

FLORIDA DEPARTMENT OF
ENVIRONMENTAL PROTECTION

FEB - 1 1999

SOUTHWEST DISTRICT
TAMPA

January 29, 1999

Ms Danielle Nichols, Environmental Specialist
Division of Waste Management
Florida Department of Environmental Protection
Southwest District
3804 Coconut Palm Drive
Tampa, Florida 33619

Subject **Bi-Annual Ground-Water Monitoring Plan Review
West Pasco Class I Landfill
LAW Project 40141-8-0452**


Dear Ms Nichols

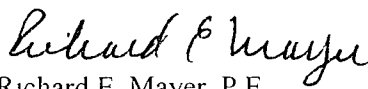
Law Engineering and Environmental Services, Inc (LAW), on behalf of Pasco County, is submitting this Bi-Annual Ground-Water Monitoring Plan Review for the West Pasco Class I Landfill. The review covers the years 1995, 1996, 1997 and 1998.

If you have any questions concerning this response, please contact Richard Mayer or George Ellsworth at 813/289-0750.

Sincerely,

LAW ENGINEERING AND ENVIRONMENTAL SERVICES, INC


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cc Vincent Mannella
 Douglas Bramlett


Vincent Mannella
2/1/99

**BI-ANNUAL GROUND-WATER MONITORING
PLAN REVIEW
WEST PASCO CLASS I LANDFILL**

Prepared for

PASCO COUNTY BOARD OF COUNTY COMMISSIONERS

Prepared by

**LAW ENGINEERING AND ENVIRONMENTAL SERVICES, INC.
Tampa, Florida**

January 1999

LAW Project 40141-8-0452

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1.0 INTRODUCTION

1.1 BACKGROUND

The West Pasco Classes I Landfill is located in northwest Pasco County on Hays Road, approximately 2.5 miles north of State Road 52. The landfill is located adjacent to the Pasco County Resource Recovery facility and the West Pasco Class III Landfill. The West Pasco Class I Landfill is permitted separately from the adjacent West Pasco Class III Landfill.

The Ground-Water Monitoring Plan provides coverage for the 160-acre Class I Landfill which at build out will consist of 16 ten-acre cells. The individual cells are to be separated by interior berms. To date only three cells have been constructed and none have received final closure. These cells are A-1, A-2 and SW-1. Cell SW-1 is open and is used for the disposal of municipal solid waste (MSW) whenever the MSW can not be combusted in the resource recovery facility. By-passed MSW is removed from the cell when capacity is available at the resource recovery facility. Cells A-1 and A-2 are used for the disposal of ash produced from the combustion of MSW at the adjacent resource recovery facility. Cell A-1 has received intermediate closure. Cell A-2 is currently open.

The cells are constructed with a double liner system, which consists of an upper and lower 60-mil thick geo-membranes, a primary leachate collection and removal systems lying above the upper geomembrane, and a leachate detection and secondary leachate collection system between the upper and lower geo-membranes.

Collected leachate was initially pumped off-site for disposal. Since May 1997 collected leachate has been treated for removal of total dissolved solids on-site. The total dissolved solids, primarily sodium chloride, removed by evaporation during the treatment process are transported off-site for disposal at an approved landfill. The water is pumped to the cooling towers at the adjacent resource recovery facility for disposal.

1.2 FDEP-APPROVED QAPP

Pasco County Environmental Laboratory (County Lab) has been collecting and analyzing samples from the ground-water monitoring system since 1990. Ground-water sampling procedures used by the County Lab, including sampling equipment decontamination, field measurements, and sample shipment, adhere to the FDEP-approved QAPP. The County Lab also performs analytical work. The laboratory procedures and analytical methods used at the County Lab are also described in the FDEP-approved QAPP.

Pasco County contracts for some laboratory services and currently has several FDEP-approved laboratories under annual contract. The contracts for laboratory services are re-bid every two to three years. The use of these contracted laboratories is reflected in the County Lab's FDEP-approved QAPP.

1.3 GROUND-WATER MONITORING PLAN

The current ground-water monitoring plan consists of six surficial aquifer monitoring wells (2MW-1, 2MW-2, 2MW-4, 2MW-5, 2MW-6 and 2MW-13) and eleven Floridan aquifer monitoring wells (4MW-1, 4MW-2, 4MW-4, 4MW-5, 4MW-6, 4MW-11, 4MW-12, 4MW-14, 4MW-15 and 4MW-16). The well locations are shown on Figures 2 and 3. The monitoring wells were sampled and analyzed quarterly in 1995 and semi-annually during 1996, 1997, and 1998. Wells numbered 11 and above were installed and first sampled in 1998.

Surficial Aquifer monitoring wells, 2MW1, 2MW2, 2MW-4, 2MW-5 and 2MW6, and Florida Aquifer monitoring wells, 4MW1, 4MW2, 4MW-4, 4MW-5 and 4MW6, are located immediately outside the perimeter of the 160 acre footprint for the West Pasco Class I Landfill. The remainder of the ground-water monitoring wells are located 50 feet from the edge of the perimeter of the liner system for Cells A-1 and A-2.

2.0 WATER LEVEL DATA

2.1 DATA TABULATION

Water level measurements were tabulated for the years 1995, 1996, 1997, and 1998. Water level elevations are shown in feet, NGVD (see Table 1). Water level measurements are available for all the Floridan aquifer wells and Surficial aquifer well 2MW-2. No water level measurements are available for the other surficial aquifer wells because these wells were consistently dry.

2.2 HYDROGRAPHS

Hydrographs were prepared for the Floridan aquifer monitoring wells. The Class I Landfill monitoring well hydrographs are presented on Figure 1.

2.3 GROUND-WATER CONTOUR MAPS

Ground-water contour maps were prepared for the Floridan aquifer for the dry season and for wet seasons for 1998 (see Figures 2 through 3). No surficial aquifer water table maps were prepared because as previously stated, all the surficial aquifer wells were dry except 2MW-2.

2.4 DATA INTERPRETATION

2.4.1 Water Levels

Water levels in the Floridan aquifer ground-water monitoring wells do not vary significantly across the site. Water levels differ by less than seven feet during individual sampling events. During the past four years, the fluctuation of water levels in the monitoring wells have been approximately 16 feet between the high and low values.

The surficial aquifer ground-water monitoring wells except 2MW-2 are dry because of their location on a topographic high. The hydrograph for 2MW-2 shows a similar response to climatic conditions as those show in the hydrographs for the Floridan wells. Water levels were generally higher or equal to the highest water level observed in the Floridan wells.

2.4.2 Ground-Water Flow Direction

The ground-water flow direction in the Floridan aquifer is consistently determined to be to the northwest (see Figures 2 and 3). This conforms to regional flow which is towards Weeki-Wachee Springs to the northwest.

2.4.3 Ground-Water Gradient

The hydraulic gradient in the Floridan aquifer, based on the wet season potentiometric maps, is approximately 1.50 feet per 1,000 feet or 1.5×10^{-3} feet/foot. The hydraulic gradient during the dry season is approximately the same.

3.0 WATER QUALITY DATA

3.1 DATA TABULATION

Ground-water sampling analytical results were tabulated for years 1995, 1996, 1997, and 1998 (see Tables 2 through 6) Individual tables were prepared for the following water quality parameters

- Total Dissolved Solids (TDS)
- pH
- Sodium
- Chlorides
- Iron

3.2 GRAPHICAL PRESENTATIONS

All tabulated parameters are presented graphically (see Figures 4 through 8) Parameter concentrations are shown chronologically in Figures 4 through 8 Chloride concentrations in the Floridan Aquifer are shown specially in the isopach map in Figure 9 This map includes data from the West Pasco Class III Florida Aquifer monitoring well 4MW-3 to provide more definition to the map

3.3 DATA INTERPRETATION

Maximum contaminant levels for seven parameters were exceeded in ground-water monitoring wells sampled at the West Pasco Class I Landfill These were antimony, barium, chromium, fluoride, iron, total dissolved solids and zinc These were one-time occurrences in a single well that were not subsequently repeated These exceedances are shown in Table 7 Several of the tabulated parameters showed trends Each of the tabulated parameters is discussed in the following sections

3.3.1 Total Dissolved Solids

Exceedances of the established MCL of 500 mg/l for total dissolved solids (TDS) was detected in Florida Aquifer monitoring well 4MW-1 during the entire review period Florida Aquifer monitoring well 4MW-1 is located upgradient of the 160 acre footprint of the Class I landfill and the Class III landfill No exceedances for TDS were observed in any of the other monitoring wells, however, an increasing trend was observed in Florida Aquifer monitoring well, 4MW-5, which is located

upgradient of Class I landfill. Slightly elevated readings were observed in two other Florida Aquifer monitoring well (4MW-14 and 4MW-15) during July 1998 (see Table 2 and Figure 4)

The exceedances in 4MW-1 showed an increasing trend beginning with 992 mg/l in 1995 and increasing to 1,580 mg/l during 1997. During 1998, the TDS concentration in 4MW-1 dropped to 1240 mg/l. The TDS concentrations in 4MW-5 showed an increasing trend beginning with 253 mg/l in 1996 and increasing to 329 mg/l during 1997. During 1998, the TDS concentration in 4MW-5 dropped to 316 mg/l. Florida Aquifer monitoring wells, 4MW-14 and 4MW-15 had elevated TDS concentrations of 434 and 548 mg/l, respectively.

3.3.2 pH

The established acceptable range for pH values in drinking water is between standard values of 6.5 and 8.5. Outside this range, the water quality is considered to be too acidic or caustic. The pH readings taken in the Floridan aquifer monitoring wells relative to the West Pasco Class I Landfill all were within the acceptable range except for one occurrence in 4MW-6 in January 1998 (see Table 3 and Figure 5).

The pH values observed in the Surficial Aquifer monitoring well, 2MW-2 were generally outside the acceptable range for pH. However, the low acidity levels observed are not considered abnormal for the Surficial aquifer.

3.3.3 Sodium

No exceedances for TDS were observed in any of the monitoring wells, however, an increasing trend was observed in Florida Aquifer monitoring well, 4MW-1 and 4MW-5. Slightly elevated readings were observed in two other Florida Aquifer monitoring well (4MW-14 and 4MW-15) during July 1998 (see Table 2 and Figure 4).

The sodium concentration in 4MW-1 showed an increasing trend beginning with 51.4 mg/l in 1995 and increasing to 134 mg/l by January 1998. During 1998, the sodium concentration in 4MW-1 dropped to 97.3 mg/l. The sodium concentrations in 4MW-5 showed an increasing trend beginning with 4.67 mg/l in 1996 and increasing to 8.22 mg/l during 1998. Florida Aquifer monitoring wells, 4MW-14 and 4MW-15 had elevated sodium concentrations of 13 and 35.6 mg/l, respectively.

3.3.4 Chlorides

Exceedances of the established MCL of 250 mg/l for chlorides was detected in Florida Aquifer monitoring well 4MW-1 during the entire review period. Florida Aquifer monitoring well 4MW-1 is located down-gradient of the 160 acre footprint of the Class I landfill and the Class III landfill. No exceedances for chlorides were observed in any of the other monitoring wells, however, an increasing trend was observed in Florida Aquifer monitoring well, 4MW-5, which is located upgradient of Class I landfill. Slightly elevated readings were observed in two other Florida Aquifer monitoring wells (4MW-14 and 4MW-15) during July 1998 (see Table 5 and Figure 7).

The chloride exceedances in 4MW-1 showed an increasing trend beginning with 291 mg/l in 1995 and increasing to 581 mg/l during 1997. During 1998, the chloride concentration in 4MW-1 dropped to 356 mg/l. The chloride concentrations in 4MW-5 showed an increasing trend beginning with 38.6 mg/l in 1996 and increasing to 60 mg/l by January 1998. During 1998, the chloride concentration in 4MW-5 dropped to 55.6 mg/l. Florida Aquifer monitoring wells, 4MW-14 and 4MW-15 had elevated chloride concentrations of 77.5 and 146 mg/l, respectively.

3.3.5 Iron

No exceedances of the MCL of 0.3 mg/l for iron were detected in the Floridan aquifer monitoring wells. One exceedance occurred in Surficial aquifer monitoring well 2MW-2 in July 1997 (see Table 6 and Figure 8).

3.4 SUMMARY

Only one ground-water monitoring well in the West Pasco Class I Landfill had any significant exceedances of the established regulatory levels. This was the upgradient Floridan Aquifer monitoring well 4MW-1. The exceedances were for TDS and chlorides. Increasing trends for these parameters were also observed in Florida Aquifer monitoring well 4MW-5 and in a West Pasco Class III Florida Aquifer monitoring well (4MW-3). Elevated concentrations for these parameters were observed in two other Floridan Aquifer monitoring wells, 4MW-14 and 4MW-15, which are located adjacent to the ash monofill cells, A-1 and A-2.

4.0 GROUND-WATER MONITORING PLAN REVIEW

4.1 SAMPLING LOCATIONS

Detection wells are in place around the constructed ash monofill cells, A-1 and A-2. Grounding water monitoring wells are also in place around the perimeter of the footprint for the permitted 160 acre Class I landfill.

4.2 MONITORING FREQUENCY

The ground-water monitoring wells are currently sampled and analyzed semi-annually as specified in the current rule, Chapter 62-701 of the FAC.

5.0 CONCLUSIONS

The ground-water monitoring wells sampling frequency and parameter suite are in compliance with FAC Rule 62-701. The spacing between ground-water monitoring is adequate.

An isopach map of the chloride concentration was drawn for the most recent sampling event, July 1998. The map shows a narrow chloride plume trending in a northwest-southeast direction between the two landfills. Chloride concentrations in excess of the MCL of 250 mg/l do not appear to extend northwest of the power line right-of-way. The isopach map indicates the plume source is located south of the West Pasco Class I and III landfills.

There does not appear to be a contribution from the Class I landfill cells. Floridan Aquifer Monitoring wells near the east end of the ash mono fill cells where the leachate sumps are located do not show elevated levels for TDS or chlorides. These sumps represent the lowest hydraulic level in the leachate containment systems. The slightly elevated levels of TDS and chlorides in the two detection wells adjacent to the west end of the ash mono fill cells A-1 and A-2 are due to their position relative to the plume shown in Figure 9 and not from the landfill cells.

6.0 RECOMMENDATIONS

No changes in the ground-water monitoring plan are recommended

Non-intrusive assessment techniques such as electromagnetic (EM) methods be evaluated or used to better define the contaminate plume encroaching on the landfill property and assist in locating any additional monitoring well points

Table 1: Water Level Elevations

Units: feet

Well / Date	Mar-95	Jul-95	Oct-95	Dec-95	Mar-96	Aug-96	Feb-97	Jul-97	Jan-98	Jul-98
2MW-1	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
2MW-2	34.61	33.06	34.41	35.91	35.56	36.56	32.11	30.41	38.11	37.76
2MW-4	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
2MW-5	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
2MW-6	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
4MW-1	33.79	32.54	34.54	34.54	35.74	36.94	32.24	30.59	38.09	36.59
4MW-2	34.01	32.41	33.91	35.51	34.86	36.16	32.01	29.76	37.91	37.31
4MW-4	26.96	25.26	28.11	30.06	28.91	31.21	25.31	22.76	32.81	30.51
4MW-5	27.66	26.06	28.96	30.76	29.81	32.31	26.06	23.56	33.66	31.31
4MW-6	31.33	29.68	31.58	33.48	32.53	34.28	28.98	26.83	35.48	35.03
4MW-11D										35.00
4MW-12D										33.93
4MW-14D										34.50
4MW-15D										35.33
4MW-16D										36.22
Well / Date	Mar-95	Jul-95	Oct-95	Dec-95	Mar-96	Aug-96	Feb-97	Jul-97	Jan-98	Jul-98

ENIRO/4014180452 XLS/WATERLEVEL

Prepared/Date AWC 1/22/99
Check/Date DM 1/22/99

Table 2: Total Dissolved Solids Analytical Results

MCL 500

Units mg/L

Well / Date	Mar-95	Jul-95	Oct-95	Dec-95	Mar-96	Aug-96	Feb-97	Jul-97	Jan-98	Jul-98
2MW-1	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
2MW-2	133	161	118	155	160	189	178	140	121	101
2MW-4	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
2MW-5	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
2MW-6	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
4MW-1	992	1104	1020	964	1373	1340	1580	1475	1580	1240
4MW-2	114	115	108	106	141	104	132	122	98	96
4MW-4	198	199	230	196	200	194	220	203	194	170
4MW-5	193	227	199	213	253	247	279	329	319	316
4MW-6	74	100	103	111	87	101	85	98	65	99
4MW-11D										275
4MW-12D										230
4MW-14D										434
4MW-15D										548
4MW-16D										216
Well / Date	Mar-95	Jul-95	Oct-95	Dec-95	Mar-96	Aug-96	Feb-97	Jul-97	Jan-98	Jul-98

ENVIRO/4014180452.XLS/TDS

MCL = Maximum Contaminant Limit

DL = Detection Limit

BDL = Below Detection Limit

Prepared/Date

Checked/Date

GOE 1/22/99
DM 1/22/99

Table 3: pH Analytical Results

MCL 6.5 to 8.5

Units Std Units

Well / Date	Mar-95	Jul-95	Oct-95	Dec-95	Mar-96	Aug-96	Feb-97	Jul-97	Jan-98	Jul-98
2MW-1	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
2MW-2	5.46	5.81	5.43	7.08	5.31	5.72	5.02	5.96	5.75	6.13
2MW-4	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
2MW-5	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
2MW-6	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
4MW-1	7.32	7.38	7.15	7.25	6.74	6.93	6.69	6.9	7.12	7.12
4MW-2	7.88	8.11	7.65	7.94	7.57	7.64	7.11	7.67	8.00	7.41
4MW-4	7.31	7.56	7.53	7.42	7.09	7.21	6.97	7.07	7.30	6.95
4MW-5	7.86	8.01	7.80	7.71	7.18	7.73	7.60	7.53	7.65	7.24
4MW-6	8.06	8.31	7.91	8.03	7.47	8.16	8.22	7.70	8.78	7.68
4MW-11D										7.45
4MW-12D										7.27
4MW-14D										7.19
4MW-15D										7.29
4MW-16D										7.24
Well / Date	Mar-95	Jul-95	Oct-95	Dec-95	Mar-96	Aug-96	Feb-97	Jul-97	Jan-98	Jul-98

ENVIRO/4014180452.XLS/Ph

MCL = Maximum Contaminant Limit

DL = Detection Limit

BDL = Below Detection Limit

Prepared/Date

Checked/Date

GWJ 1/22/99
DM 1/23/99

Table 4: Sodium Analytical Results

MCL 160

Units mg/L

Well / Date	Mar-95	Jul-95	Oct-95	Dec-95	Mar-96	Aug-96	Feb-97	Jul-97	Jan-98	Jul-98
2MW-1	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
2MW-2	3 32	3 14	3 77	3 93	3 54	3 34	3 00	3 30	3 09	2 67
2MW-4	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
2MW-5	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
2MW-6	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
4MW-1	51 4	31 4	65 1	63 5	68 3	78 4	23 2	110 0	134 0	97 3
4MW-2	2 74	2 53	2 78	2 75	2 68	2 75	2 74	2 78	2 71	2 70
4MW-4	3 90	3 06	3 21	3 21	3 09	3 17	3 17	3 26	3 21	3 21
4MW-5	3 15	4 09	4 44	4 55	4 67	5 32	6 22	6 80	7 62	8 22
4MW-6	3 10	3 07	3 05	3 09	3 06	2 99	3 09	3 07	2 92	3 02
4MW-11D										3 83
4MW-12D										4 25
4MW-14D										13 0
4MW-15D										35 6
4MW-16D										5 69
Well / Date	Mar-95	Jul-95	Oct-95	Dec-95	Mar-96	Aug-96	Feb-97	Jul-97	Jan-98	Jul-98

ENVIRO/4014180452 XLS/SODIUM

MCL = Maximum Contaminant Level

DL = Detection Limit

BDL = Below Detection Limit

Prepared/Date

Checked/Date

GW 1/22/99
Dm 1/22/99

Table 5: Chloride Analytical Results

MCL 250

Units mg/L

Well / Date	Mar-95	Jul-95	Oct-95	Dec-95	Mar-96	Aug-96	Feb-97	Jul-97	Jan-98	Jul-98
2MW-1	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
2MW-2	6.00	5.75	5.22	6.10	5.80	4.80	4.60	5.52	2.82	Dry
2MW-4	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
2MW-5	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
2MW-6	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
4MW-1	291	308	328	295	388	368	514	581	504	356
4MW-2	4.60	4.67	4.28	4.3	4.7	4.53	3.55	4.86	2.29	4.65
4MW-4	6.30	6.81	6.23	6.9	6.8	6.2	5.1	8.99	6.90	12.5
4MW-5	24.4	29.9	34.1	31.0	38.6	43.1	52.6	59.8	60.0	55.6
4MW-6	5.60	5.02	4.47	4.4	4.8	5.1	5.3	4.9	3.20	11.4
4MW-11D										11.1
4MW-12D										14.6
4MW-14D										77.5
4MW-15D										146
4MW-16D										13.5
Well / Date	Mar-95	Jul-95	Oct-95	Dec-95	Mar-96	Aug-96	Feb-97	Jul-97	Jan-98	Jul-98

ENVIRO/4014180452.XLS/CHLORIDE

MCL = Maximum Contaminant Limit

DL = Detection Limit

BDL = Below Detection Limit

Prepared/Date GWZ-1 1/22/99
Checked/Date DM 1/23/99

Table 6: Iron Analytical Results

MCL 0.3

Units mg/L

Well / Date	Mar-95	Jul-95	Oct-95	Dec-95	Mar-96	Aug-96	Feb-97	Jul-97	Jan-98	Jul-98
2MW-1	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
2MW-2	BDL	0.20	0.14		0.10	0.04	0.04	0.66	BDL	0.06
2MW-4	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
2MW-5	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
2MW-6	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
4MW-1	BDL	0.10	0.03		0.05	0.04	0.04	0.06	BDL	0.06
4MW-2	BDL	0.10	0.04		0.04	0.04	BDL	0.04	BDL	0.05
4MW-4	BDL	0.08	0.17	BDL	0.04	0.05	0.04	0.29	0.07	0.17
4MW-5	BDL	0.08	0.04	BDL	0.05	0.04	0.03	0.05	BDL	0.05
4MW-6	BDL	0.08	0.04	BDL	0.06	0.04	0.02	0.05	BDL	BDL
4MW-11D										0.14
4MW-12D										0.13
4MW-14D										0.09
4MW-15D										0.07
4MW-16D										0.10
Well / Date	Mar-95	Jul-95	Oct-95	Dec-95	Mar-96	Aug-96	Feb-97	Jul-97	Jan-98	Jul-98

ENV/RO/4014180452.XLS/IRON

MCL = Maximum Contaminant Limit

DL = Detection Limit

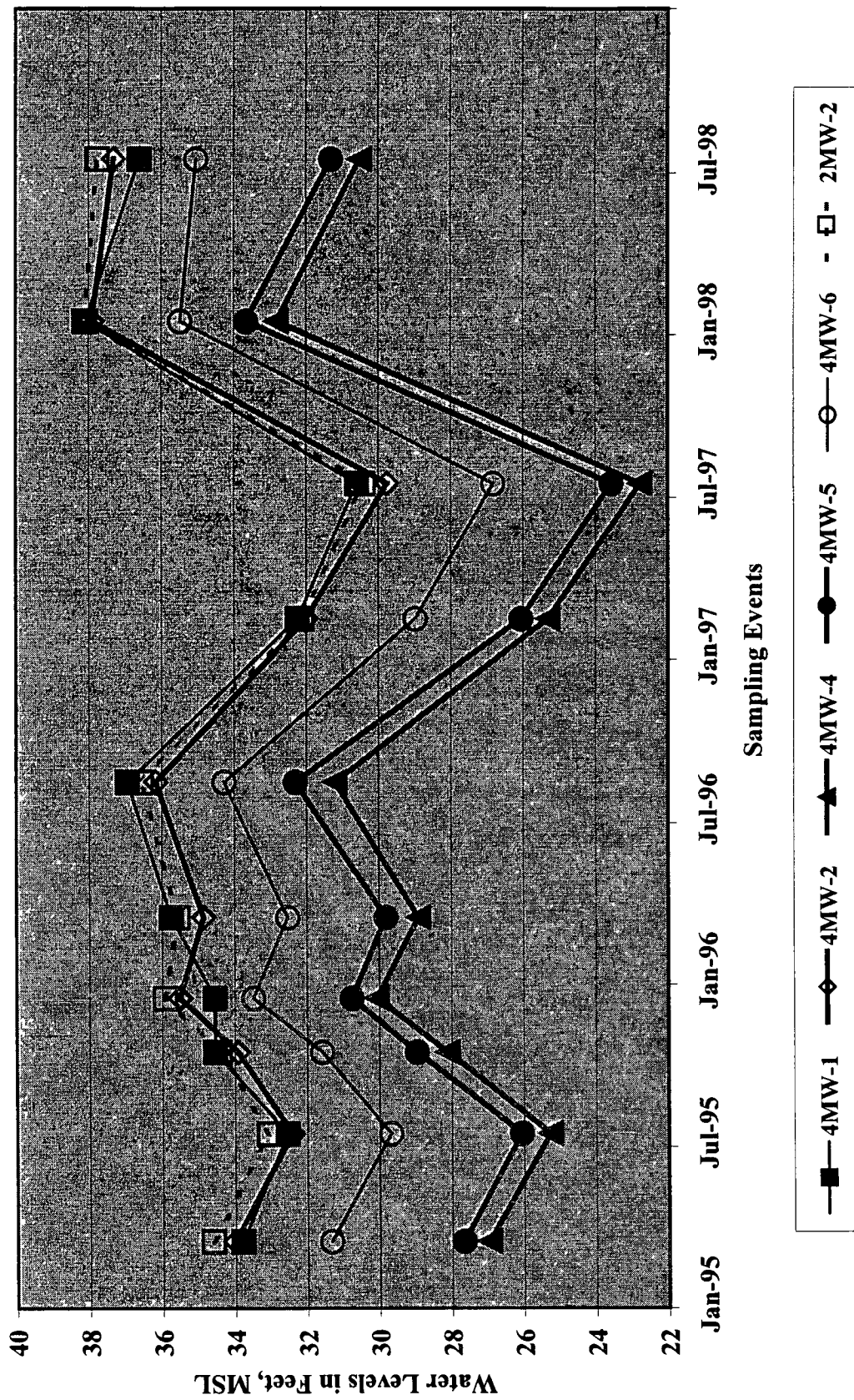
BDL = Below Detection Limit

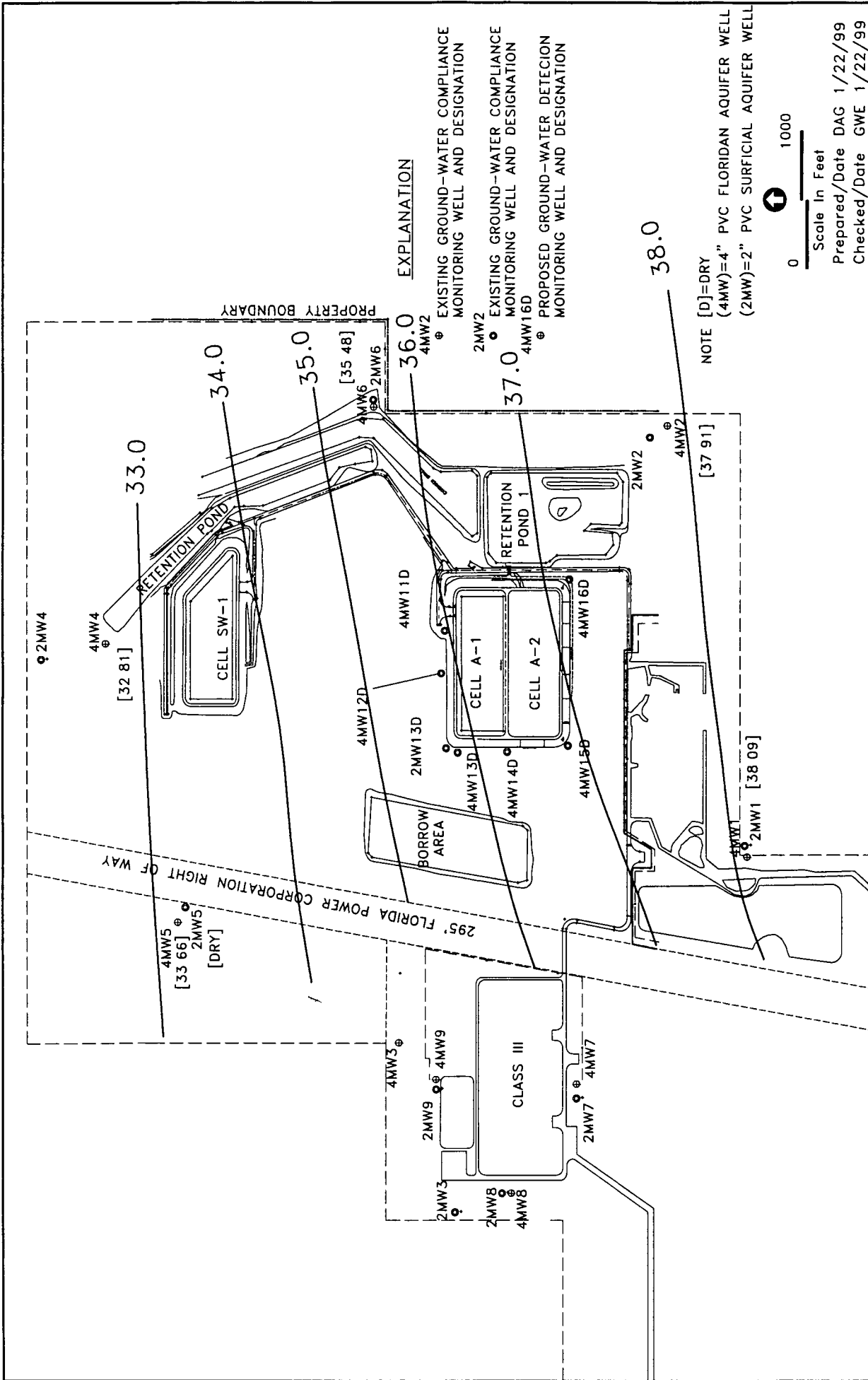
Prepared/Date

Checked/Date

GW 1/22/99
DM 1/22/99

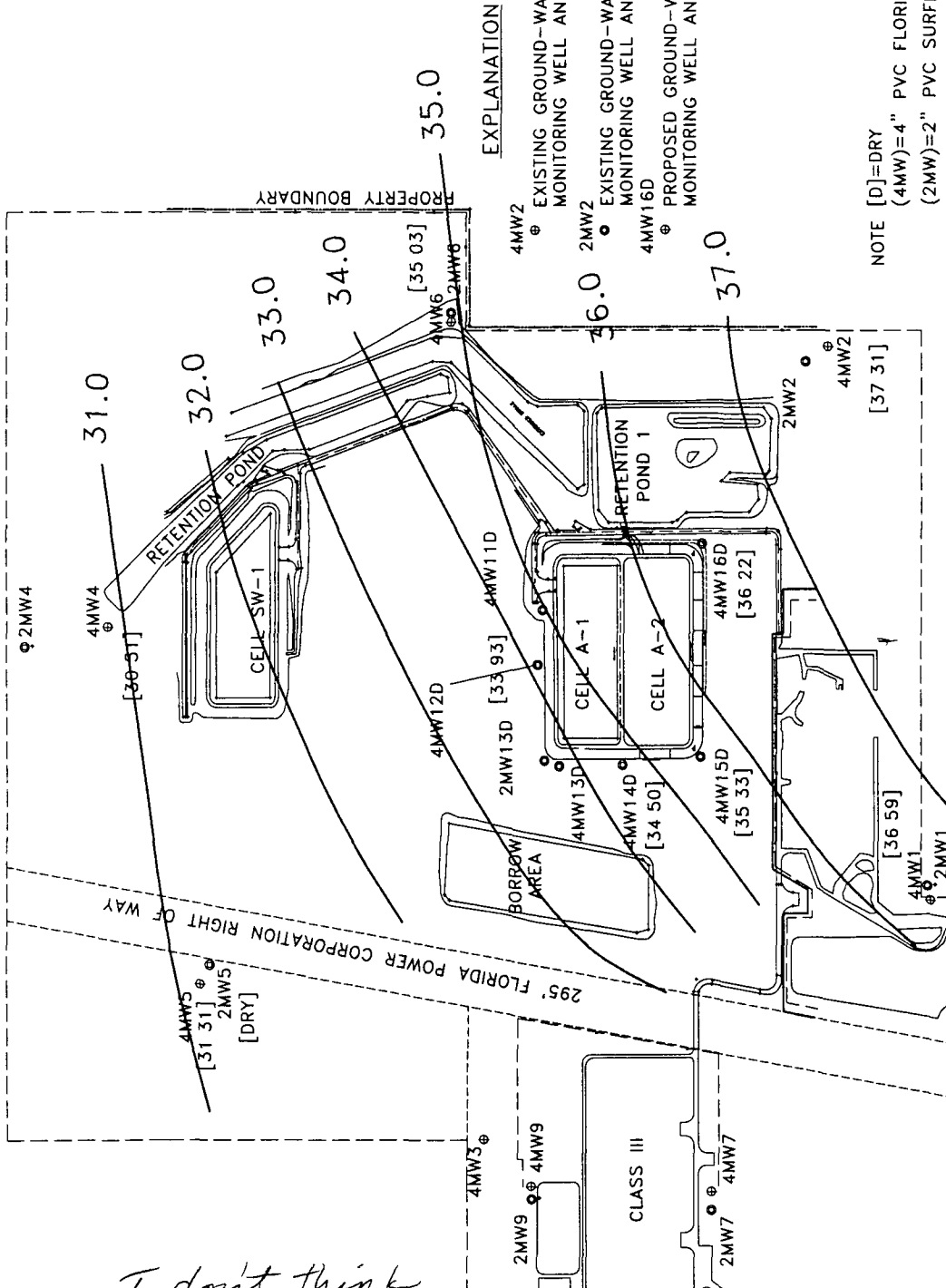
Figure 1: Hydrograph of Monitoring Wells





<p>West Pasco Class I Landfill Pasco County Board of County Commissioners Utility Services Branch Pasco County, Florida</p>	<p>LAW ENGINEERING AND ENVIRONMENTAL SERVICES</p>	<p>WEST PASCO CLASS I LANDFILL FLORIDAN AQUIFER POTENTIOMETRIC SURFACE MAP JANUARY 1998</p> <p>Project 40141-8-0452</p> <p>Figure 2</p>
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I don't think they measured in July



EXPLANATION

- 4MW2 EXISTING GROUND-WATER COMPLIANCE MONITORING WELL AND DESIGNATION
- 2MW2 EXISTING GROUND-WATER COMPLIANCE MONITORING WELL AND DESIGNATION
- 4MW16D PROPOSED GROUND-WATER DETECTION MONITORING WELL AND DESIGNATION

NOTE [D]=DRY
(4MW)=4" PVC FLORIDAN AQUIFER WELL
(2MW)=2" PVC SURFICIAL AQUIFER WELL



Prepared/Date DAG 1/22/99
Checked/Date GWE 1/22/99

West Pasco Class I Landfill
Pasco County
Board of County Commissioners
Utility Services Branch
Pasco County, Florida



**WEST PASCO CLASS I LANDFILL
FLORIDAN AQUIFER POTENTIOMETRIC
SURFACE MAP**

JULY 1998

Project 40141-8-0452

Figure 4: Total Dissolved Solids Analytical Results

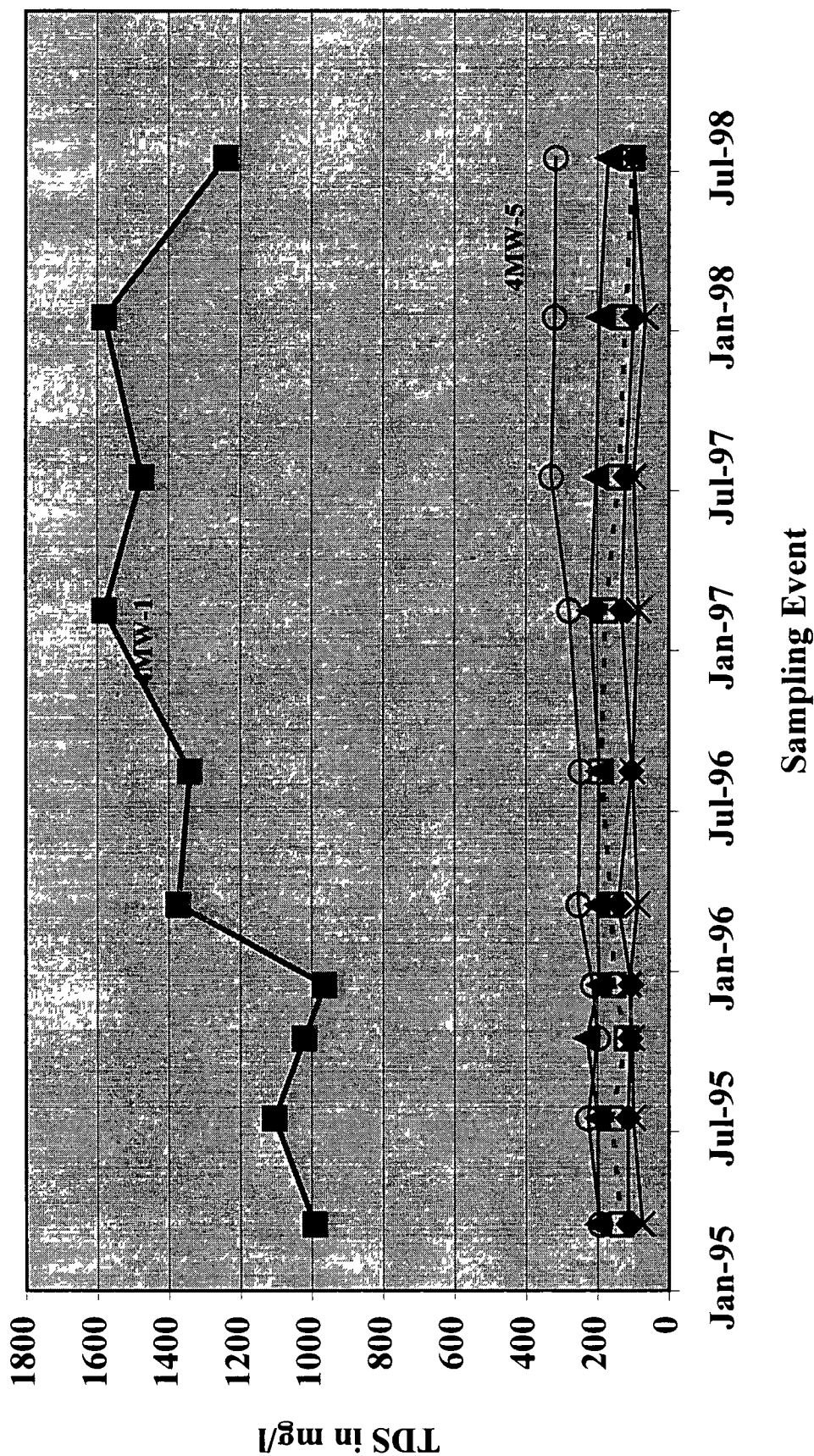
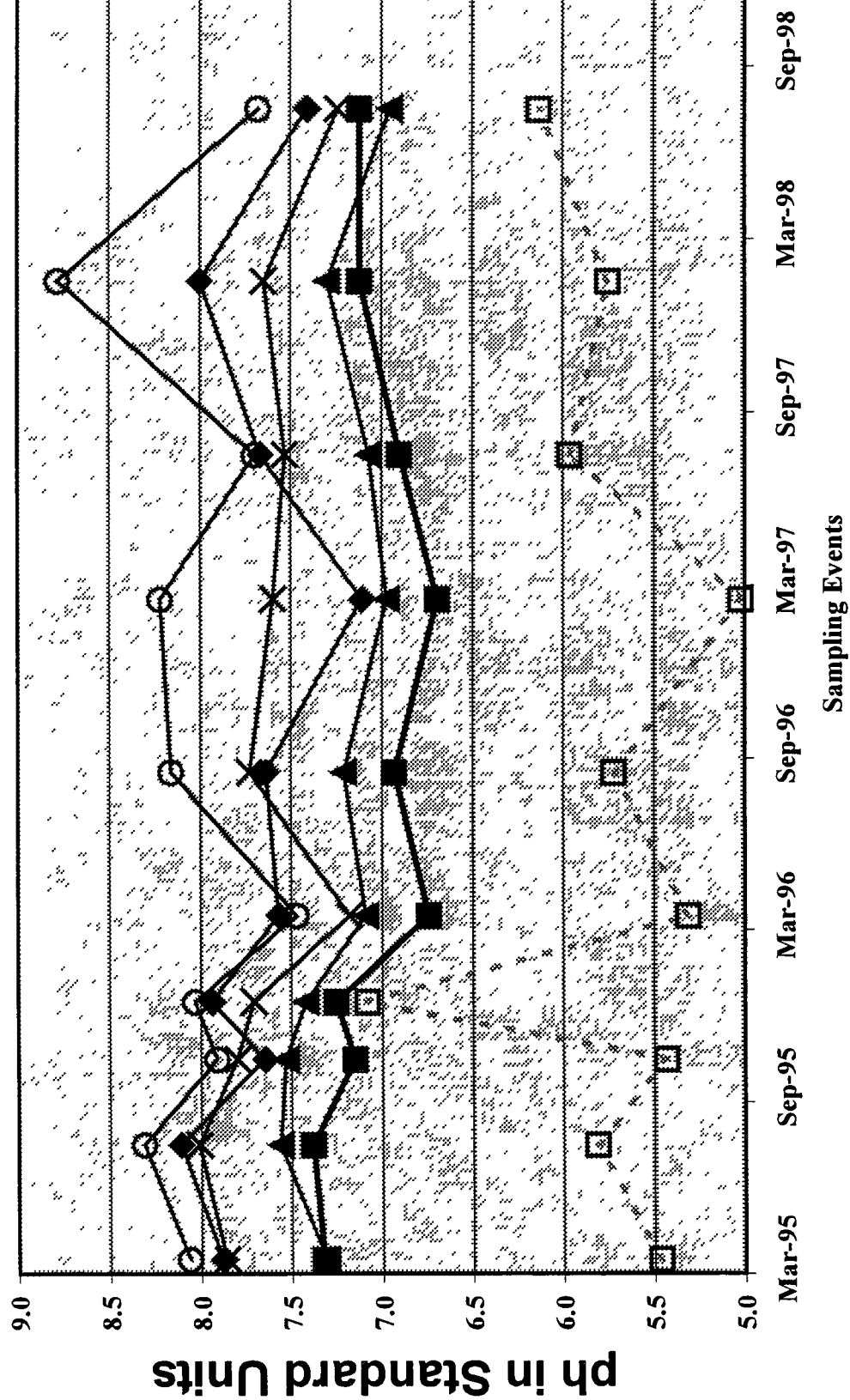


Figure 5: pH Analytical Results



—■— 4MW-1 —◆— 4MW-2 —▲— 4MW-3 —×— 4MW-4 —○— 4MW-5 —□— 4MW-6

Figure 6: Sodium Analytical Results

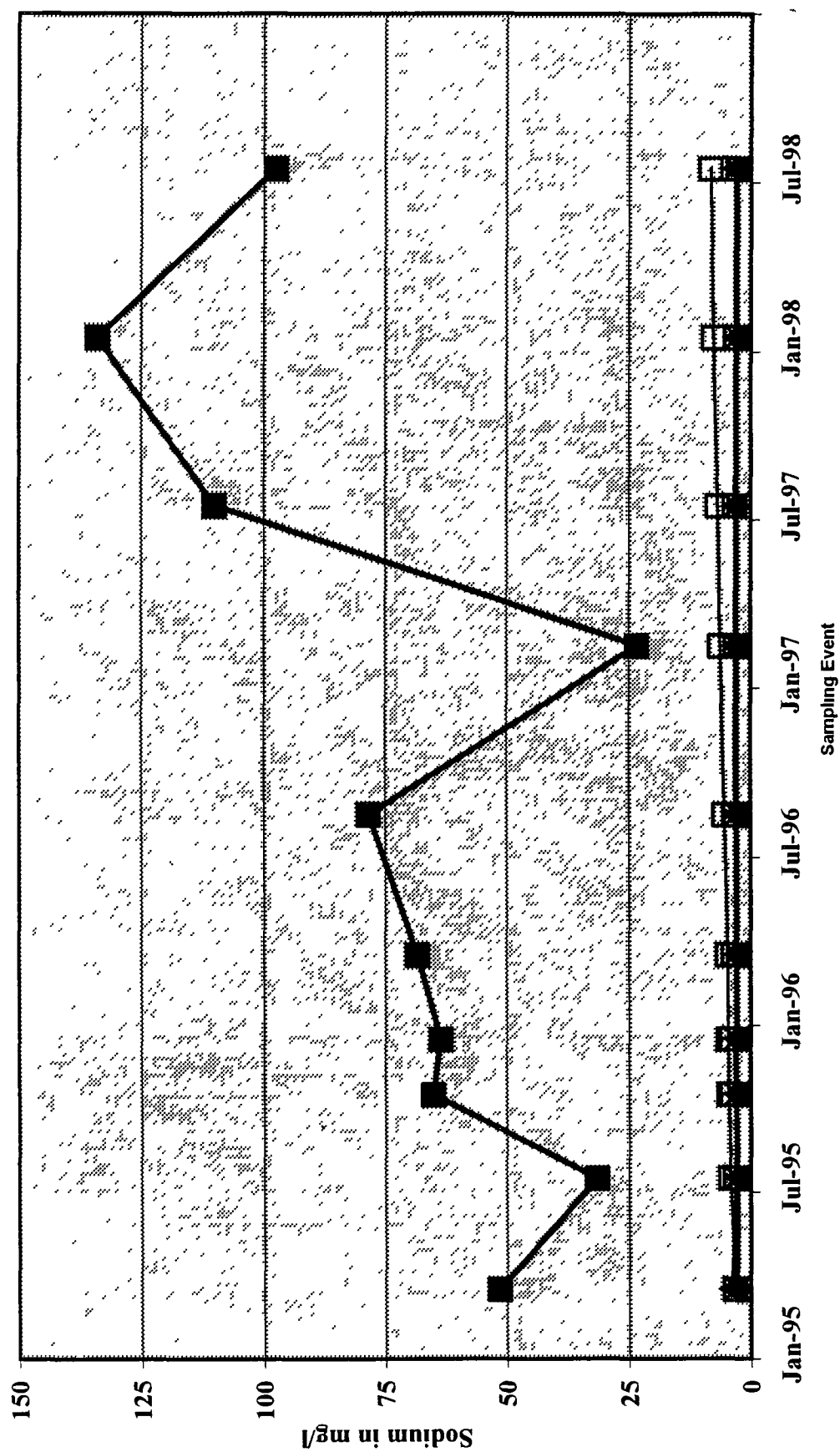
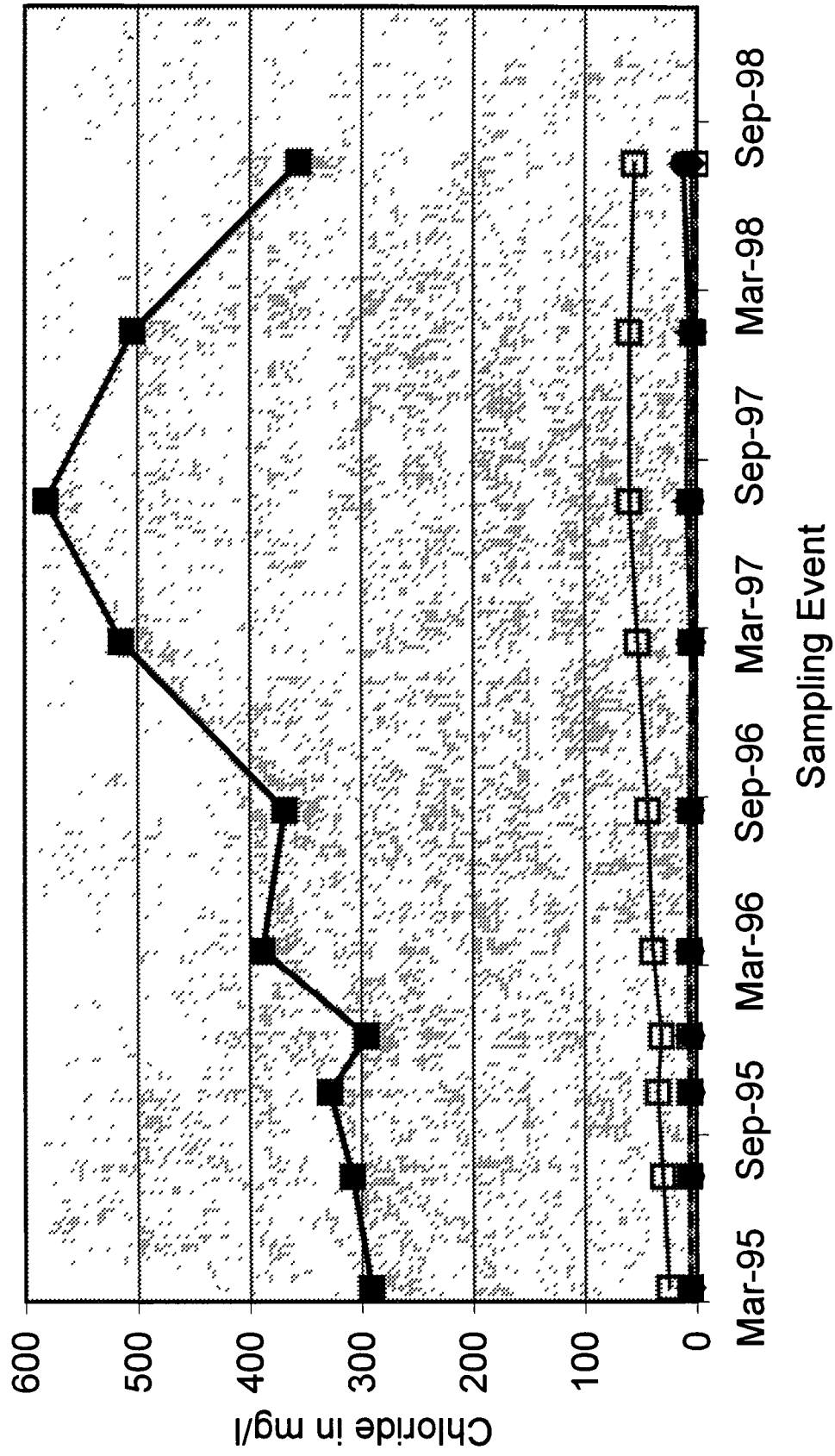
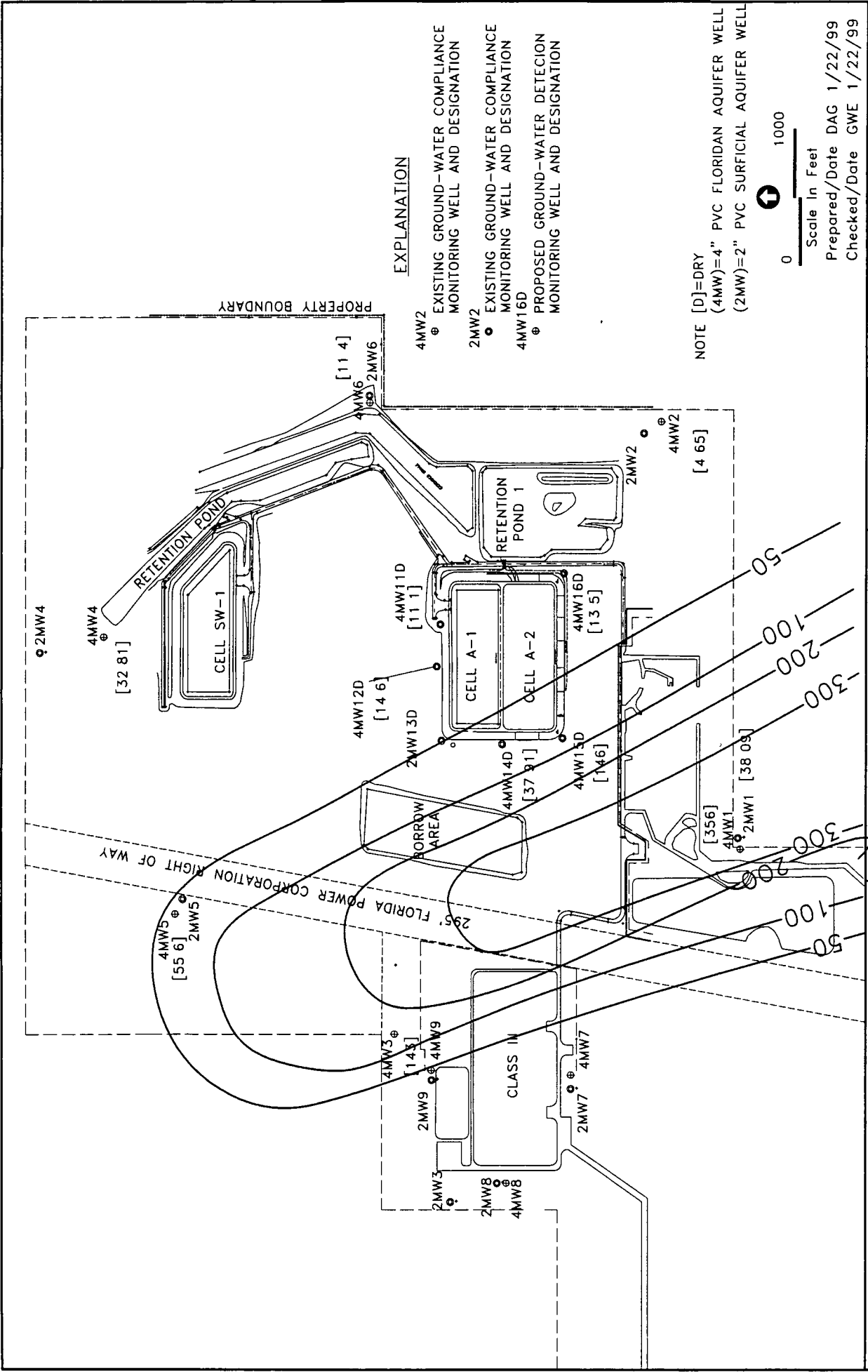


Figure 7: Chloride Analytical Results





<p>West Pasco Class I Landfill Pasco County Board of County Commissioners Utility Services Branch Pasco County, Florida</p>	<p>LAW ENGINEERING AND ENVIRONMENTAL SERVICES</p>	<p>WEST PASCO CLASS I LANDFILL CHLORIDE CONCENTRATIONS IN FLORIDAN AQUIFER JULY 1998 Project 40141-8-0452</p>
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