

# Noble Energy

CO, Weld County (NAD 83 NZ)  
Sec 10 Twn 2 N Rng 64 W  
Oscar Y10-72HN Original Hole  
05-123-38046  
H&P 277



A Schlumberger Company

## Final Survey Report

18-Nov-2014

Well Coordinates:	NAD83 CO State Plane, N Zone, US Ft
	N 40° 9' 7.99200"      W 104° 31' 51.27600"
	1299777.27 usFt      3270882.66 usFt
Ground Level:	4928.00 ft MSL
TVD Reference:	KB 24ft @ 4952.00 ft MSL
Local Coordinate Origin:	Oscar Y10-72HN well head
Vertical Section Azimuth:	0.769 ° (Grid North)
North Reference:	Grid North

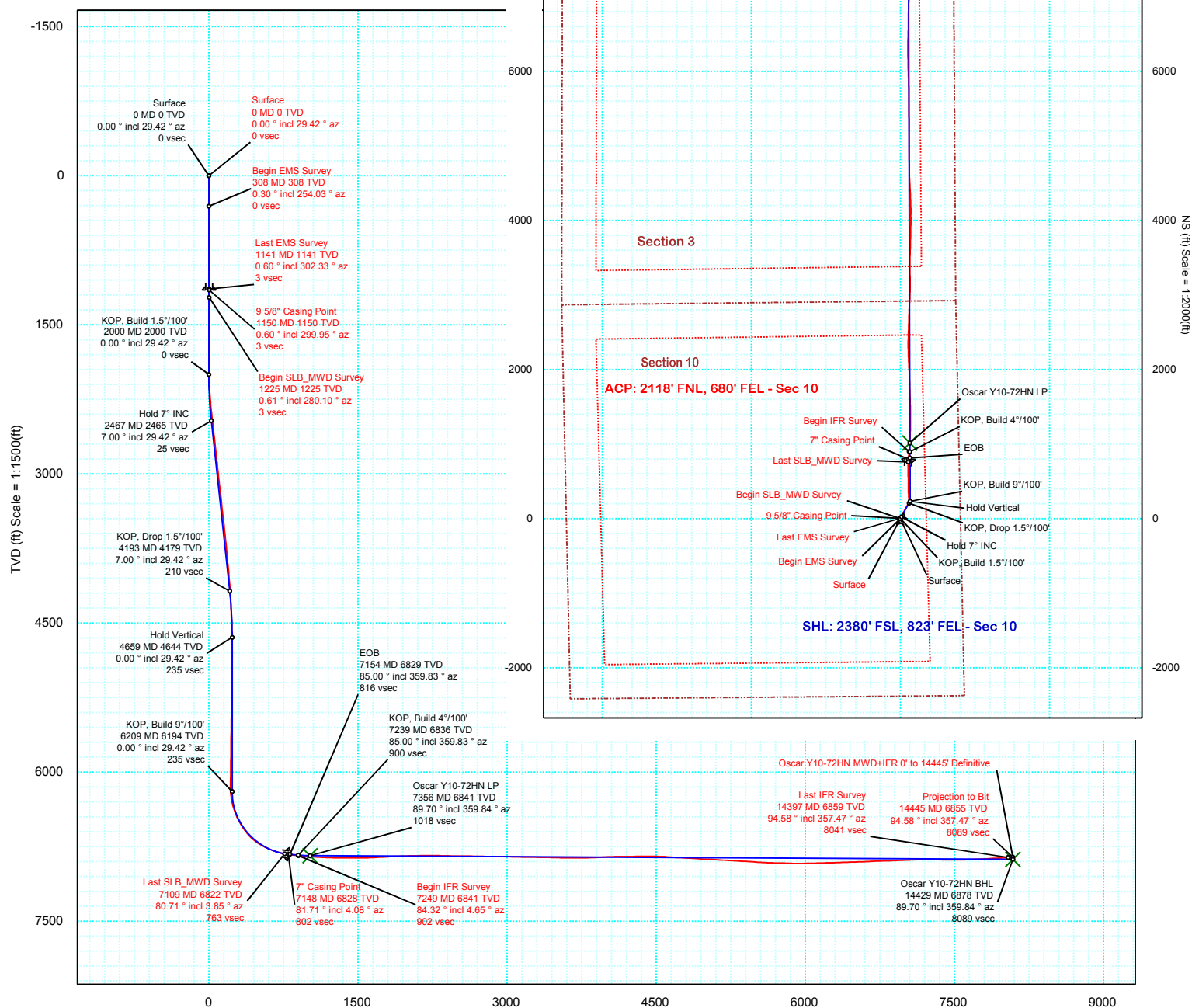
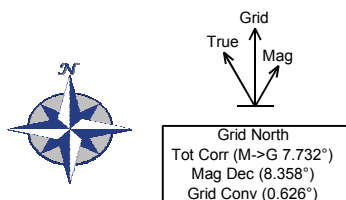
DOX Version: 2.8

<b>Borehole:</b> Original Hole	<b>Well:</b> Oscar Y10-72HN	<b>Field:</b> CO, Weld County (NAD 83 NZ)	<b>Structure:</b> 10-2N-64W (Oscar Y10-73HN Pad) - H&P 277
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<b>Gravity &amp; Magnetic Parameters</b>	<b>Surface Location</b>	<b>NAD83 Colorado State Plane, Northern Zone, US Feet</b>	<b>Miscellaneous</b>
Model: BGGM 2014 Dip: 66.764° Date: 06-Nov-2014	Lat: N 40 9 7.99 Northing: 1299776.84ftU	Grid Conv: 0.6261°	Slot: Oscar Y10-72HN
MagDec: 8.358° FS: 52556.123nT Gravity FS: 999.008mgn (9.80665 Based)	Lon: W 104 31 51.78 Easting: S 3270843.53ftU	Scale Fact: 0.99995832	TVD Ref: KB 24ft(4952ft above MSL)
			Plan: Oscar Y10-72HN MWD+IFR 0' to 14445' Definitive

PvA

EW (ft) Scale = 1:2000(ft)



Vertical Section (ft) Azim = 0.77° Scale = 1:1500(ft) Origin = 0N/-S, 0E/-W

## Oscar Y10-72HN MWD+IFR 0' to 14445' Definitive Survey Geodetic Report



(Def Survey)

<b>Report Date:</b>	November 19, 2014 - 03:47 PM
<b>Client:</b>	Noble Energy
<b>Field:</b>	CO, Weld County (NAD 83 NZ)
<b>Structure / Slot:</b>	Noble 10-2N-64W (Oscar Y10-73HN Pad) - H&P 277 / Oscar Y10-72HN
<b>Well:</b>	Oscar Y10-72HN
<b>Borehole:</b>	Original Hole
<b>UWI / API#:</b>	Unknown / Unknown
<b>Survey Name:</b>	Oscar Y10-72HN MWD+IFR 0' to 14445' Definitive
<b>Survey Date:</b>	November 06, 2014
<b>Tort / AHD / DDI / ERD Ratio:</b>	215.573 ° / 8185.865 ft / 6.566 / 1.183
<b>Coordinate Reference System:</b>	NAD83 Colorado State Plane, Northern Zone, US Feet
<b>Location Lat / Long:</b>	N 40° 9' 7.99200", W 104° 31' 51.78000"
<b>Location Grid N/E Y/X:</b>	N 1299776.842 ftUS, E 3270843.527 ftUS
<b>CRS Grid Convergence Angle:</b>	0.6261 °
<b>Grid Scale Factor:</b>	0.99995832
<b>Version / Patch:</b>	2.8.572.0

<b>Survey / DLS Computation:</b>	Minimum Curvature / Lubinski
<b>Vertical Section Azimuth:</b>	0.769 ° (Grid North)
<b>Vertical Section Origin:</b>	0.000 ft, 0.000 ft
<b>TVD Reference Datum:</b>	KB 24ft
<b>TVD Reference Elevation:</b>	4952.000 ft above MSL
<b>Seabed / Ground Elevation:</b>	4928.000 ft above MSL
<b>Magnetic Declination:</b>	8.358 °
<b>Total Gravity Field Strength:</b>	999.0079mgm (9.80665 Based)
<b>Gravity Model:</b>	GARM
<b>Total Magnetic Field Strength:</b>	52556.123 nT
<b>Magnetic Dip Angle:</b>	66.764 °
<b>Declination Date:</b>	November 06, 2014
<b>Magnetic Declination Model:</b>	BGGM 2014
<b>North Reference:</b>	Grid North
<b>Grid Convergence Used:</b>	0.6261 °
<b>Total Corr Mag North-&gt;Grid North:</b>	7.7319 °
<b>Local Coord Referenced To:</b>	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 ° ' ")
Surface	0.00	0.00	29.42	0.00	0.00	0.00	0.00	N/A	1299776.84	3270843.53	N 40 9 7.99	W 104 31 51.78
Begin EMS												
Survey	308.00	0.30	254.03	308.00	-0.23	-0.22	-0.78	0.10	1299776.62	3270842.75	N 40 9 7.99	W 104 31 51.79
	592.00	0.40	296.73	591.99	-0.01	0.02	-2.38	0.10	1299776.86	3270841.15	N 40 9 7.99	W 104 31 51.81
	887.00	0.60	314.73	886.98	1.51	1.57	-4.39	0.09	1299778.41	3270839.13	N 40 9 8.01	W 104 31 51.84
Last EMS												
Survey	1141.00	0.60	302.33	1140.97	3.13	3.22	-6.46	0.05	1299780.06	3270837.07	N 40 9 8.02	W 104 31 51.86
9 5/8" Casing												
Point	1150.00	0.60	299.95	1149.97	3.18	3.27	-6.54	0.28	1299780.11	3270836.99	N 40 9 8.02	W 104 31 51.86
Begin												
SLB_MWD												
Survey	1225.00	0.61	280.10	1224.96	3.43	3.53	-7.27	0.28	1299780.37	3270836.25	N 40 9 8.03	W 104 31 51.87
	1319.00	0.55	266.36	1318.96	3.48	3.59	-8.22	0.16	1299780.43	3270835.31	N 40 9 8.03	W 104 31 51.89
	1413.00	0.59	262.20	1412.95	3.37	3.50	-9.16	0.06	1299780.34	3270834.37	N 40 9 8.03	W 104 31 51.90
	1508.00	0.48	113.72	1507.95	3.14	3.27	-9.28	1.08	1299780.11	3270834.25	N 40 9 8.03	W 104 31 51.90
	1602.00	1.91	107.75	1601.93	2.53	2.63	-7.43	1.53	1299779.48	3270836.10	N 40 9 8.02	W 104 31 51.88
	1697.00	1.92	108.61	1696.88	1.58	1.64	-4.41	0.03	1299778.48	3270839.12	N 40 9 8.01	W 104 31 51.84
	1791.00	1.98	106.35	1790.82	0.66	0.68	-1.35	0.10	1299777.52	3270842.17	N 40 9 8.00	W 104 31 51.80
	1885.00	1.94	100.52	1884.77	-0.04	-0.07	1.77	0.22	1299776.78	3270845.30	N 40 9 7.99	W 104 31 51.76
	1980.00	2.81	71.12	1979.69	0.47	0.39	5.55	1.54	1299777.23	3270849.07	N 40 9 8.00	W 104 31 51.71
	2074.00	3.49	48.17	2073.55	3.18	3.05	9.86	1.51	1299779.89	3270853.38	N 40 9 8.02	W 104 31 51.65
	2168.00	4.23	30.29	2167.34	8.14	7.95	13.74	1.49	1299784.79	3270857.27	N 40 9 8.07	W 104 31 51.60
	2262.00	5.15	29.24	2261.02	14.86	14.63	17.55	0.98	1299791.47	3270861.08	N 40 9 8.13	W 104 31 51.55
	2355.00	6.36	16.78	2353.56	23.48	23.20	21.08	1.86	1299800.04	3270864.60	N 40 9 8.22	W 104 31 51.51
	2450.00	6.94	18.91	2447.92	34.00	33.67	24.46	0.67	1299810.51	3270867.98	N 40 9 8.32	W 104 31 51.46
	2545.00	6.64	15.76	2542.25	44.76	44.39	27.81	0.50	1299821.23	3270871.33	N 40 9 8.43	W 104 31 51.42
	2639.00	6.30	16.28	2635.65	54.98	54.57	30.73	0.37	1299831.41	3270874.26	N 40 9 8.53	W 104 31 51.38
	2734.00	7.03	26.02	2730.01	65.26	64.80	34.74	1.42	1299841.64	3270878.27	N 40 9 8.63	W 104 31 51.32
	2829.00	6.99	26.89	2824.30	75.71	75.19	39.91	0.12	1299852.02	3270883.43	N 40 9 8.73	W 104 31 51

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 ° ' ")
Begin IFR Survey	7249.00	84.32	4.65	6840.70	901.66	900.17	116.88	2.64	1300676.97	3270960.41	N 40 9 16.87 W 104 31 50.15	
	7343.00	85.70	4.10	6848.88	995.11	993.54	124.03	1.58	1300770.34	3270967.55	N 40 9 17.80 W 104 31 50.04	
	7438.00	86.80	3.27	6855.09	1089.79	1088.14	130.12	1.45	1300864.93	3270973.64	N 40 9 18.73 W 104 31 49.95	
	7533.00	87.56	1.11	6859.77	1184.64	1182.95	133.74	2.41	1300959.74	3270977.26	N 40 9 19.67 W 104 31 49.89	
	7628.00	89.59	0.27	6862.13	1279.60	1277.91	134.89	2.31	1301054.69	3270978.41	N 40 9 20.61 W 104 31 49.86	
	7723.00	89.52	359.42	6862.87	1374.58	1372.90	134.63	0.90	1301149.68	3270978.15	N 40 9 21.54 W 104 31 49.85	
	7817.00	89.66	359.73	6863.54	1468.56	1466.90	133.93	0.36	1301243.67	3270977.45	N 40 9 22.47 W 104 31 49.85	
	7912.00	91.65	358.50	6862.45	1563.51	1561.87	132.47	2.46	1301338.65	3270975.99	N 40 9 23.41 W 104 31 49.85	
	8006.00	92.30	358.07	6859.21	1657.36	1655.77	129.65	0.83	1301432.54	3270973.18	N 40 9 24.34 W 104 31 49.88	
	8101.00	93.54	357.99	6854.37	1752.13	1750.59	126.39	1.31	1301527.36	3270969.91	N 40 9 25.28 W 104 31 49.91	
	8289.00	91.99	358.49	6845.30	1939.72	1938.28	120.63	0.87	1301715.04	3270964.15	N 40 9 27.13 W 104 31 49.95	
	8384.00	90.65	356.35	6843.12	2034.53	2033.15	116.35	2.66	1301809.90	3270959.87	N 40 9 28.07 W 104 31 50.00	
	8478.00	91.44	357.58	6841.40	2128.30	2127.00	111.38	1.55	1301903.75	3270954.90	N 40 9 29.00 W 104 31 50.05	
	8573.00	90.17	358.26	6840.07	2223.17	2221.92	107.93	1.52	1301998.67	3270951.45	N 40 9 29.94 W 104 31 50.08	
	8666.00	88.59	359.25	6841.07	2316.11	2314.89	105.91	2.00	1302091.63	3270949.43	N 40 9 30.86 W 104 31 50.09	
	8761.00	88.56	1.89	6843.44	2411.07	2409.85	106.85	2.78	1302186.59	3270950.37	N 40 9 31.79 W 104 31 50.06	
	8856.00	89.28	1.72	6845.23	2506.03	2504.79	109.84	0.78	1302281.52	3270953.37	N 40 9 32.73 W 104 31 50.01	
	8951.00	89.73	1.46	6846.05	2601.02	2599.75	112.48	0.55	1302376.47	3270956.00	N 40 9 33.67 W 104 31 49.97	
	9045.00	88.66	1.72	6847.37	2695.00	2693.70	115.09	1.17	1302470.42	3270958.61	N 40 9 34.60 W 104 31 49.92	
	9139.00	89.07	1.86	6849.23	2788.97	2787.63	118.02	0.46	1302564.35	3270961.54	N 40 9 35.53 W 104 31 49.87	
	9233.00	90.48	4.12	6849.60	2882.89	2881.50	122.93	2.83	1302658.21	3270966.45	N 40 9 36.45 W 104 31 49.79	
	9328.00	88.80	2.33	6850.20	2977.79	2976.34	128.27	2.58	1302753.05	3270971.79	N 40 9 37.39 W 104 31 49.71	
	9422.00	88.69	0.12	6852.26	3071.76	3070.29	130.28	2.35	1302846.99	3270973.80	N 40 9 38.32 W 104 31 49.67	
	9516.00	88.97	0.09	6854.17	3165.73	3164.27	130.45	0.30	1302940.97	3270973.97	N 40 9 39.25 W 104 31 49.65	
	9704.00	89.04	358.34	6857.44	3353.63	3352.21	127.88	0.93	1303128.91	3270971.40	N 40 9 41.10 W 104 31 49.66	
	9798.00	88.73	1.00	6859.27	3447.59	3446.19	127.33	2.85	1303222.88	3270970.86	N 40 9 42.03 W 104 31 49.66	
	9893.00	88.49	2.45	6861.57	3542.54	3541.11	130.19	1.55	1303317.80	3270973.71	N 40 9 42.97 W 104 31 49.60	
	9987.00	90.07	1.53	6862.75	3636.51	3635.04	133.46	1.94	1303411.73	3270976.98	N 40 9 43.90 W 104 31 49.55	
	10082.00	90.31	1.51	6862.44	3731.50	3730.01	135.98	0.25	1303506.69	3270979.50	N 40 9 44.84 W 104 31 49.50	
	10271.00	92.30	0.79	6858.14	3920.44	3918.91	139.77	1.12	1303695.58	3270983.29	N 40 9 46.70 W 104 31 49.43	
	10366.00	92.82	359.53	6853.89	4015.33	4013.82	140.03	1.43	1303790.48	3270983.56	N 40 9 47.64 W 104 31 49.41	
	10461.00	91.62	0.70	6850.21	4110.25	4108.74	140.23	1.76	1303885.40	3270983.75	N 40 9 48.58 W 104 31 49.40	
	10555.00	89.69	358.28	6849.14	4204.21	4202.72	139.39	3.29	1303979.38	3270982.91	N 40 9 49.51 W 104 31 49.39	
	10650.00	90.83	358.18	6848.71	4299.12	4297.67	136.45	1.20	1304074.33	3270979.97	N 40 9 50.44 W 104 31 49.42	
	10744.00	90.38	356.81	6847.71	4392.95	4391.57	132.35	1.53	1304168.22	3270975.87	N 40 9 51.37 W 104 31 49.46	
	10839.00	89.11	357.26	6848.14	4487.75	4486.44	127.43	1.42	1304263.09	3270970.95	N 40 9 52.31 W 104 31 49.51	
	10934.00	86.97	357.11	6851.39	4582.50	4581.27	122.77	2.26	1304357.91	3270966.29	N 40 9 53.25 W 104 31 49.55	
	11028.00	86.32	359.92	6856.89	4676.26	4675.06	120.34	3.06	1304451.70	3270963.86	N 40 9 54.18 W 104 31 49.57	
	11133.00	86.39	359.60	6863.56	4781.03	4779.85	119.90	0.31	1304556.48	3270963.42	N 40 9 55.21 W 104 31 49.56	
	11217.00	86.66	359.65	6868.65	4864.86	4863.70	119.35	0.33	1304640.32	3270962.87	N 40 9 56.04 W 104 31 49.56	
	11312.00	86.66	359.95	6874.19	4959.68	4958.53	119.02	0.32	1304735.16	3270962.54	N 40 9 56.98 W 104 31 49.55	
	11502.00	86.94	359.67	6884.80	5149.36	5148.24	118.39	0.21	1304924.85	3270961.91	N 40 9 58.85 W 104 31 49.53	
	11596.00	87.39	359.76	6889.44	5243.23	5242.12	117.92	0.49	1305018.73	3270961.44	N 40 9 59.78 W 104 31 49.52	
	11691.00	86.18	359.26	6894.77	5338.06	5336.96	117.11	1.38	1305113.57	3270960.63	N 40 10 0.72 W 104 31 49.52	
	11785.00	86.49	359.42	6900.78	5431.83	5430.77	116.03	0.37	1305207.37	3270959.55	N 40 10 1.64 W 104 31 49.52	
	11880.00	86.42	359.35	6906.66	5526.62	5525.58	115.01	0.10	1305302.18	3270958.54	N 40 10 2.58 W 104 31 49.52	
	11974.00	87.42	0.36	6911.71	5620.47	5619.44	114.78	1.51	1305396.04	3270958.30	N 40 10 3.51 W 104 31 49.51	
	12069.00	89.11	359.20	6914.58	5715.41	5714.39	114.41	2.16	1305490.98	3270957.93	N 40 10 4.45 W 104 31 49.50	
	12164.00	87.87	358.86	6917.09	5810.33	5809.34	112.80	1.35	1305585.93	3270956.33	N 40 10 5.38 W 104 31 49.51	
	12259.00	89.55	358.33	6919.22	5905.24	5904.29	110.47	1.85	1305680.87	3270954.00	N 40 10 6.32 W 104 31 49.53	
	12354.00	91.20	358.44	6918.60	6000.15	5999.24	107.80	1.74	1305775.82	3270951.32	N 40 10 7.26 W 104 31 49.55	
	12449.00	91.31	358.54	6916.52	6095.05	6094.19	105.29	0.16	1305870.76	3270948.82	N 40 10 8.20 W 104 31 49.57	
	12543.00	91.68	358.40	6914.07	6188.94	6188.12	102.79	0.42	1305964.69	3270946.31	N 40 10 9.13 W 104 31 49.59	
	12638.00	91.41	0.19	6911.51	6283.87	6283.07	101.62	1.90	1306059.64	3270945.14	N 40 10 10.07 W 104 31 49.59	
	12733.00	92.27	0.42	6908.46	6378.82	6378.02	102.12	0.94	1306154.59	3270945.65	N 40 10 11.01 W 104 31 49.57	
	12827.00	91.34	1.88	6905.50	6472.77	6471.95	104.01	1.84	1306248.51	3270947.53	N 40 10 11.93 W 104 31 49.53	
	12922.00	92.17	1.57	6902.59	6567.71	6566.87	106.87	0.93	1306343.42	3270950.39	N 40 10 12.87 W 104 31 49.48	
	13017.00	93.37	359.89	6898.00	6662.59	6661.74	108.08	2.17	1306438.29	3270951.60	N 40 10 13.81 W 104 31 49.45	
	13111.00	91.10	1.30	6894.33	6756.51	6755.66	109.05	2.84	1306532.20	3270952.57	N 40 10 14.74 W 104 31 49.42	
	13206.00	91.62	1.58	6892.08	6851.48	6850.60	111.44	0.62	1306627.14	3270954.96	N 40 10 15.67 W 104 31 49.38	
	13301.00	92.30	1.32	6888.83	6946.42	6945.51	113.84	0.77	1306722.05	3270957.36	N 40 10 16.61 W 104 31 49.34	
	13395.00	92.96	0.87	6884.51	7040.31	7039.40	115.64	0.85	1306815.93	3270959.16	N 40 10 17.54 W 104 31 49.30	
	13490.00	91.41	0.44	6880.89	7135.24	7134.32	116.72	1.69	1306910.85	3270960.24	N 40 10 18.48 W 104 31 49.27	
	13585.00	89.35	359.97	6880.26	7230.23	7229.31	117.06	2.22	1307005.84	3270960.58	N 40 10 19.42 W 104 31 49.25	
	13680.00	89.73	359.39	6881.02	7325.21	7324.30	116.53	0.73	1307100.83	3270960.05	N 40 10 20.35 W 104 31 49.25	
	13775.00	88.56	358.78	6882.44	7420.16	7419.28	115.01	1.39	1307195.80	3270958.54	N 40 10 21.29 W 104 31 49.25	
	13869.00	90.48	358.18	6883.23	7514.07	7513.24	112.52	2.14	1307289.75	3270956.04	N 40 10 22.22 W 104 31 49.27	
	13964.00	91.34	357.76	6881.72	7608.95	7608.17	109.16	1.01	1307384.68	3270952.68	N 40 10 23.16 W 104 31 49.30	
	14059.00	92.58	359.41	6878.47	7703.82	7703.08	106.81	2.17	1307479.58	3270950.33	N 40 10 24.10 W 104 31 49.32	
	14153.00	92.89	359.05	6873.99	7797.67	7796.96	105.55	0.51	1307573.46	3270949.07	N 40 10 25.03 W 104 31 49.32	
	14248.00	93.44	358.62	6868.74	7892.48	7891.80	103.62	0.73	1307668.29	3270947.14	N 40 10 25.96 W 104 31 49.33	
	14343.00	93.68	357.71	6862.84	7987.19	7986.56	100.58	0.99	1307763.06	3270944.11	N 40 10 26.90 W 104 31 49.36	
	14397.00	94.58	357.47	6858.95	8040.97	8040.37	98.32	1.72	1307816.86	3270941.84	N 40 10 27.43 W 104 31 49.38	
Last IFR Survey												
Projection to Bit	14445.00	94.58	357.47	6855.12	8088.74	8088.17	96.21	0.00	1307864.66	3270939.73	N 40 10 27.90 W 104 31 49.40	

Survey Type: Def Survey

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