

Oilfield Services, Central U.S. Land
Schlumberger Drilling and Measurements
Drilling Group
Geo Market Area: South West Texas Basin
7220 W I-H 20
Midland, Texas 79706
Phone : (432) 742-5400 (Main)
Fax : (432) 742-5606 (Shared)

Schlumberger

December 7, 2016

Oxy USA Incorporated
5 Greenway Plaza Ste 110
Houston, TX 77046-0521

22, 24S, 29E, Eddy NM
-32.20250 -103.96401

Re:

CLIENT: Oxy USA Incorporated
WELL: Cedar Canyon 22 Federal 21H
FIELD: Pierce Crossing

RIG: H&P639
COUNTY: Eddy
API NO: 30-015-43642
JOB NO: 16MLD2124

Enclosed, please find the original copy of the survey performed on the referenced well by Drilling & Measurements, a division of Schlumberger Technology Corporation (P-5 No. 754900).
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>
Kalu Uga FE	Cedar Canyon 22 Federal 21H Original Hole	448.00 Ft to 13563.00 Ft	November 25, 2016 to December 5, 2016	TelePacer SlimPulse

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

Dana Carlos
Field Service Manager

**Schlumberger Drilling and Measurements
Drilling Group**

7220 W I-H 20

Midland, Texas 79706

Phone: (432) 742-5400 (Main)

Fax: (432) 742-5606 (Shared)

Well Reference:

22, 24S, 29E, Eddy NM

-32.20250 -103.96401

I, Kalu Uga certify that; I am employed by Drilling & Measurements, a division of Schlumberger Technology Corporation; that I did on the day(s) of November 25, 2016 through December 05, 2016, conduct or supervise the taking of the TelePacer & SlimPulse surveys from a depth of 448.00 feet to a depth of 13563.00 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 Oxy USA Incorporated for the Cedar Canyon 22 Federal 21H Well (Original Hole) API No. 30-015-43642 in New Mexico; 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

Kalu Uga

FE



Subscribed and Sworn to before me this 13 day of December (month) 2016 (yr)

My Commission expires:

4-10-19

Tim Hughes

Notary Public

Los Angeles California

(County State)

TIM HUGHES
NOTARY PUBLIC
SEE ADDENDUM PAGE
COMM EXP MAY 10 2019

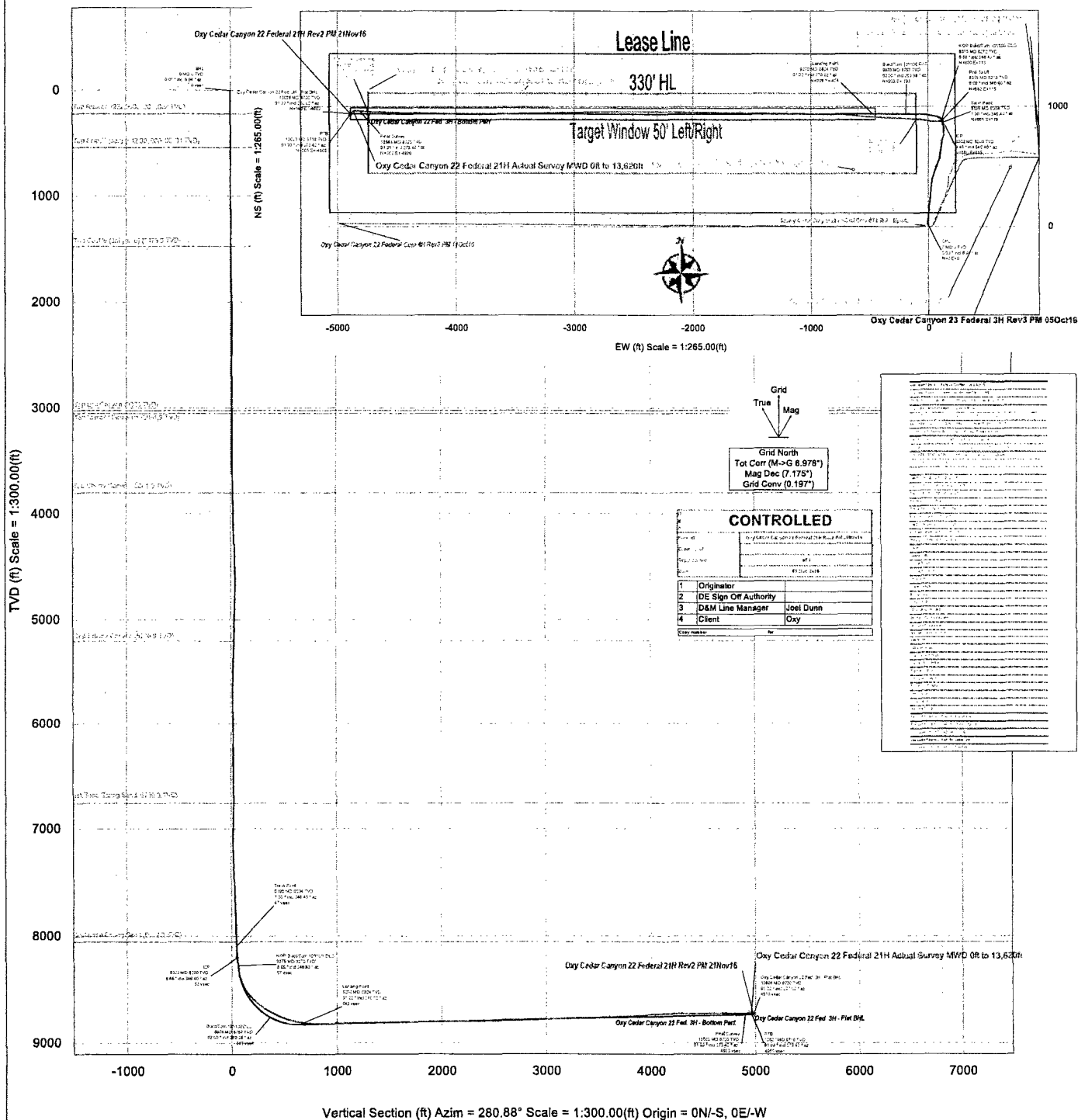

(signature)

Borehole:	Well:	Field:	Structure:
Original Borehole	Oxy Cedar Canyon 22 Federal 21H	NM Eddy County (NAD 27)	Oxy Cedar Canyon 22 Federal 21H

Gravity & Magnetic Parameters	Surface Location	Well Location	Well Location
Model: HOGM 2014	NAD27 New Mexico State Plane, Eastern Zone, US Feet	Lat: N 32 12 9.31	North: 437166.71905
Dip: 88.049°	Date: 21-Nov-2016	Long: W 101 57 00.44	East: 814235.88108
MagDec: 7.175°	PS: 48183.238mT	Gravity PS: 938.467mgals (9.80665 Based)	Grid Conv: 8.1948°
			Scale Fact: 8.99932404
			Plan: Oxy Cedar Canyon 22 Federal 21H Rev2 PM 21Nov16

Critical Points

Comments	Survey MD (ft)	Inclination (deg)	Azimuth (deg)	TVD (ft)	Sub-Sea TVD	VS (ft)	NS (ft)	EW (ft)	Latitude (deg)	Longitude (deg)	Easting (ftUS)	Northing (ftUS)	DLS (°/100ft)	Tool Face (deg)
Tie in Point	8195.00	7.30	346.40	8093.75	5108.85	46.80	865.45	118.69	N 32 12 17.573	W 103 57 49.025	614354.56	438452.09	1.41	0.00
ICP	8302.27	8.46	346.40	8200.00	5215.10	52.90	879.74	115.23	N 32 12 17.714	W 103 57 49.064	614351.10	438466.38	1.08	346.40
Proj to bit	8315.00	8.60	346.40	8212.59	5227.69	53.68	881.58	114.79	N 32 12 17.733	W 103 57 49.070	614350.66	438468.22	1.08	0.00
KOP Build/Turn 10°/100' DLS	8374.88	8.60	346.40	8271.80	5286.90	57.39	890.28	112.68	N 32 12 17.819	W 103 57 49.094	614348.55	438476.92	0.00	-81.07
Build/Turn 10°/100' DLS	8978.06	62.00	269.98	8757.27	5772.37	366.66	938.57	-192.97	N 32 12 18.307	W 103 57 52.649	614042.92	438525.20	10.00	0.07
Landing Point	9270.30	91.22	270.02	8824.20	5839.30	642.83	938.56	-474.20	N 32 12 18.316	W 103 57 55.922	613761.72	438525.20	10.00	0.00
Oxy Cedar Canyon 22 Fed. 3H - Plat BHL	13686.11	91.22	270.02	8729.90	5745.00	4978.49	939.72	-4889.00	N 32 12 18.475	W 103 58 47.301	609347.26	438526.36	0.00	



Oxy Cedar Canyon 22 Federal 21H Actual Survey MWD 0ft to Update Survey Report (Non-Def Survey)



Report Date:	December 05, 2016 - 07:25 PM	Survey / DLS Computation:	Minimum Curvature / Lubinski
Client:	OXY	Vertical Section Azimuth:	280.880 ° (Grid North)
Field:	NM Eddy County (NAD 27)	Vertical Section Origin:	0.000 ft, 0.000 ft
Structure / Slot:	Oxy Cedar Canyon 22 Federal 21H / Oxy Cedar Canyon 22 Fed. 21H	TVD Reference Datum:	RKB
Well:	Oxy Cedar Canyon 22 Federal 21H	TVD Reference Elevation:	2984.900 ft above MSL
Borehole:	Original Borehole	Seabed / Ground Elevation:	2958.400 ft above MSL
UWI / API#:	Unknown / Unknown	Magnetic Declination:	7.181 °
Survey Name:	Oxy Cedar Canyon 22 Federal 21H Actual Survey MWD 0ft to Update	Total Gravity Field Strength:	998.4673mgn (9.80665 Based)
Survey Date:	October 31, 2016	Gravity Model:	GARM
Tort / AHD / DDI / ERD Ratio:	223.077 ° / 5887.942 ft / 6.307 / 0.668	Total Magnetic Field Strength:	48189.480 nT
Coordinate Reference System:	NAD27 New Mexico State Plane, Eastern Zone, US Feet	Magnetic Dip Angle:	60.049 °
Location Lat / Long:	N 32° 12' 9.01288", W 103° 57' 50.44068"	Declination Date:	October 31, 2016
Location Grid N/E Y/X:	N 437586.710 ftUS, E 614235.880 ftUS	Magnetic Declination Model:	HDGM 2016
CRS Grid Convergence Angle:	0.1968 °	North Reference:	Grid North
Grid Scale Factor:	0.99992404	Grid Convergence Used:	0.1968 °
Version / Patch:	2.10.254.0	Total Corr Mag North->Grid North:	6.9838 °
		Local Coord Referenced To:	Structure Reference Point

Comments	MD (ft)	Incl (°)	Azim Grid (°)	TVD (ft)	VSEC (ft)	NS (ft)	EW (ft)	Closure (ft)	Closure Azimuth (°)	DLS (°/100ft)	TF (°)
SHL	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	N/A	281.82M
	448.00	0.24	281.82	448.00	0.94	0.19	-0.92	0.94	281.82	0.05	3.75M
	689.00	0.48	3.75	688.99	1.57	1.30	-1.35	1.87	314.06	0.21	12.73M
	870.00	0.59	12.73	869.99	1.83	2.97	-1.09	3.16	339.81	0.08	358.71M
	1051.00	0.90	358.71	1050.97	1.90	5.30	-0.92	5.38	350.17	0.20	350.62M
	1239.00	0.88	350.62	1238.95	2.71	8.20	-1.19	8.28	351.76	0.07	330.25M
	1427.00	0.90	330.25	1426.93	4.17	10.91	-2.15	11.12	348.82	0.17	313.19M
	1616.00	0.84	313.19	1615.91	6.31	13.14	-3.90	13.71	343.47	0.14	297.71M
	1710.00	0.88	297.71	1709.89	7.59	13.95	-5.04	14.83	340.13	0.25	282.42M
	1804.00	1.23	282.42	1803.88	9.28	14.50	-6.67	15.96	335.31	0.47	276.62M
	1898.00	1.43	276.62	1897.85	11.46	14.85	-8.82	17.27	329.31	0.26	358.2M
	1992.00	0.51	358.20	1991.84	12.72	15.41	-10.00	18.37	327.03	1.54	160.08M
	2086.00	0.44	160.06	2085.84	12.63	15.49	-9.89	18.37	327.45	1.00	334.25M
	2181.00	0.55	334.25	2180.84	12.72	15.55	-9.96	18.47	327.37	1.04	86.22M
	2275.00	0.51	86.22	2274.84	12.58	15.99	-9.74	18.72	328.66	0.94	179.37M
	2370.00	0.20	179.37	2369.84	12.14	15.85	-9.31	18.38	329.56	0.59	5.36M
	2464.00	0.11	5.36	2463.84	12.11	15.78	-9.30	18.32	329.47	0.33	152.49M
	2558.00	0.11	152.49	2557.84	12.07	15.79	-9.25	18.30	329.62	0.22	95.5M
	2653.00	0.11	95.50	2652.84	11.92	15.70	-9.12	18.15	329.84	0.11	235.59M
	2747.00	0.22	235.59	2746.84	11.96	15.59	-9.18	18.09	329.50	0.38	56.28M
	2841.00	0.09	56.28	2840.84	12.03	15.52	-9.27	18.08	329.16	0.33	310.46M
	2935.00	0.24	310.46	2934.84	12.15	15.89	-9.36	18.27	329.20	0.30	306.52M
	3029.00	0.31	306.52	3028.83	12.55	15.97	-9.71	18.69	328.70	0.08	90.48M
	3123.00	0.09	90.48	3122.83	12.71	16.12	-9.84	18.89	328.60	0.41	209.94M
	3218.00	0.09	209.94	3217.83	12.66	16.06	-9.80	18.81	328.60	0.16	169.07M
	3312.00	0.09	169.07	3311.83	12.65	15.92	-9.83	18.71	328.32	0.07	231.11M
	3406.00	0.11	231.11	3405.83	12.69	15.79	-9.88	18.63	327.96	0.11	358.68M
	3500.00	3.21	358.68	3499.79	13.30	18.37	-10.01	20.92	331.40	3.49	1.01M
	3594.00	6.94	1.01	3593.40	14.83	26.68	-9.97	28.48	339.50	3.97	0.8M
	3688.00	10.90	0.80	3686.24	17.36	41.25	-9.75	42.39	346.70	4.21	11.68R
	3782.00	15.89	4.54	3777.66	20.34	62.98	-8.61	63.56	352.22	5.39	22.14R
	3877.00	19.21	8.59	3868.23	22.40	91.41	-5.24	91.56	356.72	3.72	0.29R
	3971.00	20.61	8.61	3956.61	23.67	123.06	-0.45	123.06	359.79	1.49	30.52R
	4065.00	20.70	8.76	4044.57	24.94	155.83	4.55	155.90	1.67	0.11	123.52L
	4159.00	20.44	7.62	4132.57	26.49	188.52	9.26	188.75	2.81	0.51	34.59L
	4253.00	21.29	6.02	4220.41	28.87	221.76	13.29	222.16	3.41	1.09	143.32L
	4348.00	20.96	5.33	4309.03	31.98	255.83	16.61	256.37	3.72	0.43	151.61L
	4442.00	20.59	4.76	4398.91	35.36	289.04	19.55	289.70	3.87	0.45	158.89R
	4536.00	19.87	5.58	4485.11	38.60	321.42	22.47	322.20	4.00	0.82	164.32R
	4631.00	17.29	8.03	4575.16	40.80	351.47	26.01	352.43	4.23	2.84	157.69R
	4725.00	15.76	10.36	4665.27	41.61	377.86	30.26	379.07	4.58	1.77	148.86R
	4819.00	13.95	15.01	4758.13	40.91	401.36	35.49	402.93	5.05	2.30	148.33R
	4913.00	12.44	19.44	4847.65	38.58	421.86	41.80	423.92	5.66	1.93	179.62R
	5008.00	11.82	19.46	4940.53	35.61	440.68	48.44	443.33	6.27	0.65	9.21L
	5102.00	12.53	18.93	5032.41	32.74	459.40	54.96	462.68	6.82	0.76	178.03L
	5196.00	11.65	18.78	5124.33	30.01	478.03	61.32	481.95	7.31	0.94	126.74R
	5291.00	11.62	18.98	5217.37	27.35	496.16	67.52	500.74	7.75	0.05	170.99R
	5385.00	10.86	19.62	5309.57	24.67	513.48	73.57	518.70	8.15	0.82	9.86L
	5479.00	11.54	19.03	5401.78	21.99	530.69	79.61	536.62	8.53	0.73	151.03L
	5573.00	10.99	17.42	5493.97	19.63	548.12	85.36	554.73	8.85	0.67	77.75L
	5667.00	11.16	13.87	5586.22	18.14	565.50	90.22	572.66	9.07	0.75	38.51L
	5762.00	12.17	10.15	5679.28	17.79	584.29	94.19	591.83	9.18	1.33	172.26L
	5856.00	11.16	9.44	5771.31	18.14	603.01	97.43	610.84	9.18	1.09	166.1L
	5950.00	9.84	7.52	5863.74	18.84	619.95	99.98	627.96	9.18	1.45	175.91L
	6045.00	6.68	6.97	5957.50	19.81	635.12	101.91	643.24	9.12	1.22	138.15R
	6139.00	7.91	12.20	6050.52	20.14	648.48	104.14	656.79	9.12	1.15	8.6M
	6233.00	7.49	8.60	6143.67	20.24	660.86	106.42	669.37	9.15	0.68	6.01M
	6328.00	6.90	6.01	6237.92	20.97	672.66	107.94	681.28	9.12	0.71	9.99M
	6422.00	6.02	3.98	6331.32	22.04	683.19	108.87	691.81	9.05	0.97	5.03M
	6516.00	5.56	5.03	6424.84	23.10	692.84	109.82	701.26	8.99	0.50	5.11M
	6611.00	4.90	6.11	6519.45	23.90	701.26	110.45	709.91	8.95	0.70	4.29M

Comments	MD (ft)	Incl (°)	Azim Grid (°)	TVD (ft)	VSEC (ft)	NS (ft)	EW (ft)	Closure (ft)	Closure Azimuth (°)	DLS (%/100ft)	TF (°)
	6705.00	4.40	4.29	6813.14	24.65	708.85	111.15	717.51	8.91	0.55	8.78M
	6800.00	3.98	8.76	6707.88	25.19	715.74	111.92	724.44	8.89	0.56	19.42M
	6894.00	5.80	19.42	6801.54	24.60	723.45	114.00	732.37	8.95	2.16	24.23M
	6988.00	7.85	24.23	6894.87	22.42	733.78	118.21	743.24	9.15	2.26	20.77M
	7082.00	8.37	20.77	6987.93	19.76	746.03	123.27	756.15	9.38	0.76	136.19L
	7176.00	7.08	9.64	7081.08	18.71	758.14	126.67	768.65	9.49	2.10	353.16M
	7271.00	5.82	353.16	7175.48	20.30	768.70	127.08	779.13	9.39	2.34	349.54M
	7365.00	7.05	349.54	7268.89	23.85	779.10	125.46	789.14	9.15	1.38	1.6M
	7459.00	9.30	1.60	7361.94	27.18	792.37	124.63	802.11	8.94	3.00	97.3R
	7553.00	9.25	4.66	7454.71	29.22	807.49	125.45	817.18	8.83	0.53	166.22L
	7647.00	6.39	358.26	7547.83	31.18	820.25	125.91	829.86	8.73	3.18	342.77M
	7741.00	3.19	342.77	7641.49	33.56	827.98	124.97	837.36	8.58	3.64	335.81M
	7835.00	3.21	335.81	7735.34	36.90	832.88	123.12	841.93	8.41	0.41	352.92M
	7930.00	4.29	352.92	7830.14	38.93	838.83	121.59	847.60	8.25	1.63	3.01M
	8024.00	5.67	3.01	7923.79	40.65	846.96	121.40	855.82	8.16	1.73	348.44M
	8118.00	6.24	348.44	8017.28	43.23	856.60	120.62	865.05	8.02	1.71	346.4M
	8195.00	7.30	346.40	8093.75	46.86	865.46	118.64	873.55	7.81	1.41	291.04M
	8377.00	4.34	291.04	8274.91	58.44	879.18	109.48	885.97	7.10	3.30	266.67M
	8408.00	7.79	266.67	8305.74	61.63	879.48	106.29	885.88	6.89	13.85	261.16R
	8501.00	19.56	261.16	8395.95	82.47	876.71	84.53	880.78	5.51	12.72	28.3R
	8595.00	29.58	271.61	8481.37	120.29	874.94	45.68	876.13	2.99	11.58	23.22R
	8689.00	41.98	279.33	8557.52	174.86	880.71	-8.78	880.76	359.43	14.02	10.49L
	8783.00	49.40	277.53	8623.13	242.01	890.50	-75.27	893.68	355.17	8.01	16.82L
	8876.00	59.35	274.07	8677.25	317.18	897.99	-150.38	910.49	350.49	11.12	23.74L
	8970.00	68.80	271.90	8721.99	399.03	902.26	-232.91	931.83	345.53	5.15	7.89R
	9064.00	68.23	272.56	8760.19	483.91	905.61	-318.70	960.05	340.61	4.76	2.19L
	9157.00	79.10	272.14	8786.30	572.04	909.25	-407.74	996.49	335.85	11.70	56.86R
	9220.00	79.66	273.01	8797.92	633.31	912.03	-469.60	1025.83	332.76	1.62	29.12R
	9327.00	83.83	275.34	8813.28	738.45	919.75	-575.18	1084.79	327.98	4.45	6.1R
	9421.00	91.24	276.13	8817.32	831.92	929.13	-668.55	1144.66	324.26	7.93	89.17L
	9515.00	91.31	270.95	8815.22	925.09	934.93	-762.32	1206.93	320.81	5.51	8.13R
	9702.00	91.38	270.96	8810.83	1109.24	938.05	-949.24	1334.54	314.66	0.04	116.57L
	9888.00	91.34	270.88	8806.42	1292.39	941.03	-1135.17	1474.50	309.68	0.05	138.72L
	10076.00	90.93	270.52	8802.70	1477.39	943.33	-1323.11	1624.96	305.49	0.29	59.74R
	10263.00	91.00	270.64	8799.55	1661.35	945.22	-1510.08	1781.51	302.04	0.07	51.33R
	10449.00	91.20	270.89	8795.98	1844.42	947.71	-1696.03	1942.85	299.20	0.17	169.05L
	10637.00	90.89	270.83	8792.55	2029.53	950.53	-1883.97	2110.18	296.77	0.17	170.79L
	10824.00	90.52	270.77	8790.25	2213.63	953.14	-2070.94	2279.75	294.71	0.20	49.4R
	11012.00	90.58	270.84	8788.44	2398.72	955.78	-2258.91	2452.80	292.93	0.05	74.93R
	11105.00	90.65	271.10	8787.44	2490.32	957.35	-2351.90	2539.28	292.15	0.29	7.25L
	11198.00	91.20	271.03	8785.94	2581.95	959.08	-2444.87	2626.25	291.42	0.60	93.56L
	11292.00	91.07	268.95	8784.08	2674.23	959.07	-2538.84	2713.95	290.69	2.22	90L
	11385.00	91.07	268.92	8782.34	2765.21	957.34	-2631.81	2800.52	289.99	0.03	7.95R
	11478.00	92.00	269.05	8779.85	2856.17	955.69	-2724.76	2887.50	289.33	1.01	129.3L
	11572.00	91.82	268.83	8776.72	2948.09	953.95	-2818.69	2975.75	288.70	0.30	16.74R
	11665.00	92.75	269.11	8773.01	3039.01	952.28	-2911.60	3063.38	288.11	1.04	142.62R
	11758.00	92.58	269.24	8768.69	3129.98	950.94	-3004.49	3151.39	287.56	0.23	161.16L
	11852.00	92.17	269.10	8764.79	3221.95	949.58	-3098.40	3240.65	287.04	0.46	155.51L
	12040.00	91.27	268.69	8759.15	3405.76	945.96	-3286.28	3419.72	286.06	0.53	49.39R
	12133.00	91.45	268.90	8756.94	3496.68	944.01	-3379.23	3508.61	285.61	0.30	2.12R
	12320.00	91.99	268.92	8751.33	3679.53	940.45	-3566.11	3688.04	284.77	0.29	51.32L
	12413.00	92.03	268.87	8748.07	3770.44	938.66	-3659.04	3777.52	284.39	0.07	68.3L
	12445.00	92.34	268.09	8746.85	3901.67	937.81	-3691.01	3808.28	284.26	2.62	40.7R
	12632.00	95.83	271.11	8733.53	3984.54	936.50	-3877.48	3988.96	283.58	2.47	179.69R
	12726.00	92.16	271.13	8726.98	4076.94	938.33	-3971.21	4080.56	283.29	3.90	167.1R
	12820.00	91.68	271.24	8723.83	4169.55	940.27	-4065.14	4172.47	283.02	0.52	136.21R
	12914.00	90.72	272.16	8721.86	4262.32	943.06	-4159.08	4264.65	282.78	1.41	145.05L
	13008.00	88.76	270.79	8722.29	4355.05	945.48	-4253.04	4356.86	282.53	2.54	24.95R
	13102.00	90.48	271.59	8722.91	4447.70	947.43	-4347.01	4449.06	282.30	2.02	16.92R
	13196.00	91.86	272.01	8720.99	4540.50	950.38	-4440.94	4541.50	282.08	1.53	135.8L
	13290.00	90.07	270.27	8719.41	4633.13	952.25	-4534.90	4633.80	281.86	2.66	66.23R
	13383.00	90.55	271.36	8718.90	4724.69	953.58	-4627.89	4725.11	281.64	1.28	147.72R
	13477.00	88.35	272.75	8719.81	4817.57	956.95	-4721.82	4817.81	281.46	2.77	10.43R
Final Survey	13563.00	91.99	273.42	8719.55	4902.76	961.57	-4807.68	4902.90	281.31	4.30	HS
PTB	13620.00	91.99	273.42	8717.57	4959.24	964.97	-4884.54	4959.33	281.22	0.00	

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	26.500	Act Stns	30.000	30.000	NAL_MWD_PLUS_0.5_DEG- Depth Only	Original Borehole / Oxy Cedar Canyon 22 Federal 21H Actual Survey MWD 0ft to Update
	1	26.500	448.000	1/98.425	30.000	30.000	NAL_MWD_PLUS_0.5_DEG	Original Borehole / Oxy Cedar Canyon 22 Federal 21H Actual
	1	448.000	13620.000	Act Stns	30.000	30.000	NAL_MWD_PLUS_0.5_DEG	Original Borehole / Oxy Cedar Canyon 22 Federal 21H Actual

OXY USA Inc.
Cedar Canyon 22 Federal 21H
API No. 30-015-43642

14-3/4" hole @ 490'
10-3/4" csg @ 482'
w/ 382sx-TOC-Surf Circ

9-7/8" hole @ 8315'
7-5/8" csg @ 8300'
w/ 2627sx-TOC-Surf Calc

6-3/4" hole @ 13620'
5-1/2" x 4-1/2" csg @ 13610'
w/ 830sx-TOC-5250' CBL

Perfs @ 8887-13471'

TD- 13620' M 8718'V