

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



January 18, 2016

Cimarex
600 N MARIENFELD STREET SUITE 600
MIDLAND, TX 79701

NM OIL CONSERVATION
ARTESIA DISTRICT
JUN 27 2016

RECEIVED

Re:

CLIENT: Cimarex
WELL: Gadwall 18 Federal 4H
FIELD: 2nd Bone Spring
RIG: H&P 381
COUNTY: Eddy
API NO: 30-015-43487
JOB NO: 16MLD0576

0
N 32.13684 W 104.23598

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>
Ben Moore MWD	Gadwall 18 Federal 4H Original Hole	6731.00 Ft to 11652.00 Ft	January 7, 2016 to January 9, 2016	SlimPulse

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

Qun Xu
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

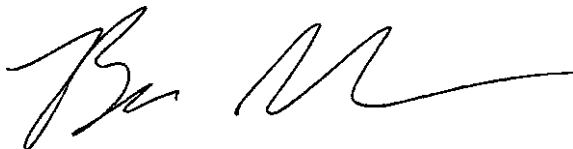
PATHFINDER
A Schlumberger Company

Well Reference:

0
N 32.13684 W 104.23598

I, Ben Moore certify that; I am employed by PathFinder, a division of Schlumberger Technology Corporation; that I did on the day(s) of January 07, 2016 through January 09, 2016, conduct or supervise the taking of the SlimPulse surveys from a depth of 6731.00 feet to a depth of 11652.00 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 for the Gadwall 18 Federal 4H Well (Original Hole) API No. 30-015-43487 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.

By
Ben Moore
MWD



Subscribed and Sworn to before me this 18th day of January (month) 2016 (yr)

My Commission expires:

September 5, 2016

Michelle Ellwood
Notary Public

Midland, TX
(County State)



NM OIL CONSERVATION
ARTESIA DISTRICT

JUN 27 2016

RECEIVED

Schlumberger Survey Report

Sunday January 10 2016 12:00 Report by MaxWell

General Information

Client : Cimarex Energy Co. Well name : Gadwall 18 Federal Com #4H
Field Eastern Zo US Feet

Survey Calculation Methods

Method for positions : Minimum Curvature Method

Job Location & Elevation

Latitude : 32.1368 degrees Longitude : -104.2360degrees
Permanent Datum : MSL Log Measured From : DF
Elevation of LMF from MSL : 3228.80 ft Elevation of TIP from MSL: 3228.80 ft
Depth Source :

Vertical Section Origin

Latitude (+N/S-) : 0.00 ft Departure (+E/W-) : 0.00 ft
Target Azimuth : 179.4400 degrees

MWD Survey Reference Criteria

----Run1----

Geomag Model: : HDGM 2015 Calculation Date: : 06 Jan 2016
Location G : 998.82 mgn Tolerance G : 2.50 mgn
Location B : 48232.11 nT Tolerance B : 300.00 nT
Magnetic Dip : 59.90 degrees Tolerance Dip : 0.45 degrees

----Run2----

Geomag Model: : HDGM 2015 Calculation Date: : 08 Jan 2016
Location G : 998.82 mgn Tolerance G : 2.50 mgn
Location B : 48231.53 nT Tolerance B : 300.00 nT
Magnetic Dip : 59.90 degrees Tolerance Dip : 0.45 degrees

MWD Survey Azimuth Correction

----Run1----

Magnetic dec (+E/W-) : 7.6266 degrees
Grid convergence (+E/W-) : 0.0518 degrees
GTotal az corr (+E/W-) : 7.5748 degrees

----Run2----

Magnetic dec (+E/W-) : 7.6260 degrees
Grid convergence (+E/W-) : 0.0518 degrees
GTotal az corr (+E/W-) : 7.5742 degrees

Survey Quality Index Description

2 : Long Survey failed mag criteria 9 : Manual
28 : Tie-In Point

-----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) /100ft)	V Sec (ft)	N/-S (ft)	E/-W (ft)	DLS (deg)	Run	Tool	QI	CI	ID
0	0	0	0	0	0	0	0	0 -	Other	28	0	0
180	0.4	215.69	180	0.51	-0.51	-0.37	0.22	1	EPulse	9	0	0
205	0.4	258.31	205	0.59	-0.6	-0.5	1.16	1	EPulse	9	0	0
301	0.62	284.11	300.99	0.53	-0.54	-1.33	0.33	1	EPulse	9	0	0
362	0.62	256.43	361.99	0.52	-0.54	-1.98	0.49	1	EPulse	9	0	0
422	0.79	277.12	421.99	0.54	-0.56	-2.7	0.51	1	EPulse	9	0	0
475	0.88	251.75	474.98	0.61	-0.64	-3.45	0.71	1	EPulse	9	0	0
569	0.88	272.14	568.97	0.8	-0.84	-4.86	0.33	1	EPulse	9	0	0
660	0.7	239.45	659.96	1.04	-1.1	-6.03	0.52	1	EPulse	9	0	0
750	0.88	242.97	749.95	1.62	-1.69	-7.12	0.21	1	EPulse	9	0	0
841	1.1	241.34	840.94	2.35	-2.43	-8.51	0.24	1	EPulse	9	0	0
931	1.41	234.75	930.92	3.38	-3.48	-10.18	0.38	1	EPulse	9	0	0
1021	1.49	232.07	1020.89	4.72	-4.84	-12	0.12	1	EPulse	9	0	0
1111	1.58	240.77	1110.86	6.03	-6.17	-14.01	0.28	1	EPulse	9	0	0
1202	1.32	227.76	1201.83	7.33	-7.48	-15.88	0.46	1	EPulse	9	0	0
1292	1.01	205.57	1291.81	8.73	-8.9	-16.99	0.6	1	EPulse	9	0	0
1382	1.32	200.95	1381.79	10.41	-10.58	-17.7	0.36	1	EPulse	9	0	0
1477	1.58	153.93	1476.76	12.61	-12.78	-17.52	1.24	1	EPulse	9	0	0
1572	2.5	128.36	1571.7	15.09	-15.24	-15.32	1.34	1	EPulse	9	0	0
1666	3.91	120.45	1665.56	18.03	-18.14	-10.95	1.57	1	EPulse	9	0	0
1761	3.12	115.83	1760.38	20.85	-20.91	-5.83	0.88	1	EPulse	9	0	0
1821	2.02	112.93	1820.31	21.99	-22.03	-3.38	1.85	1	EPulse	9	0	0
1957	2.11	125.46	1956.23	24.42	-24.42	0.86	0.34	1	EPulse	9	0	0
2051	2.11	116.41	2050.16	26.22	-26.19	3.82	0.35	1	EPulse	9	0	0
2146	2.11	112.36	2145.1	27.7	-27.63	7.01	0.16	1	EPulse	9	0	0
2241	2.2	115.04	2240.03	29.17	-29.07	10.28	0.14	1	EPulse	9	0	0
2336	1.89	121.24	2334.97	30.78	-30.65	13.27	0.4	1	EPulse	9	0	0
2430	1.58	110.95	2428.93	32.07	-31.92	15.8	0.47	1	EPulse	9	0	0
2525	1.71	125.46	2523.89	33.39	-33.21	18.18	0.46	1	EPulse	9	0	0
2619	1.49	112.84	2617.85	34.7	-34.5	20.45	0.44	1	EPulse	9	0	0
2714	1.32	116.84	2712.82	35.69	-35.47	22.56	0.21	1	EPulse	9	0	0
2809	1.41	133.45	2807.8	37.01	-36.77	24.39	0.43	1	EPulse	9	0	0
2903	1.5	116.84	2901.77	38.38	-38.12	26.33	0.46	1	EPulse	9	0	0
2998	1.58	127.96	2996.73	39.76	-39.49	28.47	0.33	1	EPulse	9	0	0
3093	1.32	131.04	3091.7	41.31	-41.01	30.33	0.29	1	EPulse	9	0	0
3188	1.32	131.34	3186.68	42.76	-42.45	31.97	0.01	1	EPulse	9	0	0
3282	1.19	122.25	3280.66	44.01	-43.69	33.61	0.25	1	EPulse	9	0	0
3377	1.32	138.24	3375.63	45.37	-45.03	35.17	0.39	1	EPulse	9	0	0
3471	1.01	120.45	3469.61	46.61	-46.26	36.61	0.5	1	EPulse	9	0	0
3566	1.19	141.23	3564.6	47.82	-47.45	37.95	0.46	1	EPulse	9	0	0
3661	1.1	125.63	3659.58	49.13	-48.75	39.31	0.34	1	EPulse	9	0	0
3756	1.58	129.94	3754.55	50.52	-50.13	41.05	0.52	1	EPulse	9	0	0
3851	1.58	133.37	3849.52	52.28	-51.87	43.01	0.1	1	EPulse	9	0	0
3946	0.7	128.53	3944.5	53.56	-53.13	44.42	0.93	1	EPulse	9	0	0
4040	0.09	119.17	4038.49	53.96	-53.52	44.93	0.65	1	EPulse	9	0	0
4135	0.31	132.35	4133.49	54.17	-53.73	45.18	0.24	1	EPulse	9	0	0
4230	0.4	136.13	4228.49	54.58	-54.14	45.6	0.1	1	EPulse	9	0	0
4325	0.31	137.45	4323.49	55.02	-54.57	46.01	0.1	1	EPulse	9	0	0

4420	0.4	227.23	4418.49	55.43	-54.98	45.94	0.53	1 EPulse	9	0	0
4514	0.4	195.46	4512.49	55.97	-55.52	45.61	0.23	1 EPulse	9	0	0
4609	0.7	222.44	4607.48	56.71	-56.27	45.13	0.41	1 EPulse	9	0	0
4704	0.7	219.76	4702.47	57.58	-57.15	44.37	0.03	1 EPulse	9	0	0
4798	0.62	170.06	4796.47	58.52	-58.09	44.09	0.6	1 EPulse	9	0	0
4893	0.62	204.64	4891.46	59.49	-59.06	43.96	0.39	1 EPulse	9	0	0
4988	1.01	183.77	4986.45	60.79	-60.36	43.69	0.51	1 EPulse	9	0	0
5083	1.19	188.74	5081.44	62.6	-62.18	43.49	0.21	1 EPulse	9	0	0
5178	1.1	211.46	5176.42	64.34	-63.93	42.86	0.48	1 EPulse	9	0	0
5272	1.01	213.96	5270.4	65.79	-65.38	41.93	0.11	1 EPulse	9	0	0
5367	1.71	216.33	5365.38	67.61	-67.22	40.62	0.74	1 EPulse	9	0	0
5462	1.32	233.87	5460.34	69.38	-69.01	38.9	0.63	1 EPulse	9	0	0
5557	1.32	231.93	5555.32	70.69	-70.33	37.15	0.05	1 EPulse	9	0	0
5652	1.19	239.76	5650.29	71.84	-71.5	35.44	0.23	1 EPulse	9	0	0
5746	1.19	264.63	5744.27	72.41	-72.08	33.62	0.55	1 EPulse	9	0	0
5841	1.19	274.56	5839.25	72.4	-72.1	31.66	0.22	1 EPulse	9	0	0
5936	2.02	276.85	5934.22	72.1	-71.82	29.01	0.88	1 EPulse	9	0	0
6031	1.1	197.26	6029.19	72.75	-72.49	27.08	2.23	1 EPulse	9	0	0
6125	1.32	164.43	6123.17	74.65	-74.39	27.1	0.76	1 EPulse	9	0	0
6220	1.1	186.36	6218.15	76.62	-76.35	27.29	0.54	1 EPulse	9	0	0
6315	1.01	163.16	6313.13	78.33	-78.06	27.44	0.46	1 EPulse	9	0	0
6410	1.1	152.13	6408.12	79.94	-79.67	28.11	0.23	1 EPulse	9	0	0
6505	1.01	187.86	6503.1	81.58	-81.31	28.42	0.69	1 EPulse	9	0	0
6600	1.41	181.13	6598.08	83.57	-83.3	28.28	0.45	1 EPulse	9	0	0
6668	2.81	185.26	6666.03	86.07	-85.8	28.11	2.07	1 EPulse	9	0	0
6731	5.71	178.15	6728.85	90.74	-90.47	28.07	4.67	1 SlimPulse	2	0	0
6779	12.25	177.58	6776.24	98.23	-97.96	28.36	13.63	1 SlimPulse	2	0	0
6826	20.13	177.59	6821.34	111.32	-111.04	28.91	16.76	1 SlimPulse	2	0	0
6874	27.18	178.73	6865.28	130.56	-130.28	29.51	14.71	1 SlimPulse	2	0	0
6921	31.19	179.05	6906.3	153.47	-153.19	29.95	8.55	1 SlimPulse	2	0	0
6969	34.87	178.11	6946.54	179.62	-179.34	30.61	7.73	1 SlimPulse	2	0	0
7016	38.87	176.81	6984.13	207.8	-207.5	31.87	8.68	1 SlimPulse	2	0	0
7110	48.25	177.13	7052.17	272.45	-272.12	35.28	9.98	1 SlimPulse	2	0	0
7205	56.78	178.27	7109.93	347.73	-347.37	38.25	9.03	1 SlimPulse	2	0	0
7300	68.01	179.36	7153.88	431.78	-431.41	39.95	11.86	1 SlimPulse	2	0	0
7395	80.11	179.84	7179.92	522.95	-522.58	40.57	12.74	1 SlimPulse	2	0	0
7489	87.9	182.23	7189.73	616.32	-615.97	38.87	8.66	1 SlimPulse	2	0	0
7521	88.66	182.15	7190.69	648.27	-647.94	37.65	2.38	1 SlimPulse	2	0	0
7628	89.86	182.69	7192.07	755.12	-754.83	33.13	1.24	2 SlimPulse	2	0	0
7723	90.52	182.31	7191.75	849.98	-849.74	28.99	0.8	2 SlimPulse	2	0	0
7818	90.31	180.29	7191.07	944.92	-944.71	26.84	2.14	2 SlimPulse	2	0	0
7912	90.52	177.95	7190.39	1038.91	-1038.69	28.29	2.5	2 SlimPulse	2	0	0
8007	90.17	177.21	7189.82	1133.86	-1133.6	32.3	0.86	2 SlimPulse	2	0	0
8102	90.21	176.24	7189.51	1228.75	-1228.44	37.73	1.02	2 SlimPulse	2	0	0
8197	89.93	175.2	7189.39	1323.55	-1323.18	44.82	1.13	2 SlimPulse	2	0	0
8291	90.86	175.59	7188.75	1417.31	-1416.87	52.36	1.07	2 SlimPulse	2	0	0
8386	90.65	176.75	7187.49	1512.15	-1511.65	58.7	1.24	2 SlimPulse	2	0	0
8481	90.79	177.91	7186.29	1607.07	-1606.54	63.12	1.23	2 SlimPulse	2	0	0
8576	91.17	179.57	7184.67	1702.05	-1701.49	65.2	1.79	2 SlimPulse	2	0	0
8671	91.07	180.53	7182.81	1797.02	-1796.48	65.11	1.02	2 SlimPulse	2	0	0
8765	91.03	181.66	7181.09	1890.97	-1890.44	63.31	1.2	2 SlimPulse	2	0	0
8860	90.58	182.65	7179.75	1985.85	-1985.36	59.74	1.14	2 SlimPulse	2	0	0
8955	89.21	183.29	7179.92	2080.67	-2080.23	54.81	1.6	2 SlimPulse	2	0	0
9049	87.49	183.82	7182.63	2174.38	-2174.01	48.99	1.91	2 SlimPulse	2	0	0
9144	87.04	182.89	7187.16	2269.05	-2268.74	43.44	1.09	2 SlimPulse	2	0	0
9239	87.42	181.79	7191.76	2363.82	-2363.54	39.57	1.22	2 SlimPulse	2	0	0
9334	87.39	181.33	7196.06	2458.66	-2458.41	36.98	0.48	2 SlimPulse	2	0	0
9428	87.42	180.37	7200.32	2552.53	-2552.3	35.59	1.03	2 SlimPulse	2	0	0
9523	87.9	179.88	7204.2	2647.44	-2647.22	35.39	0.72	2 SlimPulse	2	0	0
9618	87.8	179.71	7207.77	2742.37	-2742.16	35.73	0.21	2 SlimPulse	2	0	0
9713	87.11	178.37	7211.99	2837.28	-2837.05	37.32	1.58	2 SlimPulse	2	0	0

9808	87.49	177.5	7216.46	2932.14	-2931.88	40.74	0.99	2 SlimPulse	2	0	0
9902	87.94	177.98	7220.22	3026.02	-3025.73	44.43	0.7	2 SlimPulse	2	0	0
9997	88.11	177.48	7223.5	3120.92	-3120.6	48.19	0.56	2 SlimPulse	2	0	0
10092	87.97	177.27	7226.75	3215.8	-3215.44	52.53	0.27	2 SlimPulse	2	0	0
10187	88.07	177.33	7230.02	3310.68	-3310.28	57	0.13	2 SlimPulse	2	0	0
10281	89.07	178.17	7232.36	3404.61	-3404.18	60.68	1.39	2 SlimPulse	2	0	0
10376	88.35	178.64	7234.5	3499.57	-3499.12	63.33	0.91	2 SlimPulse	2	0	0
10471	88.42	178.34	7237.18	3594.52	-3594.05	65.83	0.32	2 SlimPulse	2	0	0
10565	88.86	178.54	7239.41	3688.48	-3687.98	68.39	0.52	2 SlimPulse	2	0	0
10660	89.59	179.74	7240.69	3783.46	-3782.96	69.81	1.48	2 SlimPulse	2	0	0
10755	89.76	181.54	7241.24	3878.44	-3877.95	68.74	1.9	2 SlimPulse	2	0	0
10850	89.21	182.52	7242.09	3973.33	-3972.89	65.37	1.18	2 SlimPulse	2	0	0
10945	88.8	183.27	7243.75	4068.15	-4067.75	60.58	0.91	2 SlimPulse	2	0	0
11039	89.42	183.98	7245.21	4161.88	-4161.55	54.64	1	2 SlimPulse	2	0	0
11134	89.28	185.1	7246.3	4256.5	-4256.24	47.12	1.19	2 SlimPulse	2	0	0
11229	88.9	184.25	7247.81	4351.09	-4350.91	39.37	0.98	2 SlimPulse	2	0	0
11324	88.49	183.74	7249.97	4445.77	-4445.66	32.75	0.7	2 SlimPulse	2	0	0
11418	87.66	182.6	7253.13	4539.51	-4539.46	27.56	1.5	2 SlimPulse	2	0	0
11513	87.45	181.63	7257.18	4634.32	-4634.31	24.06	1.04	2 SlimPulse	2	0	0
11608	87.45	180.74	7261.4	4729.18	-4729.19	22.09	0.94	2 SlimPulse	2	0	0
11652	87.87	180.18	7263.2	4773.14	-4773.15	21.74	1.59	2 SlimPulse	2	0	0
11719	87.87	180.18	7265.69	4840.09	-4840.11	21.53	0.01	2 Other	9	0	7

Cimarex Gadwall 18 Federal Com #4H MWD Off to Update Survey Report

(Non-Def Survey)

Report Date: January 09, 2016 - 05:53 AM
 Client: Cimarex Energy Co
 Field: Bonespring
 Structure / Slot: Cimarex Gadwall 18 Federal Com #4H / Cimarex Gadwall 18 Federal
 Well: Gadwall 18 Federal Com #4H
 Borehole: Original Borehole
 UWI / API#: Unknown / 30-015-43487
 Survey Name: Cimarex Gadwall 18 Federal Com #4H MWD Off to Update
 Survey Date: January 01, 2016
 Tort / AHD / DDI / ERD Ratio: 164.293 * / 4902.878 ft / 6.114 / 0.675
 Coordinate Reference System: NAD83 New Mexico State Plane, Eastern Zone, US Feet
 Location Lat / Long: N 32° 8' 12.63845" W 104° 14' 9.53428"
 Location Grid N/E Y/X: N 413533.170 rUS, E 571470.430 rUS
 CRS Grid Convergence Angle: 0.0518 *
 Grid Scale Factor: 0.99991013
 Version / Patch: 2.8.572.0

Survey / DLS Computation: Minimum Curvature / Lubinski
 Vertical Section Azimuth: 178.442 * (Grid North)
 Vertical Section Origin: 0.000 ft, 0.000 ft
 TVD Reference Datum: RKB
 TVD Reference Elevation: 3228.500 ft above MSL
 Seabed / Ground Elevation: 3203.800 ft above MSL
 Magnetic Declination: 7.561 *
 Total Gravity Field Strength: 998.4437 mgn (9.80665 Based)
 Gravity Model: GARM
 Total Magnetic Field Strength: 48023.566 nT
 Magnetic Dip Angle: 59.909 *
 Declination Date: January 01, 2016
 Magnetic Declination Model: HDGM 2015
 North Reference: Grd North
 Grid Convergence Used: 0.0518 *
 Total Corr Mag North->Grid North: 7.5092 *
 Local Coord Referenced To: Structure Reference Point

NM OIL CONSERVATION
 ARTESIA DISTRICT

JUN 27 2016

RECEIVED

Comments	MD (ft)	Incl (°)	Azim Grid (°)	TVD (ft)	VSEC (ft)	NS (ft)	EW (ft)	DLS (°/100ft)	TF (°)	BR (°/100ft)	TR (°/100ft)	Closure (ft)	Closure Azimuth (°)
SHL Cimarex Gadwall 18 Federal 4H [611' FWL, 330' FNL]	0.00	0.00	171.00	0.00	0.00	0.00	0.00	N/A	215.69M	N/A	N/A	0.00	0.00
Begin Extreme MWD Surveys	180.00	0.43	215.69	180.00	0.51	-0.51	-0.37	0.22	258.31M	0.22	0.00	0.63	215.69
	205.00	0.40	258.31	205.00	0.59	-0.80	-0.50	1.16	284.11M	0.00	170.45	0.78	220.02
	301.00	0.62	284.11	300.99	0.53	-0.54	-1.33	0.33	256.43M	0.23	26.85	1.44	247.97
	362.00	0.62	256.43	361.99	0.52	-0.54	-1.98	0.49	277.12M	0.00	-45.35	2.05	254.79
	422.00	0.79	277.12	421.99	0.54	-0.56	-2.70	0.51	251.75M	0.28	34.45	2.76	258.25
	475.00	0.88	251.75	474.98	0.61	-0.64	-3.45	0.71	272.14M	0.17	-47.87	3.51	259.43
	569.00	0.88	272.14	568.97	0.80	-0.84	-4.86	0.33	239.45M	0.00	21.69	4.93	260.15
	660.00	0.70	239.45	659.96	1.04	-1.10	-6.03	0.62	242.97M	-0.20	-35.92	6.13	259.87
	750.00	0.88	242.97	749.95	1.62	-1.69	-7.12	0.21	241.34M	0.20	3.91	7.32	256.83
	841.00	1.10	241.34	840.94	2.35	-2.43	-8.51	0.24	234.75M	0.24	-1.79	8.85	254.07
	931.00	1.41	234.75	930.92	3.38	-3.48	-10.18	0.38	232.07M	0.34	-7.32	10.75	251.10
	1021.00	1.49	232.07	1020.89	4.72	-4.84	-12.00	0.12	240.77M	0.09	-2.88	12.94	248.03
	1111.00	1.56	240.77	1110.86	6.03	-6.17	-14.01	0.28	227.76M	0.10	9.67	15.31	246.24
	1202.00	1.32	227.76	1201.83	7.33	-7.48	-15.88	0.46	205.57M	-0.29	-14.30	17.55	244.76
	1292.00	1.01	205.57	1291.81	8.73	-8.90	-16.99	0.60	200.95M	-0.34	-24.66	19.18	242.36
	1382.00	1.32	200.95	1381.79	10.41	-10.58	-17.70	0.36	153.93M	0.34	-5.13	20.62	239.13
	1477.00	1.58	153.93	1476.76	12.61	-12.78	-17.52	1.24	128.36M	0.27	-49.49	21.68	233.89
	1572.00	2.50	128.36	1571.70	15.09	-15.24	-15.32	1.34	120.45M	0.97	-26.92	21.61	225.14
	1666.00	3.91	120.45	1665.56	18.03	-18.14	-10.95	1.57	115.83M	1.50	-8.41	21.18	211.11
	1761.00	3.12	115.83	1760.38	20.85	-20.91	-5.83	0.88	112.93M	-0.83	-4.86	21.70	195.57
	1821.00	2.02	112.93	1820.31	21.99	-22.03	-3.38	1.85	125.46M	-1.83	-4.83	22.29	188.73
	1957.00	2.11	125.46	1956.23	24.42	-24.42	0.86	0.34	116.41M	0.07	9.21	24.43	177.97
	2051.00	2.11	116.41	2050.16	26.22	-26.19	3.82	0.35	112.36M	0.00	-9.63	26.47	171.70
	2146.00	2.11	112.36	2145.10	27.70	-27.63	7.01	0.16	115.04M	0.00	-4.26	28.51	165.77
	2241.00	2.20	115.04	2240.03	29.17	-29.07	10.28	0.14	121.24M	0.09	2.82	30.83	160.53
	2336.00	1.89	121.24	2334.97	30.78	-30.65	13.27	0.40	110.95M	-0.33	6.53	33.40	156.60
	2430.00	1.58	110.95	2428.93	32.07	-31.92	15.80	0.47	125.46M	-0.33	-10.95	35.62	153.66
	2525.00	1.71	125.46	2523.89	33.39	-33.21	18.18	0.46	112.84M	0.14	15.27	37.85	151.30
	2619.00	1.49	112.84	2617.85	34.70	-34.50	20.45	0.44	116.84M	-0.23	-13.43	40.10	149.34
	2714.00	1.32	116.84	2712.82	35.69	-35.47	22.56	0.21	133.45M	-0.18	4.21	42.04	147.54
	2809.00	1.41	133.45	2807.80	37.01	-36.77	24.39	0.43	116.84M	0.09	17.48	44.12	146.44
	2903.00	1.50	116.84	2901.77	38.38	-38.12	26.33	0.46	127.96M	0.10	-17.67	46.33	145.37
	2998.00	1.58	127.96	2996.73	39.76	-39.49	28.47	0.33	131.04M	0.08	11.71	48.68	144.21
	3093.00	1.32	131.04	3091.70	41.31	-41.01	30.33	0.29	131.34M	-0.27	3.24	51.01	143.52
	3188.00	1.32	131.34	3186.68	42.76	-42.45	31.97	0.01	122.25M	0.00	0.32	53.15	143.02
	3282.00	1.19	122.25	3280.66	44.02	-43.69	33.61	0.25	138.24M	-0.14	-9.67	55.12	142.43
	3377.00	1.32	138.24	3375.63	45.37	-45.03	35.17	0.39	120.45M	0.14	16.83	57.14	142.01
	3471.00	1.01	120.45	3469.61	46.61	-46.26	36.61	0.50	141.23M	-0.33	-18.93	58.99	141.64
	3566.00	1.19	141.23	3564.60	47.82	-47.45	37.95	0.46	125.63M	0.19	21.87	60.76	141.35
	3661.00	1.10	125.63	3659.58	49.13	-48.75	39.31	0.34	129.94M	-0.09	-16.42	62.63	141.12
	3756.00	1.58	129.94	3754.55	50.52	-50.13	41.05	0.52	133.37M	0.51	4.54	64.79	140.68
	3851.00	1.58	133.37	3849.52	52.28	-51.87	43.01	0.10	128.53M	0.00	3.61	67.38	140.33
	3946.00	0.70	128.53	3944.50	53.56	-53.13	44.42	0.93	119.17M	-0.93	-5.09	69.25	140.10
	4040.00	0.09	119.17	4038.49	53.96	-53.52	44.93	0.65	132.35M	-0.65	-9.96	69.88	139.99
	4135.00	0.31	132.35	4133.49	54.17	-53.73	45.18	0.24	136.13M	0.23	13.87	70.20	139.94
	4230.00	0.40	136.13	4228.49	54.58	-54.14	45.60	0.10	137.45M	0.09	3.98	70.79	139.89
	4325.00	0.31	137.45	4323.49	55.02	-54.57	46.01	0.10	227.23M	-0.09	1.39	71.38	139.87
	4420.00	0.40	227.23	4418.49	55.43	-54.98	45.94	0.53	185.46M	0.09	94.51	71.85	140.12
	4514.00	0.40	195.46	4512.49	55.97	-55.52	45.61	0.23	222.44M	0.00	-33.80	71.86	140.60
	4609.00	0.70	222.44	4607.48	56.71	-56.27	45.13	0.41	219.76M	0.32	28.40	72.13	141.27
	4704.00	0.70	219.76	4702.47	57.58	-57.15	44.37	0.03	170.06M	0.00	-2.82	72.35	142.17
	4798.00	0.62	170.06	4796.47	58.52	-58.09	44.09	0.60	204.64M	-0.09	-52.87	72.92	142.80
	4893.00	0.62	204.64	4891.46	59.49	-59.06	43.96	0.39	183.77M	0.00	36.40	73.63	143.34
	4988.00	1.01	183.77	4986.45	60.79	-60.36	43.69	0.51	168.74M	0.41	-21.97	74.52	144.10
	5083.00	1.19	188.74	5081.44	62.60	-62.18	43.49	0.21	211.46M	0.19	5.23	75.87	145.03
	5178.00	1.10	211.46	5176.42	64.34	-63.93	42.86	0.48	213.96M	-0.09	23.92	76.97	146.16
	5272.00	1.01	213.96	5270.40	65.79	-65.38	41.93	0.11	216.33M	-0.10	2.66	77.87	147.33
	5367.00	1.71	216.33	5365.38	67.61	-67.22	40.62	0.74	233.87M	0.74	2.49	78.54	148.86
	5462.00	1.32	233.87	5460.34	69.38	-69.01	38.90	0.63	231.93M	-0.41	18.46	79.22	150.59
	5557.00	1.32	231.93	5555.32	70.69	-70.33	37.15	0.05	239.76M	0.00	-2.04	79.54	152.15
	5652.00	1.19	239.76	5650.29	71.84	-71.50	35.44	0.23	264.63M	-0.14	8.24	79.80	153.63
	5746.00	1.19	264.63	5744.27	72.41	-72.08	33.62	0.55	274.55M	0.00	26.46	79.94	154.99
	5841.00	1.19	274.55	5839.25	72.40	-72.10	31.68	0.22	276.85M	0.00	10.45	78.74	156.29
	5936.00	2.02	276.85	5934.22	72.10	-71.82	29.01	0.88	197.26M	0.87	2.41	77.46	158.00

Comments	MD (ft)	Incl (°)	Azim Grid (°)	TVD (ft)	VSEC (ft)	NS (ft)	EW (ft)	DLS (°/100ft)	TF (°)	BR (°/100ft)	TR (°/100ft)	Closure (ft)	Closure Azimuth (°)
	6031.00	1.10	197.26	6028.19	72.75	-72.49	27.08	2.23	164.43M	-0.97	-83.78	77.38	159.52
	6125.00	1.32	164.43	6123.17	74.65	-74.39	27.10	0.76	166.36M	0.23	-34.93	79.18	159.98
	6220.00	1.10	186.36	6218.15	76.62	-76.35	27.29	0.54	163.16M	-0.23	23.08	81.09	160.33
	6315.00	1.01	163.16	6313.13	78.33	-78.06	27.44	0.46	152.13M	-0.09	-24.42	82.74	160.64
	6410.00	1.10	152.13	6408.12	79.94	-79.67	28.11	0.23	187.86M	0.09	-11.61	84.48	160.57
	6505.00	1.01	187.86	6503.10	81.58	-81.31	28.42	0.68	181.13M	-0.09	37.61	86.13	160.74
	6600.00	1.41	181.13	6598.08	83.58	-83.30	28.28	0.45	185.26M	0.42	-7.08	87.97	161.25
	6688.00	2.81	185.26	6686.03	86.07	-85.80	28.11	2.07	178.15M	2.06	6.07	90.29	161.86
	6731.00	5.71	178.15	6728.85	90.74	-90.47	28.07	4.67	177.58M	4.60	-11.29	94.73	162.76
	6779.00	12.25	177.58	6776.24	98.23	-97.95	28.36	13.63	HS	13.63	-1.19	101.98	163.85
	6826.00	20.13	177.59	6821.34	111.31	-111.04	28.91	16.77	4.24R	16.77	0.02	114.74	165.40
	6874.00	27.18	178.73	6865.28	130.55	-130.27	29.50	14.72	2.37R	14.69	2.38	133.57	167.24
	6921.00	31.19	179.05	6906.30	153.47	-153.18	29.94	8.54	8.32L	8.53	0.68	156.08	168.94
	6969.00	34.87	178.11	6946.54	179.62	-179.33	30.80	7.74	11.56L	7.67	-1.96	181.93	170.32
	7016.00	38.87	176.81	6984.13	207.80	-207.50	31.87	8.67	1.46R	8.51	-2.77	209.93	171.27
	7110.00	48.25	177.13	7052.17	272.44	-272.11	35.27	9.98	6.41R	9.98	0.34	274.39	172.61
	7205.00	56.78	178.27	7109.93	347.72	-347.37	38.25	9.03	5.18R	8.98	1.20	349.46	173.72
	7300.00	68.31	179.36	7153.88	431.77	-431.40	38.95	11.86	2.25R	11.82	1.15	433.24	174.71
	7395.00	80.11	179.84	7179.93	522.94	-522.57	40.57	12.75	17.11R	12.74	0.51	524.14	175.56
	7489.00	87.30	182.23	7189.74	616.31	-615.96	38.87	8.66	6.01L	8.29	2.54	617.19	176.39
	7521.00	88.56	182.15	7190.70	648.26	-647.93	37.65	2.39	24.23R	2.38	-0.25	649.02	176.67
	7628.00	89.96	182.69	7192.08	755.11	-754.82	33.13	1.23	29.93L	1.12	0.50	755.55	177.49
	7723.00	90.52	182.31	7191.76	849.97	-849.73	28.99	0.80	95.93L	0.69	-0.40	850.22	178.05
	7818.00	90.31	180.29	7191.08	944.91	-944.70	26.83	2.14	84.86L	-0.22	-2.13	945.08	178.37
	7912.00	90.52	177.95	7190.40	1038.90	-1038.68	28.28	2.50	115.31L	0.22	-2.49	1039.06	178.44
	8007.00	90.17	177.21	7189.82	1133.85	-1133.59	32.29	0.86	87.64L	-0.37	-0.78	1134.05	178.37
	8102.00	90.21	176.24	7189.51	1228.74	-1228.43	37.72	1.02	105.07L	0.04	-1.02	1229.01	178.24
	8197.00	89.93	175.20	7188.39	1323.54	-1323.16	44.81	1.13	22.75R	-0.29	-1.09	1323.92	178.06
	8291.00	90.96	175.59	7188.74	1417.30	-1416.86	52.35	1.07	100.25R	0.99	0.41	1417.82	177.88
	8386.00	90.85	176.75	7187.49	1512.14	-1511.64	58.70	1.24	83.11R	-0.22	1.22	1512.78	177.78
	8481.00	90.79	177.91	7186.30	1607.06	-1606.52	63.12	1.23	77.09R	0.15	1.22	1607.76	177.75
	8576.00	91.17	179.57	7184.57	1702.04	-1701.46	65.21	1.79	95.94R	0.40	1.75	1702.73	177.81
	8671.00	91.07	180.53	7182.82	1797.01	-1796.46	65.13	1.02	92.02R	-0.11	1.01	1797.64	177.82
	8765.00	91.03	181.66	7181.09	1890.96	-1890.43	63.33	1.20	114.44R	-0.04	1.20	1891.49	178.08
	8860.00	90.58	182.65	7179.76	1985.84	-1985.35	59.76	1.14	154.96R	-0.47	1.04	1986.25	178.28
	8955.00	89.21	183.29	7179.93	2080.66	-2080.22	54.84	1.59	162.89R	-1.44	0.67	2080.94	178.49
	9049.00	87.49	183.82	7182.64	2174.37	-2174.00	49.01	1.91	115.87L	-1.83	0.56	2174.55	178.71
	9144.00	87.04	182.89	7187.17	2269.04	-2268.73	43.46	1.09	70.95L	-0.47	-0.98	2269.14	178.90
	9239.00	87.42	181.79	7191.76	2363.81	-2363.53	39.58	1.22	93.75L	0.40	-1.16	2363.86	179.04
	9334.00	87.39	181.33	7196.07	2458.64	-2458.40	37.00	0.48	88.23L	-0.03	-0.48	2458.68	179.14
	9428.00	87.42	180.37	7200.32	2552.52	-2552.29	35.61	1.02	45.58L	0.03	-1.02	2552.54	179.20
	9523.00	87.90	179.88	7204.20	2647.43	-2647.21	35.40	0.72	120.49L	0.51	-0.52	2647.45	179.23
	9618.00	87.80	179.71	7207.76	2742.36	-2742.15	35.74	0.21	117.3L	-0.11	-0.18	2742.38	179.25
	9713.00	87.11	178.37	7211.98	2837.28	-2837.04	37.33	1.59	66.4L	-0.73	-1.41	2837.28	179.25
	9808.00	87.49	177.50	7216.46	2932.13	-2931.87	40.75	1.00	46.83R	0.40	-0.92	2932.15	179.20
	9902.00	87.94	177.98	7220.21	3026.01	-3025.72	44.45	0.70	71.22L	0.48	0.51	3026.05	179.16
	9997.00	88.11	177.48	7223.48	3120.91	-3120.59	48.21	0.66	123.71L	0.18	-0.53	3120.96	179.11
	10092.00	87.97	177.27	7226.73	3215.79	-3215.43	52.56	0.27	30.95R	-0.15	-0.22	3215.86	179.06
	10187.00	88.07	177.33	7230.01	3310.67	-3310.27	57.04	0.12	40.03R	0.11	0.06	3310.76	179.01
	10281.00	89.07	176.17	7232.36	3404.60	-3404.17	60.72	1.39	146.88R	1.06	0.89	3404.71	178.98
	10376.00	88.35	178.64	7234.50	3499.56	-3499.10	63.37	0.91	76.87L	-0.76	0.49	3499.68	178.96
	10471.00	88.42	178.34	7237.17	3594.51	-3594.03	65.87	0.32	24.44R	0.07	-0.32	3594.64	178.95
	10565.00	88.86	178.54	7239.40	3688.46	-3687.97	68.43	0.51	58.89R	0.47	0.21	3688.61	178.94
	10660.00	89.59	179.74	7240.69	3783.45	-3782.95	69.85	1.48	84.61R	0.77	1.26	3783.60	178.94
	10755.00	89.76	181.54	7241.23	3878.43	-3877.94	68.79	1.90	118.31R	0.18	1.69	3878.55	178.98
	10850.00	89.21	182.52	7242.08	3973.32	-3972.87	65.43	1.18	118.67R	-0.58	1.03	3973.41	179.06
	10945.00	88.80	183.27	7243.73	4068.14	-4067.74	60.63	0.90	48.87R	-0.43	0.79	4068.19	179.15
	11039.00	89.42	183.98	7245.19	4161.87	-4161.54	54.69	1.00	97.13R	0.66	0.76	4161.90	179.25
	11134.00	89.28	185.10	7246.27	4256.49	-4256.23	47.17	1.19	114.1L	-0.15	1.18	4256.49	179.37
	11229.00	88.90	184.25	7247.78	4351.08	-4350.90	39.43	0.98	128.81L	-0.40	-0.89	4351.08	179.48
	11324.00	88.49	183.74	7249.94	4445.76	-4445.65	32.81	0.69	126.09L	-0.43	-0.54	4445.77	179.58
	11418.00	87.66	182.60	7253.10	4539.50	-4539.45	27.62	1.50	102.25L	-0.88	-1.21	4539.53	179.65
	11513.00	87.45	181.63	7257.15	4634.31	-4634.30	24.11	1.04	90L	-0.22	-1.02	4634.36	179.70
	11608.00	87.45	180.74	7261.38	4729.17	-4729.18	22.15	0.94	53.12L	0.00	-0.94	4729.23	179.73
	11652.00	87.87	180.18	7263.18	4773.13	-4773.14	21.80	1.59	HS	0.95	-1.27	4773.19	179.74
Projection to bit	11719.00	87.87	180.18	7265.67	4840.08	-4840.09	21.59	0.00		0.00	0.00	4840.14	179.74

Survey Type: Non-Def Survey

Survey Error Model: ISCWSA Rev 0 *** 3-D 95.000% Confidence 2.7955 sigma
Survey Program:

Description	Part	MD From (ft)	MD To (ft)	EOU Freq (ft)	Hole Size (in)	Casing Diameter (in)	Survey Tool Type	Borehole / Survey
	1	0.000	25.000	1/98.425	30.000	30.000	SLB_MWD-STD-Depth Only	Original Borehole / Cimarex Gadwall 18 Federal Com #4H
	1	25.000	25.000	Act Stns	30.000	30.000	SLB_MWD-STD-Depth Only	Original Borehole / Cimarex Gadwall 18 Federal Com #4H
	1	25.000	11719.000	Act Stns	30.000	30.000	SLB_MWD-STD	Original Borehole / Cimarex Gadwall 18 Federal Com #4H