

REPORT OF
SUB-SURFACE
DIRECTIONAL
SURVEY

ARCO PERMIAN
EMPIRE ABO K-16
EDDY COUNTY, NEW MEXICO

BAKER HUGHES INTEQ
2105 MARKET STREET
MIDLAND, TX 79703

ARCO

Structure : EMPIRE ABO UNIT #K-16

Field : EDDY COUNTY, NM.

Location : EDDY COUNTY, NM.

TRUE

N

MAGNETIC DECLINATION
9.6 DEGREE EAST
DIP - 60.87

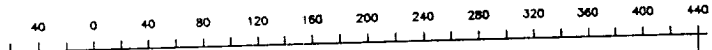
BAKER

HUGHES

INTEQ

Scale 1 : 20.00

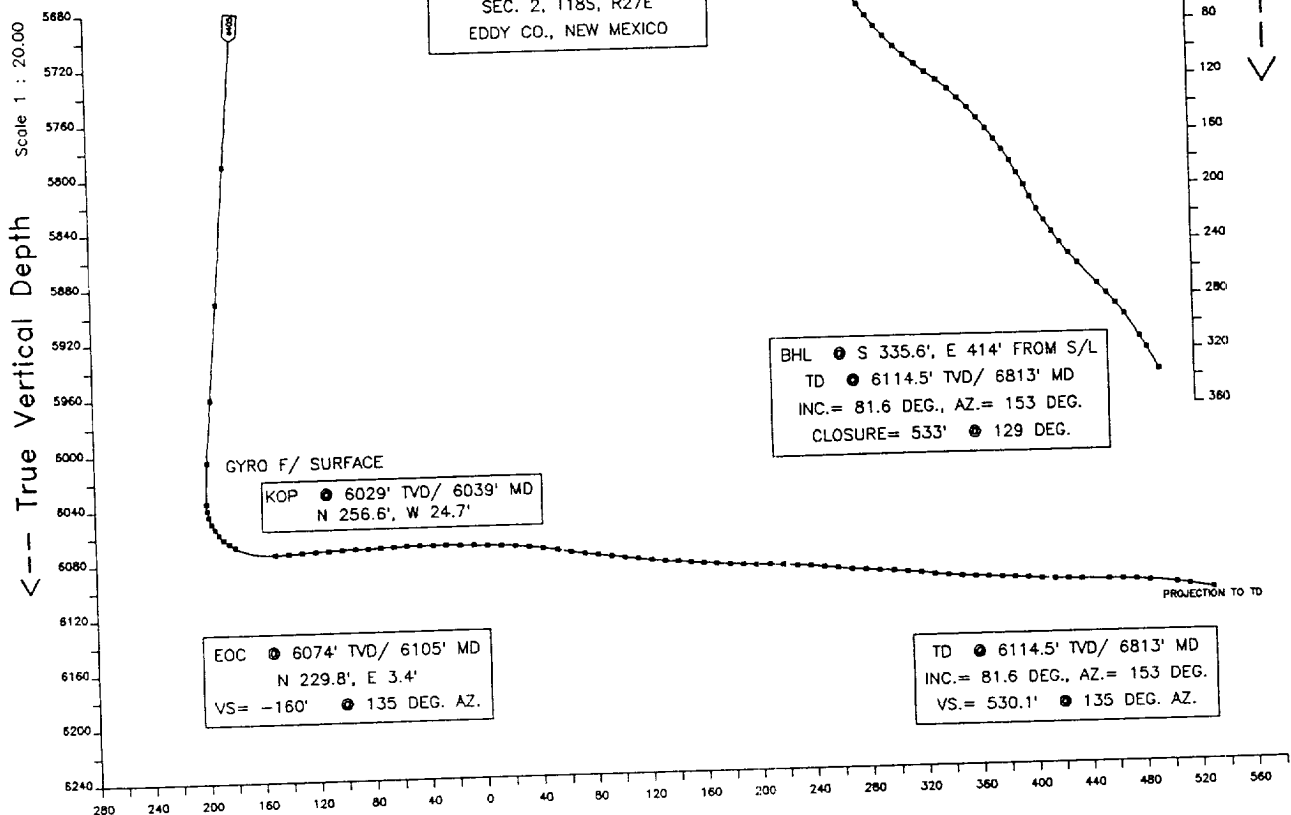
East -->



Scale 1 : 20.00

South -->

S/L 1980' FSL & 660' FEL
SEC. 2, T18S, R27E
EDDY CO., NEW MEXICO



EOC • 6074' TVD/ 6105' MD
N 229.8', E 3.4'
VS = -160' • 135 DEG. AZ.

TD • 6114.5' TVD/ 6813' MD
INC. = 81.6 DEG., AZ. = 153 DEG.
VS. = 530.1' • 135 DEG. AZ.

Scale 1 : 20.00

Vertical Section on 135.00 azimuth with reference 0.00 N, 0.00 E from slot #1

ARCO
EMPIRE ABO UNIT #K-16

slot #1
EDDY COUNTY, NM.
EDDY COUNTY, NM.

S U R V E Y L I S T I N G

by
Baker Hughes INTEQ

Your ref :
Our ref : svy405
License :

Date printed : 13-Feb-95
Date created : 27-Jan-95
Last revised : 13-Feb-95

Field is centred on 0.000,0.000,0.00000,N
Structure is centred on n32 46 28.128,w104 14 32.820,0

Slot location is n32 46 28.128,w104 14 32.820
Slot Grid coordinates are N 645478.774, E 527933.980
Slot local coordinates are 0.00 N 0.00 E
Reference North is True North

SURVEY LISTING Page 1

ARCO
EMPIRE ABO UNIT #K-16, slot #1
EDDY COUNTY, NM., EDDY COUNTY, NM.

Your ref :
Last revised : 13-Feb-95

Measured Depth	Inclin. Degrees	Azimuth Degrees	True Vert. Depth	R E C T A N G U L A R C O O R D I N A T E S	Dogleg Deg/100Ft	Vert Sect
0.00	0.00	0.00	0.00	0.00 N	0.00 E	0.00
100.00	0.28	29.50	100.00	0.21 N	0.12 E	-0.06
200.00	0.34	39.57	200.00	0.65 N	0.43 E	-0.16
300.00	0.21	39.78	300.00	1.02 N	0.74 E	-0.20
400.00	0.15	27.16	400.00	1.28 N	0.91 E	-0.26
500.00	0.19	36.15	500.00	1.53 N	1.07 E	-0.32
600.00	0.42	346.09	599.99	2.02 N	1.08 E	-0.66
700.00	0.59	324.60	699.99	2.80 N	0.69 E	-1.49
800.00	1.29	346.17	799.98	4.31 N	0.13 E	-2.96
900.00	1.23	350.00	899.95	6.46 N	0.33 W	-4.80
1000.00	1.26	352.65	999.93	8.61 N	0.66 W	-6.55
1100.00	1.32	352.06	1099.90	10.84 N	0.96 W	-8.34
1200.00	1.33	347.74	1199.88	13.11 N	1.36 W	-10.23
1300.00	1.22	349.65	1299.85	15.29 N	1.80 W	-12.09
1400.00	1.24	347.81	1399.83	17.40 N	2.22 W	-13.87
1500.00	1.23	347.50	1499.81	19.50 N	2.68 W	-15.69
1600.00	1.11	355.69	1599.78	21.52 N	2.98 W	-17.32
1700.00	1.15	357.77	1699.76	23.49 N	3.10 W	-18.80
1800.00	1.11	13.39	1799.75	25.43 N	2.91 W	-20.04
1900.00	0.99	20.43	1899.73	27.18 N	2.38 W	-20.91
2000.00	1.05	22.25	1999.71	28.84 N	1.74 W	-21.62
2100.00	1.09	20.97	2099.70	30.58 N	1.05 W	-22.36
2200.00	1.16	14.74	2199.68	32.44 N	0.45 W	-23.26
2300.00	1.19	7.14	2299.66	34.45 N	0.06 W	-24.41
2400.00	1.20	2.80	2399.63	36.53 N	0.12 E	-25.75

All data is in feet unless otherwise stated
Coordinates from slot #1 and TVD from wellhead.
Vertical section is from wellhead on azimuth 135.00 degrees.
Declination is 0.00 degrees, Convergence is 0.05 degrees.
Calculation uses the minimum curvature method.
Presented by Baker Hughes INTEQ

ARCO
EMPIRE ABO UNIT #K-16, slot #1
EDDY COUNTY, NM., EDDY COUNTY, NM.

Your ref :
Last revised : 13-Feb-95

Measured Depth	Inclin. Degrees	Azimuth Degrees	True Vert. Depth	R E C T A N G U L A R C O O R D I N A T E S	Dogleg Deg/100Ft	Vert Sect
2500.00	1.20	3.73	2499.61	38.62 N	0.23 E	0.02
2600.00	1.12	1.24	2599.59	40.64 N	0.32 E	0.09
2700.00	1.11	3.52	2699.57	42.59 N	0.40 E	0.04
2800.00	1.28	11.38	2799.55	44.65 N	0.68 E	0.24
2900.00	1.38	11.47	2899.52	46.92 N	1.14 E	0.10
3000.00	1.47	6.56	2999.49	49.38 N	1.53 E	0.15
3100.00	1.44	4.83	3099.46	51.90 N	1.78 E	0.05
3200.00	1.55	8.83	3199.43	54.49 N	2.10 E	0.15
3300.00	1.69	5.55	3299.39	57.30 N	2.45 E	0.17
3400.00	1.65	2.60	3399.34	60.20 N	2.65 E	0.09
3500.00	1.59	1.00	3499.30	63.03 N	2.74 E	0.08
3600.00	1.66	3.42	3599.26	65.86 N	2.85 E	0.10
3700.00	2.00	358.30	3699.21	69.05 N	2.89 E	0.38
3800.00	2.06	358.65	3799.15	72.59 N	2.79 E	0.06
3900.00	2.35	357.97	3899.08	76.44 N	2.68 E	0.29
4000.00	2.56	358.76	3998.98	80.72 N	2.56 E	0.21
4100.00	2.78	358.07	4098.88	85.38 N	2.43 E	0.22
4200.00	2.91	354.81	4198.75	90.33 N	2.12 E	0.21
4300.00	3.20	354.66	4298.61	95.63 N	1.63 E	0.29
4400.00	3.55	355.80	4398.44	101.50 N	1.14 E	0.36
4500.00	4.17	354.24	4498.21	108.20 N	0.55 E	0.63
4600.00	4.62	357.30	4597.92	115.85 N	0.00 W	0.51
4700.00	4.57	354.37	4697.59	123.83 N	0.58 W	0.24
4800.00	4.49	352.53	4797.28	131.68 N	1.48 W	0.16
4900.00	4.39	348.70	4896.98	139.31 N	2.74 W	0.31
						-76.12
						-81.92
						-87.98
						-94.16
						-100.45

All data is in feet unless otherwise stated
Coordinates from slot #1 and TVD from wellhead.
Vertical section is from wellhead on azimuth 135.00 degrees.
Declination is 0.00 degrees, Convergence is 0.05 degrees.
Calculation uses the minimum curvature method.
Presented by Baker Hughes INTEQ

ARCO
EMPIRE ABO UNIT #K-16, slot #1
EDDY COUNTY, NM., EDDY COUNTY, NM.

Your ref :
Last revised : 13-Feb-95

Measured Depth	Inclin. Degrees	Azimuth Degrees	True Vert. Depth	R E C T A N G U L A R C O O R D I N A T E S	Dogleg Deg/100Ft	Vert Sect
5000.00	4.92	347.02	4996.65	147.24 N	4.46 W	0.55 -107.27
5100.00	6.30	347.03	5096.17	156.77 N	6.65 W	1.38 -115.56
5200.00	6.69	348.25	5195.53	167.82 N	9.07 W	0.41 -125.08
5300.00	6.68	350.73	5294.85	179.26 N	11.19 W	0.29 -134.67
5400.00	6.83	347.58	5394.16	190.81 N	13.41 W	0.40 -144.40
5500.00	6.80	349.06	5493.45	202.43 N	15.81 W	0.18 -154.32
5600.00	6.91	348.88	5592.73	214.15 N	18.09 W	0.11 -164.22
5700.00	5.87	349.29	5692.11	225.07 N	20.20 W	1.04 -173.44
5800.00	5.61	350.31	5791.61	234.92 N	21.98 W	0.28 -181.65
5900.00	5.32	352.44	5891.16	244.33 N	23.41 W	0.35 -189.32
5970.00	5.45	352.36	5960.85	250.84 N	24.28 W	0.19 -194.54
6015.00	5.50	350.97	6005.64	255.09 N	24.90 W	0.31 -197.98
6039.00	2.41	41.97	6029.59	256.60 N	24.74 W	18.33 -198.94 KOP
6045.00	2.40	68.40	6035.58	256.74 N	24.54 W	18.33 -198.90
6050.00	7.70	124.00	6040.56	256.59 N	24.17 W	132.88 -198.53
6055.00	15.70	132.40	6045.46	255.95 N	23.39 W	163.17 -197.52
6060.00	24.00	133.50	6050.15	254.79 N	22.15 W	166.16 -195.82
6065.00	31.50	133.50	6054.58	253.19 N	20.46 W	150.00 -193.50
6070.00	39.40	133.00	6058.64	251.20 N	18.35 W	158.10 -190.60
6075.00	47.00	132.40	6062.29	248.88 N	15.84 W	152.22 -187.19
6080.00	54.50	132.60	6065.45	246.27 N	12.98 W	150.03 -183.32
6085.00	60.70	133.40	6068.13	243.39 N	9.90 W	124.73 -179.10
6105.00	85.70	137.40	6073.86	229.84 N	3.40 E	126.43 -160.11
6115.00	91.40	140.40	6074.12	222.31 N	9.97 E	64.40 -150.15
6125.00	92.90	144.20	6073.74	214.40 N	16.08 E	40.83 -140.24

END OF CURVE

All data is in feet unless otherwise stated
Coordinates from slot #1 and TVD from wellhead.
Vertical section is from wellhead on azimuth 135.00 degrees.
Declination is 0.00 degrees, Convergence is 0.05 degrees.
Calculation uses the minimum curvature method.
Presented by Baker Hughes INTEQ

ARCO
EMPIRE ABO UNIT #K-16, slot #1
EDDY COUNTY, NM., EDDY COUNTY, NM.

Your ref :
Last revised : 13-Feb-95

Measured Depth	Inclin. Degrees	Azimuth Degrees	True Vert. Depth	R E C T A N G U L A R C O O R D I N A T E S	Dogleg Deg/100Ft	Vert Sect
6135.00	93.20	146.40	6073.21	206.20 N	21.76 E	22.17 -130.41
6145.00	93.30	148.80	6072.64	197.77 N	27.12 E	23.98 -120.67
6155.00	92.90	151.40	6072.10	189.11 N	32.09 E	26.27 -111.03
6165.00	91.90	153.40	6071.68	180.26 N	36.72 E	22.34 -101.50
6175.00	91.40	156.00	6071.40	171.22 N	40.99 E	26.46 -92.09
6185.00	91.70	158.60	6071.12	162.00 N	44.85 E	26.16 -82.84
6195.00	91.80	159.70	6070.82	152.66 N	48.41 E	11.04 -73.72
6205.00	92.40	158.20	6070.45	143.33 N	52.00 E	16.15 -64.58
6215.00	91.80	155.60	6070.09	134.14 N	55.92 E	26.67 -55.31
6225.00	90.70	152.80	6069.87	125.14 N	60.27 E	30.08 -45.87
6235.00	89.80	149.60	6069.82	116.38 N	65.08 E	33.24 -36.27
6245.00	88.40	145.90	6069.98	107.93 N	70.42 E	39.55 -26.52
6255.00	87.80	142.80	6070.31	99.80 N	76.24 E	31.56 -16.66
6265.00	88.30	140.50	6070.65	91.97 N	82.44 E	23.52 -6.74
6275.00	88.40	138.20	6070.94	84.38 N	88.95 E	23.01 3.23
6285.00	87.50	135.50	6071.30	77.09 N	95.79 E	28.44 13.22
6295.00	85.90	134.10	6071.87	70.06 N	102.87 E	21.24 23.20
6305.00	83.80	132.70	6072.77	63.22 N	110.11 E	25.21 33.16
6315.00	81.60	132.90	6074.04	56.48 N	117.38 E	22.09 43.07
6325.00	80.40	133.70	6075.61	49.70 N	124.57 E	14.37 52.94
6335.00	80.90	134.70	6077.23	42.83 N	131.65 E	11.06 62.80
6345.00	82.10	135.50	6078.71	35.82 N	138.63 E	14.37 72.70
6355.00	83.40	137.60	6079.97	28.62 N	145.45 E	24.56 82.61
6365.00	83.10	142.20	6081.15	21.02 N	151.84 E	45.78 92.50
6375.00	82.70	144.60	6082.38	13.06 N	157.76 E	24.15 102.32

All data is in feet unless otherwise stated
Coordinates from slot #1 and TVD from wellhead.
Vertical section is from wellhead on azimuth 135.00 degrees.
Declination is 0.00 degrees, Convergence is 0.05 degrees.
Calculation uses the minimum curvature method.
Presented by Baker Hughes INTEQ

ARCO
EMPIRE ABO UNIT #K-16, slot #1
EDDY COUNTY, NM., EDDY COUNTY, NM.

Your ref :
Last revised : 13-Feb-95

Measured Depth	Inclin. Degrees	Azimuth Degrees	True Vert. Depth	R C O O R D I N A T E S	E C T A N G U L A R	Dogleg Deg/100Ft	Vert Sect
6385.00	82.90	147.40	6083.64	4.84 N	163.31 E	27.85	112.06
6395.00	83.80	149.10	6084.80	3.61 S	168.53 E	19.13	121.72
6405.00	85.40	151.10	6085.74	12.24 S	173.50 E	25.54	131.34
6415.00	85.80	153.40	6086.50	21.06 S	178.14 E	23.28	140.86
6425.00	86.20	155.30	6087.20	30.06 S	182.46 E	19.37	150.27
6435.00	84.80	154.00	6087.99	39.06 S	186.72 E	19.08	159.66
6445.00	85.40	151.90	6088.84	47.94 S	191.26 E	21.77	169.13
6455.00	86.90	149.80	6089.51	56.65 S	196.11 E	25.77	178.73
6465.00	87.90	146.60	6089.97	65.14 S	201.38 E	33.49	188.46
6475.00	88.10	143.90	6090.32	73.35 S	207.07 E	27.06	198.29
6485.00	87.50	140.70	6090.70	81.26 S	213.18 E	32.53	208.20
6495.00	87.10	138.20	6091.17	88.84 S	219.68 E	25.29	218.16
6505.00	86.70	135.40	6091.71	96.12 S	226.51 E	28.24	228.14
6515.00	85.50	131.40	6092.39	102.98 S	233.76 E	41.67	238.11
6525.00	83.40	128.40	6093.36	109.36 S	241.39 E	36.50	248.02
6535.00	83.90	127.10	6094.46	115.44 S	249.25 E	13.85	257.88
6545.00	85.10	128.90	6095.42	121.57 S	257.09 E	21.56	267.76
6555.00	86.00	131.90	6096.20	128.03 S	264.69 E	31.23	277.70
6565.00	86.40	134.30	6096.86	134.85 S	271.97 E	24.28	287.67
6575.00	85.90	137.70	6097.53	142.03 S	278.90 E	34.29	297.64
6585.00	84.50	140.30	6098.37	149.55 S	285.44 E	29.45	307.58
6595.00	83.30	142.30	6099.43	157.31 S	291.65 E	23.23	317.46
6605.00	83.20	144.50	6100.61	165.28 S	297.58 E	21.87	327.29
6615.00	84.70	146.20	6101.66	173.46 S	303.23 E	22.60	337.07
6625.00	86.10	148.60	6102.46	181.85 S	308.60 E	27.72	346.80

All data is in feet unless otherwise stated
Coordinates from slot #1 and TVD from wellhead.

Vertical section is from wellhead on azimuth 135.00 degrees.

Declination is 0.00 degrees, Convergence is 0.05 degrees.

Calculation uses the minimum curvature method.

Presented by Baker Hughes INTEQ

ARCO				SURVEY LISTING		Page 6	
EMPIRE ABO UNIT #K-16, slot #1				Your ref :			
EDDY COUNTY, NM., EDDY COUNTY, NM.				Last revised : 13-Feb-95			
Measured Depth	Inclin. Degrees	Azimuth Degrees	True Vert. Depth	R C	E O	T A	Vert Sect
6635.00	87.10	150.50	6103.06	190.46 S	313.66 E	21.44	356.46
6645.00	87.80	153.00	6103.50	199.26 S	318.38 E	25.94	366.03
6655.00	87.10	153.70	6103.95	208.19 S	322.87 E	9.89	375.51
6665.00	86.10	151.30	6104.54	217.04 S	327.47 E	25.96	385.03
6675.00	86.50	148.20	6105.19	225.66 S	332.50 E	31.19	394.68
6685.00	86.80	145.10	6105.77	234.00 S	337.99 E	31.09	404.46
6695.00	87.70	142.10	6106.25	242.04 S	343.92 E	31.29	414.33
6705.00	88.60	139.80	6106.57	249.80 S	350.21 E	24.69	424.27
6715.00	89.10	136.60	6106.78	257.25 S	356.88 E	32.38	434.25
6735.00	88.70	136.40	6107.16	271.76 S	370.64 E	2.24	454.24
6745.00	88.00	138.00	6107.45	279.09 S	377.43 E	17.46	464.23
6755.00	87.00	140.80	6107.88	286.67 S	383.93 E	29.71	474.19
6765.00	86.00	144.20	6108.49	294.59 S	390.01 E	35.38	484.08
6785.00	82.40	149.90	6110.52	311.28 S	400.83 E	33.58	503.53
6795.00	81.60	151.00	6111.91	319.89 S	405.71 E	13.51	513.08
6813.00	81.60	153.00	6114.54	335.61 S	414.07 E	10.99	530.10
							PROJECTION TO TD

All data is in feet unless otherwise stated
Coordinates from slot #1 and TVD from wellhead.
Vertical section is from wellhead on azimuth 135.00 degrees.
Declination is 0.00 degrees, Convergence is 0.05 degrees.
Calculation uses the minimum curvature method.
Presented by Baker Hughes INTEQ

ARCO
 EMPIRE ABO UNIT #K-16, slot #1
 EDDY COUNTY, NM., EDDY COUNTY, NM.

Your ref :
 Last revised : 13-Feb-95

Comments in wellpath
 =====
 Comment

MD	TVD	Rectangular Coords.		
6039.00	6029.59	256.60 N	24.74 W	KOP
6105.00	6073.86	229.84 N	3.40 E	END OF CURVE
6813.00	6114.54	335.61 S	414.07 E	PROJECTION TO TD

All data is in feet unless otherwise stated
 Coordinates from slot #1 and TVD from wellhead.
 Bottom hole distance is 533.00 on azimuth 129.02 degrees from wellhead.
 Vertical section is from wellhead on azimuth 135.00 degrees.
 Declination is 0.00 degrees, Convergence is 0.05 degrees.
 Calculation uses the minimum curvature method.
 Presented by Baker Hughes INTEQ