

**McVAY DRILLING COMPANY**

P.O. Box 2450
Hobbs, New Mexico 88241
(575) 397-3311
FAX: 39-DRILL

Well Name and Num: E Livingston 31 Fed 7H
Location: Sec 31, T22S, R32E
Operator: Regeneration
Drilling Contractor: McVay Drilling Company

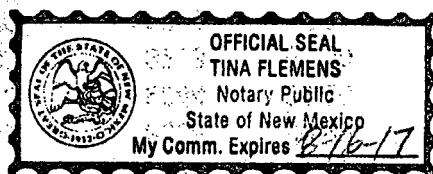
The undersigned certifies that he is an authorized representative of the drilling contractor who drilled the above described well and that he has conducted deviation tests and obtained the following results:

<u>Degrees @</u>	<u>Depth</u>	<u>Degrees @</u>	<u>Depth</u>	<u>Degrees @</u>	<u>Depth</u>	<u>Degrees @</u>	<u>Depth</u>
0.80	202	1.30	6030	73.10	10423		
1.20	557	1.20	6406	79.40	10492		
1.00	840	1.10	6971	89.00	10743		
0.50	1382	1.30	7384	91.80	11025		
0.30	1570	1.20	7537	89.50	11402		
0.30	1915	1.60	8102	89.50	11798		
0.40	2480	0.80	8479	89.20	12062		
0.20	2856	0.50	8856	89.90	13380		
0.70	3233	1.40	9044	89.90	13945		
0.60	3421	0.60	9233	89.50	14417		
1.80	3789	0.60	9609	8.80	14866		
3.80	4175	0.60	9732				
2.30	4509	12.70	9857				
2.30	4712	27.30	10015				
2.20	4900	35.60	10109				
1.90	5276	53.90	10366				
1.50	5653	62.20	10329				

By: *Mark A. Baum*

Subscribed and sworn to before me this 24th day of January, 2016

Tina Flemens
Notary Public, Lea County, New Mexico



MAY 11 2016

E. livingston 31 federal #7H
30-025-42975
Sec. 31 T22S R32E

<u>Perforations</u>	<u>7.5% Acid (Gal)</u>	<u>Sand</u>	<u>Fluid (Gal)</u>
14590-14770	2997	358442	319002
14458-14280	3007	426271	355592
13968-14146	6007	393286	331857
13797-13633	3285	453244	383515
13521-13341	6412	451024	353940
13209-13031	5832	372888	355561
12896-12716	6018	456400	368831
12584-12404	6013	450974	338228
12272-12092	5887	457353	365437
11959-11781	6001	450113	362724
11647-11467	5996	450087	363739
11335-11155	6036	455755	364802
11021-10842	6025	490904	369588



2/12/16

State of New Mexico
County of Lea

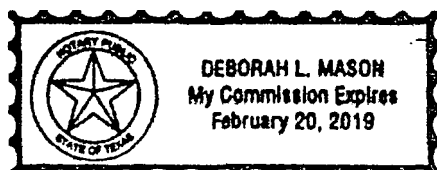
I, Donald D. Mason, certify that: I am employed by Terra Directional Services LLC; that I did on the day(s) of 01/07/2016 through 01/21/2016 conduct or supervise the taking of a MWD survey from a depth of 9732 feet to a depth of 14918 feet; that the data is true, correct, complete and within the limitations of the tool as set forth by Terra Directional Services LLC; that I am authorized and qualified to make this report; that this survey was conducted at the request of Regeneration Energy Corporation for the E. Livingston Federal #7H Well API 30-025-42975 in Lea County, New Mexico; and that I have reviewed this report and find that it conforms to the principles and procedures as set forth by Terra Directional Services LLC.

A handwritten signature of Donald D. Mason in black ink, written over a horizontal line.

Donald D. Mason
President

State of Texas
County of Burnet

Before me, a notary public, on this day personally appeared Donald D. Mason, known to me to be the person whose name is subscribed to the foregoing document and, being by me first duly sworn, declared that the statements therein contained are true and correct.

A handwritten signature of Deborah L. Mason in black ink, written over a horizontal line.
Notary Public's Signature



Regeneration
Energy Corp.

Regeneration Energy Corporation

Lea County, NM (NAD-83 2010)

E. Livingston 31 Federal #7H

E. Livingston 31 Federal #7H

30-025-42975

OH

Design: OH

Standard Survey Report

12 February, 2016





TDS
Survey Report



Company:	Regeneration Energy Corporation	Local Co-ordinate Reference:	Well E: Livingston 31 Federal #7H
Project:	Lea County: NM (NAD-83 2010)	TVD Reference:	KB @ 3523.00usft (McVay 4)
Site:	E: Livingston 31 Federal #7H	MD Reference:	KB @ 3523.00usft (McVay 4)
Well:	E: Livingston 31 Federal #7H	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	EDM 5000.1 Single User Db

Project:	Lea County, NM (NAD-83 2010)		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	New Mexico Eastern Zone		

Site:		E. Livingston 31 Federal #7H			
Site Position:		Northing:	488,427.19 usft	Latitude:	32° 20' 28.506 N
From:	Map	Easting:	731,706.30 usft	Longitude:	103° 43' 0.941 W
Position Uncertainty:	0.00 usft	Slot Radius:	13.20 in	Grid Convergence:	0.33 °

Well:	E: Livingston 31 Federal #7H					
Well Position	+N/-S	0.00 usft	Northing:	488,427.19 usft	Latitude:	32° 20' 28.506 N
	+E/-W	0.00 usft	Easting:	731,706.30 usft	Longitude:	103° 43' 0.941 W
Position Uncertainty		0.00 usft	Wellhead Elevation:	0.00 usft	Ground Level:	3,505.00 usft

Wellbore	OH				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	5/8/2015	7.18	60.17	48,281

Design		OH			
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD)	+N/-S	+E/-W	Direction	
	(usft)	(usft)	(usft)	(°)	
	0.00	0.00	0.00		359.62

Survey Program		Date	1/22/2016		
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
100.00	9,691.00	MS Gyro #1 (OH)	ISCWSA-GYRO-3	Biaxial Semi-Cont. Gyro	
9,732.00	14,918.00	TDS MWD #2 (OH)	MWD	MWD - Standard	

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
100.00	0.52	328.69	100.00	0.39	-0.24	0.39	0.52	0.52	0.00
200.00	1.07	330.10	199.99	1.58	-0.94	1.59	0.55	0.55	1.41
300.00	1.14	331.55	299.97	3.27	-1.88	3.28	0.08	0.07	1.45
400.00	1.17	336.10	399.95	5.08	-2.76	5.10	0.10	0.03	4.55
500.00	1.18	353.06	499.93	7.03	-3.30	7.05	0.35	0.01	16.96
600.00	1.23	352.89	599.91	9.12	-3.56	9.14	0.05	0.05	-0.17
700.00	1.16	359.91	699.89	11.20	-3.69	11.22	0.16	-0.07	7.02
800.00	0.85	0.52	799.87	12.95	-3.69	12.97	0.31	-0.31	0.61
900.00	0.16	337.72	899.87	13.82	-3.73	13.85	0.71	-0.69	-22.80



TDS
Survey Report



Company:	Regeneration Energy Corporation	Local Co-ordinate Reference:	Well E, Livingston 31 Federal #7H
Project:	Lea County, NM (NAD-83 2010)	TVD Reference:	KB @ 3523.00usft (McVay 4)
Site:	E, Livingston 31 Federal #7H	MD Reference:	KB @ 3523.00usft (McVay 4)
Well:	E, Livingston 31 Federal #7H	North Reference:	Gnd
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	EDM 5000.1 Single User Db

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
1,000.00	0.20	219.74	999.87	13.82	-3.90	13.84	0.31	0.04	-117.98
1,100.00	0.28	235.23	1,099.86	13.54	-4.21	13.57	0.10	0.08	15.49
1,200.00	0.35	212.90	1,199.86	13.15	-4.58	13.18	0.14	0.07	-22.33
1,300.00	0.35	220.48	1,299.86	12.66	-4.94	12.69	0.05	0.00	7.58
1,400.00	0.37	214.21	1,399.86	12.16	-5.32	12.19	0.04	0.02	-6.27
1,500.00	0.40	218.88	1,499.86	11.62	-5.72	11.66	0.04	0.03	4.67
1,600.00	0.39	217.81	1,599.85	11.08	-6.15	11.12	0.01	-0.01	-1.07
1,700.00	0.35	221.69	1,699.85	10.58	-6.56	10.63	0.05	-0.04	3.88
1,800.00	0.41	215.33	1,799.85	10.06	-6.97	10.11	0.07	0.06	-6.36
1,900.00	0.40	227.83	1,899.85	9.54	-7.44	9.59	0.09	-0.01	12.50
2,000.00	0.30	227.86	1,999.85	9.13	-7.89	9.18	0.10	-0.10	0.03
2,100.00	0.24	219.53	2,099.84	8.79	-8.22	8.84	0.07	-0.06	-8.33
2,200.00	0.25	217.30	2,199.84	8.45	-8.48	8.51	0.01	0.01	-2.23
2,300.00	0.27	233.33	2,299.84	8.14	-8.80	8.20	0.08	0.02	16.03
2,400.00	0.39	229.56	2,399.84	7.78	-9.25	7.84	0.12	0.12	-3.77
2,500.00	0.39	236.97	2,499.84	7.37	-9.80	7.44	0.05	0.00	7.41
2,600.00	0.26	232.89	2,599.84	7.05	-10.26	7.12	0.13	-0.13	-4.08
2,700.00	0.21	241.26	2,699.84	6.83	-10.61	6.90	0.06	-0.05	8.37
2,800.00	0.18	213.24	2,799.84	6.61	-10.85	6.68	0.10	-0.03	-28.02
2,900.00	0.05	226.11	2,899.84	6.44	-10.97	6.52	0.13	-0.13	12.87
3,000.00	0.15	314.26	2,999.84	6.51	-11.09	6.58	0.16	0.10	88.15
3,100.00	0.22	39.02	3,099.83	6.75	-11.07	6.82	0.25	0.07	84.76
3,200.00	0.53	353.43	3,199.83	7.35	-11.00	7.43	0.41	0.31	-45.59
3,300.00	0.61	343.20	3,299.83	8.32	-11.21	8.40	0.13	0.08	-10.23
3,400.00	0.48	335.28	3,399.82	9.21	-11.54	9.29	0.15	-0.13	-7.92
3,500.00	0.47	329.68	3,499.82	9.95	-11.92	10.03	0.05	-0.01	-5.60
3,600.00	0.27	337.06	3,599.82	10.52	-12.22	10.60	0.21	-0.20	7.38
3,700.00	0.87	127.70	3,699.81	10.27	-11.71	10.35	1.11	0.60	150.64
3,800.00	1.73	130.74	3,799.79	8.82	-9.96	8.89	0.86	0.86	3.04
3,900.00	1.82	131.86	3,899.74	6.78	-7.64	6.83	0.10	0.09	1.12
4,000.00	2.44	131.45	3,999.67	4.31	-4.86	4.34	0.62	0.62	-0.41
4,100.00	3.30	130.04	4,099.54	1.05	-1.06	1.05	0.86	0.86	-1.41
4,200.00	3.62	129.56	4,199.36	-2.81	3.58	-2.84	0.32	0.32	-0.48
4,300.00	3.41	131.77	4,299.17	-6.81	8.23	-6.86	0.25	-0.21	2.21
4,400.00	2.69	130.33	4,399.03	-10.31	12.24	-10.39	0.72	-0.72	-1.44
4,500.00	2.33	128.30	4,498.94	-13.08	15.62	-13.19	0.37	-0.36	-2.03
4,600.00	2.27	128.93	4,598.85	-15.59	18.76	-15.71	0.07	-0.06	0.63
4,700.00	2.10	130.48	4,698.78	-18.02	21.69	-18.17	0.18	-0.17	1.55
4,800.00	2.14	131.11	4,798.71	-20.44	24.49	-20.60	0.05	0.04	0.63
4,900.00	2.05	130.80	4,898.65	-22.84	27.25	-23.02	0.09	-0.09	-0.31
5,000.00	1.97	129.08	4,998.58	-25.09	29.94	-25.29	0.10	-0.08	-1.72
5,100.00	1.83	129.48	5,098.53	-27.19	32.51	-27.40	0.14	-0.14	0.40
5,200.00	1.87	129.32	5,198.48	-29.24	35.00	-29.47	0.04	0.04	-0.16



TDS
Survey Report



Company:	Regeneration Energy Corporation	Local Co-ordinate Reference:	Well E - Livingston 31 Federal #7H
Project:	Lea County, NM (NAD-83 2010)	TVD Reference:	KB @ 3523.00usft (McVay 4)
Site:	E - Livingston 31 Federal #7H	MD Reference:	KB @ 3523.00usft (McVay 4)
Well:	E - Livingston 31 Federal #7H	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	EDM 5000.1 Single User.Db

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)
5,300.00	1.76	130.10	5,298.43	-31.26	37.44	-31.51	0.11	-0.11	0.78
5,400.00	1.76	131.76	5,398.38	-33.27	39.76	-33.53	0.05	0.00	1.66
5,500.00	1.45	132.27	5,498.34	-35.14	41.84	-35.42	0.31	-0.31	0.51
5,600.00	1.48	134.00	5,598.31	-36.89	43.71	-37.18	0.05	0.03	1.73
5,700.00	1.29	131.63	5,698.28	-38.54	45.48	-38.84	0.20	-0.19	-2.37
5,800.00	1.33	131.21	5,798.25	-40.05	47.19	-40.36	0.04	0.04	-0.42
5,900.00	1.22	127.22	5,898.23	-41.46	48.91	-41.78	0.14	-0.11	-3.99
6,000.00	1.23	126.76	5,998.21	-42.74	50.62	-43.08	0.01	0.01	-0.46
6,100.00	1.25	128.09	6,098.18	-44.06	52.34	-44.41	0.04	0.02	1.33
6,200.00	1.26	130.14	6,198.16	-45.44	54.04	-45.80	0.05	0.01	2.05
6,300.00	1.18	132.73	6,298.14	-46.85	55.63	-47.22	0.10	-0.08	2.59
6,400.00	1.06	129.09	6,398.12	-48.13	57.11	-48.51	0.14	-0.12	-3.64
6,500.00	1.22	132.06	6,498.10	-49.43	58.62	-49.82	0.17	0.16	2.97
6,600.00	1.21	128.55	6,598.07	-50.80	60.23	-51.20	0.08	-0.01	-3.51
6,700.00	1.04	136.37	6,698.05	-52.11	61.68	-52.52	0.23	-0.17	7.82
6,800.00	1.01	157.62	6,798.04	-53.59	62.65	-54.00	0.38	-0.03	21.25
6,900.00	1.09	166.37	6,898.02	-55.32	63.21	-55.74	0.18	0.08	8.75
7,000.00	1.08	168.24	6,998.00	-57.17	63.62	-57.59	0.04	-0.01	1.87
7,100.00	1.21	171.69	7,097.98	-59.14	63.97	-59.56	0.15	0.13	3.45
7,200.00	1.12	175.28	7,197.96	-61.16	64.20	-61.58	0.12	-0.09	3.59
7,300.00	1.15	178.73	7,297.94	-63.14	64.30	-63.56	0.07	0.03	3.45
7,400.00	1.21	176.00	7,397.92	-65.19	64.40	-65.62	0.08	0.06	-2.73
7,500.00	1.05	178.79	7,497.90	-67.16	64.49	-67.59	0.17	-0.16	2.79
7,600.00	1.14	179.51	7,597.89	-69.07	64.52	-69.50	0.09	0.09	0.72
7,700.00	1.19	174.72	7,697.86	-71.10	64.62	-71.53	0.11	0.05	-4.79
7,800.00	1.19	174.24	7,797.84	-73.17	64.82	-73.60	0.01	0.00	-0.48
7,900.00	1.21	177.00	7,897.82	-75.26	64.98	-75.68	0.06	0.02	2.76
8,000.00	1.33	180.08	7,997.80	-77.47	65.04	-77.90	0.14	0.12	3.08
8,100.00	1.50	182.43	8,097.77	-79.94	64.98	-80.37	0.18	0.17	2.35
8,200.00	1.50	180.12	8,197.73	-82.55	64.92	-82.98	0.06	0.00	-2.31
8,300.00	1.64	180.04	8,297.69	-85.29	64.92	-85.72	0.14	0.14	-0.08
8,400.00	1.74	182.80	8,397.65	-88.24	64.84	-88.67	0.13	0.10	2.76
8,500.00	0.89	212.07	8,497.62	-90.42	64.35	-90.84	1.06	-0.85	29.27
8,600.00	1.05	211.42	8,597.61	-91.86	63.46	-92.28	0.16	0.16	-0.65
8,700.00	1.12	212.23	8,697.59	-93.47	62.47	-93.88	0.07	0.07	0.81
8,800.00	0.37	252.69	8,797.58	-94.39	61.64	-94.79	0.87	-0.75	40.46
8,900.00	0.54	240.06	8,897.58	-94.72	60.92	-95.12	0.20	0.17	-12.63
9,000.00	0.99	215.81	8,997.57	-95.66	60.01	-96.05	0.54	0.45	-24.25
9,100.00	1.15	187.46	9,097.55	-97.35	59.37	-97.74	0.55	0.16	-28.35
9,200.00	0.88	192.12	9,197.54	-99.10	59.08	-99.49	0.28	-0.27	4.66
9,300.00	0.42	181.26	9,297.53	-100.21	58.91	-100.60	0.47	-0.46	-10.86
9,400.00	0.09	14.27	9,397.53	-100.50	58.92	-100.89	0.51	-0.33	-166.99
9,500.00	0.36	9.47	9,497.53	-100.12	58.99	-100.51	0.27	0.27	-4.80



TDS
Survey Report



Company:	Regeneration Energy Corporation	Local Co-ordinate Reference:	Well E. Livingston 31 Federal #7H
Project:	Lea County, NM (NAD-83 2010)	TVD Reference:	KB @ 3523.00usft (McVay 4)
Site:	E. Livingston 31 Federal #7H	MD Reference:	KB @ 3523.00usft (McVay 4)
Well:	E. Livingston 31 Federal #7H	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	EDM 5000.1 Single User Db

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)
9,600.00	0.52	10.31	9,597.53	-99.36	59.12	-99.75	0.16	0.16	0.84
9,691.00	0.51	352.24	9,688.52	-98.55	59.14	-98.94	0.18	-0.01	-19.86
Tie-In to MS Gyro									
9,732.00	0.60	335.10	9,729.52	-98.18	59.03	-98.57	0.46	0.22	-41.80
First TDS MWD Survey									
9,763.00	2.50	340.80	9,760.51	-97.39	58.74	-97.78	6.14	6.13	18.39
9,794.00	5.50	351.70	9,791.43	-95.28	58.30	-95.67	9.94	9.68	35.16
9,826.00	9.40	353.10	9,823.15	-91.17	57.77	-91.55	12.20	12.19	4.38
9,857.00	12.70	352.20	9,853.58	-85.28	57.00	-85.66	10.66	10.65	-2.90
9,889.00	16.20	351.00	9,884.56	-77.38	55.82	-77.75	10.98	10.94	-3.75
9,920.00	19.40	352.00	9,914.07	-68.01	54.43	-68.37	10.37	10.32	3.23
9,952.00	22.40	354.30	9,943.96	-56.68	53.08	-57.03	9.72	9.38	7.19
9,984.00	24.70	355.00	9,973.30	-43.95	51.90	-44.29	7.24	7.19	2.19
10,015.00	27.30	355.40	10,001.16	-30.41	50.76	-30.74	8.41	8.39	1.29
10,046.00	29.80	354.50	10,028.38	-15.65	49.45	-15.98	8.18	8.06	-2.90
10,078.00	32.40	354.00	10,055.78	0.79	47.79	0.47	8.16	8.13	-1.56
10,109.00	35.60	353.70	10,081.48	18.02	45.93	17.72	10.34	10.32	-0.97
10,141.00	39.50	354.30	10,106.84	37.42	43.90	37.12	12.24	12.19	1.88
10,172.00	43.70	353.80	10,130.02	57.88	41.76	57.60	13.59	13.55	-1.61
10,203.00	47.30	354.20	10,151.75	79.87	39.46	79.60	11.65	11.61	1.29
10,235.00	50.70	354.30	10,172.74	103.89	37.04	103.65	10.63	10.63	0.31
10,266.00	53.90	353.90	10,191.69	128.29	34.51	128.06	10.37	10.32	-1.29
10,297.00	58.20	354.80	10,209.00	153.87	31.99	153.66	14.08	13.87	2.90
10,329.00	62.20	354.60	10,224.90	181.52	29.42	181.32	12.51	12.50	-0.63
10,360.00	65.00	356.80	10,238.68	209.20	27.35	209.02	11.04	9.03	7.10
10,392.00	69.50	354.50	10,251.06	238.62	25.10	238.44	15.55	14.06	-7.19
10,423.00	73.10	354.00	10,260.99	267.83	22.16	267.67	11.71	11.61	-1.61
10,454.00	75.90	354.00	10,269.28	297.53	19.04	297.40	9.03	9.03	0.00
10,492.00	79.40	353.90	10,277.40	334.44	15.12	334.33	9.21	9.21	-0.26
10,523.00	81.80	354.50	10,282.47	364.87	12.03	364.78	7.97	7.74	1.94
10,554.00	84.40	353.70	10,286.19	395.48	8.87	395.41	8.77	8.39	-2.58
10,586.00	86.60	353.90	10,288.70	427.19	5.42	427.14	6.90	6.88	0.63
10,649.00	89.60	354.60	10,290.79	489.83	-0.88	489.82	4.89	4.76	1.11
10,743.00	89.00	357.40	10,291.94	583.58	-7.44	583.62	3.05	-0.64	2.98
10,837.00	90.10	0.70	10,292.68	677.55	-9.00	677.60	3.70	1.17	3.51
10,931.00	90.60	1.30	10,292.10	771.54	-7.36	771.57	0.83	-0.53	0.64
11,025.00	91.80	2.60	10,290.13	865.46	-4.16	865.47	1.88	1.28	1.38
11,119.00	90.80	1.50	10,288.00	959.37	-0.80	959.35	1.58	-1.06	-1.17
11,214.00	89.40	1.60	10,287.84	1,054.33	1.77	1,054.30	1.48	-1.47	0.11
11,308.00	90.60	2.50	10,287.84	1,148.27	5.13	1,148.21	1.60	1.28	0.96
11,402.00	89.90	0.00	10,287.43	1,242.24	7.19	1,242.16	2.76	-0.74	-2.66
11,496.00	89.60	359.50	10,287.84	1,336.24	6.77	1,336.16	0.62	-0.32	-0.53
11,591.00	89.80	358.90	10,288.33	1,431.23	5.45	1,431.16	0.67	0.21	-0.63
11,685.00	89.50	359.70	10,288.91	1,525.22	4.30	1,525.15	0.91	-0.32	0.85



TDS
Survey Report



Company:	Regeneration Energy Corporation	Local Co-ordinate Reference:	Well E..Livingston 31 Federal #7H
Project:	Lea County NM (NAD-83 2010)	TVD Reference:	KB @ 3523.00usft (McVay 4)
Site:	E..Livingston 31 Federal #7H	MD Reference:	KB @ 3523.00usft (McVay 4)
Well:	E..Livingston 31 Federal #7H	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	EDM 5000.1 Single User Db

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)
11,779.00	89.40	0.20	10,289.81	1,619.21	4.22	1,619.15	0.54	-0.11	0.53
11,873.00	89.40	357.90	10,290.79	1,713.19	2.66	1,713.13	2.45	0.00	-2.45
11,967.00	89.10	358.00	10,292.02	1,807.12	-0.70	1,807.08	0.34	-0.32	0.11
12,062.00	89.20	357.90	10,293.43	1,902.05	-4.10	1,902.03	0.15	0.11	-0.11
12,156.00	88.80	357.80	10,295.07	1,995.97	-7.63	1,995.97	0.44	-0.43	-0.11
12,250.00	89.90	358.40	10,296.14	2,089.91	-10.74	2,089.93	1.33	1.17	0.64
12,344.00	90.90	359.10	10,295.48	2,183.88	-12.79	2,183.92	1.30	1.06	0.74
12,438.00	91.70	359.60	10,293.35	2,277.85	-13.86	2,277.89	1.00	0.85	0.53
12,532.00	91.60	359.60	10,290.65	2,371.81	-14.52	2,371.85	0.11	-0.11	0.00
12,627.00	91.70	0.00	10,287.91	2,466.77	-14.85	2,466.81	0.43	0.11	0.42
12,721.00	91.70	0.10	10,285.12	2,560.73	-14.76	2,560.77	0.11	0.00	0.11
12,815.00	91.50	0.70	10,282.50	2,654.69	-14.11	2,654.72	0.67	-0.21	0.64
12,909.00	91.50	1.00	10,280.04	2,748.64	-12.71	2,748.67	0.32	0.00	0.32
13,003.00	91.30	1.00	10,277.74	2,842.60	-11.07	2,842.61	0.21	-0.21	0.00
13,097.00	91.60	1.20	10,275.36	2,936.55	-9.27	2,936.55	0.38	0.32	0.21
13,192.00	92.10	1.50	10,272.29	3,031.48	-7.03	3,031.46	0.61	0.53	0.32
13,286.00	90.70	0.30	10,270.00	3,125.43	-5.56	3,125.40	1.96	-1.49	-1.28
13,380.00	89.90	359.30	10,269.50	3,219.43	-5.89	3,219.40	1.36	-0.85	-1.06
13,474.00	90.30	359.30	10,269.34	3,313.42	-7.03	3,313.40	0.43	0.43	0.00
13,569.00	90.50	359.20	10,268.68	3,408.41	-8.28	3,408.39	0.24	0.21	-0.11
13,663.00	88.50	359.00	10,269.50	3,502.39	-9.75	3,502.38	2.14	-2.13	-0.21
13,757.00	88.90	359.50	10,271.63	3,596.36	-10.98	3,596.35	0.68	0.43	0.53
13,851.00	89.20	359.80	10,273.19	3,690.35	-11.56	3,690.34	0.45	0.32	0.32
13,945.00	89.90	0.10	10,273.93	3,784.34	-11.64	3,784.34	0.81	0.74	0.32
14,040.00	90.10	0.30	10,273.93	3,879.34	-11.31	3,879.33	0.30	0.21	0.21
14,134.00	90.10	0.30	10,273.76	3,973.34	-10.82	3,973.32	0.00	0.00	0.00
14,228.00	90.20	0.80	10,273.52	4,067.33	-9.91	4,067.31	0.54	0.11	0.53
14,322.00	90.10	1.00	10,273.27	4,161.32	-8.44	4,161.29	0.24	-0.11	0.21
14,417.00	89.50	359.90	10,273.60	4,256.32	-7.69	4,256.27	1.32	-0.63	-1.16
14,511.00	89.20	359.80	10,274.67	4,350.31	-7.94	4,350.27	0.34	-0.32	-0.11
14,605.00	88.90	0.20	10,276.23	4,444.30	-7.94	4,444.25	0.53	-0.32	0.43
14,700.00	88.70	0.50	10,278.22	4,539.27	-7.36	4,539.22	0.38	-0.21	0.32
14,794.00	88.30	0.90	10,280.68	4,633.24	-6.21	4,633.17	0.60	-0.43	0.43
14,866.00	88.00	1.50	10,283.00	4,705.18	-4.70	4,705.11	0.93	-0.42	0.83
Final MWD Survey									
14,918.00	88.00	1.50	10,284.82	4,757.13	-3.34	4,757.05	0.00	0.00	0.00
Projection to Bit/TD									



TDS
Survey Report



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Site:	E Livingston 31 Federal #7H	MD Reference:	KB @ 3523.00usft (McVay 4)
Well:	E Livingston 31 Federal #7H	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	EDM 5000.1 Single User Db

Design Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
9,691.00	9,688.52	-98.55	59.14	Tie-In to MS Gyro
9,732.00	9,729.52	-98.18	59.03	First TDS MWD Survey
14,866.00	10,283.00	4,705.18	-4.70	Final MWD Survey
14,918.00	10,284.82	4,757.13	-3.34	Projection to Bit/TD

Checked By: Deborah L. Mason Approved By: [Signature] Date: 2/12/16

