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

Well Reference:

32.20880 -103.96431

I, Rasheed Atanda certify that; I am employed by Drilling & Measurements, a division of Schlumberger Technology Corporation; that I did on the day(s) of July 06, 2017 through July 28, 2017, conduct or supervise the taking of the TelePacer & SlimPulse surveys from a depth of 1500.37.00 feet to a depth of 17622.00 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 INC. for the Cedar Canyon 23-24 Federal 32H Well (Original Hole) API No. 30-015-44180 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
Rasheed Atanda
FE

Subscribed and Sworn to before me this 10th day of August (month) 2017 (yr)

My Commission expires.

December 20, 2020

JENNIFER ALLEMAND
Notary Public
State of Colorado
Notary ID # 20164047962
My Commission Expires 12-20-2020

Jallemand
(Signature)

Notary Public

Adams County Colorado
(County State)

Final PVA - Rev6 H&P 639 (RKB=26.5ft)

Schlumberger

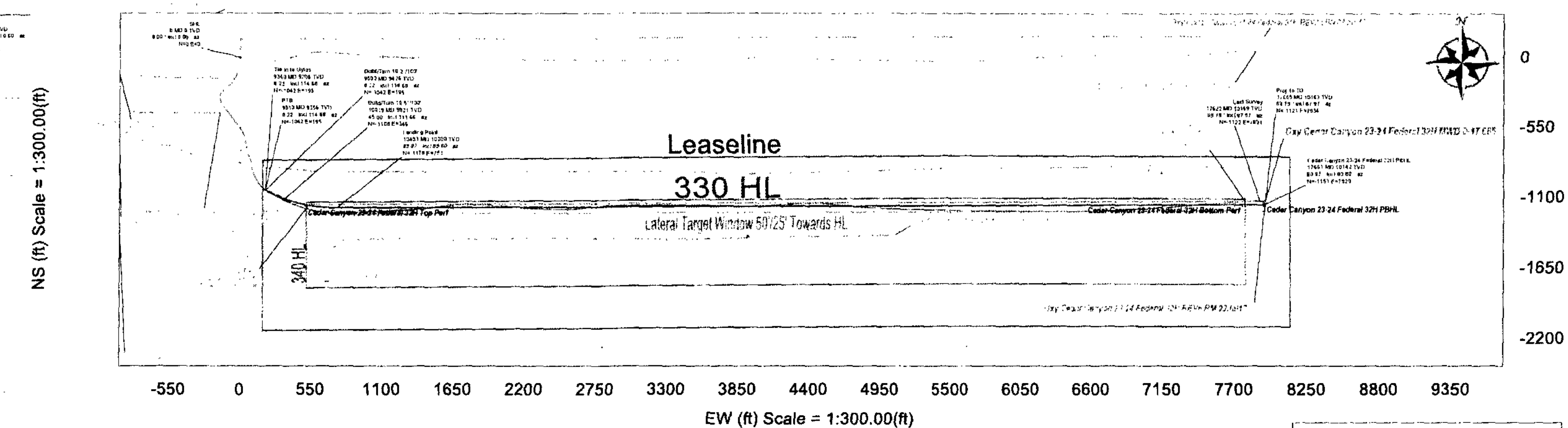
OXY

Borehole: Original Borehole
Well: Oxy Cedar Canyon 23-24 Federal 32H
Field: NM Eddy County (NAD 83)
Structure: Oxy Cedar Canyon 23-24 Federal 32H

Gravity & Magnetic Parameters
Model: HDGM 2016 Dip: 60.047° Date: 22-Jul-2017
MagDec: 7.115° FS: 48113.009nT Gravity FS: 998.469mgn (9.80665 Based)

Surface Location NAD83 New Mexico State Plane, Eastern Zone, US Feet
Lat: N 32 12 31.69 Northing: 439892.5RUS Grid Conv: 0.1967°
Lon: W 103 57 51.50 Easting: 655472.1RUS Scale Fact: 0.99992401

Miscellaneous
Slot: Oxy Cedar Canyon 23-24 Federal 32H TVD Ref: RKB=26.5'(2970.1ft above MSL)
Plan: Oxy Cedar Canyon 23-24 Federal 32H REV6 RM 22Jul17



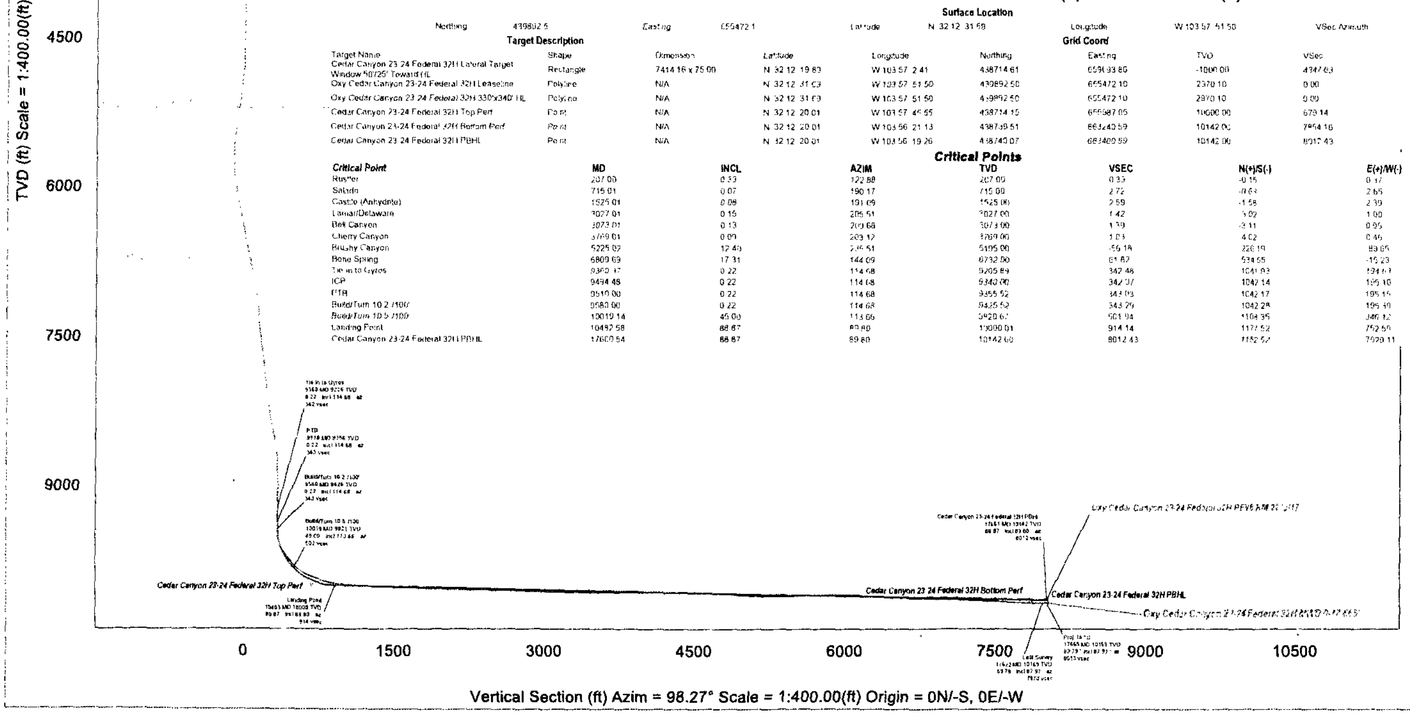
Surface Location

Northing 439892.5 Easting 655472.1 Latitude N 32 12 31.69 Longitude W 103 57 51.50 VSec Azimuth 98.27

Target Name	Shape	Dimension	Latitude	Longitude	Northing	Easting	TVD	VSec	N(+)/S(-)	E(+)/W(-)
Cedar Canyon 23-24 Federal 32H Lateral Target Window 50'/25' Toward HL	Rectangle	7414.16 x 75.00	N 32 12 19.83	W 103 57 2.41	438714.61	659693.80	-1000.00	4347.63	-1177.98	4222.09
Oxy Cedar Canyon 23-24 Federal 32H Leaseline	Polyline	N/A	N 32 12 31.69	W 103 57 51.50	439892.50	655472.10	2370.10	0.00	0.00	0.00
Oxy Cedar Canyon 23-24 Federal 32H 330'x340' HL	Polyline	N/A	N 32 12 31.69	W 103 57 51.50	439892.50	655472.10	2970.10	0.00	0.00	0.00
Cedar Canyon 23-24 Federal 32H Top Perf	Point	N/A	N 32 12 20.01	W 103 57 45.55	438714.15	655987.05	10000.00	679.14	-1178.44	514.09
Cedar Canyon 23-24 Federal 32H Bottom Perf	Point	N/A	N 32 12 20.01	W 103 56 21.13	438739.51	663240.59	10142.00	7954.16	-1153.08	7769.10
Cedar Canyon 23-24 Federal 32H PBHL	Point	N/A	N 32 12 20.01	W 103 56 19.26	438740.07	663400.59	10142.00	8012.43	-1152.52	7929.11

Critical Points

Critical Point	MD	INCL	AZIM	TVD	VSEC	N(+)/S(-)	E(+)/W(-)	DLS
Rustler	207.00	0.33	122.88	207.00	0.33	-0.15	0.37	0.06
Salado	715.01	0.07	190.17	715.00	2.72	-0.63	2.65	0.04
Castile (Anhydrite)	1525.01	0.08	191.09	1525.00	2.59	-1.58	2.30	0.02
Lamar/Delaware	3027.01	0.15	205.51	3027.00	1.42	-3.02	1.00	0.04
Bell Canyon	3073.01	0.13	209.68	3073.00	1.39	-3.11	0.95	0.04
Cherry Canyon	3769.01	0.09	203.12	3769.00	1.03	-4.02	0.46	0.02
Brushy Canyon	5225.07	12.40	235.51	5105.00	-56.18	226.19	89.65	2.72
Bone Spring	6809.69	17.31	144.09	6732.00	61.82	534.65	-15.23	0.63
Tie in to Gyros	9360.37	0.22	114.68	9205.89	342.48	1041.93	194.63	
ICP	9494.48	0.22	114.68	9340.00	342.97	1042.14	195.10	0.00
FTB	9510.00	0.22	114.68	9355.52	343.03	1042.17	195.15	0.00
Build/Turn 10.2 /100'	9580.00	0.22	114.68	9425.52	343.29	1042.28	195.39	0.00
Build/Turn 10.5 /100'	10019.14	45.00	113.66	9820.67	501.94	1108.35	340.12	10.20
Landing Point	10492.58	88.67	89.80	10000.01	914.14	1177.52	752.59	10.50
Cedar Canyon 23-24 Federal 32H PBHL	17600.54	88.67	89.80	10142.60	8012.43	1152.52	7929.11	0.00



Grid
True
Mag

Grid North
Tot Corr (M->G 6.918°)
Mag Dec (7.115°)
Grid Conv (0.197°)

CONTROLLED

1	Originator
2	DE Sign Off Authority
3	D&M Line Manager
4	Client

Schlumberger

Oxy Cedar Canyon 23-24 Federal 32H MWD 0-17,665' Survey Geodetic Report

(Def Survey)

Report Date:	July 28, 2017 - 12:05 PM	**Survey / DLS Computation:**	Minimum Curvature / Lubinski
Client:	OXY	**Vertical Section Azimuth:**	98.270 ° (Grid North)
Field:	NM Eddy County (NAD 83)	**Vertical Section Origin:**	0.000 ft, 0.000 ft
Structure / Slot:	Oxy Cedar Canyon 23-24 Federal 32H / Oxy Cedar Canyon 23-24 Federal 32H	**TVD Reference Datum:**	RKB=26.5'
Well:	Oxy Cedar Canyon 23-24 Federal 32H	**TVD Reference Elevation:**	2970.100 ft above MSL
Borehole:	Original Borehole	**Seabed / Ground Elevation:**	2943.600 ft above MSL
UWI / API#:	Unknown / Unknown	**Magnetic Declination:**	7.126 °
Survey Name:	Oxy Cedar Canyon 23-24 Federal 32H MWD 0-17,665'	**Total Gravity Field Strength:**	998.4695mgn (9.80665 Based)
Survey Date:	June 20, 2017	**Gravity Model:**	GARM
Tort / AHD / DDI / ERD Ratio:	337.844 ° / 8981.671 ft / 6.722 / 0.883	**Total Magnetic Field Strength:**	48106.251 nT
Coordinate Reference System:	NAD83 New Mexico State Plane, Eastern Zone, US Feet	***Magnetic Dip Angle:***	60.015 °
Location Lat / Long:	N 32° 12' 31.69021", W 103° 57' 51.49939"	**Declination Date:**	July 22, 2017
Location Grid N/E Y/X:	N 439892.500 ftUS, E 655472.100 ftUS	**Magnetic Declination Model:**	HDGM 2017
CRS Grid Convergence Angle:	0.1967 °	**North Reference:**	Grid North
Grid Scale Factor:	0.99992401	**Grid Convergence Used:**	0.1967 °
Version / Patch:	2.10.544.0	**Total Corr Mag North->Grid North:**	6.9296 °
		Local Coord Referenced To:	Well Head

Comments	MD (ft)	Incl (°)	Azim Grid (°)	TVD (ft)	VSEC (ft)	NS (ft)	EW (ft)	DLS (°/100ft)	Northing (ftUS)	Easting (ftUS)	Latitude (N/S ° ' ")	Longitude (E/W ° ' ")
SHL	0.00	0.00	0.00	0.00	0.00	0.00	0.00	N/A	439892.50	655472.10	N 32 12 31.69	W 103 57 51.50
RKB	26.50	0.00	0.00	26.50	0.00	0.00	0.00	0.00	439892.50	655472.10	N 32 12 31.69	W 103 57 51.50
	90.37	0.09	351.10	90.37	-0.01	0.05	-0.01	0.14	439892.55	655472.09	N 32 12 31.69	W 103 57 51.50
	181.37	0.38	124.62	181.37	0.23	-0.05	0.23	0.49	439892.45	655472.33	N 32 12 31.69	W 103 57 51.50
	272.37	0.41	118.75	272.37	0.81	-0.38	0.76	0.06	439892.12	655472.86	N 32 12 31.69	W 103 57 51.49
	363.64	0.32	101.20	363.64	1.37	-0.59	1.30	0.16	439891.91	655473.40	N 32 12 31.68	W 103 57 51.48
	454.37	0.39	87.23	454.36	1.93	-0.62	1.86	0.12	439891.88	655473.96	N 32 12 31.68	W 103 57 51.48
	544.37	0.31	77.66	544.36	2.46	-0.55	2.40	0.11	439891.95	655474.50	N 32 12 31.68	W 103 57 51.47
	634.37	0.06	163.83	634.36	2.70	-0.55	2.65	0.35	439891.95	655474.75	N 32 12 31.68	W 103 57 51.47
	724.37	0.07	192.70	724.36	2.72	-0.65	2.65	0.04	439891.85	655474.75	N 32 12 31.68	W 103 57 51.47
	813.37	0.06	185.21	813.36	2.72	-0.74	2.64	0.01	439891.76	655474.74	N 32 12 31.68	W 103 57 51.47
	905.37	0.07	189.54	905.36	2.72	-0.85	2.62	0.01	439891.65	655474.72	N 32 12 31.68	W 103 57 51.47
	995.37	0.06	191.91	995.36	2.71	-0.95	2.60	0.01	439891.55	655474.70	N 32 12 31.68	W 103 57 51.47
	1027.37	0.07	187.42	1027.36	2.71	-0.98	2.60	0.04	439891.52	655474.70	N 32 12 31.68	W 103 57 51.47
	1121.37	0.07	192.56	1121.36	2.71	-1.10	2.58	0.01	439891.40	655474.68	N 32 12 31.68	W 103 57 51.47
	1216.37	0.08	192.07	1216.36	2.70	-1.22	2.55	0.01	439891.28	655474.65	N 32 12 31.68	W 103 57 51.47
	1311.37	0.07	199.45	1311.36	2.68	-1.34	2.52	0.01	439891.16	655474.62	N 32 12 31.68	W 103 57 51.47
	1405.37	0.07	228.34	1405.35	2.64	-1.43	2.46	0.04	439891.07	655474.56	N 32 12 31.68	W 103 57 51.47
	1500.37	0.09	192.40	1500.36	2.59	-1.54	2.40	0.06	439890.96	655474.50	N 32 12 31.67	W 103 57 51.47
	1595.37	0.07	186.26	1595.36	2.59	-1.67	2.37	0.02	439890.83	655474.47	N 32 12 31.67	W 103 57 51.47
	1689.37	0.08	194.43	1689.36	2.59	-1.79	2.35	0.02	439890.71	655474.45	N 32 12 31.67	W 103 57 51.47
	1784.37	0.08	199.71	1784.36	2.56	-1.92	2.31	0.01	439890.58	655474.41	N 32 12 31.67	W 103 57 51.47
	1878.37	0.08	208.84	1878.36	2.53	-2.04	2.26	0.01	439890.46	655474.36	N 32 12 31.67	W 103 57 51.47
	1973.37	0.10	238.47	1973.36	2.44	-2.14	2.16	0.05	439890.36	655474.26	N 32 12 31.67	W 103 57 51.47
	2068.37	0.10	234.09	2068.36	2.32	-2.23	2.02	0.01	439890.27	655474.12	N 32 12 31.67	W 103 57 51.48
	2162.37	0.07	226.70	2162.36	2.22	-2.32	1.91	0.03	439890.18	655474.01	N 32 12 31.67	W 103 57 51.48
	2257.37	0.14	219.42	2257.36	2.13	-2.45	1.79	0.07	439890.05	655473.89	N 32 12 31.67	W 103 57 51.48
	2352.37	0.15	256.02	2352.36	1.95	-2.57	1.60	0.10	439889.93	655473.70	N 32 12 31.66	W 103 57 51.48
	2446.37	0.08	236.13	2446.36	1.79	-2.64	1.43	0.08	439889.86	655473.53	N 32 12 31.66	W 103 57 51.48
	2541.37	0.07	265.65	2541.36	1.68	-2.68	1.31	0.04	439889.82	655473.41	N 32 12 31.66	W 103 57 51.48
	2635.37	0.08	222.41	2635.36	1.59	-2.73	1.21	0.06	439889.77	655473.31	N 32 12 31.66	W 103 57 51.49
	2730.37	0.11	29.10	2730.36	1.59	-2.70	1.21	0.20	439889.80	655473.31	N 32 12 31.66	W 103 57 51.49
	2825.37	0.06	236.67	2825.36	1.57	-2.66	1.20	0.19	439889.84	655473.30	N 32 12 31.66	W 103 57 51.49
	2919.37	0.12	203.86	2919.36	1.49	-2.78	1.11	0.07	439889.72	655473.21	N 32 12 31.66	W 103 57 51.49
	3014.37	0.15	204.51	3014.36	1.43	-2.99	1.01	0.03	439889.51	655473.11	N 32 12 31.66	W 103 57 51.49
	3109.37	0.12	213.69	3109.36	1.36	-3.18	0.91	0.04	439889.32	655473.01	N 32 12 31.66	W 103 57 51.49
	3203.37	0.12	216.93	3203.36	1.27	-3.34	0.79	0.01	439889.16	655472.89	N 32 12 31.66	W 103 57 51.49
	3298.37	0.02	24.33	3298.36	1.22	-3.41	0.74	0.15	439889.09	655472.84	N 32 12 31.66	W 103 57 51.49
	3393.37	0.10	180.95	3393.36	1.24	-3.47	0.75	0.12	439889.03	655472.85	N 32 12 31.66	W 103 57 51.49
	3487.37	0.10	211.88	3487.36	1.22	-3.63	0.70	0.06	439888.87	655472.80	N 32 12 31.65	W 103 57 51.49
	3580.37	0.09	216.00	3580.36	1.15	-3.75	0.62	0.01	439888.75	655472.72	N 32 12 31.65	W 103 57 51.49
	3677.37	0.10	211.63	3677.36	1.08	-3.89	0.53	0.01	439888.61	655472.63	N 32 12 31.65	W 103 57 51.49
	3772.37	0.09	202.77	3772.36	1.03	-4.03	0.45	0.02	439888.47	655472.55	N 32 12 31.65	W 103 57 51.49
	3866.37	0.09	213.09	3866.36	0.98	-4.16	0.38	0.02	439888.34	655472.48	N 32 12 31.65	W 103 57 51.50
	3961.37	0.09	185.52	3961.36	0.95	-4.29	0.34	0.05	439888.21	655472.44	N 32 12 31.65	W 103 57 51.50
	4056.37	1.00	195.58	4056.35	0.85	-5.17	0.11	0.96	439887.33	655472.21	N 32 12 31.64	W 103 57 51.50
	4150.37	1.00	194.92	4150.34	0.65	-6.75	-0.32	0.01	439885.75	655471.78	N 32 12 31.62	W 103 57 51.50
	4245.37	5.63	195.16	4245.15	-0.01	-12.05	-1.76	4.87	439880.45	655470.34	N 32 12 31.57	W 103 57 51.52
	4340.37	11.00	195.95	4339.12	-1.78	-25.27	-5.47	5.65	439867.23	655466.63	N 32 12 31.44	W 103 57 51.56
	4434.37	15.32	193.65	4430.63	-4.14	-45.97	-10.87	4.63	439846.53	655461.23	N 32 12 31.24	W 103 57 51.63
	4529.37	16.14	191.88	4522.07	-6.15	-71.09	-16.55	1.00	439821.41	655455.55	N 32 12 30.99	W 103 57 51.69
	4623.37	15.63	191.06	4612.48	-7.59	-96.30	-21.67	0.59	439796.20	655450.44	N 32 12 30.74	W 103 57 51.76
	4718.37	15.44	187.32	4704.01	-8.00	-121.41	-25.73	1.07	439771.10	655446.37	N 32 12 30.49	W 103 57 51.80
	4813.37	12.47	206.96	4796.25	-11.08	-143.11	-32.00	5.84	439749.40	655440.10	N 32 12 30.28	W 103 57 51.88
	4908.37	14.12	216.23	4888.71	-19.80	-161.60	-43.50	2.83	439730.91	655428.60	N 32 12 30.09	W 103 57 52.01
	5003.37	15.97	209.90	4980.46	-30.05	-182.28	-56.86	2.60	439710.23	655415.24	N 32 12 29.89	W 103 57 52.17
	5097.37	15.46	209.28	5070.94	-39.31	-204.42	-69.44	0.57	439688.10	655402.67	N 32 12 29.67	W 103 57 52.32
	5192.37	12.79	231.85	5163.13	-51.11	-221.98	-83.91	6.39	439670.54	655388.19	N 32 12 29.50	W 103 57 52.48
	5287.37	11.81	243.09	5255.97	-66.31	-232.87	-100.85	2.72	439659.64	655371.25	N 32 12 29.39	W 103 57 52.68
	5381.37	11.99	231.50	5347.96	-80.86	-243.31	-117.08	2.55	439649.21	655355.03	N 32 12 29.29	W 103 57 52.87
	5476.37	11.99	220.60	5440.90	-92.90	-256.94	-131.22	2.38	439635.58	655340.89	N 32 12 29.15	W 103 57 53.04
	5571.37	11.97	213.16	5533.83	-102.32	-272.66	-143.03	1.62	439619.84	655329.08	N 32 12 29.00	W 103 57 53.17
	5665.37	11.76	198.52	5625.85	-108.13	-289.93	-151.41	3.20	439602.59	655320.70	N 32 12 28.83	W 103 57 53.27
	5760.37	11.81	185.89	5718.86	-109.45	-308.78	-155.48	2.71	439583.74	655316.63	N 32 12 28.64	W 103 57 53.32
	5855.37	12.15	173.71	5811.81	-106.53	-328.40	-155.39	2.68	439564.13	655316.73	N 32 12 28.45	W 103 57 53.32
	5949.37	12.41	159.51	5903.68	-99.18	-347.69	-150.76	3.22	439544.83	655321.35	N 32 12 28.25	W 103 57 53.27
	6044.37	13.42	152.91	5996.28	-87.89	-367.07	-142.17	1.88	439525.46	655329.94	N 32 12 28.06	W 103 57 53.17
	6139.37	14.61	144.93	6088.46	-73.29	-386.70	-130.26	2.39	439505.83	655341.85	N 32 12 27.87	W 103 57 53.03
	6234.37	15.71	143.05	6180.15	-55.93	-406.78	-115.65	1.27	439485.75	655356.46	N 32 12 27.67	W 103 57 52.86
	6328.37	16.07	140.83	6270.56	-37.32	-427.04	-99.78	0.75	439465.49	655372.33	N 32 12 27.47	W 103 57 52.68
	6423.37	15.53	141.72	6361.97	-18.40	-447.22	-83.60	0.62	439445.32	655388.51	N 32 12 27.27	W 103 57 52.49
	6518.37	16.22	140.94	6453.35	0.59	-467.50	-67.36	0.76	439425.03	655404.75	N 32 12 27.07	W 103 57 52.30
	6612.37	16.92	142.44	6543.44	20.05	-488.54	-50.75	0.87	439404.00	655421.36	N 32 12 26.86	W 103 57 52.11
	6707.37	17.15	141.34	6634.27	40.20	-510.44	-33.57	0.42	439382.10	655438.53	N 32 12 26.64	W 103 57 51.91
	6802.37	17.30	143.94	6725.01	60.30	-532.79	-16.50	0.83	439359.75	655455.60	N 32 12 26.42	W 103 57 51.71
	6897.37	17.47	145.86	6815.68	79.79	-556.01	-0.19	0.63	439336.53	655471.91	N 32 12 26.19	W 103 57 51.52
	6991.37	17.65	151.99	6905.30	97.74	-580.28	14.43	1.98	439312.27	655486.52	N 32 12 25.95	W 103 57 51.35
	7086.37	17.33	158.87	6995.92	113.21	-606.19	26.29	2.20	439286.36	655498.39	N 32 12 25.69	W 103 57 51.22

Comments	MD (ft)	Incl (°)	Azim Grid (°)	TVD (ft)	VSEC (ft)	NS (ft)	EW (ft)	DLS (°/100ft)	Northing (ftUS)	Easting (ftUS)	Latitude (N/S ° ' ")	Longitude (E/W ° ' ")
	7181.37	16.40	166.10	7086.84	125.22	-632.41	34.61	2.41	439260.14	655506.71	N 32 12 25.43	W 103 57 51.12
	7276.37	15.40	165.96	7178.21	135.07	-657.67	40.90	1.05	439234.88	655512.99	N 32 12 25.18	W 103 57 51.05
	7371.37	13.62	169.76	7270.18	143.41	-680.91	45.95	2.12	439211.64	655518.04	N 32 12 24.95	W 103 57 50.99
	7466.37	14.81	176.89	7362.27	149.36	-704.05	48.59	2.23	439188.51	655520.69	N 32 12 24.72	W 103 57 50.96
	7561.37	18.74	167.99	7453.23	157.05	-731.11	52.43	4.93	439161.44	655524.53	N 32 12 24.45	W 103 57 50.92
	7655.37	16.84	161.71	7542.74	168.37	-758.81	59.85	2.87	439133.74	655531.94	N 32 12 24.18	W 103 57 50.83
	7750.37	14.68	157.56	7634.16	180.67	-783.01	68.76	2.56	439109.55	655540.86	N 32 12 23.94	W 103 57 50.73
	7845.37	13.13	159.80	7726.38	191.97	-804.26	77.08	1.73	439088.30	655549.18	N 32 12 23.73	W 103 57 50.63
	7940.37	14.29	165.32	7818.67	201.68	-825.73	83.78	1.84	439066.83	655555.87	N 32 12 23.52	W 103 57 50.56
	8034.37	17.12	168.78	7909.16	210.82	-850.53	89.41	3.17	439042.03	655561.51	N 32 12 23.27	W 103 57 50.49
	8129.37	18.84	169.27	7999.51	220.48	-879.32	94.99	1.82	439013.25	655567.08	N 32 12 22.99	W 103 57 50.43
	8224.37	16.85	161.79	8089.95	231.62	-907.48	102.15	3.19	438985.09	655574.24	N 32 12 22.71	W 103 57 50.35
	8319.37	15.45	156.52	8181.20	244.42	-932.17	111.50	2.13	438960.41	655583.59	N 32 12 22.46	W 103 57 50.24
	8413.37	15.17	152.11	8271.87	258.27	-954.52	122.24	1.27	438938.05	655594.33	N 32 12 22.24	W 103 57 50.11
	8508.37	15.42	144.61	8363.52	274.32	-975.81	135.37	2.10	438916.77	655607.46	N 32 12 22.03	W 103 57 49.96
	8603.37	16.96	135.17	8454.76	294.13	-995.93	152.45	3.20	438896.64	655624.54	N 32 12 21.83	W 103 57 49.76
	8697.37	14.13	136.23	8545.31	314.14	-1013.95	170.06	3.03	438878.63	655642.15	N 32 12 21.65	W 103 57 49.56
	8792.37	7.40	139.61	8638.59	327.89	-1026.99	182.06	7.11	438865.59	655654.15	N 32 12 21.52	W 103 57 49.42
	8887.37	4.31	140.03	8733.08	335.15	-1034.39	188.32	3.25	438858.19	655660.40	N 32 12 21.45	W 103 57 49.35
	8981.37	1.68	144.09	8826.95	338.75	-1038.21	191.40	2.81	438854.37	655663.48	N 32 12 21.41	W 103 57 49.31
	9076.37	1.68	143.85	8921.90	340.69	-1040.47	193.04	0.01	438852.11	655665.12	N 32 12 21.39	W 103 57 49.29
	9171.37	0.21	111.00	9016.89	341.84	-1041.65	194.02	1.59	438850.93	655666.10	N 32 12 21.38	W 103 57 49.28
	9266.37	0.19	115.91	9111.89	342.16	-1041.79	194.32	0.03	438850.80	655666.41	N 32 12 21.38	W 103 57 49.28
	9360.37	0.22	114.68	9205.89	342.48	-1041.93	194.63	0.03	438850.65	655666.71	N 32 12 21.37	W 103 57 49.28
	9540.00	0.68	320.17	9385.51	342.01	-1041.25	194.26	0.49	438851.33	655666.34	N 32 12 21.38	W 103 57 49.28
	9588.00	0.47	290.68	9433.51	341.61	-1040.97	193.89	0.74	438851.62	655665.98	N 32 12 21.38	W 103 57 49.28
	9683.00	11.53	120.56	9527.90	350.05	-1045.67	201.73	12.62	438846.91	655673.82	N 32 12 21.34	W 103 57 49.19
	9778.00	26.16	115.85	9617.57	378.95	-1059.71	228.90	15.47	438832.87	655700.98	N 32 12 21.20	W 103 57 48.88
	9872.00	37.04	117.40	9697.51	425.60	-1081.84	272.82	11.61	438810.75	655744.90	N 32 12 20.98	W 103 57 48.37
	9967.00	42.59	116.93	9770.45	483.13	-1109.59	326.92	5.85	438783.00	655799.00	N 32 12 20.70	W 103 57 47.74
	10062.00	52.32	114.60	9834.62	549.83	-1139.87	389.92	10.40	438752.72	655861.99	N 32 12 20.40	W 103 57 47.01
	10156.00	63.62	110.32	9884.41	626.98	-1170.08	463.49	12.62	438722.51	655935.55	N 32 12 20.10	W 103 57 46.15
	10251.00	70.16	103.13	9921.71	713.30	-1195.07	547.09	9.79	438697.53	656019.15	N 32 12 19.85	W 103 57 45.18
	10345.00	71.85	97.43	9952.33	802.08	-1210.90	634.50	6.01	438681.70	656106.55	N 32 12 19.69	W 103 57 44.16
	10440.00	78.21	91.35	9976.88	893.55	-1217.84	725.92	9.11	438674.75	656197.96	N 32 12 19.61	W 103 57 43.10
	10535.00	87.17	88.43	9988.96	986.66	-1217.64	820.04	9.91	438674.96	656292.08	N 32 12 19.61	W 103 57 42.00
	10647.00	84.93	86.25	9996.67	1096.35	-1212.46	931.64	2.79	438680.14	656403.67	N 32 12 19.66	W 103 57 40.71
	10742.00	85.87	86.93	10004.29	1189.09	-1206.82	1026.17	1.22	438685.77	656498.19	N 32 12 19.71	W 103 57 39.60
	10836.00	86.42	87.32	10010.61	1281.10	-1202.12	1119.83	0.72	438690.47	656591.85	N 32 12 19.76	W 103 57 38.51
	10931.00	87.32	86.57	10015.80	1374.11	-1197.06	1214.56	1.23	438695.53	656686.56	N 32 12 19.80	W 103 57 37.41
	11025.00	88.42	86.19	10019.29	1466.03	-1191.13	1308.30	1.24	438701.46	656780.30	N 32 12 19.86	W 103 57 36.32
	11120.00	89.11	83.85	10021.34	1558.47	-1182.89	1402.91	2.57	438709.70	656874.91	N 32 12 19.94	W 103 57 35.22
	11214.00	88.86	82.91	10023.01	1649.30	-1172.05	1496.27	1.03	438720.54	656968.26	N 32 12 20.04	W 103 57 34.13
	11309.00	88.07	84.00	10025.55	1741.11	-1161.23	1590.62	1.42	438731.36	657062.59	N 32 12 20.15	W 103 57 33.03
	11404.00	87.52	87.09	10029.21	1833.70	-1153.86	1685.25	3.30	438738.73	657157.22	N 32 12 20.21	W 103 57 31.93
	11498.00	88.11	89.82	10032.79	1926.24	-1151.32	1779.14	2.97	438741.26	657251.10	N 32 12 20.24	W 103 57 30.84
	11593.00	88.18	91.91	10035.87	2020.40	-1152.76	1874.07	2.20	438739.83	657346.02	N 32 12 20.22	W 103 57 29.73
	11782.00	88.66	94.55	10041.08	2208.58	-1163.40	2062.68	1.42	438729.19	657534.62	N 32 12 20.11	W 103 57 27.54
	11877.00	89.14	95.54	10042.90	2303.41	-1171.76	2157.29	1.16	438720.84	657629.23	N 32 12 20.02	W 103 57 26.44
	11971.00	88.55	94.25	10044.80	2397.22	-1179.77	2250.93	1.51	438712.82	657722.85	N 32 12 19.94	W 103 57 25.35
	12066.00	89.62	92.88	10046.31	2491.89	-1185.68	2345.73	1.83	438706.91	657817.65	N 32 12 19.88	W 103 57 24.25
	12161.00	89.17	91.11	10047.32	2586.31	-1188.99	2440.66	1.92	438703.61	657912.57	N 32 12 19.84	W 103 57 23.14
	12255.00	89.04	88.10	10048.79	2679.21	-1188.34	2534.64	3.20	438704.25	658006.54	N 32 12 19.84	W 103 57 22.05
	12350.00	88.90	85.43	10050.49	2772.28	-1182.98	2629.46	2.81	438709.61	658101.36	N 32 12 19.89	W 103 57 20.94
	12444.00	88.04	82.86	10053.00	2863.40	-1173.40	2722.93	2.88	438719.20	658194.82	N 32 12 19.99	W 103 57 19.86
	12539.00	87.97	83.97	10056.31	2955.17	-1162.51	2817.25	1.17	438730.08	658289.13	N 32 12 20.09	W 103 57 18.76
	12633.00	88.49	88.71	10059.22	3047.06	-1156.51	2910.98	5.07	438736.08	658382.86	N 32 12 20.15	W 103 57 17.67
	12728.00	89.14	90.69	10061.18	3140.98	-1156.02	3005.96	2.19	438736.57	658477.82	N 32 12 20.15	W 103 57 16.56
	12822.00	89.48	90.45	10062.31	3234.12	-1156.95	3099.94	0.44	438735.64	658571.80	N 32 12 20.14	W 103 57 15.47
	12917.00	88.62	89.07	10063.89	3328.06	-1156.55	3194.93	1.71	438736.04	658666.78	N 32 12 20.14	W 103 57 14.36
	13106.00	88.97	90.19	10067.86	3514.87	-1155.33	3383.88	0.62	438737.26	658855.71	N 32 12 20.14	W 103 57 12.16
	13201.00	90.55	90.70	10068.26	3608.98	-1156.07	3478.87	1.75	438736.52	658950.70	N 32 12 20.13	W 103 57 11.06
	13295.00	89.97	91.60	10067.83	3702.26	-1157.96	3572.85	1.14	438734.63	659044.67	N 32 12 20.11	W 103 57 9.96
	13390.00	90.21	91.62	10067.69	3796.62	-1160.63	3667.81	0.25	438731.96	659139.63	N 32 12 20.08	W 103 57 8.86
	13484.00	90.24	91.35	10067.32	3889.96	-1163.06	3761.78	0.29	438729.53	659233.59	N 32 12 20.05	W 103 57 7.77
	13579.00	90.24	90.88	10066.92	3984.22	-1164.91	3856.76	0.49	438727.68	659328.56	N 32 12 20.03	W 103 57 6.66
	13674.00	90.34	88.98	10066.44	4078.20	-1164.80	3951.75	2.00	438727.80	659423.55	N 32 12 20.03	W 103 57 5.55
	13863.00	89.28	85.71	10067.06	4263.75	-1156.04	4140.52	1.82	438736.55	659612.30	N 32 12 20.11	W 103 57 3.36
	13957.00	89.55	86.76	10068.02	4355.68	-1149.87	4234.31	1.15	438742.72	659706.08	N 32 12 20.17	W 103 57 2.27
	14052.00	90.21	86.45	10068.22	4448.72	-1144.24	4329.15	0.77	438748.35	659800.91	N 32 12 20.22	W 103 57 1.16
	14241.00	87.87	93.63	10071.39	4635.61	-1144.37	4517.98	3.99	438748.22	659989.73	N 32 12 20.21	W 103 56 58.96
	14336.00	86.80	96.38	10075.81	4730.34	-1152.65	4612.51	3.10	438739.94	660084.25	N 32 12 20.12	W 103 56 57.86
	14525.00	85.80	94.56	10088.01	4918.71	-1170.63	4800.24	1.10	438721.96	660271.97	N 32 12 19.94	W 103 56 55.68
	14620.00	86.32	93.10	10094.54	5013.20	-1176.96	4894.80	1.63	438715.63	660366.52	N 32 12 19.87	W 103 56 54.58
	14809.00	89.24	92.12	10101.86	5201.11	-1185.56	5083.44	1.63	438707.04	660555.15	N 32 12 19.78	W 103 56 52.38
	14998.00	91.34	91.38	10100.90	5388.88	-1191.33	5272.34	1.18	438701.27	660744.03	N 32 12 19.72	W 103 56 50.19
	15093.00	91.00	91.43	10098.96	5483.17	-1193.66	5367.29	0.36	438698.94	660838.97	N 32 12 19.69	W 103 56 49.08
	15187.00	91.03	91.12	10097.30	5576.46	-1195.75	5461.26	0.33	438696.85	660932.93	N 32 12 19.67	W 103 56 47.99
	15377.00	91.58	90.49	10092.97	5764.80	-1198.42	5651.19	0.44	438694.18	661122.84	N 32 12 19.64	W 103 56 45.78
	15471.00	90.89	91.24	10090.94	5857.99	-1199.84	5745.15	1.08	438692.76	661216.80	N 32 12 19.62	W 103 56 44.68
	15566.00	91.00	90.46	10089.38	5952.18	-1201.24	5840.13	0.83	438691.35	661311.77	N 32 12 19.60	W 103 56 43.58
	15660.00	88.18	90.57	10090.05	6045.31	-1202.09	5934.11	3.00	438690.50	661405.75	N 32 12 19.59	W 103 56 42.48
	15755.00	84.70	90.46	10095.95	6139.25	-1202.94	6028.91	3.66	438689.65	661500.54	N 32 12 19.58	W 103 56 41.38
	15850.00	86.70	90.60	10103.07	6233.11	-1203.82	6123.63	2.11	438688.78	661595.26	N 32 12 19.56	W 103 56 40.28
	15944.00	86.63	90.60	10108.54	6326.11	-1204.80	6217.47	0.07	438687.79	661689.08	N 32 12 19.55	W 103 56 39.19
	16134.00	87.11	90.32	10118.91	6514.07	-1206.32	6407.18	0.29	438686.27	661878.78	N 32 12 19.53	W 103 56 36.98
	16229.00	88.00	89.36	10122.96	6607.95	-1206.06	6502.09	1.38	438686.54	661973.68	N 32 12 19.53	W 103 56 35.87
	16324.00	88.28	88.39	10126.05	6701.63	-1204.19	6597.02	1.06	438688.40	662068.61	N 32 12 19.54	W 103 56 34.77
	16418.00	88.25	88.14	10128.89	6794.16	-1201.35	6690.93	0.27	438691.24	662162.51	N 32 12 19.57	W 103 56 33.68
	16513.00	87.73	87.54	10132.23	6887.53	-1197.77	6785.81	0.84	438694.82	662257.38	N 32 12 19.60	W 103 56 32.57
	16608.00	88.83	87.31	10135.08	6980.79	-1193.50	6880.67	1.18	438699.09	662352.23	N 32 12 19.64	W 103 56 31.47
	16703.00	88.93	86.95	10136.93	7073.98	-1188.75	6975.53	0.39	438703.84	662447.09	N 32 12 19.68	W 103 56 30.36
	16797.00	89.17	86.23	10138.49	7166.02	-1183.16	7069.35	0.81	438709.43	662540.90	N 32 12 19.74	W 103 56 29.27
	16986.00	87.14	84.14	10144.58	7350.00	-1167.31	7257.57	1.54	438725.29	662729.10	N 32 12 19.89	W 103 56 27.08
	17081.00	88.00	84.80	10148.61	7442.17	-1158.16	7352.04	1.14	438734.43	662823.56	N 32 12 19.97	W 103 56 25.98
	17270.00	85.80	86.90	10158.83	7626.46	-1144.50	7540.24	1.61	438748.09	663011.75	N 32 12 20.10	W 103 56 23.79
	17364.00	86.18	85.12	10165.40	7718.06	-1137.98	7633.76	1.93	438754.61	663105.29	N 32 12 20.16	W 103 56 22.70
	17459.00	88.66	86.50	10169.68	7810.74	-1131.04	7728.42	2.99	438761.55	663199.92	N 32 12 20.23	W 103 56 21.60
	17554.00	91.58	86.58	10169.48	7903.75	-1125.31	7823.24	3.07	438767.28	663294.73	N 32 12 20.28	W 103 56 20.50
Last Survey	17622.00	89.79	87.97	10168.67	7970.49	-1122.08	7891.15	3.33	438770.51	663362.64	N 32 12 20.31	W 103 56 19.71
Proj to TD	17665.00	89.79	87.97	10168.82	8012.80	-1120.55	7934.12	0.00	438772.03	663405.61	N 32 12 20.32	W 103 56 19.20

Survey Type: Def Survey

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

Comments	MD (ft)	Incl (°)	Azim Grid (°)	TVD (ft)	VSEC (ft)	NS (ft)	EW (ft)	DLS (°/100ft)	Northing (ftUS)	Easting (ftUS)	Latitude (N/S ° ' ")	Longitude (E/W ° ' ")
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	1/98.425	30.000	30.000	NAL_NSG+MSHOT-Depth Only	Original Borehole / Oxy Cedar Canyon 23-24 Federal 32H MWD 0-17,665'				
	1	26.500	26.500	Act Stns	30.000	30.000	NAL_NSG+MSHOT-Depth Only	Original Borehole / Oxy Cedar Canyon 23-24 Federal 32H MWD 0-17,665'				
	1	26.500	9360.370	Act Stns	30.000	30.000	NAL_NSG+MSHOT	Original Borehole / Oxy Cedar Canyon 23-24 Federal 32H MWD				
	1	9360.370	17665.000	Act Stns	30.000	30.000	NAL_MWD_PLUS_0.5_DEG	Original Borehole / Oxy Cedar Canyon 23-24 Federal 32H MWD				