

DISTRICT I
1626 N. French Dr., Hobbs, N.M. 88240
Phone: (878) 383-6161 Fax: (878) 383-0720

DISTRICT II
811 S. First St., Artesia, N.M. 88210
Phone: (878) 748-1883 Fax: (878) 748-9720

DISTRICT III
1000 Rio Brancos 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) 478-3469 Fax: (505) 478-3468

State of New Mexico
Energy, Minerals & Natural Resources Department

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

RECEIVED

Form C-102
Revised August 1, 2011
Submit one copy to appropriate
District Office
MAR 05 2014

Formation Field Office
Bureau of Land Management

"AS DRILLED PLAT" AMENDED REPORT

WELL LOCATION AND ACREAGE DEDICATION PLAT

¹ API Number 30-043-21182	² Pool Code 97989	³ Pool Name WC 22N5W6; GALLUP (O)
⁴ Property Code 311963	⁵ Property Name LOGOS	⁶ Well Number 601H
⁷ OGRID No. 289408	⁸ Operator Name LOGOS OPERATING, LLC	⁹ Elevation 6891

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
D	5	22-N	5-W	4	440	NORTH	560	WEST	SANDOVAL

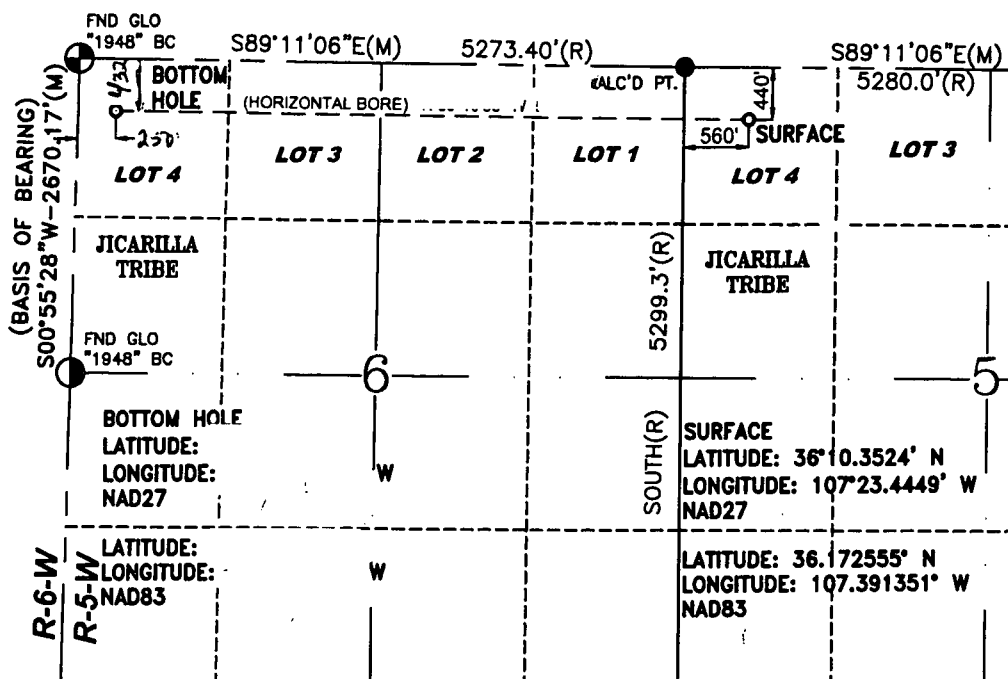
¹¹ Bottom Hole Location If Different From Surface

UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
D	6	22-N	5-W	4	433'	NORTH	250'	WEST	SANDOVAL

¹² Dedicated Acres 161 acres N1/2, N1/2 Sec 6	¹³ Joint or Infill	¹⁴ Consolidation Code	¹⁵ Order No. RCVD MAR 6 '14 OIL CONS. DIV. N5L-6990
---	-------------------------------	----------------------------------	---

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 DIST. 3

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 a working interest, or to a voluntary pooling agreement or a compulsory pooling order heretofore entered by the division.

Tamara Sessions 3-4-14
Signature Date
Tamara Sessions
Printed Name
tsessions@logosresourcesllc.com
E-mail Address

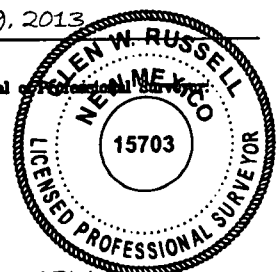
18 SURVEYOR CERTIFICATION

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, 2013

Date of Survey

Signature and Seal of Professional Surveyor



GLEN W. RUSSELL

Certificate Number

15703

BASIS OF BEARING:

BETWEEN FOUND MONUMENTS AT THE NORTHWEST CORNER AND THE WEST QUARTER CORNER OF SECTION 6, TOWNSHIP 22 NORTH, RANGE 5 WEST, N.M.P.M. SANDOVAL COUNTY, NEW MEXICO.

LINE BEARS: S 00°55'28" W A DISTANCE OF 2670.17 FEET AS MEASURED BY G.P.S. LOCAL GRID NAD83.

CONFIDENTIAL

RCVD MAR 5 '14
OIL CONS. DIV.
DIST. 3

WELL NAME AND NUMBER: LOGOS 601H

LOCATION: SEC. 6, TOWNSHIP 22N, RANGE 5W; SANDOVAL SAN JUAN COUNTY, NEW MEXICO
(New Mexico give U, S, T, & R)

OPERATOR: LOGOS RESOURCES

DRILLING CONTRACTOR: AZTEC WELL SERVICING COMPANY INC.

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

PAGE 1

Degrees @ Depth

0.4 ° @	562
.4 ° @	623
0.4 ° @	685
0.8 ° @	745
.8 ° @	806
.8 ° @	867
.6 ° @	928
0.7 ° @	989
.6 ° @	1050
.5 ° @	1112
.7 ° @	1172
.1 ° @	1233
.4 ° @	1294
.4 ° @	1356
.3 ° @	1417
.2 ° @	1478
.5 ° @	1540
.7 ° @	1601
.8 ° @	1662
0.8 ° @	1723
0.7 ° @	1784
0.8 ° @	1847
0.9 ° @	1911
0.8 ° @	1974
0.7 ° @	2037
0.9 ° @	2100
0.9 ° @	2164
0.9 ° @	2227
0.5 ° @	2290

Degrees @ Depth

0.5 ° @	2353
0.7 ° @	2417
0.8 ° @	2480
0.8 ° @	2543
0.5 ° @	2606
0.8 ° @	2669
0.4 ° @	2732
0.1 ° @	2795
0.1 ° @	2859
0.3 ° @	2922
0.3 ° @	2985
0.4 ° @	3048
0.6 ° @	3111
0.4 ° @	3175
0.4 ° @	3238
0.4 ° @	3301
0.3 ° @	3365
0.5 ° @	3428
0.4 ° @	3491
0.2 ° @	3554
0.2 ° @	3617
0.2 ° @	3680
0.3 ° @	3743
0.2 ° @	3807
0.3 ° @	3870
0.1 ° @	3933
0.4 ° @	3997
0.2 ° @	4060
0.4 ° @	4123

[illegible]

BY

5-1-2016

Notary Public
San Juan County, New Mexico



145020

March 3, 2014

Logos Resources, LLC.

Jay Paul McWilliams

4001 N. Butler Avenue

Farmington, NM 87401

RCVD MAR 5 '14

OIL CONS. DIV.

DIST. 3

CATHEDRAL ENERGY SERVICES
The Trinity Building
Suite 300, 1801 Broadway Street
Denver, Colorado, United States
80202

303.825.1001 Office
877.825.1002 Toll-Free
303.825.1991 Fax

CathedralEnergyServices.com

Drilling + Completions

Re: Certified Final Directional Survey

Dear Sir,

Please find enclosed Cathedral Energy Services Certified Final Survey for Logos Resources, LLC.

Rig: Aztec #730

Well: LOGOS NM (Sec 5) #601H

API # 30-043-21182

County: Sandoval County, NM

The data and calculations included in this survey have been reviewed and conform to the operational procedures set forth by Cathedral Energy Services. Should you have any questions please do not hesitate to contact Cathedral Energy Services.

Sincerely,

Cathedral Energy Services

SCOTT CROSLEY

Well Planner Print Name

Well Planner Signature

3 MAR 14

Date

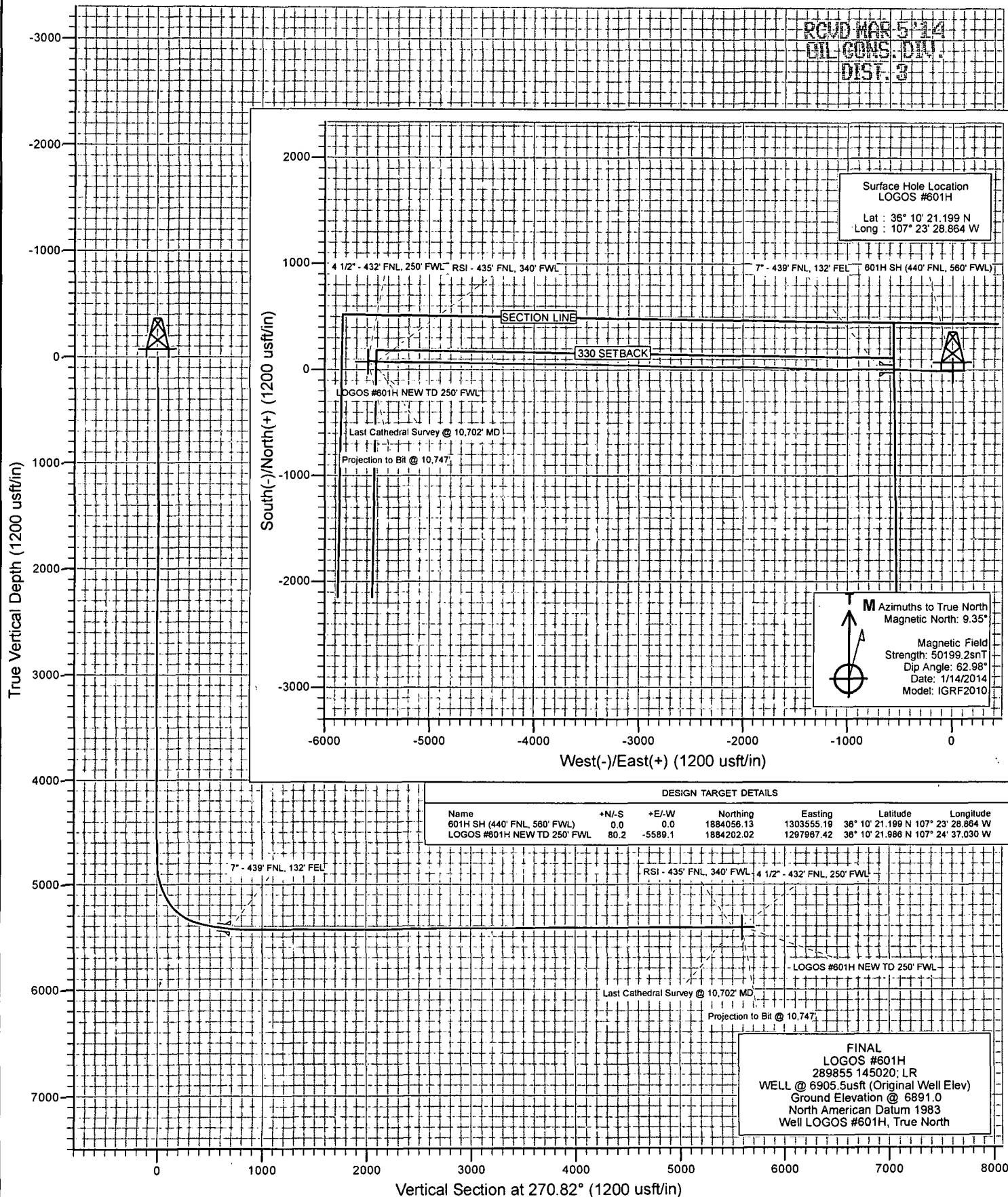
CONFIDENTIAL



Project: Sandoval County, NM
 Site: S5-T22N-R5W
 Well: LOGOS #601H
 Wellbore: Hz
 Design: FINAL

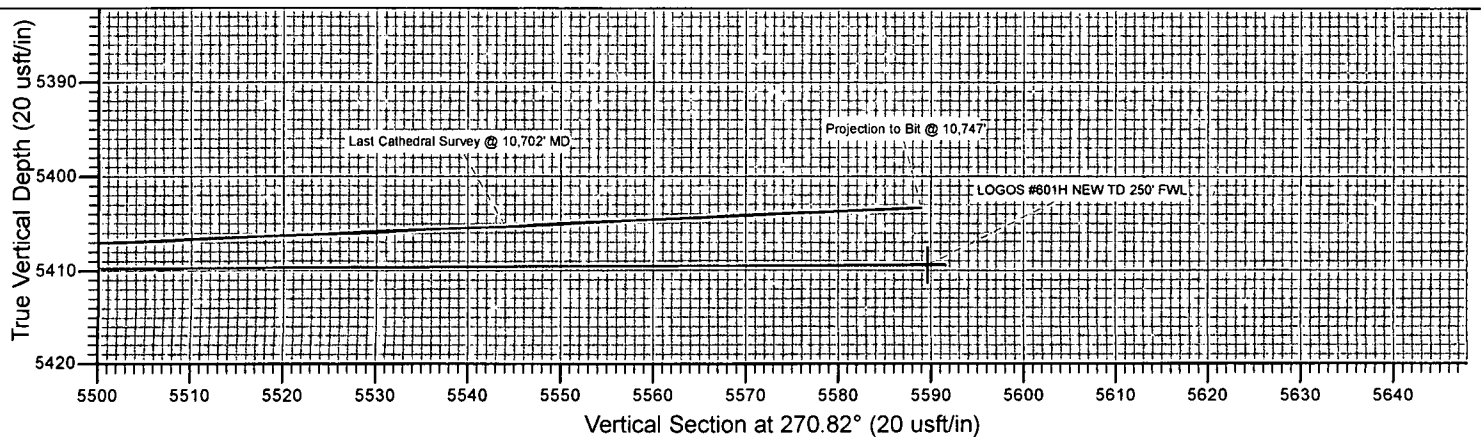
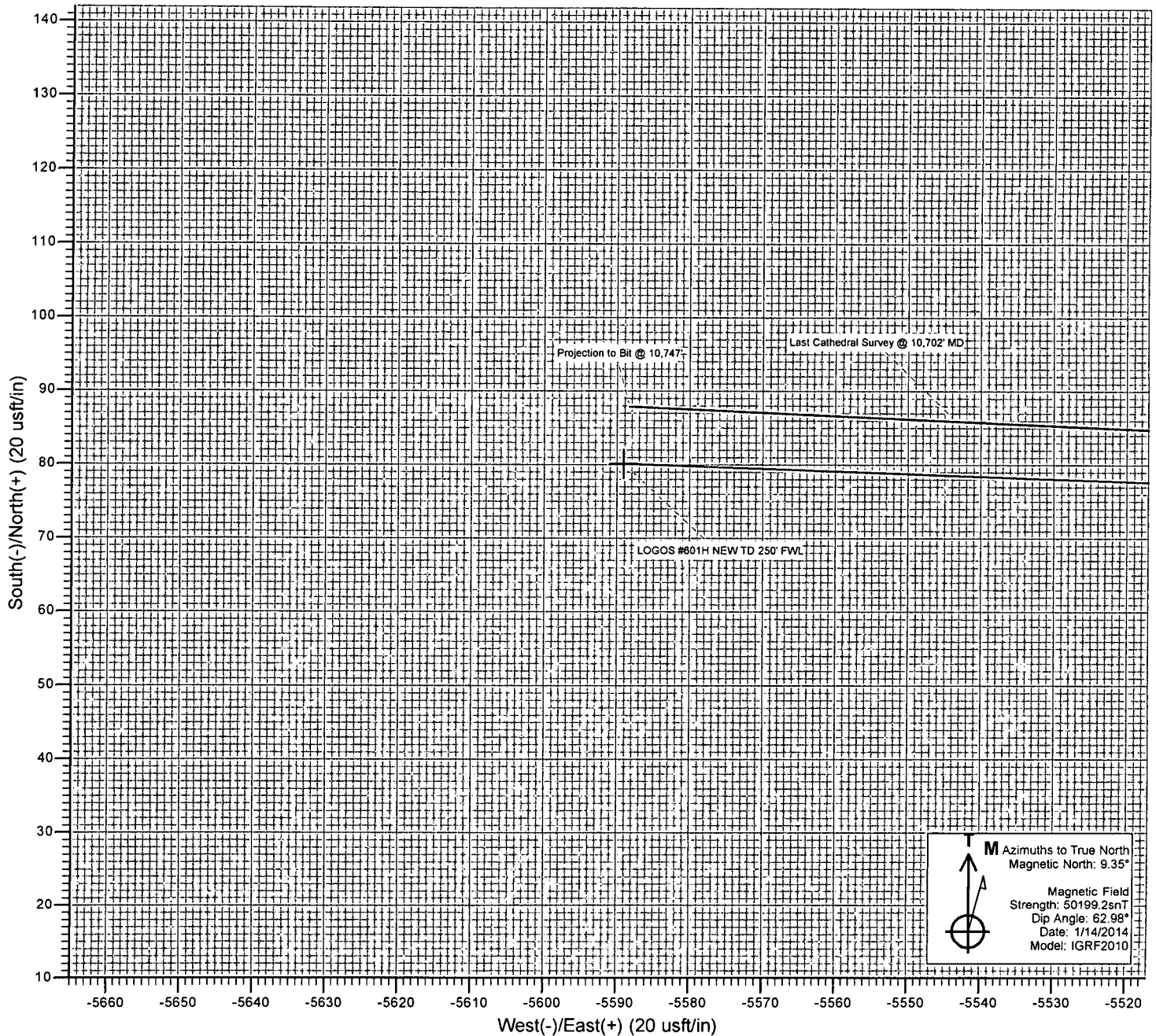


RCVD MAR 5 2014
 OIL CONS. DIV.
 DIST. 3





Project: Sandoval County, NM
Site: S5-T22N-R5W
Well: LOGOS #601H
Wellbore: Hz
Design: FINAL



Cathedral Energy Services

Survey Report

Company:	LOGOS Operating LLC	Local Co-ordinate Reference:	Well LOGOS #601H
Project:	Sandoval County, NM	TVD Reference:	WELL @ 6905.5usft (Original Well Elev)
Site:	S5-T22N-R5W	MD Reference:	WELL @ 6905.5usft (Original Well Elev)
Well:	LOGOS #601H	North Reference:	True
Wellbore:	Hz	Survey Calculation Method:	Minimum Curvature
Design:	FINAL	Database:	USA EDM 5000 Multi Users DB

Project	Sandoval County, NM		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	New Mexico Central Zone		

Site	S5-T22N-R5W				
Site Position:		Northing:	1,884,056.13 usft	Latitude:	36° 10' 21.199 N
From:	Lat/Long	Easting:	1,303,555.19 usft	Longitude:	107° 23' 28.864 W
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16"	Grid Convergence:	-0.67 °

Well	LOGOS #601H					
Well Position	+N/-S	0.0 usft	Northing:	1,884,056.13 usft	Latitude:	36° 10' 21.199 N
	+E/-W	0.0 usft	Easting:	1,303,555.19 usft	Longitude:	107° 23' 28.864 W
Position Uncertainty	0.0 usft	Wellhead Elevation:	usft	Ground Level:	6,891.0 usft	

Wellbore	Hz				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	1/14/2014	9.35	62.98	50,199

Design	FINAL			
Audit Notes:				
Version:	1.0	Phase:	ACTUAL	Tie On Depth: 0.0
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	0.0	0.0	0.0	270.82

Survey Program		Date	1/27/2014		
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
562.0	10,747.0	Survey #1 (Hz)			

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usf)	Build Rate (°/100u)	Formations / Comments
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	
562.0	0.40	256.70	562.0	-0.5	-1.9	1.9	0.07	0.07	
623.0	0.40	250.10	623.0	-0.6	-2.3	2.3	0.08	0.00	
685.0	0.40	263.30	685.0	-0.7	-2.7	2.7	0.15	0.00	
745.0	0.80	270.60	745.0	-0.7	-3.4	3.4	0.68	0.67	
806.0	0.80	270.70	806.0	-0.7	-4.2	4.2	0.00	0.00	
867.0	0.80	268.90	867.0	-0.7	-5.1	5.1	0.04	0.00	
928.0	0.60	238.10	928.0	-0.9	-5.8	5.7	0.69	-0.33	
989.0	0.70	247.30	989.0	-1.2	-6.4	6.4	0.24	0.16	
1,050.0	0.60	267.90	1,050.0	-1.3	-7.0	7.0	0.41	-0.16	
1,112.0	0.50	247.00	1,112.0	-1.4	-7.6	7.6	0.36	-0.16	
1,172.0	0.70	266.50	1,172.0	-1.6	-8.2	8.2	0.47	0.33	
1,233.0	0.10	279.40	1,233.0	-1.6	-8.6	8.6	0.99	-0.98	

Cathedral Energy Services

Survey Report

Company:	LOGOS Operating LLC	Local Co-ordinate Reference:	Well LOGOS #601H
Project:	Sandoval County, NM	TVD Reference:	WELL @ 6905.5usft (Original Well Elev)
Site:	S5-T22N-R5W	MD Reference:	WELL @ 6905.5usft (Original Well Elev)
Well:	LOGOS #601H	North Reference:	True
Wellbore:	Hz	Survey Calculation Method:	Minimum Curvature
Design:	FINAL	Database:	USA EDM 5000 Multi Users DB

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usf)	Build Rate (°/100u)	Formations / Comments
1,294.0	0.40	123.40	1,294.0	-1.7	-8.5	8.5	0.81	0.49	
1,356.0	0.40	133.40	1,356.0	-2.0	-8.2	8.2	0.11	0.00	
1,417.0	0.30	178.10	1,417.0	-2.3	-8.0	8.0	0.46	-0.16	
1,478.0	0.20	99.40	1,478.0	-2.4	-7.9	7.9	0.53	-0.16	
1,540.0	0.50	158.10	1,540.0	-2.7	-7.7	7.7	0.70	0.48	
1,601.0	0.70	103.30	1,600.9	-3.0	-7.2	7.2	0.95	0.33	
1,662.0	0.80	66.80	1,661.9	-3.0	-6.5	6.4	0.79	0.16	
1,723.0	0.80	41.60	1,722.9	-2.5	-5.8	5.8	0.57	0.00	
1,784.0	0.70	69.20	1,783.9	-2.0	-5.2	5.2	0.61	-0.16	
1,847.0	0.80	65.30	1,846.9	-1.7	-4.4	4.4	0.18	0.16	
1,911.0	0.90	68.80	1,910.9	-1.3	-3.5	3.5	0.18	0.16	
1,974.0	0.80	83.90	1,973.9	-1.1	-2.6	2.6	0.39	-0.16	
2,037.0	0.70	78.40	2,036.9	-1.0	-1.8	1.8	0.20	-0.16	
2,100.0	0.90	80.20	2,099.9	-0.8	-1.0	1.0	0.32	0.32	
2,164.0	0.90	77.50	2,163.9	-0.6	0.0	0.0	0.07	0.00	
2,227.0	0.90	84.50	2,226.9	-0.5	1.0	-1.0	0.17	0.00	
2,290.0	0.50	68.00	2,289.9	-0.3	1.7	-1.7	0.70	-0.63	
2,353.0	0.50	99.40	2,352.9	-0.3	2.3	-2.3	0.43	0.00	
2,417.0	0.70	99.40	2,416.9	-0.4	2.9	-2.9	0.31	0.31	
2,480.0	0.80	101.40	2,479.9	-0.5	3.7	-3.7	0.16	0.16	
2,543.0	0.80	91.80	2,542.9	-0.6	4.6	-4.6	0.21	0.00	
2,606.0	0.50	89.30	2,605.9	-0.6	5.3	-5.3	0.48	-0.48	
2,669.0	0.80	81.00	2,668.9	-0.6	6.0	-6.0	0.50	0.48	
2,732.0	0.40	17.20	2,731.8	-0.3	6.5	-6.5	1.14	-0.63	
2,795.0	0.10	111.80	2,794.8	-0.1	6.6	-6.6	0.67	-0.48	
2,859.0	0.10	187.50	2,858.8	-0.2	6.7	-6.7	0.19	0.00	
2,922.0	0.30	238.10	2,921.8	-0.3	6.5	-6.5	0.39	0.32	
2,985.0	0.30	218.90	2,984.8	-0.5	6.3	-6.3	0.16	0.00	
3,048.0	0.40	163.80	3,047.8	-0.9	6.3	-6.3	0.53	0.16	
3,111.0	0.60	164.60	3,110.8	-1.4	6.4	-6.4	0.32	0.32	
3,175.0	0.40	136.30	3,174.8	-1.9	6.6	-6.7	0.49	-0.31	
3,238.0	0.40	164.40	3,237.8	-2.3	6.9	-6.9	0.31	0.00	
3,301.0	0.40	125.90	3,300.8	-2.6	7.1	-7.1	0.42	0.00	
3,365.0	0.30	13.80	3,364.8	-2.6	7.3	-7.4	0.91	-0.16	
3,428.0	0.50	328.70	3,427.8	-2.2	7.2	-7.2	0.57	0.32	
3,491.0	0.40	304.20	3,490.8	-1.8	6.9	-6.9	0.34	-0.16	
3,554.0	0.20	301.70	3,553.8	-1.6	6.6	-6.6	0.32	-0.32	
3,617.0	0.40	347.40	3,616.8	-1.4	6.5	-6.5	0.47	0.32	
3,680.0	0.20	32.60	3,679.8	-1.1	6.5	-6.5	0.47	-0.32	
3,743.0	0.30	157.20	3,742.8	-1.1	6.6	-6.6	0.71	0.16	
3,807.0	0.20	300.80	3,806.8	-1.2	6.6	-6.6	0.74	-0.16	
3,870.0	0.30	237.20	3,869.8	-1.2	6.3	-6.4	0.44	0.16	
3,933.0	0.10	243.20	3,932.8	-1.4	6.2	-6.2	0.32	-0.32	
3,997.0	0.40	242.50	3,996.8	-1.5	5.9	-5.9	0.47	0.47	
4,060.0	0.20	201.80	4,059.8	-1.7	5.7	-5.7	0.45	-0.32	
4,123.0	0.40	261.10	4,122.8	-1.8	5.4	-5.4	0.55	0.32	
4,186.0	0.40	217.80	4,185.8	-2.0	5.1	-5.1	0.47	0.00	
4,249.0	0.30	214.90	4,248.8	-2.3	4.8	-4.9	0.16	-0.16	
4,313.0	0.60	231.40	4,312.8	-2.7	4.5	-4.5	0.51	0.47	
4,376.0	0.40	193.30	4,375.8	-3.1	4.2	-4.2	0.60	-0.32	
4,439.0	0.40	213.50	4,438.8	-3.5	4.0	-4.0	0.22	0.00	
4,502.0	0.50	200.80	4,501.8	-3.9	3.8	-3.8	0.22	0.16	
4,566.0	0.30	269.30	4,565.8	-4.2	3.5	-3.6	0.75	-0.31	

Cathedral Energy Services

Survey Report

Company:	LOGOS Operating LLC	Local Co-ordinate Reference:	Well LOGOS #601H
Project:	Sandoval County, NM	TVD Reference:	WELL @ 6905.5usft (Original Well Elev)
Site:	S5-T22N-R5W	MD Reference:	WELL @ 6905.5usft (Original Well Elev)
Well:	LOGOS #601H	North Reference:	True
Wellbore:	HZ	Survey Calculation Method:	Minimum Curvature
Design:	FINAL	Database:	USA EDM 5000 Multi Users DB

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usf)	Build Rate (°/100u)	Formations / Comments
4,629.0	0.60	237.90	4,628.8	-4.4	3.1	-3.1	0.60	0.48	
4,692.0	0.80	230.50	4,691.8	-4.8	2.4	-2.5	0.35	0.32	
4,754.0	0.50	232.60	4,753.8	-5.3	1.9	-2.0	0.49	-0.48	
4,768.0	0.40	203.70	4,767.8	-5.4	1.8	-1.9	1.75	-0.71	
4,800.0	0.40	201.90	4,799.8	-5.6	1.7	-1.8	0.04	0.00	
4,831.0	2.30	255.50	4,830.8	-5.8	1.1	-1.2	6.73	6.13	
4,863.0	6.40	262.40	4,862.7	-6.2	-1.3	1.2	12.89	12.81	
4,894.0	9.80	264.90	4,893.4	-6.7	-5.6	5.5	11.02	10.97	
4,926.0	12.60	262.20	4,924.8	-7.4	-11.8	11.7	8.90	8.75	
4,958.0	14.70	265.90	4,955.9	-8.2	-19.3	19.2	7.10	6.56	
4,990.0	16.90	269.80	4,986.7	-8.5	-28.0	27.9	7.63	6.87	
5,021.0	19.50	271.80	5,016.1	-8.3	-37.7	37.6	8.62	8.39	
5,053.0	23.00	273.00	5,045.9	-7.8	-49.3	49.2	11.02	10.94	
5,084.0	25.50	273.20	5,074.2	-7.1	-62.0	61.9	8.07	8.06	
5,116.0	27.20	273.40	5,102.9	-6.3	-76.2	76.1	5.32	5.31	
5,148.0	28.90	271.80	5,131.1	-5.6	-91.2	91.1	5.81	5.31	
5,179.0	31.40	269.40	5,157.9	-5.5	-106.8	106.7	8.95	8.06	
5,211.0	34.90	267.90	5,184.7	-5.9	-124.3	124.2	11.23	10.94	
5,242.0	38.60	267.40	5,209.5	-6.7	-142.8	142.7	11.97	11.94	
5,274.0	42.50	269.30	5,233.8	-7.3	-163.6	163.5	12.78	12.19	
5,305.0	46.50	270.90	5,256.0	-7.2	-185.3	185.2	13.40	12.90	
5,337.0	50.70	271.70	5,277.1	-6.7	-209.3	209.2	13.26	13.12	
5,369.0	54.90	272.80	5,296.5	-5.7	-234.8	234.6	13.41	13.12	
5,401.0	58.30	273.80	5,314.1	-4.1	-261.4	261.3	10.94	10.62	
5,432.0	61.70	274.40	5,329.6	-2.2	-288.2	288.1	11.10	10.97	
5,464.0	66.40	273.90	5,343.6	-0.1	-316.9	316.8	14.75	14.69	
5,496.0	70.40	273.70	5,355.3	1.9	-346.6	346.6	12.51	12.50	
5,528.0	73.70	273.00	5,365.2	3.6	-376.9	377.0	10.52	10.31	
5,559.0	75.40	272.20	5,373.5	5.0	-406.8	406.8	6.02	5.48	
5,591.0	76.50	271.70	5,381.2	6.0	-437.8	437.9	3.76	3.44	
5,623.0	77.00	271.90	5,388.6	7.0	-469.0	469.0	1.68	1.56	
5,654.0	78.60	271.30	5,395.1	7.9	-499.2	499.3	5.50	5.16	
5,686.0	80.80	271.40	5,400.8	8.6	-530.7	530.8	6.88	6.87	
5,718.0	82.20	270.90	5,405.6	9.2	-562.4	562.4	4.64	4.37	
5,750.0	82.40	270.40	5,409.8	9.6	-594.1	594.1	1.67	0.62	
5,781.0	83.10	271.30	5,413.8	10.1	-624.8	624.9	3.66	2.26	
5,801.0	83.50	271.60	5,416.1	10.6	-644.7	644.8	2.49	2.00	
5,843.0	83.50	269.60	5,420.8	11.0	-686.4	686.5	4.73	0.00	
5,875.0	83.80	269.50	5,424.4	10.7	-718.2	718.3	0.99	0.94	
5,907.0	84.50	269.00	5,427.6	10.3	-750.0	750.1	2.68	2.19	
5,939.0	87.90	268.80	5,429.8	9.7	-781.9	782.0	10.64	10.63	
5,971.0	89.30	269.70	5,430.6	9.3	-813.9	814.0	5.20	4.38	
6,035.0	90.50	269.40	5,430.7	8.8	-877.9	878.0	1.93	1.88	
6,099.0	90.90	270.00	5,429.9	8.5	-941.9	941.9	1.13	0.63	
6,160.0	90.10	270.00	5,429.3	8.5	-1,002.9	1,002.9	1.31	-1.31	
6,222.0	89.50	269.70	5,429.6	8.3	-1,064.9	1,064.9	1.08	-0.97	
6,283.0	89.70	270.20	5,430.0	8.2	-1,125.9	1,125.9	0.88	0.33	
6,345.0	89.80	271.50	5,430.3	9.2	-1,187.9	1,187.9	2.10	0.16	
6,406.0	90.40	271.20	5,430.2	10.6	-1,248.9	1,248.9	1.10	0.98	
6,469.0	90.80	270.90	5,429.5	11.8	-1,311.9	1,311.9	0.79	0.63	
6,530.0	90.00	271.60	5,429.1	13.1	-1,372.8	1,372.9	1.74	-1.31	
6,591.0	89.10	272.20	5,429.5	15.1	-1,433.8	1,433.9	1.77	-1.48	
6,653.0	89.80	272.00	5,430.1	17.4	-1,495.8	1,495.9	1.17	1.13	

Cathedral Energy Services

Survey Report

Company:	LOGOS Operating LLC	Local Co-ordinate Reference:	Well LOGOS #601H
Project:	Sandoval County, NM	TVD Reference:	WELL @ 6905.5usft (Original Well Elev)
Site:	S5-T22N-R5W	MD Reference:	WELL @ 6905.5usft (Original Well Elev)
Well:	LOGOS #601H	North Reference:	True
Wellbore:	Hz	Survey Calculation Method:	Minimum Curvature
Design:	FINAL	Database:	USA EDM 5000 Multi Users DB

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100u	Formations / Comments
6,714.0	89.30	271.80	5,430.6	19.4	-1,556.7	1,556.8	0.88	-0.82	
6,775.0	89.90	271.60	5,431.0	21.2	-1,617.7	1,617.8	1.04	0.98	
6,836.0	89.70	272.10	5,431.3	23.2	-1,678.7	1,678.8	0.88	-0.33	
6,898.0	89.00	271.50	5,432.0	25.1	-1,740.6	1,740.8	1.49	-1.13	
6,959.0	89.70	271.50	5,432.7	26.7	-1,801.6	1,801.8	1.15	1.15	
7,021.0	90.40	270.90	5,432.6	28.0	-1,863.6	1,863.8	1.49	1.13	
7,083.0	89.50	270.70	5,432.7	28.9	-1,925.6	1,925.8	1.49	-1.45	
7,144.0	90.00	270.80	5,432.9	29.7	-1,986.6	1,986.8	0.84	0.82	
7,206.0	90.70	271.20	5,432.5	30.8	-2,048.6	2,048.8	1.30	1.13	
7,268.0	91.20	271.00	5,431.5	32.0	-2,110.6	2,110.8	0.87	0.81	
7,330.0	91.80	270.80	5,429.9	32.9	-2,172.5	2,172.8	1.02	0.97	
7,392.0	91.00	270.50	5,428.4	33.6	-2,234.5	2,234.8	1.38	-1.29	
7,453.0	90.40	270.40	5,427.6	34.1	-2,295.5	2,295.7	1.00	-0.98	
7,515.0	90.50	269.30	5,427.1	34.0	-2,357.5	2,357.7	1.78	0.16	
7,578.0	91.30	268.60	5,426.2	32.8	-2,420.5	2,420.7	1.69	1.27	
7,642.0	90.70	269.00	5,425.0	31.5	-2,484.4	2,484.6	1.13	-0.94	
7,705.0	90.80	269.90	5,424.2	30.9	-2,547.4	2,547.6	1.44	0.16	
7,768.0	90.00	269.50	5,423.8	30.5	-2,610.4	2,610.6	1.42	-1.27	
7,831.0	90.60	270.90	5,423.4	30.7	-2,673.4	2,673.6	2.42	0.95	
7,894.0	90.20	272.20	5,423.0	32.5	-2,736.4	2,736.6	2.16	-0.63	
7,957.0	91.00	271.80	5,422.3	34.6	-2,799.4	2,799.6	1.42	1.27	
8,020.0	89.80	272.20	5,421.9	36.8	-2,862.3	2,862.6	2.01	-1.90	
8,082.0	90.70	272.20	5,421.6	39.2	-2,924.3	2,924.5	1.45	1.45	
8,145.0	89.40	272.40	5,421.6	41.8	-2,987.2	2,987.5	2.09	-2.06	
8,208.0	90.20	272.20	5,421.8	44.3	-3,050.2	3,050.5	1.31	1.27	
8,271.0	91.30	272.20	5,421.0	46.7	-3,113.1	3,113.5	1.75	1.75	
8,333.0	89.70	272.00	5,420.4	49.0	-3,175.1	3,175.4	2.60	-2.58	
8,396.0	90.70	271.60	5,420.2	51.0	-3,238.0	3,238.4	1.71	1.59	
8,459.0	90.00	271.10	5,419.8	52.4	-3,301.0	3,301.4	1.37	-1.11	
8,522.0	90.70	271.10	5,419.4	53.6	-3,364.0	3,364.4	1.11	1.11	
8,585.0	90.20	270.80	5,419.0	54.7	-3,427.0	3,427.4	0.93	-0.79	
8,648.0	90.70	270.50	5,418.5	55.4	-3,490.0	3,490.4	0.93	0.79	
8,711.0	91.50	270.40	5,417.2	55.9	-3,553.0	3,553.4	1.28	1.27	
8,774.0	90.70	270.60	5,416.0	56.5	-3,616.0	3,616.4	1.31	-1.27	
8,837.0	91.30	270.10	5,414.9	56.8	-3,678.9	3,679.4	1.24	0.95	
8,899.0	90.30	271.20	5,414.1	57.5	-3,740.9	3,741.4	2.40	-1.61	
8,960.0	88.90	270.90	5,414.5	58.7	-3,801.9	3,802.4	2.35	-2.30	
9,023.0	89.60	270.20	5,415.3	59.3	-3,864.9	3,865.4	1.57	1.11	
9,086.0	90.20	270.20	5,415.4	59.5	-3,927.9	3,928.4	0.95	0.95	
9,149.0	91.00	270.20	5,414.8	59.7	-3,990.9	3,991.4	1.27	1.27	
9,211.0	90.40	269.30	5,414.0	59.4	-4,052.9	4,053.3	1.74	-0.97	
9,274.0	89.90	270.00	5,413.9	59.0	-4,115.9	4,116.3	1.37	-0.79	
9,337.0	90.40	269.80	5,413.7	58.9	-4,178.9	4,179.3	0.85	0.79	
9,400.0	89.70	270.30	5,413.6	59.0	-4,241.9	4,242.3	1.37	-1.11	
9,463.0	90.40	270.00	5,413.6	59.2	-4,304.9	4,305.3	1.21	1.11	
9,525.0	89.30	270.70	5,413.7	59.5	-4,366.9	4,367.3	2.10	-1.77	
9,589.0	90.10	270.80	5,414.1	60.4	-4,430.9	4,431.3	1.26	1.25	
9,652.0	91.00	271.10	5,413.5	61.4	-4,493.9	4,494.3	1.51	1.43	
9,715.0	90.40	272.00	5,412.7	63.1	-4,556.8	4,557.3	1.72	-0.95	
9,778.0	88.60	271.40	5,413.2	65.0	-4,619.8	4,620.3	3.01	-2.86	
9,841.0	89.40	271.30	5,414.3	66.5	-4,682.8	4,683.3	1.28	1.27	
9,904.0	90.40	271.20	5,414.5	67.8	-4,745.8	4,746.3	1.60	1.59	
9,967.0	90.40	272.20	5,414.0	69.7	-4,808.8	4,809.3	1.59	0.00	

Cathedral Energy Services

Survey Report

Company:	LOGOS Operating LLC	Local Co-ordinate Reference:	Well LOGOS #601H
Project:	Sandoval County, NM	TVD Reference:	WELL @ 6905.5usft (Original Well Elev)
Site:	S5-T22N-R5W	MD Reference:	WELL @ 6905.5usft (Original Well Elev)
Well:	LOGOS #601H	North Reference:	True
Wellbore:	Hz	Survey Calculation Method:	Minimum Curvature
Design:	FINAL	Database:	USA EDM 5000 Multi Users DB

Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usf)	Build Rate (°/100u)	Formations / Comments
10,030.0	89.70	272.00	5,414.0	72.0	-4,871.7	4,872.2	1.16	-1.11	
10,093.0	90.30	271.70	5,414.0	74.1	-4,934.7	4,935.2	1.06	0.95	
10,155.0	90.30	270.80	5,413.6	75.4	-4,996.7	4,997.2	1.45	0.00	
10,218.0	90.70	270.40	5,413.1	76.1	-5,059.7	5,060.2	0.90	0.63	
10,282.0	90.40	269.90	5,412.5	76.2	-5,123.7	5,124.2	0.91	-0.47	
10,345.0	91.00	270.30	5,411.7	76.3	-5,186.6	5,187.2	1.14	0.95	
10,408.0	89.50	269.70	5,411.4	76.3	-5,249.6	5,250.2	2.56	-2.38	
10,471.0	90.60	270.60	5,411.4	76.5	-5,312.6	5,313.2	2.26	1.75	
10,534.0	91.50	273.20	5,410.2	78.6	-5,375.6	5,376.2	4.37	1.43	
10,597.0	91.20	272.20	5,408.7	81.6	-5,438.5	5,439.1	1.66	-0.48	
10,661.0	92.10	272.50	5,406.9	84.2	-5,502.4	5,503.1	1.48	1.41	
10,702.0	92.50	272.50	5,405.2	86.0	-5,543.4	5,544.0	0.98	0.98	Last Cathedral Survey @ 10,702' MD
10,747.0	92.50	272.50	5,403.3	87.9	-5,588.3	5,589.0	0.00	0.00	Projection to Bit @ 10,747'

Targets

Target Name

- hit/miss target	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
- Shape									
LOGOS #601H NEW TC	0.00	0.00	5,409.4	80.2	-5,589.1	1,884,202.02	1,297,967.42	36° 10' 21.986 N	107° 24' 37.030 W
- actual wellpath misses target center by 9.9usft at 10747.0usft MD (5403.3 TVD, 87.9 N, -5588.3 E)									
- Point									
601H SH (440' FNL, 56C	0.00	359.32	-5,360.0	0.0	0.0	1,884,056.13	1,303,555.19	36° 10' 21.199 N	107° 23' 28.864 W
- actual wellpath misses target center by 5360.0usft at 0.0usft MD (0.0 TVD, 0.0 N, 0.0 E)									
- Point									
601H PBHL (440' FNL, 3	0.00	0.00	5,387.0	79.1	-5,509.1	1,884,199.96	1,298,047.39	36° 10' 21.976 N	107° 24' 36.054 W
- actual wellpath misses target center by 20.4usft at 10668.2usft MD (5406.6 TVD, 84.5 N, -5509.7 E)									
- Point									
601H PBHL (440' FNL, 3	0.00	0.00	5,387.0	79.1	-5,509.1	1,884,199.96	1,298,047.39	36° 10' 21.976 N	107° 24' 36.054 W
- actual wellpath misses target center by 20.4usft at 10668.2usft MD (5406.6 TVD, 84.5 N, -5509.7 E)									
- Point									
601H PBHL (440' FNL, 3	0.00	0.00	5,397.0	79.1	-5,509.1	1,884,199.96	1,298,047.39	36° 10' 21.976 N	107° 24' 36.054 W
- actual wellpath misses target center by 11.1usft at 10667.8usft MD (5406.6 TVD, 84.5 N, -5509.3 E)									
- Point									

Design Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
10,702.0	5,405.2	86.0	-5,543.4	Last Cathedral Survey @ 10,702' MD Projection to Bit @ 10,747'
10,747.0	5,403.3	87.9	-5,588.3	

Checked By: _____ Approved By: _____ Date: _____

Cathedral Energy Services

Survey Report

Company:	LOGOS Operating LLC	Local Co-ordinate Reference:	Well LOGOS #601H
Project:	Sandoval County, NM	TVD Reference:	WELL @ 6905.5usft (Original Well Elev)
Site:	S5-T22N-R5W	MD Reference:	WELL @ 6905.5usft (Original Well Elev)
Well:	LOGOS #601H	North Reference:	True
Wellbore:	HZ	Survey Calculation Method:	Minimum Curvature
Design:	FINAL	Database:	USA EDM 5000 Multi Users DB

Project	Sandoval County, NM	System Datum:	Mean Sea Level
Map System:	US State Plane 1983		
Geo Datum:	North American Datum 1983		
Map Zone:	New Mexico Central Zone		

Site	S5-T22N-R5W				
Site Position:		Northing:	1,884,056.13 usft	Latitude:	36° 10' 21.199 N
From:	Lat/Long	Easting:	1,303,555.19 usft	Longitude:	107° 23' 28.864 W
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16"	Grid Convergence:	-0.67 °

Well	LOGOS #601H					
Well Position	+N/-S	0.0 usft	Northing:	1,884,056.13 usft	Latitude:	36° 10' 21.199 N
	+E/-W	0.0 usft	Easting:	1,303,555.19 usft	Longitude:	107° 23' 28.864 W
Position Uncertainty	0.0 usft	Wellhead Elevation:	usft	Ground Level:	6,891.0 usft	

Wellbore	HZ				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	1/14/2014	9.35	62.98	50,199

Design	FINAL				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.0
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)	
	0.0	0.0	0.0	270.82	

Survey Program	Date	1/27/2014			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
562.0	10,747.0	Survey #1 (Hz)			

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usf	Build Rate (°/100u	Formations / Comments
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	
562.0	0.40	256.70	562.0	-0.5	-1.9	1.9	0.07	0.07	
623.0	0.40	250.10	623.0	-0.6	-2.3	2.3	0.08	0.00	
685.0	0.40	263.30	685.0	-0.7	-2.7	2.7	0.15	0.00	
745.0	0.80	270.60	745.0	-0.7	-3.4	3.4	0.68	0.67	
806.0	0.80	270.70	806.0	-0.7	-4.2	4.2	0.00	0.00	
867.0	0.80	268.90	867.0	-0.7	-5.1	5.1	0.04	0.00	
928.0	0.60	238.10	928.0	-0.9	-5.8	5.7	0.69	-0.33	
989.0	0.70	247.30	989.0	-1.2	-6.4	6.4	0.24	0.16	
1,050.0	0.60	267.90	1,050.0	-1.3	-7.0	7.0	0.41	-0.16	
1,112.0	0.50	247.00	1,112.0	-1.4	-7.6	7.6	0.36	-0.16	
1,172.0	0.70	266.50	1,172.0	-1.6	-8.2	8.2	0.47	0.33	
1,233.0	0.10	279.40	1,233.0	-1.6	-8.6	8.6	0.99	-0.98	

Cathedral Energy Services

Survey Report

Company:	LOGOS Operating LLC	Local Co-ordinate Reference:	Well LOGOS #601H
Project:	Sandoval County, NM	TVD Reference:	WELL @ 6905.5usft (Original Well Elev)
Site:	S5-T22N-R5W	MD Reference:	WELL @ 6905.5usft (Original Well Elev)
Well:	LOGOS #601H	North Reference:	True
Wellbore:	Hz	Survey Calculation Method:	Minimum Curvature
Design:	FINAL	Database:	USA EDM 5000 Multi Users DB

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usf)	Build Rate (°/100u)	Formations / Comments
1,294.0	0.40	123.40	1,294.0	-1.7	-8.5	8.5	0.81	0.49	
1,356.0	0.40	133.40	1,356.0	-2.0	-8.2	8.2	0.11	0.00	
1,417.0	0.30	178.10	1,417.0	-2.3	-8.0	8.0	0.46	-0.16	
1,478.0	0.20	99.40	1,478.0	-2.4	-7.9	7.9	0.53	-0.16	
1,540.0	0.50	158.10	1,540.0	-2.7	-7.7	7.7	0.70	0.48	
1,601.0	0.70	103.30	1,600.9	-3.0	-7.2	7.2	0.95	0.33	
1,662.0	0.80	66.80	1,661.9	-3.0	-6.5	6.4	0.79	0.16	
1,723.0	0.80	41.60	1,722.9	-2.5	-5.8	5.8	0.57	0.00	
1,784.0	0.70	69.20	1,783.9	-2.0	-5.2	5.2	0.61	-0.16	
1,847.0	0.80	65.30	1,846.9	-1.7	-4.4	4.4	0.18	0.16	
1,911.0	0.90	68.80	1,910.9	-1.3	-3.5	3.5	0.18	0.16	
1,974.0	0.80	83.90	1,973.9	-1.1	-2.6	2.6	0.39	-0.16	
2,037.0	0.70	78.40	2,036.9	-1.0	-1.8	1.8	0.20	-0.16	
2,100.0	0.90	80.20	2,099.9	-0.8	-1.0	1.0	0.32	0.32	
2,164.0	0.90	77.50	2,163.9	-0.6	0.0	0.0	0.07	0.00	
2,227.0	0.90	84.50	2,226.9	-0.5	1.0	-1.0	0.17	0.00	
2,290.0	0.50	68.00	2,289.9	-0.3	1.7	-1.7	0.70	-0.63	
2,353.0	0.50	99.40	2,352.9	-0.3	2.3	-2.3	0.43	0.00	
2,417.0	0.70	99.40	2,416.9	-0.4	2.9	-2.9	0.31	0.31	
2,480.0	0.80	101.40	2,479.9	-0.5	3.7	-3.7	0.16	0.16	
2,543.0	0.80	91.80	2,542.9	-0.6	4.6	-4.6	0.21	0.00	
2,606.0	0.50	89.30	2,605.9	-0.6	5.3	-5.3	0.48	-0.48	
2,669.0	0.80	81.00	2,668.9	-0.6	6.0	-6.0	0.50	0.48	
2,732.0	0.40	17.20	2,731.8	-0.3	6.5	-6.5	1.14	-0.63	
2,795.0	0.10	111.80	2,794.8	-0.1	6.6	-6.6	0.67	-0.48	
2,859.0	0.10	187.50	2,858.8	-0.2	6.7	-6.7	0.19	0.00	
2,922.0	0.30	238.10	2,921.8	-0.3	6.5	-6.5	0.39	0.32	
2,985.0	0.30	218.90	2,984.8	-0.5	6.3	-6.3	0.16	0.00	
3,048.0	0.40	163.80	3,047.8	-0.9	6.3	-6.3	0.53	0.16	
3,111.0	0.60	164.60	3,110.8	-1.4	6.4	-6.4	0.32	0.32	
3,175.0	0.40	136.30	3,174.8	-1.9	6.6	-6.7	0.49	-0.31	
3,238.0	0.40	164.40	3,237.8	-2.3	6.9	-6.9	0.31	0.00	
3,301.0	0.40	125.90	3,300.8	-2.6	7.1	-7.1	0.42	0.00	
3,365.0	0.30	13.80	3,364.8	-2.6	7.3	-7.4	0.91	-0.16	
3,428.0	0.50	328.70	3,427.8	-2.2	7.2	-7.2	0.57	0.32	
3,491.0	0.40	304.20	3,490.8	-1.8	6.9	-6.9	0.34	-0.16	
3,554.0	0.20	301.70	3,553.8	-1.6	6.6	-6.6	0.32	-0.32	
3,617.0	0.40	347.40	3,616.8	-1.4	6.5	-6.5	0.47	0.32	
3,680.0	0.20	32.60	3,679.8	-1.1	6.5	-6.5	0.47	-0.32	
3,743.0	0.30	157.20	3,742.8	-1.1	6.6	-6.6	0.71	0.16	
3,807.0	0.20	300.80	3,806.8	-1.2	6.6	-6.6	0.74	-0.16	
3,870.0	0.30	237.20	3,869.8	-1.2	6.3	-6.4	0.44	0.16	
3,933.0	0.10	243.20	3,932.8	-1.4	6.2	-6.2	0.32	-0.32	
3,997.0	0.40	242.50	3,996.8	-1.5	5.9	-5.9	0.47	0.47	
4,060.0	0.20	201.80	4,059.8	-1.7	5.7	-5.7	0.45	-0.32	
4,123.0	0.40	261.10	4,122.8	-1.8	5.4	-5.4	0.55	0.32	
4,186.0	0.40	217.80	4,185.8	-2.0	5.1	-5.1	0.47	0.00	
4,249.0	0.30	214.90	4,248.8	-2.3	4.8	-4.9	0.16	-0.16	
4,313.0	0.60	231.40	4,312.8	-2.7	4.5	-4.5	0.51	0.47	
4,376.0	0.40	193.30	4,375.8	-3.1	4.2	-4.2	0.60	-0.32	
4,439.0	0.40	213.50	4,438.8	-3.5	4.0	-4.0	0.22	0.00	
4,502.0	0.50	200.80	4,501.8	-3.9	3.8	-3.8	0.22	0.16	
4,566.0	0.30	269.30	4,565.8	-4.2	3.5	-3.6	0.75	-0.31	

Cathedral Energy Services

Survey Report

Company:	LOGOS Operating LLC	Local Co-ordinate Reference:	Well LOGOS #601H
Project:	Sandoval County, NM	TVD Reference:	WELL @ 6905.5usft (Original Well Elev)
Site:	S5-T22N-R5W	MD Reference:	WELL @ 6905.5usft (Original Well Elev)
Well:	LOGOS #601H	North Reference:	True:
Wellbore:	Hz	Survey Calculation Method:	Minimum Curvature
Design:	FINAL	Database:	USA EDM 5000 Multi Users DB

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usf)	Build Rate (°/100u)	Formations / Comments
4,629.0	0.60	237.90	4,628.8	-4.4	3.1	-3.1	0.60	0.48	
4,692.0	0.80	230.50	4,691.8	-4.8	2.4	-2.5	0.35	0.32	
4,754.0	0.50	232.60	4,753.8	-5.3	1.9	-2.0	0.49	-0.48	
4,768.0	0.40	203.70	4,767.8	-5.4	1.8	-1.9	1.75	-0.71	
4,800.0	0.40	201.90	4,799.8	-5.6	1.7	-1.8	0.04	0.00	
4,831.0	2.30	255.50	4,830.8	-5.8	1.1	-1.2	6.73	6.13	
4,863.0	6.40	262.40	4,862.7	-6.2	-1.3	1.2	12.89	12.81	
4,894.0	9.80	264.90	4,893.4	-6.7	-5.6	5.5	11.02	10.97	
4,926.0	12.60	262.20	4,924.8	-7.4	-11.8	11.7	8.90	8.75	
4,958.0	14.70	265.90	4,955.9	-8.2	-19.3	19.2	7.10	6.56	
4,990.0	16.90	269.80	4,986.7	-8.5	-28.0	27.9	7.63	6.87	
5,021.0	19.50	271.80	5,016.1	-8.3	-37.7	37.6	8.62	8.39	
5,053.0	23.00	273.00	5,045.9	-7.8	-49.3	49.2	11.02	10.94	
5,084.0	25.50	273.20	5,074.2	-7.1	-62.0	61.9	8.07	8.06	
5,116.0	27.20	273.40	5,102.9	-6.3	-76.2	76.1	5.32	5.31	
5,148.0	28.90	271.80	5,131.1	-5.6	-91.2	91.1	5.81	5.31	
5,179.0	31.40	269.40	5,157.9	-5.5	-106.8	106.7	8.95	8.06	
5,211.0	34.90	267.90	5,184.7	-5.9	-124.3	124.2	11.23	10.94	
5,242.0	38.60	267.40	5,209.5	-6.7	-142.8	142.7	11.97	11.94	
5,274.0	42.50	269.30	5,233.8	-7.3	-163.6	163.5	12.78	12.19	
5,305.0	46.50	270.90	5,256.0	-7.2	-185.3	185.2	13.40	12.90	
5,337.0	50.70	271.70	5,277.1	-6.7	-209.3	209.2	13.26	13.12	
5,369.0	54.90	272.80	5,296.5	-5.7	-234.8	234.6	13.41	13.12	
5,401.0	58.30	273.80	5,314.1	-4.1	-261.4	261.3	10.94	10.62	
5,432.0	61.70	274.40	5,329.6	-2.2	-288.2	288.1	11.10	10.97	
5,464.0	66.40	273.90	5,343.6	-0.1	-316.9	316.8	14.75	14.69	
5,496.0	70.40	273.70	5,355.3	1.9	-346.6	346.6	12.51	12.50	
5,528.0	73.70	273.00	5,365.2	3.6	-376.9	377.0	10.52	10.31	
5,559.0	75.40	272.20	5,373.5	5.0	-406.8	406.8	6.02	5.48	
5,591.0	76.50	271.70	5,381.2	6.0	-437.8	437.9	3.76	3.44	
5,623.0	77.00	271.90	5,388.6	7.0	-469.0	469.0	1.68	1.56	
5,654.0	78.60	271.30	5,395.1	7.9	-499.2	499.3	5.50	5.16	
5,686.0	80.80	271.40	5,400.8	8.6	-530.7	530.8	6.88	6.87	
5,718.0	82.20	270.90	5,405.6	9.2	-562.4	562.4	4.64	4.37	
5,750.0	82.40	270.40	5,409.8	9.6	-594.1	594.1	1.67	0.62	
5,781.0	83.10	271.30	5,413.8	10.1	-624.8	624.9	3.66	2.26	
5,801.0	83.50	271.60	5,416.1	10.6	-644.7	644.8	2.49	2.00	
5,843.0	83.50	269.60	5,420.8	11.0	-686.4	686.5	4.73	0.00	
5,875.0	83.80	269.50	5,424.4	10.7	-718.2	718.3	0.99	0.94	
5,907.0	84.50	269.00	5,427.6	10.3	-750.0	750.1	2.68	2.19	
5,939.0	87.90	268.80	5,429.8	9.7	-781.9	782.0	10.64	10.63	
5,971.0	89.30	269.70	5,430.6	9.3	-813.9	814.0	5.20	4.38	
6,035.0	90.50	269.40	5,430.7	8.8	-877.9	878.0	1.93	1.88	
6,099.0	90.90	270.00	5,429.9	8.5	-941.9	941.9	1.13	0.63	
6,160.0	90.10	270.00	5,429.3	8.5	-1,002.9	1,002.9	1.31	-1.31	
6,222.0	89.50	269.70	5,429.6	8.3	-1,064.9	1,064.9	1.08	-0.97	
6,283.0	89.70	270.20	5,430.0	8.2	-1,125.9	1,125.9	0.88	0.33	
6,345.0	89.80	271.50	5,430.3	9.2	-1,187.9	1,187.9	2.10	0.16	
6,406.0	90.40	271.20	5,430.2	10.6	-1,248.9	1,248.9	1.10	0.98	
6,469.0	90.80	270.90	5,429.5	11.8	-1,311.9	1,311.9	0.79	0.63	
6,530.0	90.00	271.60	5,429.1	13.1	-1,372.8	1,372.9	1.74	-1.31	
6,591.0	89.10	272.20	5,429.5	15.1	-1,433.8	1,433.9	1.77	-1.48	
6,653.0	89.80	272.00	5,430.1	17.4	-1,495.8	1,495.9	1.17	1.13	

Cathedral Energy Services

Survey Report

Company:	LOGOS Operating LLC	Local Co-ordinate Reference:	Well LOGOS #601H
Project:	Sandoval County, NM	TVD Reference:	WELL @ 6905.5usft (Original Well Elev)
Site:	S5-T22N-R5W	MD Reference:	WELL @ 6905.5usft (Original Well Elev)
Well:	LOGOS #601H	North Reference:	True
Wellbore:	HZ	Survey Calculation Method:	Minimum Curvature
Design:	FINAL	Database:	USA EDM 5000 Multi Users DB

Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usf)	Build Rate (°/100u)	Formations / Comments
6,714.0	89.30	271.80	5,430.6	19.4	-1,556.7	1,556.8	0.88	-0.82	
6,775.0	89.90	271.60	5,431.0	21.2	-1,617.7	1,617.8	1.04	0.98	
6,836.0	89.70	272.10	5,431.3	23.2	-1,678.7	1,678.8	0.88	-0.33	
6,898.0	89.00	271.50	5,432.0	25.1	-1,740.6	1,740.8	1.49	-1.13	
6,959.0	89.70	271.50	5,432.7	26.7	-1,801.6	1,801.8	1.15	1.15	
7,021.0	90.40	270.90	5,432.6	28.0	-1,863.6	1,863.8	1.49	1.13	
7,083.0	89.50	270.70	5,432.7	28.9	-1,925.6	1,925.8	1.49	-1.45	
7,144.0	90.00	270.80	5,432.9	29.7	-1,986.6	1,986.8	0.84	0.82	
7,206.0	90.70	271.20	5,432.5	30.8	-2,048.6	2,048.8	1.30	1.13	
7,268.0	91.20	271.00	5,431.5	32.0	-2,110.6	2,110.8	0.87	0.81	
7,330.0	91.80	270.80	5,429.9	32.9	-2,172.5	2,172.8	1.02	0.97	
7,392.0	91.00	270.50	5,428.4	33.6	-2,234.5	2,234.8	1.38	-1.29	
7,453.0	90.40	270.40	5,427.6	34.1	-2,295.5	2,295.7	1.00	-0.98	
7,515.0	90.50	269.30	5,427.1	34.0	-2,357.5	2,357.7	1.78	0.16	
7,578.0	91.30	268.60	5,426.2	32.8	-2,420.5	2,420.7	1.69	1.27	
7,642.0	90.70	269.00	5,425.0	31.5	-2,484.4	2,484.6	1.13	-0.94	
7,705.0	90.80	269.90	5,424.2	30.9	-2,547.4	2,547.6	1.44	0.16	
7,768.0	90.00	269.50	5,423.8	30.5	-2,610.4	2,610.6	1.42	-1.27	
7,831.0	90.60	270.90	5,423.4	30.7	-2,673.4	2,673.6	2.42	0.95	
7,894.0	90.20	272.20	5,423.0	32.5	-2,736.4	2,736.6	2.16	-0.63	
7,957.0	91.00	271.80	5,422.3	34.6	-2,799.4	2,799.6	1.42	1.27	
8,020.0	89.80	272.20	5,421.9	36.8	-2,862.3	2,862.6	2.01	-1.90	
8,082.0	90.70	272.20	5,421.6	39.2	-2,924.3	2,924.5	1.45	1.45	
8,145.0	89.40	272.40	5,421.6	41.8	-2,987.2	2,987.5	2.09	-2.06	
8,208.0	90.20	272.20	5,421.8	44.3	-3,050.2	3,050.5	1.31	1.27	
8,271.0	91.30	272.20	5,421.0	46.7	-3,113.1	3,113.5	1.75	1.75	
8,333.0	89.70	272.00	5,420.4	49.0	-3,175.1	3,175.4	2.60	-2.58	
8,396.0	90.70	271.60	5,420.2	51.0	-3,238.0	3,238.4	1.71	1.59	
8,459.0	90.00	271.10	5,419.8	52.4	-3,301.0	3,301.4	1.37	-1.11	
8,522.0	90.70	271.10	5,419.4	53.6	-3,364.0	3,364.4	1.11	1.11	
8,585.0	90.20	270.80	5,419.0	54.7	-3,427.0	3,427.4	0.93	-0.79	
8,648.0	90.70	270.50	5,418.5	55.4	-3,490.0	3,490.4	0.93	0.79	
8,711.0	91.50	270.40	5,417.2	55.9	-3,553.0	3,553.4	1.28	1.27	
8,774.0	90.70	270.60	5,416.0	56.5	-3,616.0	3,616.4	1.31	-1.27	
8,837.0	91.30	270.10	5,414.9	56.8	-3,678.9	3,679.4	1.24	0.95	
8,899.0	90.30	271.20	5,414.1	57.5	-3,740.9	3,741.4	2.40	-1.61	
8,960.0	88.90	270.90	5,414.5	58.7	-3,801.9	3,802.4	2.35	-2.30	
9,023.0	89.60	270.20	5,415.3	59.3	-3,864.9	3,865.4	1.57	1.11	
9,086.0	90.20	270.20	5,415.4	59.5	-3,927.9	3,928.4	0.95	0.95	
9,149.0	91.00	270.20	5,414.8	59.7	-3,990.9	3,991.4	1.27	1.27	
9,211.0	90.40	269.30	5,414.0	59.4	-4,052.9	4,053.3	1.74	-0.97	
9,274.0	89.90	270.00	5,413.9	59.0	-4,115.9	4,116.3	1.37	-0.79	
9,337.0	90.40	269.80	5,413.7	58.9	-4,178.9	4,179.3	0.85	0.79	
9,400.0	89.70	270.30	5,413.6	59.0	-4,241.9	4,242.3	1.37	-1.11	
9,463.0	90.40	270.00	5,413.6	59.2	-4,304.9	4,305.3	1.21	1.11	
9,525.0	89.30	270.70	5,413.7	59.5	-4,366.9	4,367.3	2.10	-1.77	
9,589.0	90.10	270.80	5,414.1	60.4	-4,430.9	4,431.3	1.26	1.25	
9,652.0	91.00	271.10	5,413.5	61.4	-4,493.9	4,494.3	1.51	1.43	
9,715.0	90.40	272.00	5,412.7	63.1	-4,556.8	4,557.3	1.72	-0.95	
9,778.0	88.60	271.40	5,413.2	65.0	-4,619.8	4,620.3	3.01	-2.86	
9,841.0	89.40	271.30	5,414.3	66.5	-4,682.8	4,683.3	1.28	1.27	
9,904.0	90.40	271.20	5,414.5	67.8	-4,745.8	4,746.3	1.60	1.59	
9,967.0	90.40	272.20	5,414.0	69.7	-4,808.8	4,809.3	1.59	0.00	

Cathedral Energy Services

Survey Report

Company:	LOGOS Operating LLC	Local Co-ordinate Reference:	Well LOGOS #601H
Project:	Sandoval County, NM	TVD Reference:	WELL @ 6905.5usft (Original Well Elev)
Site:	S5-T22N-R5W	MD Reference:	WELL @ 6905.5usft (Original Well Elev)
Well:	LOGOS #601H	North Reference:	True
Wellbore:	HZ	Survey Calculation Method:	Minimum Curvature
Design:	FINAL	Database:	USA EDM 5000 Multi Users DB

Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usf)	Build Rate (°/100u)	Formations / Comments
10,030.0	89.70	272.00	5,414.0	72.0	-4,871.7	4,872.2	1.16	-1.11	
10,093.0	90.30	271.70	5,414.0	74.1	-4,934.7	4,935.2	1.06	0.95	
10,155.0	90.30	270.80	5,413.6	75.4	-4,996.7	4,997.2	1.45	0.00	
10,218.0	90.70	270.40	5,413.1	76.1	-5,059.7	5,060.2	0.90	0.63	
10,282.0	90.40	269.90	5,412.5	76.2	-5,123.7	5,124.2	0.91	-0.47	
10,345.0	91.00	270.30	5,411.7	76.3	-5,186.6	5,187.2	1.14	0.95	
10,408.0	89.50	269.70	5,411.4	76.3	-5,249.6	5,250.2	2.56	-2.38	
10,471.0	90.60	270.60	5,411.4	76.5	-5,312.6	5,313.2	2.26	1.75	
10,534.0	91.50	273.20	5,410.2	78.6	-5,375.6	5,376.2	4.37	1.43	
10,597.0	91.20	272.20	5,408.7	81.6	-5,438.5	5,439.1	1.66	-0.48	
10,661.0	92.10	272.50	5,406.9	84.2	-5,502.4	5,503.1	1.48	1.41	
10,702.0	92.50	272.50	5,405.2	86.0	-5,543.4	5,544.0	0.98	0.98	Last Cathedral Survey @ 10,702' MD
10,747.0	92.50	272.50	5,403.3	87.9	-5,588.3	5,589.0	0.00	0.00	Projection to Bit @ 10,747'

Targets

Target Name	- hit/miss target	- Shape	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
LOGOS #601H NEW TC			0.00	0.00	5,409.4	80.2	-5,589.1	1,884,202.02	1,297,967.42	36° 10' 21.986 N	107° 24' 37.030 W
- actual wellpath misses target center by 9.9usft at 10747.0usft MD (5403.3 TVD, 87.9 N, -5588.3 E)											
- Point											
601H SH (440' FNL, 56C			0.00	359.32	-5,360.0	0.0	0.0	1,884,056.13	1,303,555.19	36° 10' 21.199 N	107° 23' 28.864 W
- actual wellpath misses target center by 5360.0usft at 0.0usft MD (0.0 TVD, 0.0 N, 0.0 E)											
- Point											
601H PBHL (440' FNL, 3			0.00	0.00	5,387.0	79.1	-5,509.1	1,884,199.96	1,298,047.39	36° 10' 21.976 N	107° 24' 36.054 W
- actual wellpath misses target center by 20.4usft at 10668.2usft MD (5406.6 TVD, 84.5 N, -5509.7 E)											
- Point											
601H PBHL (440' FNL, 3			0.00	0.00	5,387.0	79.1	-5,509.1	1,884,199.96	1,298,047.39	36° 10' 21.976 N	107° 24' 36.054 W
- actual wellpath misses target center by 20.4usft at 10668.2usft MD (5406.6 TVD, 84.5 N, -5509.7 E)											
- Point											
601H PBHL (440' FNL, 3			0.00	0.00	5,397.0	79.1	-5,509.1	1,884,199.96	1,298,047.39	36° 10' 21.976 N	107° 24' 36.054 W
- actual wellpath misses target center by 11.1usft at 10667.8usft MD (5406.6 TVD, 84.5 N, -5509.3 E)											
- Point											

Design Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
10,702.0	5,405.2	86.0	-5,543.4	Last Cathedral Survey @ 10,702' MD
10,747.0	5,403.3	87.9	-5,588.3	Projection to Bit @ 10,747'

Checked By: _____ Approved By: _____ Date: _____

Cathedral Energy Services

Survey Report

Company:	LOGOS Operating LLC	Local Co-ordinate Reference:	Well LOGOS #601H
Project:	Sandoval County, NM	TVD Reference:	WELL @ 6905.5usft (Original Well Elev)
Site:	S5-T22N-R5W	MD Reference:	WELL @ 6905.5usft (Original Well Elev)
Well:	LOGOS #601H	North Reference:	True
Wellbore:	HZ	Survey Calculation Method:	Minimum Curvature
Design:	FINAL	Database:	USA EDM 5000 Multi Users DB.

Project	Sandoval County, NM		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	New Mexico Central Zone		

Site:		S5-T22N-R5W			
Site Position:		Northing:	1,884,056.13 usft	Latitude:	36° 10' 21.199 N
From:	Lat/Long	Easting:	1,303,555.19 usft	Longitude:	107° 23' 28.864 W
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16"	Grid Convergence:	-0.67 °

Well	LOGOS #601H					
Well Position	+N-S	0.0 usft	Northing:	1,884,056.13 usft	Latitude:	36° 10' 21.199 N
	+E-W	0.0 usft	Easting:	1,303,555.19 usft	Longitude:	107° 23' 28.864 W
Position Uncertainty	0.0 usft	Wellhead Elevation:	usft	Ground Level:	6,891.0 usft	

Wellbore	Hz				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	1/14/2014	9.35	62.98	50,199

Design	FINAL				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.0
Vertical Section:	Depth From (TVD)	+N/-S	+E/-W	Direction	
	(usft)	(usft)	(usft)	(°)	
	0.0	0.0	0.0	270.82	

Survey Program		Date	1/27/2014		
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
562.0	10,747.0	Survey #1 (Hz)			

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usf)	Build Rate (°/100u)	Formations / Comments
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	
562.0	0.40	256.70	562.0	-0.5	-1.9	1.9	0.07	0.07	
623.0	0.40	250.10	623.0	-0.6	-2.3	2.3	0.08	0.00	
685.0	0.40	263.30	685.0	-0.7	-2.7	2.7	0.15	0.00	
745.0	0.80	270.60	745.0	-0.7	-3.4	3.4	0.68	0.67	
806.0	0.80	270.70	806.0	-0.7	-4.2	4.2	0.00	0.00	
867.0	0.80	268.90	867.0	-0.7	-5.1	5.1	0.04	0.00	
928.0	0.60	238.10	928.0	-0.9	-5.8	5.7	0.69	-0.33	
989.0	0.70	247.30	989.0	-1.2	-6.4	6.4	0.24	0.16	
1,050.0	0.60	267.90	1,050.0	-1.3	-7.0	7.0	0.41	-0.16	
1,112.0	0.50	247.00	1,112.0	-1.4	-7.6	7.6	0.36	-0.16	
1,172.0	0.70	266.50	1,172.0	-1.6	-8.2	8.2	0.47	0.33	
1,233.0	0.10	279.40	1,233.0	-1.6	-8.6	8.6	0.99	-0.98	

Cathedral Energy Services

Survey Report

Company:	LOGOS Operating LLC	Local Co-ordinate Reference:	Well LOGOS #601H
Project:	Sandoval County, NM	TVD Reference:	WELL @ 6905.5usft (Original Well Elev)
Site:	S5-T22N-R5W	MD Reference:	WELL @ 6905.5usft (Original Well Elev)
Well:	LOGOS #601H	North Reference:	True
Wellbore:	Hz	Survey Calculation Method:	Minimum Curvature
Design:	FINAL	Database:	USA EDM 5000 Multi Users DB

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usf)	Build Rate (°/100u)	Formations / Comments
1,294.0	0.40	123.40	1,294.0	-1.7	-8.5	8.5	0.81	0.49	
1,356.0	0.40	133.40	1,356.0	-2.0	-8.2	8.2	0.11	0.00	
1,417.0	0.30	178.10	1,417.0	-2.3	-8.0	8.0	0.46	-0.16	
1,478.0	0.20	99.40	1,478.0	-2.4	-7.9	7.9	0.53	-0.16	
1,540.0	0.50	158.10	1,540.0	-2.7	-7.7	7.7	0.70	0.48	
1,601.0	0.70	103.30	1,600.9	-3.0	-7.2	7.2	0.95	0.33	
1,662.0	0.80	66.80	1,661.9	-3.0	-6.5	6.4	0.79	0.16	
1,723.0	0.80	41.60	1,722.9	-2.5	-5.8	5.8	0.57	0.00	
1,784.0	0.70	69.20	1,783.9	-2.0	-5.2	5.2	0.61	-0.16	
1,847.0	0.80	65.30	1,846.9	-1.7	-4.4	4.4	0.18	0.16	
1,911.0	0.90	68.80	1,910.9	-1.3	-3.5	3.5	0.18	0.16	
1,974.0	0.80	83.90	1,973.9	-1.1	-2.6	2.6	0.39	-0.16	
2,037.0	0.70	78.40	2,036.9	-1.0	-1.8	1.8	0.20	-0.16	
2,100.0	0.90	80.20	2,099.9	-0.8	-1.0	1.0	0.32	0.32	
2,164.0	0.90	77.50	2,163.9	-0.6	0.0	0.0	0.07	0.00	
2,227.0	0.90	84.50	2,226.9	-0.5	1.0	-1.0	0.17	0.00	
2,290.0	0.50	68.00	2,289.9	-0.3	1.7	-1.7	0.70	-0.63	
2,353.0	0.50	99.40	2,352.9	-0.3	2.3	-2.3	0.43	0.00	
2,417.0	0.70	99.40	2,416.9	-0.4	2.9	-2.9	0.31	0.31	
2,480.0	0.80	101.40	2,479.9	-0.5	3.7	-3.7	0.16	0.16	
2,543.0	0.80	91.80	2,542.9	-0.6	4.6	-4.6	0.21	0.00	
2,606.0	0.50	89.30	2,605.9	-0.6	5.3	-5.3	0.48	-0.48	
2,669.0	0.80	81.00	2,668.9	-0.6	6.0	-6.0	0.50	0.48	
2,732.0	0.40	17.20	2,731.8	-0.3	6.5	-6.5	1.14	-0.63	
2,795.0	0.10	111.80	2,794.8	-0.1	6.6	-6.6	0.67	-0.48	
2,859.0	0.10	187.50	2,858.8	-0.2	6.7	-6.7	0.19	0.00	
2,922.0	0.30	238.10	2,921.8	-0.3	6.5	-6.5	0.39	0.32	
2,985.0	0.30	218.90	2,984.8	-0.5	6.3	-6.3	0.16	0.00	
3,048.0	0.40	163.80	3,047.8	-0.9	6.3	-6.3	0.53	0.16	
3,111.0	0.60	164.60	3,110.8	-1.4	6.4	-6.4	0.32	0.32	
3,175.0	0.40	136.30	3,174.8	-1.9	6.6	-6.7	0.49	-0.31	
3,238.0	0.40	164.40	3,237.8	-2.3	6.9	-6.9	0.31	0.00	
3,301.0	0.40	125.90	3,300.8	-2.6	7.1	-7.1	0.42	0.00	
3,365.0	0.30	13.80	3,364.8	-2.6	7.3	-7.4	0.91	-0.16	
3,428.0	0.50	328.70	3,427.8	-2.2	7.2	-7.2	0.57	0.32	
3,491.0	0.40	304.20	3,490.8	-1.8	6.9	-6.9	0.34	-0.16	
3,554.0	0.20	301.70	3,553.8	-1.6	6.6	-6.6	0.32	-0.32	
3,617.0	0.40	347.40	3,616.8	-1.4	6.5	-6.5	0.47	0.32	
3,680.0	0.20	32.60	3,679.8	-1.1	6.5	-6.5	0.47	-0.32	
3,743.0	0.30	157.20	3,742.8	-1.1	6.6	-6.6	0.71	0.16	
3,807.0	0.20	300.80	3,806.8	-1.2	6.6	-6.6	0.74	-0.16	
3,870.0	0.30	237.20	3,869.8	-1.2	6.3	-6.4	0.44	0.16	
3,933.0	0.10	243.20	3,932.8	-1.4	6.2	-6.2	0.32	-0.32	
3,997.0	0.40	242.50	3,996.8	-1.5	5.9	-5.9	0.47	0.47	
4,060.0	0.20	201.80	4,059.8	-1.7	5.7	-5.7	0.45	-0.32	
4,123.0	0.40	261.10	4,122.8	-1.8	5.4	-5.4	0.55	0.32	
4,186.0	0.40	217.80	4,185.8	-2.0	5.1	-5.1	0.47	0.00	
4,249.0	0.30	214.90	4,248.8	-2.3	4.8	-4.9	0.16	-0.16	
4,313.0	0.60	231.40	4,312.8	-2.7	4.5	-4.5	0.51	0.47	
4,376.0	0.40	193.30	4,375.8	-3.1	4.2	-4.2	0.60	-0.32	
4,439.0	0.40	213.50	4,438.8	-3.5	4.0	-4.0	0.22	0.00	
4,502.0	0.50	200.80	4,501.8	-3.9	3.8	-3.8	0.22	0.16	
4,566.0	0.30	269.30	4,565.8	-4.2	3.5	-3.6	0.75	-0.31	

Cathedral Energy Services

Survey Report

Company:	LOGOS Operating LLC	Local Co-ordinate Reference:	Well LOGOS #601H
Project:	Sandoval County, NM	TVD Reference:	WELL @ 6905.5usft (Original Well Elev)
Site:	S5-T22N-R5W	MD Reference:	WELL @ 6905.5usft (Original Well Elev)
Well:	LOGOS #601H	North Reference:	True
Wellbore:	HZ	Survey Calculation Method:	Minimum Curvature
Design:	FINAL	Database:	USA EDM 5000 Multi Users DB

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usf)	Build Rate (°/100u)	Formations / Comments
4,629.0	0.60	237.90	4,628.8	-4.4	3.1	-3.1	0.60	0.48	
4,692.0	0.80	230.50	4,691.8	-4.8	2.4	-2.5	0.35	0.32	
4,754.0	0.50	232.60	4,753.8	-5.3	1.9	-2.0	0.49	-0.48	
4,768.0	0.40	203.70	4,767.8	-5.4	1.8	-1.9	1.75	-0.71	
4,800.0	0.40	201.90	4,799.8	-5.6	1.7	-1.8	0.04	0.00	
4,831.0	2.30	255.50	4,830.8	-5.8	1.1	-1.2	6.73	6.13	
4,863.0	6.40	262.40	4,862.7	-6.2	-1.3	1.2	12.89	12.81	
4,894.0	9.80	264.90	4,893.4	-6.7	-5.6	5.5	11.02	10.97	
4,926.0	12.60	262.20	4,924.8	-7.4	-11.8	11.7	8.90	8.75	
4,958.0	14.70	265.90	4,955.9	-8.2	-19.3	19.2	7.10	6.56	
4,990.0	16.90	269.80	4,986.7	-8.5	-28.0	27.9	7.63	6.87	
5,021.0	19.50	271.80	5,016.1	-8.3	-37.7	37.6	8.62	8.39	
5,053.0	23.00	273.00	5,045.9	-7.8	-49.3	49.2	11.02	10.94	
5,084.0	25.50	273.20	5,074.2	-7.1	-62.0	61.9	8.07	8.06	
5,116.0	27.20	273.40	5,102.9	-6.3	-76.2	76.1	5.32	5.31	
5,148.0	28.90	271.80	5,131.1	-5.6	-91.2	91.1	5.81	5.31	
5,179.0	31.40	269.40	5,157.9	-5.5	-106.8	106.7	8.95	8.06	
5,211.0	34.90	267.90	5,184.7	-5.9	-124.3	124.2	11.23	10.94	
5,242.0	38.60	267.40	5,209.5	-6.7	-142.8	142.7	11.97	11.94	
5,274.0	42.50	269.30	5,233.8	-7.3	-163.6	163.5	12.78	12.19	
5,305.0	46.50	270.90	5,256.0	-7.2	-185.3	185.2	13.40	12.90	
5,337.0	50.70	271.70	5,277.1	-6.7	-209.3	209.2	13.26	13.12	
5,369.0	54.90	272.80	5,296.5	-5.7	-234.8	234.6	13.41	13.12	
5,401.0	58.30	273.80	5,314.1	-4.1	-261.4	261.3	10.94	10.62	
5,432.0	61.70	274.40	5,329.6	-2.2	-288.2	288.1	11.10	10.97	
5,464.0	66.40	273.90	5,343.6	-0.1	-316.9	316.8	14.75	14.69	
5,496.0	70.40	273.70	5,355.3	1.9	-346.6	346.6	12.51	12.50	
5,528.0	73.70	273.00	5,365.2	3.6	-376.9	377.0	10.52	10.31	
5,559.0	75.40	272.20	5,373.5	5.0	-406.8	406.8	6.02	5.48	
5,591.0	76.50	271.70	5,381.2	6.0	-437.8	437.9	3.76	3.44	
5,623.0	77.00	271.90	5,388.6	7.0	-469.0	469.0	1.68	1.56	
5,654.0	78.60	271.30	5,395.1	7.9	-499.2	499.3	5.50	5.16	
5,686.0	80.80	271.40	5,400.8	8.6	-530.7	530.8	6.88	6.87	
5,718.0	82.20	270.90	5,405.6	9.2	-562.4	562.4	4.64	4.37	
5,750.0	82.40	270.40	5,409.8	9.6	-594.1	594.1	1.67	0.62	
5,781.0	83.10	271.30	5,413.8	10.1	-624.8	624.9	3.66	2.26	
5,801.0	83.50	271.60	5,416.1	10.6	-644.7	644.8	2.49	2.00	
5,843.0	83.50	269.60	5,420.8	11.0	-686.4	686.5	4.73	0.00	
5,875.0	83.80	269.50	5,424.4	10.7	-718.2	718.3	0.99	0.94	
5,907.0	84.50	269.00	5,427.6	10.3	-750.0	750.1	2.68	2.19	
5,939.0	87.90	268.80	5,429.8	9.7	-781.9	782.0	10.64	10.63	
5,971.0	89.30	269.70	5,430.6	9.3	-813.9	814.0	5.20	4.38	
6,035.0	90.50	269.40	5,430.7	8.8	-877.9	878.0	1.93	1.88	
6,099.0	90.90	270.00	5,429.9	8.5	-941.9	941.9	1.13	0.63	
6,160.0	90.10	270.00	5,429.3	8.5	-1,002.9	1,002.9	1.31	-1.31	
6,222.0	89.50	269.70	5,429.6	8.3	-1,064.9	1,064.9	1.08	-0.97	
6,283.0	89.70	270.20	5,430.0	8.2	-1,125.9	1,125.9	0.88	0.33	
6,345.0	89.80	271.50	5,430.3	9.2	-1,187.9	1,187.9	2.10	0.16	
6,406.0	90.40	271.20	5,430.2	10.6	-1,248.9	1,248.9	1.10	0.98	
6,469.0	90.80	270.90	5,429.5	11.8	-1,311.9	1,311.9	0.79	0.63	
6,530.0	90.00	271.60	5,429.1	13.1	-1,372.8	1,372.9	1.74	-1.31	
6,591.0	89.10	272.20	5,429.5	15.1	-1,433.8	1,433.9	1.77	-1.48	
6,653.0	89.80	272.00	5,430.1	17.4	-1,495.8	1,495.9	1.17	1.13	

Cathedral Energy Services

Survey Report

Company:	LOGOS Operating LLC	Local Co-ordinate Reference:	Well LOGOS #601H
Project:	Sandoval County, NM	TVD Reference:	WELL @ 6905.5usft (Original Well Elev)
Site:	S5-T22N-R5W	MD Reference:	WELL @ 6905.5usft (Original Well Elev)
Well:	LOGOS #601H	North Reference:	True
Wellbore:	H2	Survey Calculation Method:	Minimum Curvature
Design:	FINAL	Database:	USA EDM 5000 Multi Users DB

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100u)	Formations / Comments
6,714.0	89.30	271.80	5,430.6	19.4	-1,556.7	1,556.8	0.88	-0.82	
6,775.0	89.90	271.60	5,431.0	21.2	-1,617.7	1,617.8	1.04	0.98	
6,836.0	89.70	272.10	5,431.3	23.2	-1,678.7	1,678.8	0.88	-0.33	
6,898.0	89.00	271.50	5,432.0	25.1	-1,740.6	1,740.8	1.49	-1.13	
6,959.0	89.70	271.50	5,432.7	26.7	-1,801.6	1,801.8	1.15	1.15	
7,021.0	90.40	270.90	5,432.6	28.0	-1,863.6	1,863.8	1.49	1.13	
7,083.0	89.50	270.70	5,432.7	28.9	-1,925.6	1,925.8	1.49	-1.45	
7,144.0	90.00	270.80	5,432.9	29.7	-1,986.6	1,986.8	0.84	0.82	
7,206.0	90.70	271.20	5,432.5	30.8	-2,048.6	2,048.8	1.30	1.13	
7,268.0	91.20	271.00	5,431.5	32.0	-2,110.6	2,110.8	0.87	0.81	
7,330.0	91.80	270.80	5,429.9	32.9	-2,172.5	2,172.8	1.02	0.97	
7,392.0	91.00	270.50	5,428.4	33.6	-2,234.5	2,234.8	1.38	-1.29	
7,453.0	90.40	270.40	5,427.6	34.1	-2,295.5	2,295.7	1.00	-0.98	
7,515.0	90.50	269.30	5,427.1	34.0	-2,357.5	2,357.7	1.78	0.16	
7,578.0	91.30	268.60	5,426.2	32.8	-2,420.5	2,420.7	1.69	1.27	
7,642.0	90.70	269.00	5,425.0	31.5	-2,484.4	2,484.6	1.13	-0.94	
7,705.0	90.80	269.90	5,424.2	30.9	-2,547.4	2,547.6	1.44	0.16	
7,768.0	90.00	269.50	5,423.8	30.5	-2,610.4	2,610.6	1.42	-1.27	
7,831.0	90.60	270.90	5,423.4	30.7	-2,673.4	2,673.6	2.42	0.95	
7,894.0	90.20	272.20	5,423.0	32.5	-2,736.4	2,736.6	2.16	-0.63	
7,957.0	91.00	271.80	5,422.3	34.6	-2,799.4	2,799.6	1.42	1.27	
8,020.0	89.80	272.20	5,421.9	36.8	-2,862.3	2,862.6	2.01	-1.90	
8,082.0	90.70	272.20	5,421.6	39.2	-2,924.3	2,924.5	1.45	1.45	
8,145.0	89.40	272.40	5,421.6	41.8	-2,987.2	2,987.5	2.09	-2.06	
8,208.0	90.20	272.20	5,421.8	44.3	-3,050.2	3,050.5	1.31	1.27	
8,271.0	91.30	272.20	5,421.0	46.7	-3,113.1	3,113.5	1.75	1.75	
8,333.0	89.70	272.00	5,420.4	49.0	-3,175.1	3,175.4	2.60	-2.58	
8,396.0	90.70	271.60	5,420.2	51.0	-3,238.0	3,238.4	1.71	1.59	
8,459.0	90.00	271.10	5,419.8	52.4	-3,301.0	3,301.4	1.37	-1.11	
8,522.0	90.70	271.10	5,419.4	53.6	-3,364.0	3,364.4	1.11	1.11	
8,585.0	90.20	270.80	5,419.0	54.7	-3,427.0	3,427.4	0.93	-0.79	
8,648.0	90.70	270.50	5,418.5	55.4	-3,490.0	3,490.4	0.93	0.79	
8,711.0	91.50	270.40	5,417.2	55.9	-3,553.0	3,553.4	1.28	1.27	
8,774.0	90.70	270.60	5,416.0	56.5	-3,616.0	3,616.4	1.31	-1.27	
8,837.0	91.30	270.10	5,414.9	56.8	-3,678.9	3,679.4	1.24	0.95	
8,899.0	90.30	271.20	5,414.1	57.5	-3,740.9	3,741.4	2.40	-1.61	
8,960.0	88.90	270.90	5,414.5	58.7	-3,801.9	3,802.4	2.35	-2.30	
9,023.0	89.60	270.20	5,415.3	59.3	-3,864.9	3,865.4	1.57	1.11	
9,086.0	90.20	270.20	5,415.4	59.5	-3,927.9	3,928.4	0.95	0.95	
9,149.0	91.00	270.20	5,414.8	59.7	-3,990.9	3,991.4	1.27	1.27	
9,211.0	90.40	269.30	5,414.0	59.4	-4,052.9	4,053.3	1.74	-0.97	
9,274.0	89.90	270.00	5,413.9	59.0	-4,115.9	4,116.3	1.37	-0.79	
9,337.0	90.40	269.80	5,413.7	58.9	-4,178.9	4,179.3	0.85	0.79	
9,400.0	89.70	270.30	5,413.6	59.0	-4,241.9	4,242.3	1.37	-1.11	
9,463.0	90.40	270.00	5,413.6	59.2	-4,304.9	4,305.3	1.21	1.11	
9,525.0	89.30	270.70	5,413.7	59.5	-4,366.9	4,367.3	2.10	-1.77	
9,589.0	90.10	270.80	5,414.1	60.4	-4,430.9	4,431.3	1.26	1.25	
9,652.0	91.00	271.10	5,413.5	61.4	-4,493.9	4,494.3	1.51	1.43	
9,715.0	90.40	272.00	5,412.7	63.1	-4,556.8	4,557.3	1.72	-0.95	
9,778.0	88.60	271.40	5,413.2	65.0	-4,619.8	4,620.3	3.01	-2.86	
9,841.0	89.40	271.30	5,414.3	66.5	-4,682.8	4,683.3	1.28	1.27	
9,904.0	90.40	271.20	5,414.5	67.8	-4,745.8	4,746.3	1.60	1.59	
9,967.0	90.40	272.20	5,414.0	69.7	-4,808.8	4,809.3	1.59	0.00	

Cathedral Energy Services

Survey Report

Company:	LOGOS Operating LLC	Local Co-ordinate Reference:	Well LOGOS #601H
Project:	Sandoval County, NM	TVD Reference:	WELL @ 6905.5usft (Original Well Elev)
Site:	S5-T22N-R5W	MD Reference:	WELL @ 6905.5usft (Original Well Elev)
Well:	LOGOS #601H	North Reference:	True
Wellbore:	Hz	Survey Calculation Method:	Minimum Curvature
Design:	FINAL	Database:	USA EDM 5000 Multi Users DB

Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usf)	Build Rate (°/100u)	Formations / Comments
10,030.0	89.70	272.00	5,414.0	72.0	-4,871.7	4,872.2	1.16	-1.11	
10,093.0	90.30	271.70	5,414.0	74.1	-4,934.7	4,935.2	1.06	0.95	
10,155.0	90.30	270.80	5,413.6	75.4	-4,996.7	4,997.2	1.45	0.00	
10,218.0	90.70	270.40	5,413.1	76.1	-5,059.7	5,060.2	0.90	0.63	
10,282.0	90.40	269.90	5,412.5	76.2	-5,123.7	5,124.2	0.91	-0.47	
10,345.0	91.00	270.30	5,411.7	76.3	-5,186.6	5,187.2	1.14	0.95	
10,408.0	89.50	269.70	5,411.4	76.3	-5,249.6	5,250.2	2.56	-2.38	
10,471.0	90.60	270.60	5,411.4	76.5	-5,312.6	5,313.2	2.26	1.75	
10,534.0	91.50	273.20	5,410.2	78.6	-5,375.6	5,376.2	4.37	1.43	
10,597.0	91.20	272.20	5,408.7	81.6	-5,438.5	5,439.1	1.66	-0.48	
10,661.0	92.10	272.50	5,406.9	84.2	-5,502.4	5,503.1	1.48	1.41	
10,702.0	92.50	272.50	5,405.2	86.0	-5,543.4	5,544.0	0.98	0.98	Last Cathedral Survey @ 10,702' MD
10,747.0	92.50	272.50	5,403.3	87.9	-5,588.3	5,589.0	0.00	0.00	Projection to Bit @ 10,747'

Targets

Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
- hit/miss target									
- Shape									
LOGOS #601H NEW TC	0.00	0.00	5,409.4	80.2	-5,589.1	1,884,202.02	1,297,967.42	36° 10' 21.986 N	107° 24' 37.030 W
- actual wellpath misses target center by 9.9usft at 10747.0usft MD (5403.3 TVD, 87.9 N, -5588.3 E)									
- Point									
601H SH (440' FNL, 56C	0.00	359.32	-5,360.0	0.0	0.0	1,884,056.13	1,303,555.19	36° 10' 21.199 N	107° 23' 28.864 W
- actual wellpath misses target center by 5360.0usft at 0.0usft MD (0.0 TVD, 0.0 N, 0.0 E)									
- Point									
601H PBHL (440' FNL, 3	0.00	0.00	5,387.0	79.1	-5,509.1	1,884,199.96	1,298,047.39	36° 10' 21.976 N	107° 24' 36.054 W
- actual wellpath misses target center by 20.4usft at 10668.2usft MD (5406.6 TVD, 84.5 N, -5509.7 E)									
- Point									
601H PBHL (440' FNL, 3	0.00	0.00	5,387.0	79.1	-5,509.1	1,884,199.96	1,298,047.39	36° 10' 21.976 N	107° 24' 36.054 W
- actual wellpath misses target center by 20.4usft at 10668.2usft MD (5406.6 TVD, 84.5 N, -5509.7 E)									
- Point									
601H PBHL (440' FNL, 3	0.00	0.00	5,397.0	79.1	-5,509.1	1,884,199.96	1,298,047.39	36° 10' 21.976 N	107° 24' 36.054 W
- actual wellpath misses target center by 11.1usft at 10667.8usft MD (5406.6 TVD, 84.5 N, -5509.3 E)									
- Point									

Design Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates	Comment
		+N/-S (usft)	+E/-W (usft)
10,702.0	5,405.2	86.0	-5,543.4
10,747.0	5,403.3	87.9	-5,588.3
			Last Cathedral Survey @ 10,702' MD
			Projection to Bit @ 10,747'

Checked By: _____ Approved By: _____ Date: _____