-853.21	-3,798.43	3,892.24	2.49	-2.47	0.36
11,423.00	90.51	271.89	6,373.88	-851.17	-3,861.39	3,953.55	0.66	0.65	0.11
11,486.00	90.84	271.89	6,373.14	-849.09	-3,924.35	4,014.83	0.52	0.52	0.00
11,549.00	90.24	271.20	6,372.55	-847.39	-3,987.33	4,076.21	1.45	-0.95	-1.10
11,611.00	90.74	271.06	6,372.02	-846.17	-4,049.31	4,136.71	0.84	0.81	-0.23
11,675.00	93.20	270.87	6,369.82	-845.09	-4,113.26	4,199.17	3.86	3.84	-0.30
11,738.00	93.70	270.98	6,366.02	-844.08	-4,176.14	4,260.59	0.81	0.79	0.17
11,791.00	94.50	271.64	6,362.24	-842.87	-4,228.99	4,312.14	1.95	1.51	1.24
Planned Liner Set Depth @ 11,791' MD									
11,801.00	94.65	271.76	6,361.44	-842.58	-4,238.95	4,321.84	1.95	1.51	1.24
11,814.00	94.91	270.76	6,360.35	-842.29	-4,251.90	4,334.48	7.92	2.00	-7.69
Last SDI Lateral MWD Survey									
11,816.00	94.91	270.76	6,360.18	-842.26	-4,253.90	4,336.43	0.00	0.00	0.00
Crossed 330' Setback (11,816' MD / 6360.18' TVD / 94.91° Inc / 270.76° Az)									
11,890.00	94.91	270.76	6,353.85	-841.29	-4,327.62	4,408.48	0.00	0.00	0.00
TD (11,890' MD / 6353.85' TVD / 94.91° Inc / 270.76° Az) - Projection to TD									

Design Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
266.00	265.99	-1.77	1.10	First SDI Surface MWD Survey
3,437.00	3,436.47	-55.29	3.53	Last SDI Surface MWD Survey
3,466.00	3,465.47	-55.42	3.66	KOP (3466' MD / 3465.47' TVD / 0.83° Inc / 133.84° Az)
3,502.00	3,501.46	-56.03	4.30	First SDI Curve MWD Survey
7,175.00	6,506.02	-891.38	382.53	Last SDI Curve MWD Survey
7,184.00	6,506.29	-890.93	373.54	POE (7184' MD / 6506.29' TVD / 88.40° Inc / 272.85° Az)
7,249.00	6,506.97	-887.81	308.62	First SDI Lateral MWD Survey
11,791.00	6,362.24	-842.87	-4,228.99	Planned Liner Set Depth @ 11,791' MD
11,814.00	6,360.35	-842.29	-4,251.90	Last SDI Lateral MWD Survey
11,816.00	6,360.18	-842.26	-4,253.90	Crossed 330' Setback (11,816' MD / 6360.18' TVD / 94.91° Inc / 270.76° Az)
11,890.00	6,353.85	-841.29	-4,327.62	TD (11,890' MD / 6353.85' TVD / 94.91° Inc / 270.76° Az)
11,890.00	6,353.85	-841.29	-4,327.62	Projection to TD

Checked By: _____

Approved By: _____

Date: _____