

Reservoir Development

PathFinder, a Schlumberger Company
9200 West Reno Avenue
Oklahoma City, Oklahoma 73127 USA
Phone: (405) 789-1515
Fax: (405) 789-1519

PATHFINDER
A Schlumberger Company

300541849

February 5, 2015

Cimarex
600 N MARIENFELD STREET SUITE 600

MIDLAND, TX 79701

NM OIL CONSERVATION
ARTESIA DISTRICT

MAR 23 2015

RECEIVED

Re:

CLIENT: Cimarex Energy Co.
WELL: Marquardt Federal 11H
FIELD: Bone Spring
RIG: Cactus 116
COUNTY: Eddy
API NO: 30-015-41849
JOB NO: 14MLD0504

Sec 13 T25S R26E, 360 FNL 1750FWL
N 32.13624 W 104.24938

Enclosed, please find the original copy of the survey performed on the referenced well by PathFinder, a division of Schlumberger Technology Corporation.
Other information required by your office is as follows.

<u>Name & Title of Surveyor</u>	<u>Drainhole Number</u>	<u>Surveyed Depths</u>	<u>Dates Performed</u>	<u>Type of Survey</u>
Eric Schauer MWD	Marquardt Federal 11H Original Hole	6521.00 Ft to 12272.00 Ft	October 4, 2014 to October 12, 2014	SlimPulse

If any other information is required, please contact the undersigned at the above letterhead and phone number.
Sincerely,

Joe Hogan
Field Service Manager

Reservoir Development

PathFinder, a Schlumberger Company
9200 West Reno Avenue
Oklahoma City, Oklahoma 73127 USA
Phone: (405) 789-1515
Fax: (405) 789-1519

Well Reference:

Sec 13 T25S R26E, 360 FNL 1750FWL
N 32.13624 W 104.24938

I, Eric Schauer certify that; I am employed by PathFinder, a division of Schlumberger Technology Corporation; that I did on the day(s) of October 04, 2014 through October 12, 2014, conduct or supervise the taking of the SlimPulse surveys from a depth of 6521.00 feet to a depth of 12272.00 feet referenced to driller's depth; that the data is true, correct, complete and within the limitations of the tool as set forth by Drilling & Measurements, a division of Schlumberger Technology Corporation; that I am authorized and qualified to make this report; that this survey was conducted at the request of Cimarex Energy Co. for the Marquardt Federal 11H Well (Original Hole) API No. 30-015-41849 and that I have reviewed this report and find that it conforms to the principals and procedures as set forth by Drilling & Measurements, a division of Schlumberger Technology Corporation.

SIGNED ON BEHALF OF ERIC SCHAUER BY JOE HOGAN

By
Eric Schauer
MWD

Subscribed and Sworn to before me this 5 day of February (month) 2015 (yr)

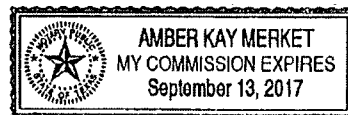
My Commission expires:

September 13, 2017

Amber Kay Merket
Notary Public

(signature)

Midland County, Texas
(County State)



Schlumberger Survey Report

Sunday October 12, 2014 11:2 Report by MaxWell

General Information

Client : Cimarex Energy Co. Well name : Marquardt Federal 11H
Field Eastern Zo US Feet

Survey Calculation Methods

Method for positions : Minimum Curvature Method

Job Location & Elevation

Latitude : 32.1362 degrees Longitude : -104.2494degrees
Permanent Datum : MSL Log Measured From : KB
Elevation of LMF from MSL : 3294.00 ft Elevation of TIP from MSL: 3294.00 ft
Depth Source :

Vertical Section Origin

Latitude (+N/S-) : 0.00 ft Departure (+E/W-) : 0.00 ft
Target Azimuth : 1.6300 degrees

MWD Survey Reference Criteria

Run1

Geomag Model: : BGGM 2014 Calculation Date: : 04-Oct-2014
Location G : 998.82 mgn Tolerance G : 2.50 mgn
Location B : 48109.96 nT Tolerance B : 300.00 nT
Magnetic Dip : 59.89 degrees Tolerance Dip : 0.45 degrees

Run2

Geomag Model: : BGGM 2014 Calculation Date: : 09-Oct-2014
Location G : 998.82 mgn Tolerance G : 2.50 mgn
Location B : 48108.28 nT Tolerance B : 300.00 nT
Magnetic Dip : 59.89 degrees Tolerance Dip : 0.45 degrees

MWD Survey Azimuth Correction

Run1

Magnetic dec (+E/W-) : 7.6529 degrees
Grid convergence (+E/W-) : 0.0447 degrees
GTotal az corr (+E/W-) : 7.6083 degrees

Run2

Magnetic dec (+E/W-) : 7.6516 degrees
Grid convergence (+E/W-) : 0.0447 degrees
GTotal az corr (+E/W-) : 7.6069 degrees

Survey Quality Index Description

0 : Long Survey passed all criteria 2 : Long Survey failed mag criteria

-----Survey Correction Index Description-----

0 : No Correction

-----Survey Description Index Description-----

0 : Not Flagged Survey 7 : Projection to Bit

===== Survey List =====

MD (ft)	Incl (deg)	Azim (deg)	TVD (ft)	V Sec (ft)	N/-S (ft)	E/-W (ft)	DLS (deg)	Run	Tool	QI	CI	ID
/100ft)												
0	0	0	0	0	0	0	0	0	Other	28	0	0
86	0.4	307.29	86	0.18	0.18	-0.24	0.47	1	SingleShot	9	0	0
176	0.62	289.27	176	0.51	0.53	-0.95	0.3	1	SingleShot	9	0	0
276	0.7	273.36	275.99	0.69	0.75	-2.07	0.2	1	SingleShot	9	0	0
327	0.62	261.98	326.99	0.65	0.73	-2.65	0.3	1	SingleShot	9	0	0
373	0.62	267.78	372.98	0.59	0.68	-3.15	0.14	1	SingleShot	9	0	0
443	0.62	261.28	442.98	0.5	0.61	-3.9	0.1	1	SingleShot	9	0	0
499	0.7	259.48	498.98	0.37	0.5	-4.54	0.15	1	SingleShot	9	0	0
557	0.62	262.38	556.97	0.25	0.4	-5.2	0.15	1	SingleShot	9	0	0
648	0.62	253.06	647.97	0.01	0.19	-6.16	0.11	1	SingleShot	9	0	0
737	0.62	239.48	736.96	-0.4	-0.2	-7.03	0.16	1	SingleShot	9	0	0
830	0.48	234.25	829.96	-0.9	-0.68	-7.78	0.16	1	SingleShot	9	0	0
922	0.48	226.96	921.95	-1.41	-1.17	-8.37	0.07	1	SingleShot	9	0	0
1012	0.62	228.76	1011.95	-2	-1.75	-9.02	0.16	1	SingleShot	9	0	0
1104	0.7	224.28	1103.94	-2.75	-2.48	-9.78	0.1	1	SingleShot	9	0	0
1195	0.7	205.86	1194.94	-3.67	-3.38	-10.41	0.25	1	SingleShot	9	0	0
1285	0.7	172.46	1284.93	-4.71	-4.42	-10.58	0.45	1	SingleShot	9	0	0
1380	0.88	140.56	1379.92	-5.84	-5.55	-10.04	0.49	1	SingleShot	9	0	0
1476	1.1	136.39	1475.91	-7.04	-6.79	-8.94	0.24	1	SingleShot	9	0	0
1568	1.49	128.08	1567.88	-8.37	-8.17	-7.39	0.47	1	SingleShot	9	0	0
1663	1.89	123.07	1662.84	-9.93	-9.78	-5.1	0.45	1	SingleShot	9	0	0
1756	1.8	126.28	1755.79	-11.56	-11.49	-2.64	0.15	1	SingleShot	9	0	0
1823	1.8	126.76	1822.76	-12.76	-12.74	-0.95	0.02	1	SingleShot	9	0	0
1946	1.71	126.06	1945.7	-14.91	-14.97	2.08	0.08	1	SingleShot	9	0	0
2039	1.49	130.98	2038.67	-16.46	-16.58	4.12	0.28	1	SingleShot	9	0	0
2133	1.49	126.85	2132.64	-17.94	-18.12	6.02	0.11	1	SingleShot	9	0	0
2228	1.49	130.59	2227.6	-19.43	-19.66	7.94	0.1	1	SingleShot	9	0	0
2325	1.49	132.56	2324.57	-21.05	-21.34	9.83	0.05	1	SingleShot	9	0	0
2418	1.49	131.29	2417.54	-22.61	-22.95	11.63	0.04	1	SingleShot	9	0	0
2513	0.4	74.77	2512.53	-23.31	-23.68	12.88	1.38	1	SingleShot	9	0	0
2606	0.31	83.78	2605.52	-23.18	-23.57	13.44	0.11	1	SingleShot	9	0	0
2701	0.22	81.19	2700.52	-23.11	-23.51	13.88	0.1	1	SingleShot	9	0	0
2794	0.22	69.06	2793.52	-23.01	-23.42	14.22	0.05	1	SingleShot	9	0	0
2889	0.22	119.95	2888.52	-23.02	-23.45	14.55	0.2	1	SingleShot	9	0	0
2983	0.22	133.75	2982.52	-23.23	-23.66	14.84	0.06	1	SingleShot	9	0	0
3078	0.09	156.16	3077.52	-23.42	-23.86	15	0.15	1	SingleShot	9	0	0
3171	0.09	198.48	3170.52	-23.56	-23.99	15	0.07	1	SingleShot	9	0	0
3267	0.09	245.06	3266.52	-23.66	-24.1	14.91	0.07	1	SingleShot	9	0	0
3361	0.09	171.85	3360.52	-23.77	-24.2	14.86	0.11	1	SingleShot	9	0	0
3455	0.09	244.75	3454.52	-23.87	-24.3	14.8	0.11	1	SingleShot	9	0	0
3549	0.09	268.88	3548.52	-23.91	-24.34	14.66	0.04	1	SingleShot	9	0	0
3643	0.7	234.47	3642.52	-24.26	-24.67	14.12	0.67	1	SingleShot	9	0	0

3738	1.1	232.36	3737.51	-25.19	-25.57	12.92	0.42	1 SingleShot	9	0	0
3836	0.22	220.85	3835.5	-25.93	-26.28	12.05	0.9	1 SingleShot	9	0	0
3930	0.48	231.35	3929.5	-26.32	-26.67	11.63	0.28	1 SingleShot	9	0	0
4024	0.4	245.99	4023.49	-26.72	-27.04	11.02	0.15	1 SingleShot	9	0	0
4119	0.62	239.66	4118.49	-27.14	-27.44	10.28	-0.24	1 SingleShot	9	0	0
4212	0.22	242.69	4211.49	-27.49	-27.78	9.68	0.43	1 SingleShot	9	0	0
4309	0.4	228.98	4308.49	-27.81	-28.08	9.26	0.2	1 SingleShot	9	0	0
4403	0.48	223.49	4402.48	-28.32	-28.58	8.74	0.1	1 SingleShot	9	0	0
4497	0.48	220.85	4496.48	-28.92	-29.17	8.21	0.02	1 SingleShot	9	0	0
4591	0.48	228.98	4590.48	-29.49	-29.72	7.66	0.07	1 SingleShot	9	0	0
4685	0.4	221.99	4684.47	-30.01	-30.23	7.14	0.1	1 SingleShot	9	0	0
4779	0.62	220.76	4778.47	-30.66	-30.86	6.59	0.23	1 SingleShot	9	0	0
4874	0.62	228.45	4873.46	-31.41	-31.59	5.87	0.09	1 SingleShot	9	0	0
4970	0.7	223.88	4969.46	-32.2	-32.35	5.08	0.1	1 SingleShot	9	0	0
5065	0.79	220.28	5064.45	-33.14	-33.27	4.25	0.11	1 SingleShot	9	0	0
5157	0.79	226.56	5156.44	-34.08	-34.19	3.38	0.09	1 SingleShot	9	0	0
5253	0.79	223.09	5252.43	-35.05	-35.13	2.45	0.05	1 SingleShot	9	0	0
5348	0.88	234.08	5347.42	-35.98	-36.04	1.41	0.19	1 SingleShot	9	0	0
5443	1.01	232.05	5442.41	-36.96	-36.98	0.16	0.14	1 SingleShot	9	0	0
5537	0.48	251.57	5536.4	-37.62	-37.61	-0.87	0.62	1 SingleShot	9	0	0
5632	1.58	251.26	5631.38	-38.21	-38.16	-2.49	1.16	1 SingleShot	9	0	0
5726	1.49	252.58	5725.35	-39.06	-38.94	-4.88	0.1	1 SingleShot	9	0	0
5820	1.1	247.08	5819.33	-39.84	-39.66	-6.88	0.43	1 SingleShot	9	0	0
5915	1.89	218.17	5914.29	-41.47	-41.24	-8.68	1.12	1 SingleShot	9	0	0
6010	1.89	195.05	6009.24	-44.26	-43.99	-10.06	0.8	1 SingleShot	9	0	0
6106	1.1	152.56	6105.21	-46.6	-46.34	-10.05	1.36	1 SingleShot	9	0	0
6200	1.41	133.27	6199.19	-48.16	-47.93	-8.79	0.55	1 SingleShot	9	0	0
6295	1.32	128.08	6294.16	-49.59	-49.41	-7.08	0.16	1 SingleShot	9	0	0
6389	1.41	120.44	6388.14	-50.79	-50.66	-5.23	0.22	1 SingleShot	9	0	0
6490	1.5	127.62	6489.1	-52.16	-52.1	-3.11	0.2	1 SingleShot	9	0	0
6521	1.39	125.16	6520.09	-52.61	-52.56	-2.48	0.4	1 SlimPulse	0	0	0
6552	3.41	75.53	6551.07	-52.56	-52.55	-1.28	8.77	1 SlimPulse	0	0	0
6647	14.65	48.65	6644.77	-43.56	-43.88	10.51	12.33	1 SlimPulse	0	0	0
6742	25.63	34.21	6733.87	-17.96	-18.85	31.16	12.61	1 SlimPulse	0	0	0
6837	30.51	23.42	6817.73	21.79	20.32	52.32	7.39	1 SlimPulse	0	0	0
6931	32.32	29.96	6897.97	66.08	64	74.36	4.11	1 SlimPulse	0	0	0
7026	41.7	32.95	6973.75	115.54	112.63	104.3	10.05	1 SlimPulse	0	0	0
7121	50.46	28.79	7039.6	175.26	171.38	139.2	9.73	1 SlimPulse	2	0	0
7216	60.48	29.46	7093.38	244.58	239.64	177.27	10.57	1 SlimPulse	0	0	0
7310	69.69	29.12	7132.94	320	313.92	218.93	9.8	1 SlimPulse	0	0	0
7404	76.09	23.88	7160.6	401.46	394.27	258.91	8.64	1 SlimPulse	0	0	0
7499	80.35	16.36	7180.01	489.58	481.53	290.83	8.95	1 SlimPulse	2	0	0
7593	85.01	9.02	7192	581	572.4	311.27	9.2	1 SlimPulse	0	0	0
7687	88.52	0.88	7197.32	674.6	665.81	319.34	9.42	1 SlimPulse	2	0	0
7782	88.59	359.66	7199.71	769.54	760.77	319.79	1.28	1 SlimPulse	0	0	0
7876	90.31	1.22	7200.62	863.51	854.76	320.52	2.47	1 SlimPulse	0	0	0
7970	89.9	0.71	7200.45	957.5	948.75	322.1	0.7	1 SlimPulse	2	0	0
8064	90.07	0.41	7200.48	1051.49	1042.74	323.02	0.37	1 SlimPulse	2	0	0
8159	89.83	0.87	7200.56	1146.47	1137.73	324.09	0.54	1 SlimPulse	2	0	0
8254	89.52	0.69	7201.1	1241.46	1232.72	325.38	0.38	1 SlimPulse	2	0	0
8349	90.07	0.79	7201.45	1336.45	1327.72	326.6	0.59	1 SlimPulse	0	0	0
8444	90.14	1.03	7201.28	1431.44	1422.7	328.11	0.27	1 SlimPulse	0	0	0
8538	89.79	1.84	7201.33	1525.44	1516.67	330.47	0.93	1 SlimPulse	0	0	0
8632	89.76	1.44	7201.7	1619.44	1610.63	333.16	0.44	1 SlimPulse	2	0	0
8727	90.31	0.74	7201.64	1714.43	1705.62	334.96	0.94	1 SlimPulse	2	0	0
8822	90.1	358.38	7201.3	1809.36	1800.61	334.23	2.49	1 SlimPulse	2	0	0
8916	90	0.05	7201.22	1903.28	1894.59	332.94	1.78	1 SlimPulse	2	0	0
9011	89.76	358.04	7201.42	1998.18	1989.57	331.36	2.13	1 SlimPulse	2	0	0

9105	90.62	1.19	7201.11	2092.1	2083.56	330.72	3.47	1 SlimPulse	2	0	0
9200	91.65	356.53	7199.22	2186.95	2178.49	328.83	5.02	1 SlimPulse	2	0	0
9294	90.45	1.05	7197.5	2280.79	2272.43	326.85	4.98	1 SlimPulse	0	0	0
9389	90.79	358.91	7196.47	2375.74	2367.42	326.82	2.28	1 SlimPulse	2	0	0
9483	91.03	359.72	7194.97	2469.65	2461.4	325.7	0.9	1 SlimPulse	2	0	0
9577	90.96	359.53	7193.34	2563.58	2555.38	325.09	0.22	1 SlimPulse	2	0	0
9671	91.34	0.45	7191.45	2657.52	2649.36	325.07	1.05	1 SlimPulse	0	0	0
9766	90.83	359.93	7189.66	2752.47	2744.35	325.38	0.76	1 SlimPulse	2	0	0
9860	91.03	359.64	7188.13	2846.41	2838.33	325.03	0.38	1 SlimPulse	2	0	0
9953	91.3	0.73	7186.23	2939.36	2931.31	325.33	1.2	1 SlimPulse	2	0	0
10048	91.52	356.6	7183.89	3034.19	3026.24	323.11	4.34	1 SlimPulse	2	0	0
10143	90.31	357.8	7182.38	3128.89	3121.11	318.48	1.79	1 SlimPulse	2	0	0
10237	90.45	358.79	7181.76	3222.73	3215.06	315.68	1.06	1 SlimPulse	2	0	0
10331	90.14	359.19	7181.28	3316.63	3309.05	314.02	0.54	1 SlimPulse	2	0	0
10426	90.41	356.18	7180.82	3411.39	3403.96	310.19	3.18	1 SlimPulse	2	0	0
10520	89.24	357.24	7181.11	3505.04	3497.8	304.8	1.68	1 SlimPulse	2	0	0
10606	89.69	359.48	7181.91	3590.89	3583.75	302.34	2.65	2 SlimPulse	0	0	0
10700	89.93	359.27	7182.22	3684.82	3677.75	301.31	0.34	2 SlimPulse	0	0	0
10795	89.83	358.61	7182.42	3779.71	3772.73	299.55	0.7	2 SlimPulse	0	0	0
10890	89.86	357.73	7182.67	3874.54	3867.68	296.51	0.93	2 SlimPulse	0	0	0
10985	90.07	357.71	7182.73	3969.32	3962.61	292.73	0.22	2 SlimPulse	0	0	0
11080	90.24	358.42	7182.47	4064.13	4057.55	289.53	0.77	2 SlimPulse	0	0	0
11174	90.55	358.99	7181.83	4158.01	4151.52	287.41	0.69	2 SlimPulse	0	0	0
11270	90.41	359.32	7181.02	4253.92	4247.51	285.99	0.37	2 SlimPulse	0	0	0
11364	90.28	359.35	7180.45	4347.84	4341.5	284.9	0.15	2 SlimPulse	0	0	0
11459	90.31	359.48	7179.97	4442.77	4436.5	283.93	0.15	2 SlimPulse	0	0	0
11554	90.48	0.52	7179.31	4537.72	4531.49	283.93	1.11	2 SlimPulse	0	0	0
11648	90.41	0.55	7178.58	4631.7	4625.49	284.8	0.08	2 SlimPulse	0	0	0
11742	90.41	1.74	7177.9	4725.7	4719.46	286.68	1.26	2 SlimPulse	0	0	0
11837	90.17	2.22	7177.42	4820.69	4814.4	289.95	0.57	2 SlimPulse	0	0	0
11932	90.34	2.18	7176.99	4915.69	4909.33	293.6	0.19	2 SlimPulse	0	0	0
12027	90.31	1.85	7176.45	5010.68	5004.27	296.95	0.35	2 SlimPulse	0	0	0
12121	90.34	1.09	7175.91	5104.68	5098.24	299.36	0.81	2 SlimPulse	0	0	0
12216	90.21	0.29	7175.45	5199.67	5193.23	300.51	0.85	2 SlimPulse	0	0	0
12272	90.07	0.04	7175.32	5255.65	5249.23	300.67	0.51	2 SlimPulse	0	0	0
12347	90.07	0.04	7175.23	5330.62	5324.23	300.73	0.01	2 Other	9	0	7