



30-039-27660

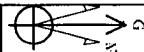
Field: Rio Arriba, NM
Site: Carracas Canyon Section 27 T32N R5W
Well: Carracas 27A #3
Wellpath: 1
Plan: Plan #2

[Signature]

ENERGEN.

LEGEND

— Carracas 27A #3, 1, Gyro
— Carracas 27A #3, 1, MWD
— 1
— Plan #2



Azimuths to Grid North
True North: -20.29°
Magnetic North: 10.19°
Magnetic Field
Strength: 51578nT
Dip Angle: 63.87°
Date: 2003-06-02
Model: int2005

SECTION DETAILS							
Sec	MD	Inc	Azi	TYD	+N/-S	+E/-W	DLog
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	3713.00	0.00	0.00	3713.00	0.00	0.00	0.00
3	3961.19	90.00	217.97	3871.00	-124.56	-97.21	36.26
4	5940.58	90.00	217.97	3871.00	-1684.98	-1315.03	0.00

WELL DETAILS

Name	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Slot
Carracas 27A #3	0.00	0.00	2167545.26	640819.54	36°57'20.988N	107°21'04.968W	N/A

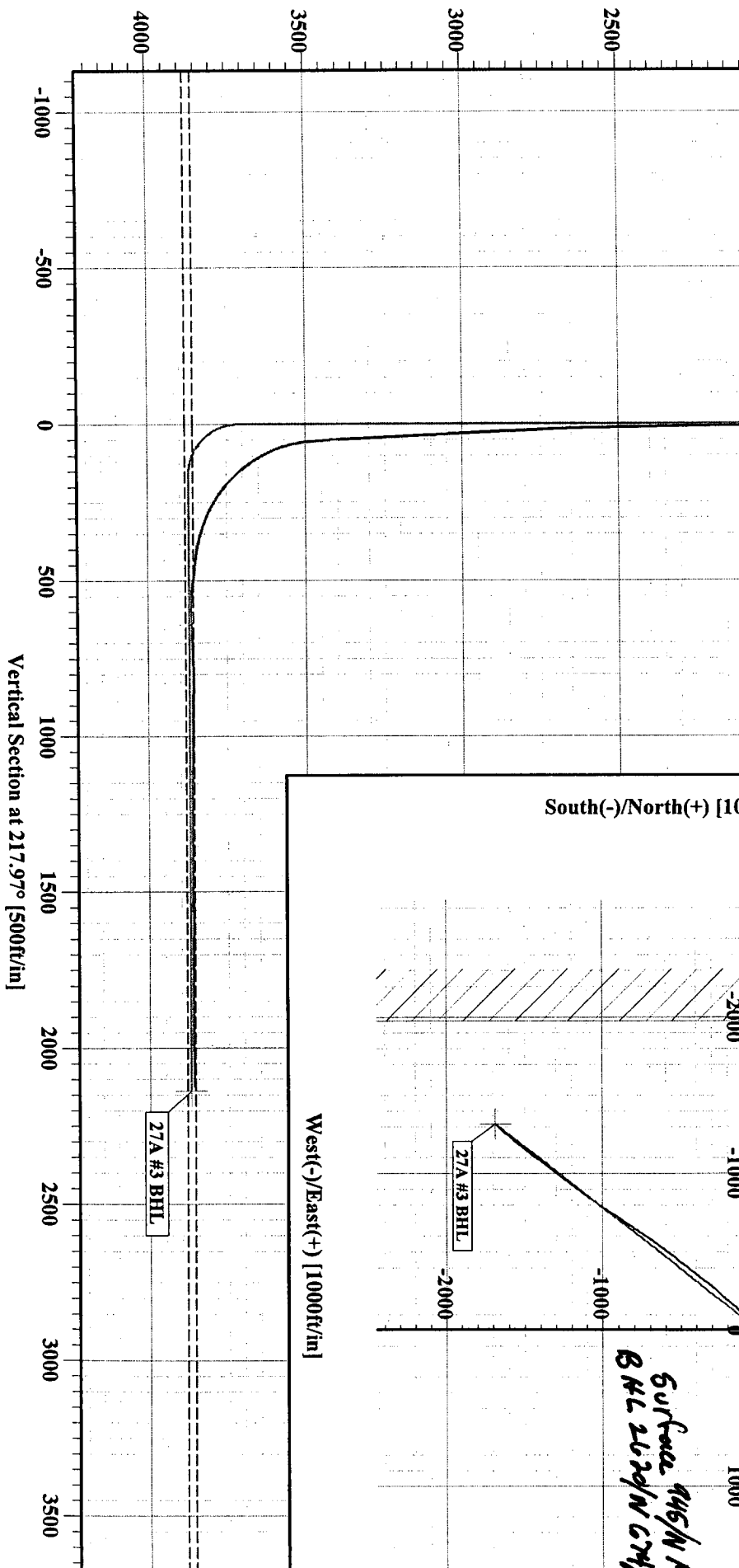
TARGET DETAILS

Name	TYD	+N/-S	+E/-W	Shape
27A #3 BHL	3871.00	-1685.00	-1315.00	Point

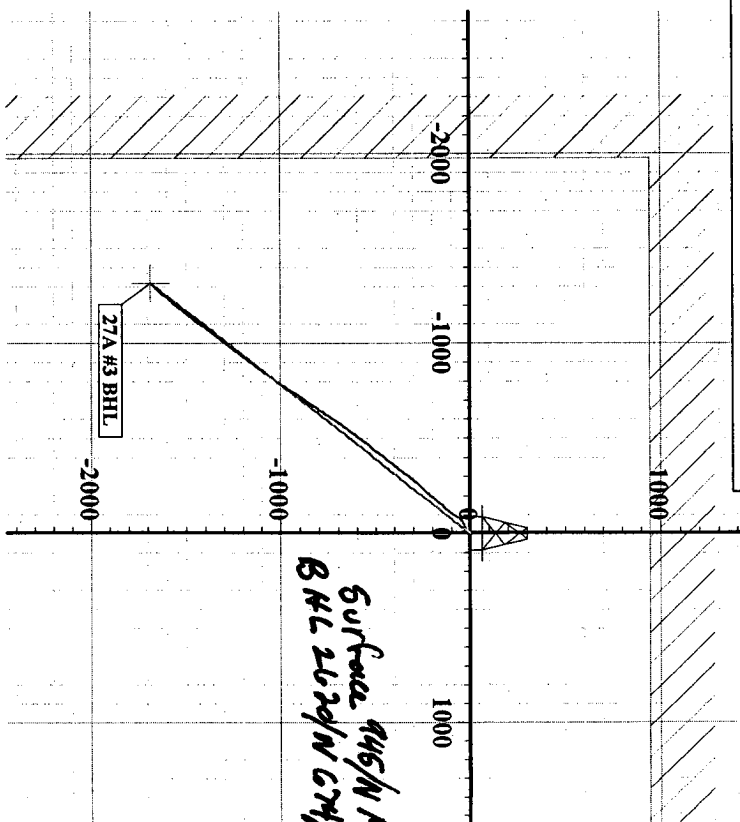
FORMATION TOP DETAILS

No.	TYDPath	MDPath	Formation
1	3858.00	3896.64	Top of Coal

True Vertical Depth [500ft/in]



South(-)/North(+) [1000ft/in]



West(-)/East(+) [1000ft/in]



Scientific Drilling Survey

Company: ENERGEN. **Date:** 2005-07-21 **Time:** 16:23:45 **Page:** 1
Field: Rio Arriba, NM **Co-ordinate(NE) Reference:** Well: Carracas 27A #3, Grid North
Site: Carracas Canyon Section 27 T32N R5W **Vertical (TVD) Reference:** GL ELEVATION 7171.0
Well: Carracas 27A #3 **Section (VS) Reference:** Well (0.00N,0.00E,217.97Azi)
Wellpath: 1 **Survey Calculation Method:** Minimum Curvature **Db:** Sybase

Field: Rio Arriba, NM

Map System: US State Plane Coordinate System 1927
Geo Datum: NAD27 (Clarke 1866)
Sys Datum: Mean Sea Level

Map Zone: New Mexico, Western Zone
Coordinate System: Well Centre
Geomagnetic Model: igrf2005

Site: Carracas Canyon Section 27 T32N R5W

Site Position: **From:** Lease Line **Northing:** **Easting:** **ft** **Latitude:** **Longitude:**
Position Uncertainty: 0.00 ft **North Reference:** Grid
Ground Level: 0.00 ft **Grid Convergence:** 0.29 deg

Well: Carracas 27A #3

Slot Name:

Well Position: +N/-S 0.00 ft **Northing:** 2167545.26 ft **Latitude:** 36 57 20.988 N
 +E/-W 0.00 ft **Easting:** 640819.54 ft **Longitude:** 107 21 4.968 W
Position Uncertainty: 0.00 ft

Wellpath: 1

Current Datum: GL ELEVATION **Height** 7171.00 ft **Drilled From:** Surface
Magnetic Data: 2005-06-02 **Tie-on Depth:** 0.00 ft
Field Strength: 51578 nT **Above System Datum:** Mean Sea Level
Vertical Section: **Depth From (TVD)** **+N/-S** **ft** **Declination:** 10.48 deg
ft **Mag Dip Angle:** 63.87 deg
ft **Direction**
deg
 0.00 0.00 0.00 217.97

Survey Program for Definitive Wellpath

Date: 2005-07-21 **Validated:** No
Actual From **To** **Survey**
ft **ft**

Version: 1
Toolcode

Tool Name

100.00 3400.00 Gyro (100.00-3400.00) Keeper Keeper Standard Rate Gyro
 3506.00 5750.00 MWD (3506.00-5750.00) MWD MWD - Standard ISCWSA

Survey

MD ft	Incl deg	Azim deg	TVD ft	N/S ft	E/W ft	VS ft	DLS deg/100ft	Build deg/100ft	Turn deg/100ft	ClsA deg	ClsD ft	Tool
0.00	0.00	0.29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	TIE LINE
100.00	0.21	305.65	100.00	0.11	-0.15	0.01	0.21	0.21	0.00	305.65	0.18	Keeper
200.00	0.08	42.24	200.00	0.27	-0.25	-0.05	0.23	-0.13	96.59	316.60	0.37	Keeper
300.00	0.08	211.31	300.00	0.26	-0.24	-0.06	0.16	0.00	169.07	316.97	0.35	Keeper
400.00	0.19	137.59	400.00	0.08	-0.16	0.04	0.18	0.11	-73.72	294.56	0.18	Keeper
500.00	0.14	190.06	500.00	-0.17	-0.07	0.18	0.15	-0.05	52.47	203.91	0.18	Keeper
600.00	0.20	104.87	600.00	-0.33	0.07	0.22	0.23	0.06	-85.19	167.60	0.34	Keeper
700.00	0.18	148.99	700.00	-0.51	0.32	0.21	0.14	-0.02	44.12	147.77	0.61	Keeper
800.00	0.09	237.14	800.00	-0.69	0.34	0.34	0.20	-0.09	88.15	153.90	0.77	Keeper
900.00	0.07	247.10	900.00	-0.76	0.22	0.46	0.02	-0.02	9.96	164.08	0.79	Keeper
1000.00	0.44	204.57	1000.00	-1.13	0.00	0.89	0.39	0.37	-42.53	180.02	1.13	Keeper
1100.00	0.20	157.15	1100.00	-1.64	-0.09	1.35	0.34	-0.24	-47.42	183.23	1.64	Keeper
1200.00	0.26	170.86	1199.99	-2.02	0.01	1.59	0.08	0.06	13.71	179.68	2.02	Keeper
1300.00	0.50	194.66	1299.99	-2.67	-0.06	2.14	0.28	0.24	23.80	181.35	2.67	Keeper
1400.00	0.38	174.74	1399.99	-3.42	-0.14	2.79	0.19	-0.12	-19.92	182.39	3.42	Keeper
1500.00	0.40	193.82	1499.99	-4.09	-0.20	3.35	0.13	0.02	19.08	182.74	4.10	Keeper
1600.00	0.23	153.41	1599.99	-4.61	-0.19	3.75	0.27	-0.17	-40.41	182.35	4.61	Keeper
1700.00	0.35	172.76	1699.98	-5.09	-0.06	4.05	0.15	0.12	19.35	180.69	5.09	Keeper
1800.00	0.18	206.65	1799.98	-5.54	-0.09	4.42	0.22	-0.17	33.89	180.96	5.54	Keeper
1900.00	0.49	184.98	1899.98	-6.10	-0.20	4.93	0.33	0.31	-21.67	181.88	6.11	Keeper
2000.00	0.61	146.62	1999.98	-6.97	0.06	5.46	0.38	0.12	-38.36	179.55	6.97	Keeper
2100.00	0.80	167.13	2099.97	-8.10	0.50	6.07	0.31	0.19	20.51	176.44	8.11	Keeper



Scientific Drilling Survey

Company: ENERGEN.
Field: Rio Arriba, NM
Site: Carracas Canyon Section 27 T32N R5W
Well: Carracas 27A #3
Wellpath: 1

Date: 2005-07-21 Time: 16:23:45 Page: 2
Co-ordinate(NE) Reference: Well: Carracas 27A #3, Grid North
Vertical (TVD) Reference: GL ELEVATION 7171.0
Section (VS) Reference: Well (0.00N,0.00E,217.97Azi)
Survey Calculation Method: Minimum Curvature Db: Sybase

Survey

MD ft	Incl deg	Azim deg	TVD ft	N/S ft	E/W ft	VS ft	DLS deg/100ft	Build deg/100ft	Turn deg/100ft	ClsA deg	ClsD ft	Tool
2200.00	0.82	151.56	2199.96	-9.41	1.00	6.80	0.22	0.02	-15.57	173.93	9.46	Keeper
2300.00	1.22	184.99	2299.94	-11.10	1.25	7.98	0.70	0.40	33.43	173.58	11.17	Keeper
2400.00	1.23	186.62	2399.92	-13.22	1.03	9.79	0.04	0.01	1.63	175.54	13.26	Keeper
2500.00	0.89	201.10	2499.90	-15.01	0.63	11.45	0.43	-0.34	14.48	177.60	15.03	Keeper
2600.00	1.31	196.91	2599.89	-16.83	0.02	13.26	0.43	0.42	-4.19	179.95	16.83	Keeper
2700.00	2.39	217.98	2699.83	-19.57	-1.60	16.41	1.26	1.08	21.07	184.67	19.64	Keeper
2800.00	2.36	221.95	2799.75	-22.74	-4.26	20.55	0.17	-0.03	3.97	190.61	23.14	Keeper
2900.00	2.73	230.60	2899.65	-25.79	-7.48	24.93	0.53	0.37	8.65	196.17	26.85	Keeper
3000.00	3.07	247.67	2999.52	-28.32	-11.79	29.58	0.92	0.34	17.07	202.61	30.67	Keeper
3100.00	4.01	263.67	3099.33	-29.72	-17.75	34.35	1.36	0.94	16.00	210.84	34.61	Keeper
3200.00	4.21	264.63	3199.08	-30.45	-24.88	39.31	0.21	0.20	0.96	219.25	39.32	Keeper
3300.00	3.76	266.04	3298.83	-31.02	-31.80	44.02	0.46	-0.45	1.41	225.71	44.42	Keeper
3400.00	4.36	267.35	3398.58	-31.42	-38.87	48.68	0.61	0.60	1.31	231.05	49.98	Keeper
3506.00	7.50	250.90	3504.01	-33.87	-49.43	57.12	3.34	2.96	-15.52	235.58	59.93	MWD
3537.00	12.48	241.40	3534.53	-36.14	-54.29	61.89	16.87	16.06	-30.65	236.35	65.22	MWD
3571.00	17.56	235.40	3567.36	-40.81	-61.74	70.16	15.61	14.94	-17.65	236.53	74.01	MWD
3602.00	22.42	227.80	3596.49	-47.44	-69.98	80.46	17.75	15.68	-24.52	235.86	84.54	MWD
3633.00	26.77	221.10	3624.68	-56.68	-78.95	93.26	16.65	14.03	-21.61	234.32	97.19	MWD
3664.00	30.69	215.10	3651.86	-68.42	-88.10	108.14	15.69	12.65	-19.35	232.16	111.55	MWD
3695.00	35.47	212.50	3677.83	-82.49	-97.48	125.01	16.08	15.42	-8.39	229.76	127.70	MWD
3726.00	40.24	213.67	3702.30	-98.42	-107.87	143.95	15.56	15.39	3.77	227.62	146.02	MWD
3749.00	43.12	217.70	3719.48	-110.83	-116.80	159.23	17.10	12.52	17.52	226.50	161.01	MWD
3773.00	46.19	220.58	3736.55	-123.90	-127.46	176.09	15.32	12.79	12.00	225.81	177.75	MWD
3803.00	50.59	221.12	3756.47	-140.86	-142.13	198.48	14.73	14.67	1.80	225.26	200.10	MWD
3834.00	55.15	221.10	3775.17	-159.47	-158.37	223.16	14.71	14.71	-0.06	224.80	224.75	MWD
3864.00	59.51	220.60	3791.37	-178.57	-174.88	248.37	14.60	14.53	-1.67	224.40	249.95	MWD
3895.00	64.38	220.77	3805.94	-199.31	-192.71	275.69	15.72	15.71	0.55	224.04	277.24	MWD
3925.00	68.63	220.50	3817.90	-220.19	-210.63	303.17	14.19	14.17	-0.90	223.73	304.71	MWD
4000.00	75.87	222.58	3840.75	-273.59	-257.98	374.40	10.01	9.65	2.77	223.32	376.04	MWD
4060.00	84.78	217.50	3850.83	-318.84	-295.95	433.43	17.03	14.85	-8.47	222.87	435.02	MWD
4090.00	84.51	216.43	3853.63	-342.70	-313.91	463.30	3.66	-0.90	-3.57	222.49	464.74	MWD
4124.00	81.83	216.99	3857.67	-369.76	-334.09	497.05	8.05	-7.88	1.65	222.10	498.34	MWD
4154.00	83.02	217.68	3861.63	-393.41	-352.13	526.78	4.58	3.97	2.30	221.83	527.98	MWD
4185.00	85.26	217.52	3864.79	-417.84	-370.94	557.62	7.24	7.23	-0.52	221.60	558.74	MWD
4216.00	89.16	216.66	3866.30	-442.53	-389.61	588.57	12.88	12.58	-2.77	221.36	589.60	MWD
4248.00	91.88	216.77	3866.01	-468.18	-408.74	620.56	8.51	8.50	0.34	221.12	621.50	MWD
4279.00	93.03	217.10	3864.68	-492.94	-427.35	651.52	3.86	3.71	1.06	220.92	652.39	MWD
4311.00	94.04	217.26	3862.71	-518.38	-446.65	683.46	3.20	3.16	0.50	220.75	684.26	MWD
4343.00	92.59	216.92	3860.86	-543.87	-465.91	715.40	4.65	-4.53	-1.06	220.59	716.15	MWD
4375.00	91.58	216.83	3859.69	-569.45	-485.10	747.37	3.17	-3.16	-0.28	220.43	748.06	MWD
4406.00	92.32	216.76	3858.64	-594.26	-503.66	778.35	2.40	2.39	-0.23	220.28	778.98	MWD
4438.00	89.93	216.65	3858.01	-619.91	-522.78	810.33	7.48	-7.47	-0.34	220.14	810.92	MWD
4469.00	88.65	215.78	3858.40	-644.91	-541.09	841.31	4.99	-4.13	-2.81	220.00	841.84	MWD
4499.00	88.75	214.99	3859.08	-669.37	-558.46	871.28	2.65	0.33	-2.63	219.84	871.74	MWD
4529.00	89.46	214.70	3859.55	-693.98	-575.60	901.23	2.56	2.37	-0.97	219.67	901.63	MWD
4559.00	90.20	214.20	3859.63	-718.72	-592.57	931.17	2.98	2.47	-1.67	219.50	931.51	MWD
4589.00	88.79	214.71	3859.90	-743.46	-609.54	961.11	5.00	-4.70	1.70	219.35	961.39	MWD
4620.00	89.26	214.71	3860.43	-768.94	-627.19	992.06	1.52	1.52	0.00	219.20	992.29	MWD
4652.00	89.56	214.96	3860.76	-795.20	-645.47	1024.01	1.22	0.94	0.78	219.07	1024.20	MWD
4683.00	90.20	214.37	3860.82	-820.70	-663.10	1054.96	2.81	2.06	-1.90	218.94	1055.11	MWD
4713.00	87.99	214.30	3861.29	-845.47	-680.02	1084.89	7.37	-7.37	-0.23	218.81	1085.01	MWD
4744.00	87.95	214.10	3862.39	-871.09	-697.43	1115.80	0.66	-0.13	-0.65	218.68	1115.89	MWD
4776.00	88.45	214.20	3863.40	-897.56	-715.39	1147.72	1.59	1.56	0.31	218.56	1147.78	MWD



Scientific Drilling Survey

Company: ENERGEN.
Field: Rio Arriba, NM
Site: Carracas Canyon Section 27 T32N R5W
Well: Carracas 27A #3
Wellpath: 1

Date: 2005-07-21 Time: 16:23:45 Page: 3
Co-ordinate(NE) Reference: Well: Carracas 27A #3, Grid North
Vertical (TVD) Reference: GL ELEVATION 7171.0
Section (VS) Reference: Well (0.00N,0.00E,217.97Azi)
Survey Calculation Method: Minimum Curvature Db: Sybase

Survey

MD ft	Incl deg	Azim deg	TVD ft	N/S ft	E/W ft	VS ft	DLS deg/100ft	Build deg/100ft	Turn deg/100ft	ClsA deg	ClsD ft	Tool
4807.00	88.89	213.90	3864.12	-923.24	-732.74	1178.64	1.72	1.42	-0.97	218.44	1178.68	MWD
4839.00	90.13	214.30	3864.39	-949.73	-750.68	1210.56	4.07	3.87	1.25	218.32	1210.58	MWD
4870.00	90.84	214.63	3864.13	-975.29	-768.22	1241.50	2.53	2.29	1.06	218.23	1241.51	MWD
4901.00	90.30	214.27	3863.82	-1000.85	-785.76	1272.44	2.09	-1.74	-1.16	218.14	1272.45	MWD
4933.00	88.42	214.92	3864.18	-1027.19	-803.92	1304.38	6.22	-5.87	2.03	218.05	1304.38	MWD
4964.00	88.72	214.87	3864.95	-1052.61	-821.65	1335.33	0.98	0.97	-0.16	217.98	1335.33	MWD
4996.00	89.83	215.10	3865.36	-1078.83	-840.00	1367.28	3.54	3.47	0.72	217.91	1367.28	MWD
5028.00	90.03	215.58	3865.40	-1104.93	-858.51	1399.25	1.62	0.62	1.50	217.85	1399.25	MWD
5058.00	90.24	215.19	3865.32	-1129.39	-875.88	1429.22	1.48	0.70	-1.30	217.79	1429.22	MWD
5089.00	91.14	215.28	3864.95	-1154.71	-893.76	1460.18	2.92	2.90	0.29	217.74	1460.19	MWD
5120.00	91.28	216.43	3864.30	-1179.83	-911.92	1491.15	3.74	0.45	3.71	217.70	1491.17	MWD
5151.00	91.75	216.19	3863.48	-1204.80	-930.27	1522.13	1.70	1.52	-0.77	217.67	1522.15	MWD
5183.00	91.95	216.82	3862.44	-1230.51	-949.29	1554.10	2.06	0.62	1.97	217.65	1554.12	MWD
5215.00	90.54	218.33	3861.75	-1255.86	-968.80	1586.09	6.46	-4.41	4.72	217.65	1586.11	MWD
5246.00	89.16	218.03	3861.83	-1280.23	-987.96	1617.09	4.56	-4.45	-0.97	217.66	1617.11	MWD
5278.00	89.43	217.84	3862.22	-1305.46	-1007.63	1649.09	1.03	0.84	-0.59	217.66	1649.11	MWD
5310.00	89.36	217.27	3862.56	-1330.83	-1027.14	1681.08	1.79	-0.22	-1.78	217.66	1681.11	MWD
5341.00	89.29	217.23	3862.93	-1355.51	-1045.90	1712.08	0.26	-0.23	-0.13	217.65	1712.10	MWD
5373.00	89.46	217.08	3863.28	-1381.01	-1065.23	1744.07	0.71	0.53	-0.47	217.64	1744.10	MWD
5405.00	88.59	216.53	3863.82	-1406.63	-1084.39	1776.06	3.22	-2.72	-1.72	217.63	1776.09	MWD
5436.00	88.36	216.02	3864.65	-1431.61	-1102.73	1807.04	1.80	-0.74	-1.65	217.61	1807.07	MWD
5465.00	90.07	216.86	3865.04	-1454.93	-1119.95	1836.02	6.57	5.90	2.90	217.59	1836.06	MWD
5497.00	91.81	218.62	3864.52	-1480.24	-1139.53	1868.02	7.73	5.44	5.50	217.59	1868.06	MWD
5528.00	91.24	220.09	3863.69	-1504.20	-1159.18	1898.99	5.08	-1.84	4.74	217.62	1899.03	MWD
5560.00	90.54	221.01	3863.20	-1528.51	-1179.99	1930.96	3.61	-2.19	2.87	217.67	1930.98	MWD
5592.00	91.38	220.63	3862.66	-1552.72	-1200.90	1962.91	2.88	2.62	-1.19	217.72	1962.93	MWD
5623.00	90.10	219.44	3862.26	-1576.45	-1220.84	1993.89	5.64	-4.13	-3.84	217.75	1993.90	MWD
5654.00	90.84	219.35	3862.00	-1600.41	-1240.51	2024.88	2.40	2.39	-0.29	217.78	2024.89	MWD
5686.00	90.84	219.35	3861.54	-1625.15	-1260.80	2056.87	0.00	0.00	0.00	217.80	2056.87	MWD
5750.00	90.84	219.35	3860.60	-1674.64	-1301.38	2120.84	0.00	0.00	0.00	217.85	2120.84	MWD