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Environmental Protection Department
Operations and Regulatory Affairs Division

Lawrence Livermore National Laboratory Experimental Test Site 300

Compliance Monitoring Program for Waste Discharge Requirements 96-248

Annual/Fourth Quarter Report 2003

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List of Abbreviations and Acronyms

1,1,1-TCA	1,1,1-trichloroethane
1,2-DCA	1,2-dichloroethane, or ethylene dichloride
ANOVA	analysis of variance
BC	BC Laboratories, Inc.
BOD	biochemical oxygen demand
BMP	best management practice
CERCLA	Comprehensive Environmental Response Compensation and Liability Act
CFR	Code of Federal Regulations
CL	concentration limit
COC	constituent of concern
CVRWQCB	Central Valley Regional Water Quality Control Board
DMSO	dimethyl sulfoxide
DO	dissolved oxygen
DSWP	sewage percolation pond influent sampling location
EC	electrical conductivity or specific conductance
EPA	Environmental Protection Agency
EPD	Environmental Protection Department (LLNL)
ERD	Environmental Restoration Division
est.	estimated (concentration)
ESWP	sampling location within sewage evaporation pond
FGL	FGL Environmental Laboratories
GC/MS	gas chromatography/ mass spectrometry
GEL	General Engineering Laboratories
GFAA	graphite furnace atomic absorption spectroscopy
GW	ground water
HDPE	high-density polyethylene
HMX	octahydro-1, 3, 5, 7-tetranitro-1, 3, 5, 7-tetrazocine (also cyclo-tetramethylene-tetranitramine)
HPLC	high-performance liquid chromatography

List of Abbreviations and Acronyms (continued)

ICP	inductively coupled plasma spectroscopy
ISWP	sewage pond influent sampling location
LCRS	leachate collection and removal system
LCS	laboratory control sample
LLNL	Lawrence Livermore National Laboratory
m	meters
MCL	maximum contaminant level
MDL	method detection limit
MEK	methyl ethyl ketone (2-butanone)
MPN	most probable number
MRP	Monitoring and Reporting Program
MS	matrix spike
MSD	matrix spike duplicate
MTBE	methyl *tert*-butyl ether
NA	not applicable, or not analyzed
NAFL	not available from laboratory
ND	not detected
NL	no limit
NR	analysis not required by permit
NS	not sampled
PCE	tetrachloroethene (tetrachloroethylene, perchloroethylene)
PETN	pentaerythritol tetranitrate
PQL	practical quantitation limit
QA	quality assurance
Qal	Quaternary Age alluvium
QC	quality control
RCRA	Resource Conservation and Recovery Act
RDX	hexahydro-1, 3, 5-trinitro-1, 3, 5-triazine (also cyclo-1, 3, 5-trimethylene 2, 4, 6-trinitramine)

List of Abbreviations and Acronyms (concluded)

RHWM	Radioactive and Hazardous Waste Management
RL	reporting limit
RPD	relative percent difference
SL	statistical test limit
SOP	standard operating procedure
STLC	soluble threshold limit concentration
SVOC	Semi volatile organic compound
TATB	2, 4, 6-trinitro-1, 3, 5-benzenetriamine
TBD	to be determined
TCE	trichloroethene (trichloroethylene)
TCLP	toxicity characteristic leaching procedure
TDS	total dissolved solids
TIC	tentatively identified compound
$Tnbs_1$	Tertiary Age, Neroly Formation Lower Blue Sandstone (the regional aquifer)
$Tnbs_2$	Tertiary Age, Neroly Formation Upper Blue Sandstone
$Tnsc_1$	Tertiary Age, Neroly Formation Lower Siltstone/Claystone
TNT	2, 4, 6-trinitrotoluene (also 2-methyl-1, 3, 5-trinitrobenzene)
VOC	volatile organic compound
WDR	Waste Discharge Requirements (Permit)
WGMG	Water Guidance and Monitoring Group (EPD)

EXECUTIVE SUMMARY

This report contains the elements required by Waste Discharge Requirements (WDR) 96-248 (Permit) for the combined 2003 fourth quarter and annual report. This is the eighth annual report prepared under this Permit. Compliance monitoring networks discussed in the report include:

- Process wastewater discharged into the Class II surface water impoundments (surface impoundment) (in **Section 2.2**)
- Leak detection monitoring (including leachate collection and removal system monitoring, and ground water monitoring) for the surface impoundments (in **Section 2.3**)
- Wastewater monitoring for the sewage evaporation and percolation ponds (in **Section 3.2**)
- Ground water monitoring for the sewage evaporation and percolation ponds (in **Section 3.3**)
- Observations at the percolation pits (in **Section 4.0**).

The annual report elements are incorporated into this annual/fourth quarter report. Brief narrative summaries of each compliance network lead each section. These narrative summaries discuss compliance issues and significant incidents that occurred during 2003. Annual summaries of monitoring data are presented in graphical and tabular form in **Appendices A, B, C,** and **D.** Methods used to determine statistical test limits (SLs) for ground water constituents of concern (COCs) are summarized in **Appendix E.** Fourth quarter quality assurance and quality control (QA/QC) data are summarized in **Appendix F.**

All discharges into the surface impoundments were in compliance with the Permit during 2003.

The following damage to the surface impoundments' high-density polyethylene liner was reported during 2003. The event was reported to Susan Timm of the Central Valley Regional Water Quality Control Board (CVRWQCB) in a phone call on November 17, 2003:

- On November 17, two splits in the high-density polyethylene liner of the upper surface impoundment were discovered. The splits are approximately 6 to 8 inches long and 18 to 20 inches above the present water line. The splits are in two areas where several striations have been visible for the past few years, but the splits were not present during the previous inspection. The cracks likely occurred as a result of the recent temperature changes. The repairs were completed March 24, 2004.

LLNL does not expect this occurrence to adversely impact either surface or ground water at Site 300 since the cracks are located above the freeboard line and are unlikely to contact wastewater contained in the surface impoundment.

No liquids were discovered in the leachate collection and removal systems (LCRS) during weekly monitoring.

Required ground water monitoring parameters for the surface impoundments were below the specified SLs throughout 2003, except as identified in **Table 1**.

Table 1. COCs exceeding their SLs in 2003.

COC exceeding SL (confirmed by retest)	**Downgradient Wells**		
	W-817-02	**W-817-03**	**W-817-04**
Bicarbonate alkalinity	Did not exceed SL	Did not exceed SL	4th quarter (7/2/2001)[a]
Ortho-phosphate	3rd quarter (10/13/2003)[a]	3rd quarter (10/13/2003)[a]	3rd quarter (10/13/2003)[a]
Dissolved arsenic	1st quarter (4/14/1997)[a]	Did not exceed SL	Did not exceed SL
Dissolved zinc	Did not exceed SL	1st quarter (1/9/1997)[a]	Did not exceed SL

[a] Date reported to the CVRWQCB.

The high concentrations of bicarbonates just in W-817-04 have been observed sporadically since the second quarter of 2001. Although the concentration of bicarbonates exceed the current SL, the concentration of bicarbonates is consistent with the SL that LLNL proposed in 2002 (Brown 2002) and remains below that SL.

Third quarter ground water monitoring data confirm statistically significant evidence of a release for ortho-phosphate from the Site 300 surface impoundments for all three downgradient monitor wells: W-817-02, W–817–03, and W-817-04. However concentrations of ortho-phosphate have been higher in ground water samples collected from upgradient well W-817-01 than those in the downgradient wells. Therefore, the elevated concentrations of ortho-phosphate must originate upgradient from the surface impoundments.

The concentrations of dissolved arsenic in a ground water sample collected from monitoring well W-817-02 and the concentration of dissolved zinc in a ground water sample collected from monitoring well W-817-03 were confirmed as exceeding the SLs during first quarter monitoring. Concentrations of arsenic and zinc exceeding their respective SLs in these two wells have been reported previously, and further actions on these exceedances are being prioritized under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA). Although the concentration of dissolved zinc exceed the current SL, the concentration of dissolved zinc is consistent with the SL that LLNL proposed for well W-817-03 in 2001 (Brown 2001) and remains below that SL.

Monitoring data indicated compliance with the limits for the ground water and wastewater at the sewage evaporation and percolation ponds. None of the permitted mechanical equipment percolation pits overflowed during 2003.

1.0 Introduction

This report satisfies the 2003 fourth quarter and annual monitoring and reporting requirements of the Central Valley Regional Water Quality Control Board's (CVRWQCB's) Waste Discharge Requirements 96-248 (the Permit). It details the results of compliance monitoring networks in the High Explosives Process Area and the General Services Area and visual observations at a third percolation pit system at Site 300.

The High Explosive Process Area compliance network analyzes samples of ground water beneath, and process wastewater influent discharged into, two connected Class II surface impoundments where the process wastewater is evaporated. The General Services Area network analyzes samples of ground water beneath, and wastewater discharged into, the sewage evaporation and percolation ponds (sewage ponds) where sanitary waste is treated. The percolation pit network entails visual monitoring of five percolation pits that receive mechanical equipment wastewater.

The Experimental Test Site (Site 300), operated by LLNL, is located in the Altamont Hills approximately 13 kilometers (8 miles) southwest of the city of Tracy, California. **Figure 1** shows the locations of the surface impoundments within the Explosives Process Area and of the sewage ponds in the General Services Area of Site 300.

2.0 Class II Surface Water Impoundments

2.1 Compliance Monitoring Program

The Monitoring and Reporting Program in the Permit as modified in 1998 (MRP 96-248, Revision 1) specifies the required environmental monitoring for operation of the surface impoundments (Cohen 1998). These specifications include monitoring of process wastewater discharges to the surface impoundments and leak detection systems.

Process wastewater discharged to the surface impoundments is monitored for constituents found (or likely to be found) in materials used in operations conducted at buildings discharging to the surface impoundments. The monitoring program includes collecting and analyzing samples from: photographic process rinsewater from Buildings 801, 823, and 851 (**Tables A-1.1**, **A-1.2**, and **A-1.3**); Chemistry wastewater from Buildings 825, 826, and the Building 827 Complex (827A, 827C/D, and 827E) (**Tables A-2.1** through **A-2.4**); and High Explosives Process wastewater from Buildings 806/807, 809, and 817 (**Tables A-3.1**, and **A-3.2**).

Leak detection system monitoring includes monitoring of the leachate collection and removal systems (LCRSs)and ground water. LCRSs installed between the clay liners of the surface impoundments are inspected weekly for the presence of moisture that might

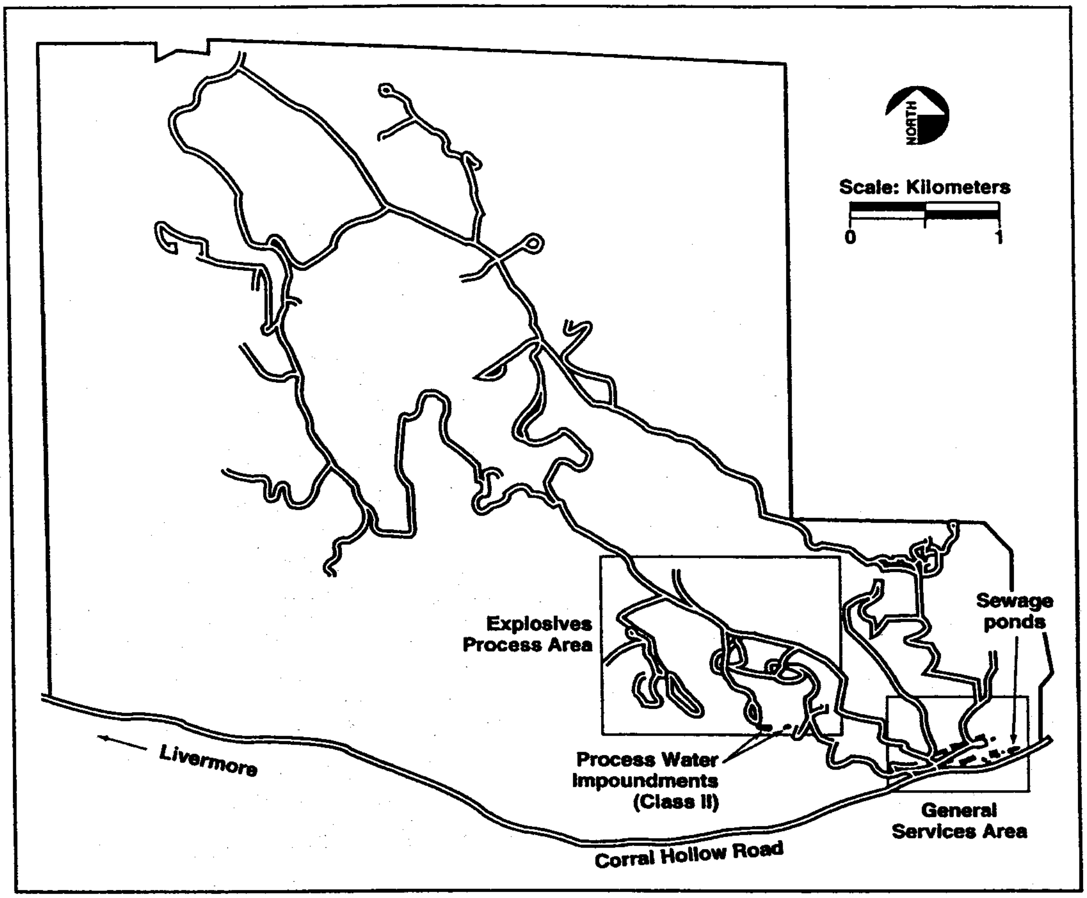

Figure 1. Location of Class II surface water impoundments and sewage evaporation and percolation ponds.

indicate a leak in the high-density polyethylene liner. Ground water samples are collected quarterly from monitoring wells located upgradient and downgradient of the surface impoundments (**Figure 2**). Ground water analytical results are compared with statistical test limits (SLs) to identify statistical evidence of a release of chemicals into the ground water from the surface impoundments.

The four ground water monitoring wells are screened in the Tertiary Age, Neroly Formation Upper Blue Sandstone ($Tnbs_2$). The direction of ground water flow is approximately southeasterly. Monitoring well W-817-01 is hydrologically upgradient of the surface impoundments, and monitoring wells W-817-02, W-817-03, and W-817-04 are downgradient. LLNL collects ground water samples quarterly from these monitoring wells and analyzes them for the COCs specified in MRP 96-248, Revision 1 (Cohen 1998).

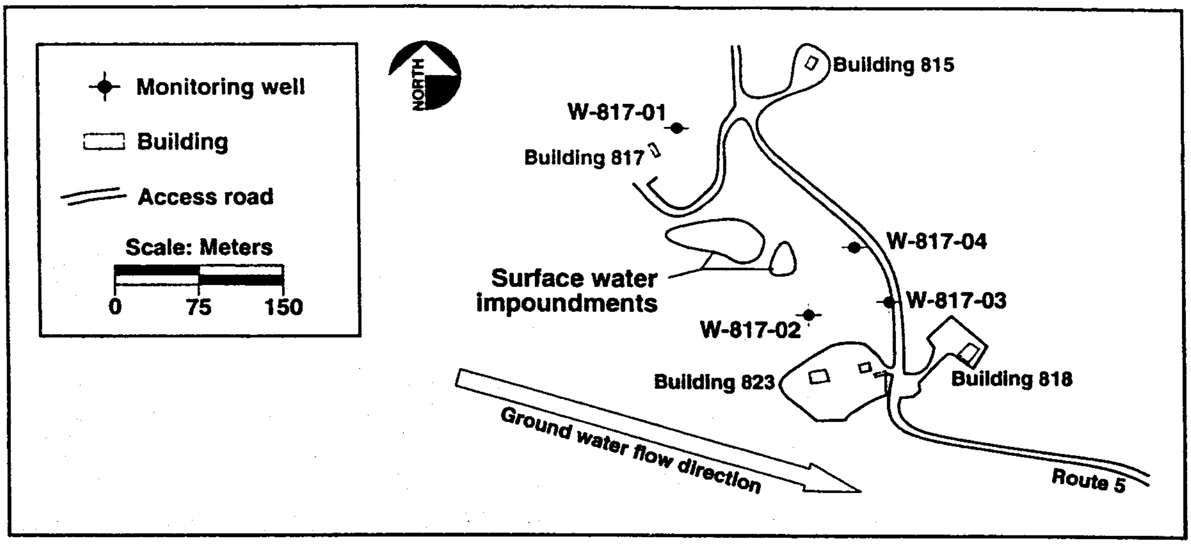

Figure 2. Site 300 High Explosives Process Area ground water compliance monitoring locations.

2.2 Process Wastewater Monitoring Network

Data discussed in this section are provided in tabular form in **Appendix A** (**Tables A-1.1** through **A-3.2**) for all 2003 data. A discussion of the process wastewater quality assurance/quality control (QA/QC) data is provided in **Appendix F** along with the associated field/method blank QA/QC data tables for the fourth quarter data (**Tables F-1.1** and **F-1.2**).

2.2.1 Photographic Process Rinsewater Discharges

LLNL samples all discharges from photographic process rinsewater retention tanks at Buildings 801 and 851. Once samples are collected, the tank contents are immediately discharged to the surface impoundments. Analytical results are used to confirm that the discharges are consistent with the effluent limits specified in the Permit. Photographic process rinsewater from the Building 823 retention tank discharges automatically to the surface impoundments. Because of pump problems in the past, LLNL has switched to manual operation of the pump. This waste stream is sampled once each quarter to verify that discharges are consistent with the effluent limits specified in the Permit.

All discharges into the Class II surface impoundments were in compliance with the effluent limits during 2003. Metals concentrations in all process rinsewater discharges sampled from retention tanks were in compliance with the Permit's effluent limits during 2003. Historical data for the COCs are plotted in **Appendix A**, and the 2003 analytical results are tabulated in **Tables A-1.1**, **A-1.2**, and **A-1.3**.

During 2003, each of two discharges from Building 801 were sampled in the first and third quarters (**Table A-1.1**); each of four discharges from Building 823 were sampled in the first, second, third, and fourth quarters (**Table A-1.2**); and each of four discharges from Building 851 were sampled in the first, second, third, and fourth quarters (**Table A-1.3**).

2.2.2 Chemistry Area Wastewater Discharges

Process wastewater generated from the Chemistry Area (Buildings 825, 826, and the Building 827 Complex) is held in retention tanks until evaluation of the analytical results from the samples collected indicates compliance with the Permit's effluent limits. Data are reported for the quarter when the discharge to the surface impoundments occurs, although wastewater samples may actually be collected in an earlier quarter.

Constituent concentrations in all process wastewater discharges that occurred during 2003 from the Building 827 Complex were in compliance with the effluent limits. No discharges occurred from the retention tanks at Buildings 825 or 827A during the year. Analytical results for the Chemistry Area wastewater samples including COCs and additional analytes are presented in **Tables A-2.1** through **A-2.4**. Historical data plots are included in **Appendix A**.

2.2.3 High Explosives Process Area Wastewater Discharges

Wastewater generated from the Explosives Process Area (Buildings 806/807, 809, and 817) is sampled annually in accordance with MRP 96-248, Revision 1 (Cohen 1998).

The concentrations of COCs in all process wastewater discharges sampled during 2003 from the High Explosives Process Area were in compliance with the effluent limits. Process discharges associated with Buildings 806/807 were sampled once during the third quarter; discharges associated with Building 817 were also sampled once during the third quarter. There were no discharges associated with Building 809; there have been no processes operating at Building 809 since construction activities began there in May 2001. Although construction has been completed, Building 809 will be offline until the final certification for the new isostatic press and ovens is complete. Annual analytical results of Explosives Process Area wastewater discharge samples are presented in **Tables A-3.1** and **A-3.2**. Historical data plots are included in **Appendix A.**

Constituent concentrations in all process wastewater discharges that occurred during 2003 from the High Explosives Process Area were in compliance with the effluent limits.

2.3 Leak Detection Monitoring Network

On November 17, two splits in the high density polyethylene liner of the upper surface impoundment were discovered. The splits are approximately 6 to 8 inches long and 18 to 20 inches above the present water line. The splits are in two areas where several striations have been visible for the past few years, but the splits were not present during the previous inspection. The cracks likely occurred as a result of the recent temperature changes. The repairs were completed March 24, 2004 (Mathews 2003).

2.3.1 Leachate Collection and Removal Systems Monitoring

The two LCRSs were monitored weekly for the presence of liquids that would indicate a leak in a surface impoundment liner. No liquid was discovered in this system during 2003.

2.3.2 Ground Water Monitoring

In 2003, four COCs (bicarbonate alkalinity in a sample from well W-817-04 during the fourth quarter; ortho-phosphate in samples from wells W-817-02, W-817-03, and W-817-04 during the third quarter; arsenic in a sample from well W-817-02 during the first quarter; and dissolved zinc in a sample from well W-817-03 during the first quarter) exceeded their respective SLs. LLNL does not believe any of these elevated concentrations of any COC (**Table B-1.1**) originated from the surface impoundments.

Table B-1.2 lists all ground water analytical results, including retest sample results, for the fourth quarter of 2003 for COCs under MRP 96-248, Revision 1 (Cohen 1998). Analytical results from other parameters analyzed in water samples from these wells, which are not required by MRP 96-248, Revision 1, but are part of the analytical laboratory suites, are listed in **Tables B-2.1** and **B-2.2. Appendix E** provides a brief description of all statistical methods used to evaluate compliance with the limits established in MRP 96-248, Revision 1 (Cohen 1998). A discussion of the fourth quarter ground water QA/QC data is provided in **Appendix F**, along with the field QA/QC data tables (**Tables F-2.1** and **F-2.2**).

Concentrations of bicarbonate alkalinity were confirmed as exceeding the SL (277 mg/L) in samples collected from downgradient well W-817-04 during fourth quarter monitoring (**Table B-1.1**) and were previously reported to the CVRWQCB at the end of the second quarter of 2001 (Raber 2001). Although the concentration of bicarbonates exceed the current SL, the concentration of bicarbonates is consistent with the SL that LLNL proposed in 2002 (Brown 2002) and remains below that SL.

The concentration of ortho-phosphate analyzed in a ground water sample collected on August 19, 2003, was 0.41 mg/L from downgradient well W-817-02; 0.35 mg/L from downgradient well W-817-03; and 0.32 mg/L from downgradient well W-817-04. All of these exceeded the SL of 0.19 mg/L (**Table B-1.1**). This exceedence was confirmed by results of the retest samples collected from well W-817-02 on September 5, 2003 (Brown 2003c). The statistically significant evidence was reported to the CVRWQCB (Raber 2003a). However, concentrations of ortho-phosphate in ground water samples collected from upgradient well W-817-01 have been higher than those in the downgradient wells. Therefore, the elevated concentrations of ortho-phosphate must originate upgradient from the surface impoundments.

The concentration of dissolved arsenic analyzed in a ground water sample collected from downgradient well W-817-02 on January 24, 2003, was 0.080 mg/L, greater than the SL of 0.073 mg/L (**Table B-1.1**). This was confirmed by results of both retest samples collected from this well on February 28 and March 7 (Brown 2003a). The concentrations of dissolved arsenic collected from downgradient well W-817-02 were first reported as exceeding its SL in April 1997 (Galles 1997b), and investigations into arsenic occurrence were turned over to CERCLA at that time (**Table E-1**).

The concentration of dissolved zinc analyzed in a ground water sample collected from downgradient well W-817-03 on January 24, 2003, was 0.01 mg/L, greater than the SL of 0.0099 mg/L (**Table B-1.1**). This was confirmed by results of the retest sample collected from this well on February 28, 2003 (Brown 2003a). The concentrations of dissolved zinc collected from downgradient well W-817-03 were first reported as exceeding its SL in January1997 (Galles 1997a), and investigations into dissolved zinc occurrence were turned over to CERCLA at that time (**Table E-1**). Although the concentration of dissolved zinc exceed the current SL, the concentration of dissolved zinc is consistent with the SL that LLNL proposed for well W-817-03 in 2001 (Brown 2001) and remains below that SL.

Plots of all COC data over time and tabular annual summaries of the ground water analytical data are included in **Appendix B**. Each COC concentration confirmed as exceeding the SL is discussed by well and by COC.

3.0 Sewage Evaporation and Percolation Ponds

3.1 Compliance Monitoring Program

Monitoring at the sewage evaporation pond (evaporation pond) and the sewage percolation pond (percolation pond) (**Figure 3**) is also specified in the MRP 96-248, Revision 1 (Cohen 1998). Applicable reporting requirements are detailed in the Permit (CVRWQCB 1996).

Quarterly samples of wastewater flowing into the evaporation pond are collected for analysis from a location west of the pond (sampling location ISWP in **Figure 3**). ISWP is a manhole that captures all waste streams before they flow into the pond. The samples are analyzed for electrical conductivity (EC), pH, and biochemical oxygen demand (BOD).

Quarterly wastewater samples are collected from the evaporation pond (sampling location ESWP) and analyzed for pH, EC, and dissolved oxygen (DO). Observations of the pond are made at least monthly for freeboard, color, odor, and levee condition. Any discharge from the evaporation pond to the percolation pond (sampling location DSWP) is sampled and analyzed for BOD, EC, total and fecal coliform, and pH.

Leak detection monitoring at the sewage ponds is accomplished by monitoring the shallow ground water, including the regional aquifer ($Tnbs_1$) beneath and adjacent to the ponds. Ground water monitoring includes semiannual sampling and analysis of the collected samples. **Table 1** lists each monitoring well; and whether it is upgradient, downgradient, or crossgradient of the sewage ponds; and the geological interval(s) over which it is screened. **Figure 3** shows the location of each of the wells.

Table 2. Monitoring well location relative to sewage ponds and aquifer monitored.

Monitoring well	Location	Screening interval
W-7E	Upgradient	$Tnsc_1/Tnbs_1$
W-7ES	Upgradient	$Qal/Tnsc_1$
W-7PS	Upgradient	Qal
W-35A-04	Crossgradient	Qal
W-26R-01	Downgradient	$Tnbs_1$
W-26R-11	Downgradient	Qal
W-26R-05	Downgradient	$Qal/Tnbs_1$
W-25N-20	Downgradient	$Qal/Tnbs_1$
W-7DS	Downgradient	$Qal/Tnbs_1$

Note: $Tnbs_1$ is the regional aquifer.

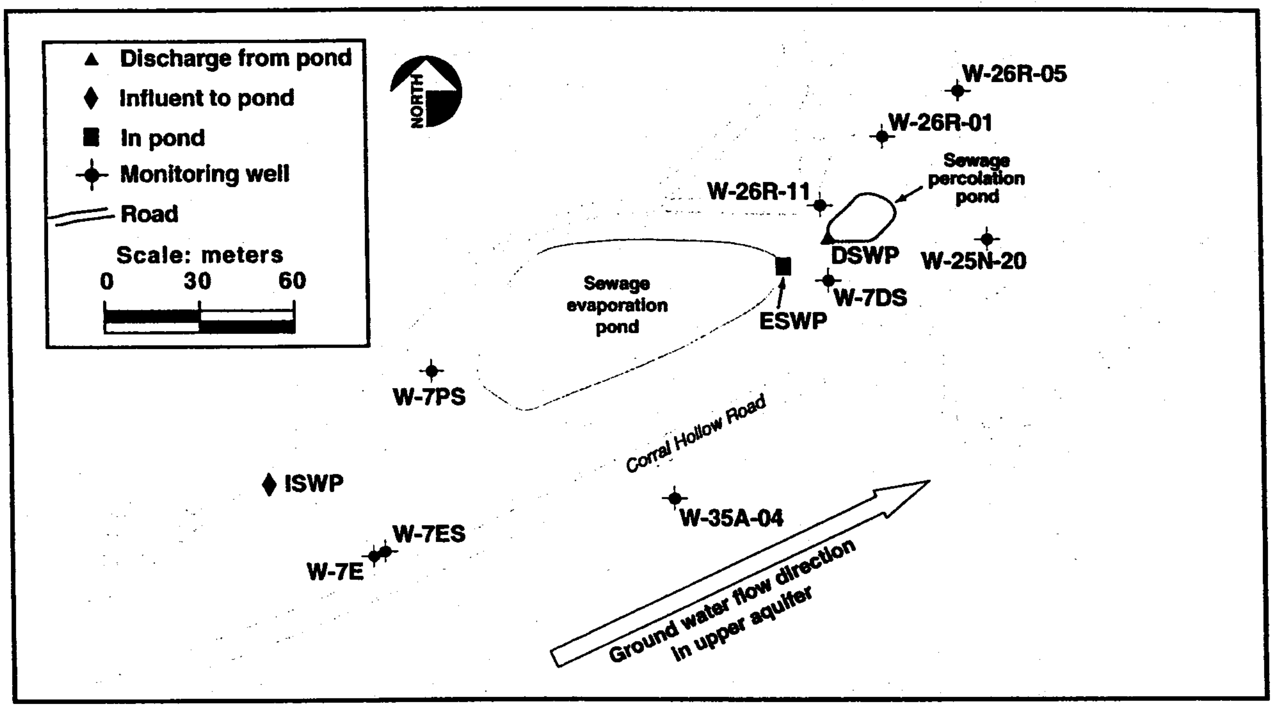

Figure 3. Site 300 sewage pond ground water and surface water compliance monitoring locations

3.2 Wastewater Monitoring

All required wastewater monitoring parameters for the sewage ponds were in compliance with the Permit's provisions and specifications throughout 2003. Continuous discharge occurred during the first quarter (**Table C-4**) from the evaporation pond to the percolation pond (Brown 2003a). Historical plots and tabular summaries of the 2003 data are included in **Appendix C.**

3.3 Ground Water Monitoring

All required monitoring parameters for the sewage pond ground water network were in compliance with specified ground water receiving limits throughout 2003. Semiannual ground water samples were collected and analyzed during the first and third quarters of 2003. Historical data plots and tabular annual summaries of the analytical data are included in **Appendix D**.

4.0 Percolation Pits

MRP 96-248, Revision 1, requires monthly inspections of the percolation pits at Buildings 806A, 827A, 827C, 827D, and 827E. Sampling and analysis for metals is required whenever an overflow occurs.

During 2003, the percolation pits at Buildings 806A, 827A, 827C, 827D, and 827E operated normally, and no overflows occurred. The percolation pit at Building 806A contained 4 inches of standing water in November and 8 inches in December. The standing water in the percolation pit at 827C was 2 inches in October, 17 inches in November, and none in December. The percolation pit at Building 827D also contained 4 inches of standing water in October and none in November or December.

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Appendix A

Annual Summary Plots and Tables of Surface Impoundments Process Water Monitoring Data

Appendix A

This appendix contains graphical and tabular summaries of the 2003 surface water impoundments influent monitoring. The monitoring requirements of WDR 96-248 began in the fourth quarter of 1996.

Wastewater influent monitoring includes photographic process water from Buildings 801, 823, and 851; the Chemistry Area (Buildings 825, 826, and 827 Complex); and discharges from the Explosives Process Area (Buildings 806, 807, 809, and 817).

Retention tank designations for the photographic process and Chemistry Areas are as follows: 801-R3O1 (old), 801-R3O2 (new), 823-R1U1, 851-R1A1 (photographic process area); and 825-R1A1, 826-R1A1, 827A-R1A1, 827C-R1A1, and 827A-R2A1 (Chemistry Area). Process discharges from the Explosives Process Area are generated from Buildings 806/807 and 817 and are designated as B806/807 and B817, respectively. The plots contain all monitoring data available since LLNL began storing sample results from these retention tanks in 1992. There are no 2003 data for B809 because there have been no operations there since May 2001.

The plots display the pH parameter and concentrations of trace metals, volatile organic compounds, and semi-volatile organic compounds in wastewater influent to the surface water impoundments. The plots begin with the retention tank associated with the lowest building number for each detected analyte always plotted first. Only analytes detected in each retention tank are plotted.

Each two-dimensional graph plots concentration on the vertical axis versus time (years divided into four quarterly sampling periods) on the horizontal axis. Units of measure are given on the vertical axis label and in the header at the top of each page. Values above the analytical reporting limit for each analyte are plotted as solid diamonds, values below the reporting limit are plotted as open inverted triangles, and the estimated values between the reporting limit and method detection limit are plotted as crosses.

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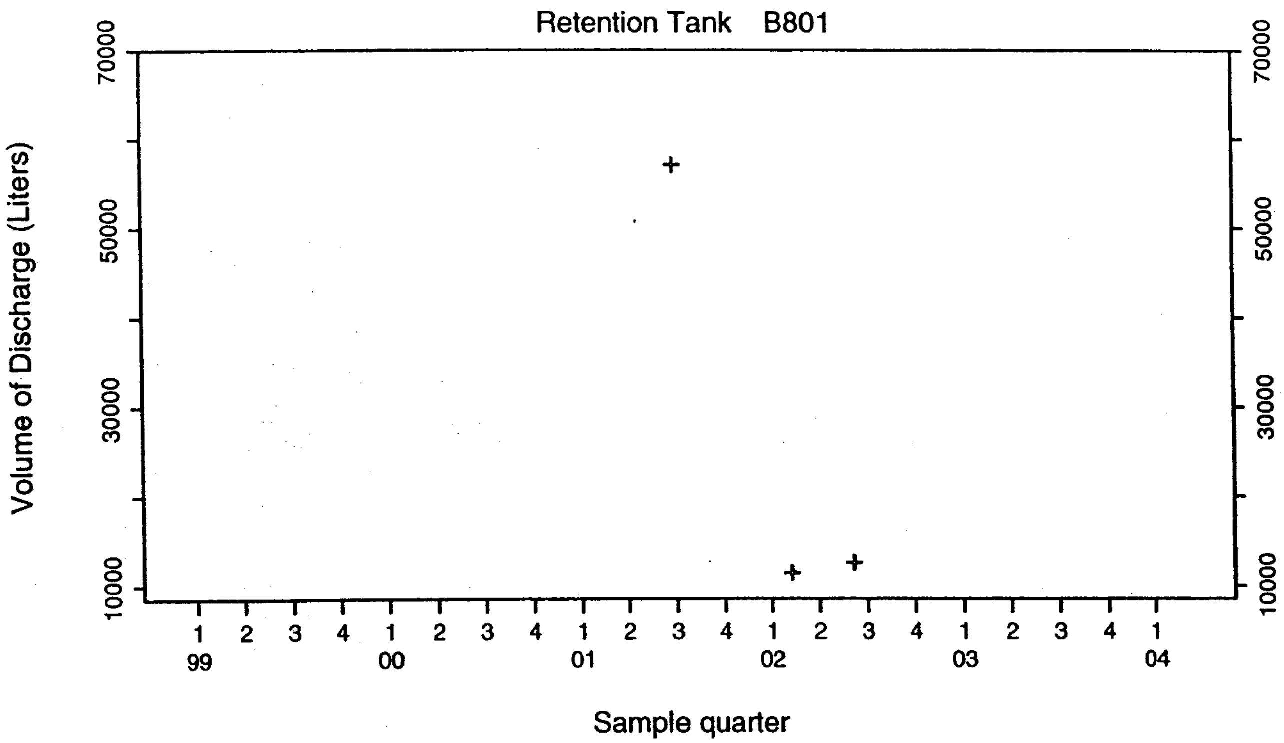
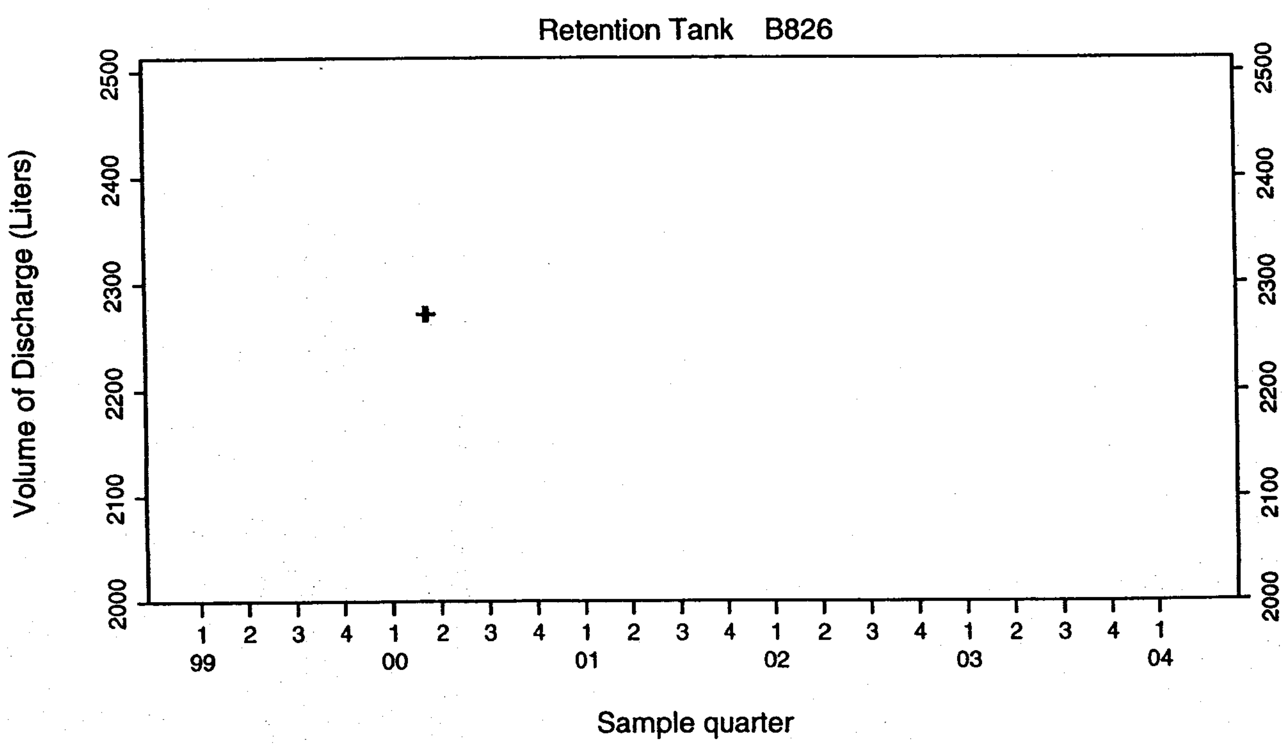
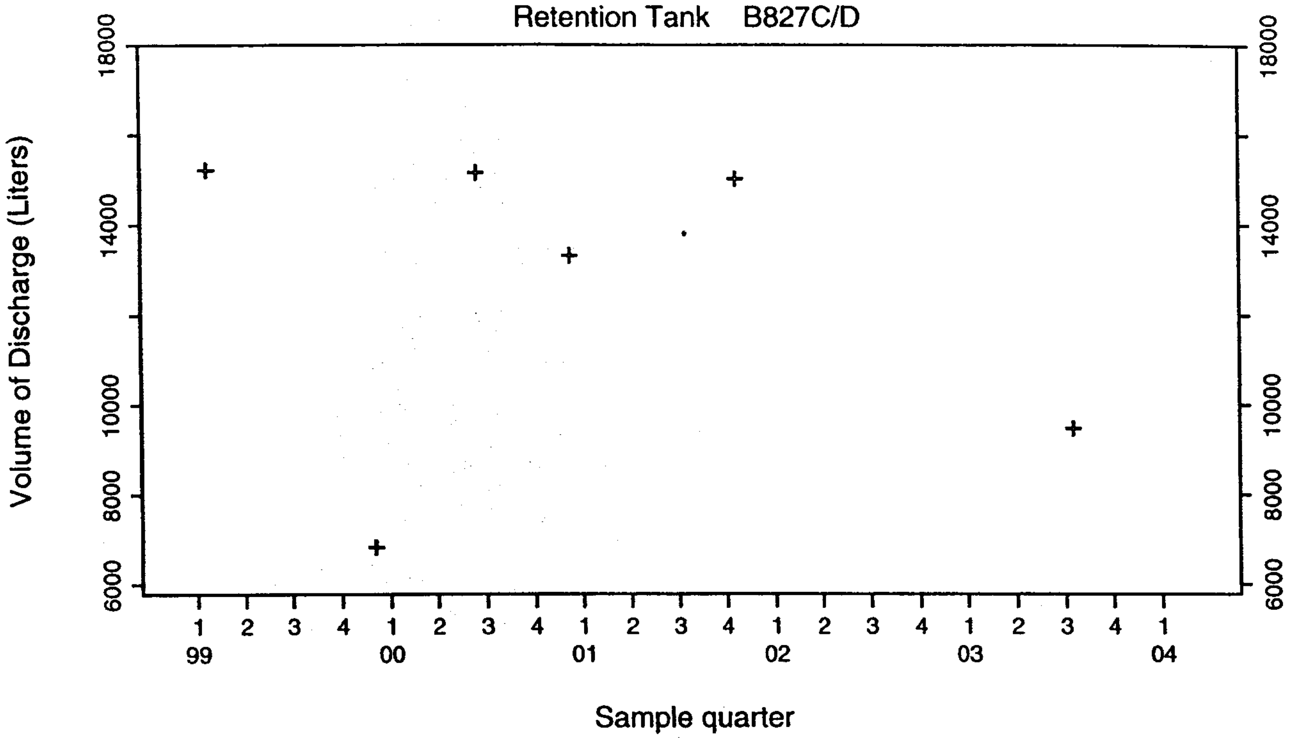
Annual Plots of Surface Impoundments Process Water Monitoring Data

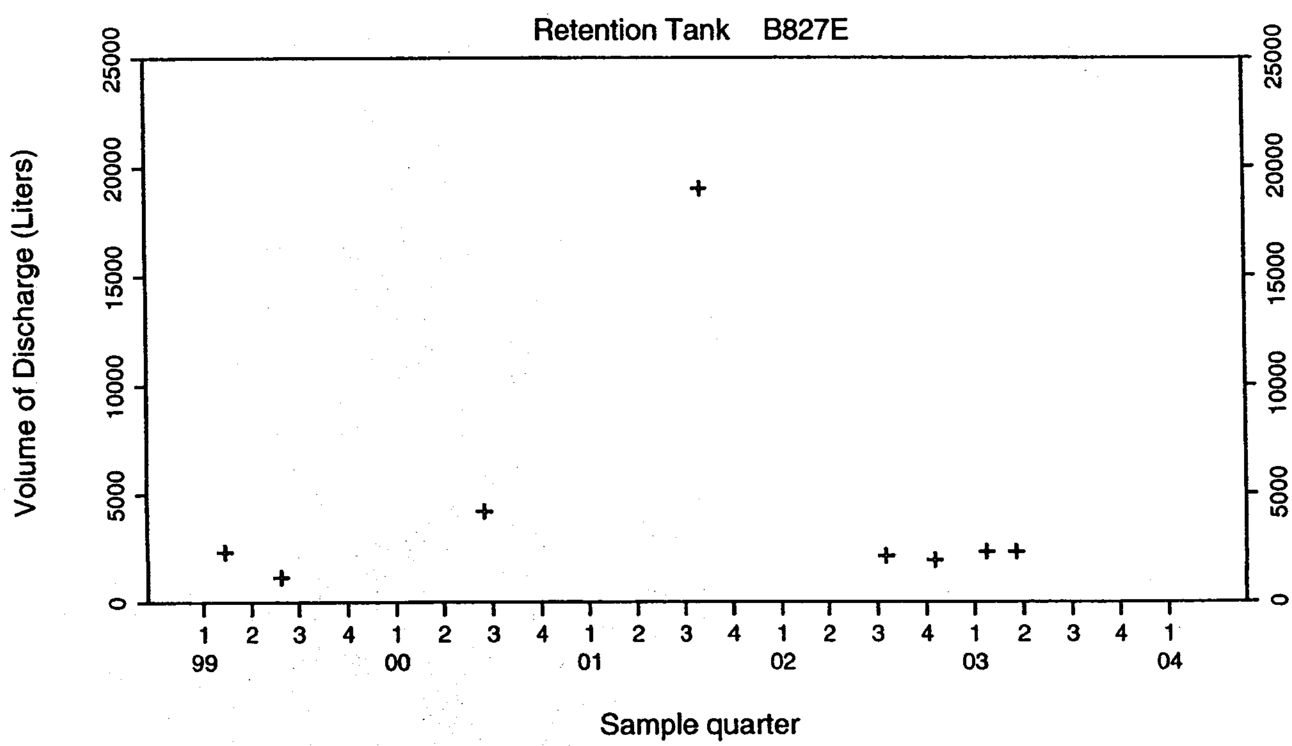
Surface Impoundments Process Water
Volume of Discharge (Liters)



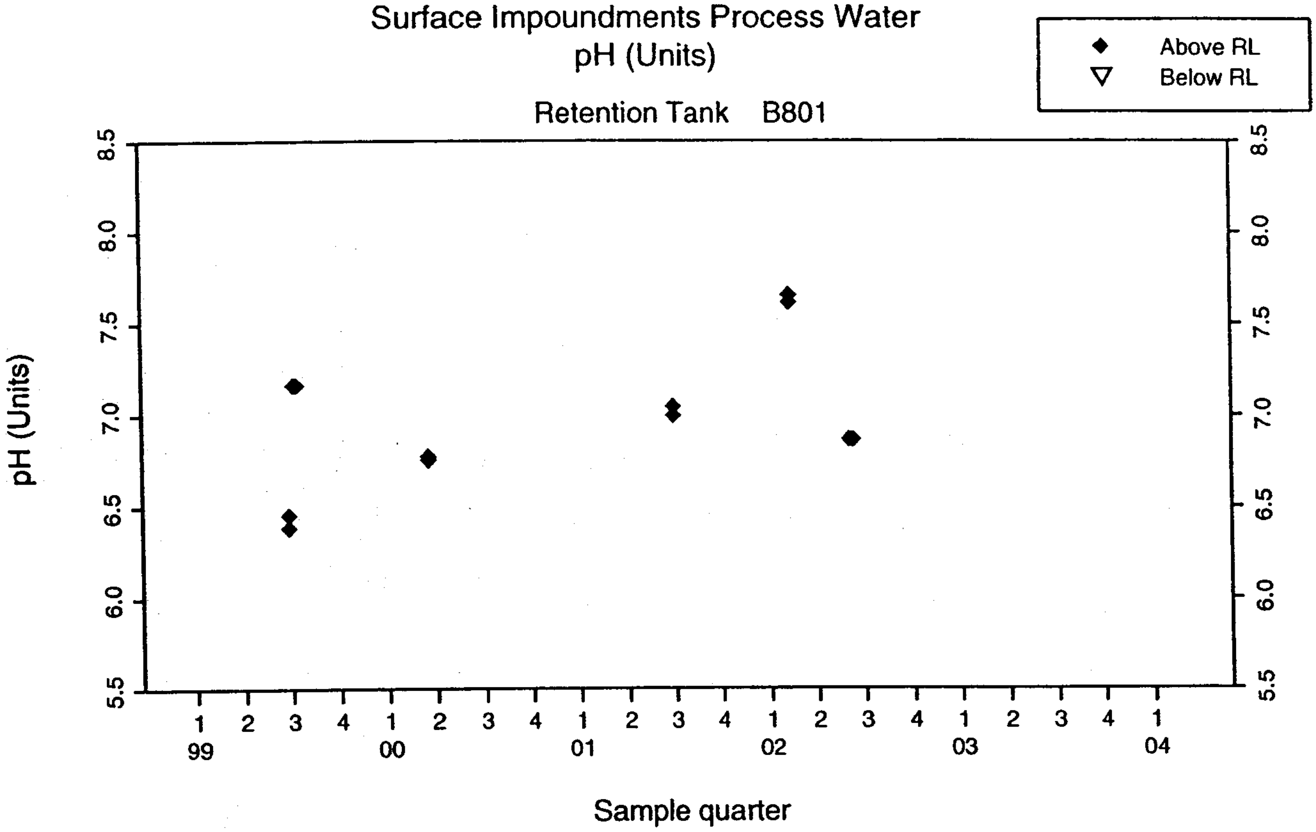


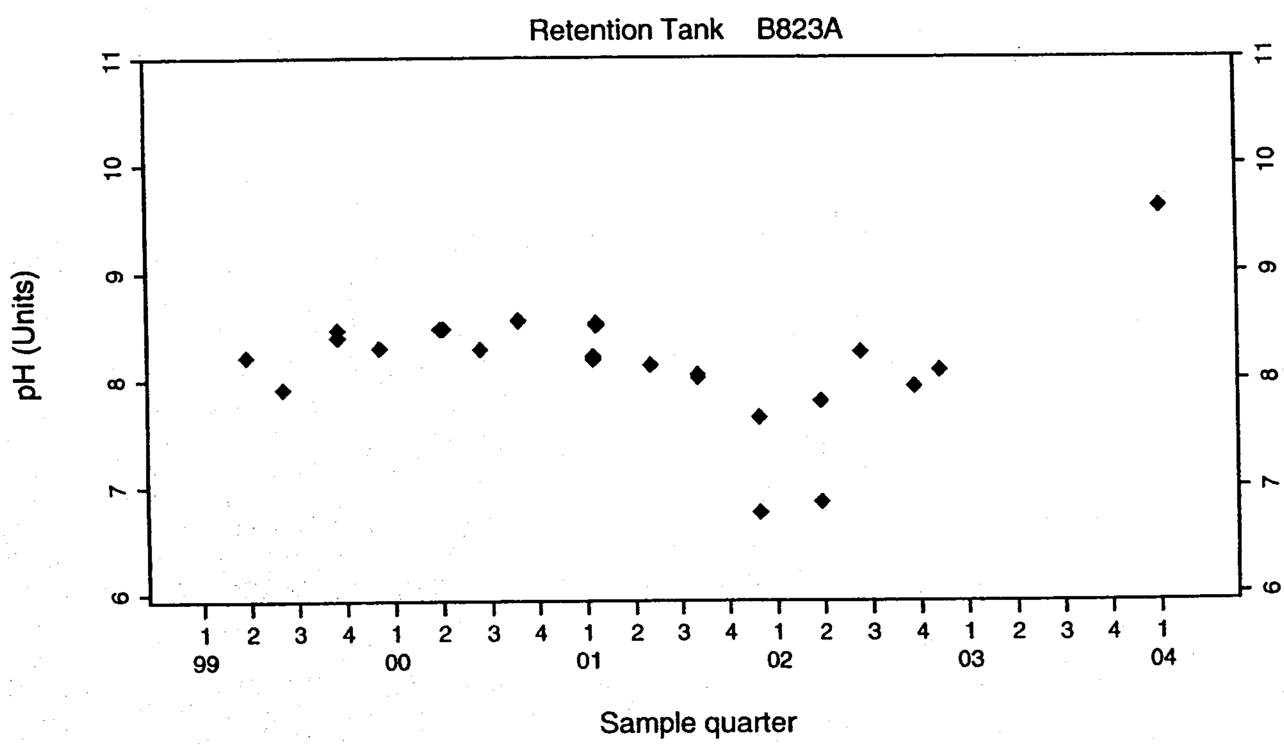
Surface Impoundments Process Water
Volume of Discharge (Liters)



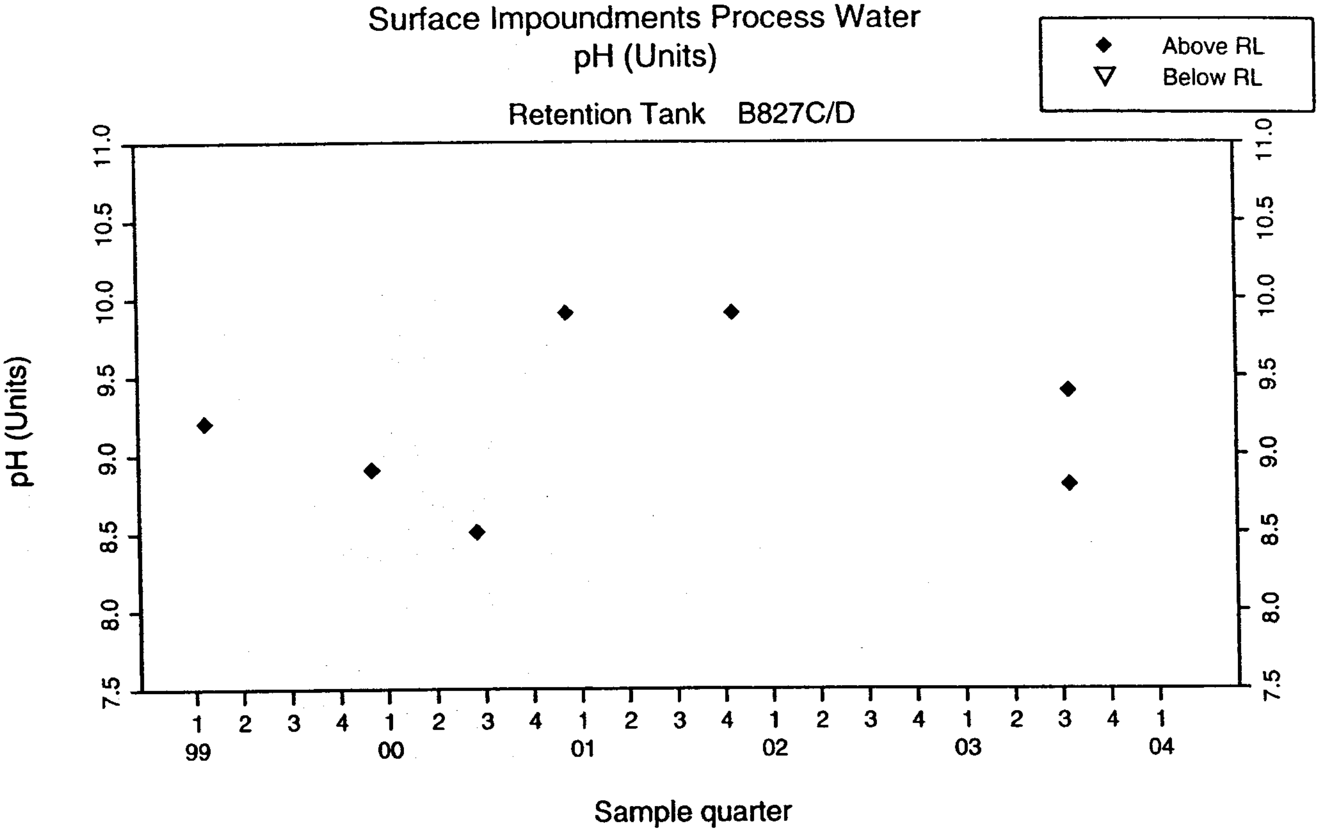


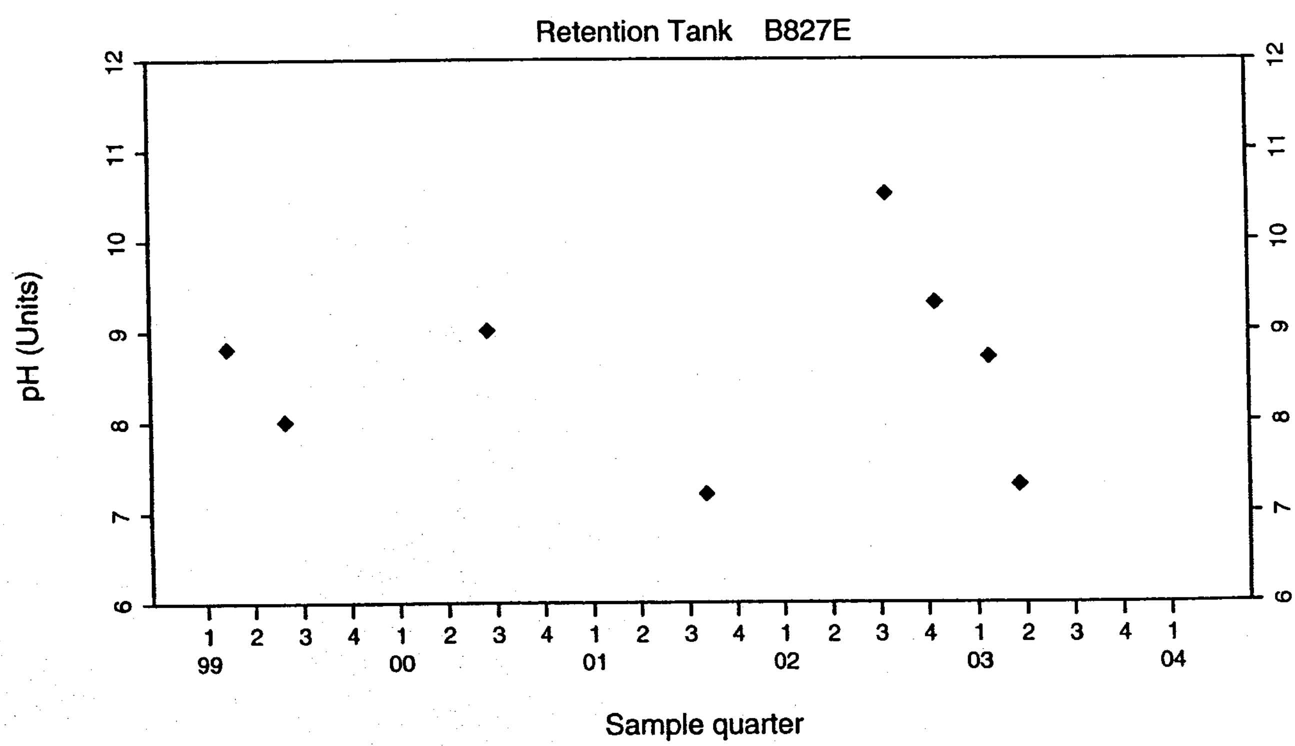
Surface Impoundments Process Water
pH (Units)

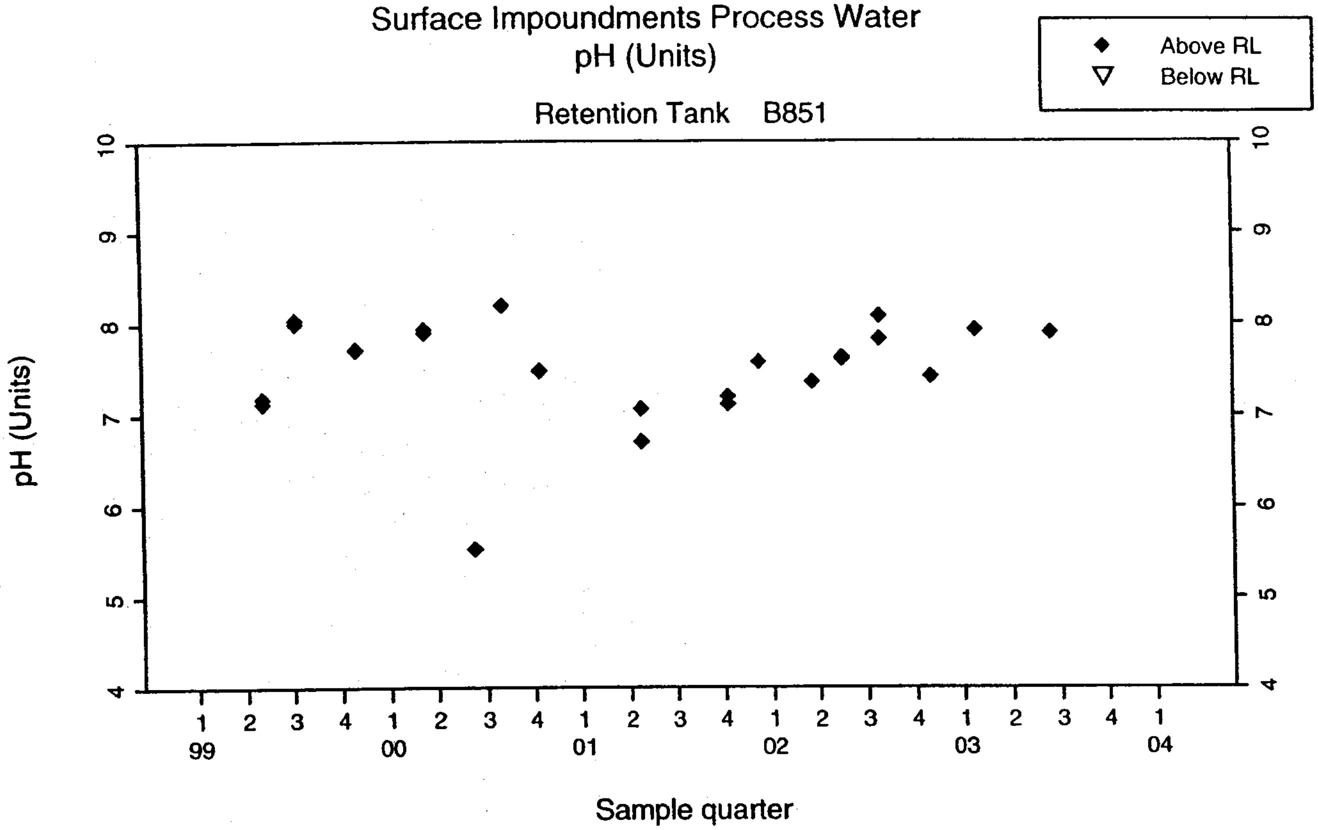




Surface Impoundments Process Water
pH (Units)

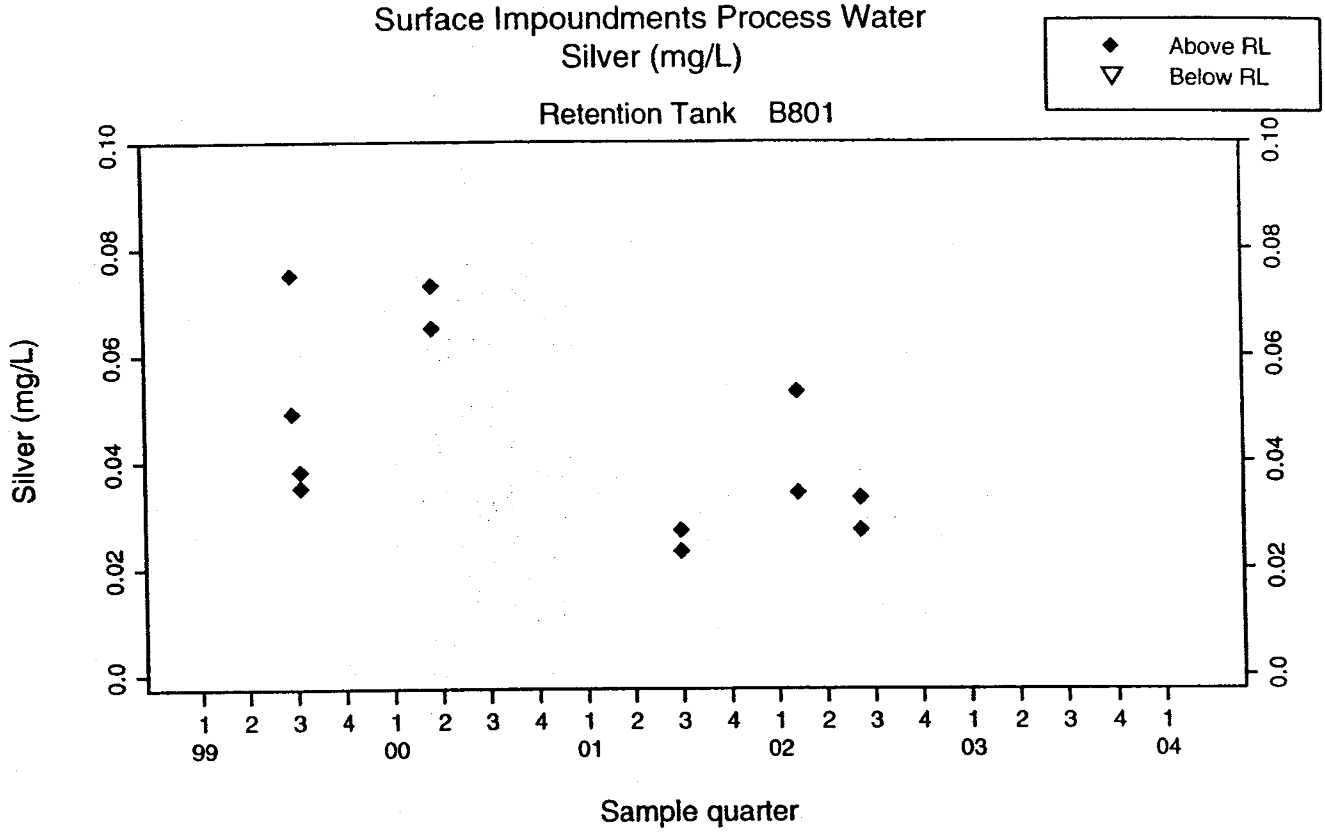




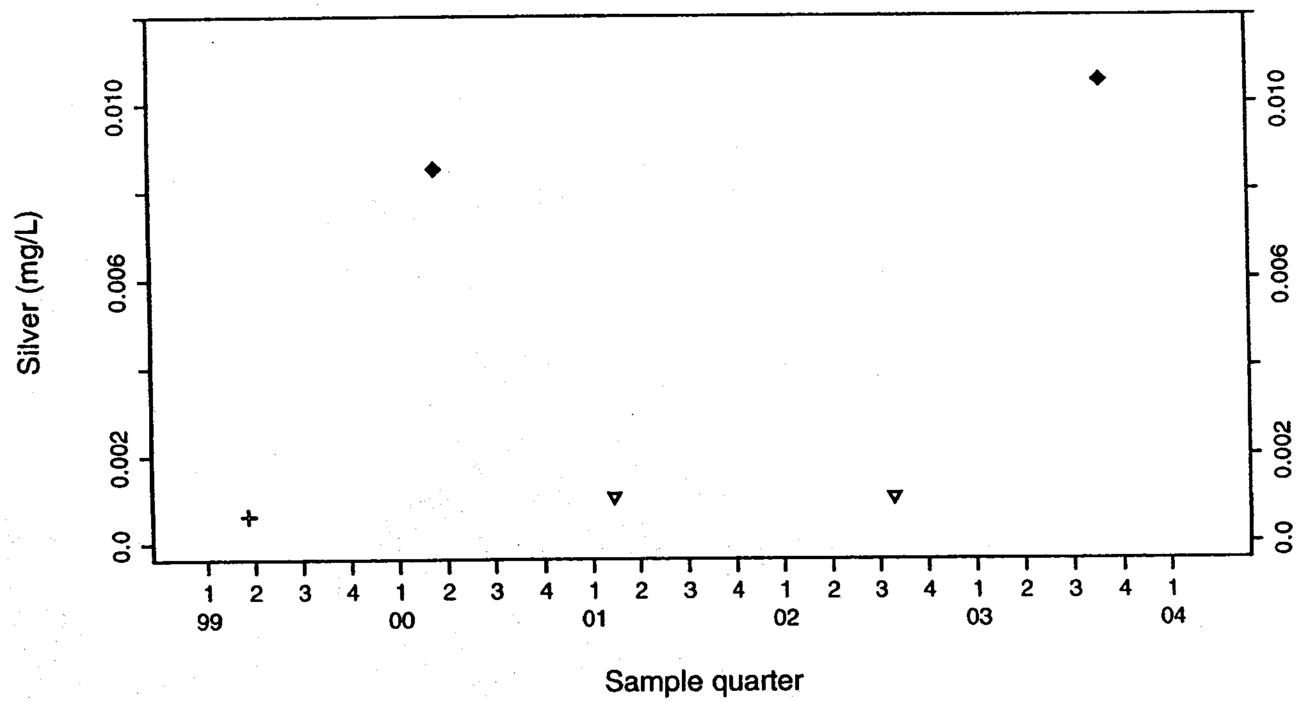

Surface Impoundments Process Water
pH (Units)
Retention Tank B851
Above RL
Below RL
pH (Units)
10
9
8
7
6
5
4
1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1
99
00
01
02
03
04
Sample quarter

Surface Impoundments Process Water
Silver (mg/L)

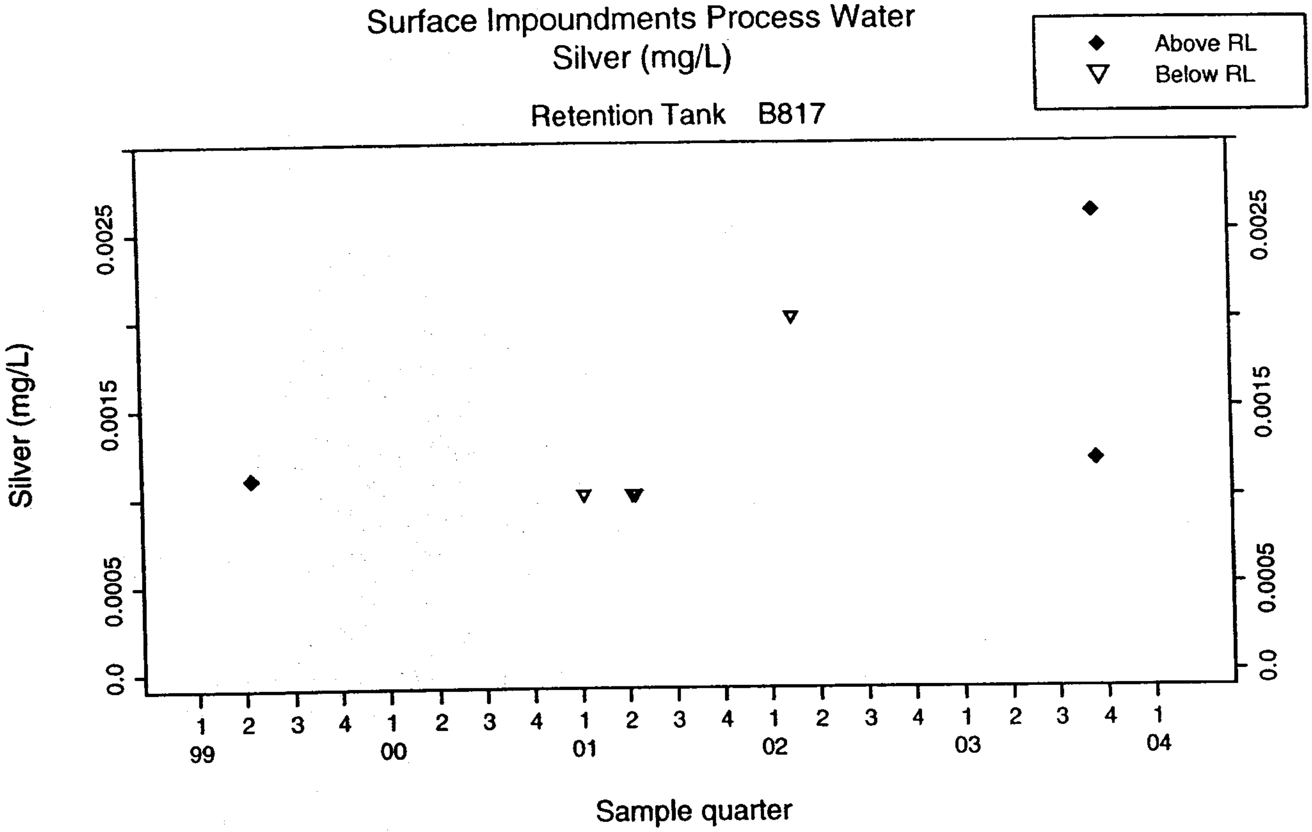
Retention Tank B801

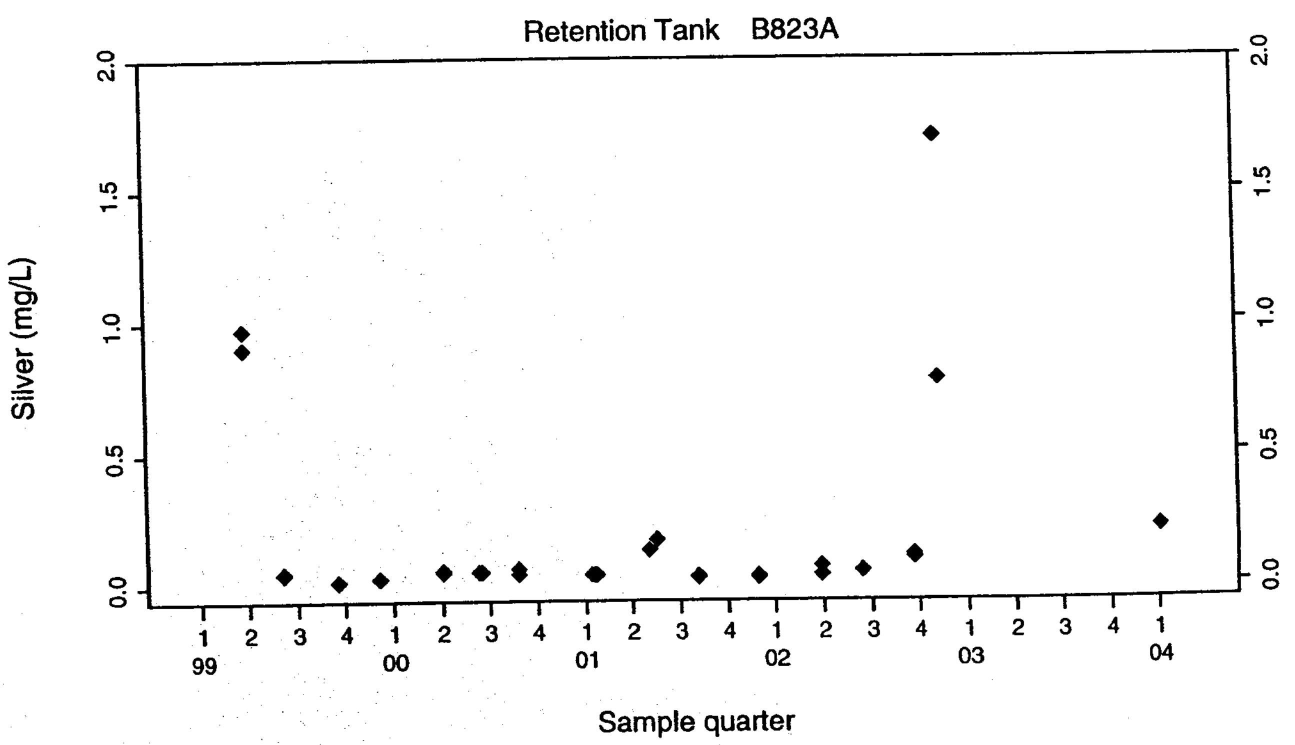


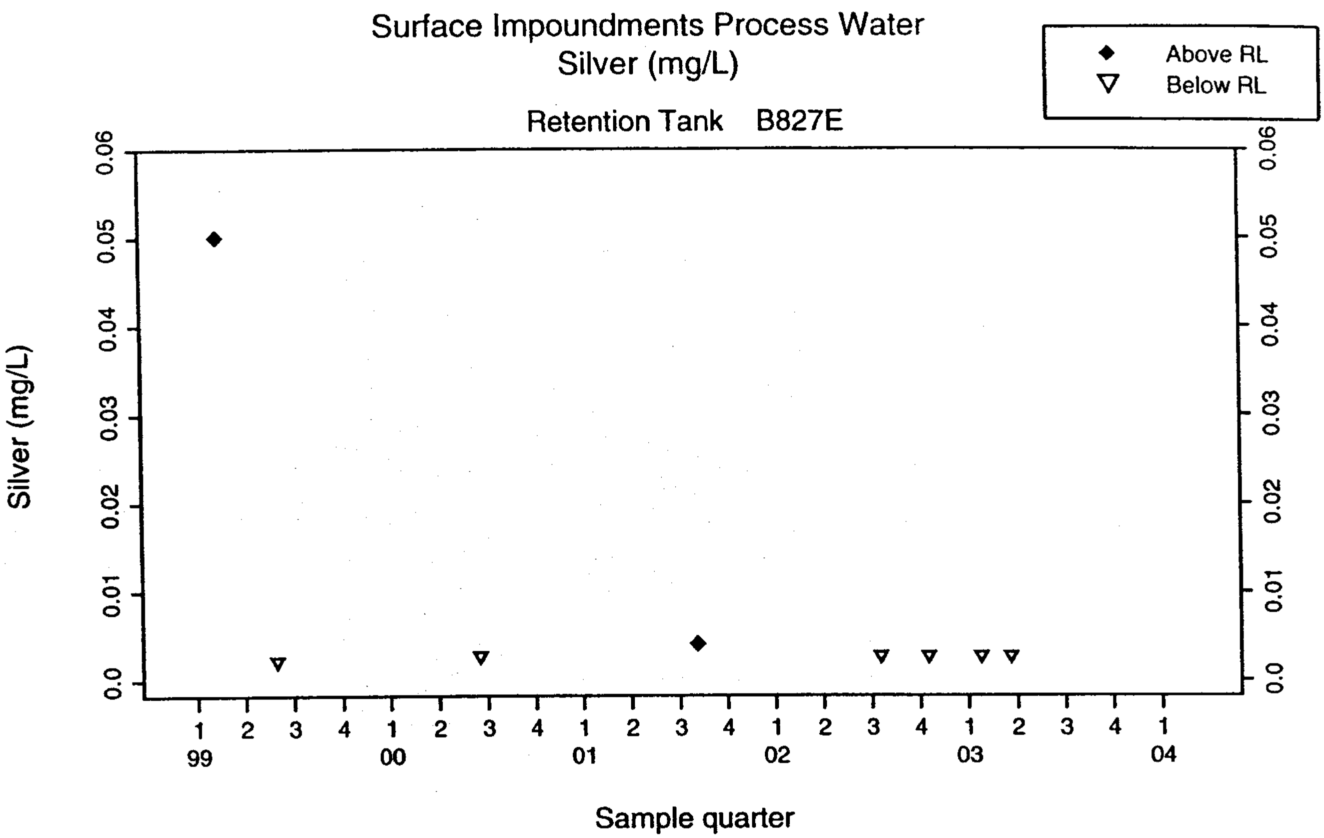
Retention Tank B806/807

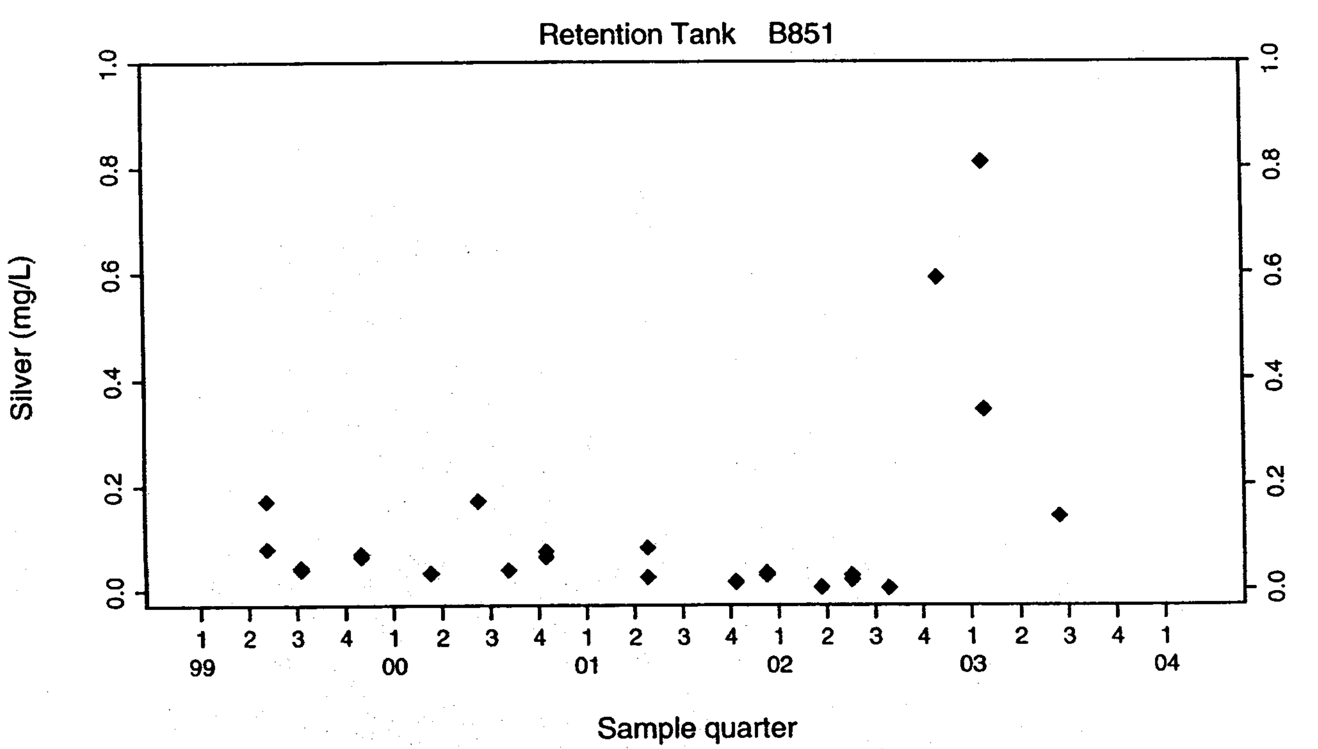


Surface Impoundments Process Water
Silver (mg/L)

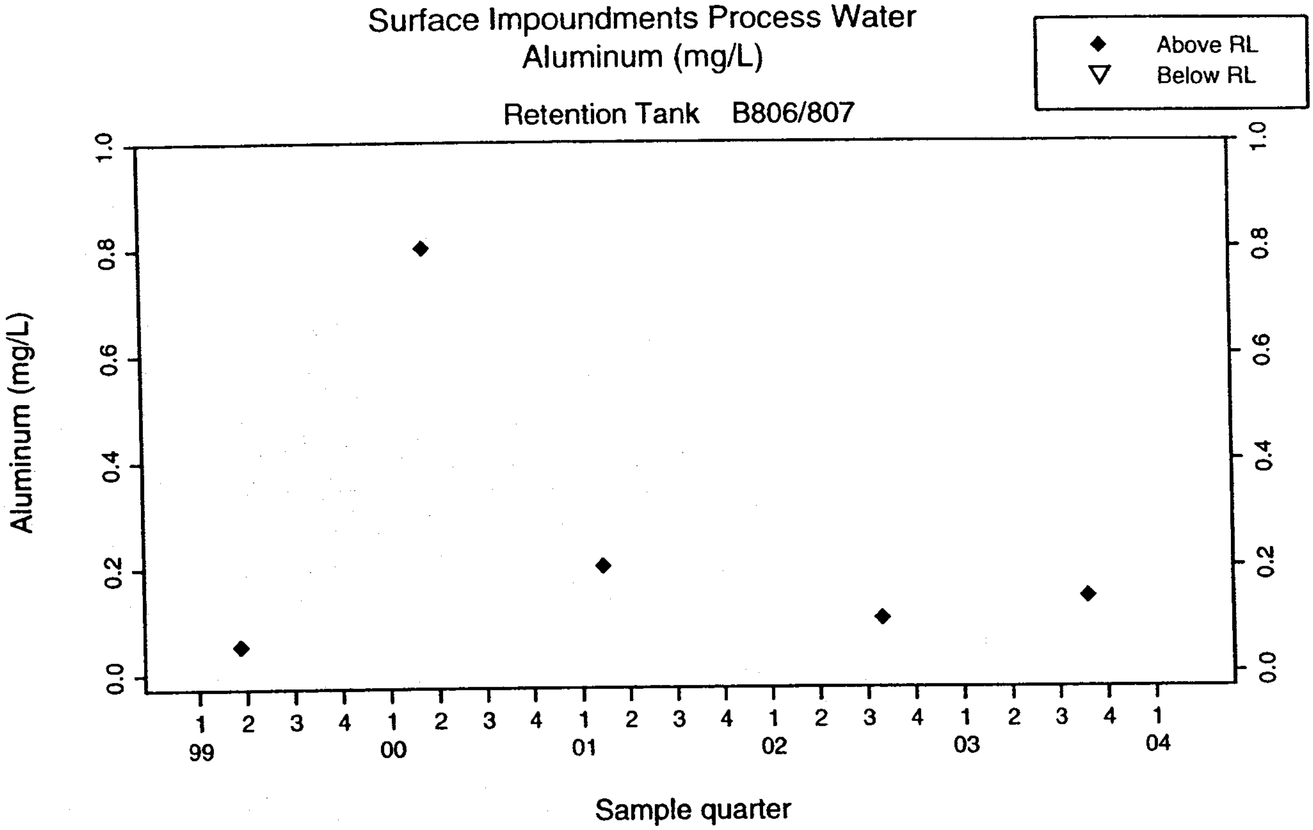


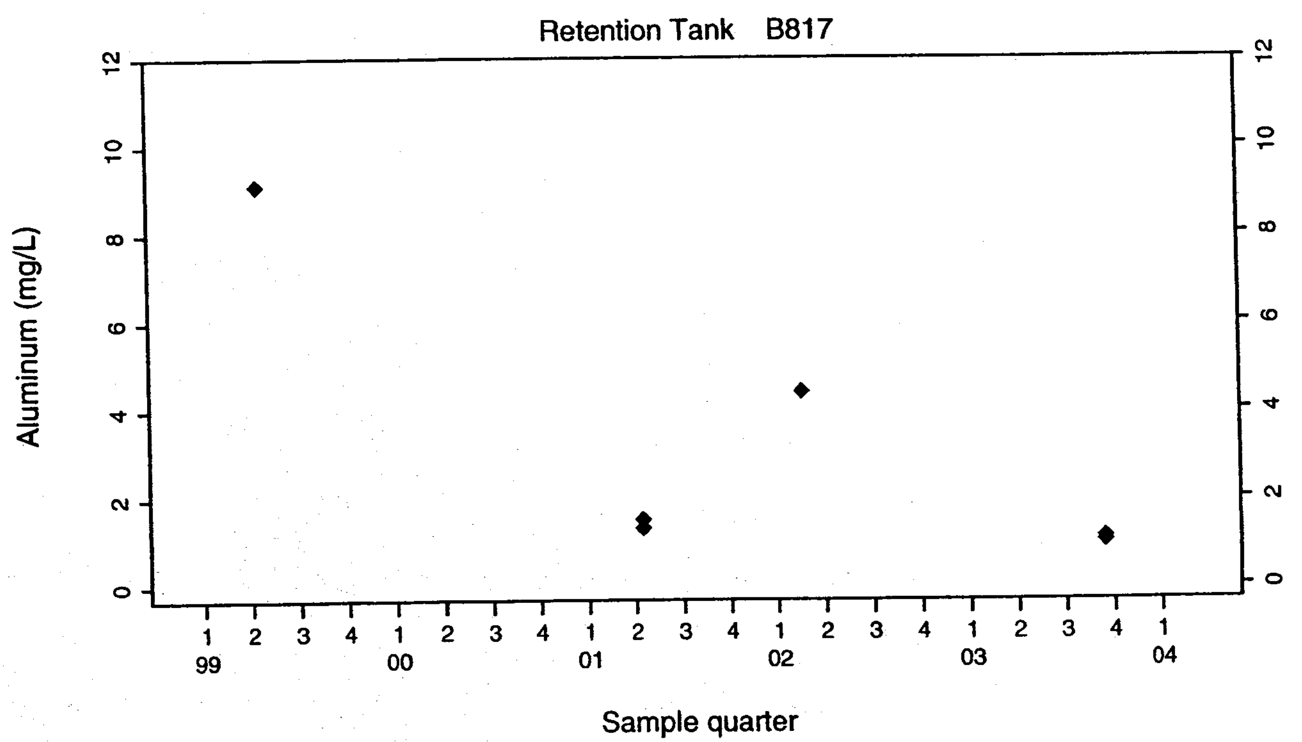



Surface Impoundments Process Water
Silver (mg/L)
Above RL
Below RL
Retention Tank B827E
Silver (mg/L)
0.0
0.01
0.02
0.03
0.04
0.05
0.06
1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1
99 00 01 02 03 04
Sample quarter

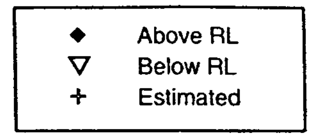

Retention Tank B851
Silver (mg/L)
0.0
0.2
0.4
0.6
0.8
1.0
1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1
99 00 01 02 03 04
Sample quarter

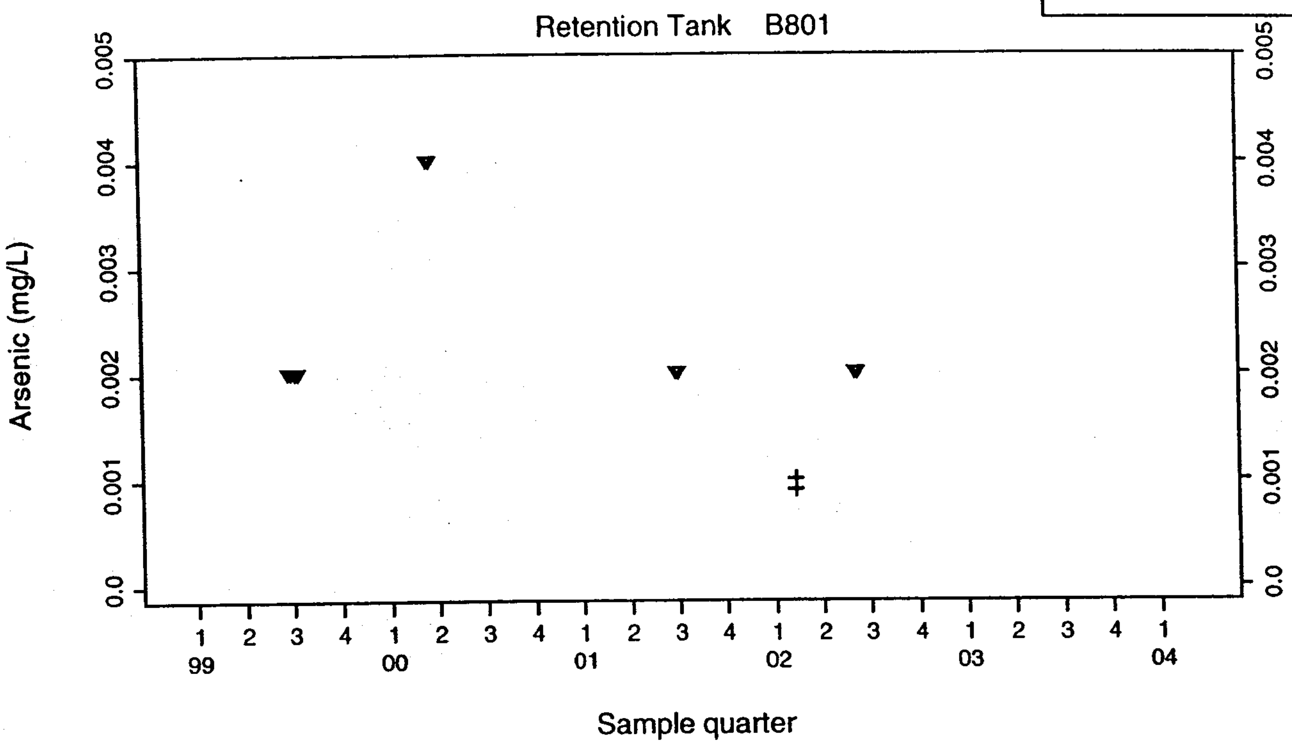
Surface Impoundments Process Water
Aluminum (mg/L)

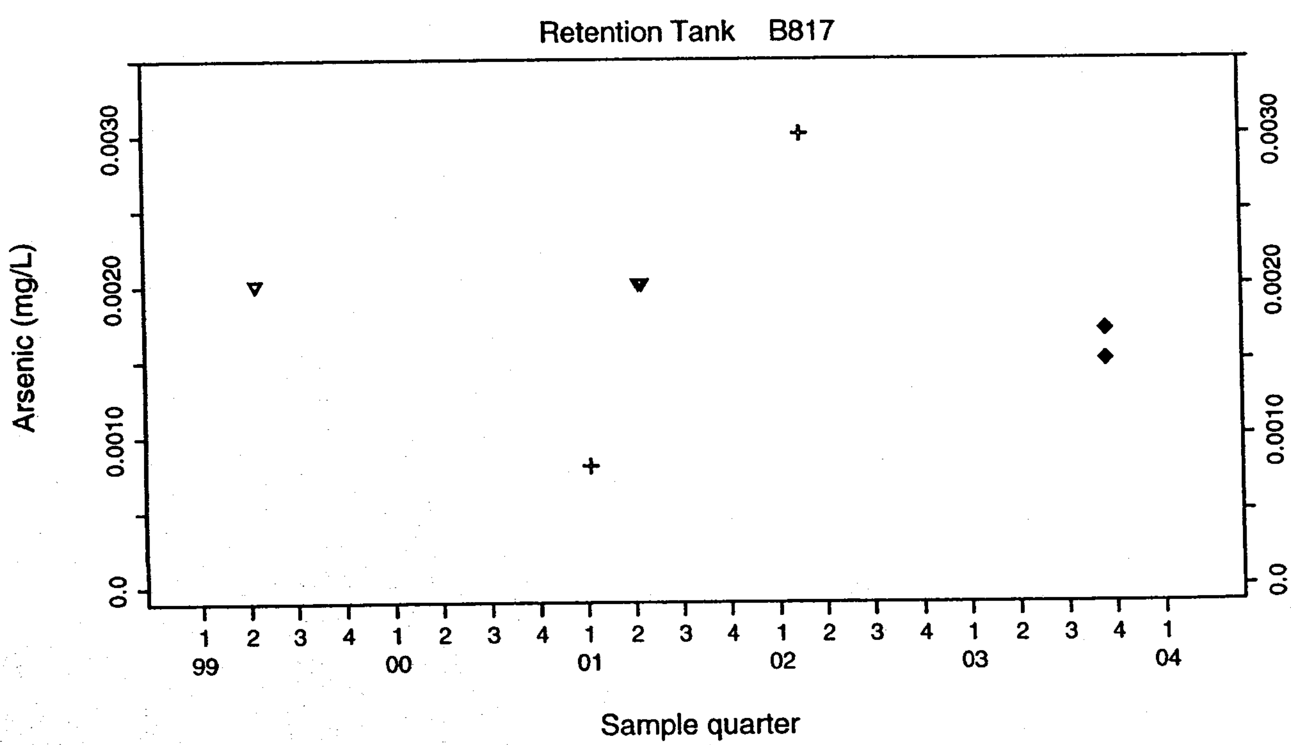




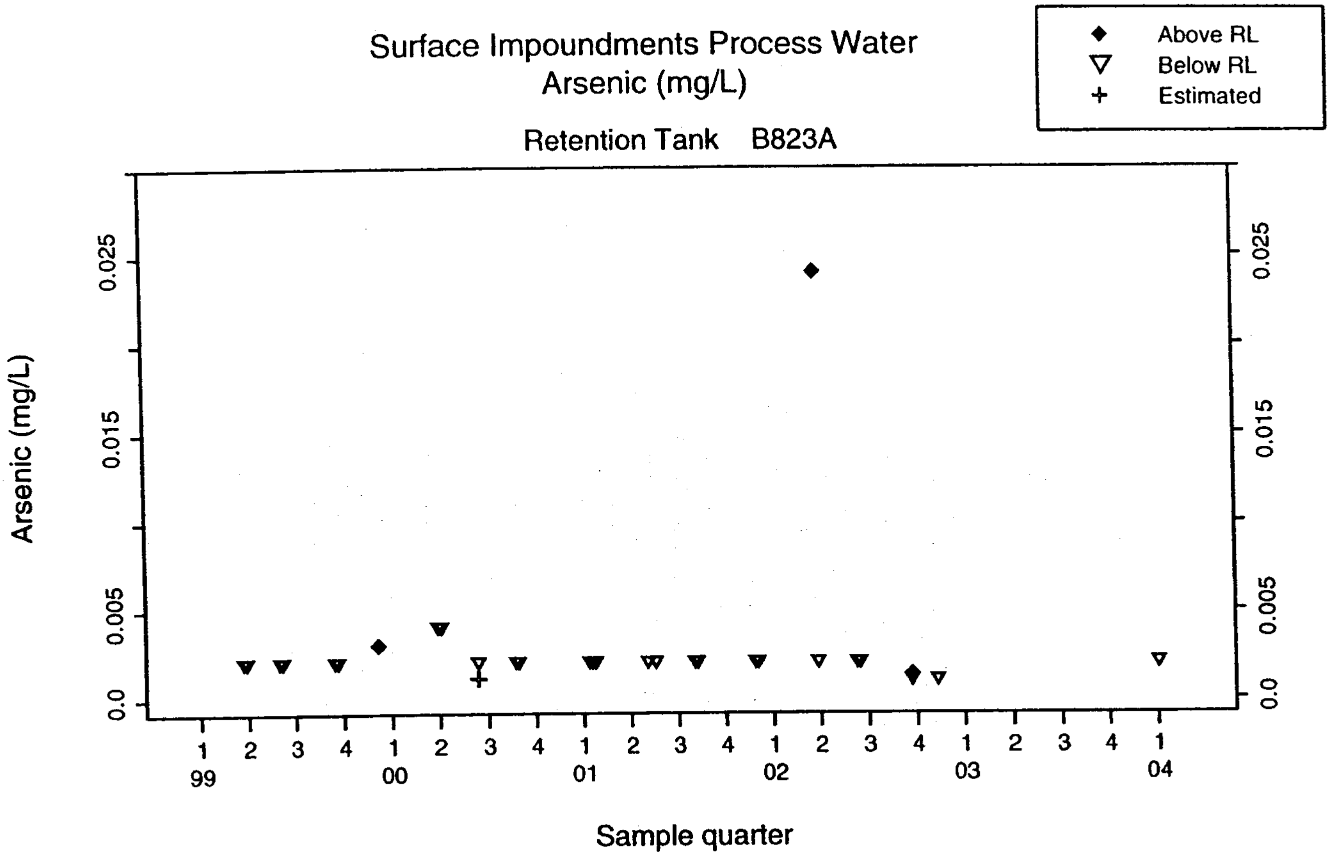
Surface Impoundments Process Water
Arsenic (mg/L)

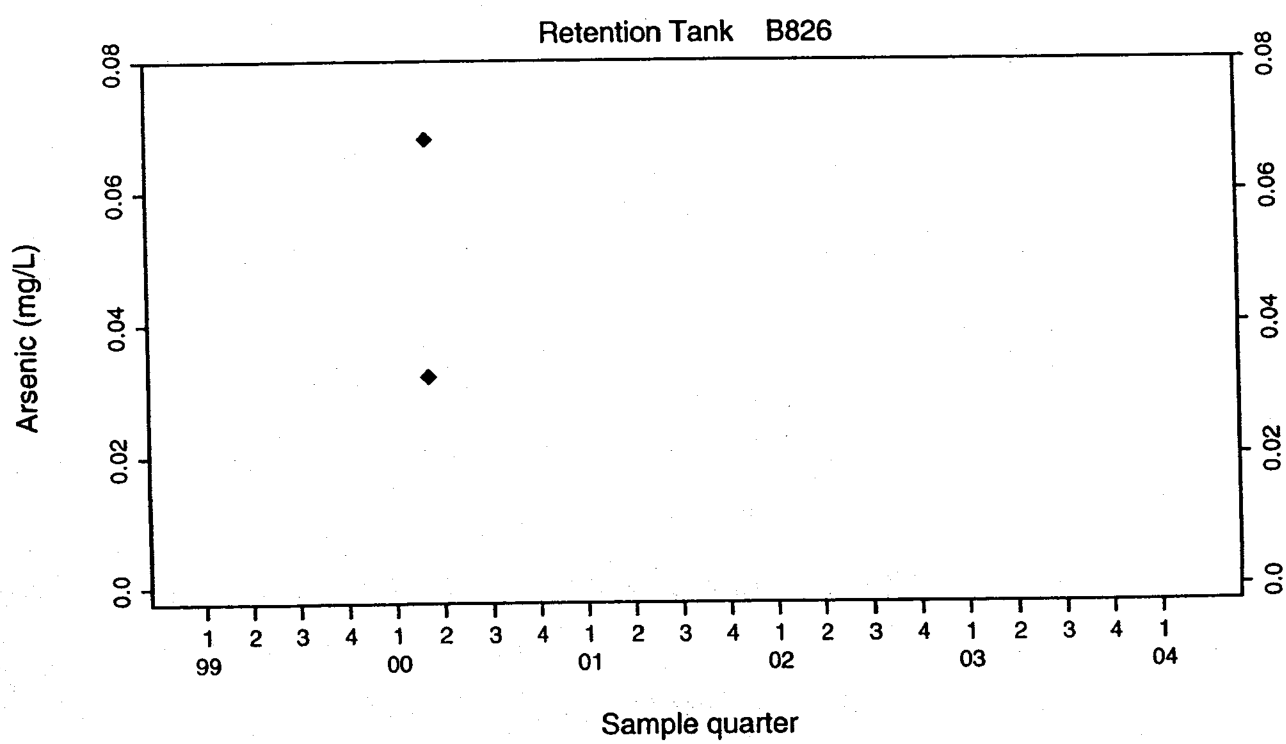




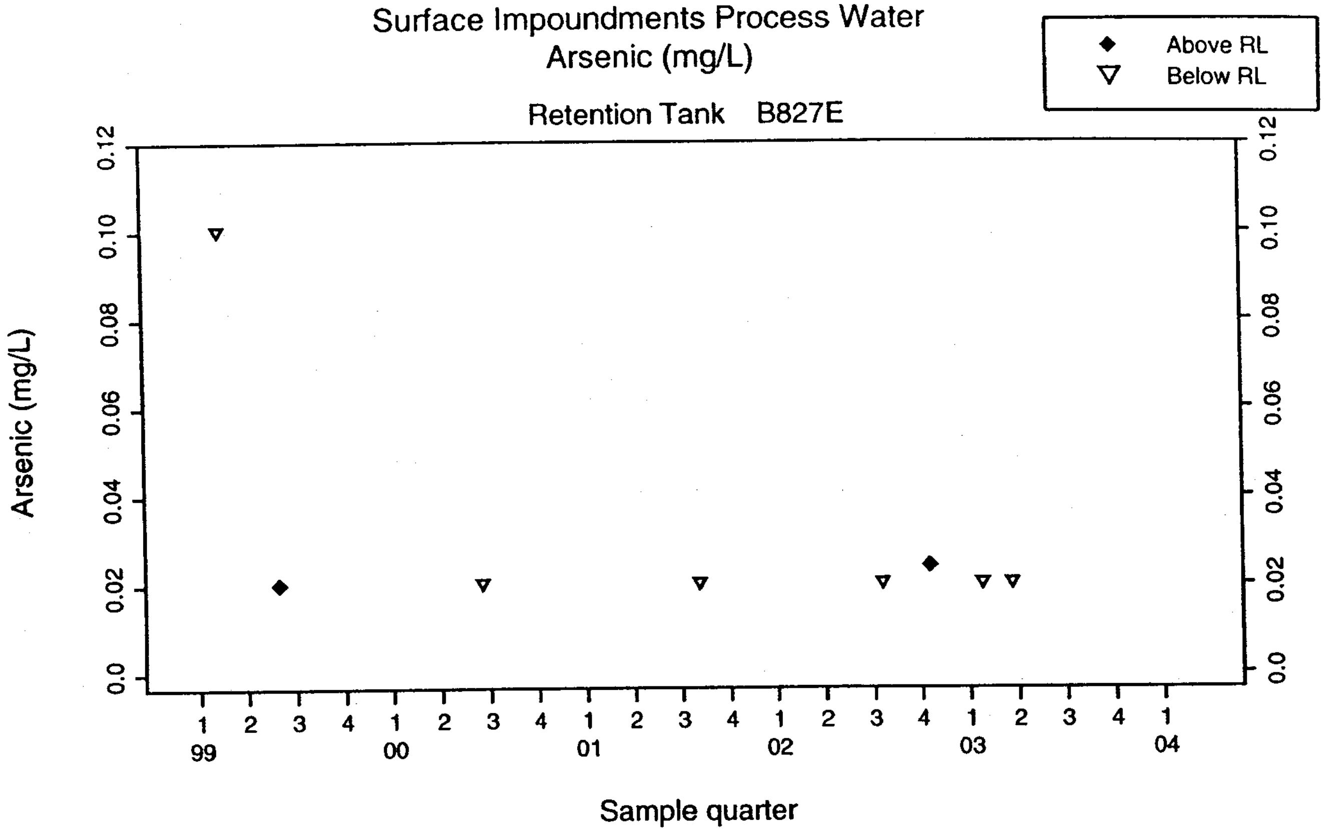


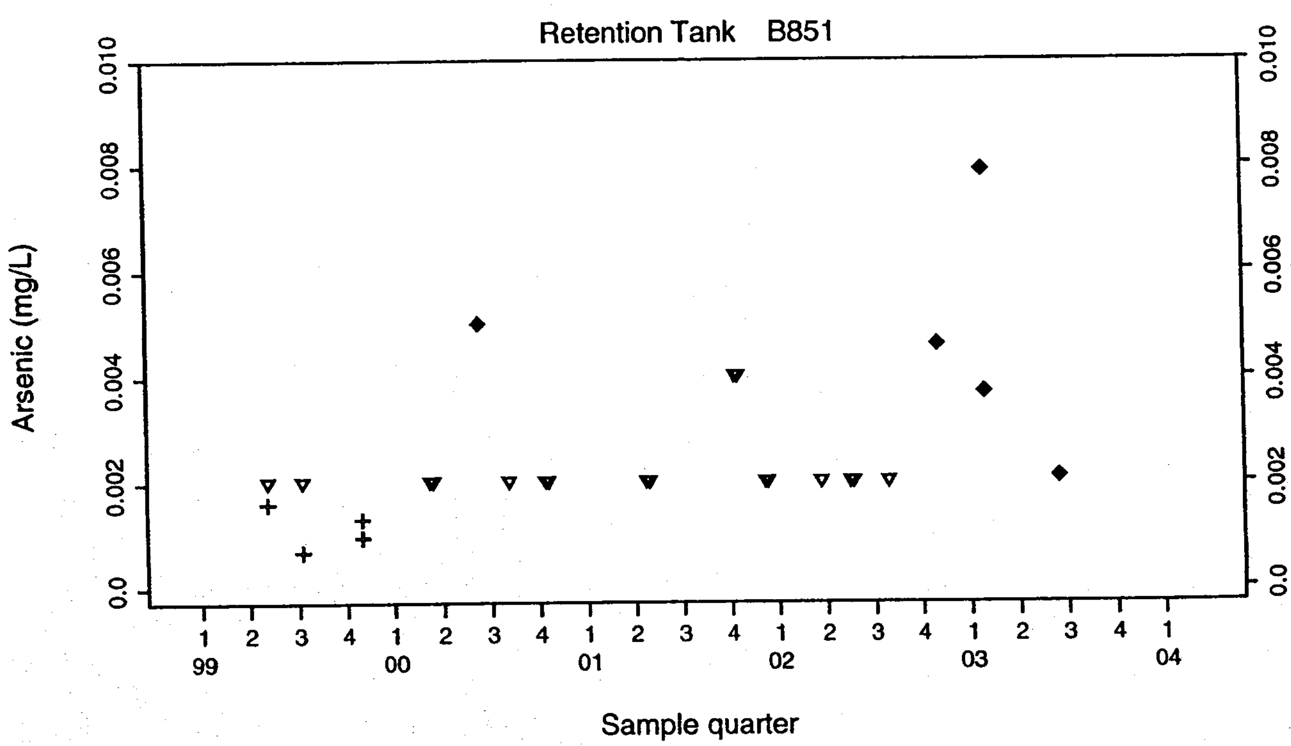
Surface Impoundments Process Water
Arsenic (mg/L)





Surface Impoundments Process Water
Arsenic (mg/L)

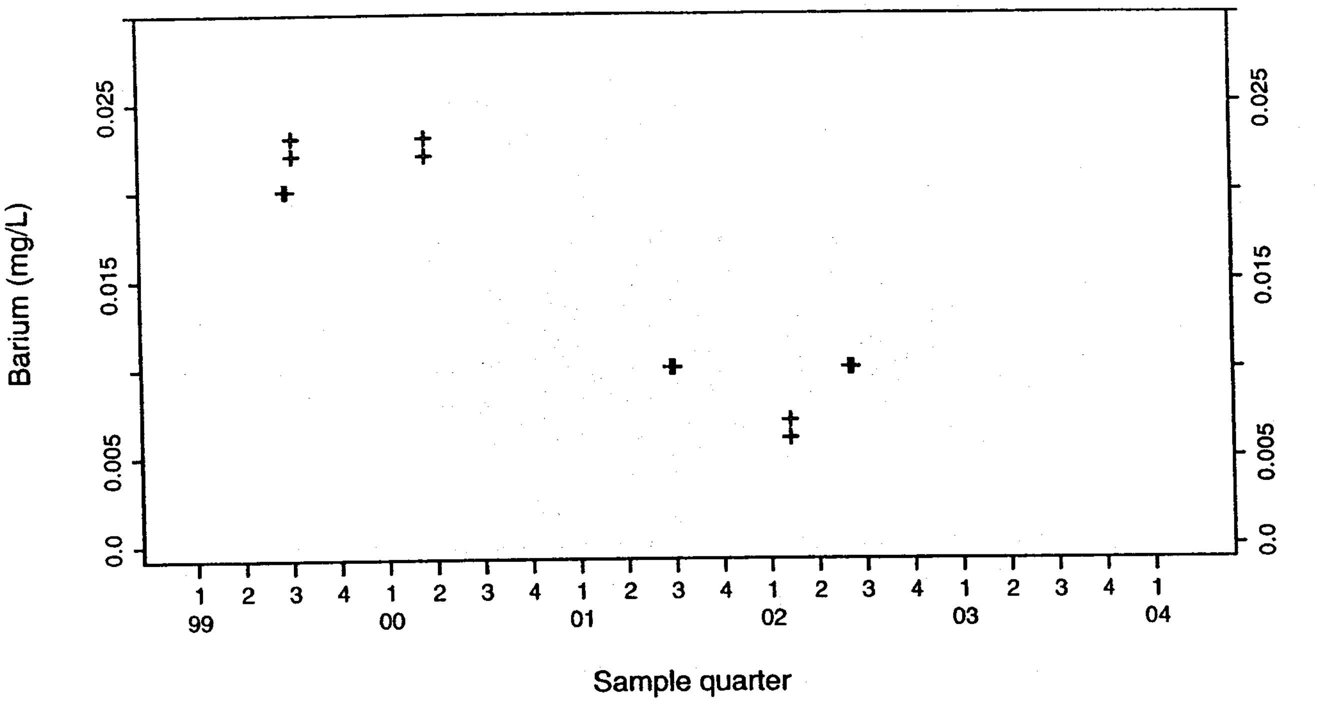




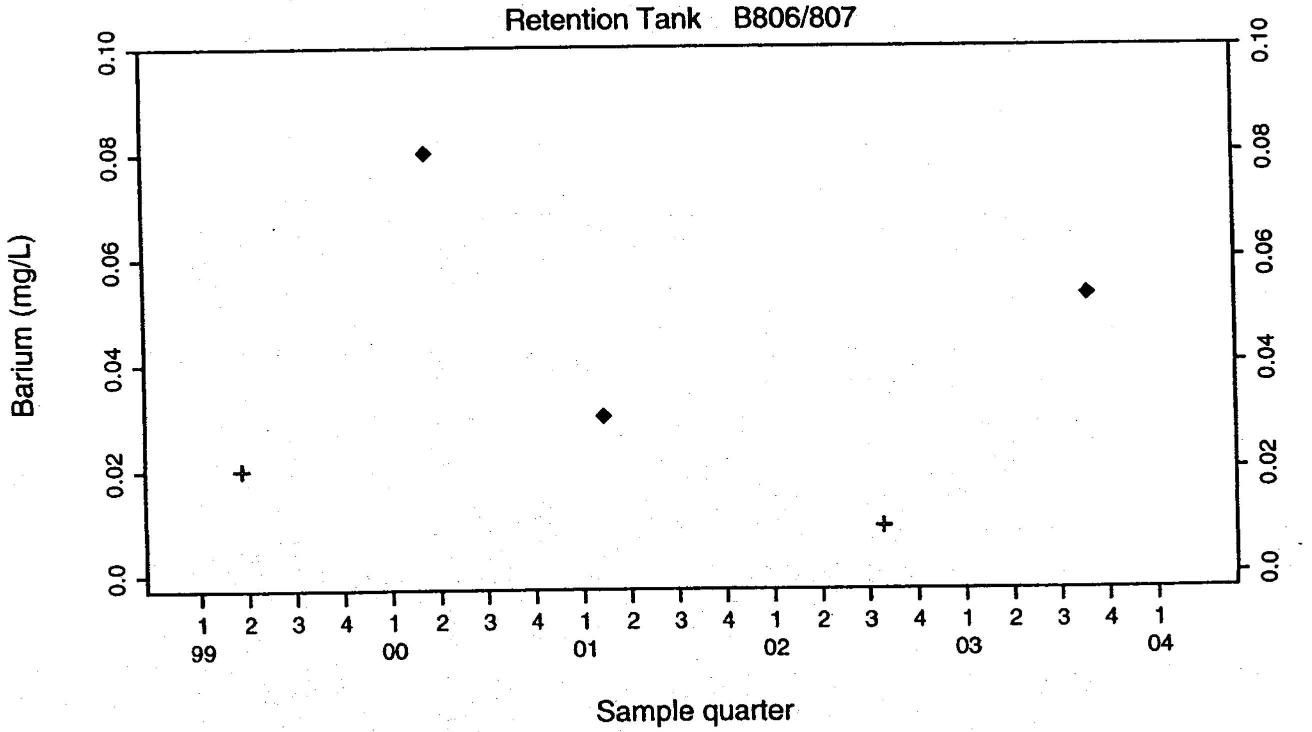
Surface Impoundments Process Water
Barium (mg/L)

◆ Above RL
+ Estimated

Retention Tank B801

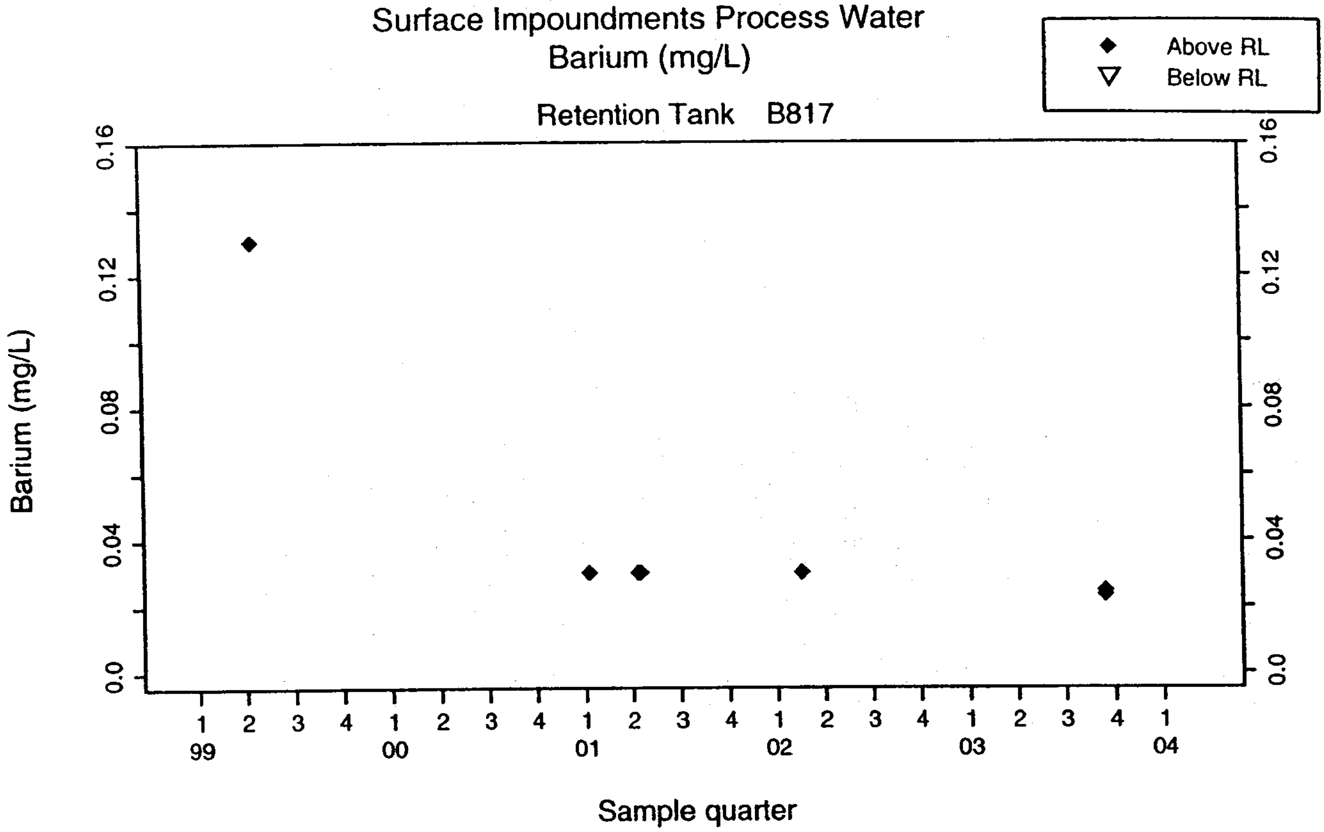


Retention Tank B806/807

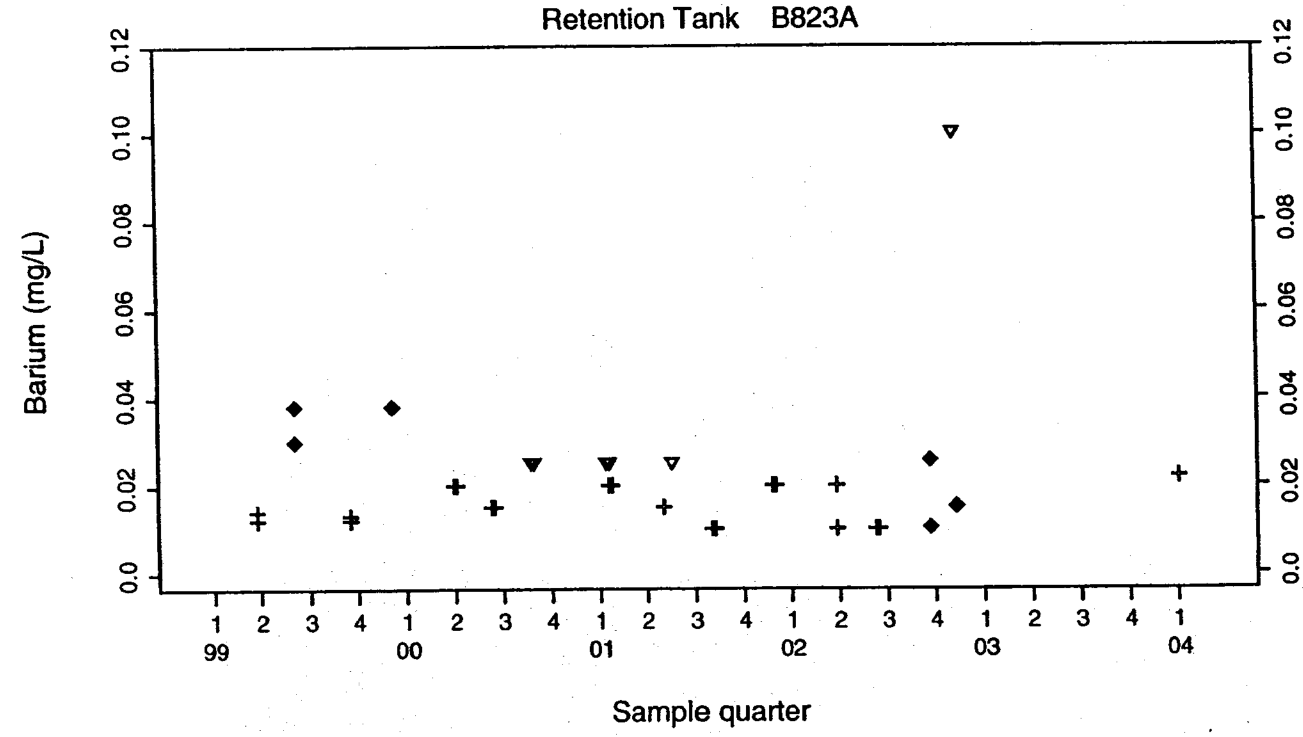


Surface Impoundments Process Water
Barium (mg/L)

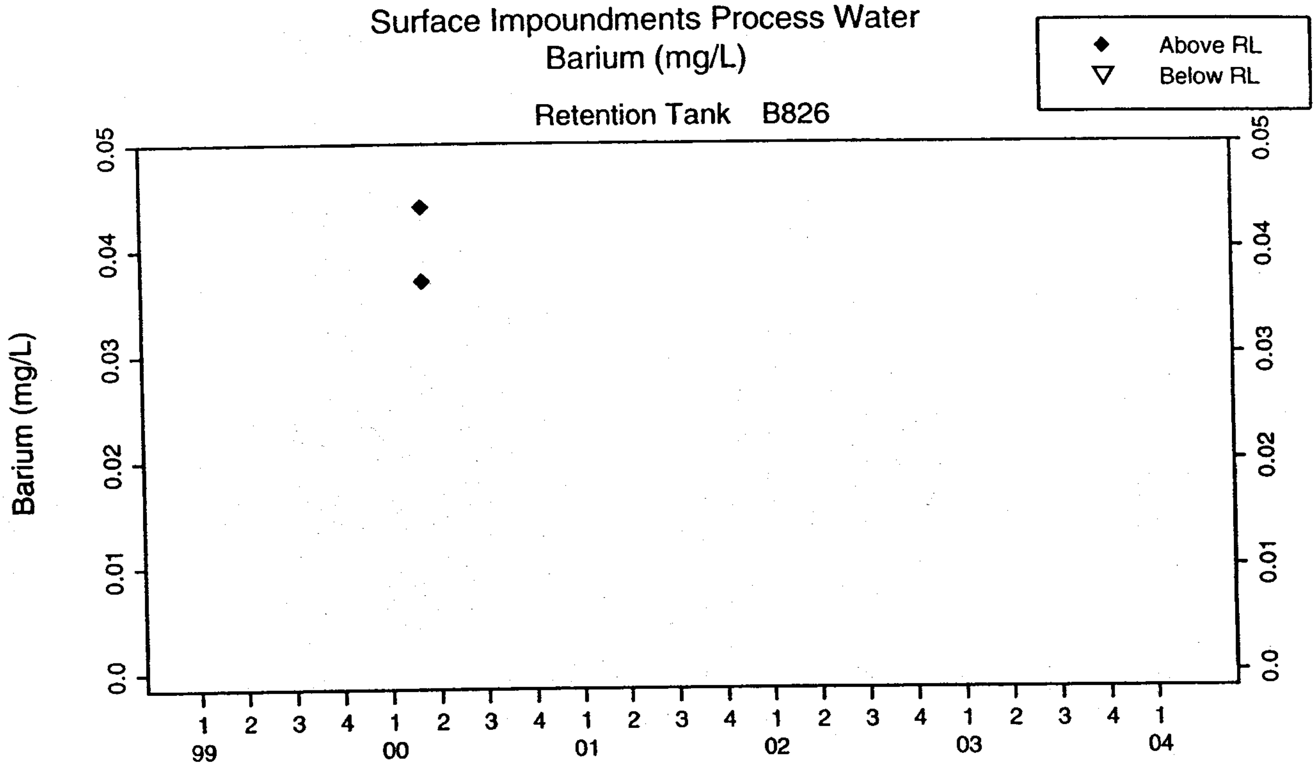
Retention Tank B817

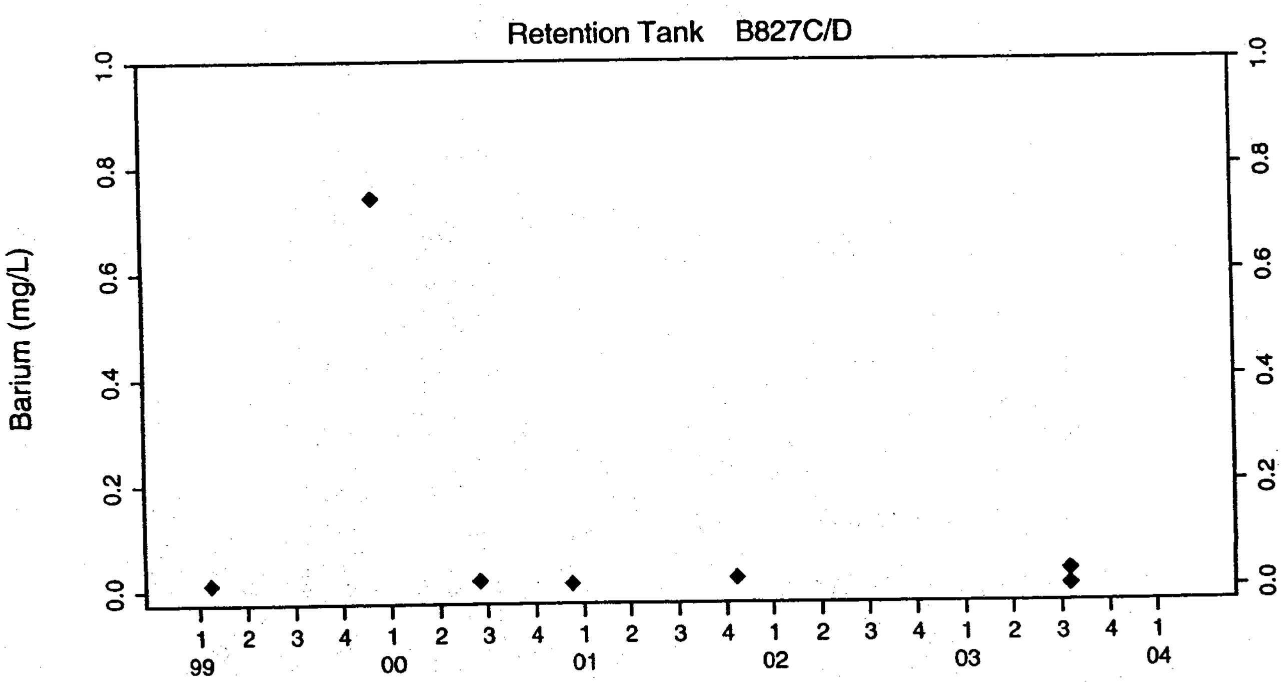


Retention Tank B823A

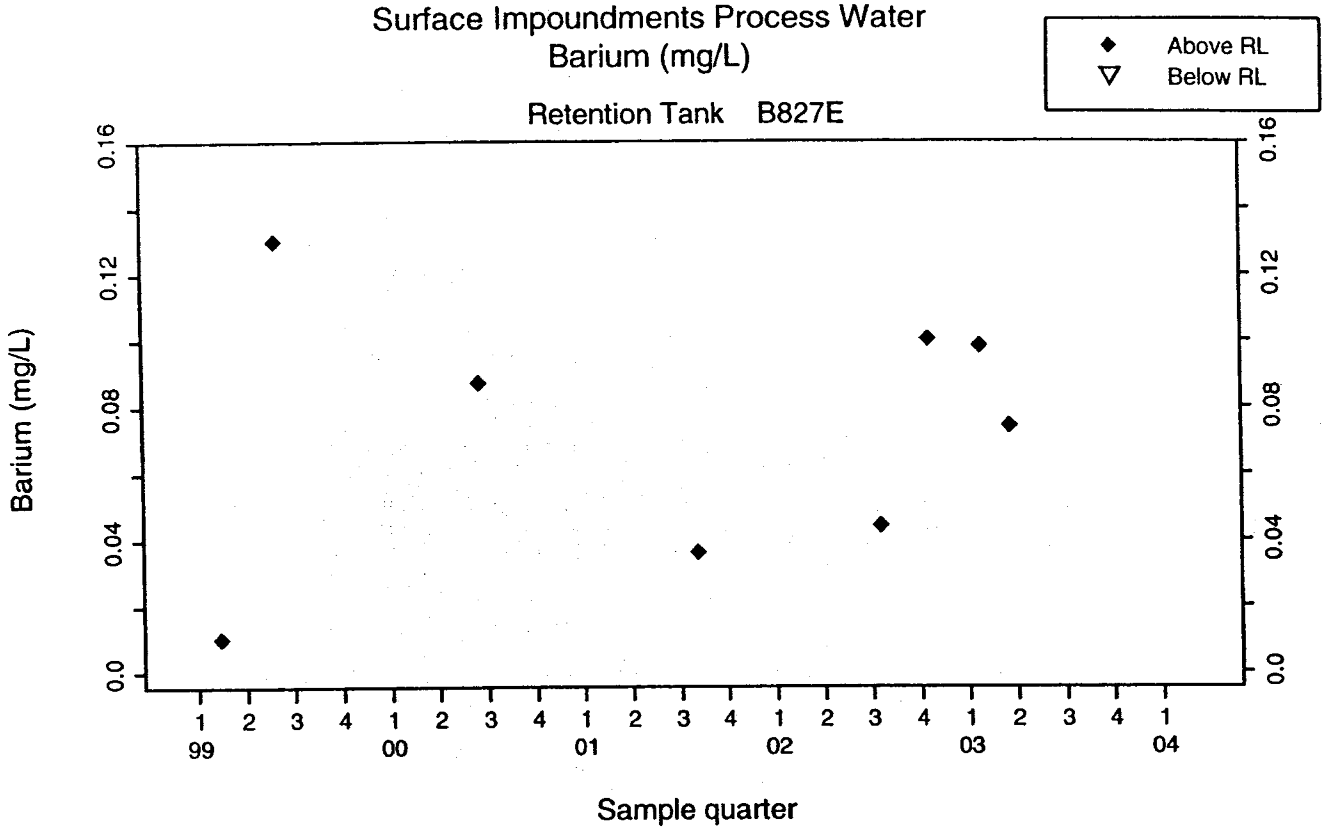


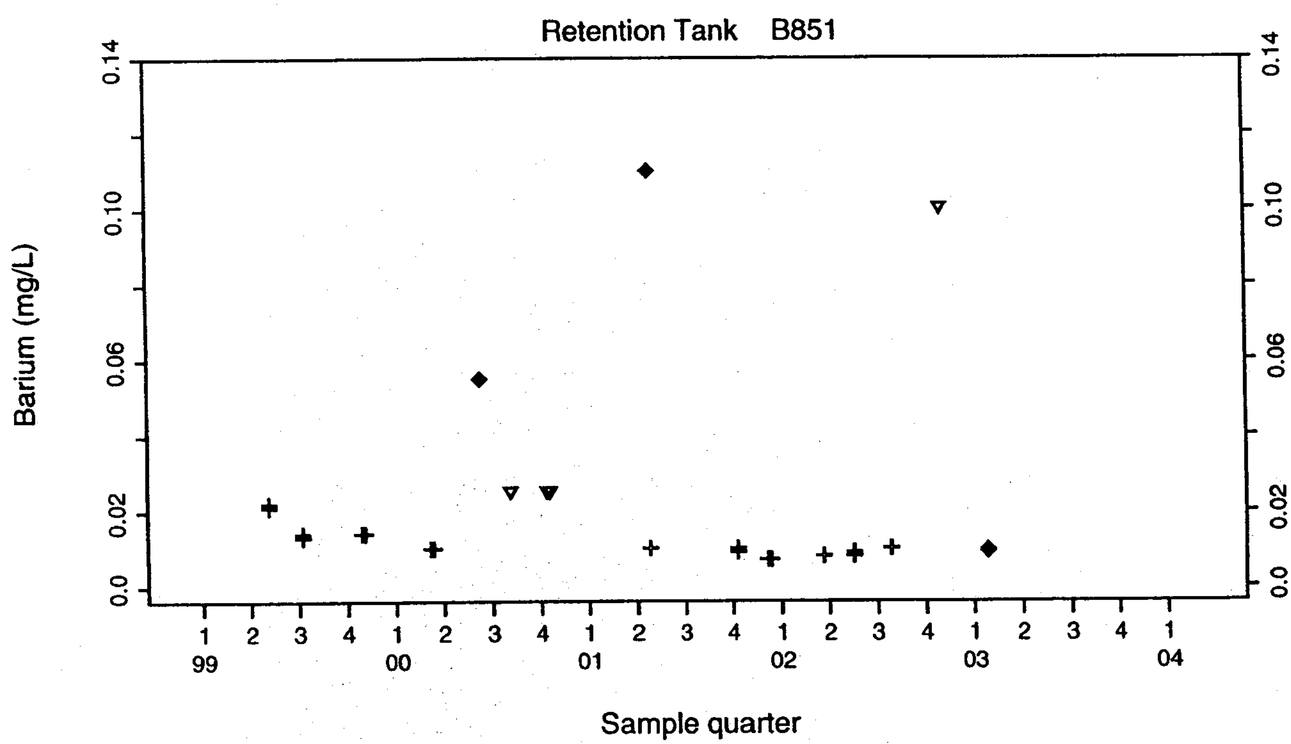
Surface Impoundments Process Water
Barium (mg/L)



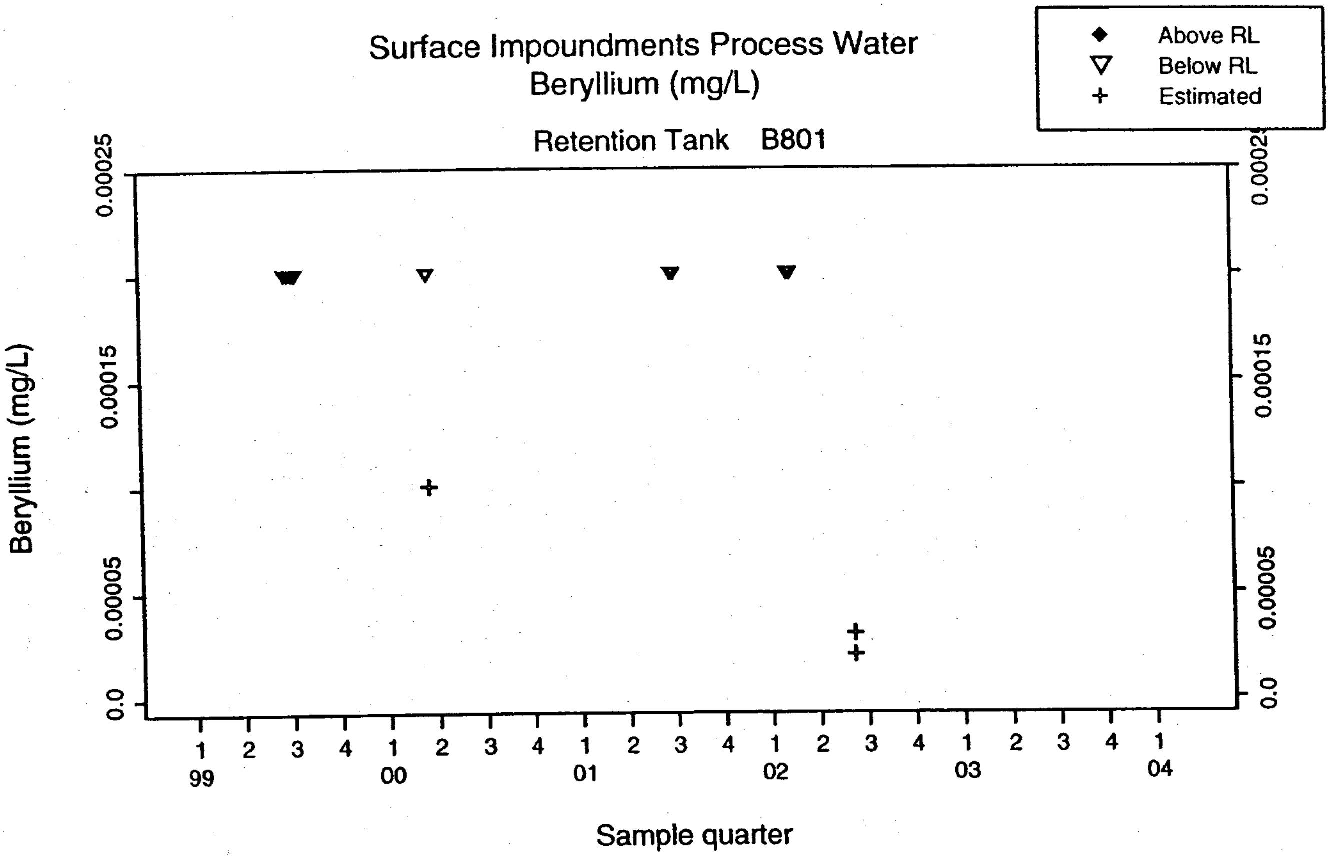


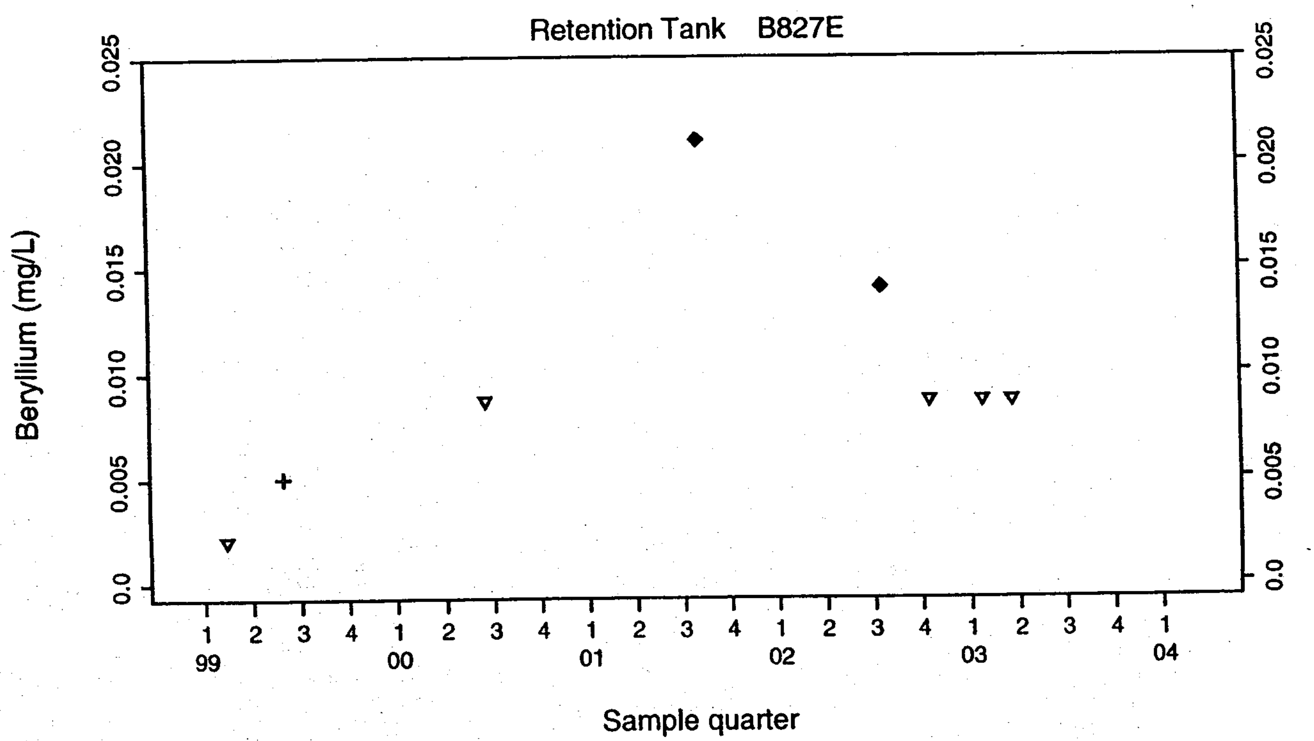
Surface Impoundments Process Water
Barium (mg/L)

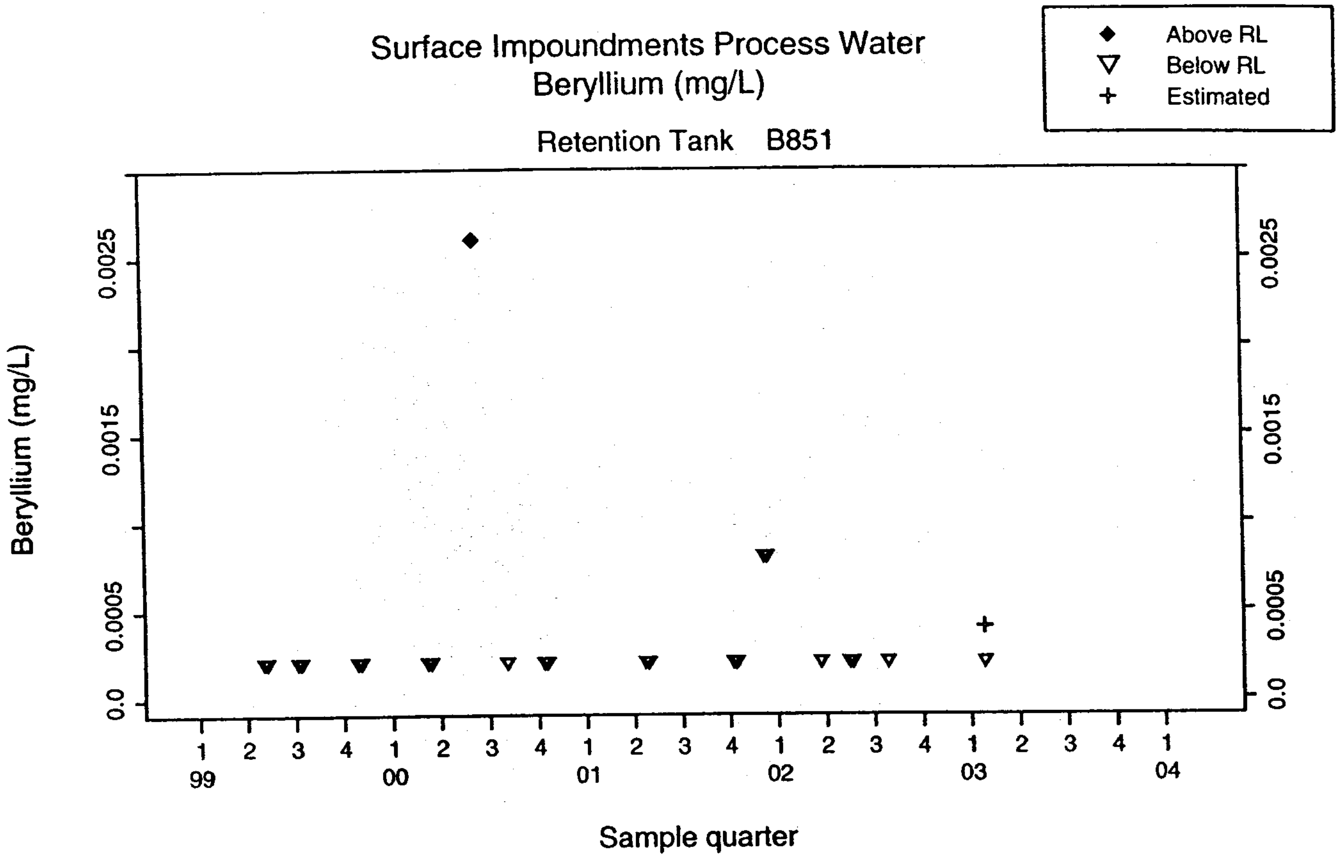


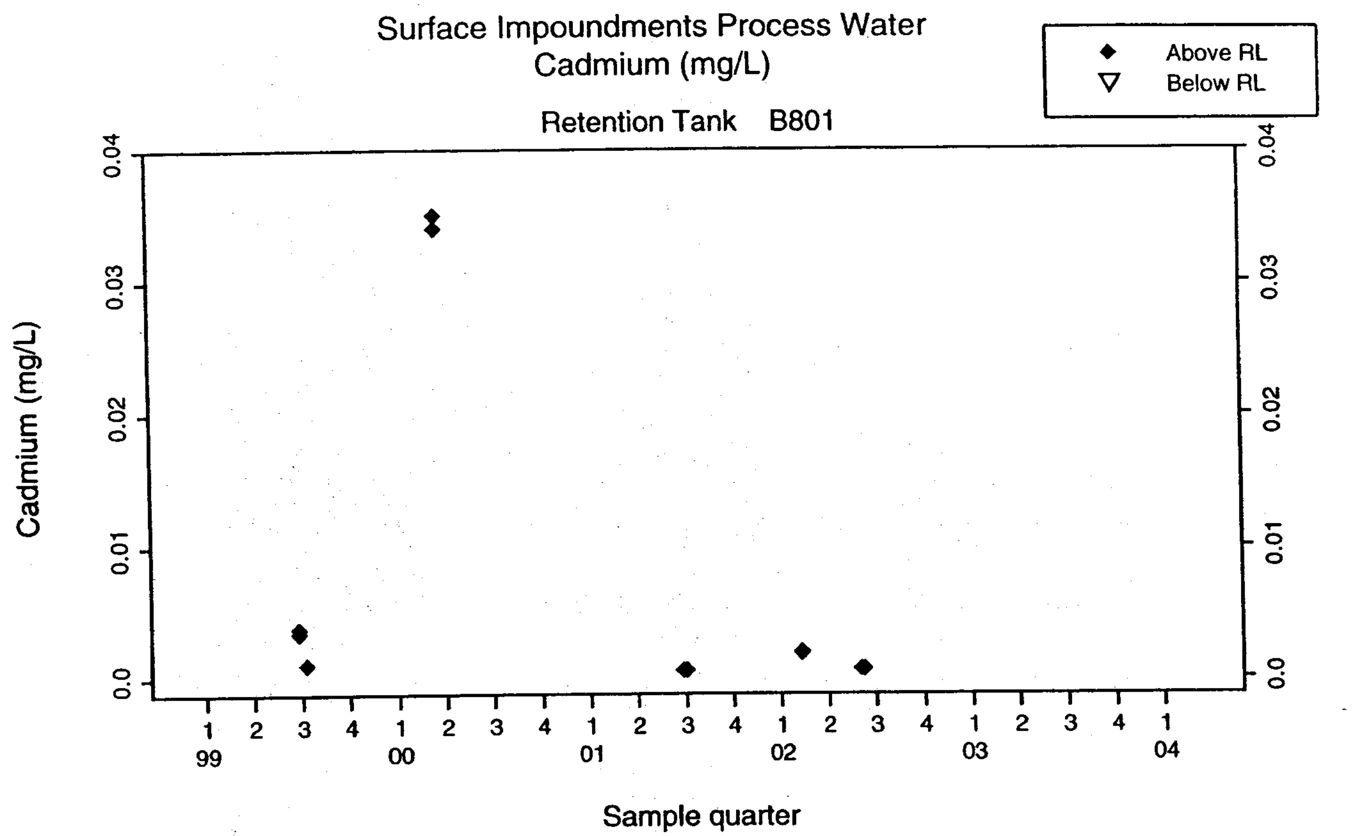


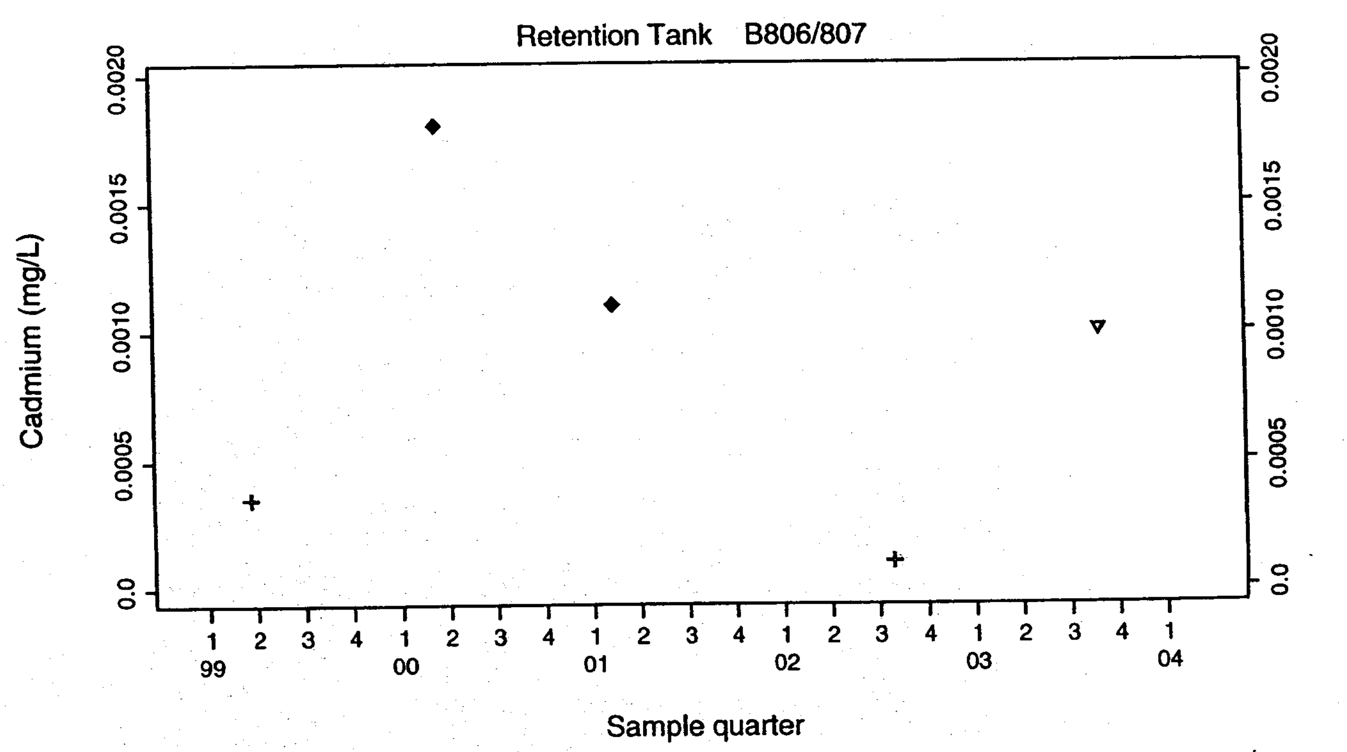
Surface Impoundments Process Water
Beryllium (mg/L)





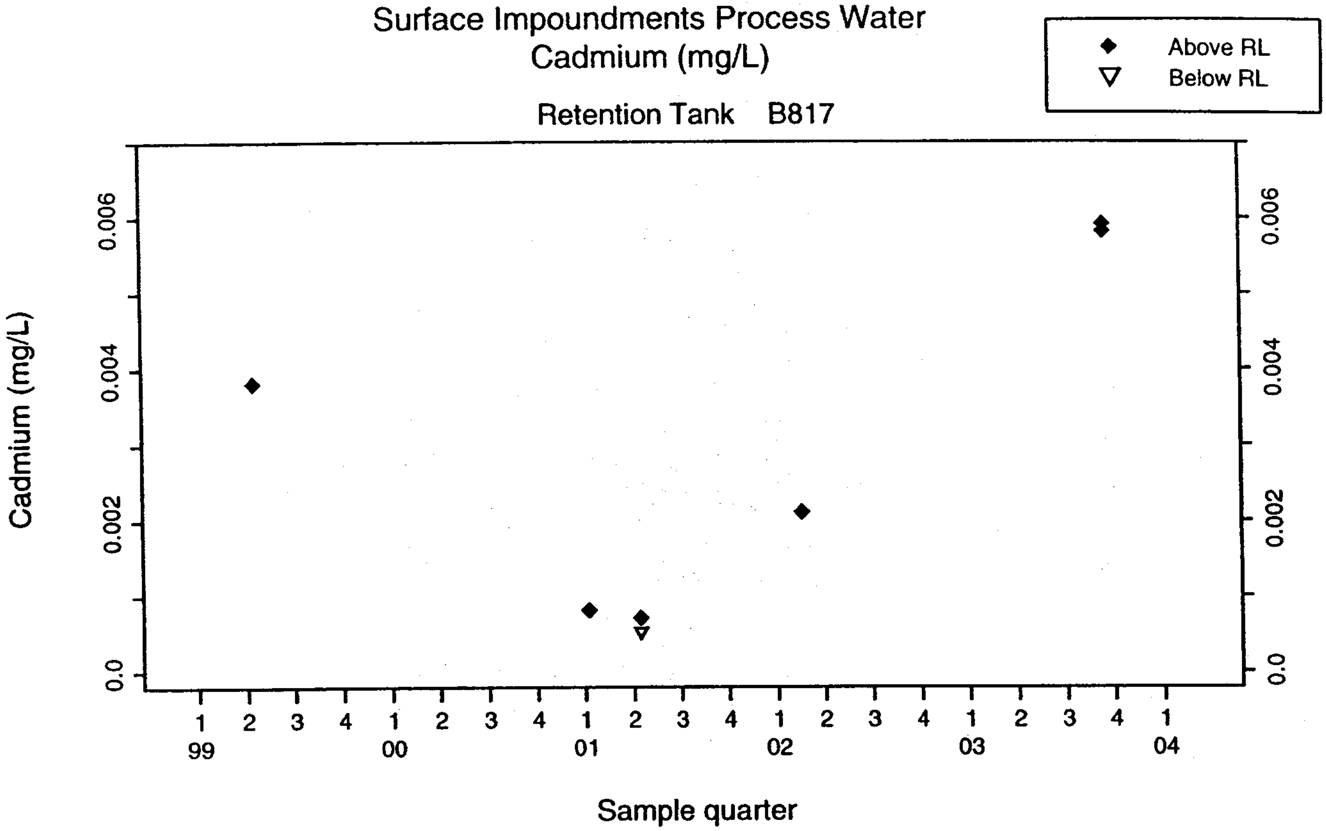

Surface Impoundments Process Water
Beryllium (mg/L)
Retention Tank B851
Above RL
Below RL
Estimated
Beryllium (mg/L)
0.0
0.0005
0.0015
0.0025
1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1
99 00 01 02 03 04
Sample quarter


Surface Impoundments Process Water
Cadmium (mg/L)
Above RL
Below RL
Retention Tank B801
Cadmium (mg/L)
0.0
0.01
0.02
0.03
0.04
1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1
99
00
01
02
03
04
Sample quarter

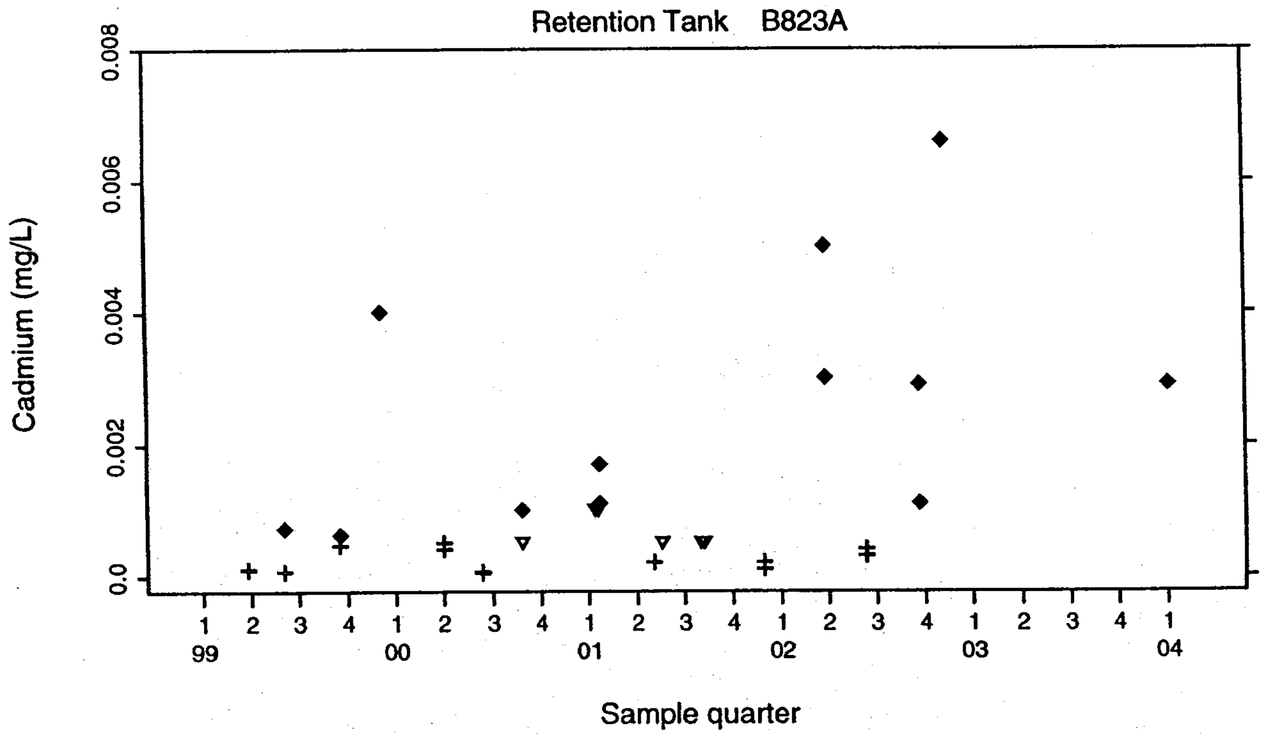

Retention Tank B806/807
Cadmium (mg/L)
0.0
0.0005
0.0010
0.0015
0.0020
1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1
99
00
01
02
03
04
Sample quarter

Surface Impoundments Process Water
Cadmium (mg/L)

Retention Tank B817



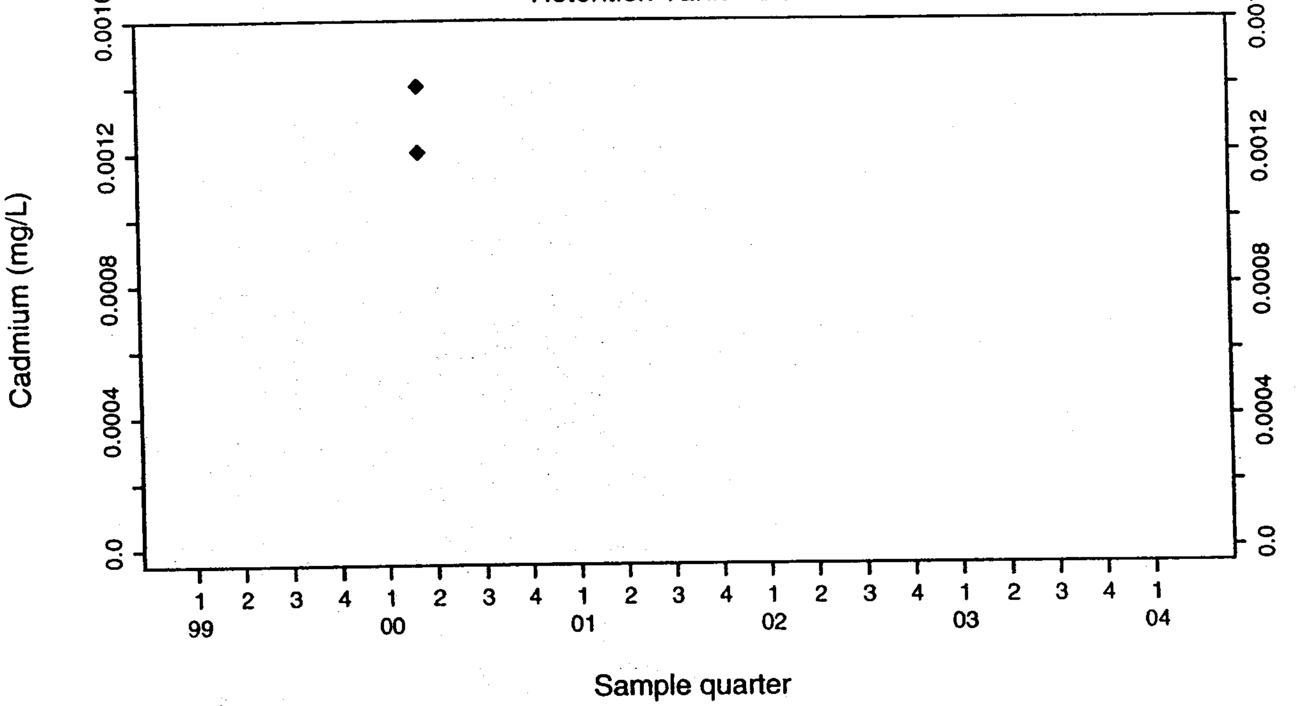
Retention Tank B823A



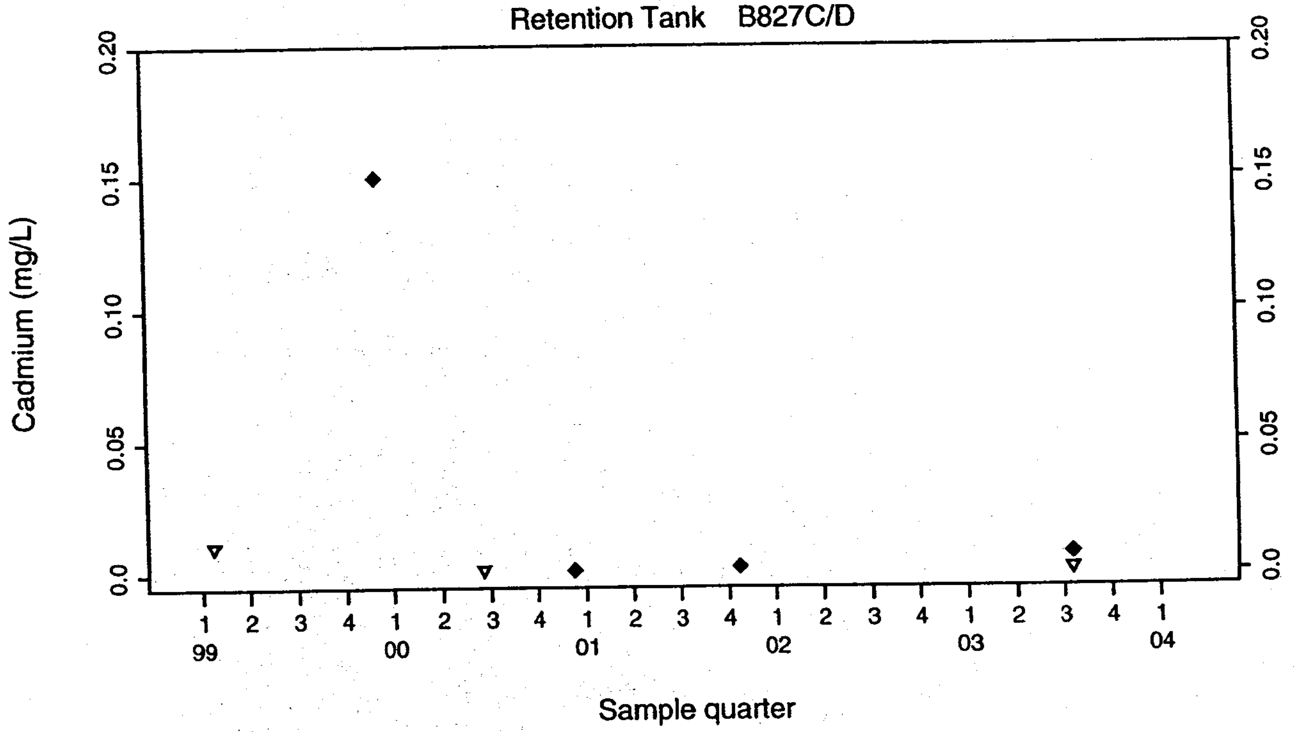
Surface Impoundments Process Water
Cadmium (mg/L)

Above RL
Below RL

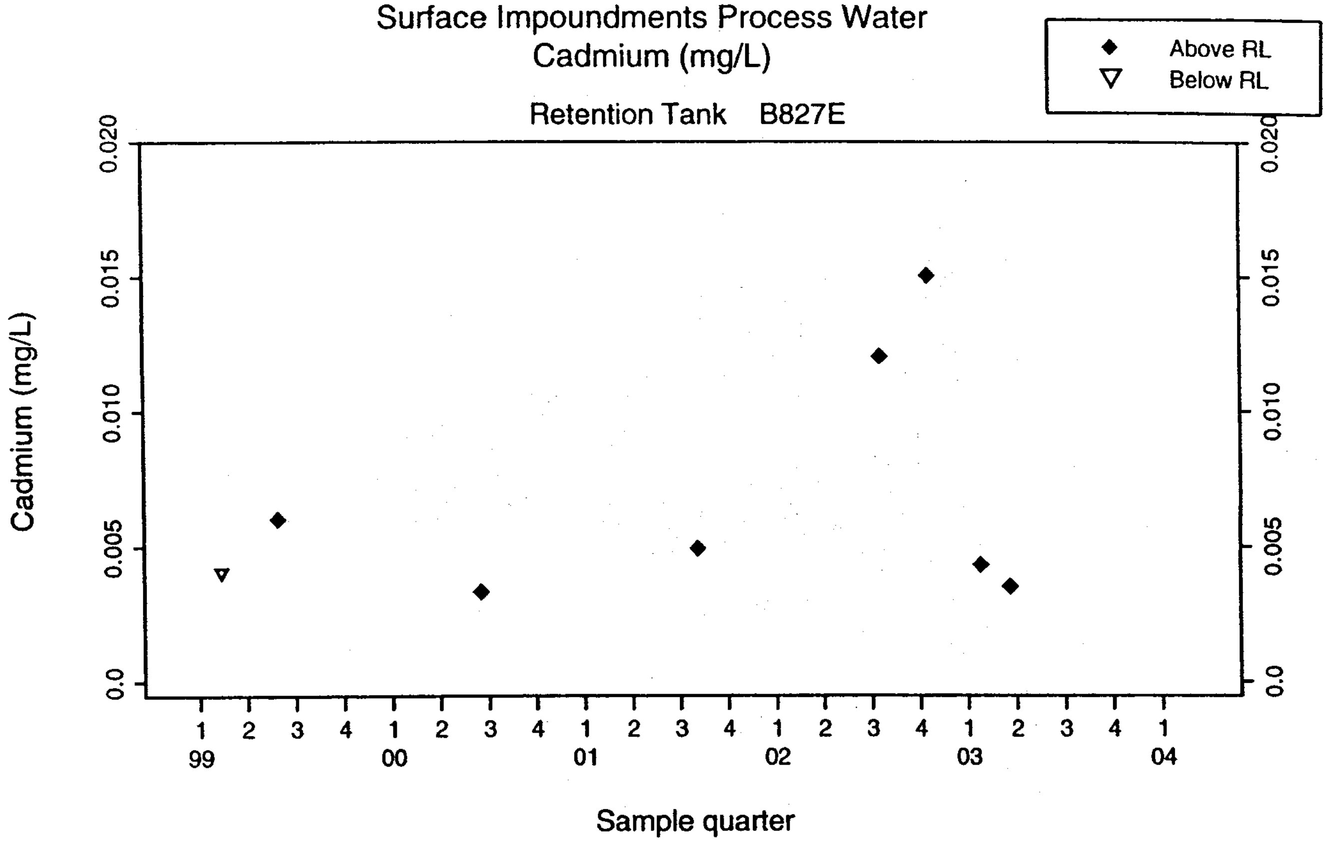
Retention Tank B826

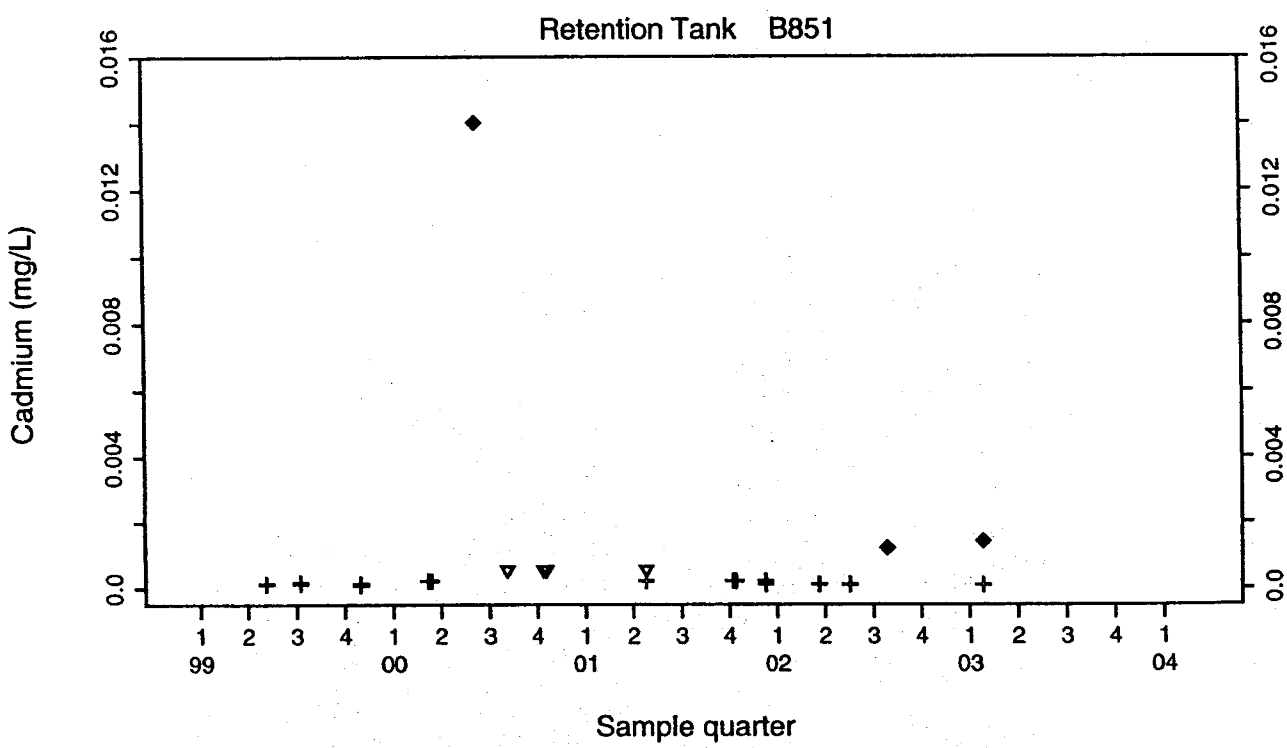


Retention Tank B827C/D

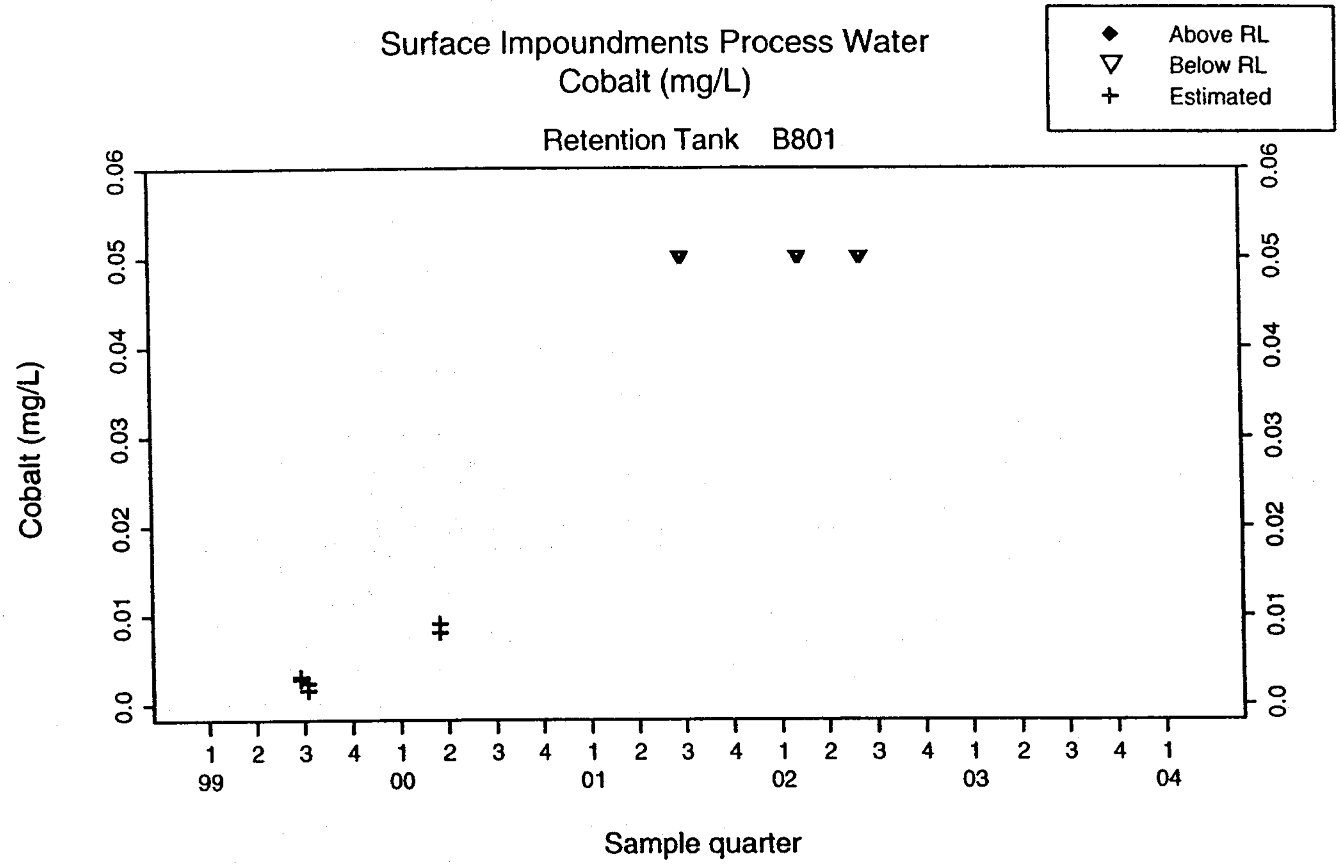


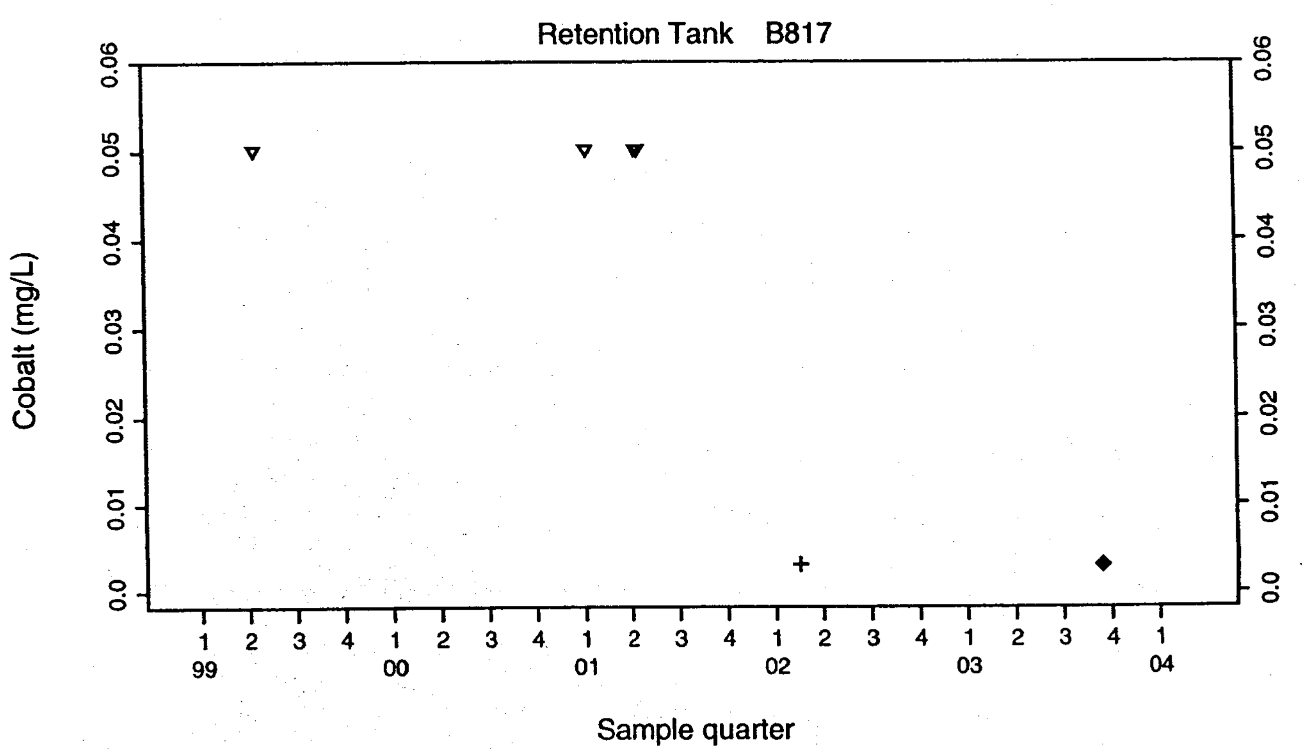
Surface Impoundments Process Water
Cadmium (mg/L)



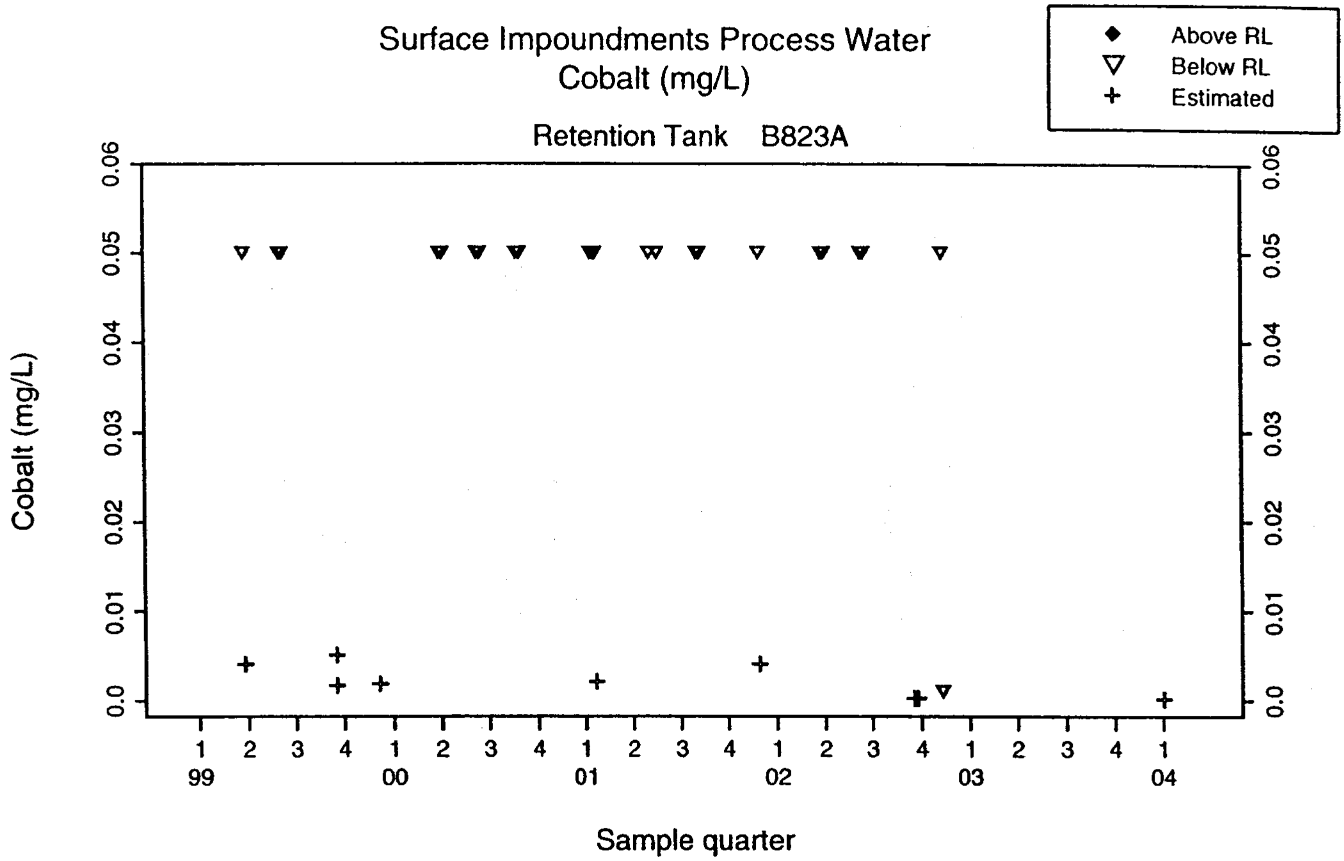


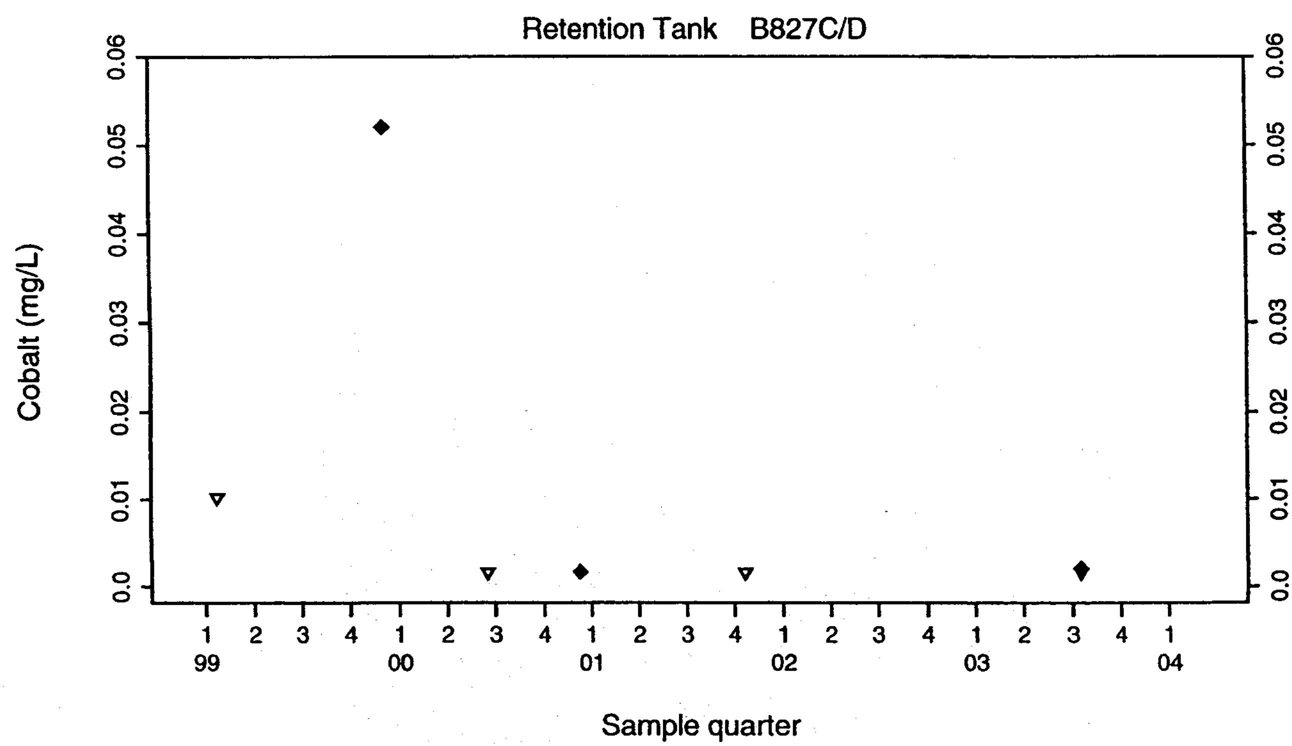
Surface Impoundments Process Water
Cobalt (mg/L)



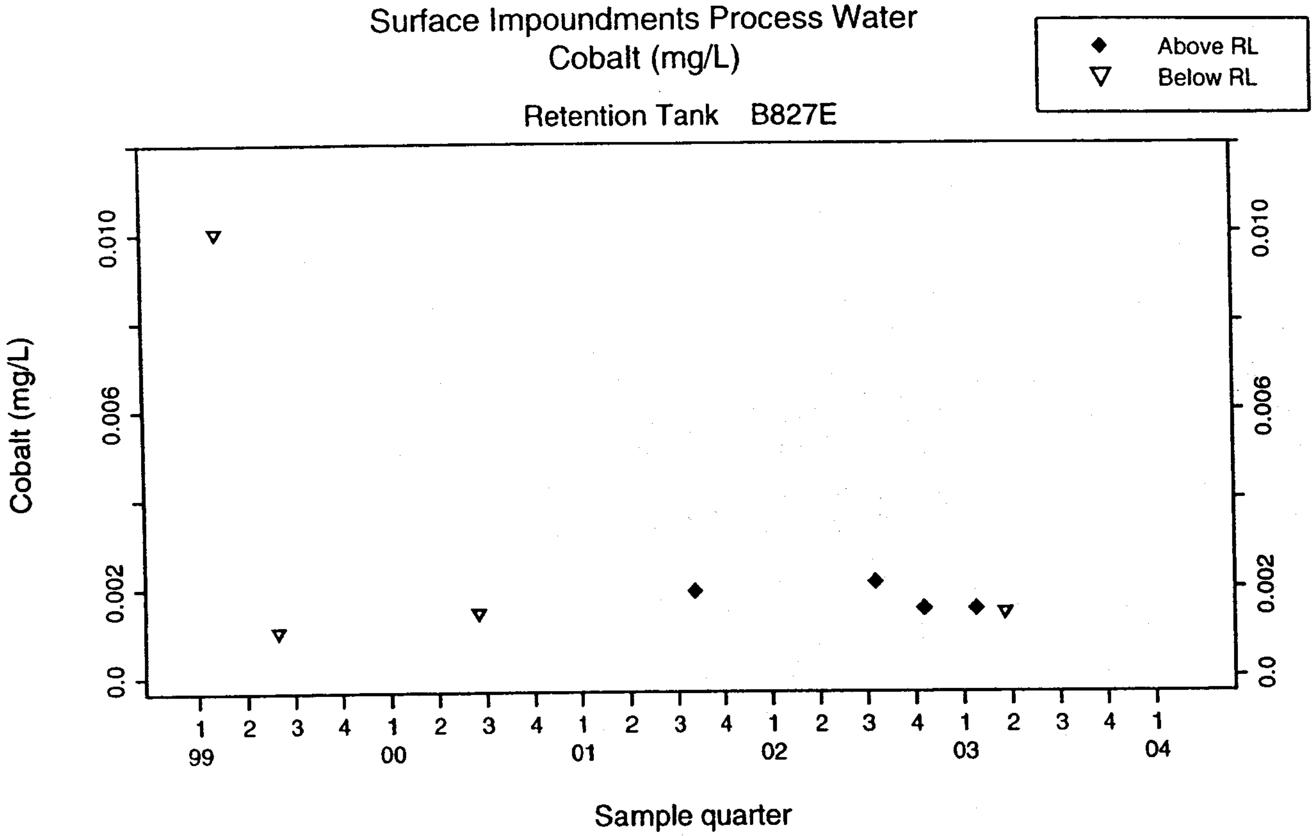


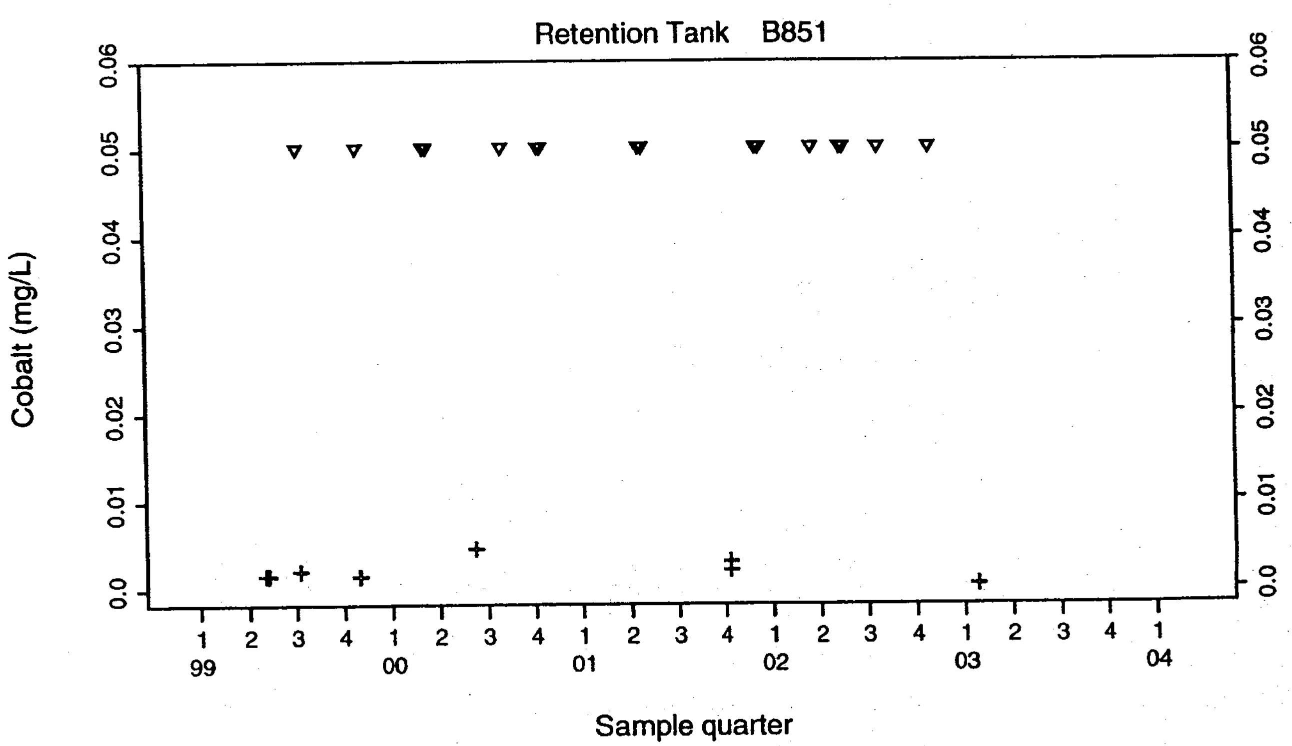
Surface Impoundments Process Water
Cobalt (mg/L)



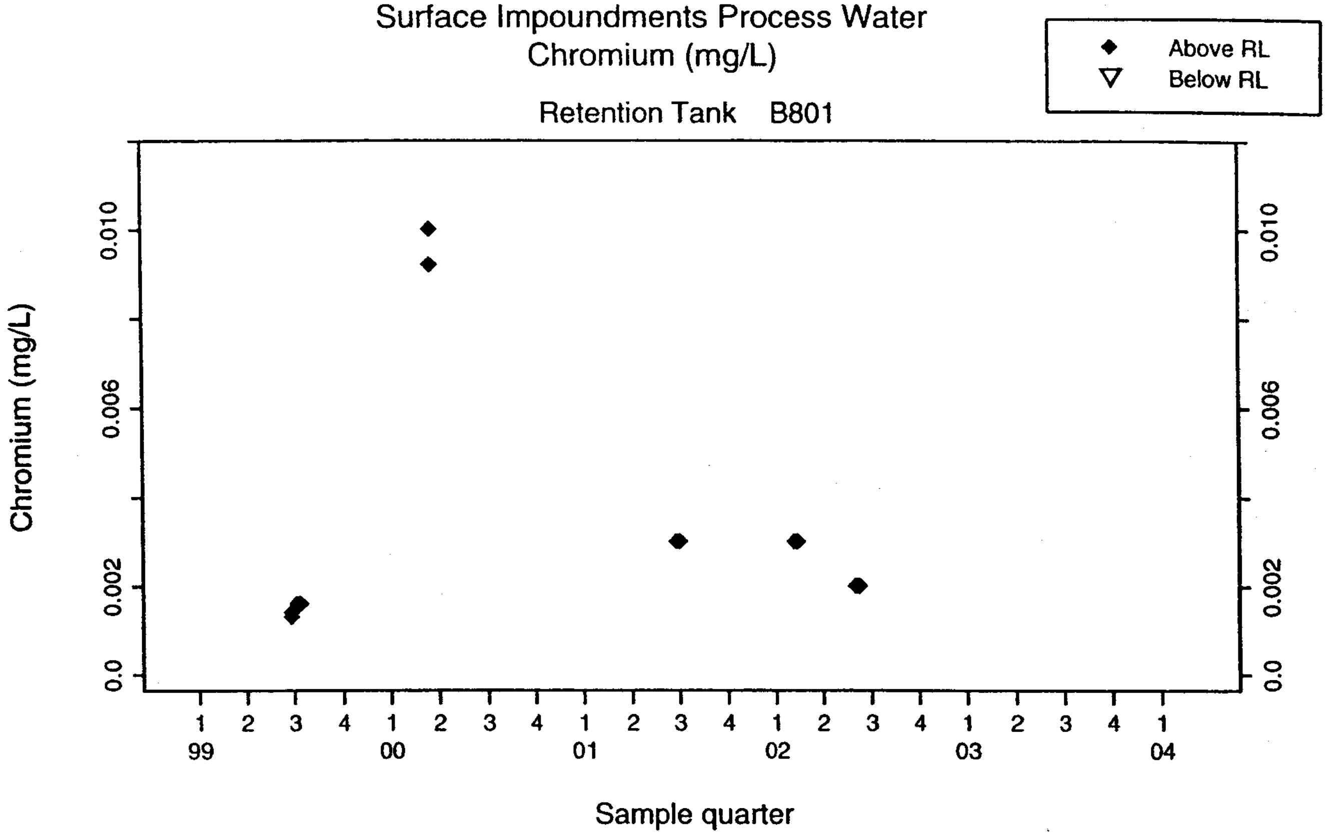


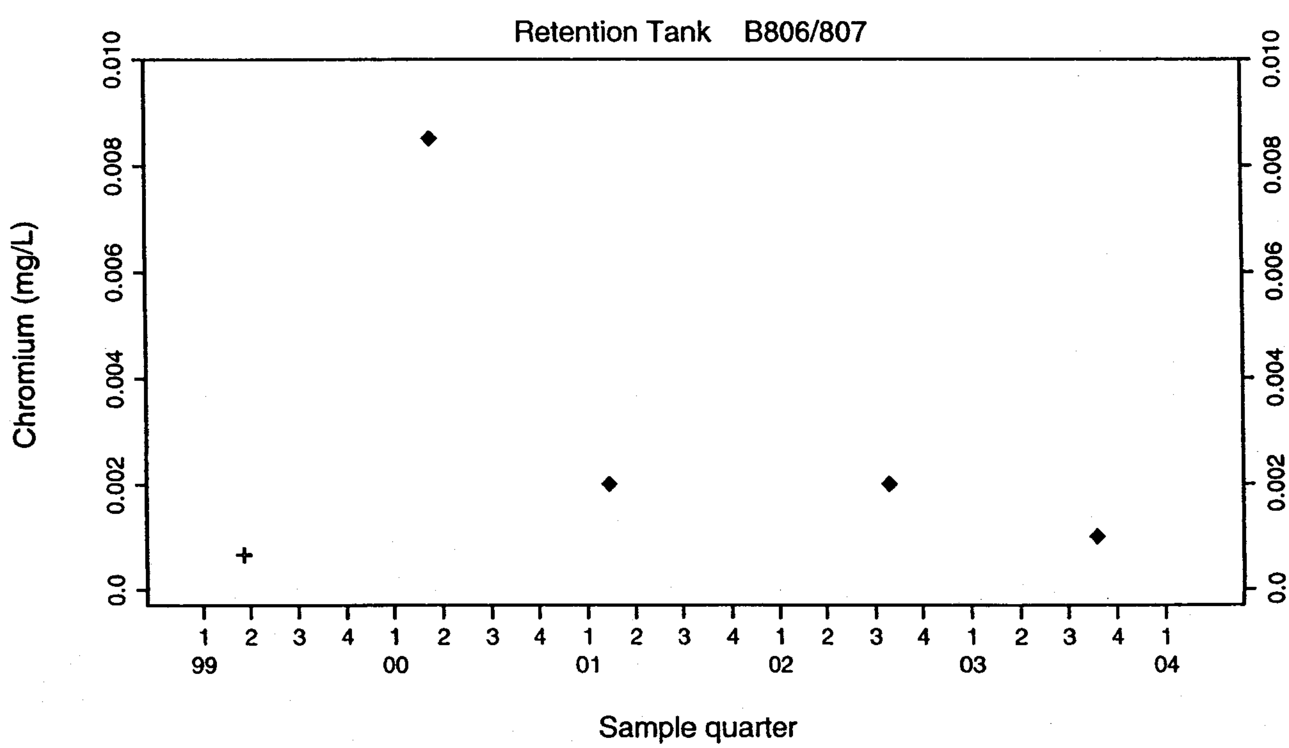
Surface Impoundments Process Water
Cobalt (mg/L)



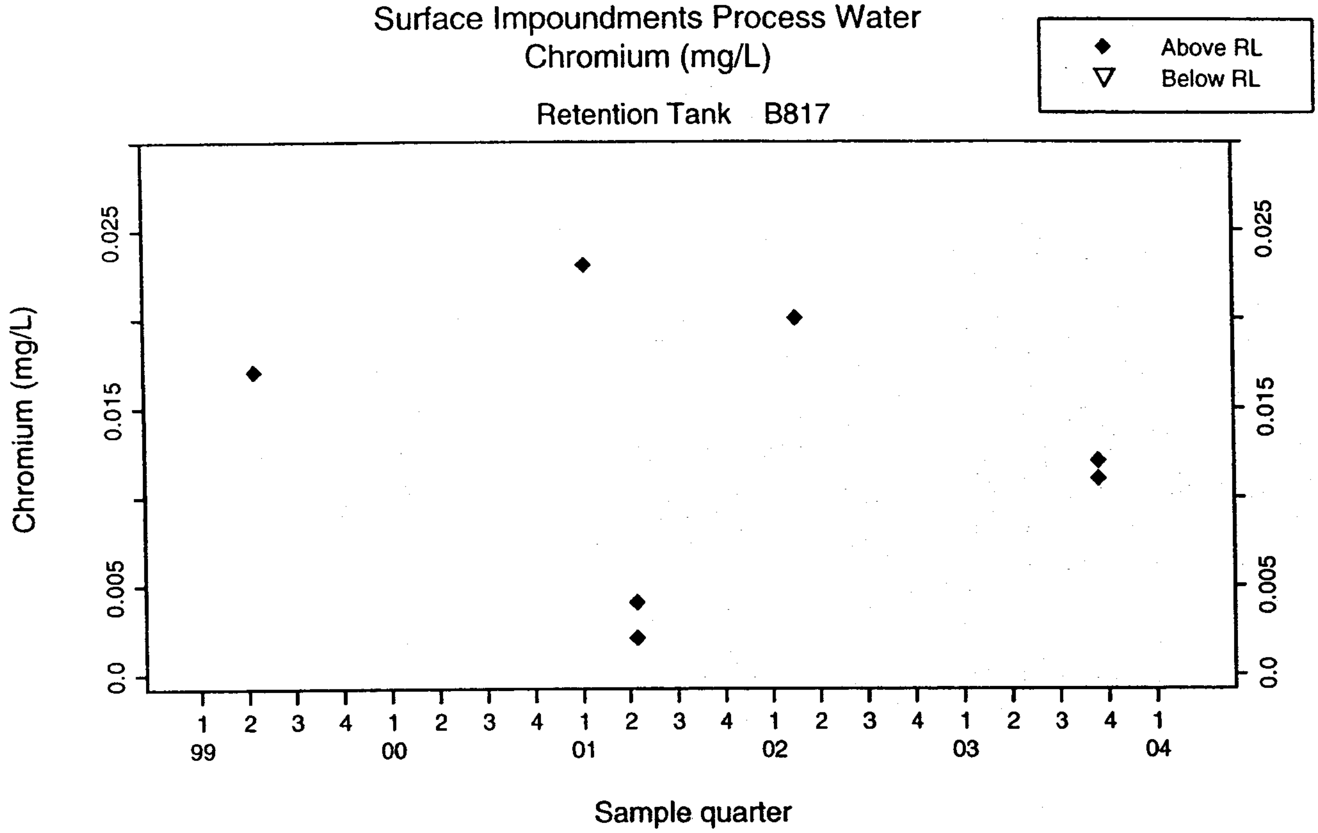


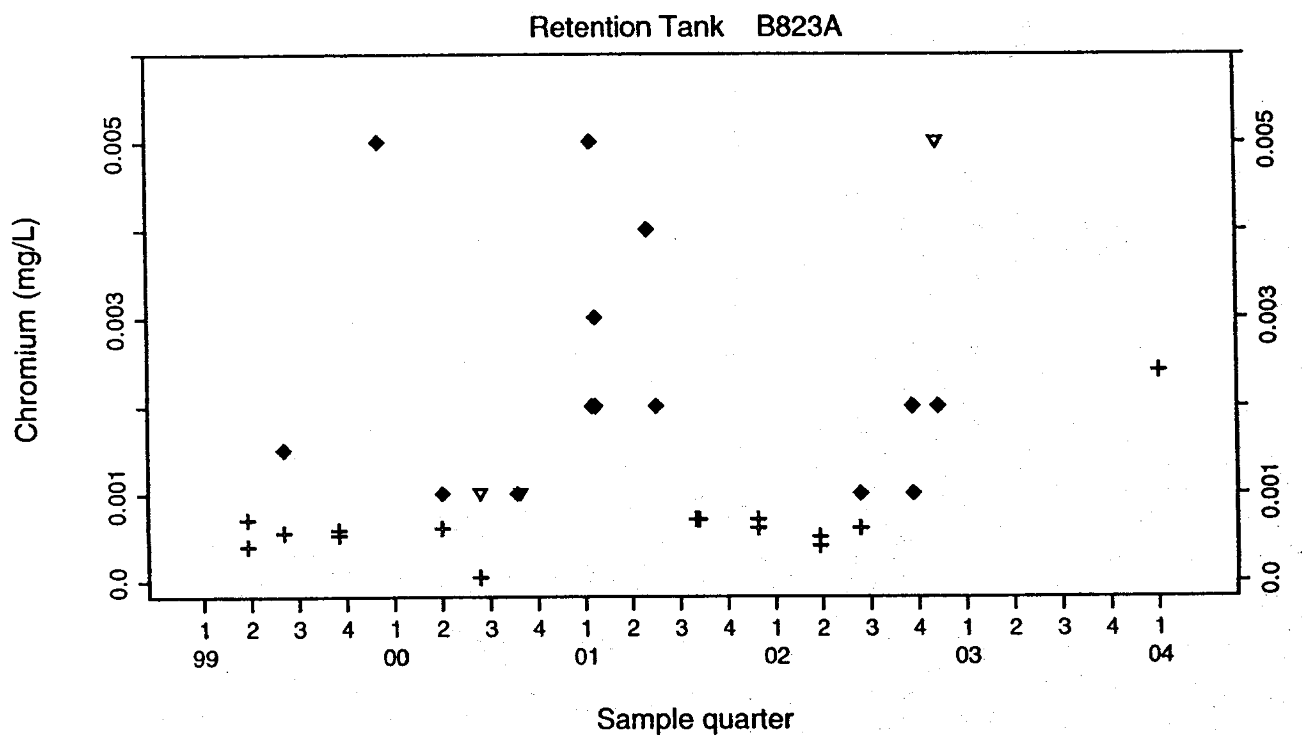
Surface Impoundments Process Water
Chromium (mg/L)



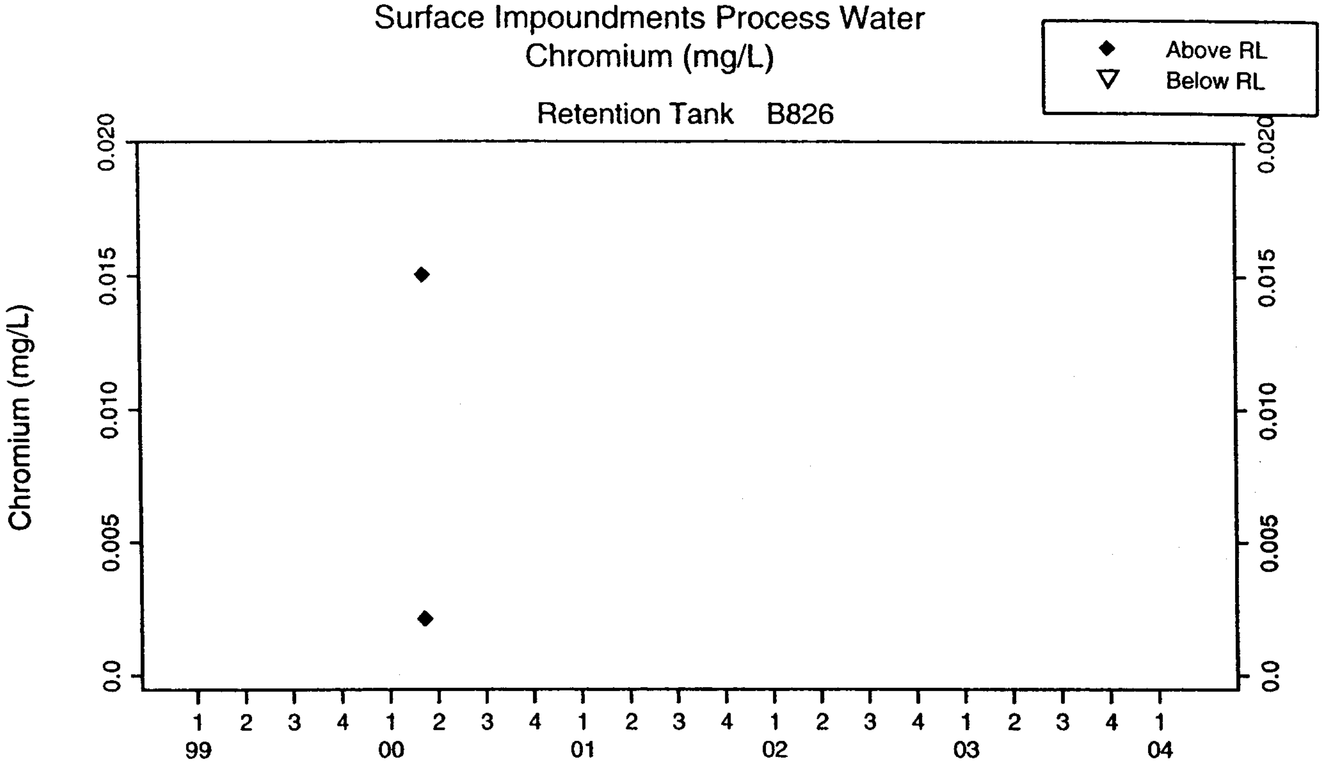


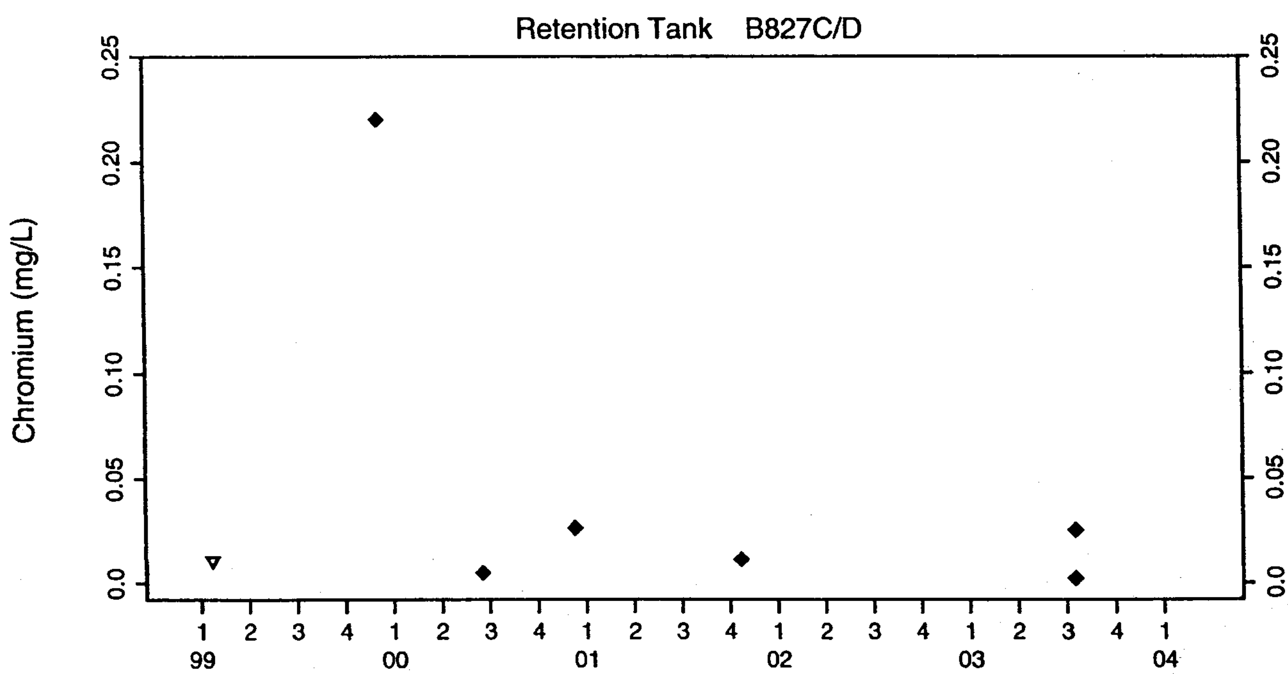
Surface Impoundments Process Water Chromium (mg/L)





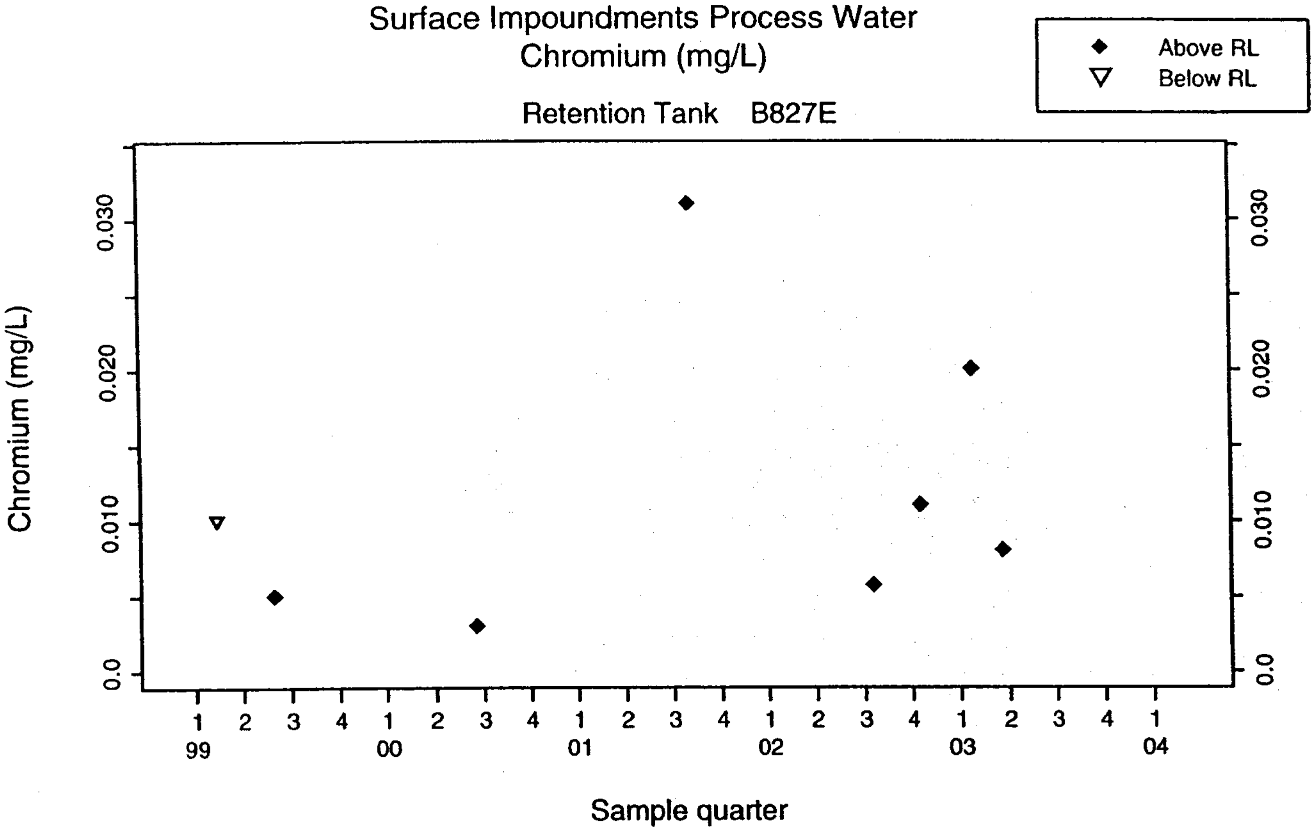
Surface Impoundments Process Water
Chromium (mg/L)



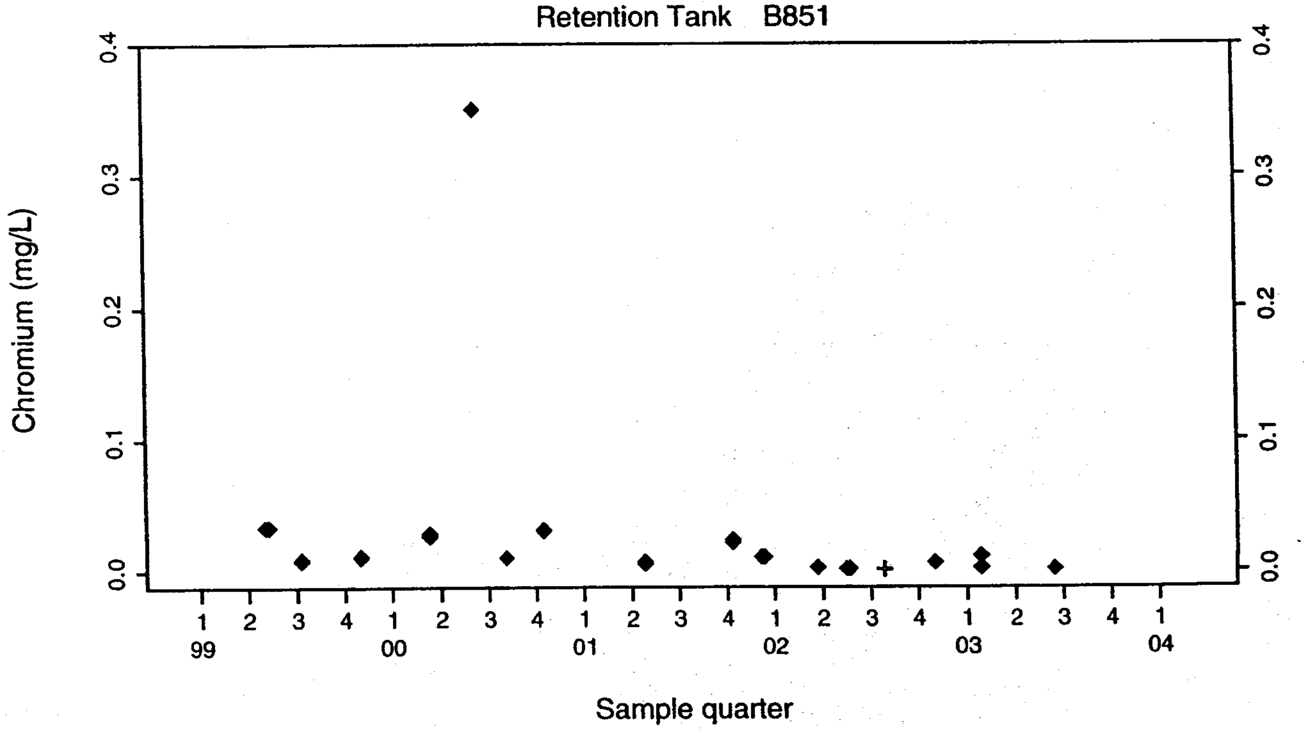


Surface Impoundments Process Water
Chromium (mg/L)

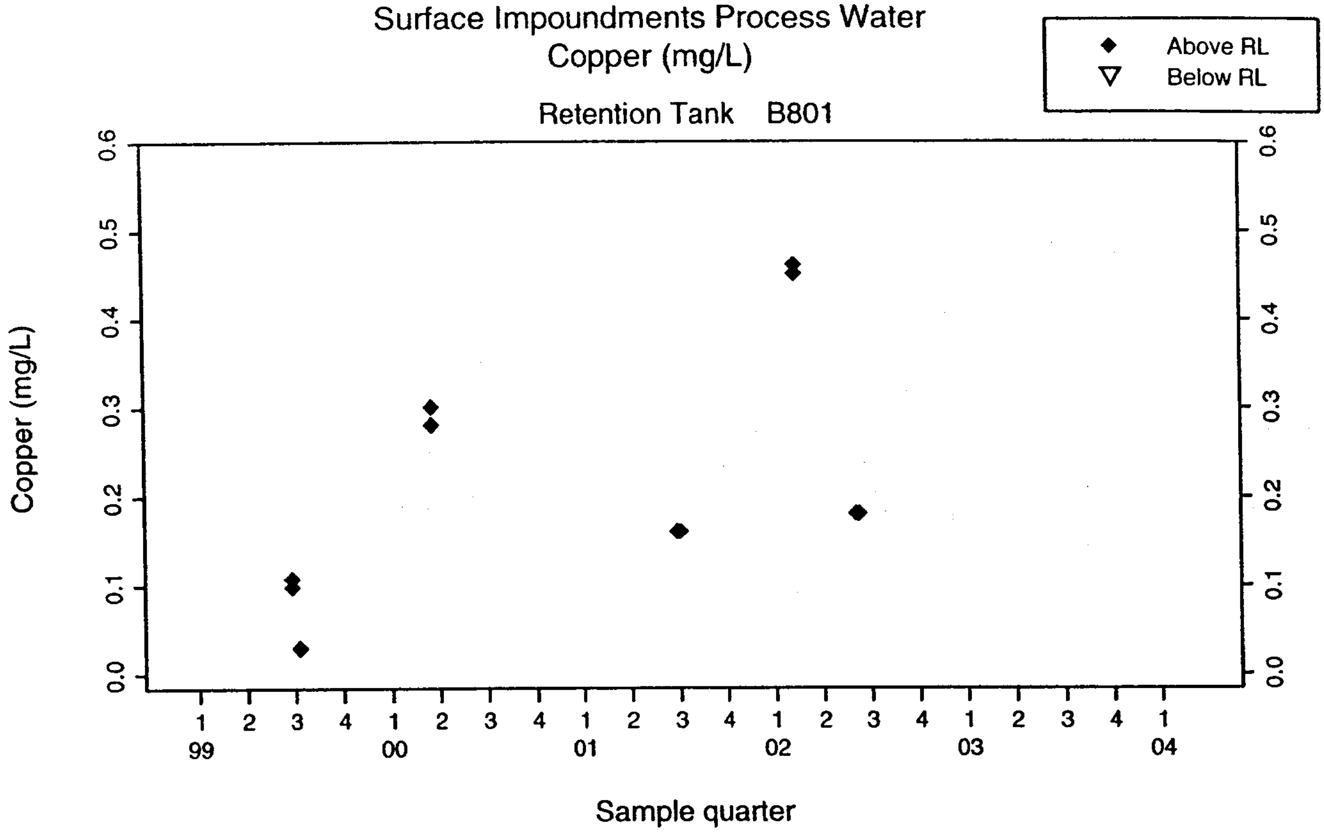
Retention Tank B827E

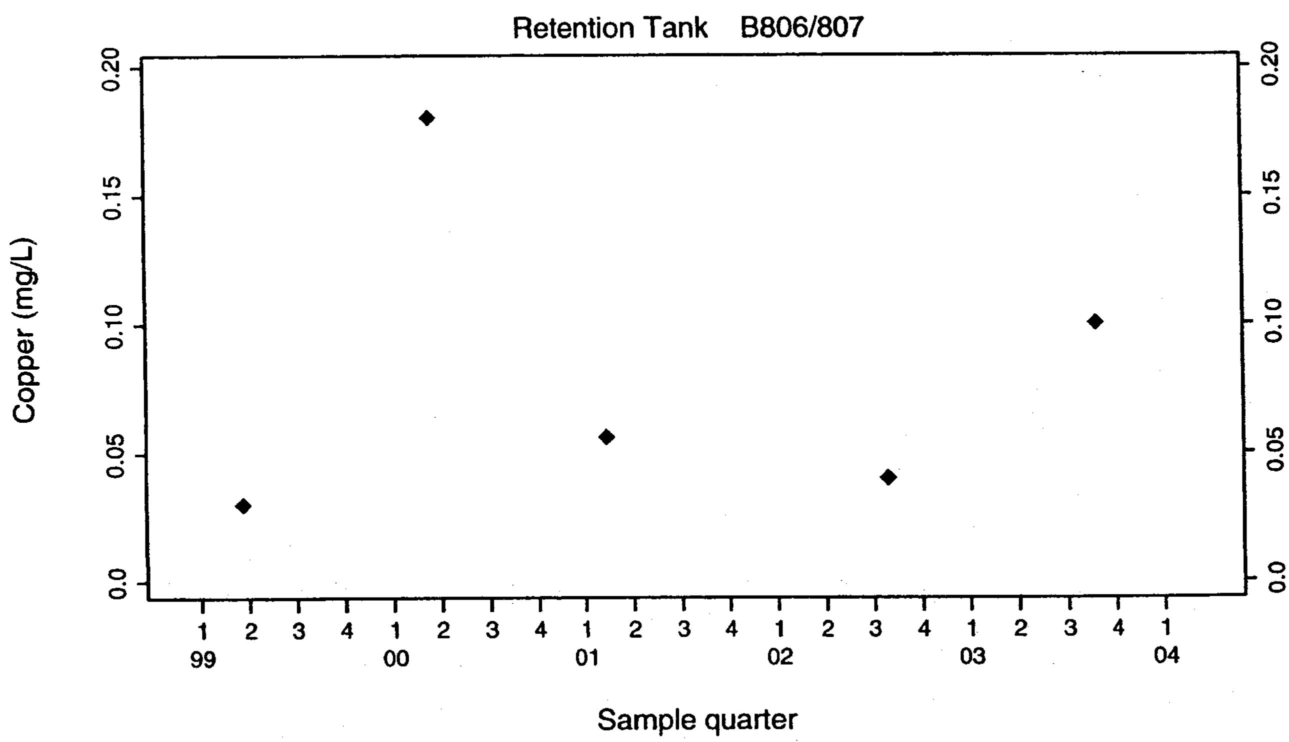


Retention Tank B851

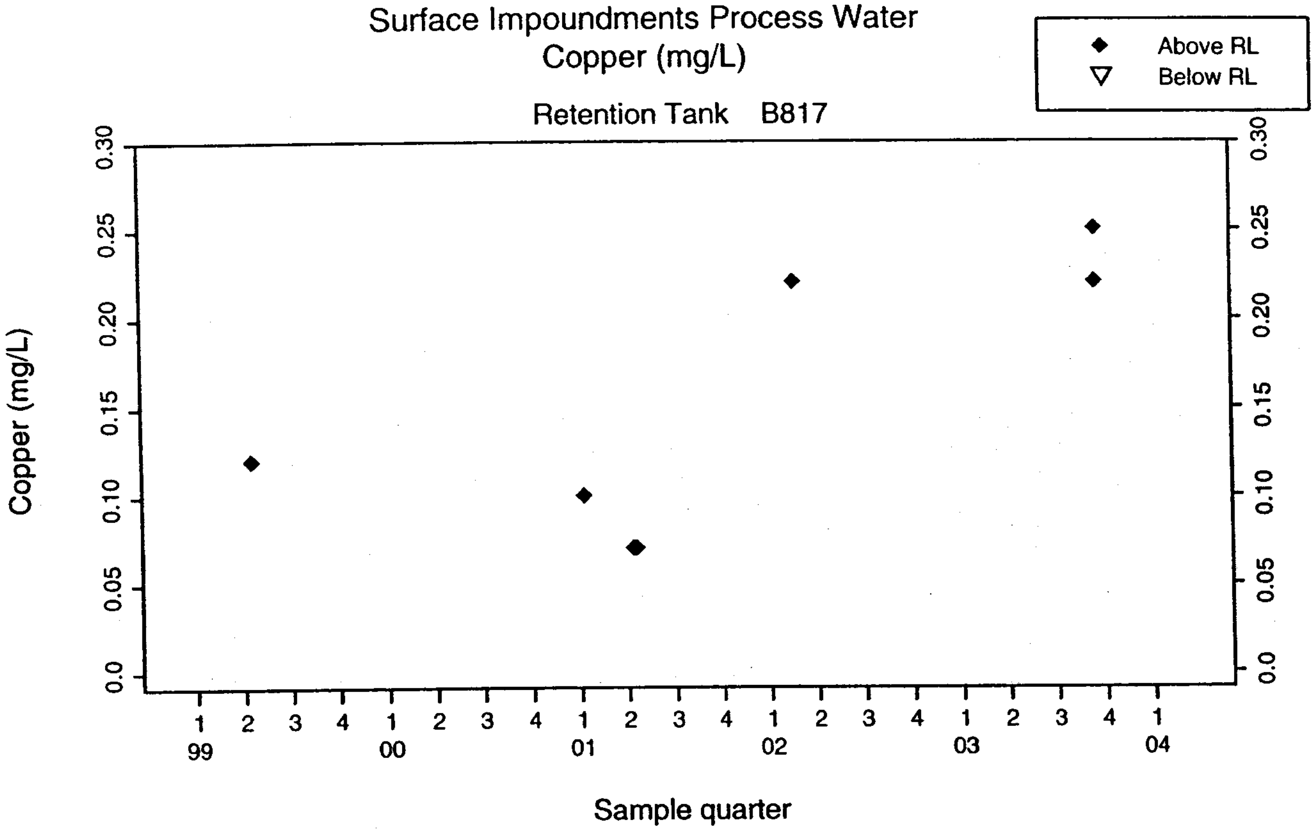


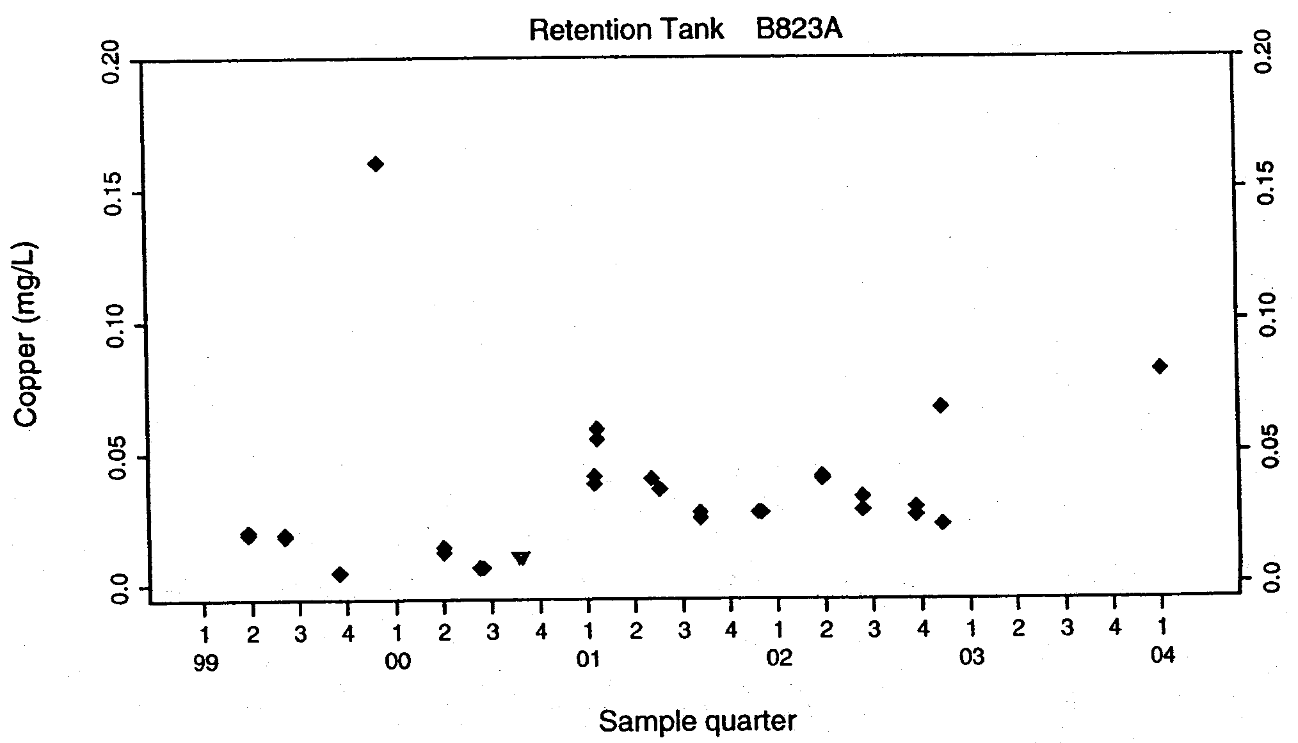
Surface Impoundments Process Water
Copper (mg/L)



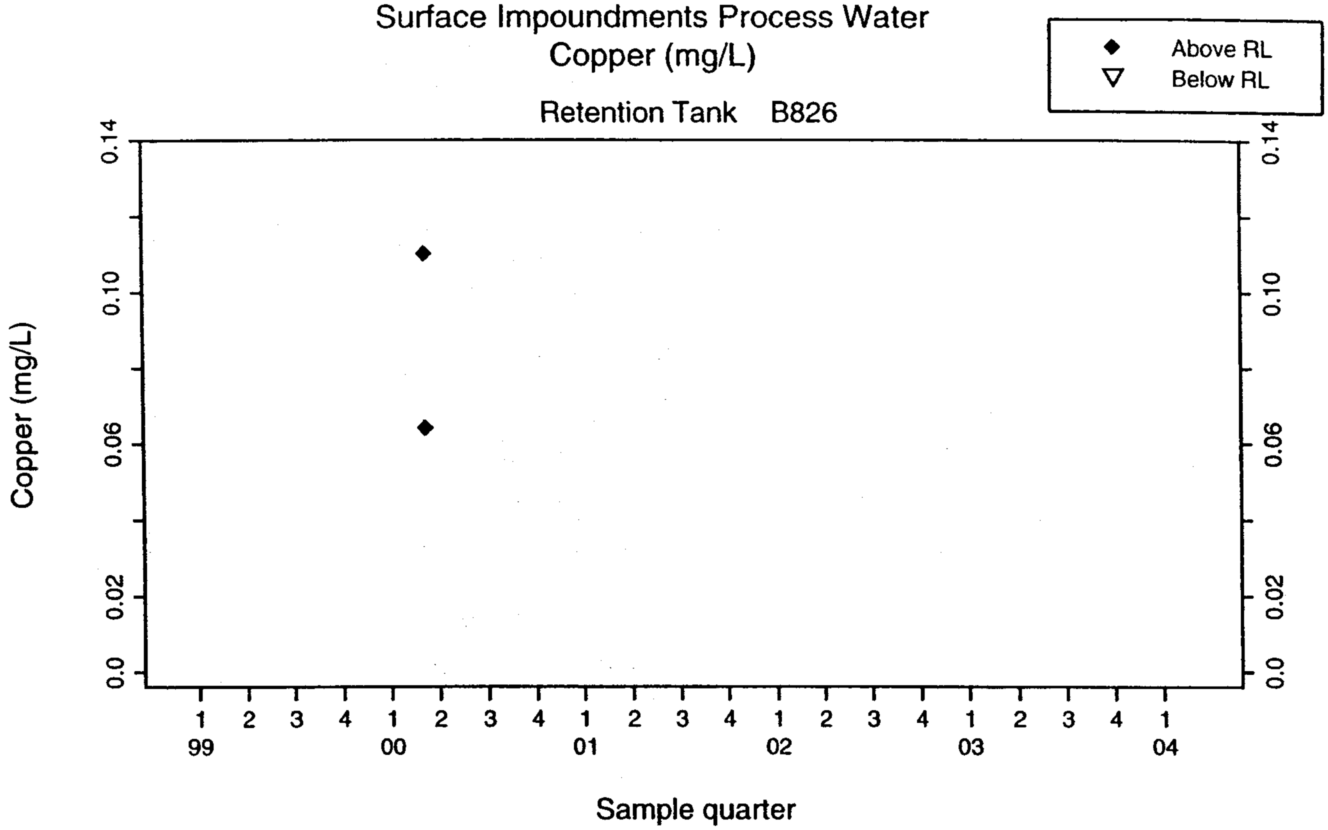


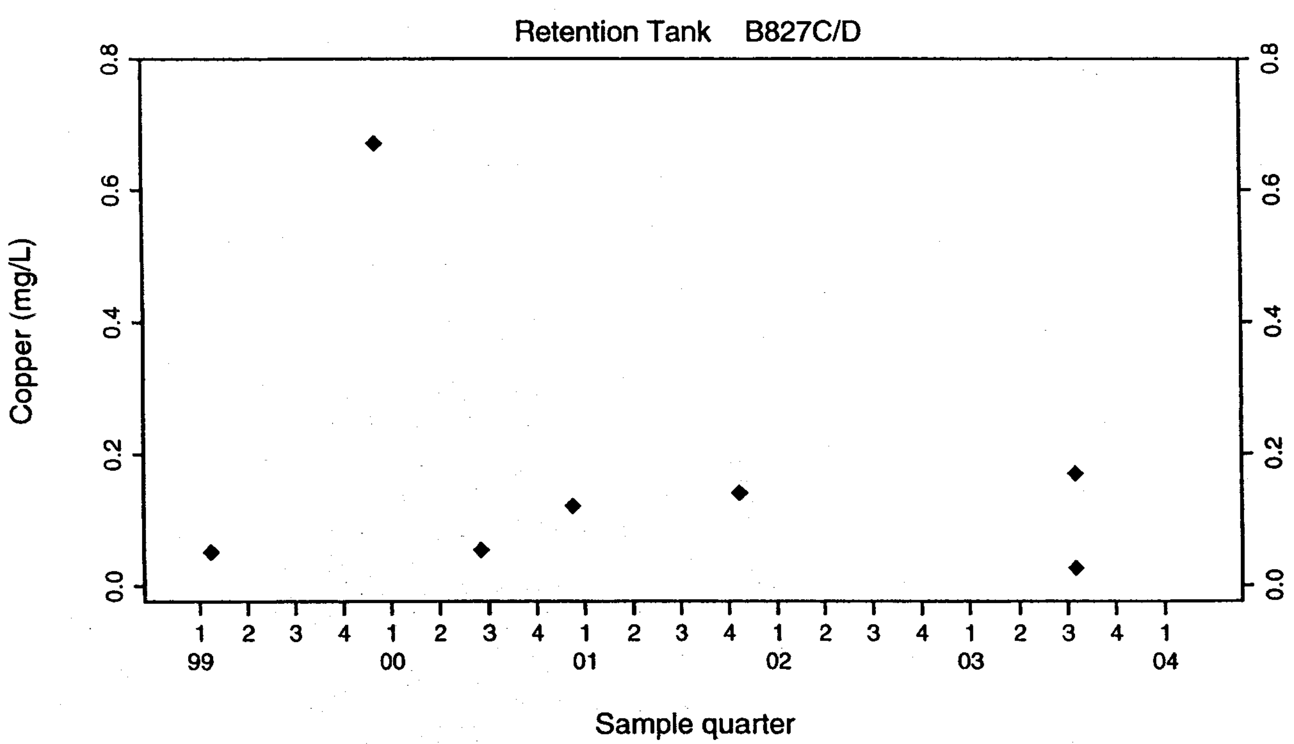
Surface Impoundments Process Water
Copper (mg/L)



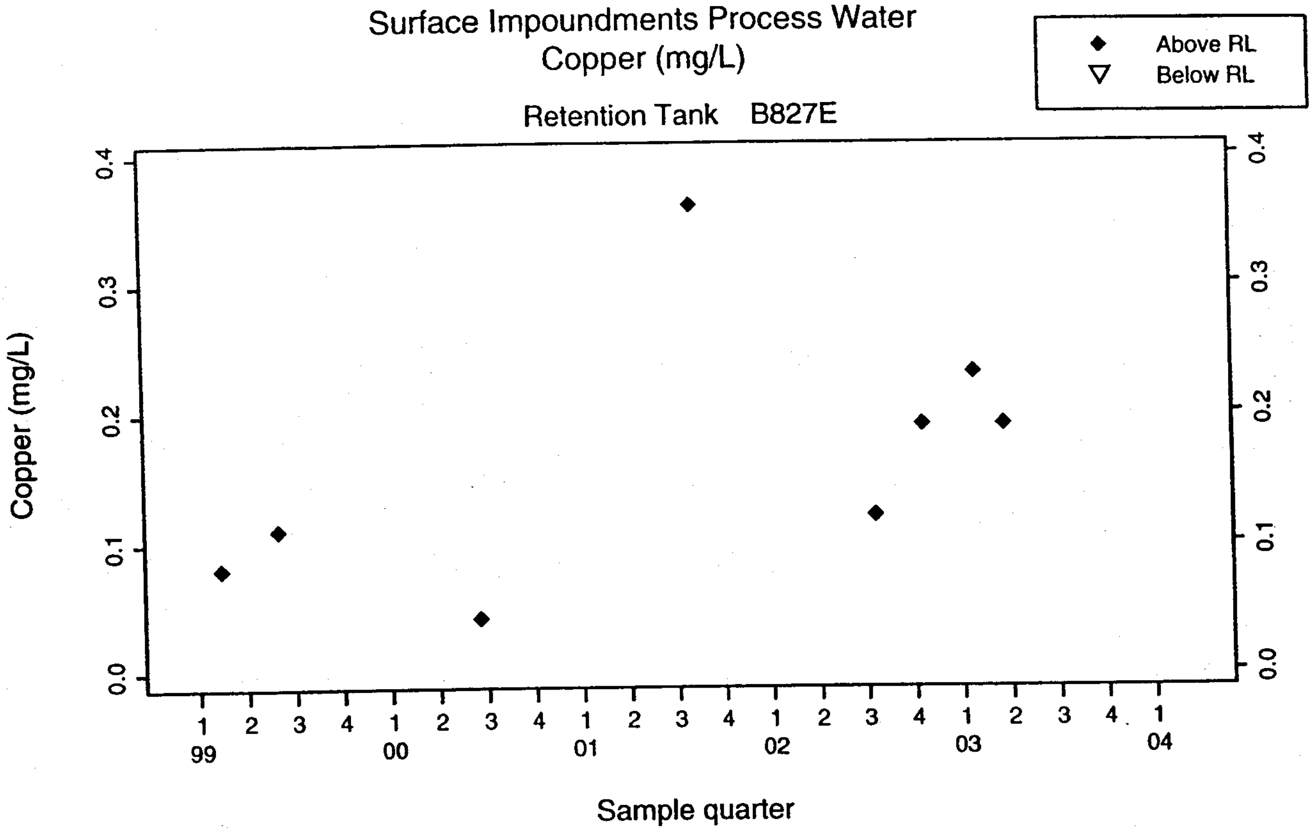


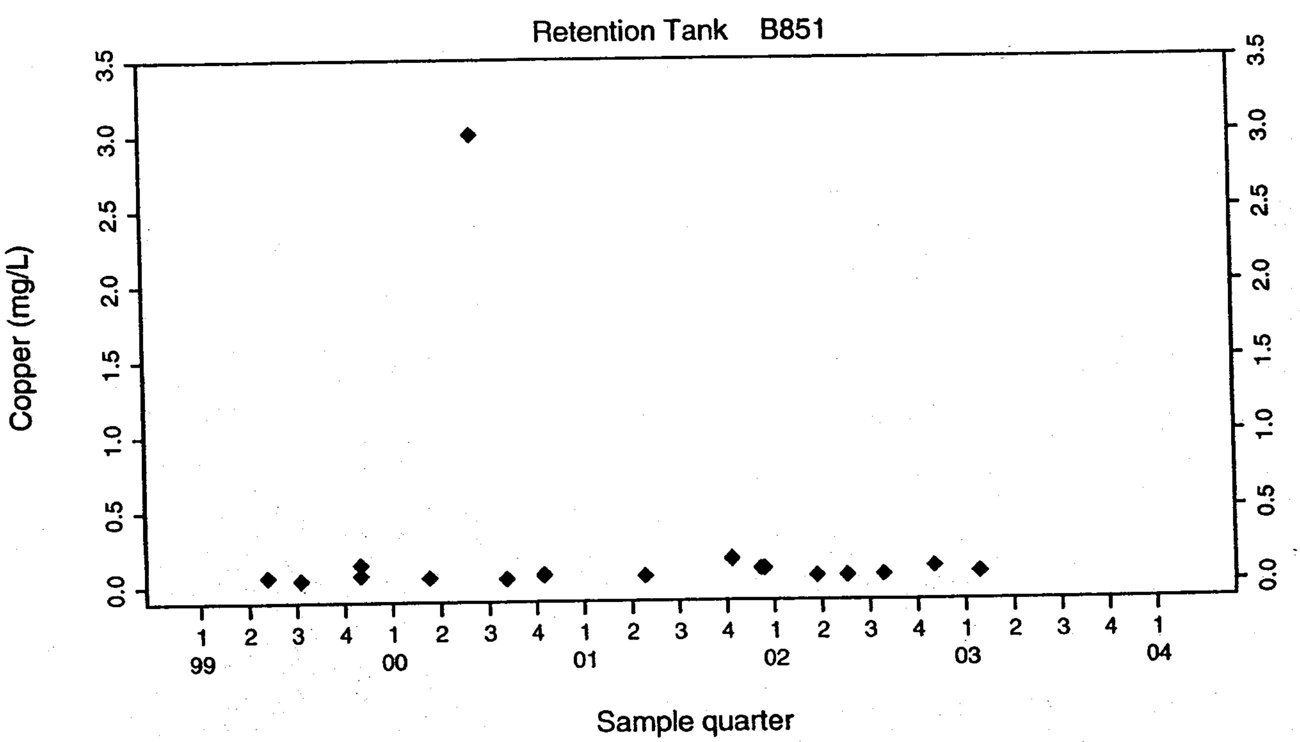
Surface Impoundments Process Water
Copper (mg/L)





Surface Impoundments Process Water
Copper (mg/L)

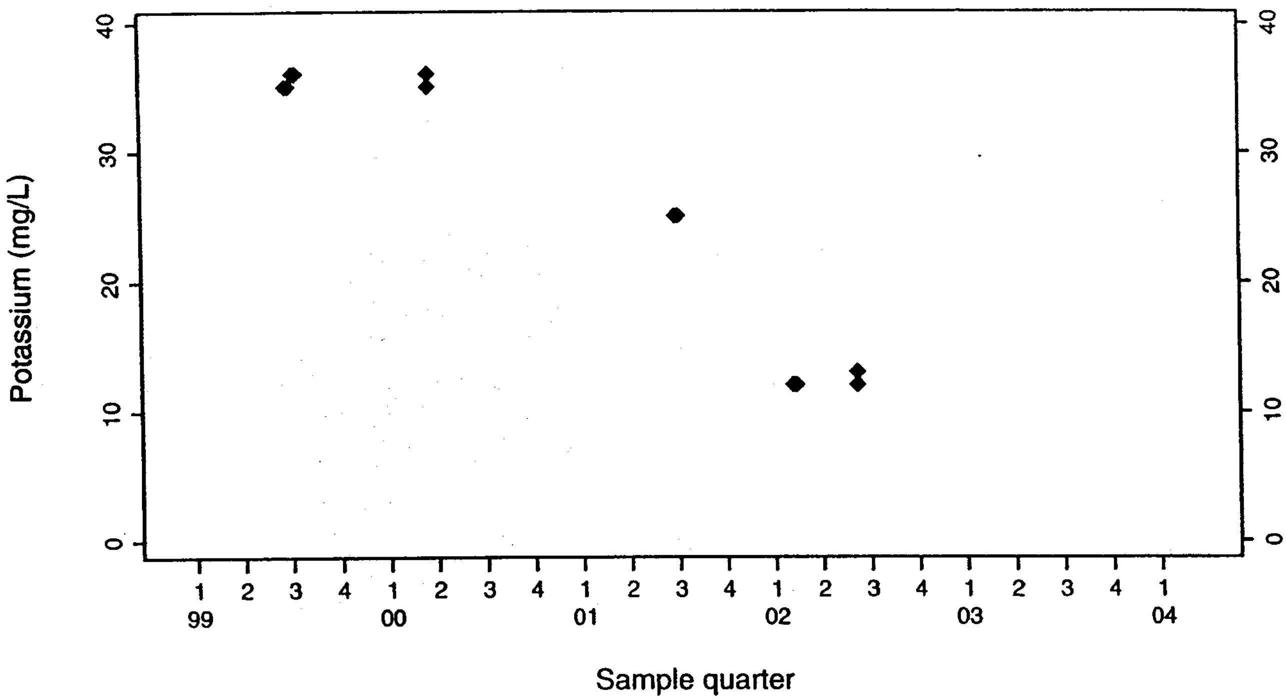




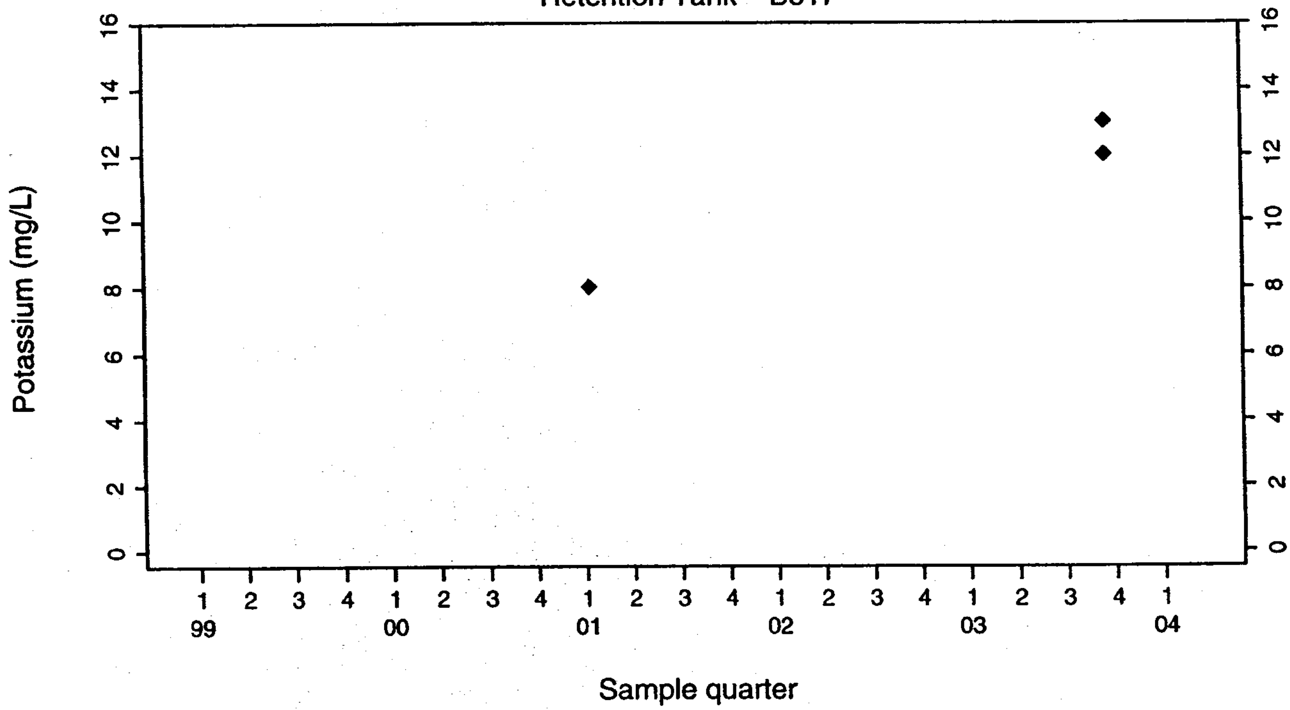
Surface Impoundments Process Water
Potassium (mg/L)

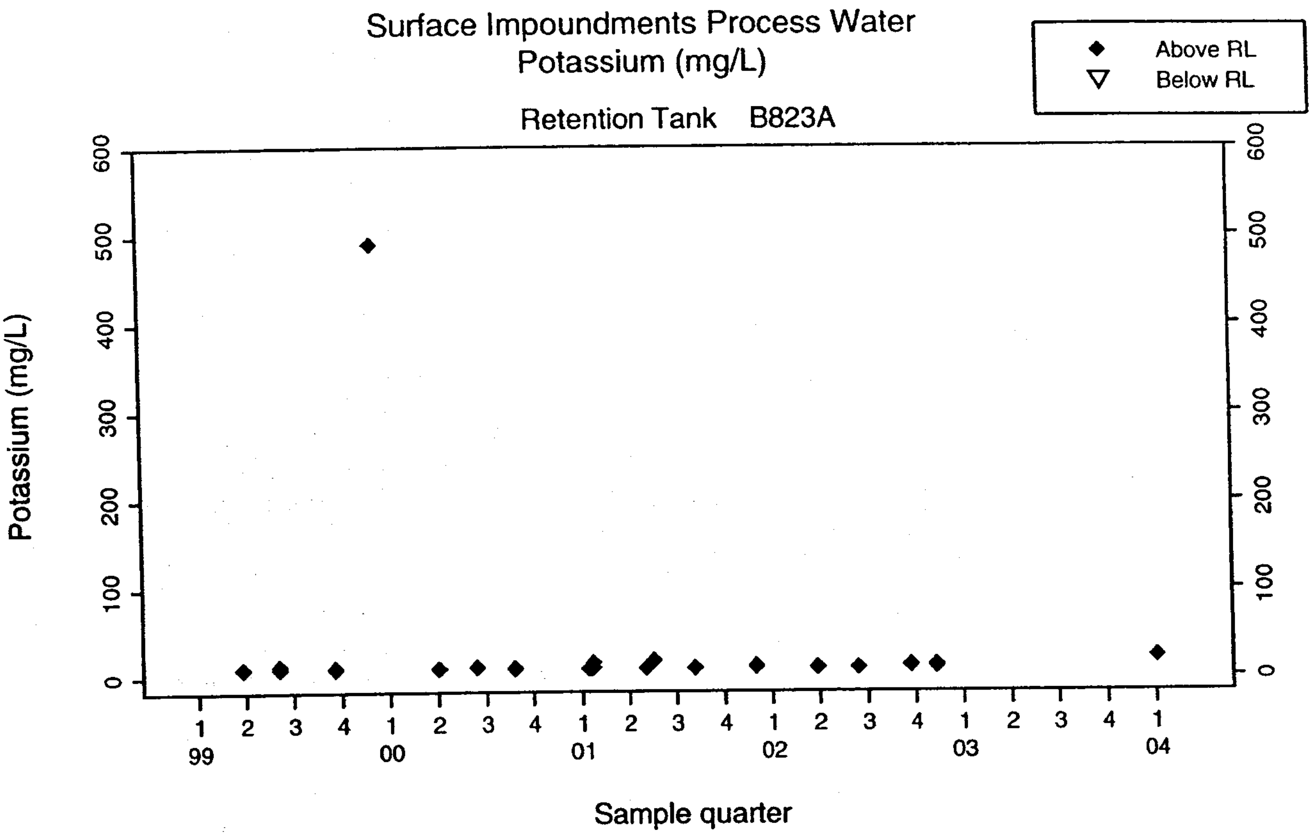
◆ Above RL
▽ Below RL

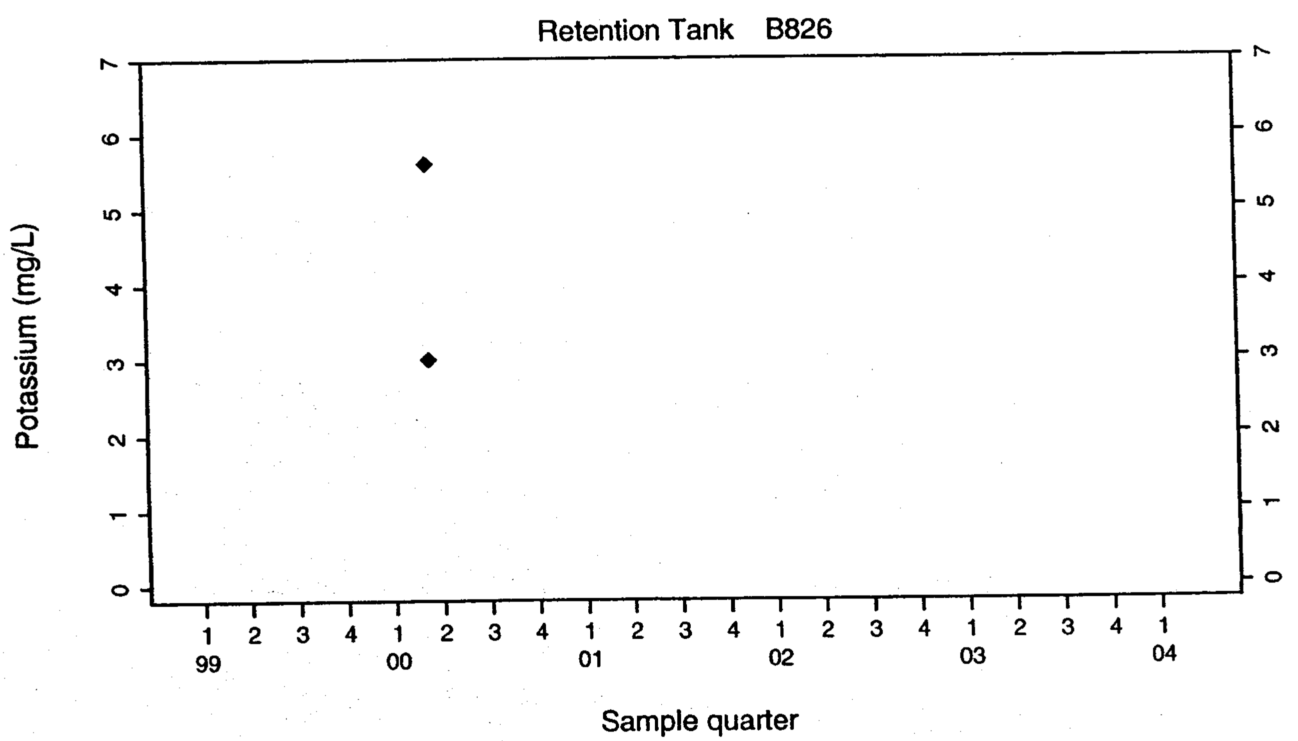
Retention Tank B801

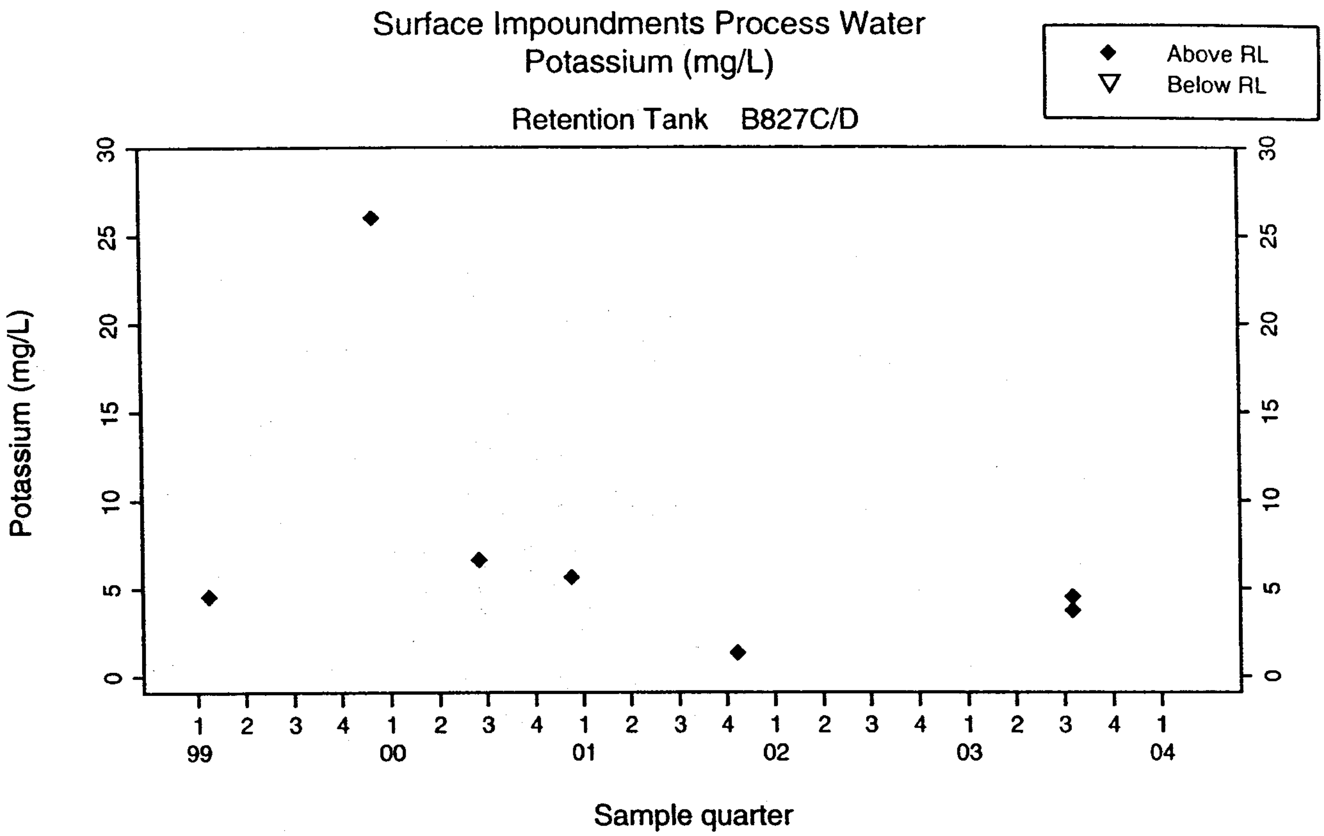


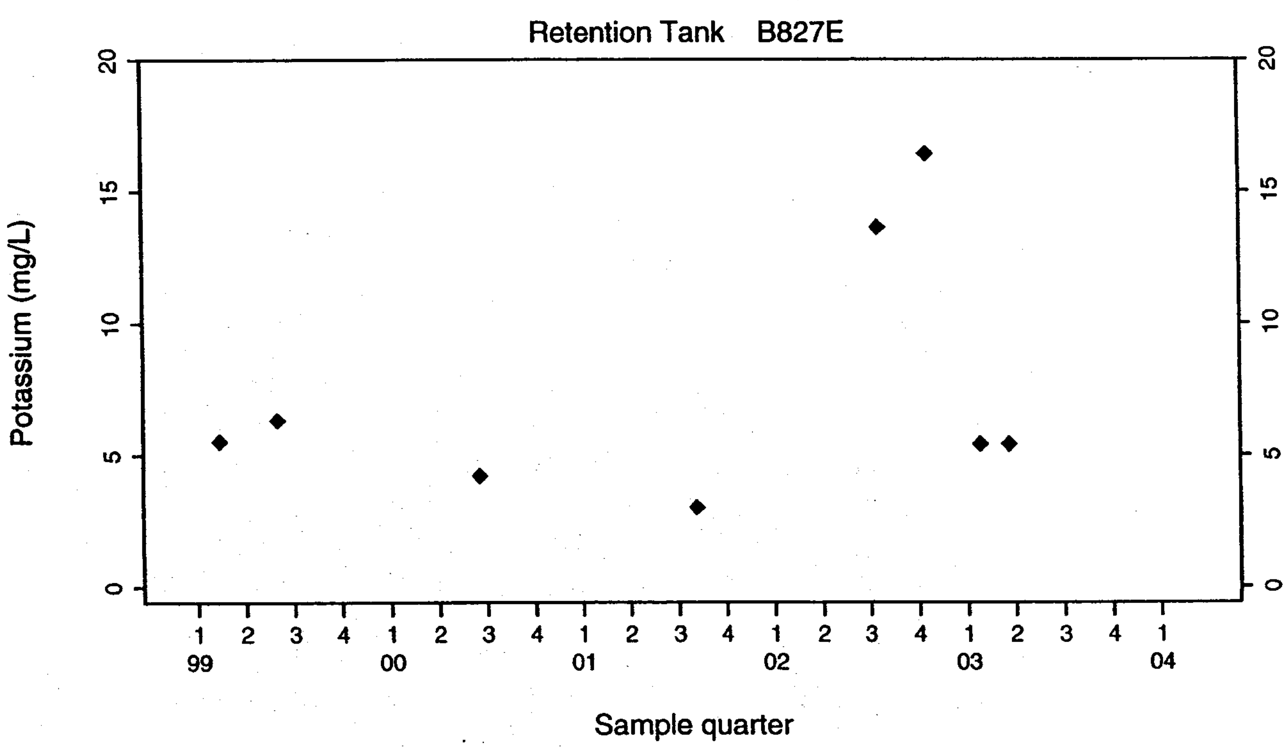
Retention Tank B817

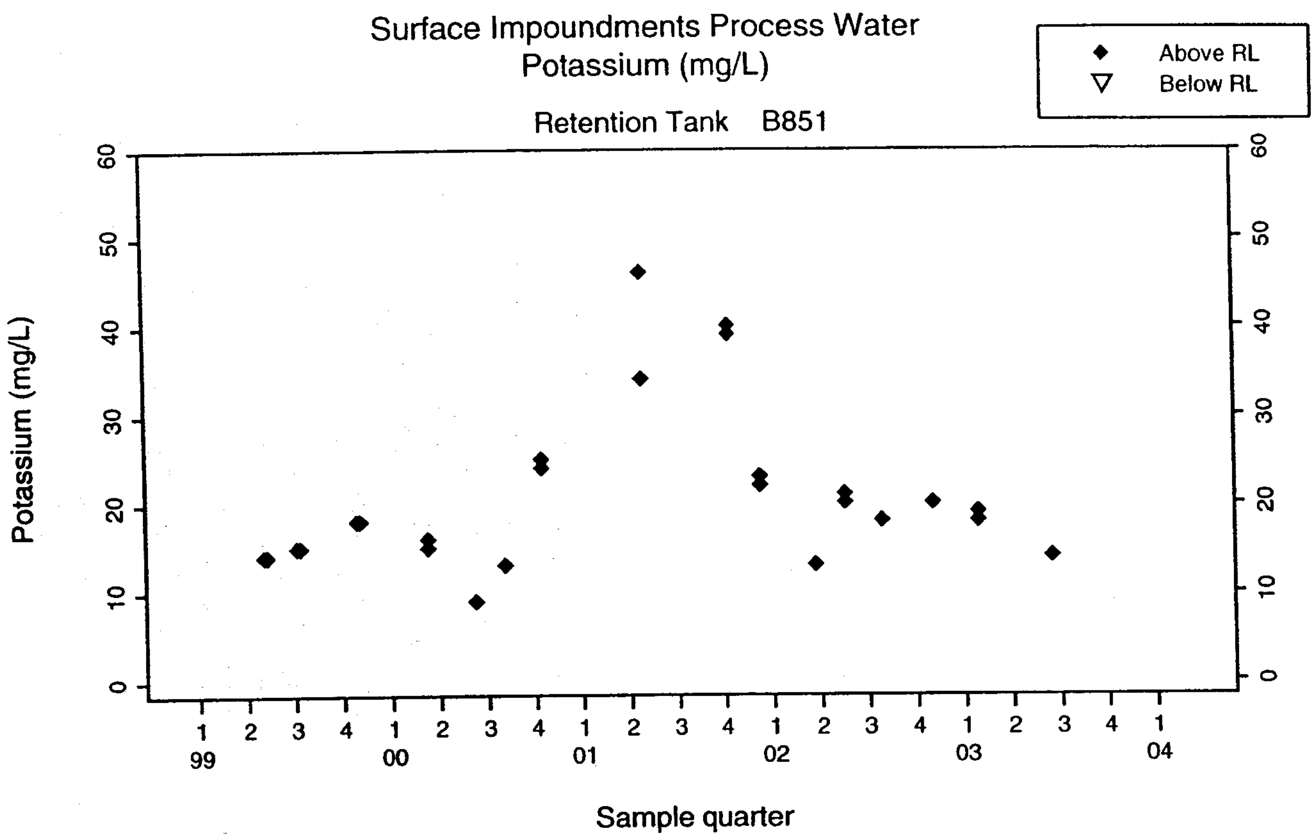



Surface Impoundments Process Water
Potassium (mg/L)
Above RL
Below RL
Retention Tank B823A
Potassium (mg/L)
0
100
200
300
400
500
600
1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1
99 00 01 02 03 04
Sample quarter

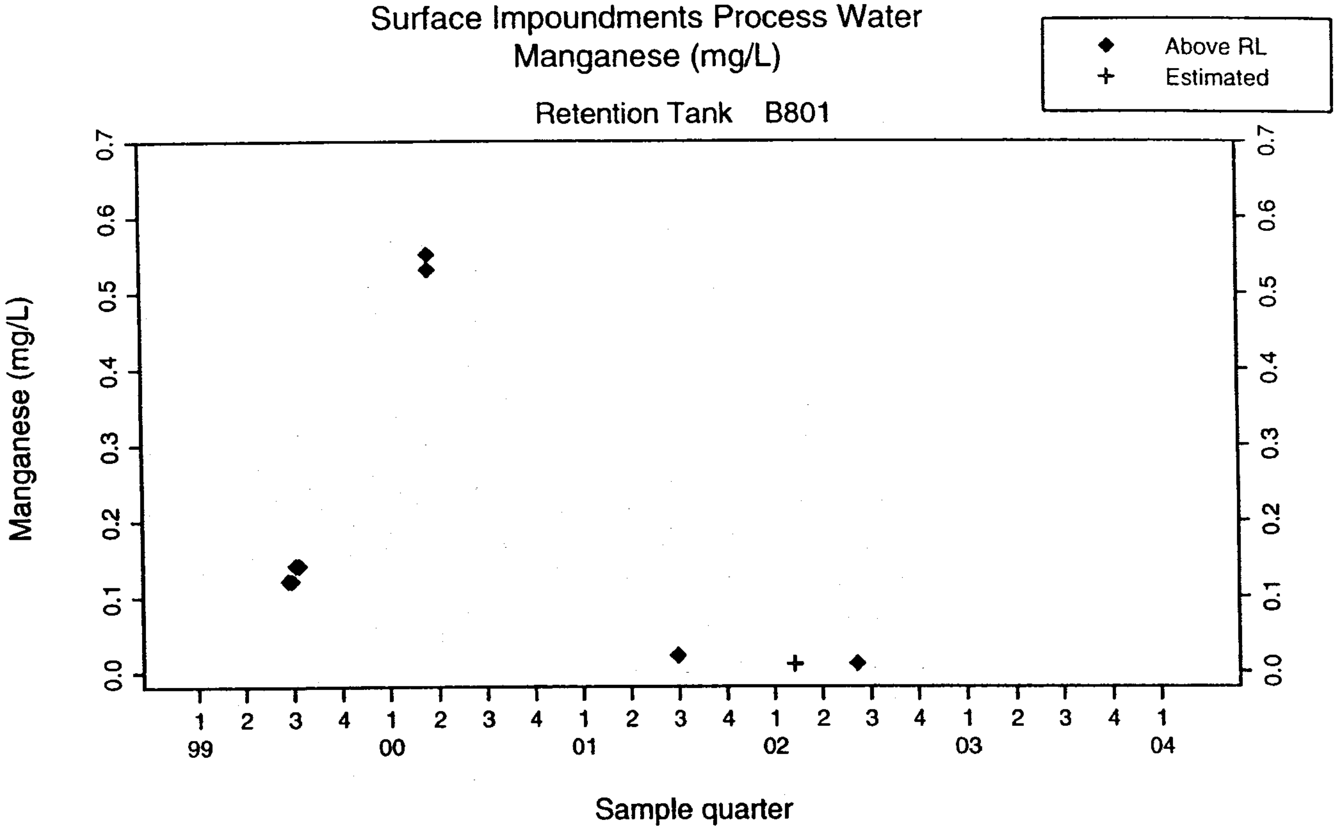

Retention Tank B826
Potassium (mg/L)
0
1
2
3
4
5
6
7
1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1
99 00 01 02 03 04
Sample quarter

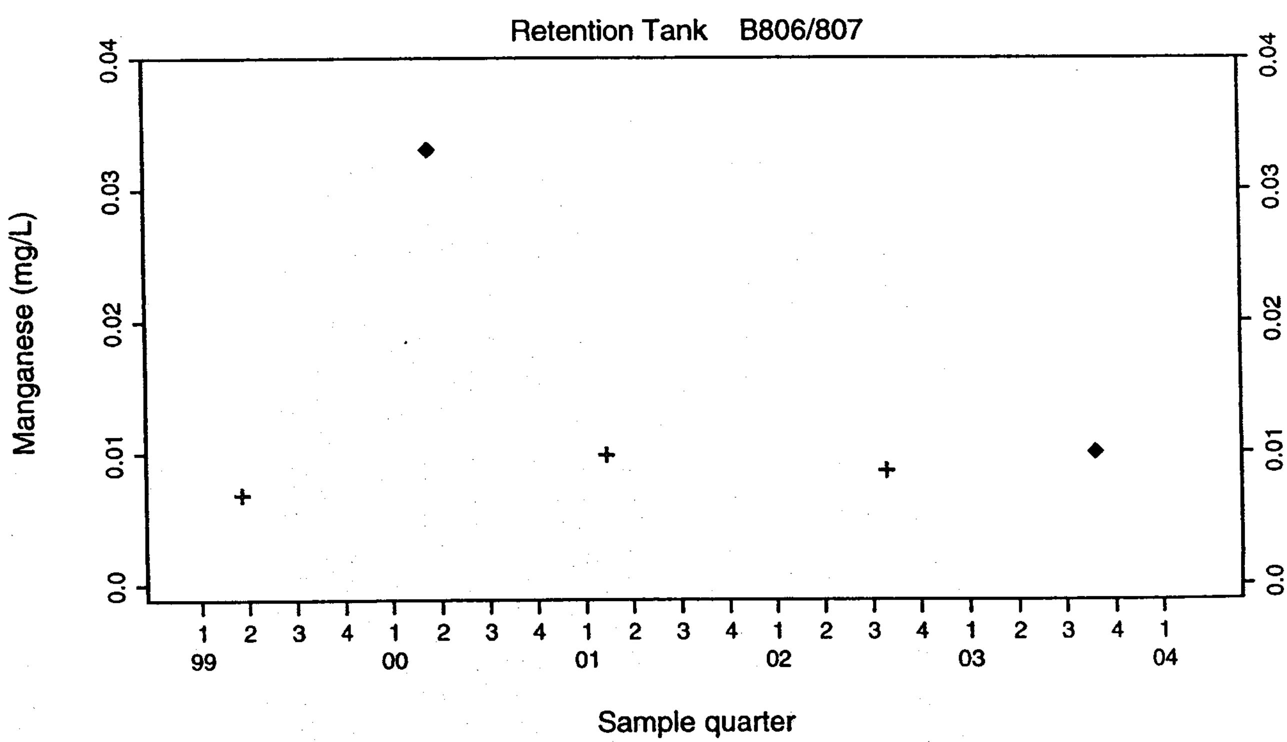

Surface Impoundments Process Water
Potassium (mg/L)
Above RL
Below RL
Retention Tank B827C/D
Potassium (mg/L)
0
5
10
15
20
25
30
1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1
99 00 01 02 03 04
Sample quarter


Retention Tank B827E
Potassium (mg/L)
0
5
10
15
20
1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1
99 00 01 02 03 04
Sample quarter

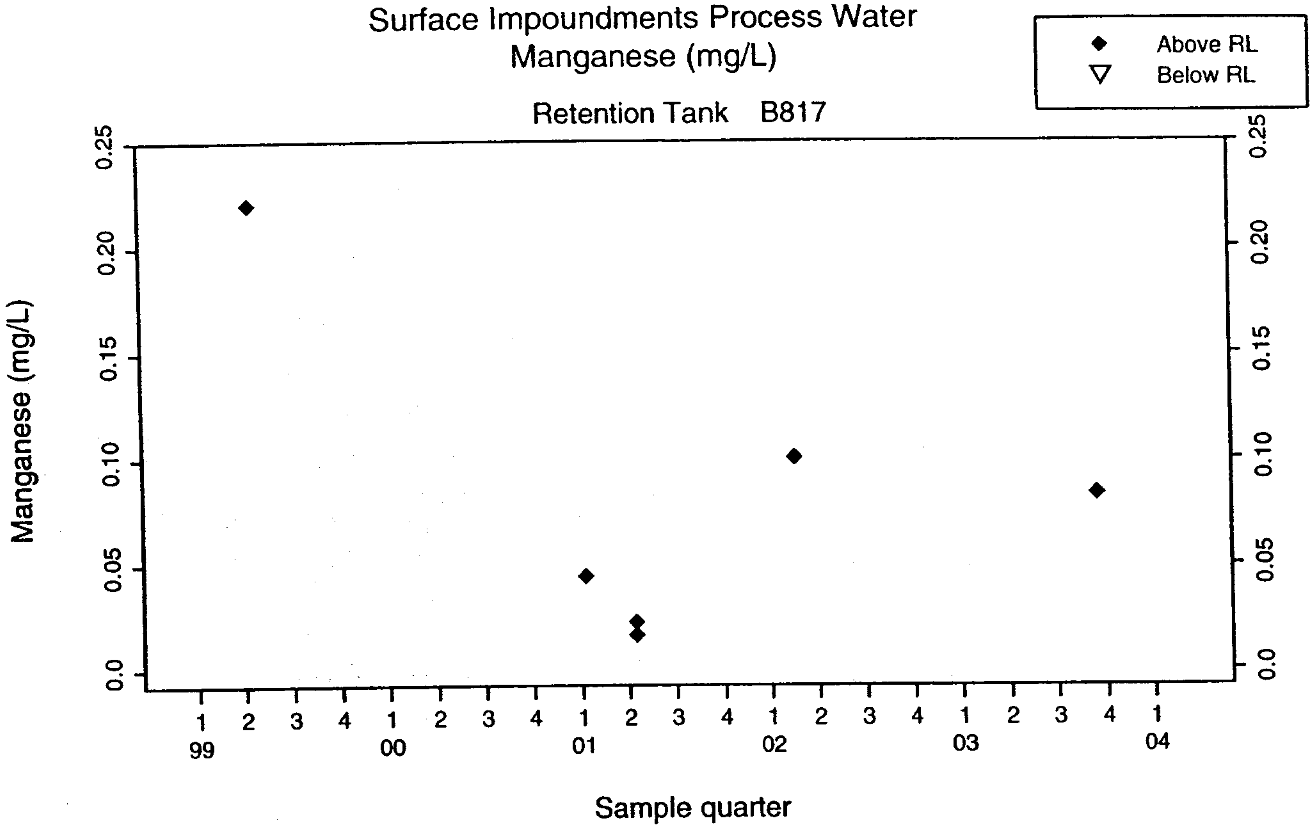

Surface Impoundments Process Water
Potassium (mg/L)
Retention Tank B851
Above RL
Below RL
Potassium (mg/L)
0
10
20
30
40
50
60
1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1
99
00
01
02
03
04
Sample quarter

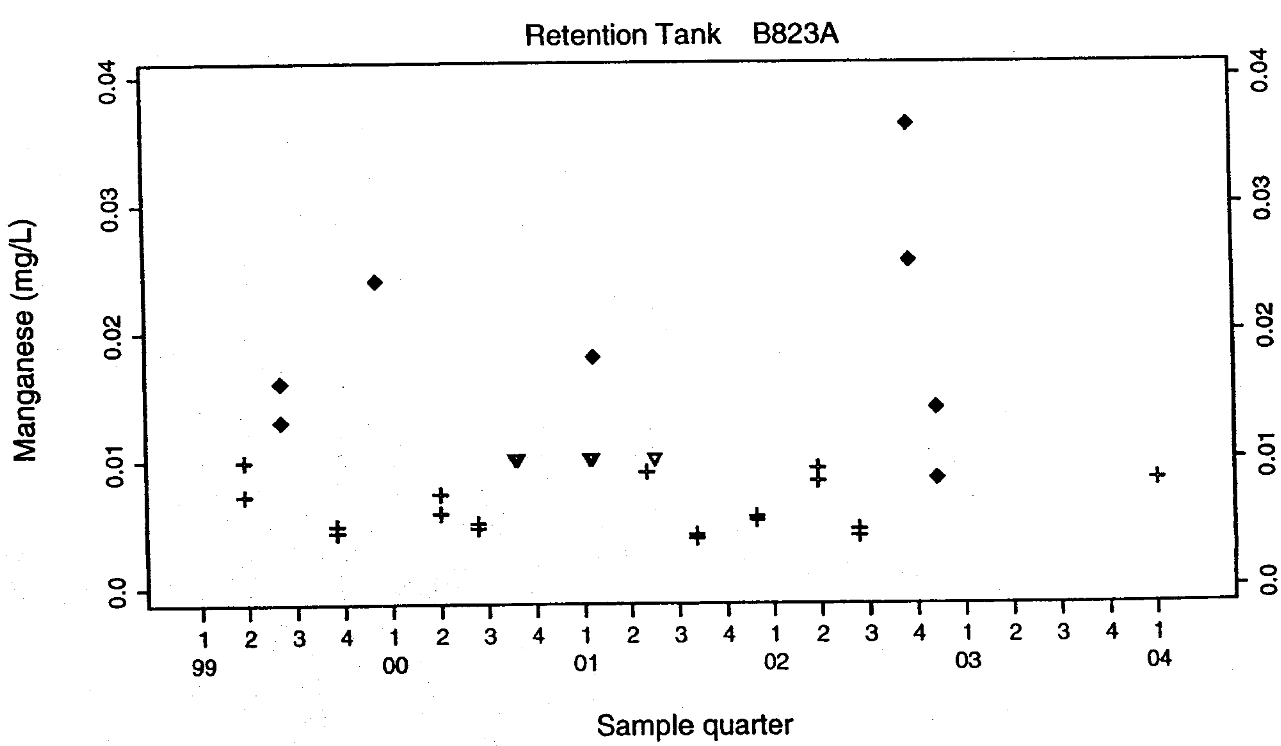
Surface Impoundments Process Water
Manganese (mg/L)



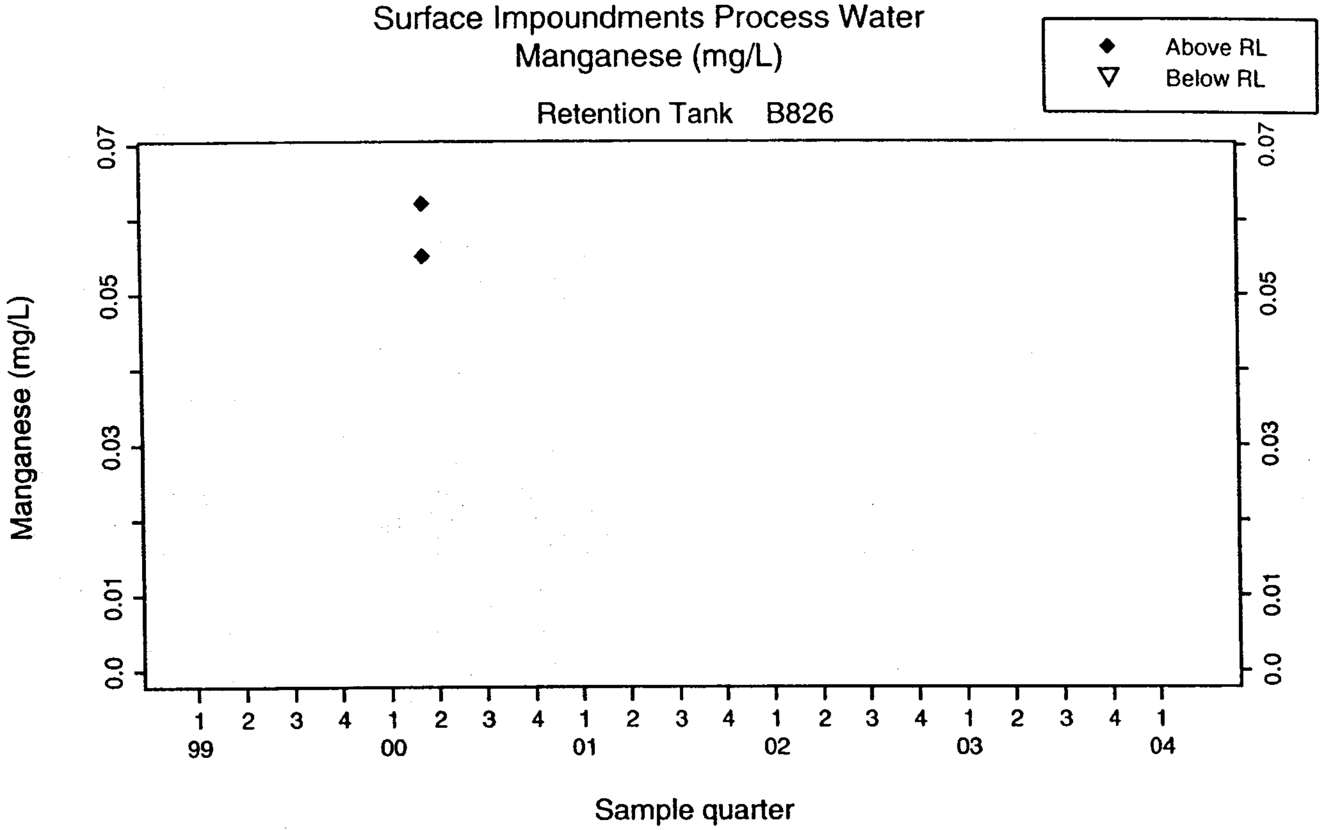


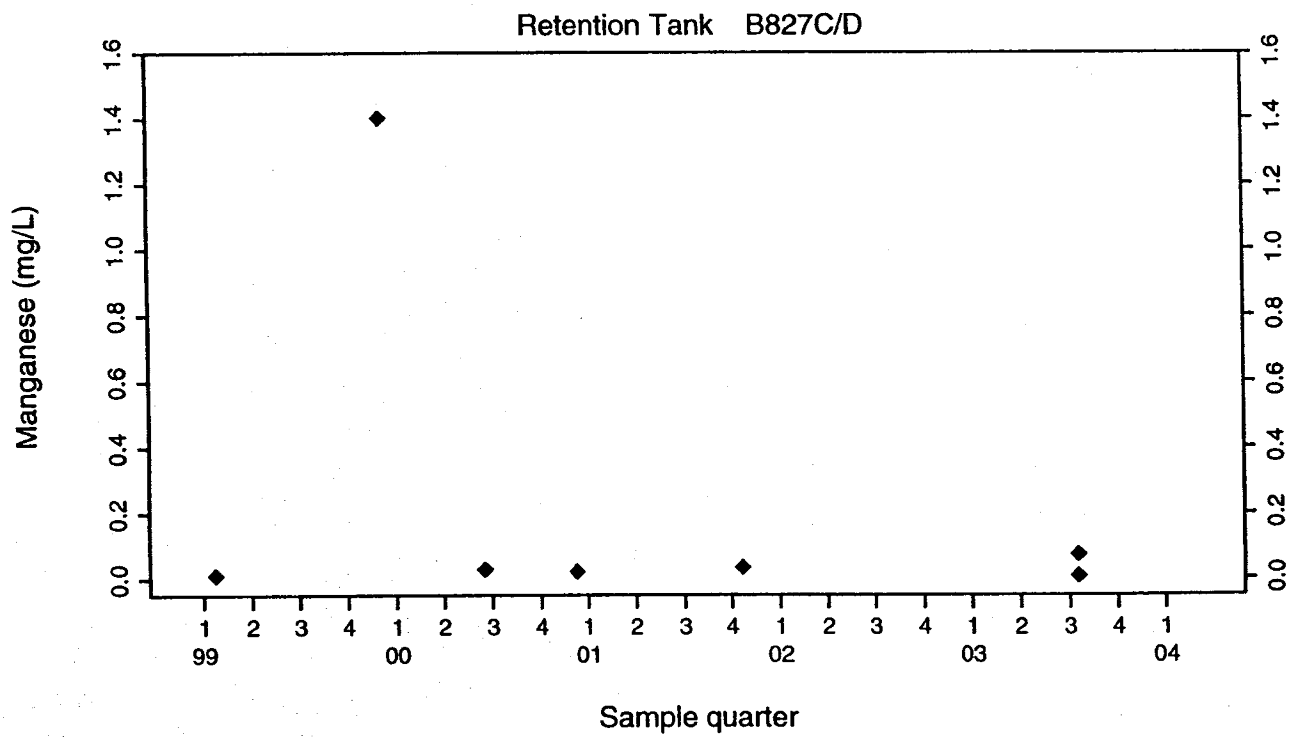
Surface Impoundments Process Water
Manganese (mg/L)



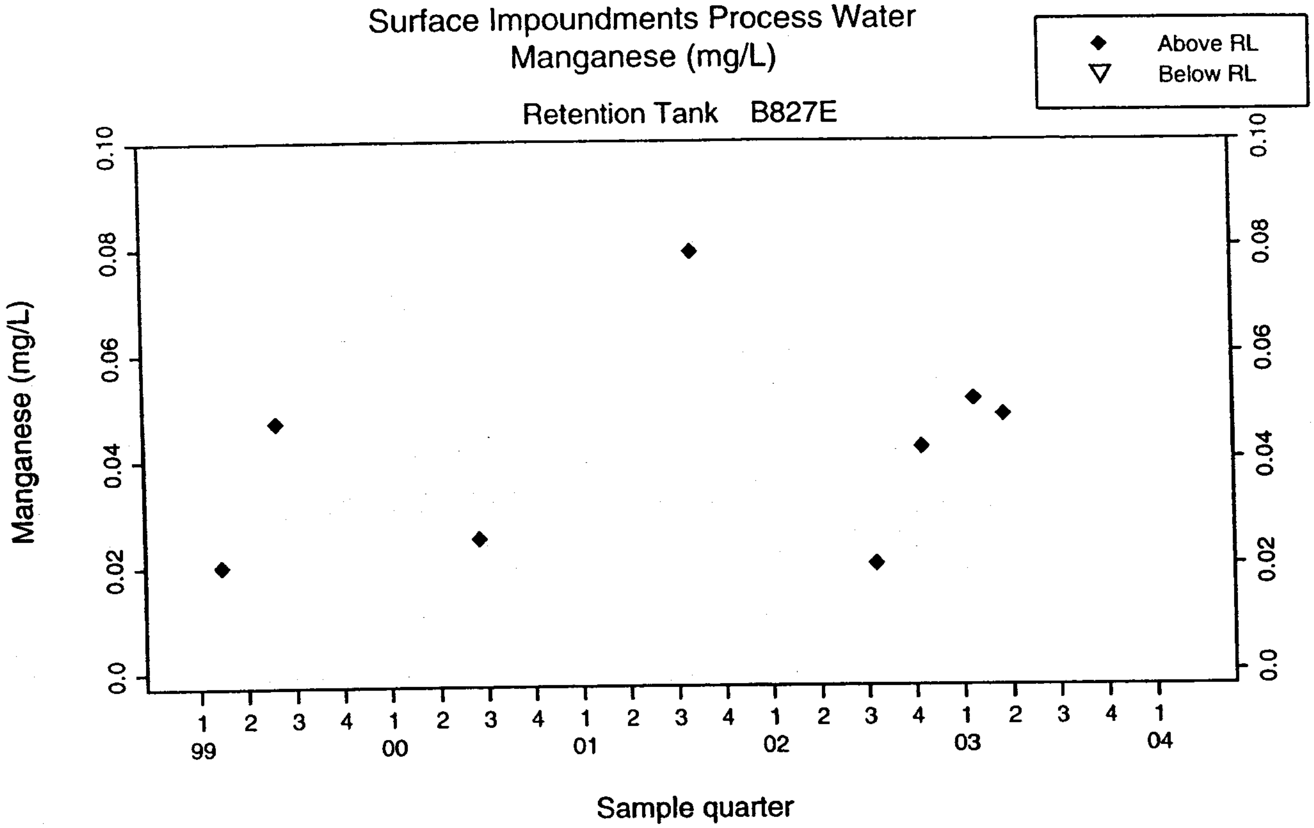


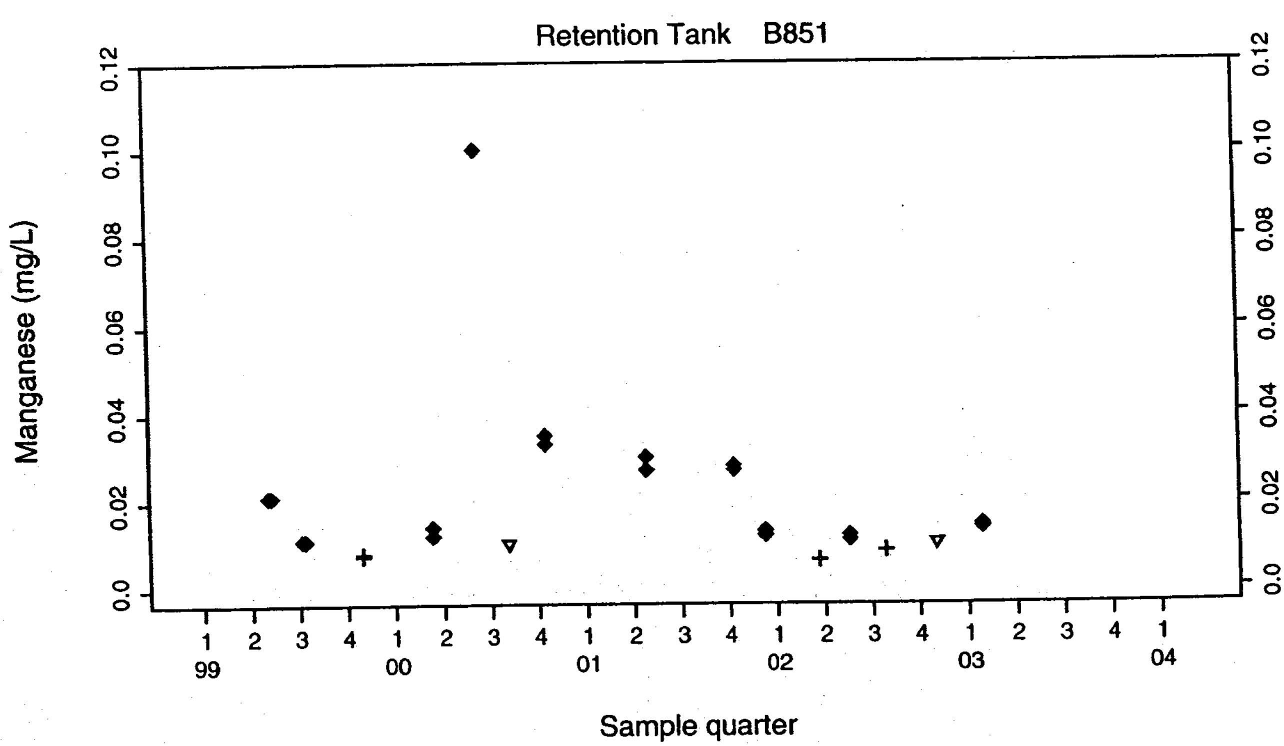
Surface Impoundments Process Water Manganese (mg/L)





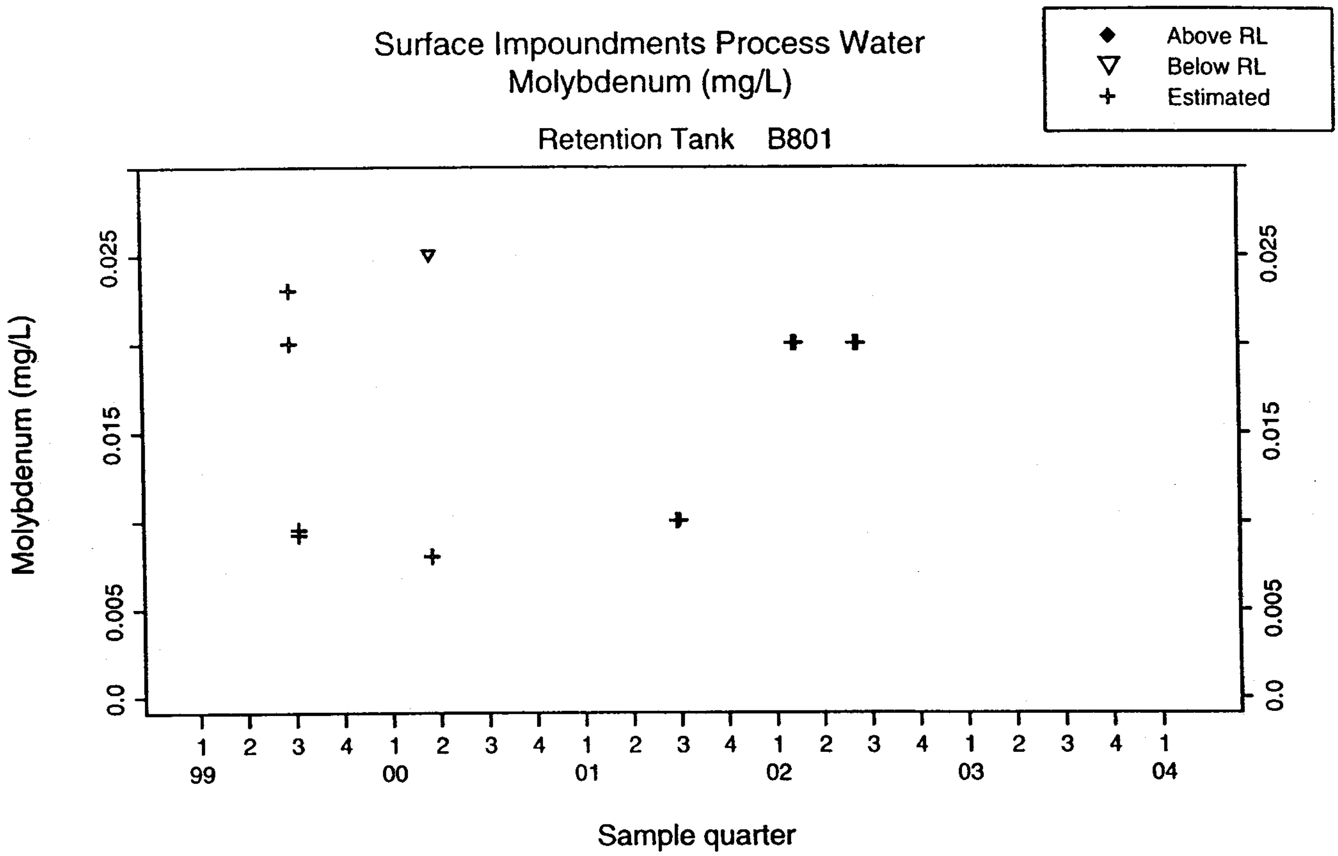
Surface Impoundments Process Water
Manganese (mg/L)



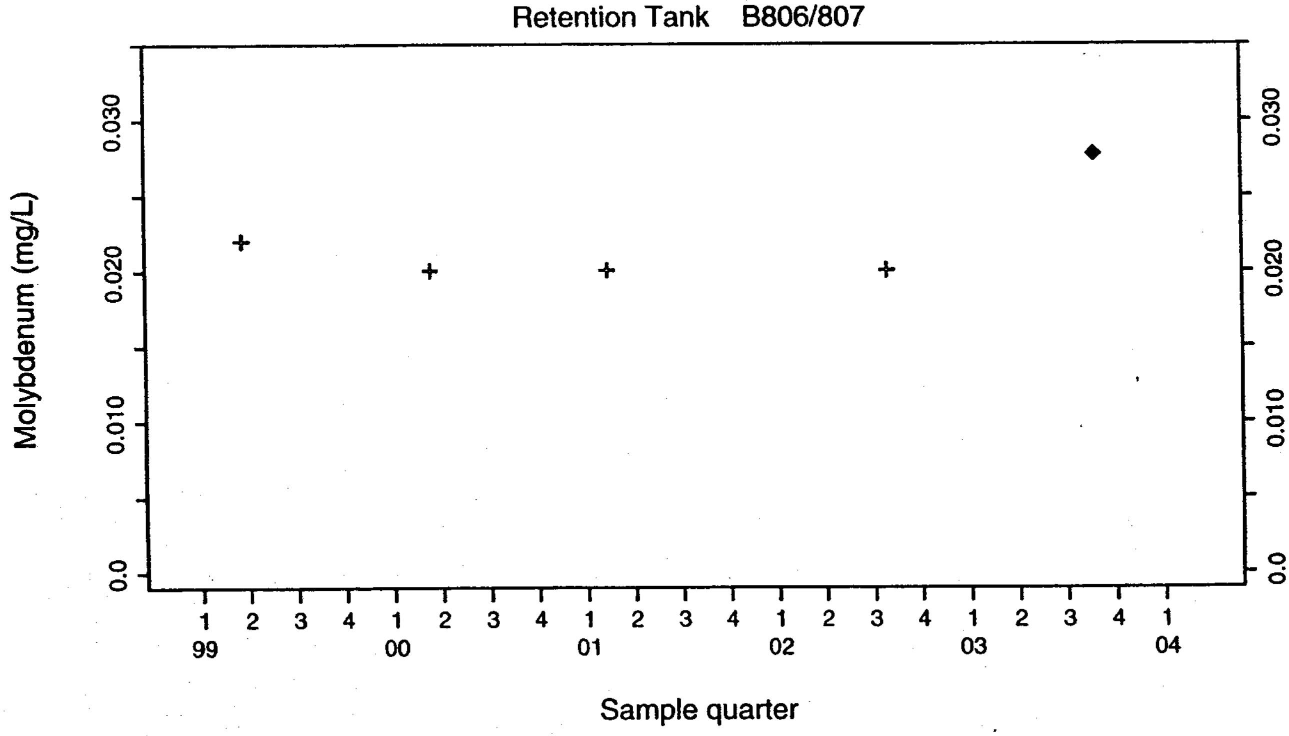


Surface Impoundments Process Water
Molybdenum (mg/L)

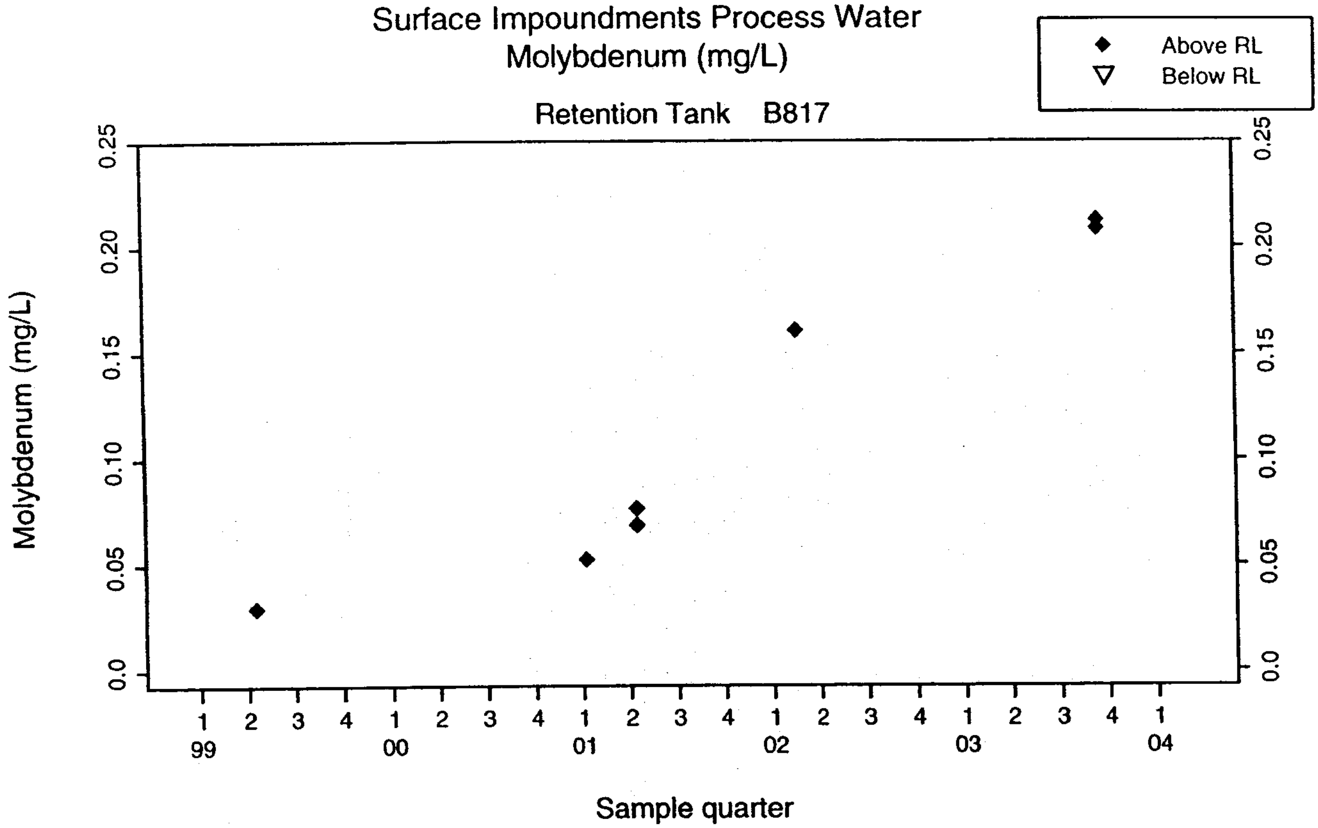
Retention Tank B801

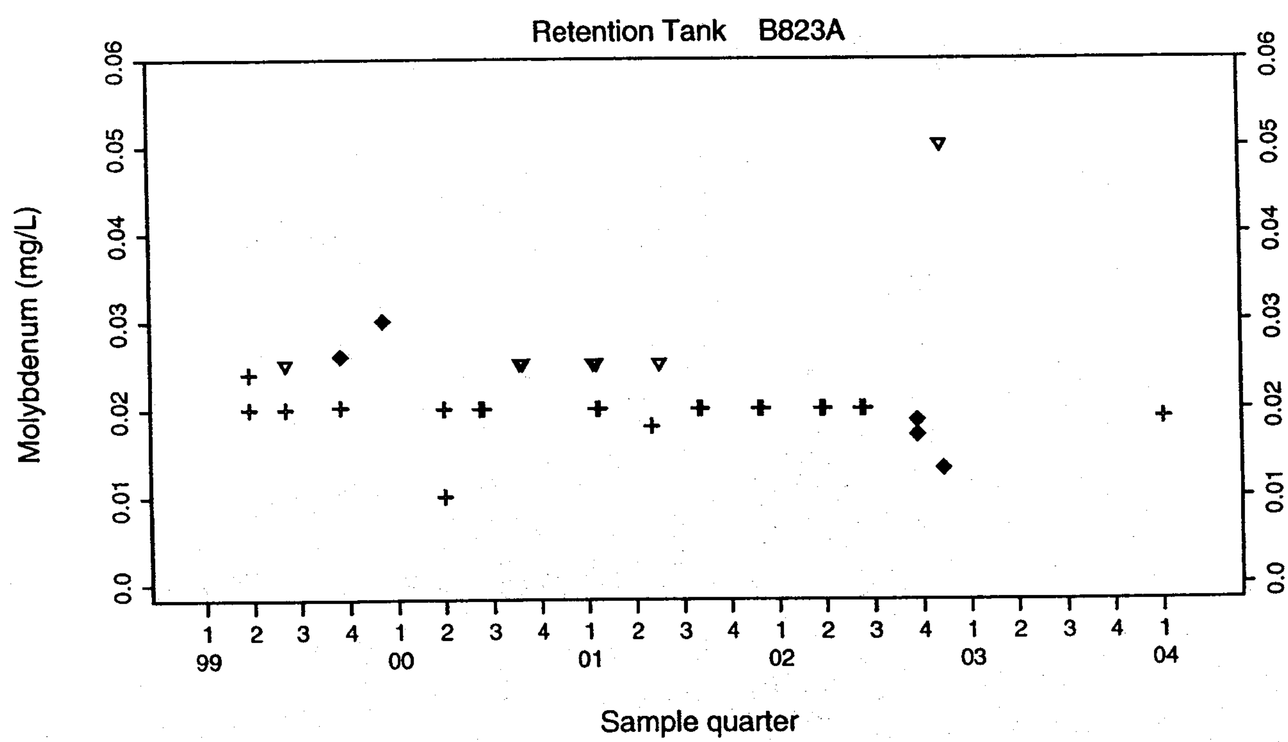


Retention Tank B806/807

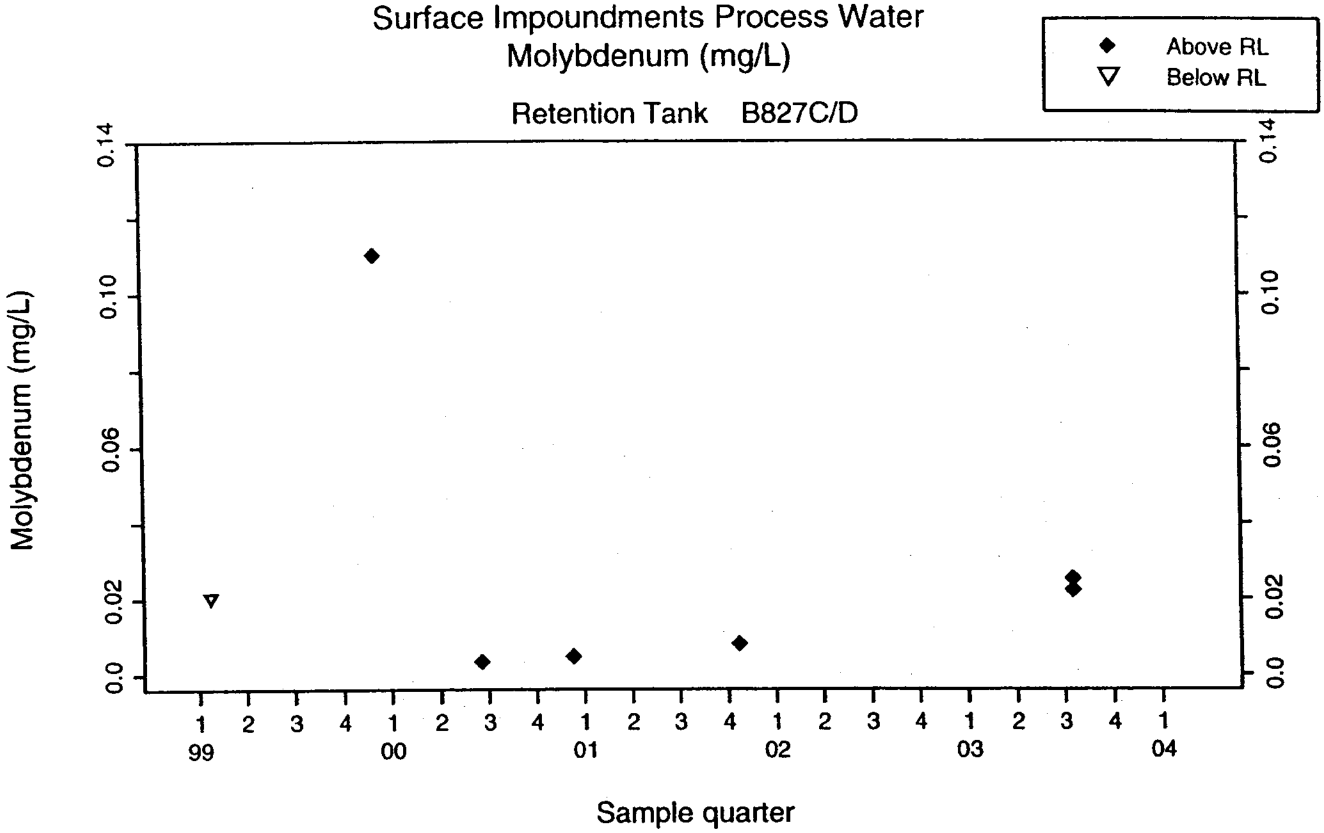


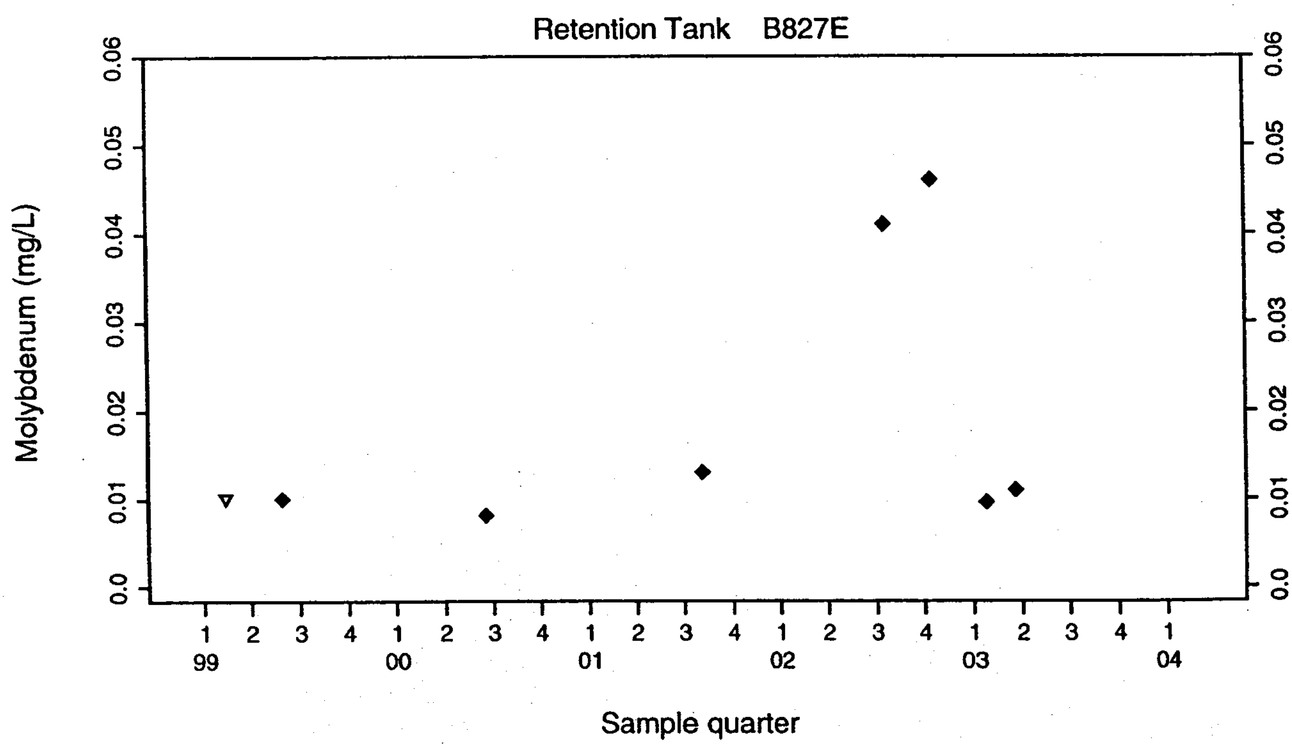
Surface Impoundments Process Water
Molybdenum (mg/L)

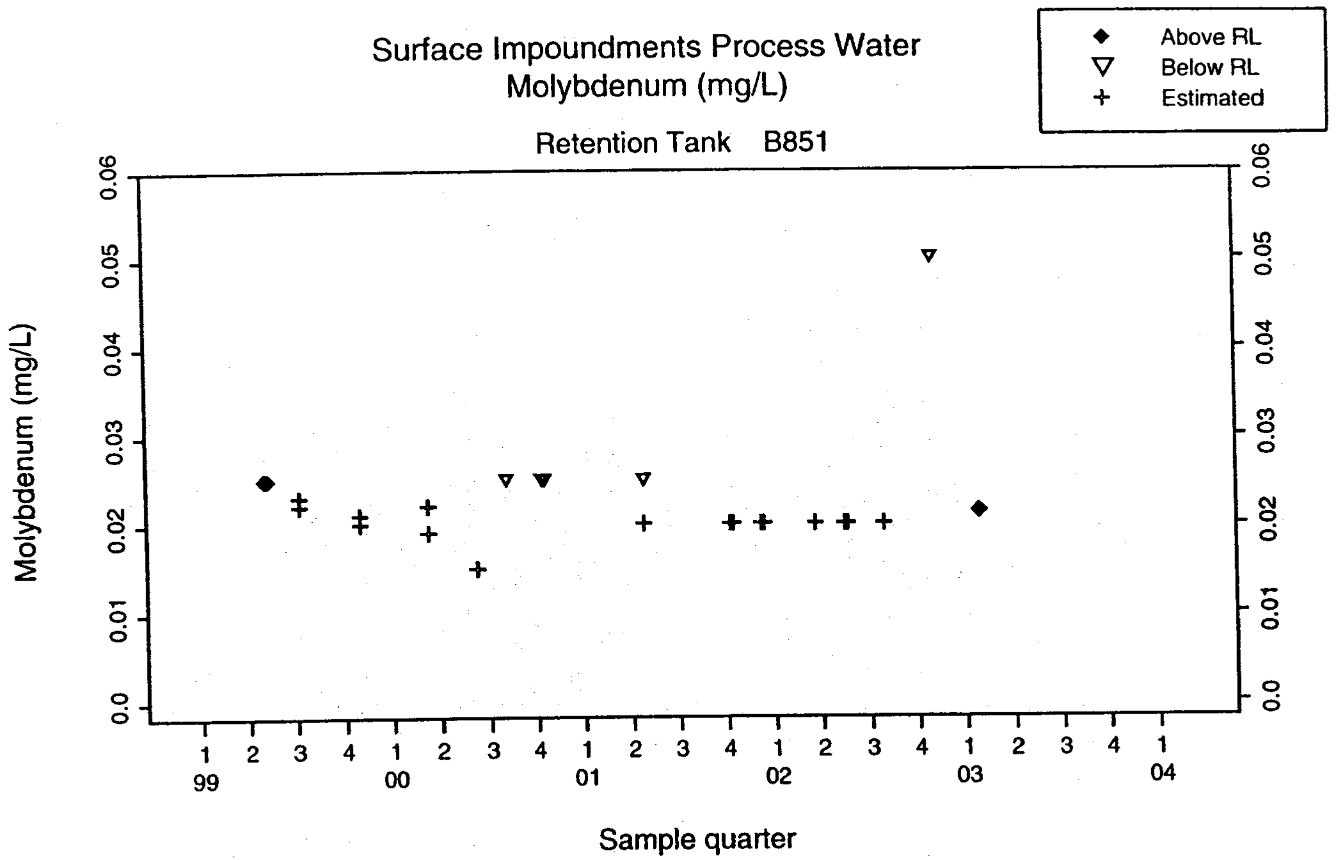


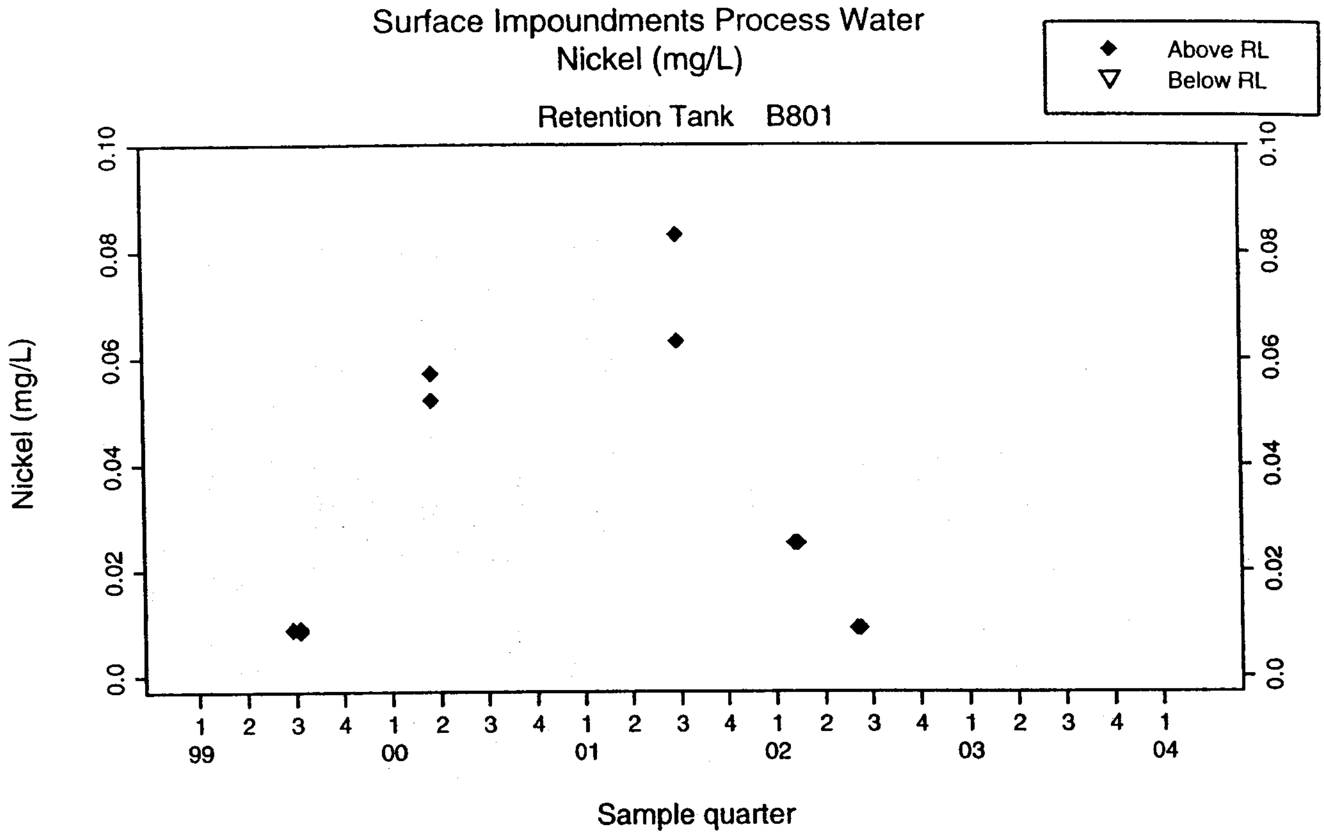


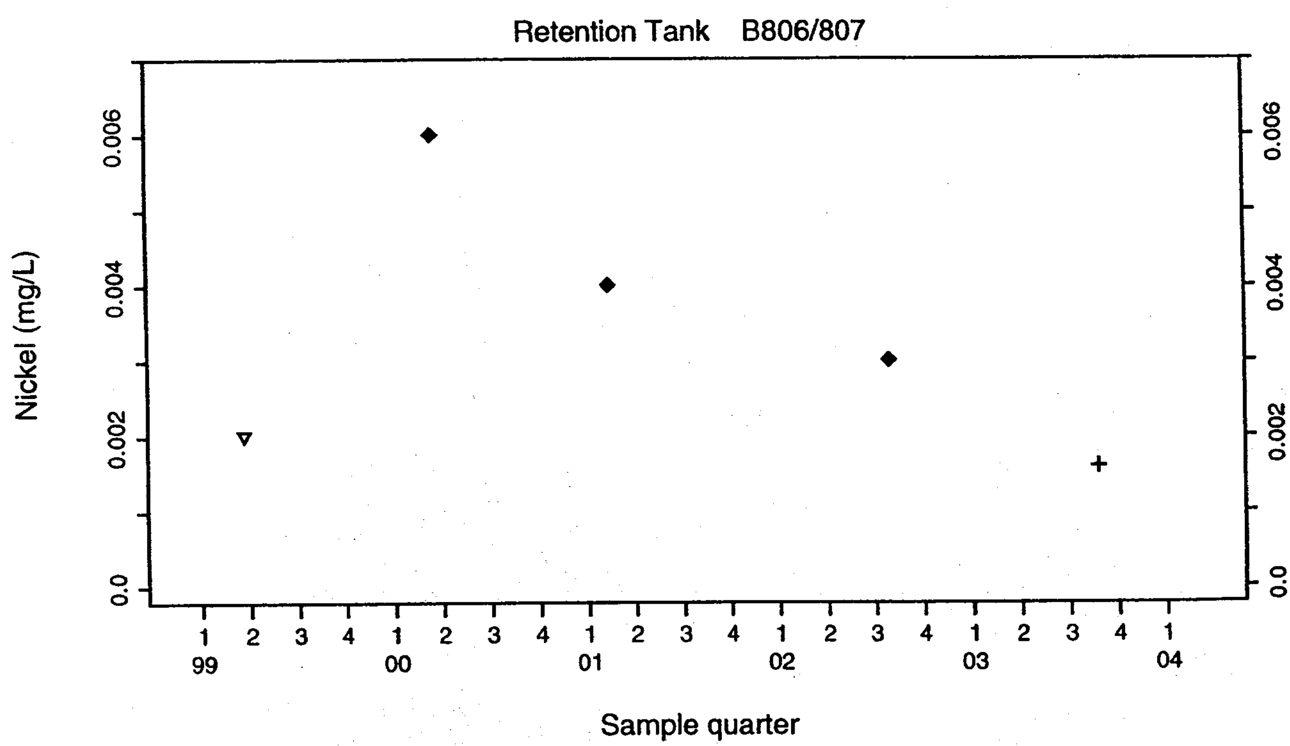
Surface Impoundments Process Water
Molybdenum (mg/L)






Surface Impoundments Process Water
Molybdenum (mg/L)
Retention Tank B851
Above RL
Below RL
Estimated
Molybdenum (mg/L)
0.0
0.01
0.02
0.03
0.04
0.05
0.06
1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1
99 00 01 02 03 04
Sample quarter

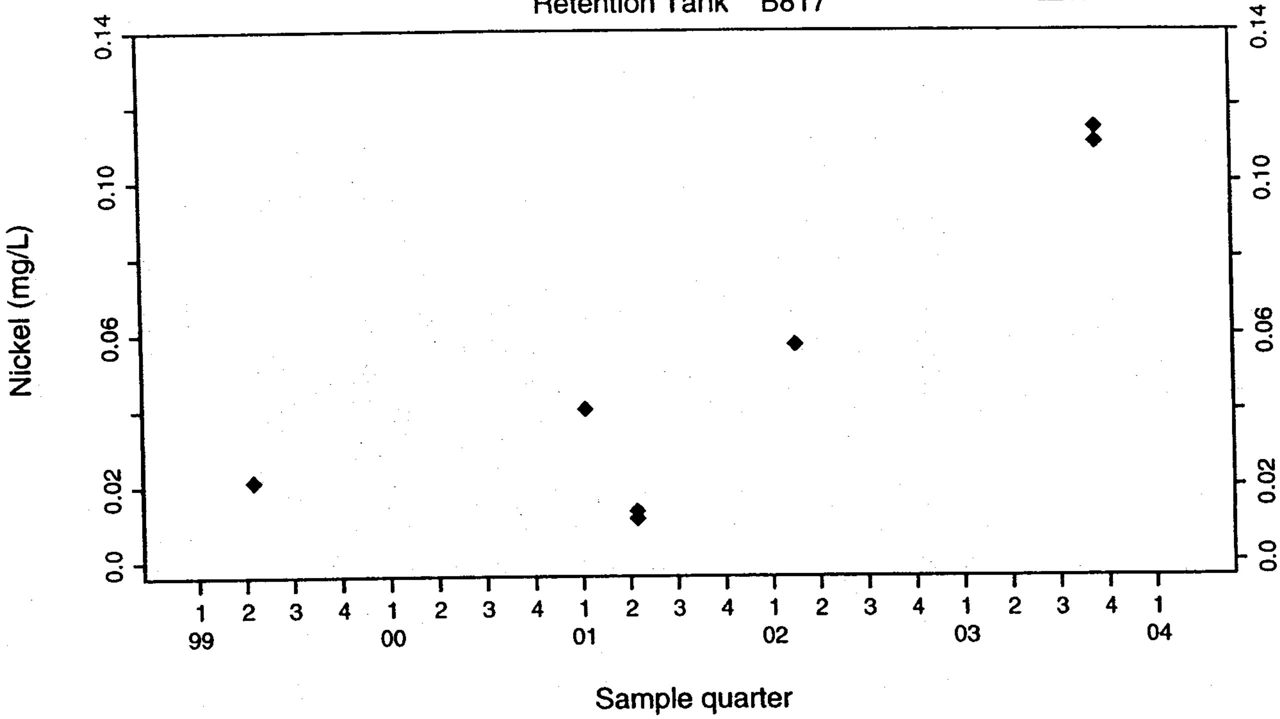

Surface Impoundments Process Water
Nickel (mg/L)
Above RL
Below RL
Retention Tank B801
Nickel (mg/L)
0.0
0.02
0.04
0.06
0.08
0.10
1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1
99 00 01 02 03 04
Sample quarter


Retention Tank B806/807
Nickel (mg/L)
0.0
0.002
0.004
0.006
1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1
99 00 01 02 03 04
Sample quarter

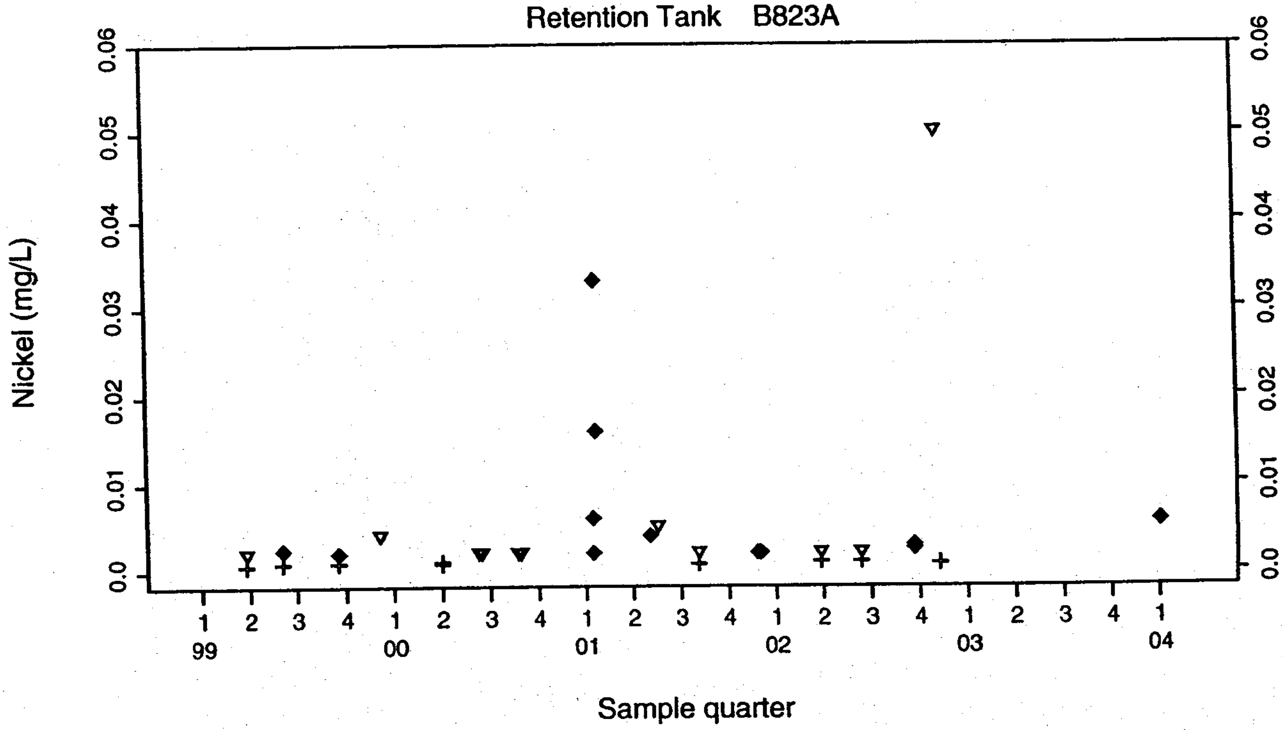
Surface Impoundments Process Water
Nickel (mg/L)

◆ Above RL
▽ Below RL

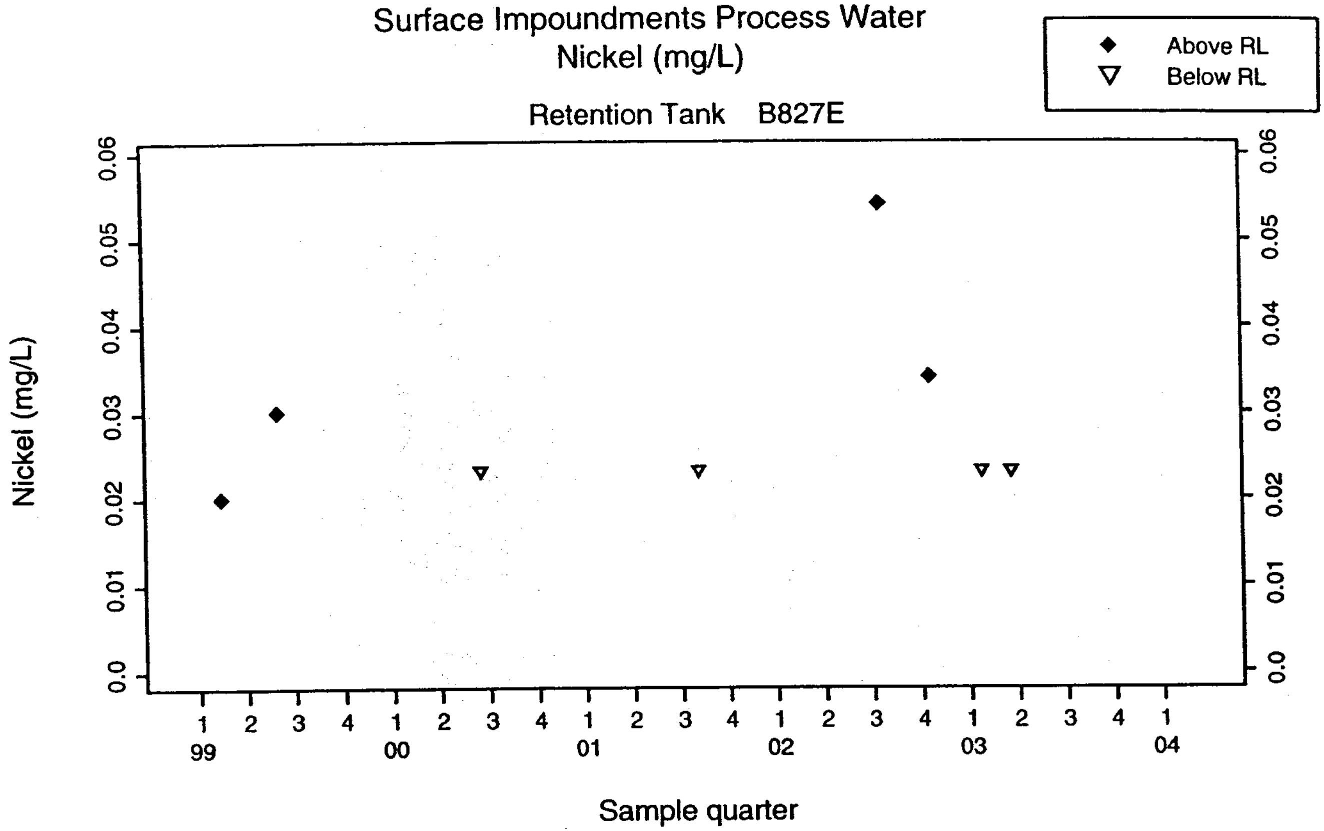
Retention Tank B817

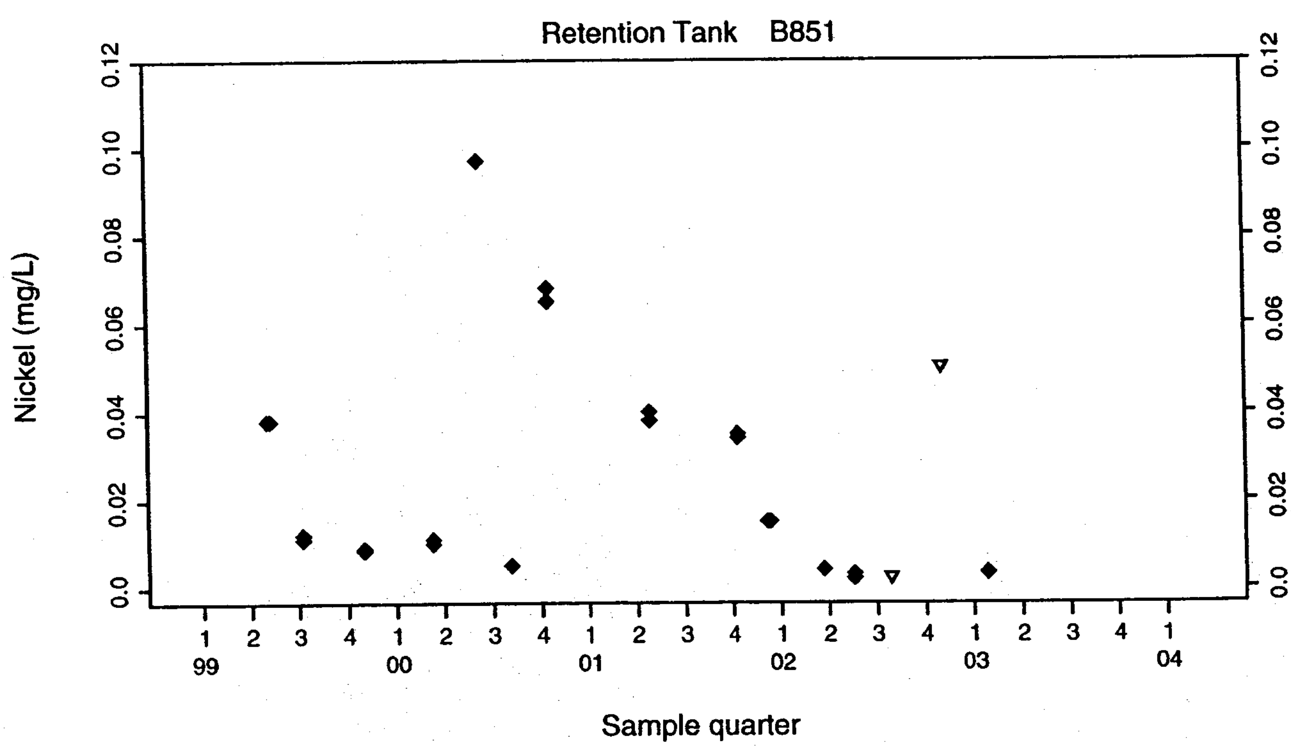


Retention Tank B823A

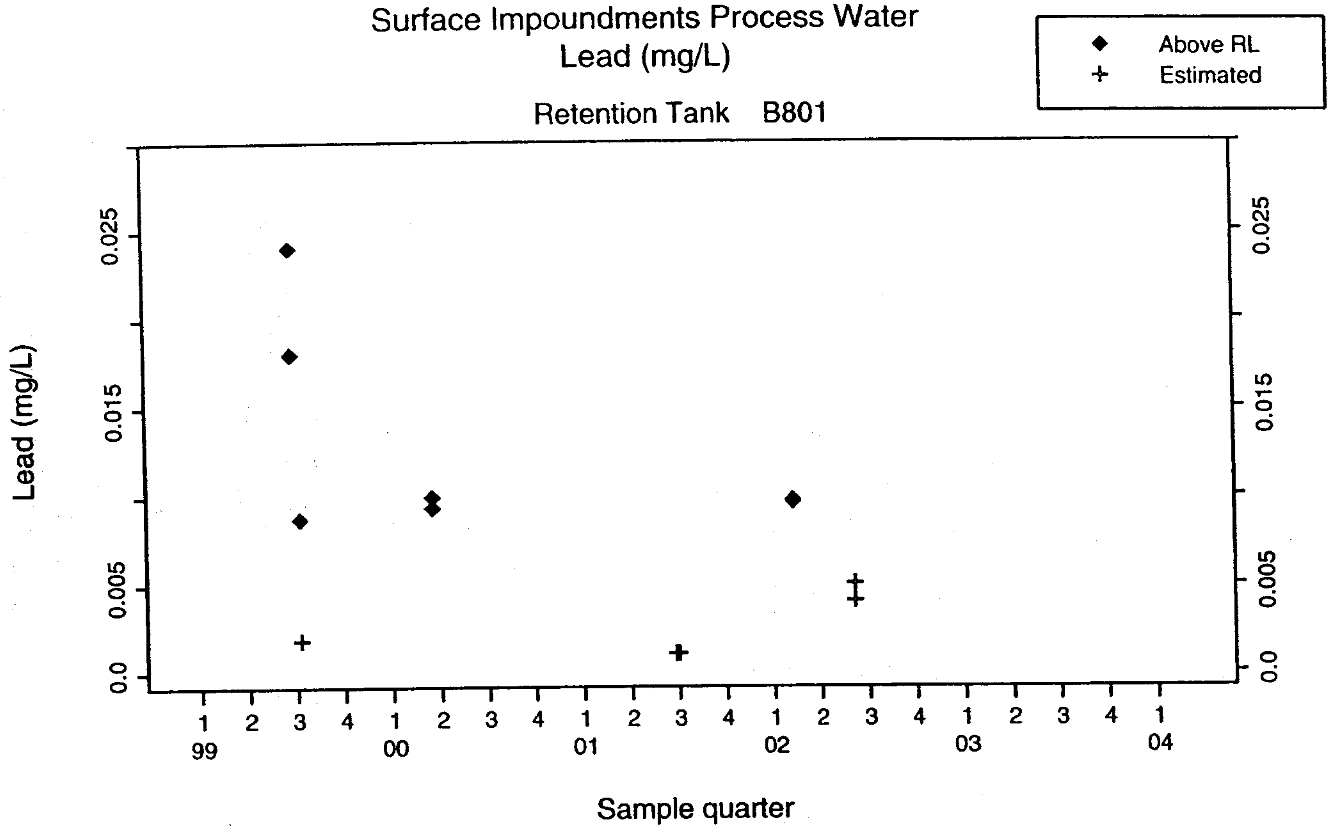


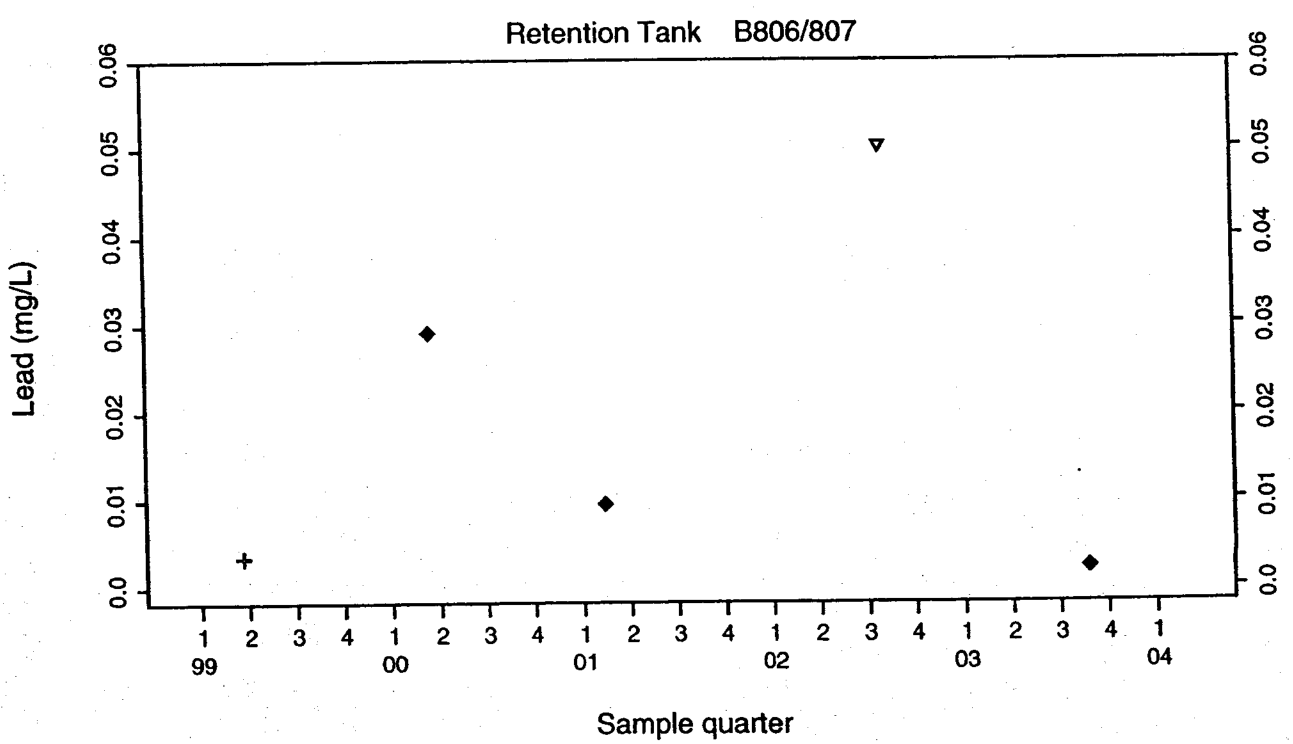
Surface Impoundments Process Water
Nickel (mg/L)



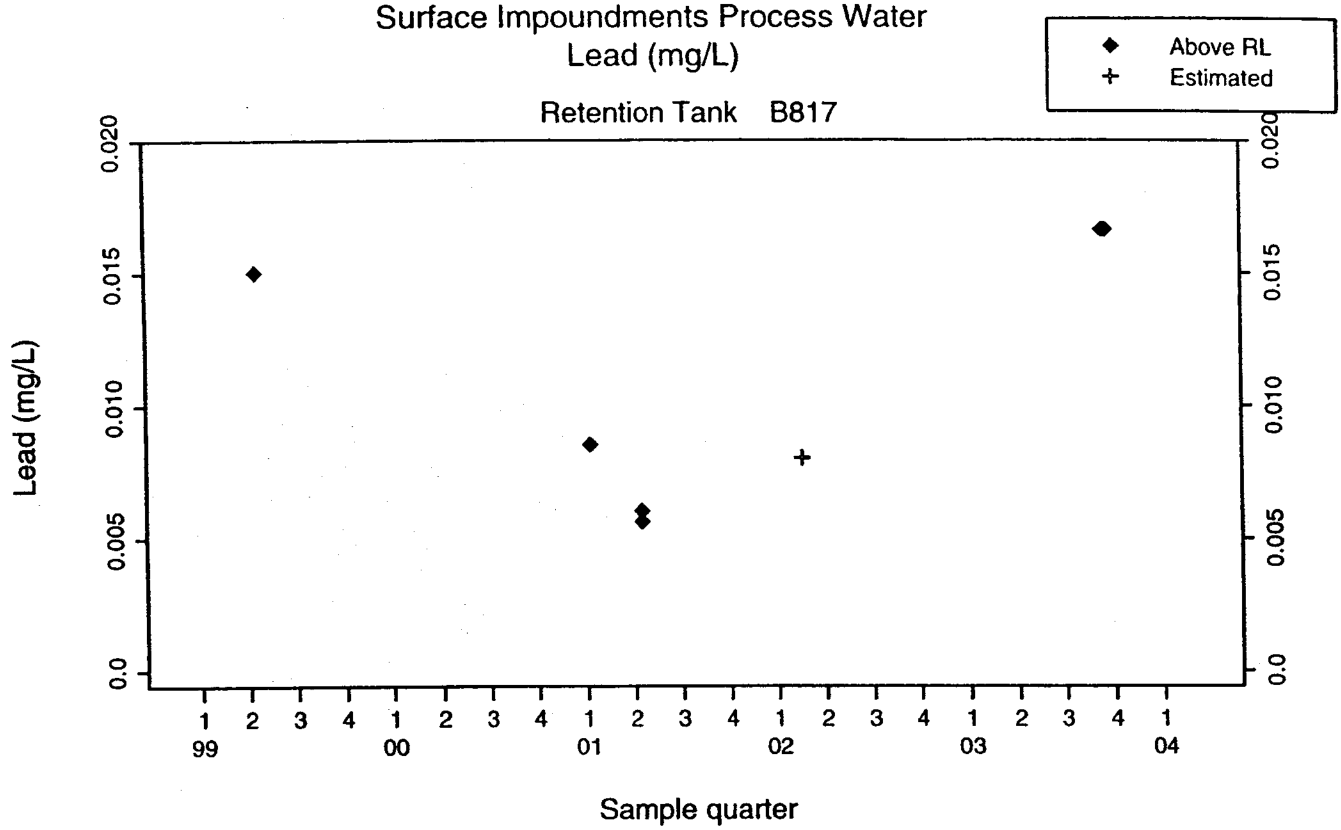


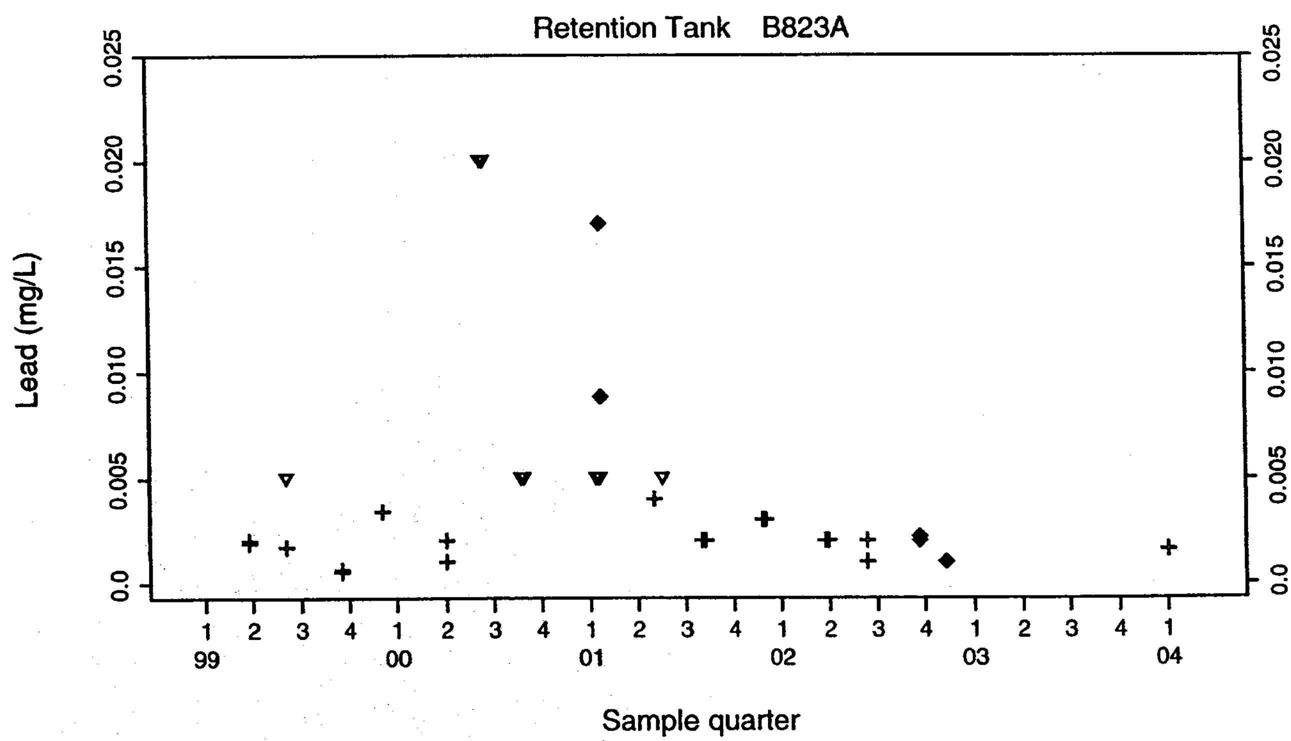
Surface Impoundments Process Water
Lead (mg/L)



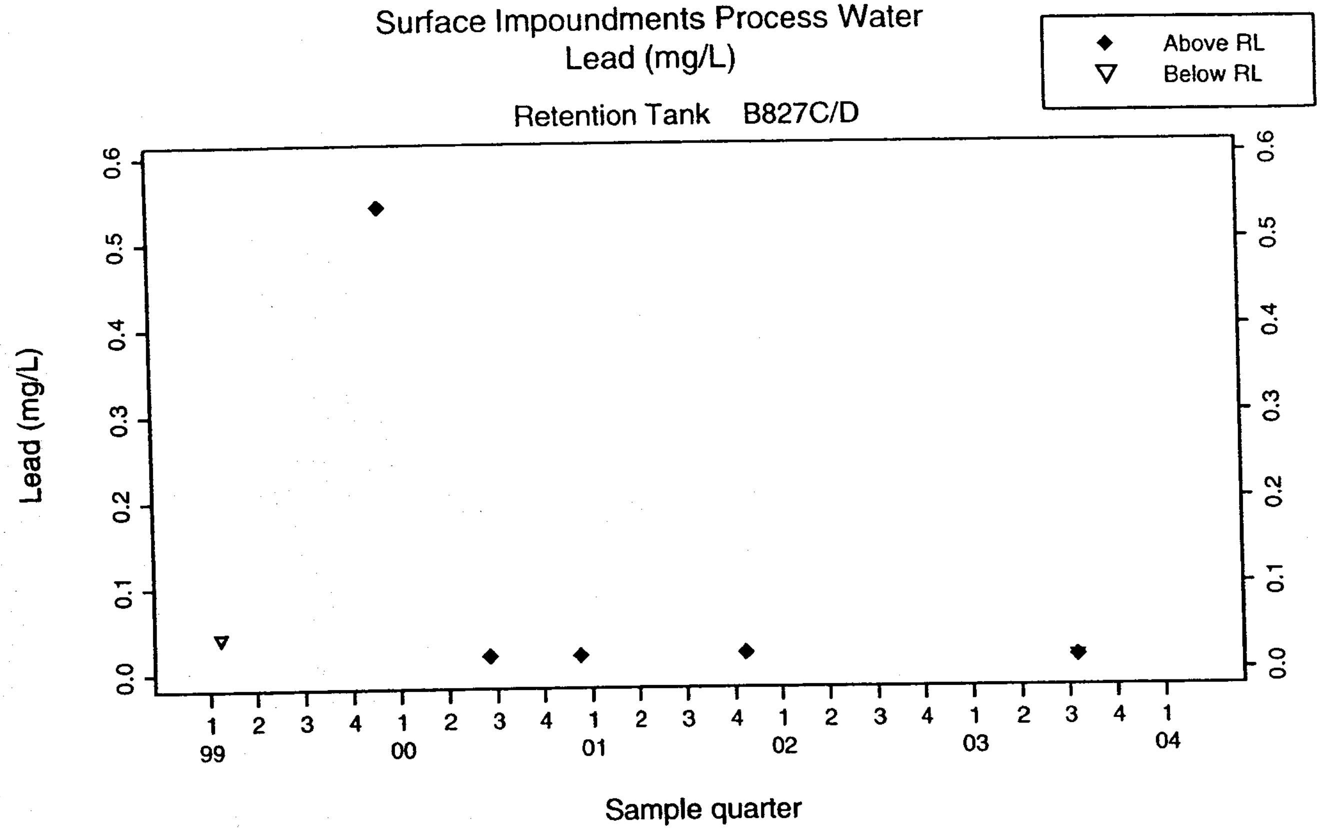


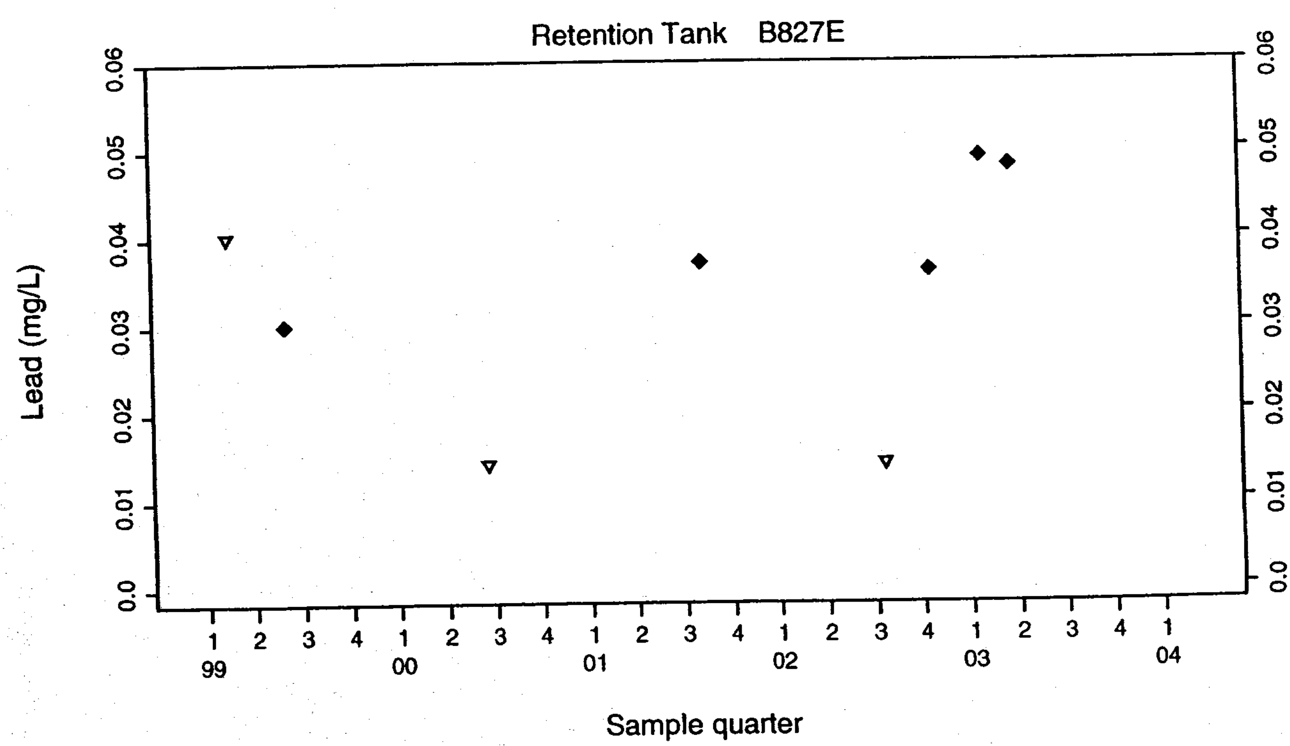
Surface Impoundments Process Water
Lead (mg/L)

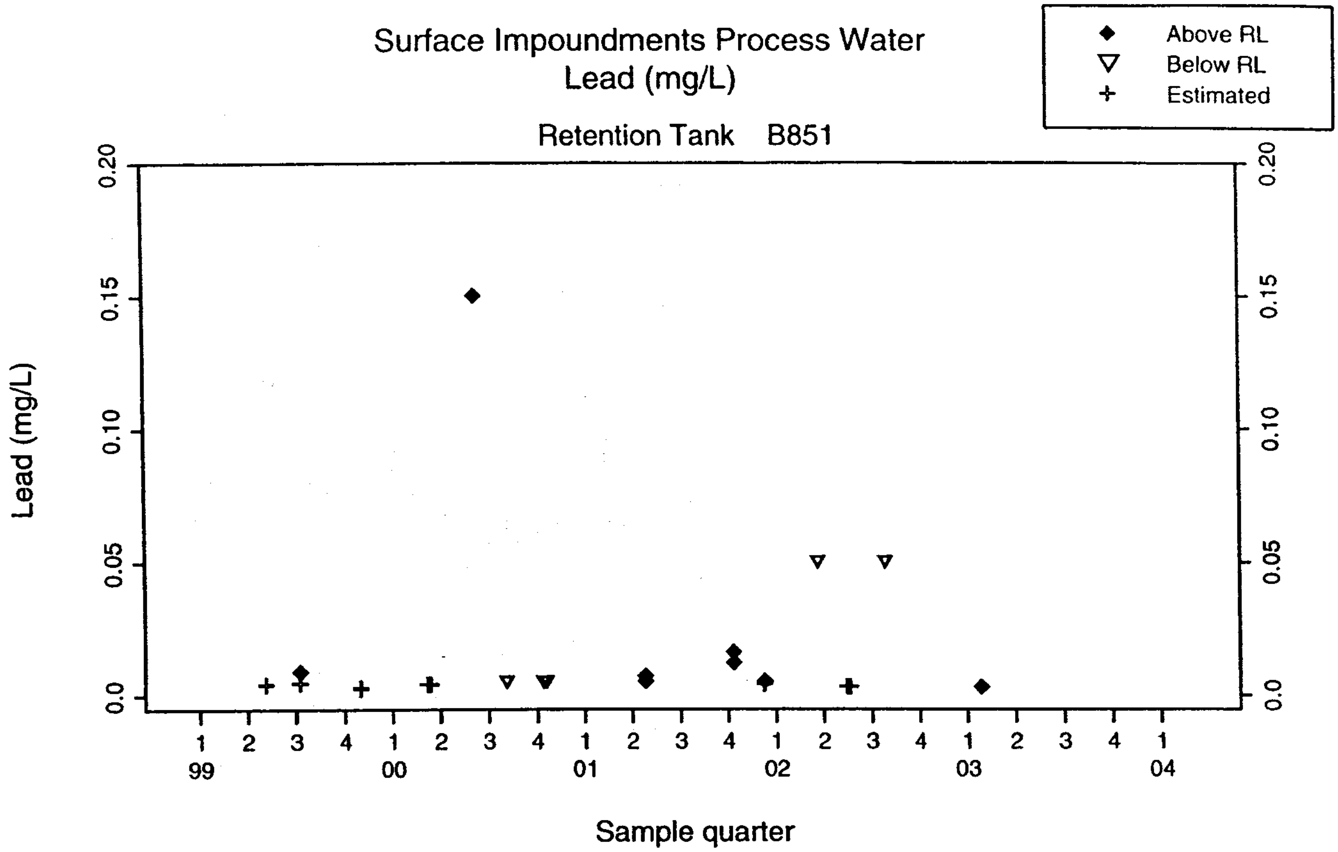




Surface Impoundments Process Water
Lead (mg/L)



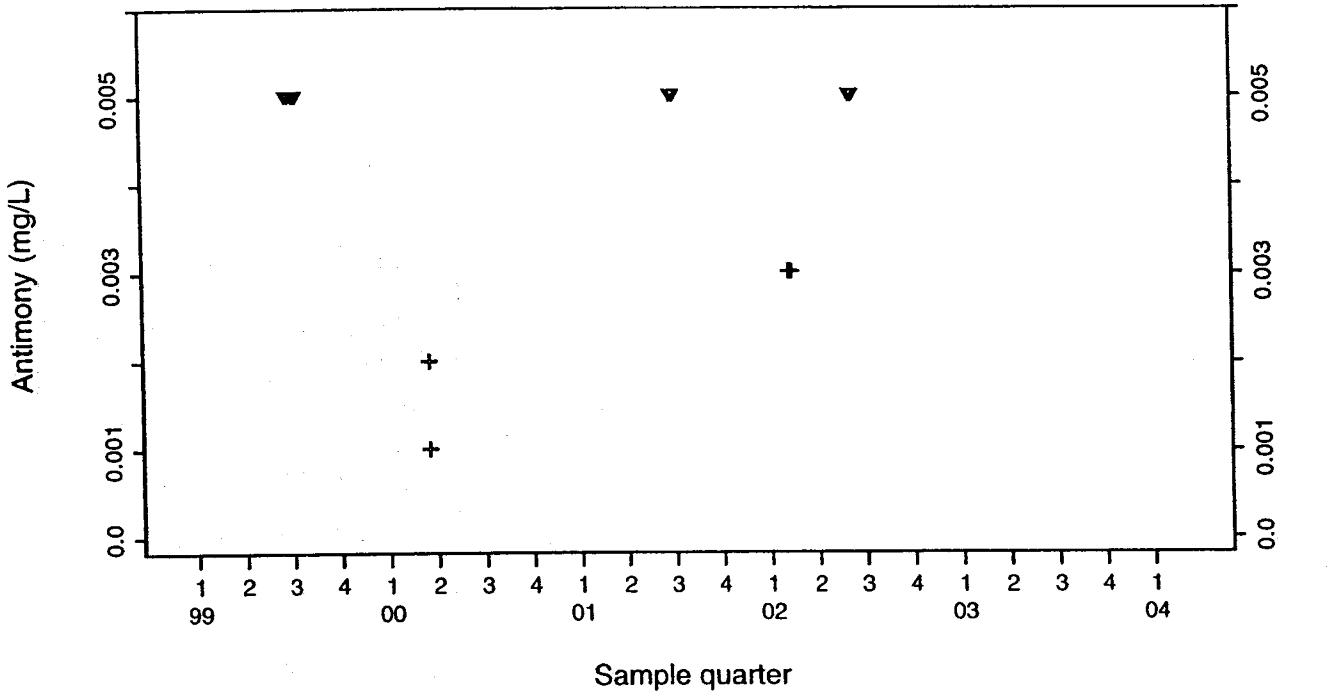



Surface Impoundments Process Water
Lead (mg/L)
Retention Tank B851
Above RL
Below RL
Estimated
Lead (mg/L)
0.0
0.05
0.10
0.15
0.20
1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1
99
00
01
02
03
04
Sample quarter

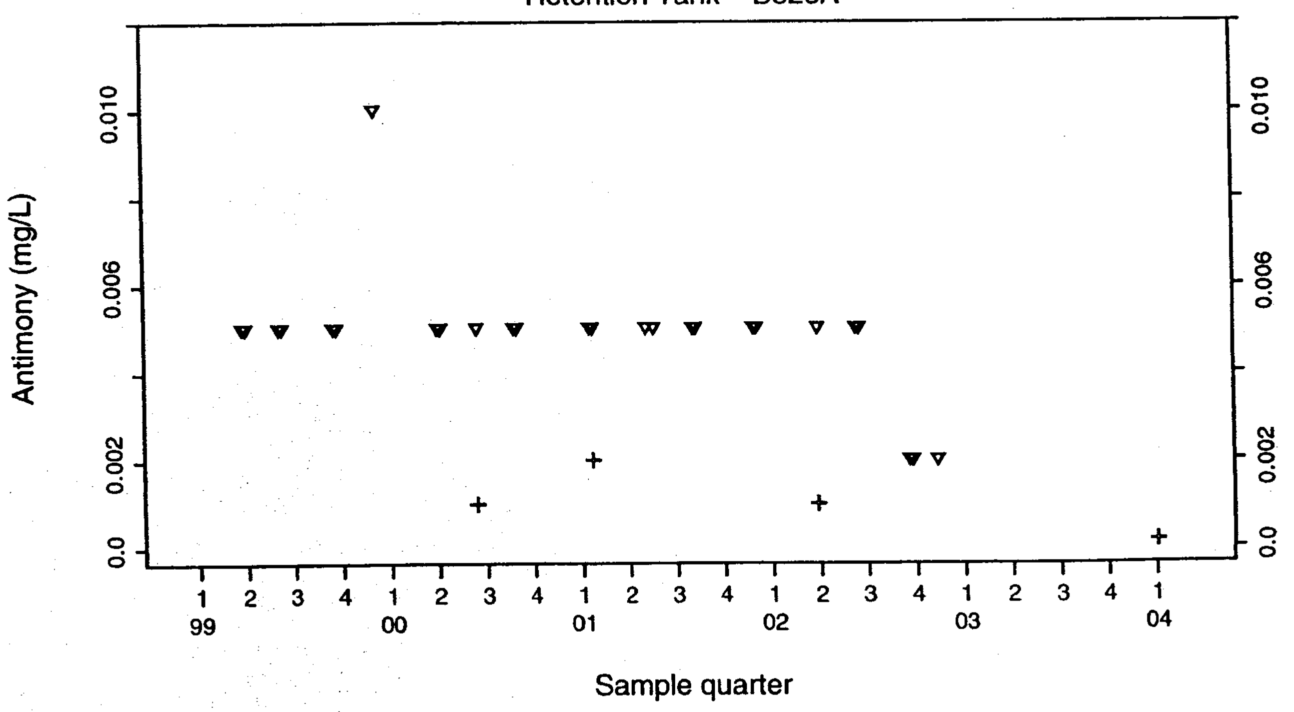
Surface Impoundments Process Water
Antimony (mg/L)

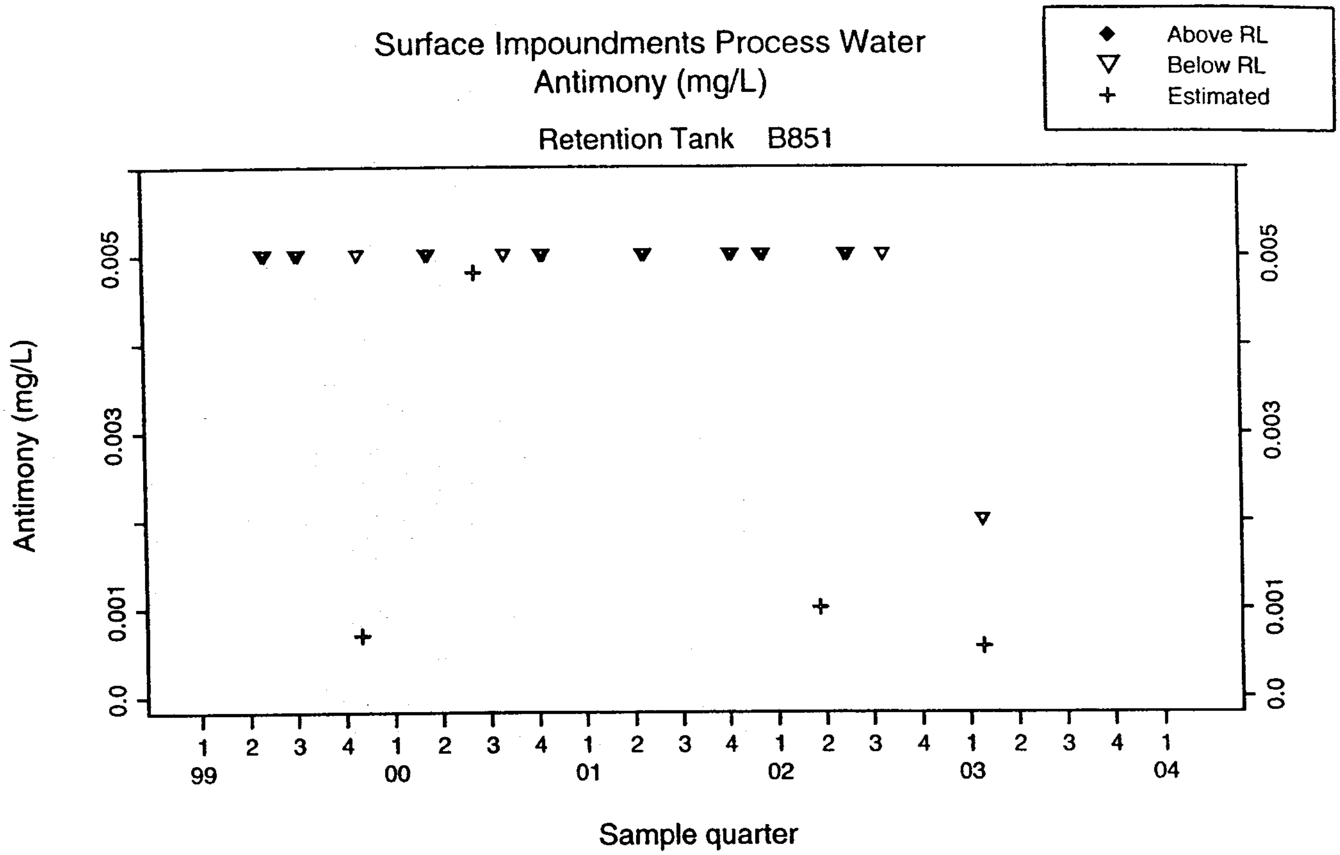
◆ Above RL
▽ Below RL
+ Estimated

Retention Tank B801

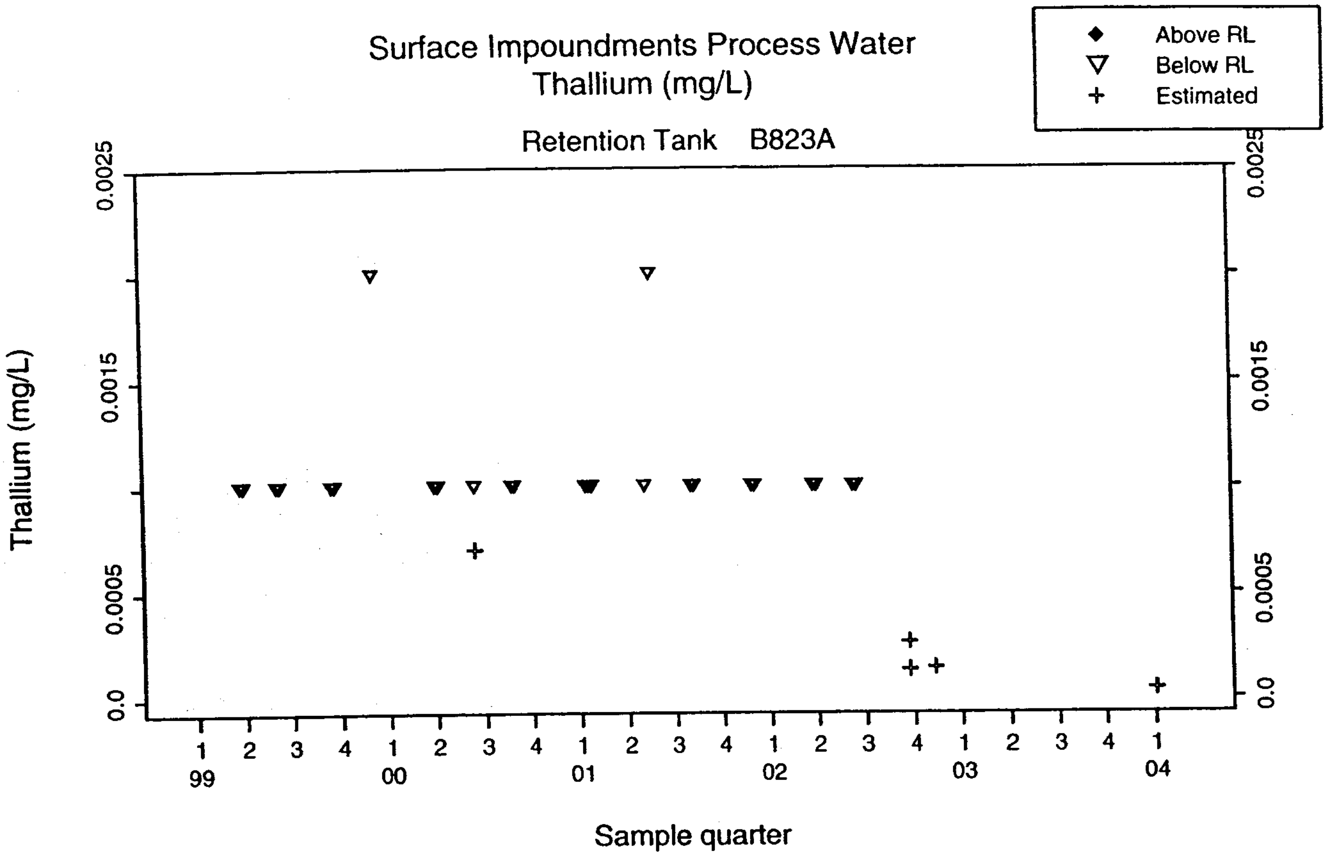


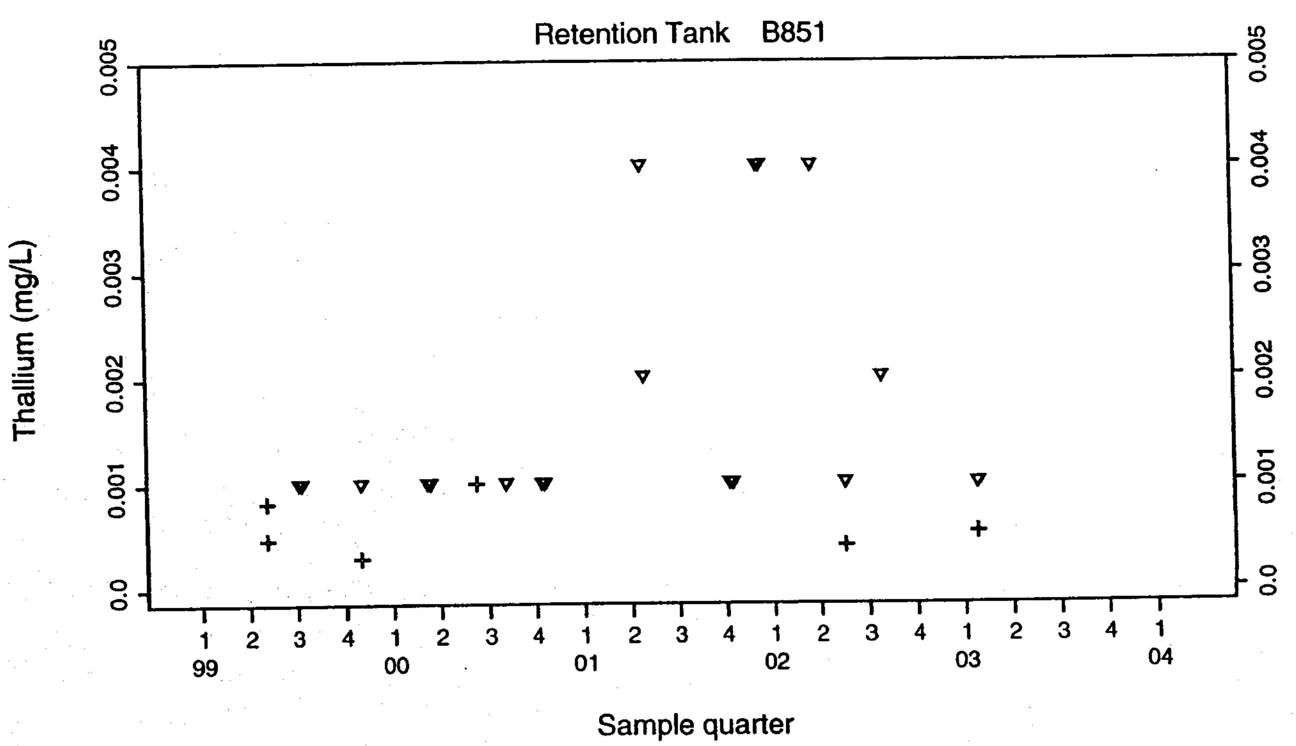
Retention Tank B823A



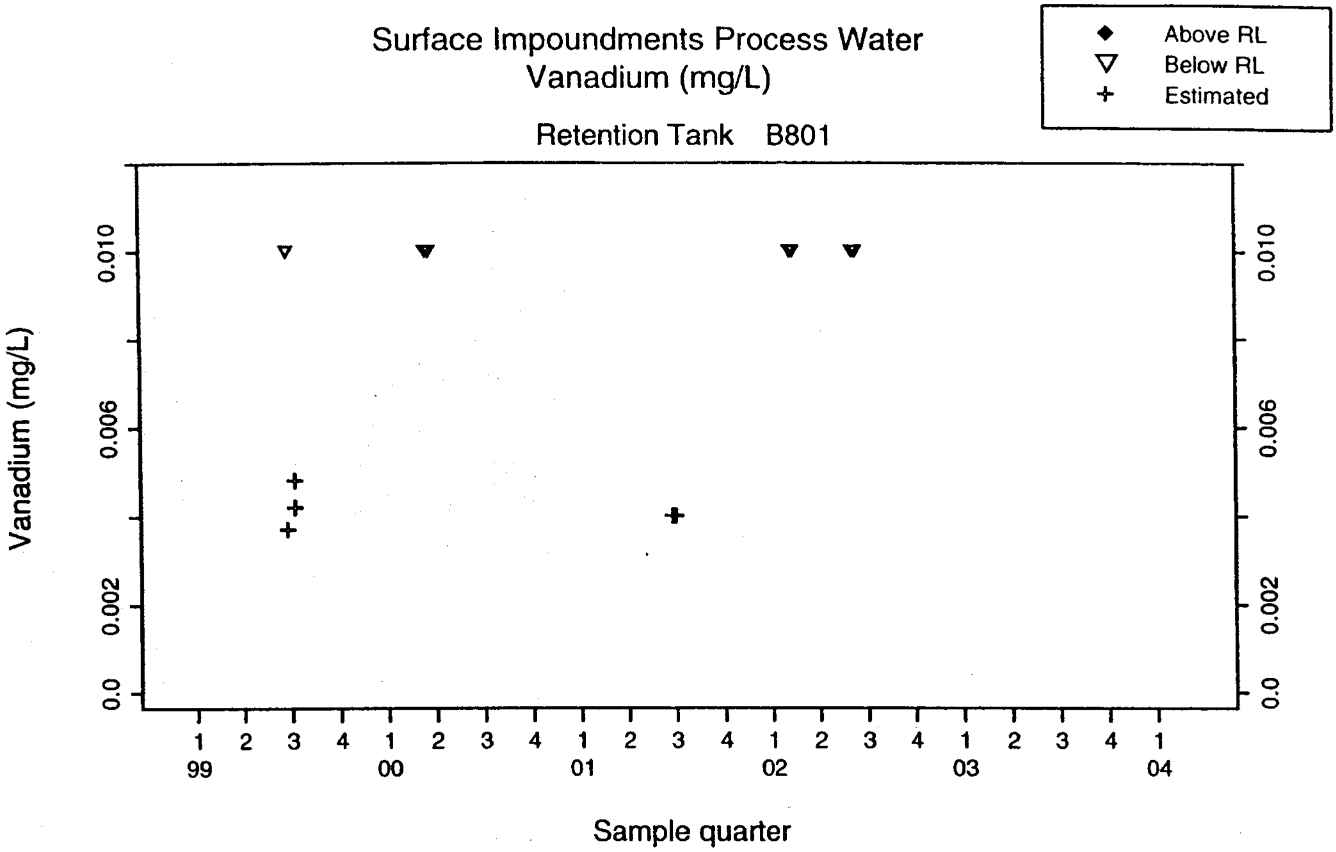

Surface Impoundments Process Water
Antimony (mg/L)
Retention Tank B851
Above RL
Below RL
Estimated
Antimony (mg/L)
0.0
0.001
0.003
0.005
1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1
99
00
01
02
03
04
Sample quarter

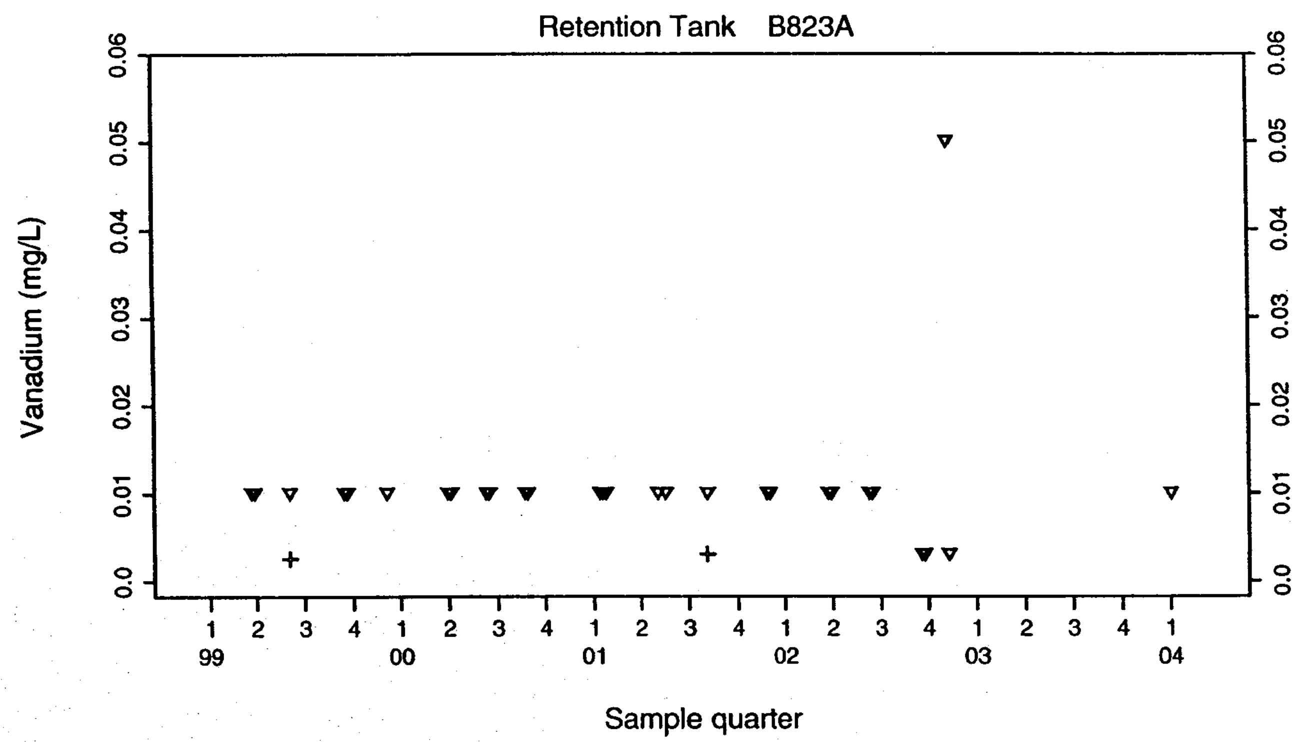
Surface Impoundments Process Water Thallium (mg/L)



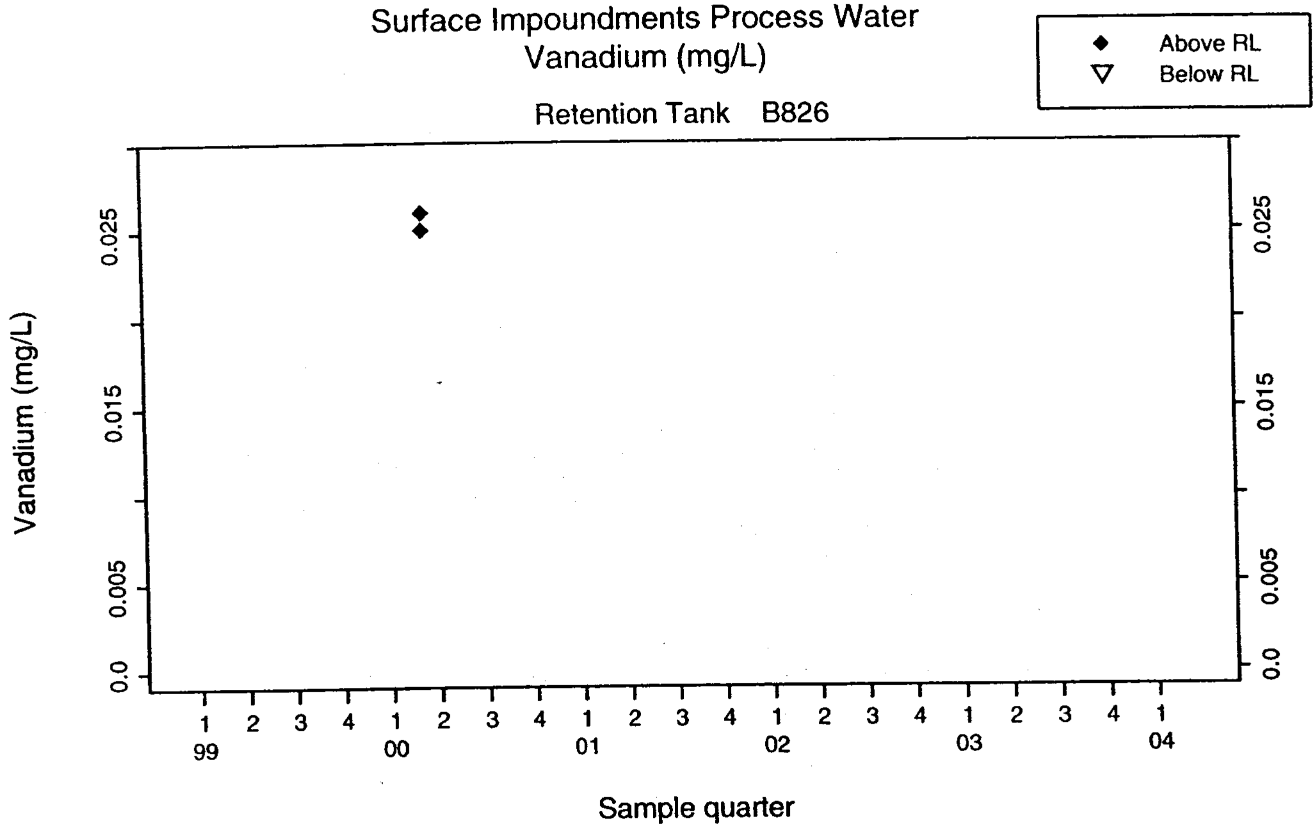


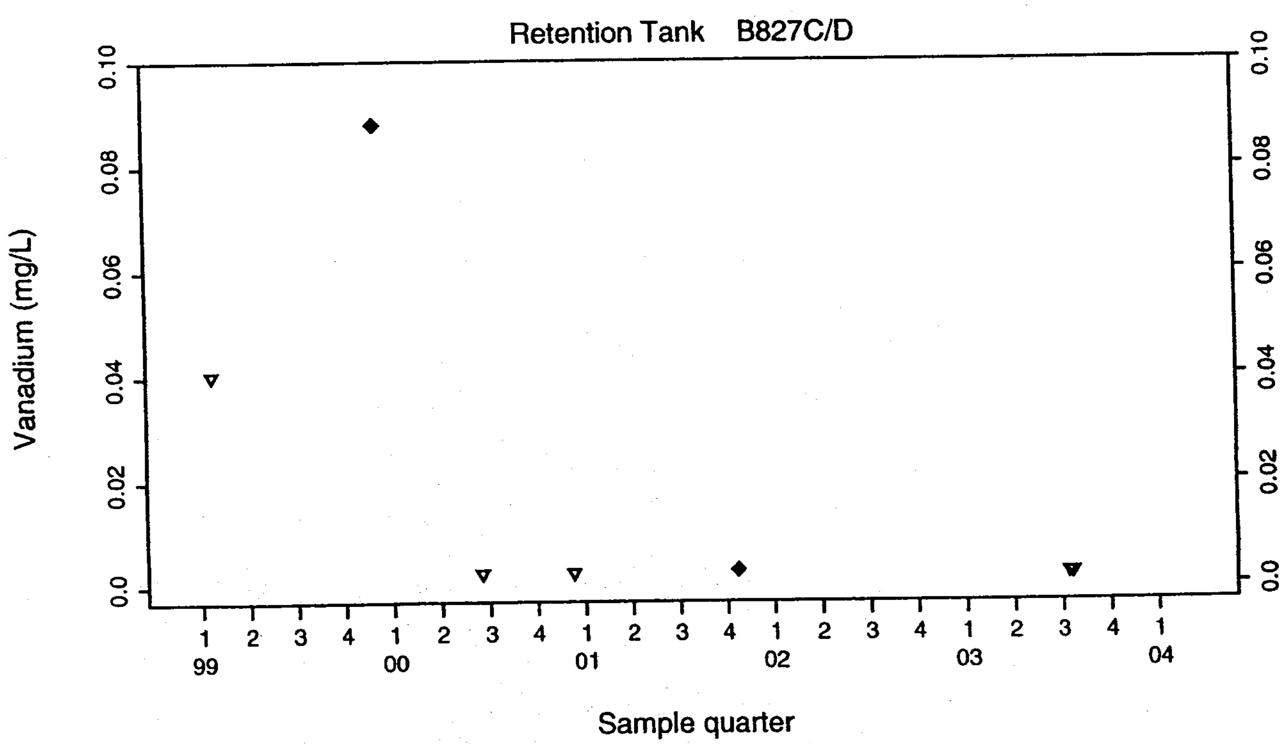
Surface Impoundments Process Water
Vanadium (mg/L)

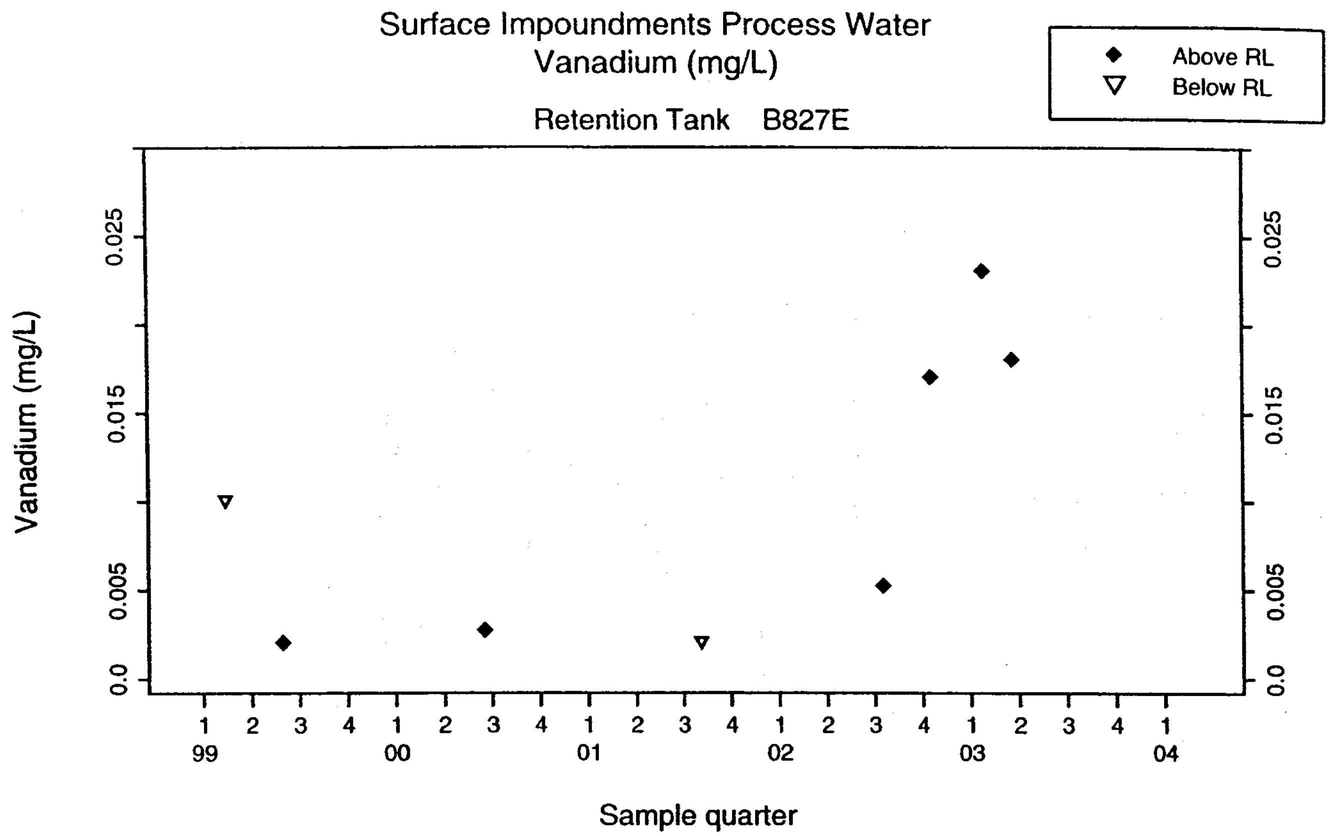


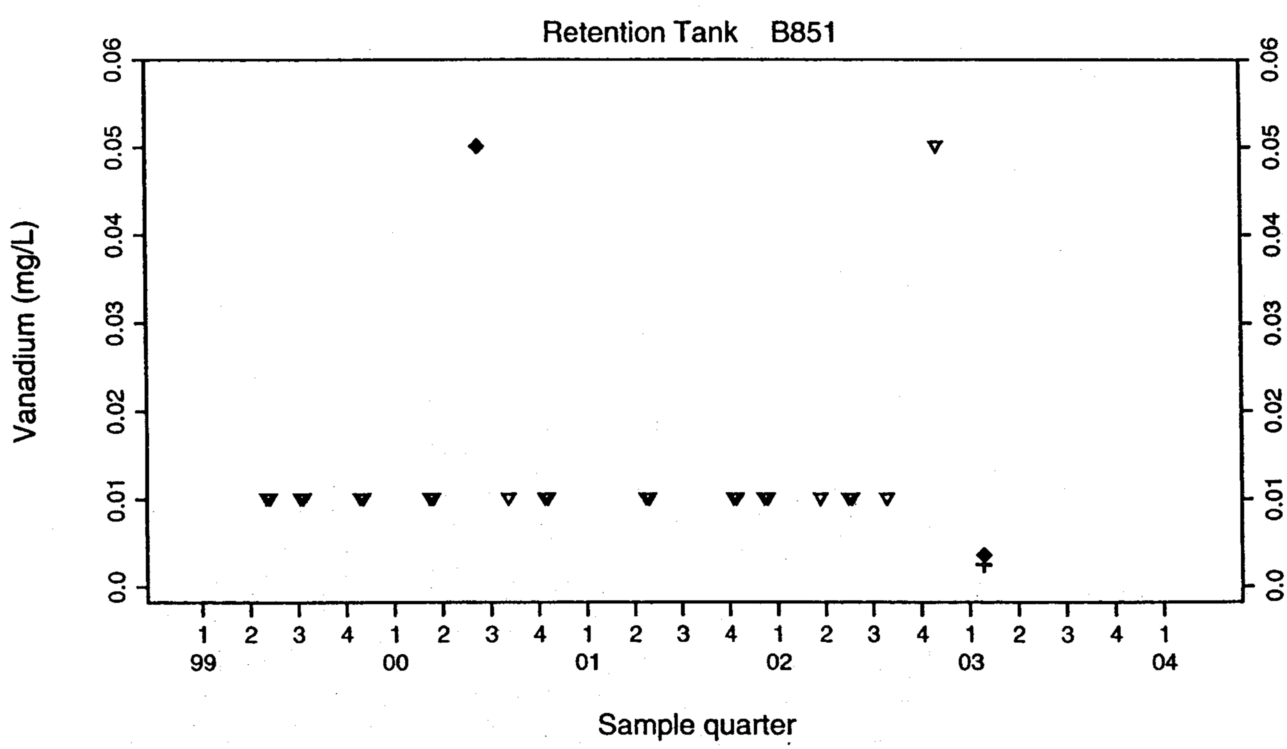


Surface Impoundments Process Water
Vanadium (mg/L)

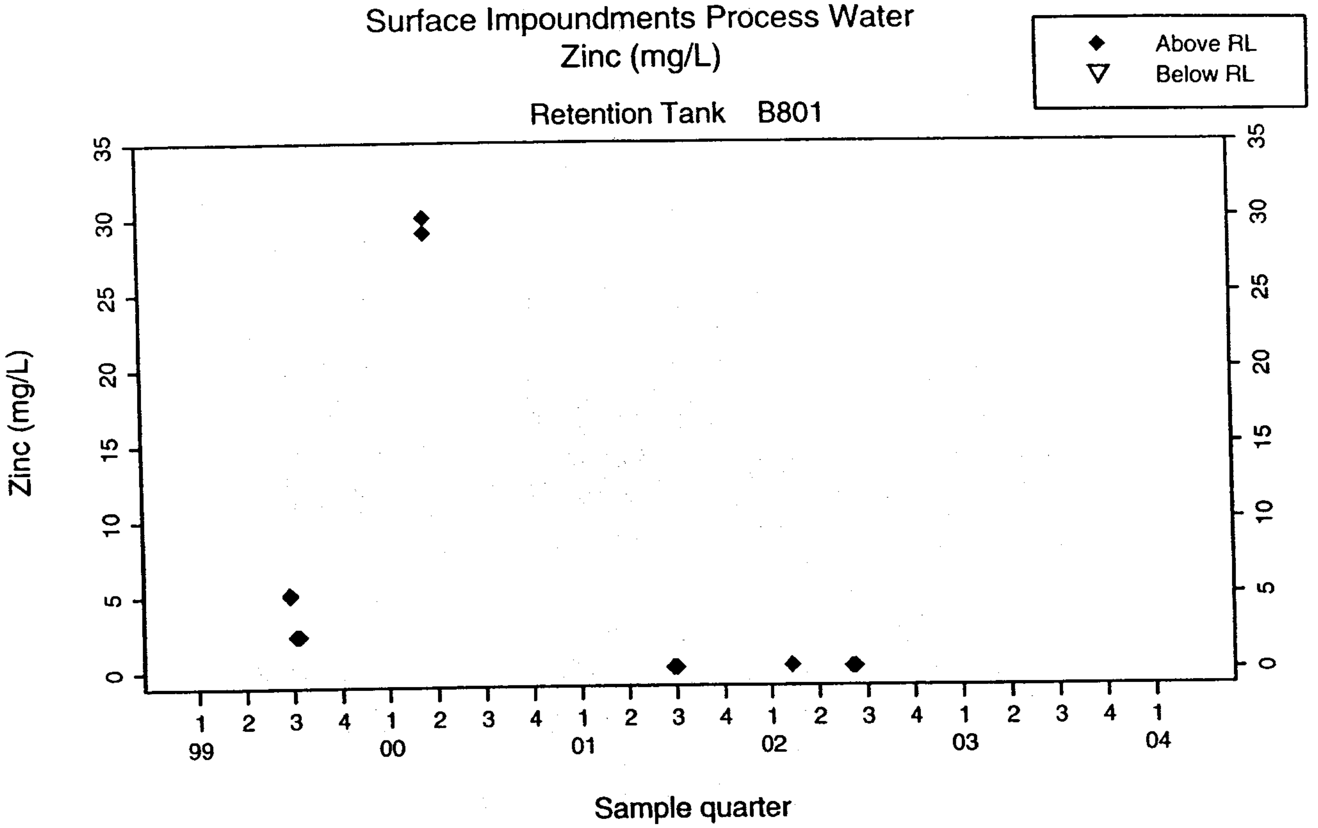


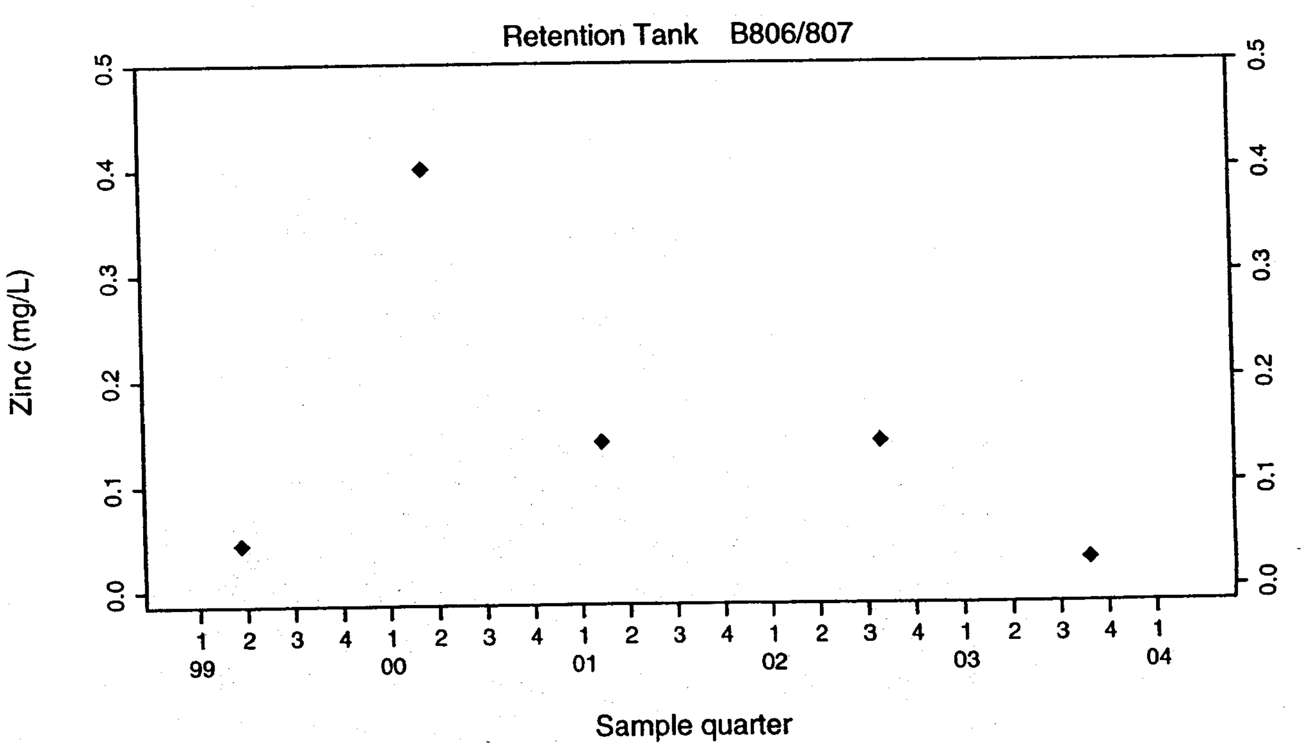



Surface Impoundments Process Water
Vanadium (mg/L)
Above RL
Below RL
Retention Tank B827E
Vanadium (mg/L)
0.0
0.005
0.015
0.025
1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1
99 00 01 02 03 04
Sample quarter


Retention Tank B851
Vanadium (mg/L)
0.0
0.01
0.02
0.03
0.04
0.05
0.06
1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1
99 00 01 02 03 04
Sample quarter

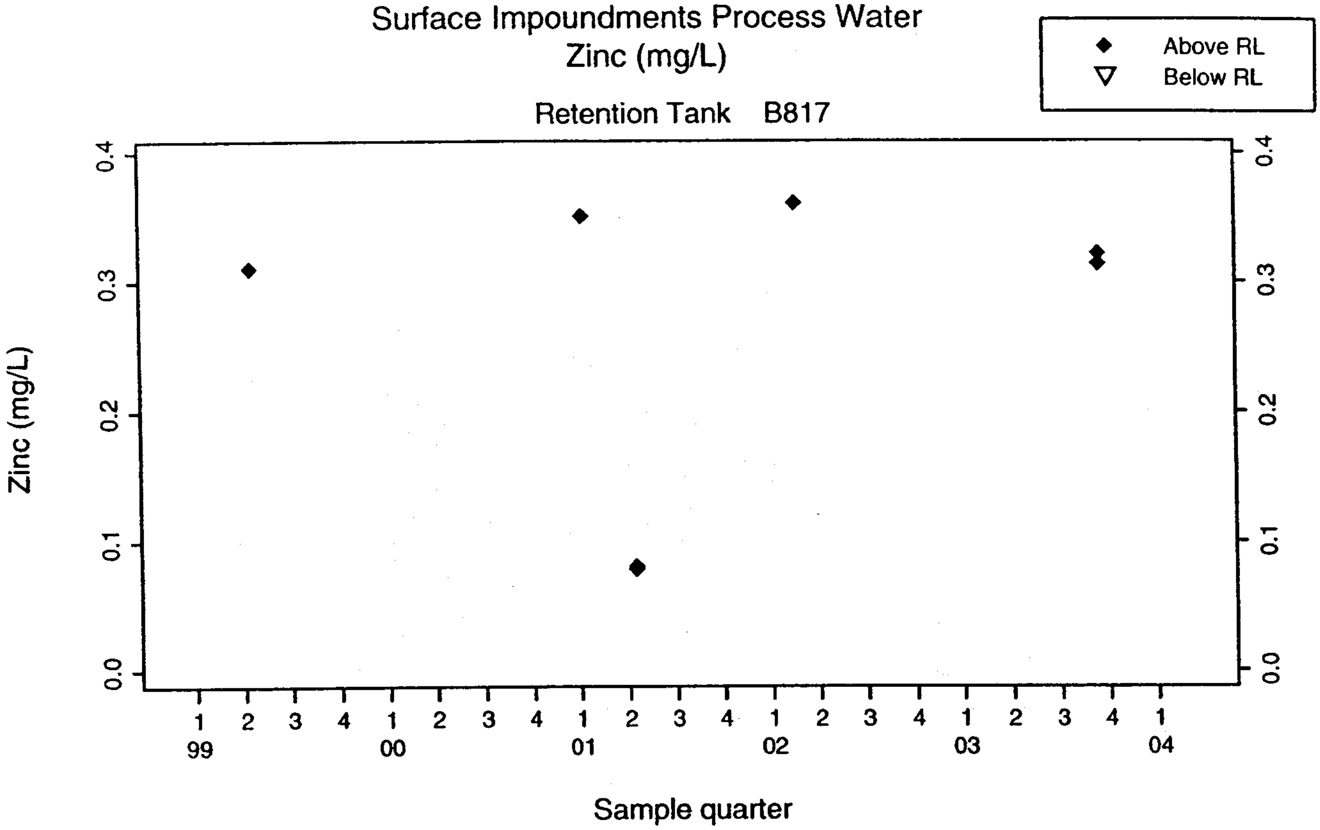
Surface Impoundments Process Water
Zinc (mg/L)



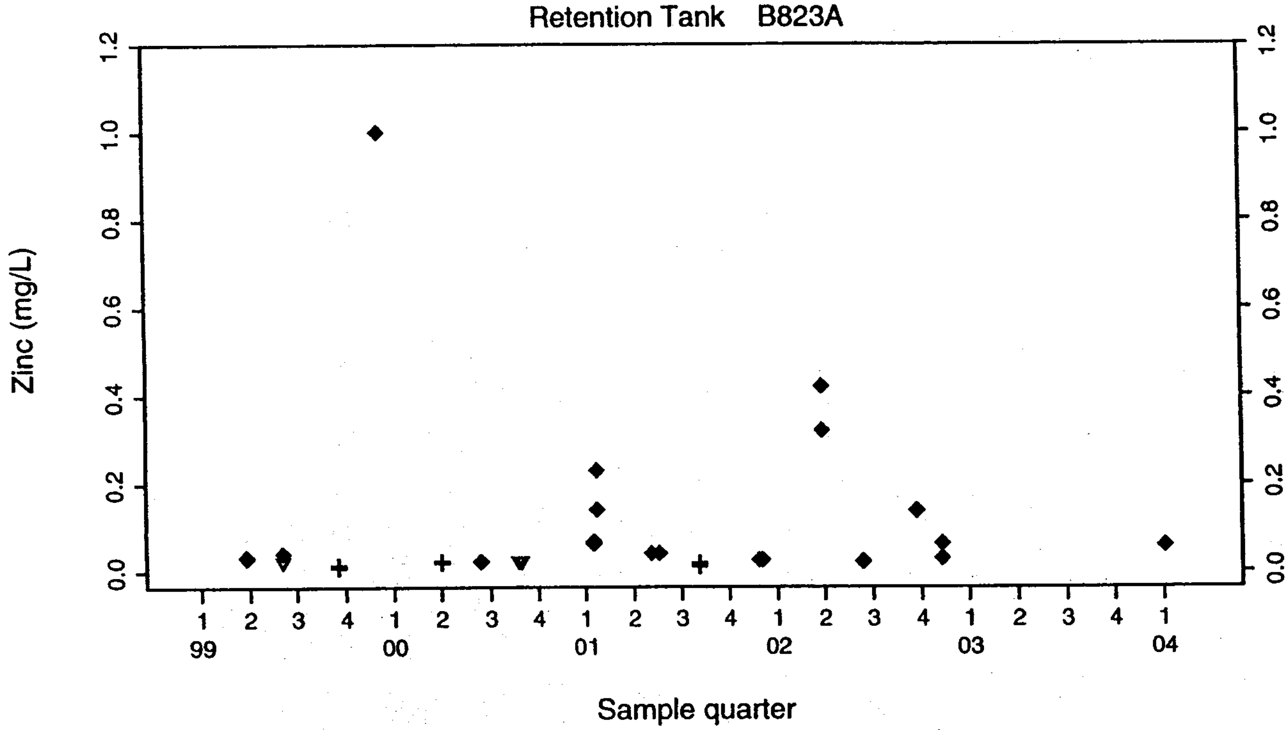


Surface Impoundments Process Water
Zinc (mg/L)

Retention Tank B817

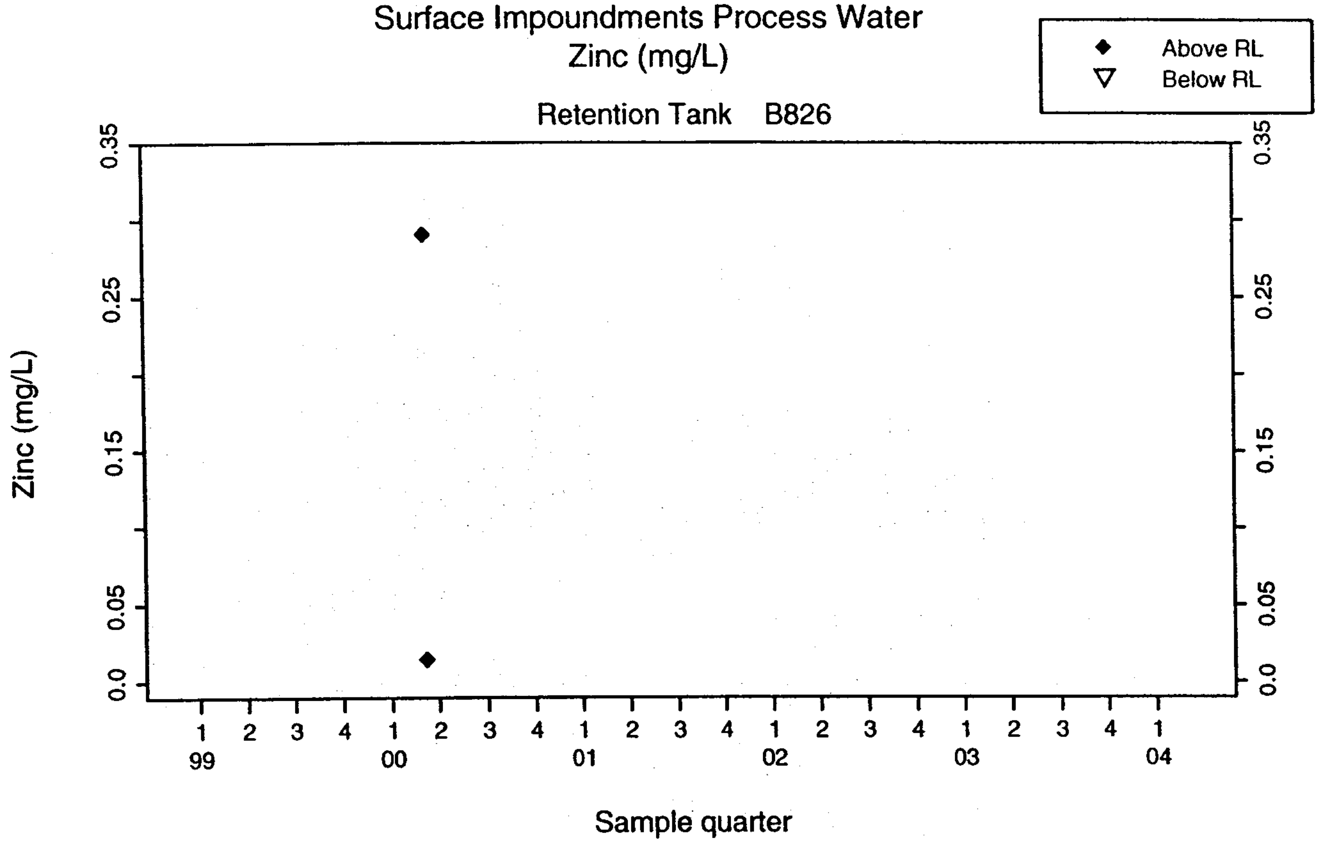


Retention Tank B823A

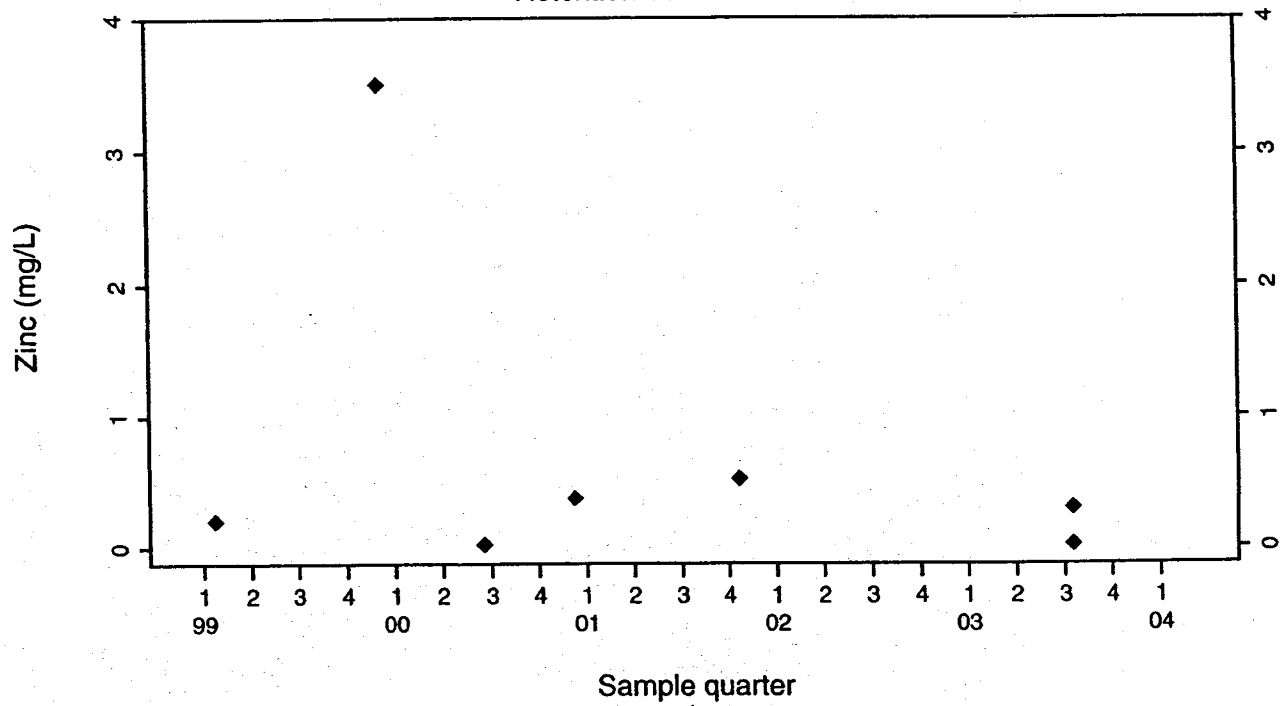


Surface Impoundments Process Water
Zinc (mg/L)

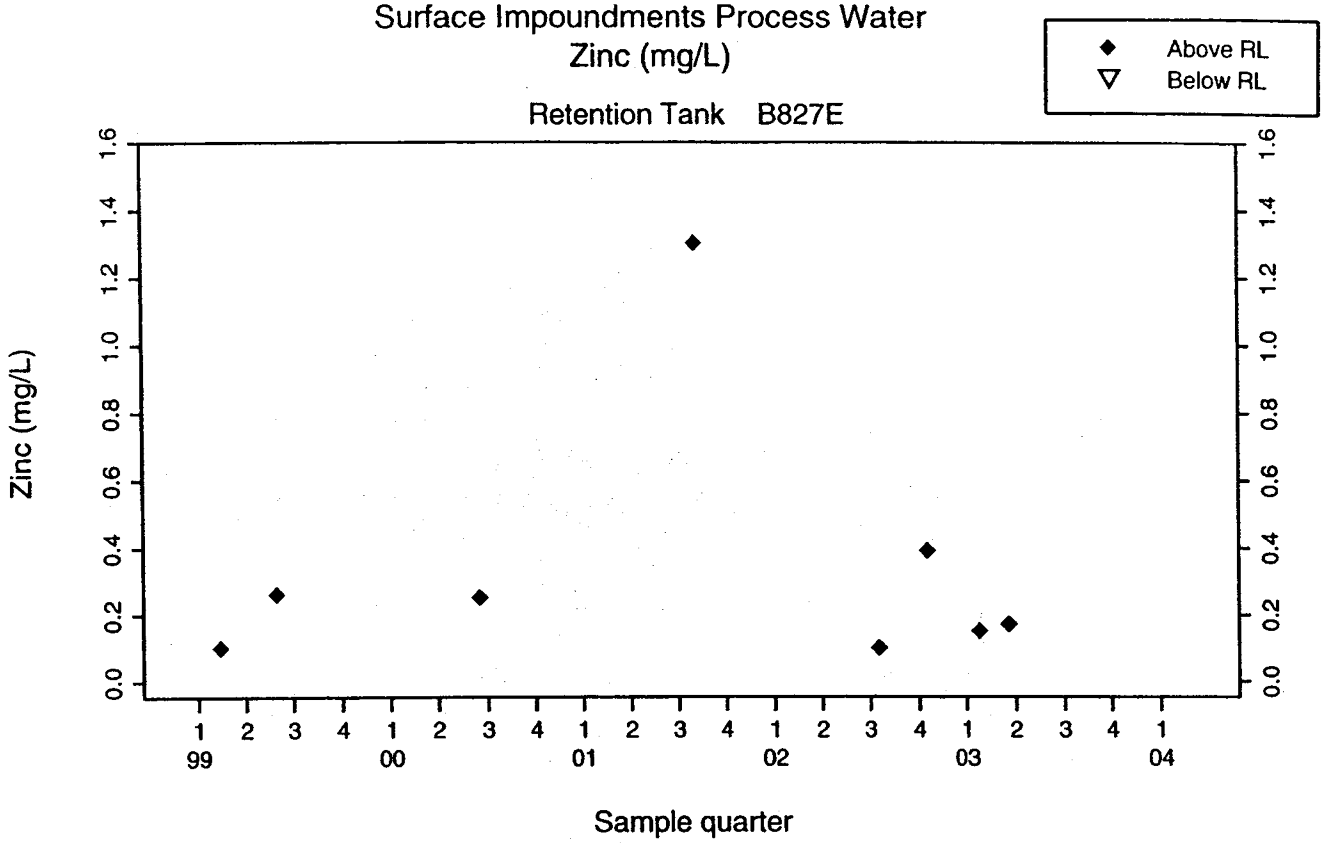
Retention Tank B826

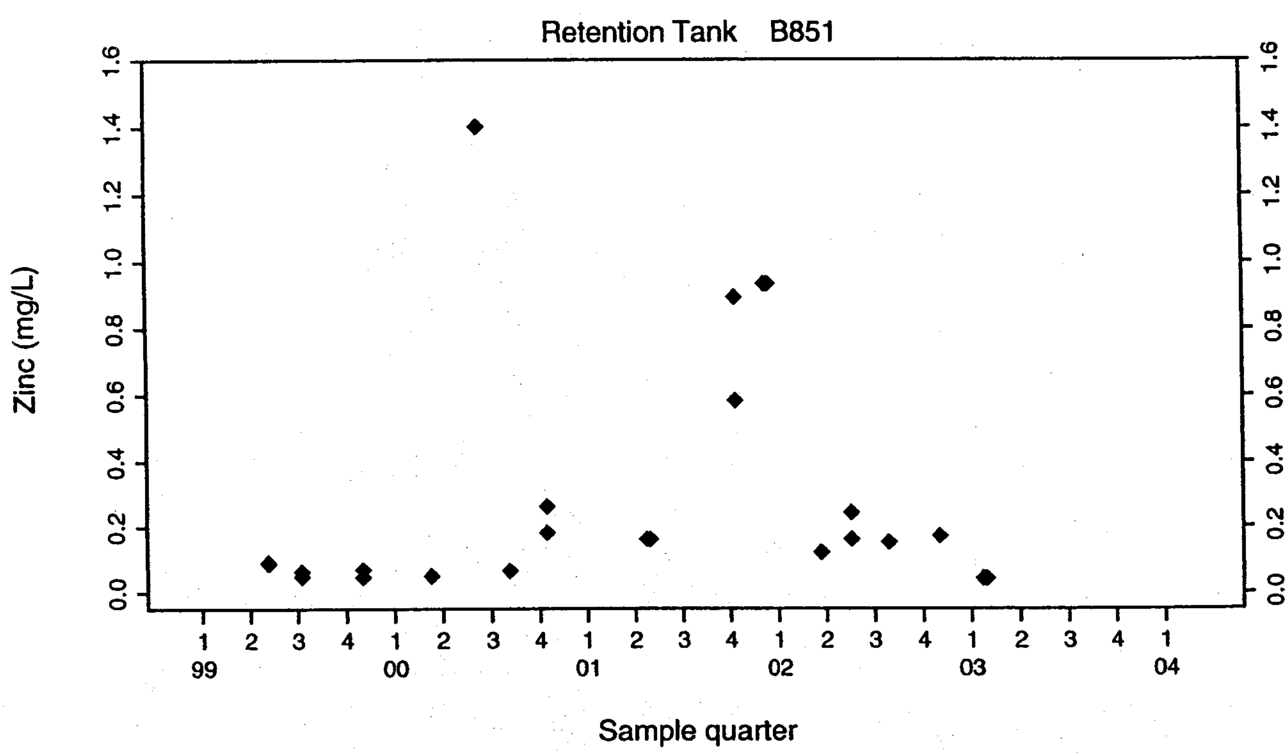


Retention Tank B827C/D

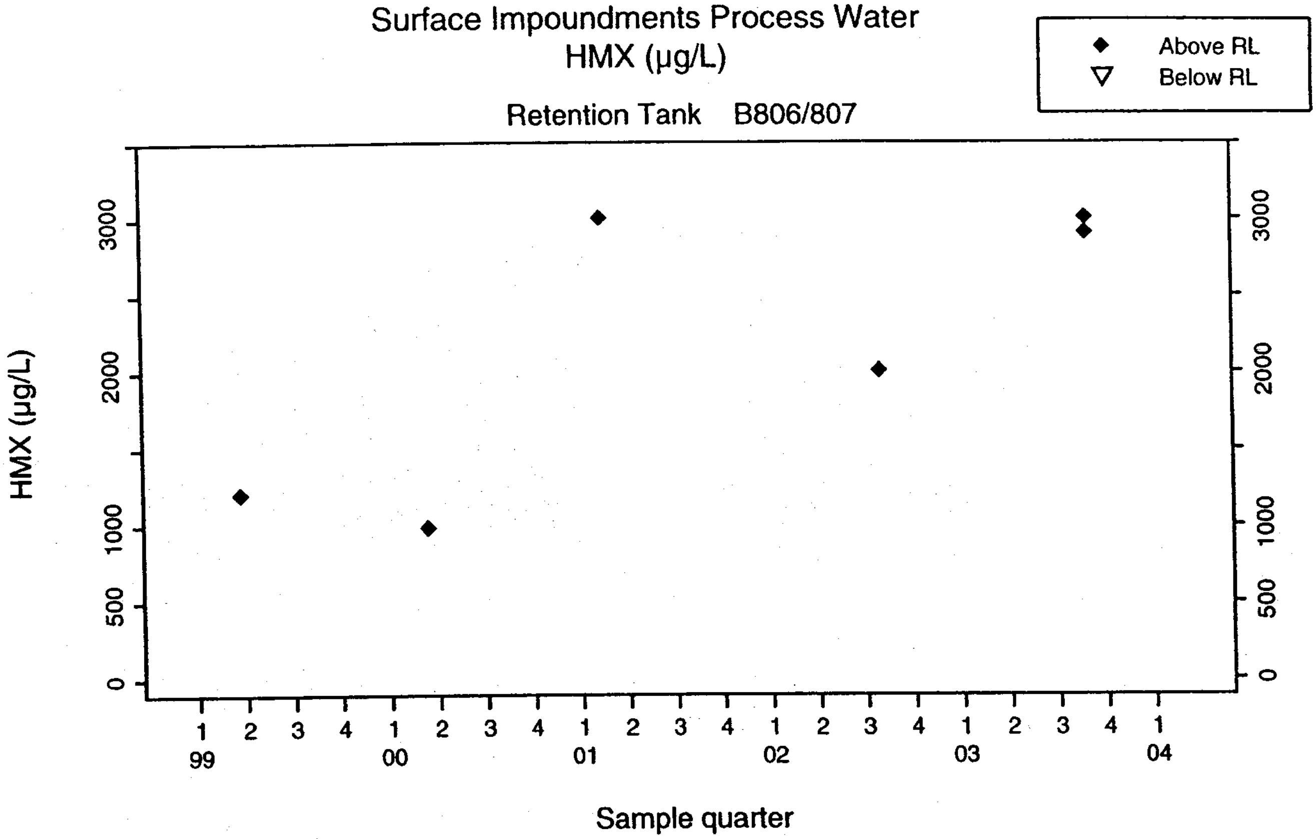


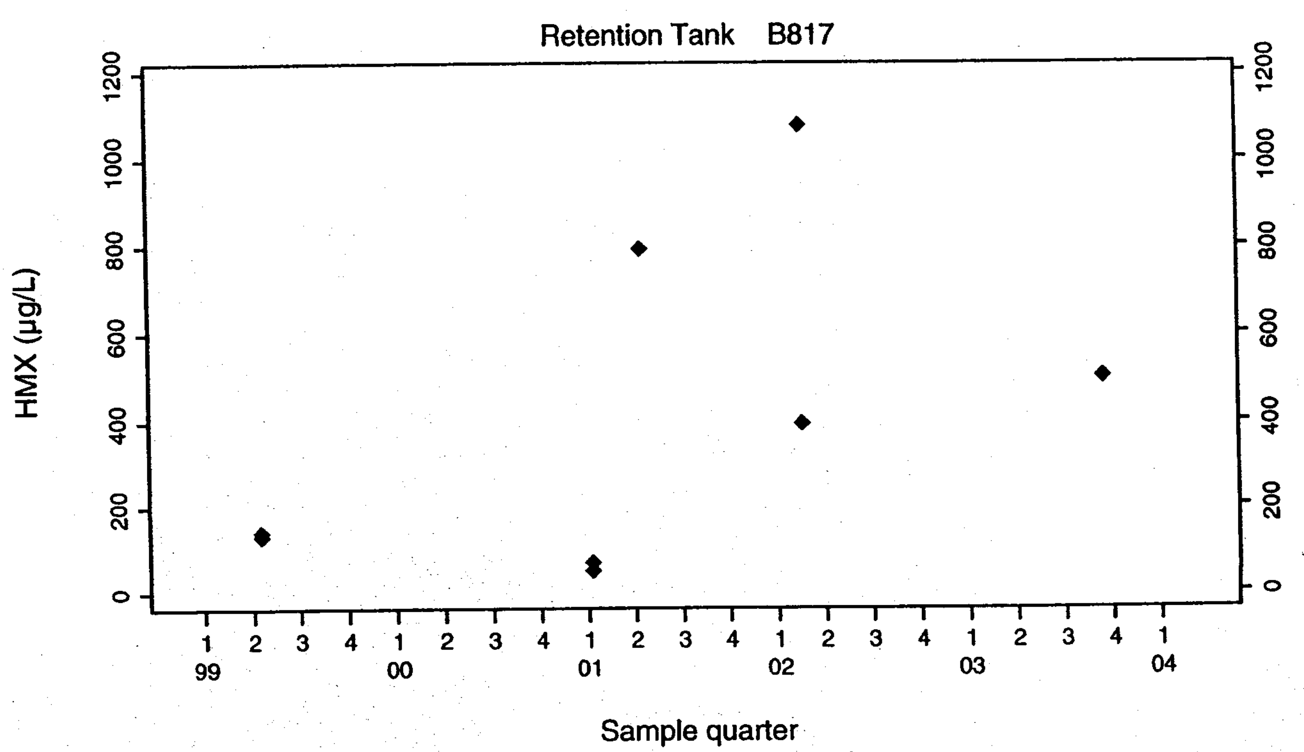
Surface Impoundments Process Water
Zinc (mg/L)



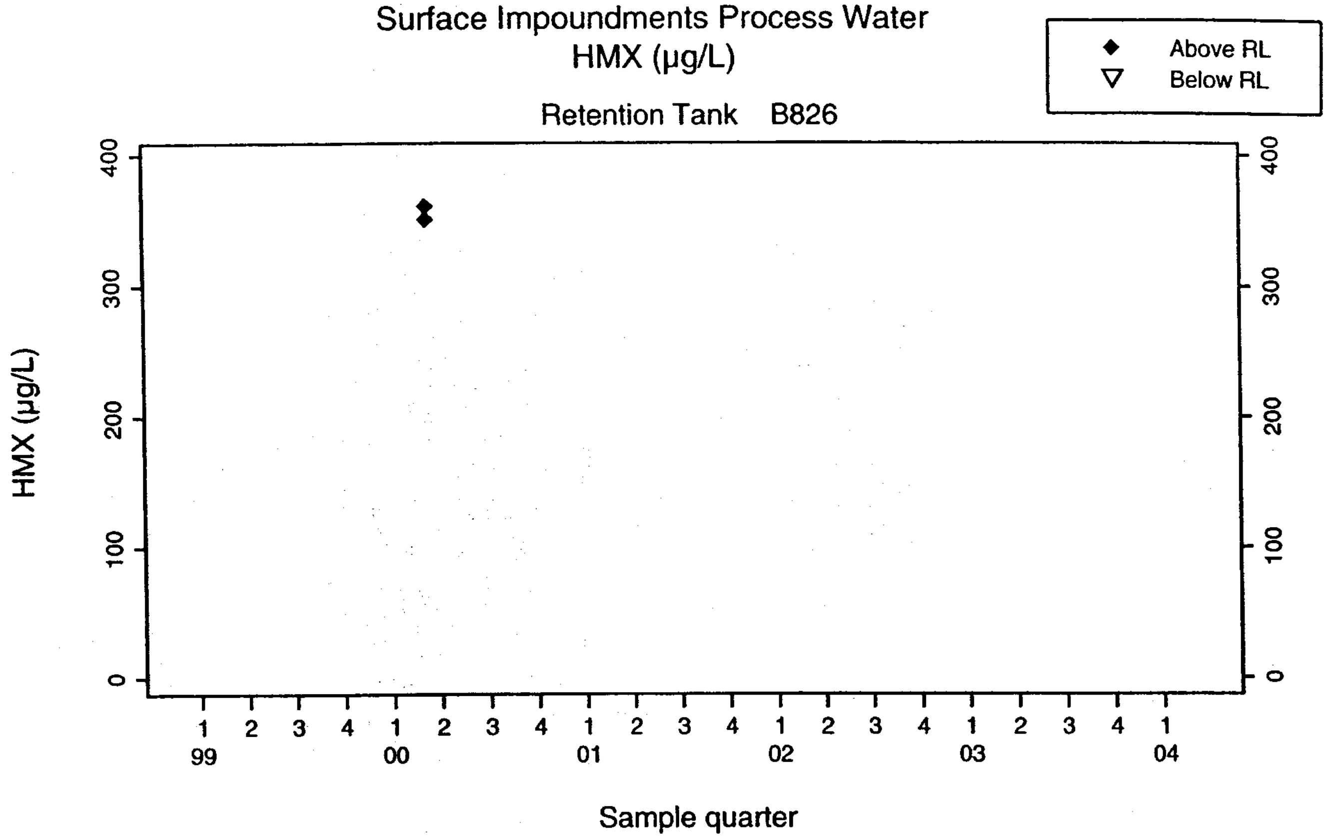


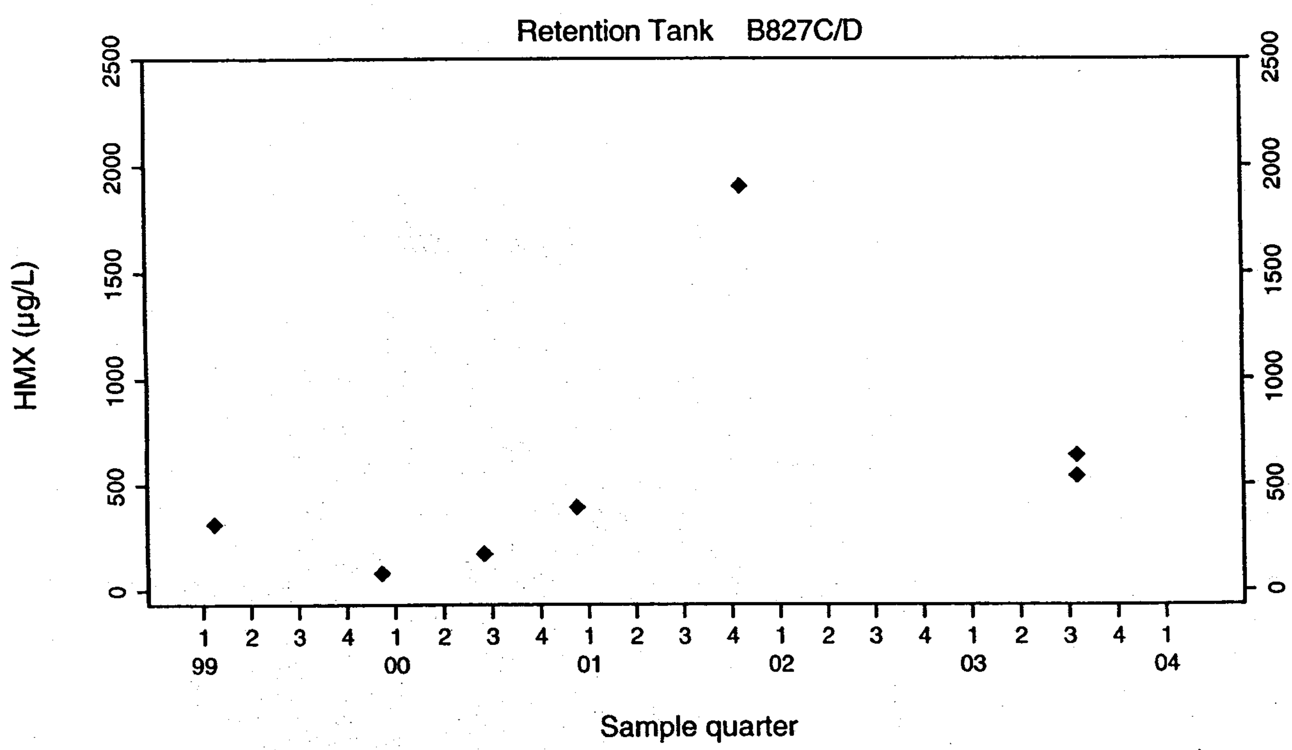
Surface Impoundments Process Water
HMX (µg/L)

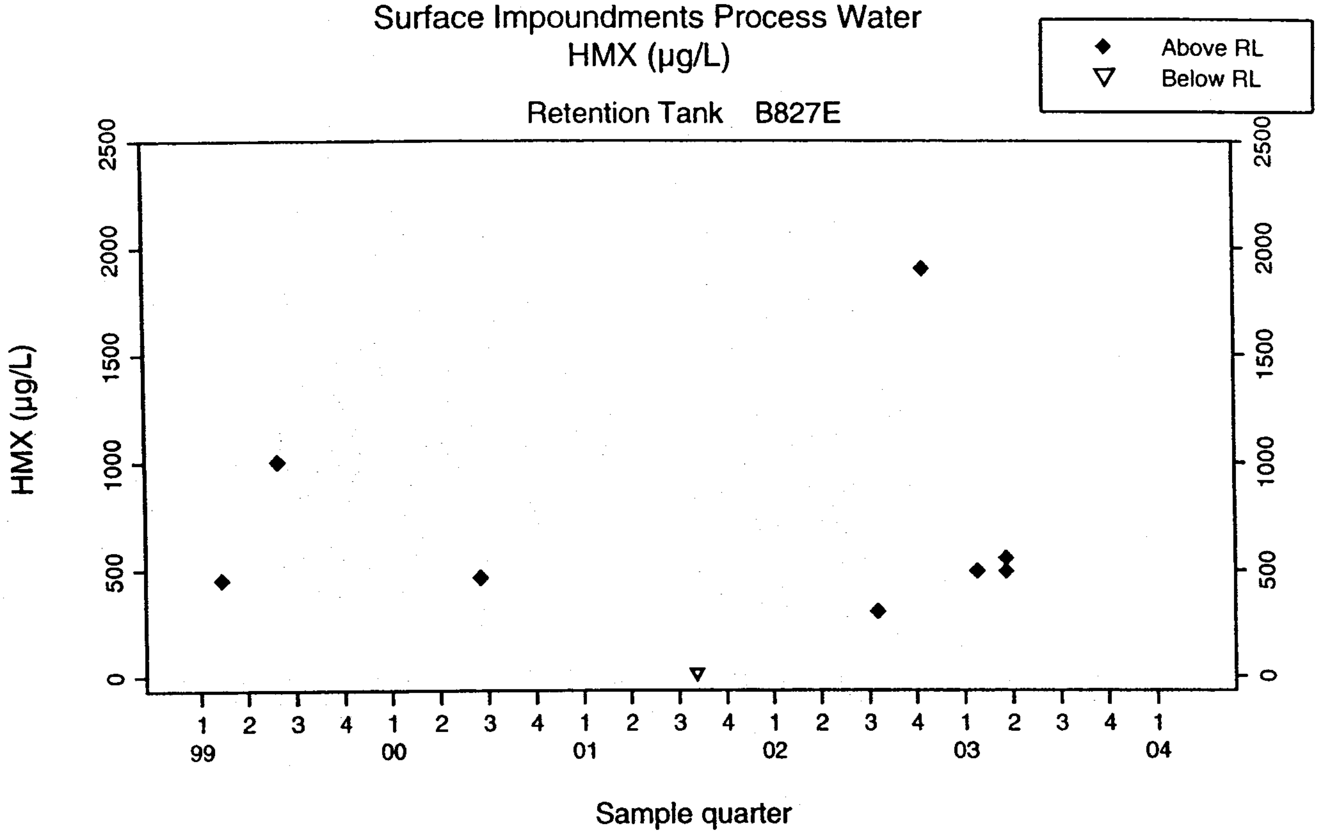




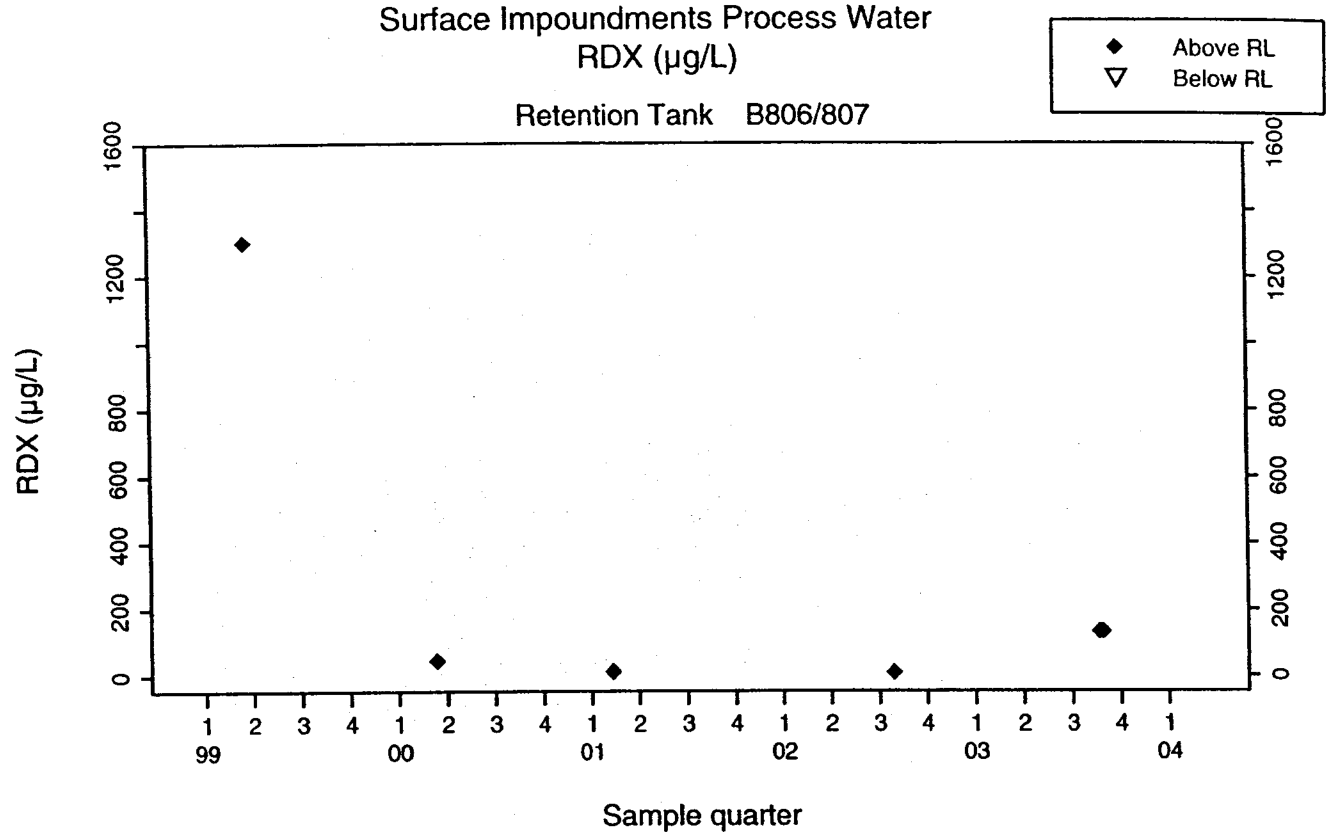
Surface Impoundments Process Water
HMX (µg/L)

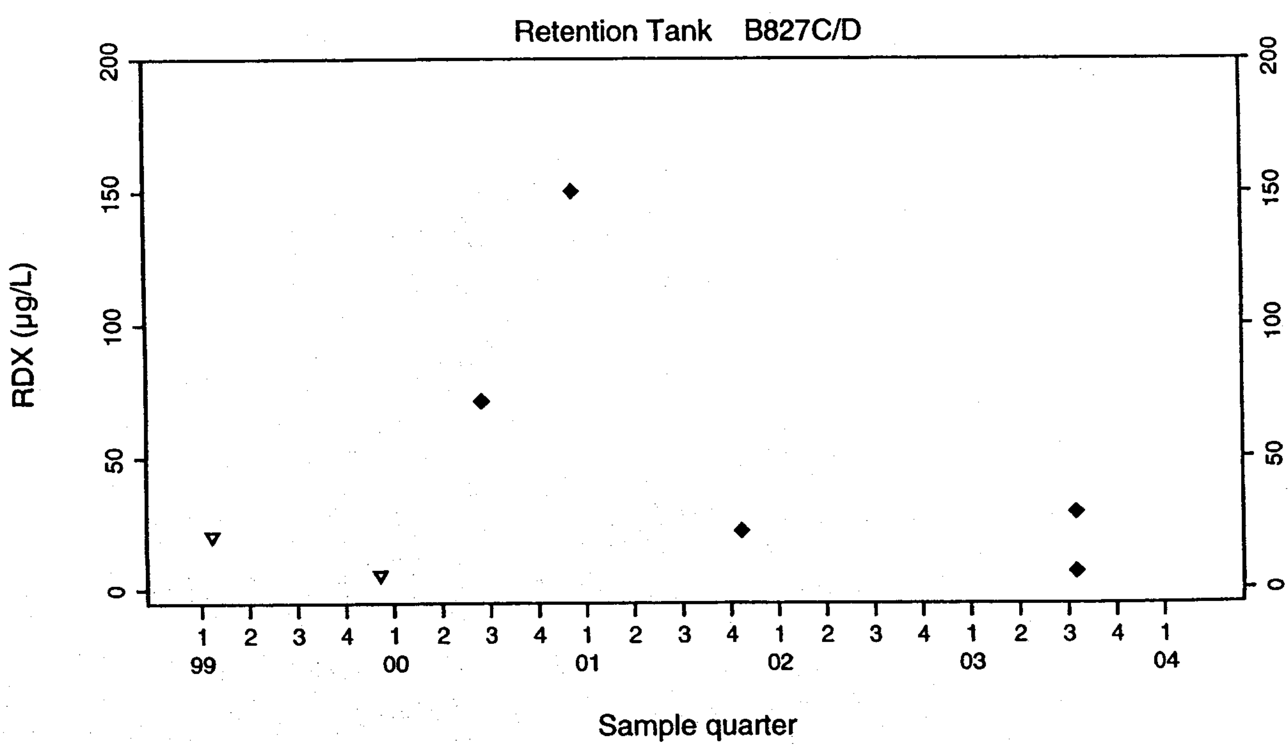


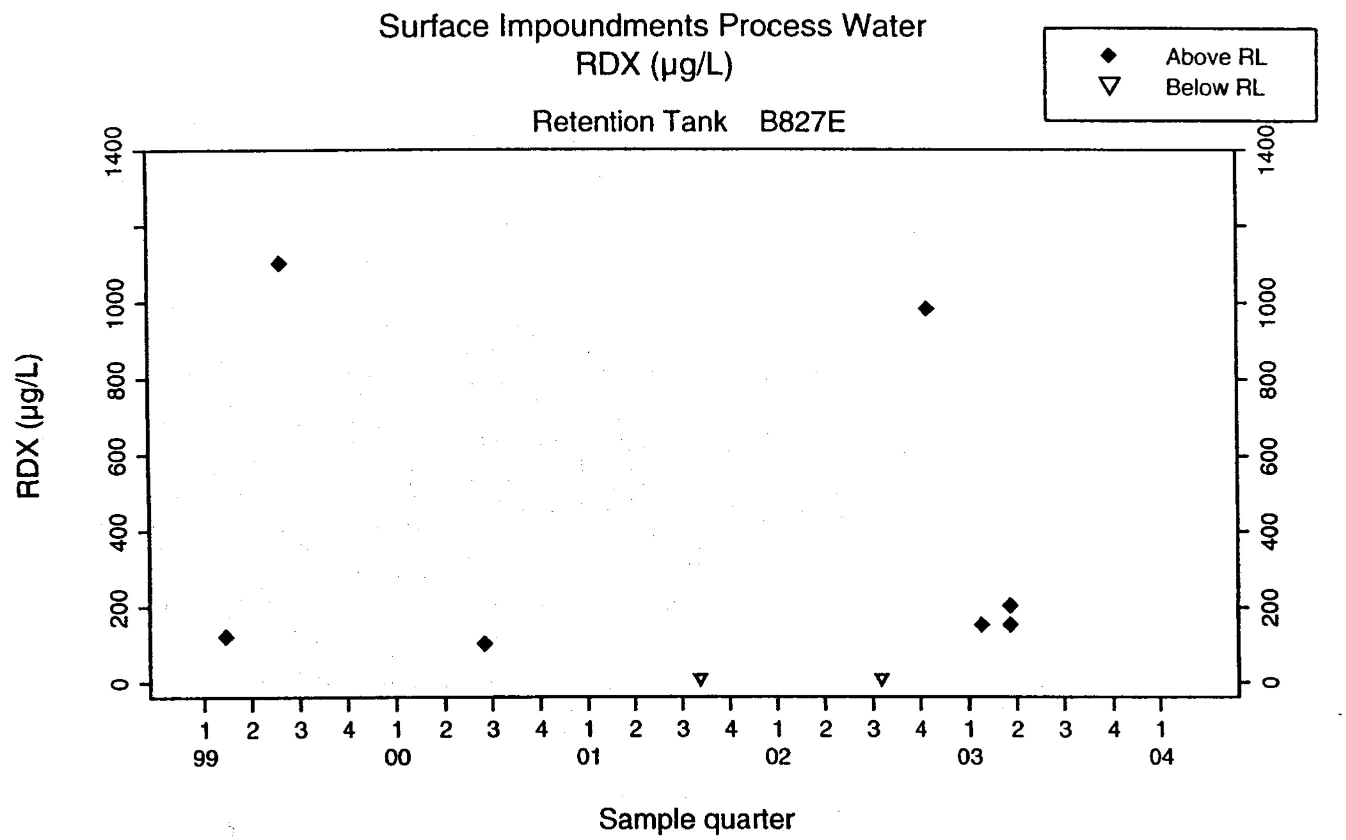


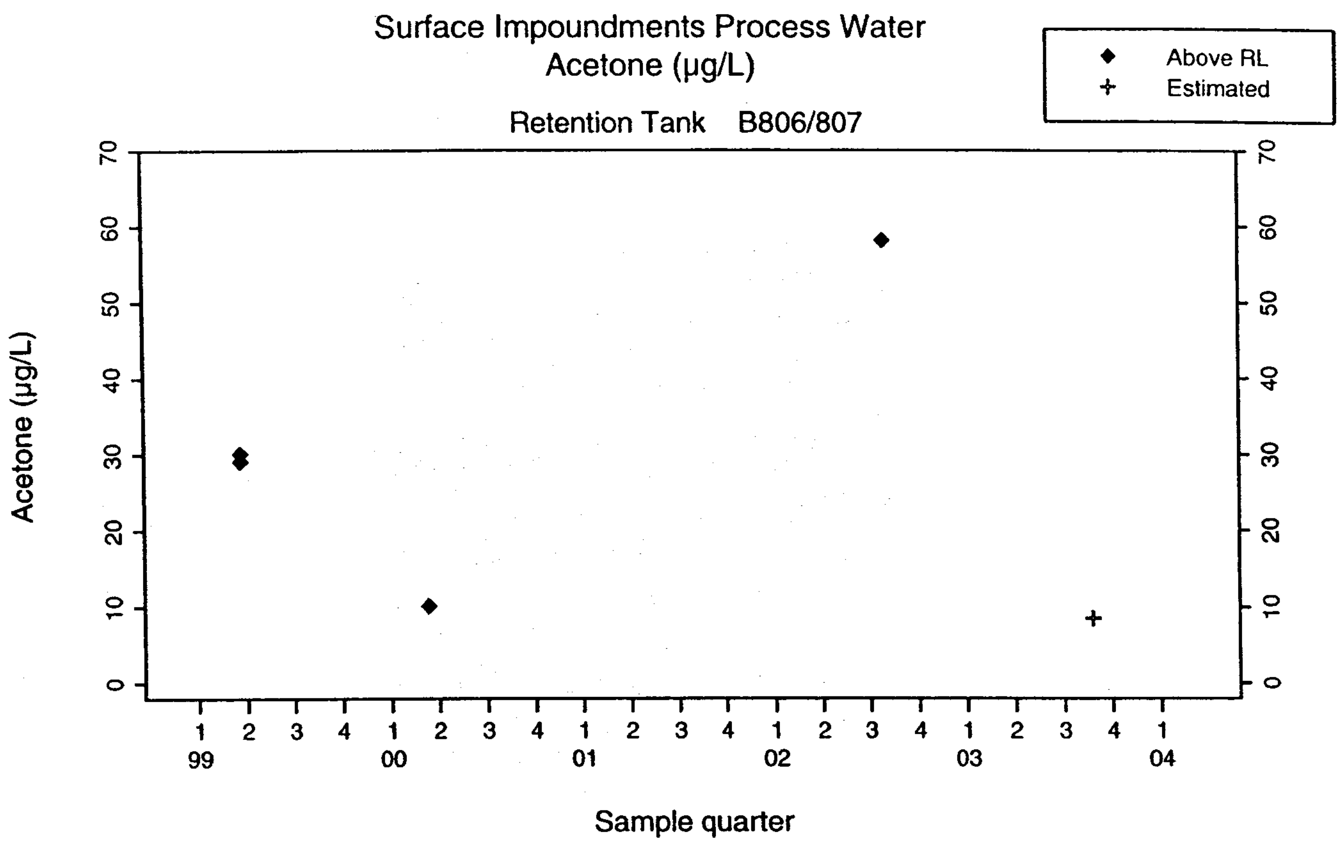

Surface Impoundments Process Water
HMX (µg/L)
Retention Tank B827E
Above RL
Below RL
HMX (µg/L)
0
500
1000
1500
2000
2500
1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1
99
00
01
02
03
04
Sample quarter

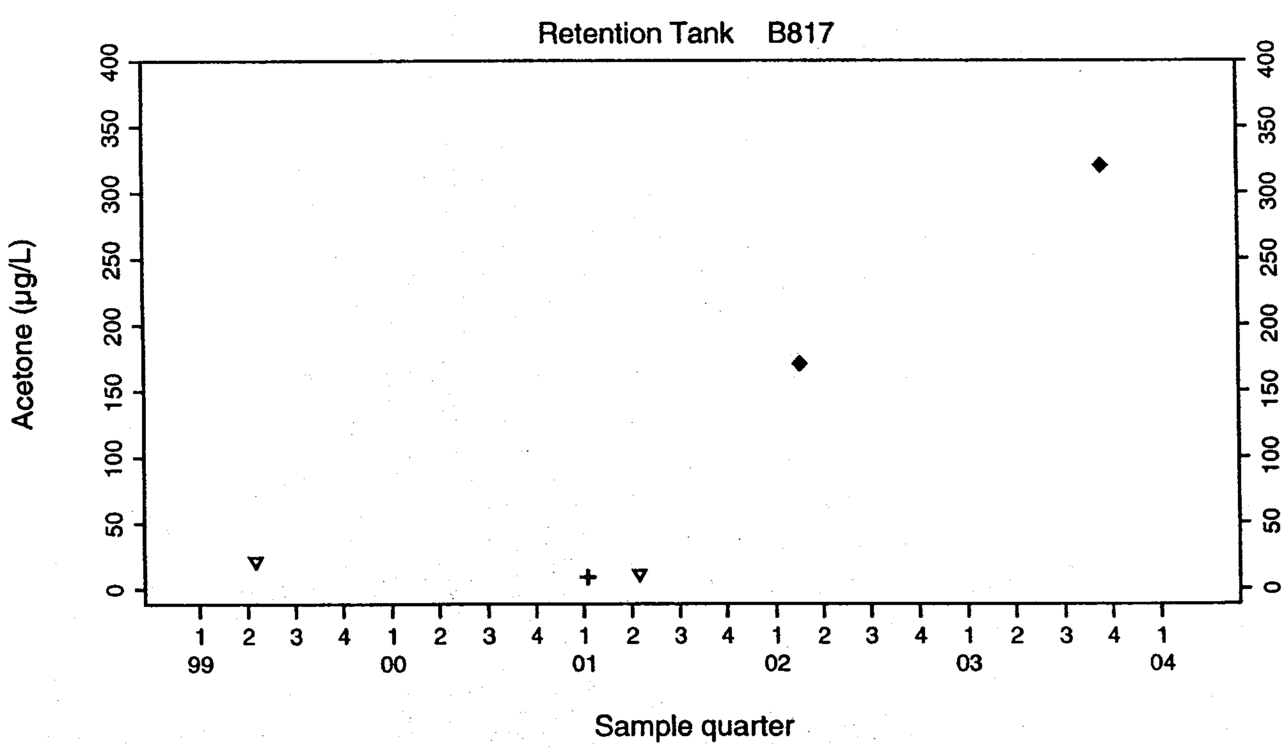
Surface Impoundments Process Water RDX (µg/L)

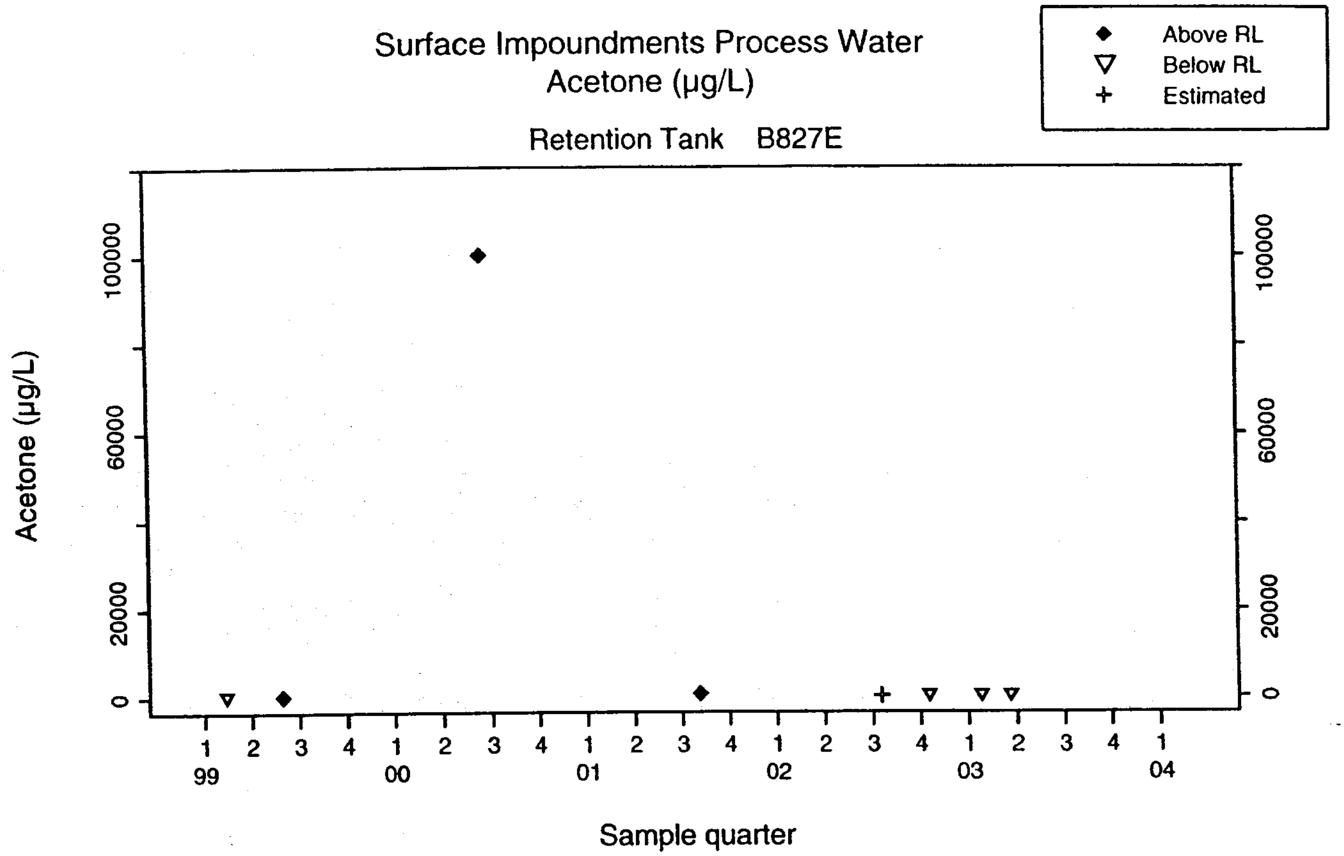




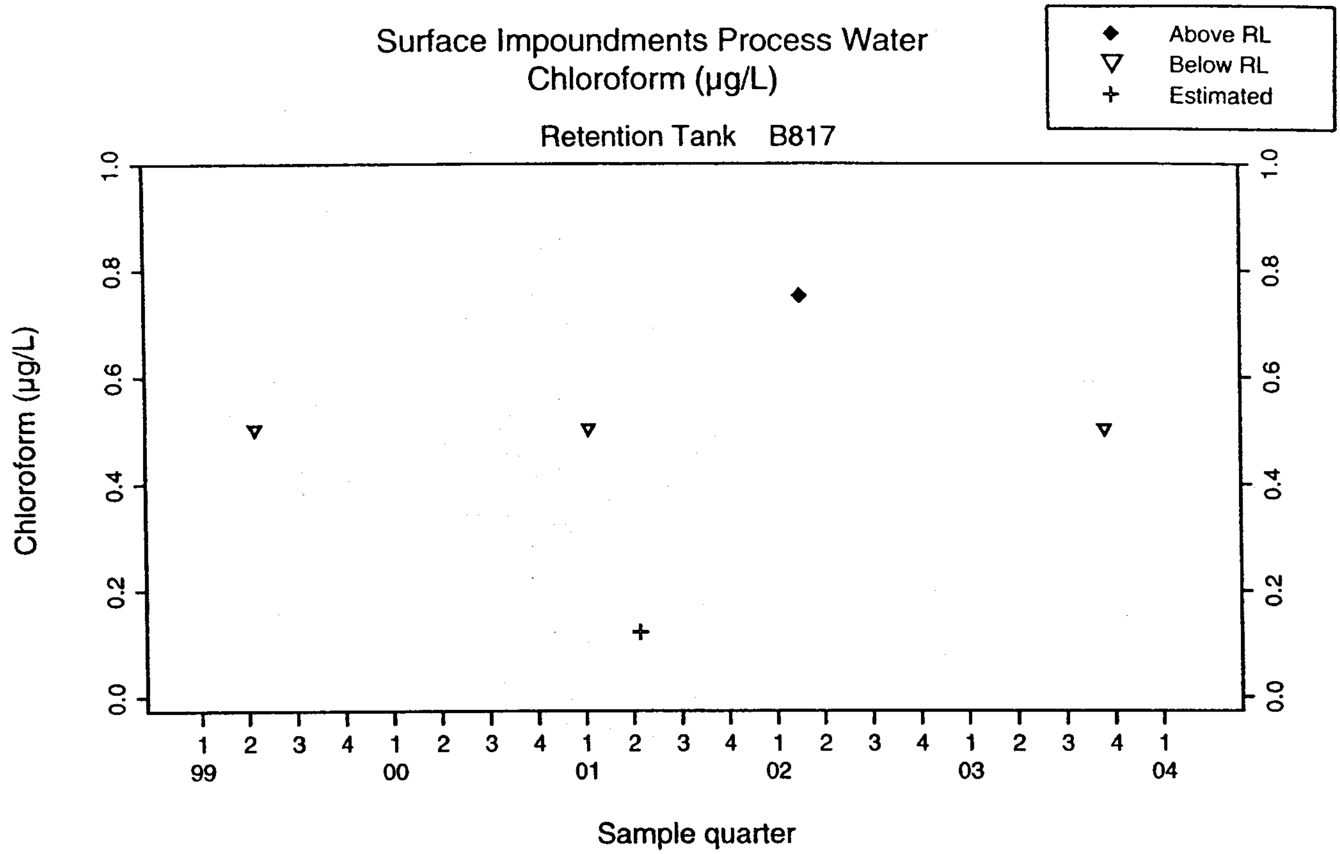

Surface Impoundments Process Water
RDX (µg/L)
Retention Tank B827E
Above RL
Below RL
RDX (µg/L)
0
200
400
600
800
1000
1400
1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1
99
00
01
02
03
04
Sample quarter

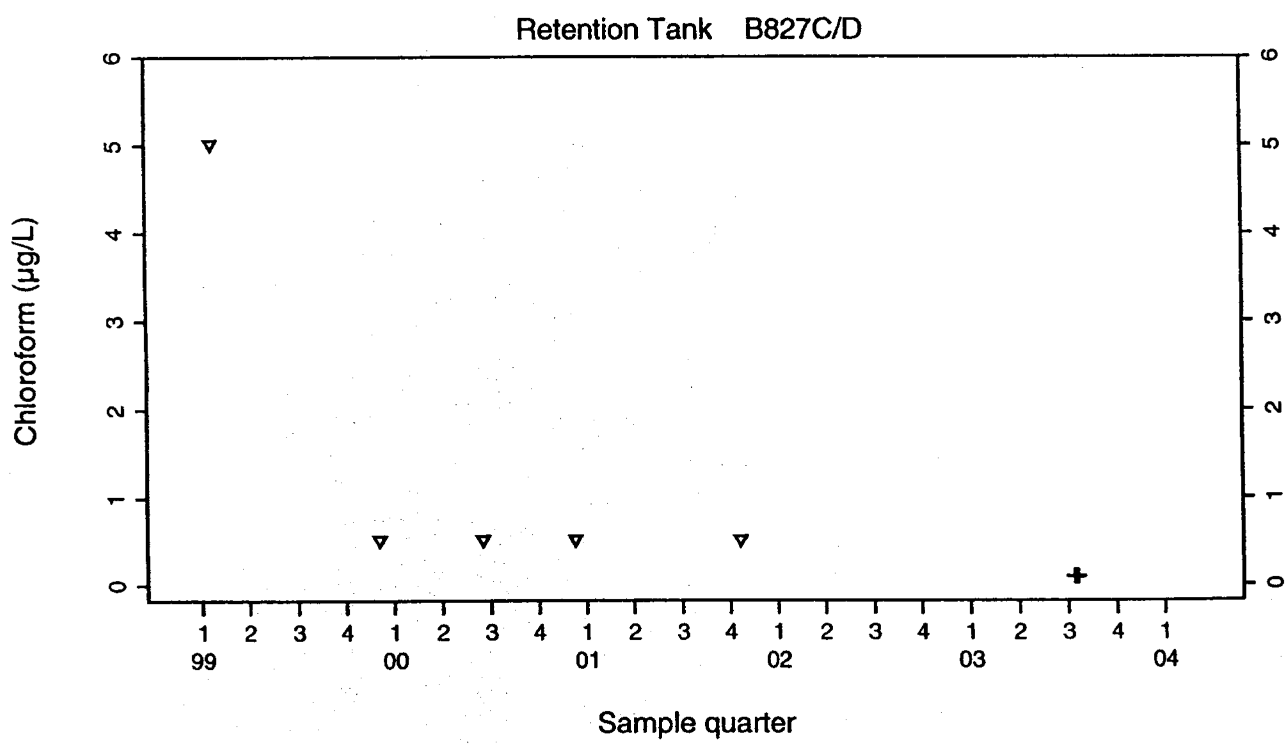

Surface Impoundments Process Water
Acetone (µg/L)
Above RL
Estimated
Retention Tank B806/807
Acetone (µg/L)
0
10
20
30
40
50
60
70
1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1
99
00
01
02
03
04
Sample quarter

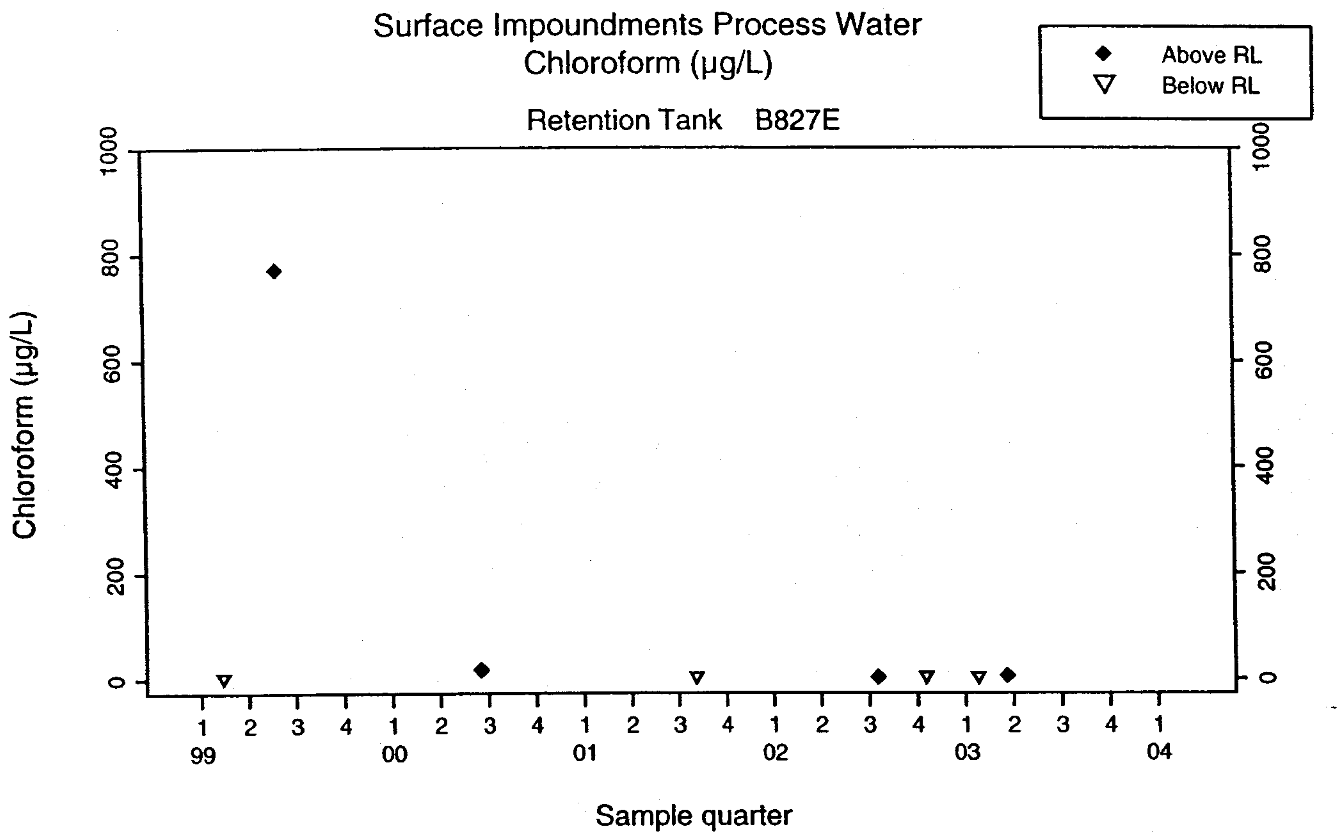

Retention Tank B817
Acetone (µg/L)
0
50
100
150
200
250
300
350
400
1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1
99
00
01
02
03
04
Sample quarter


Surface Impoundments Process Water
Acetone (µg/L)
Retention Tank B827E
Above RL
Below RL
Estimated
Acetone (µg/L)
0
20000
60000
100000
1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1
99
00
01
02
03
04
Sample quarter

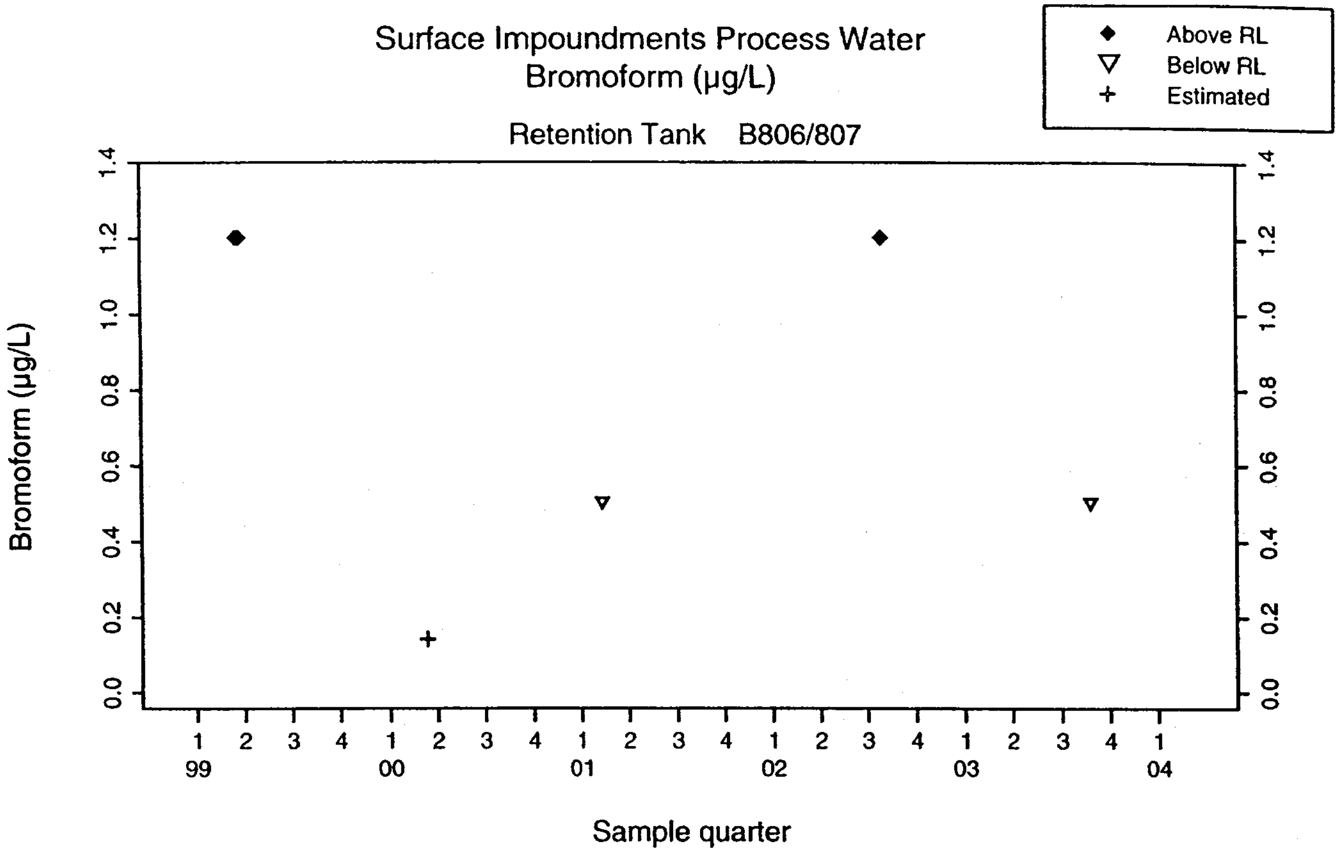
Surface Impoundments Process Water Chloroform (µg/L)

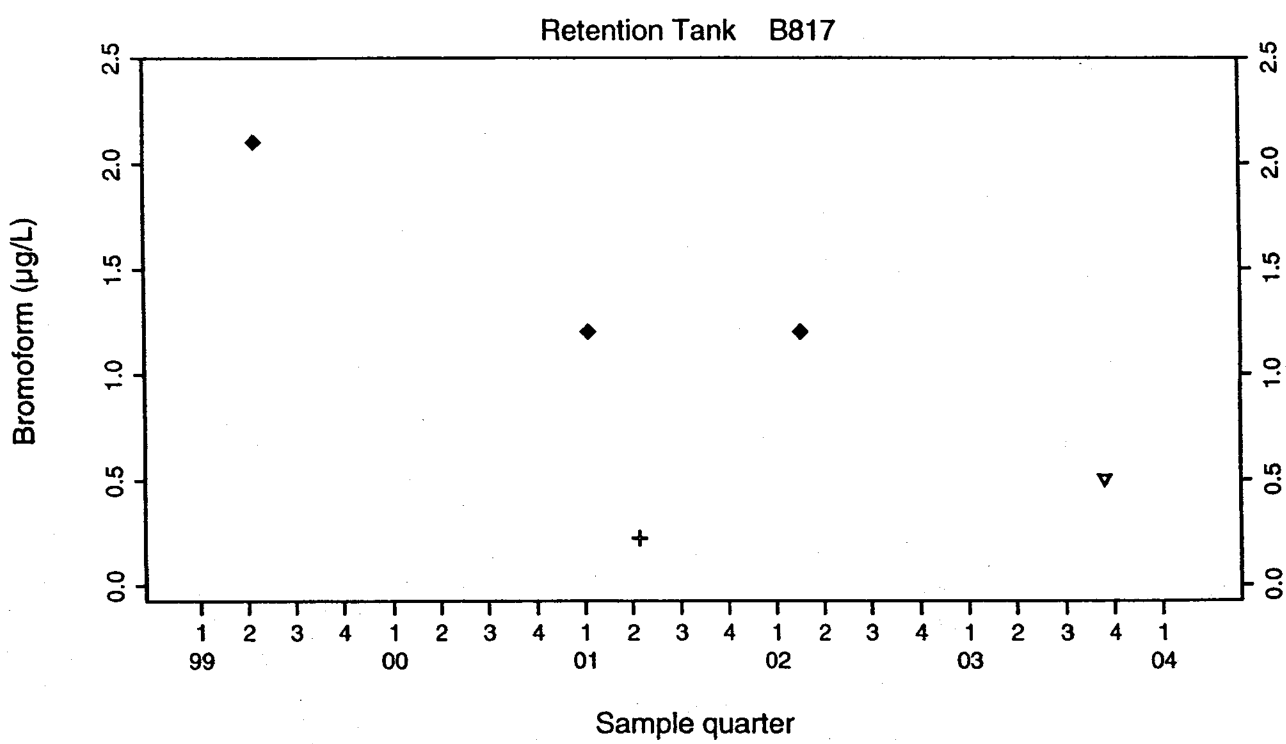




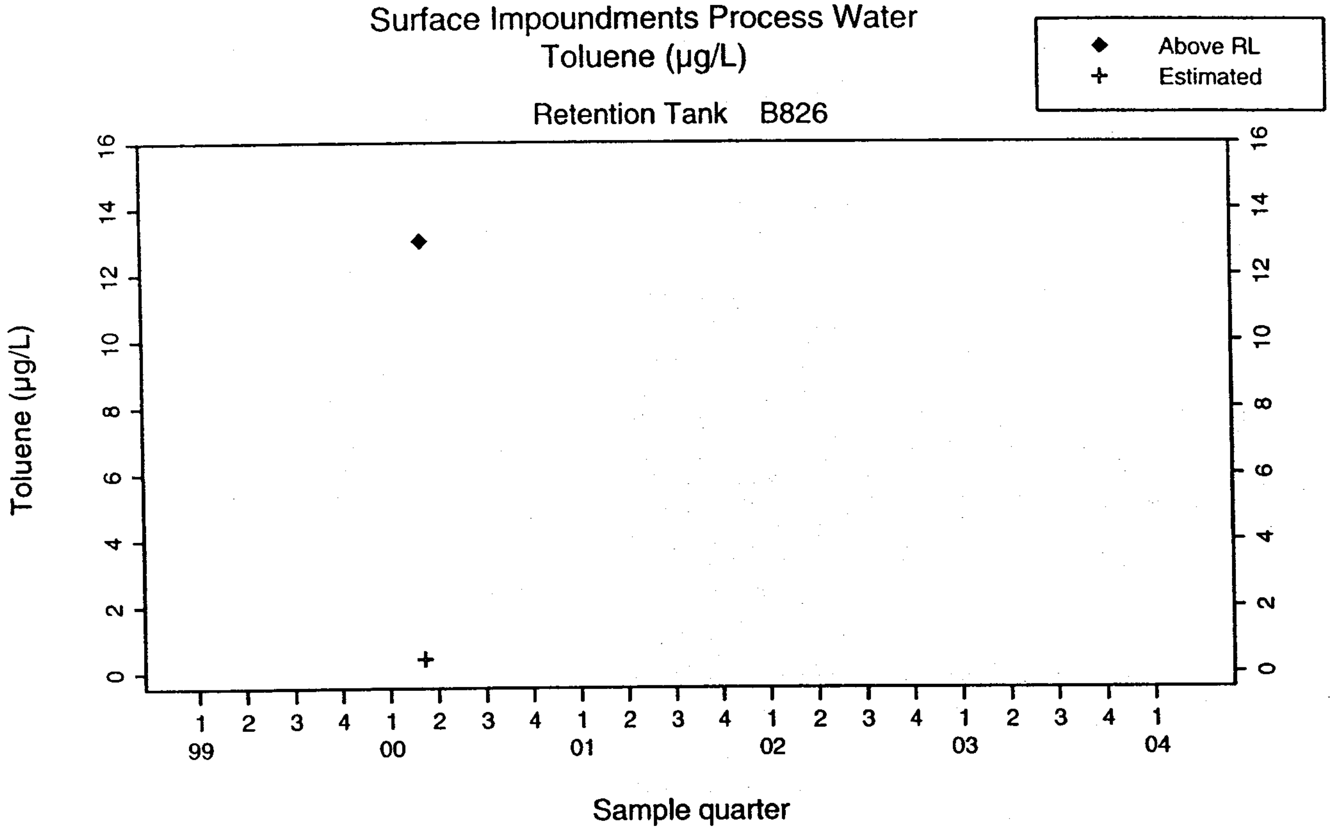


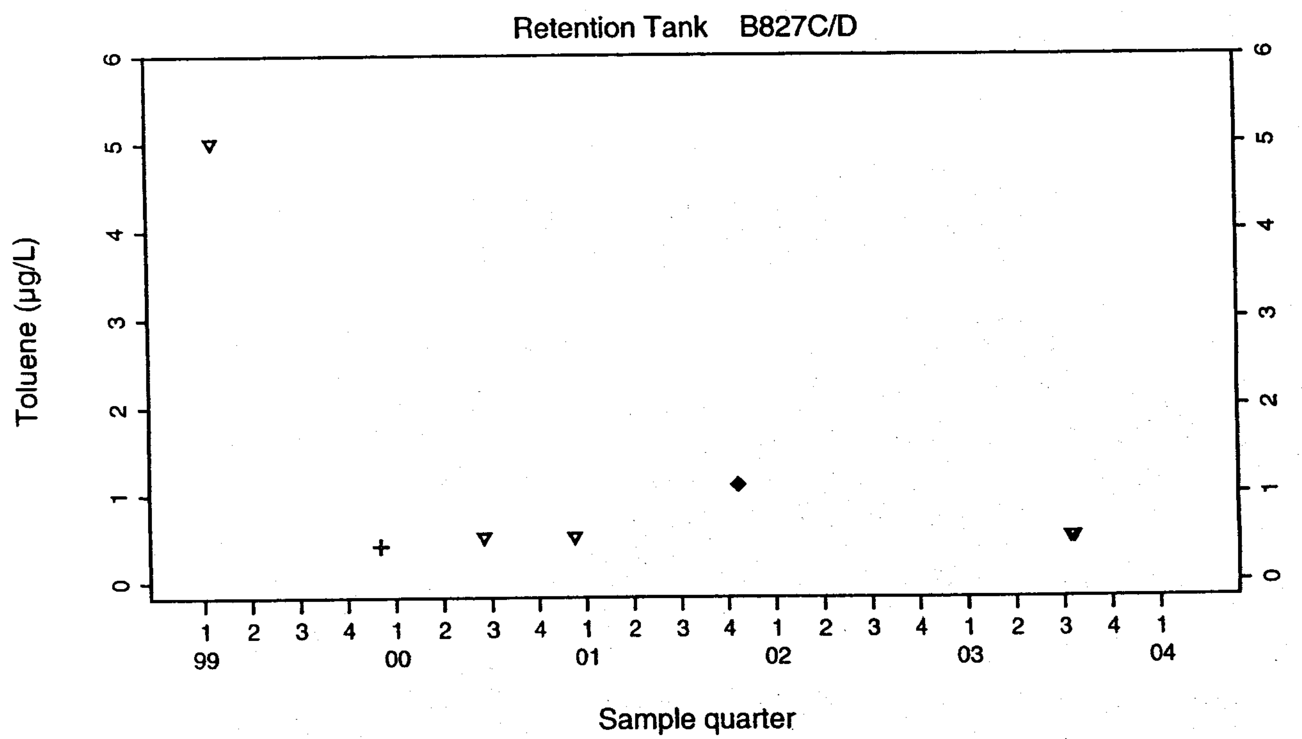
Surface Impoundments Process Water
Chloroform (µg/L)
Retention Tank B827E
Above RL
Below RL
Chloroform (µg/L)
0
200
400
600
800
1000
1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1
99
00
01
02
03
04
Sample quarter

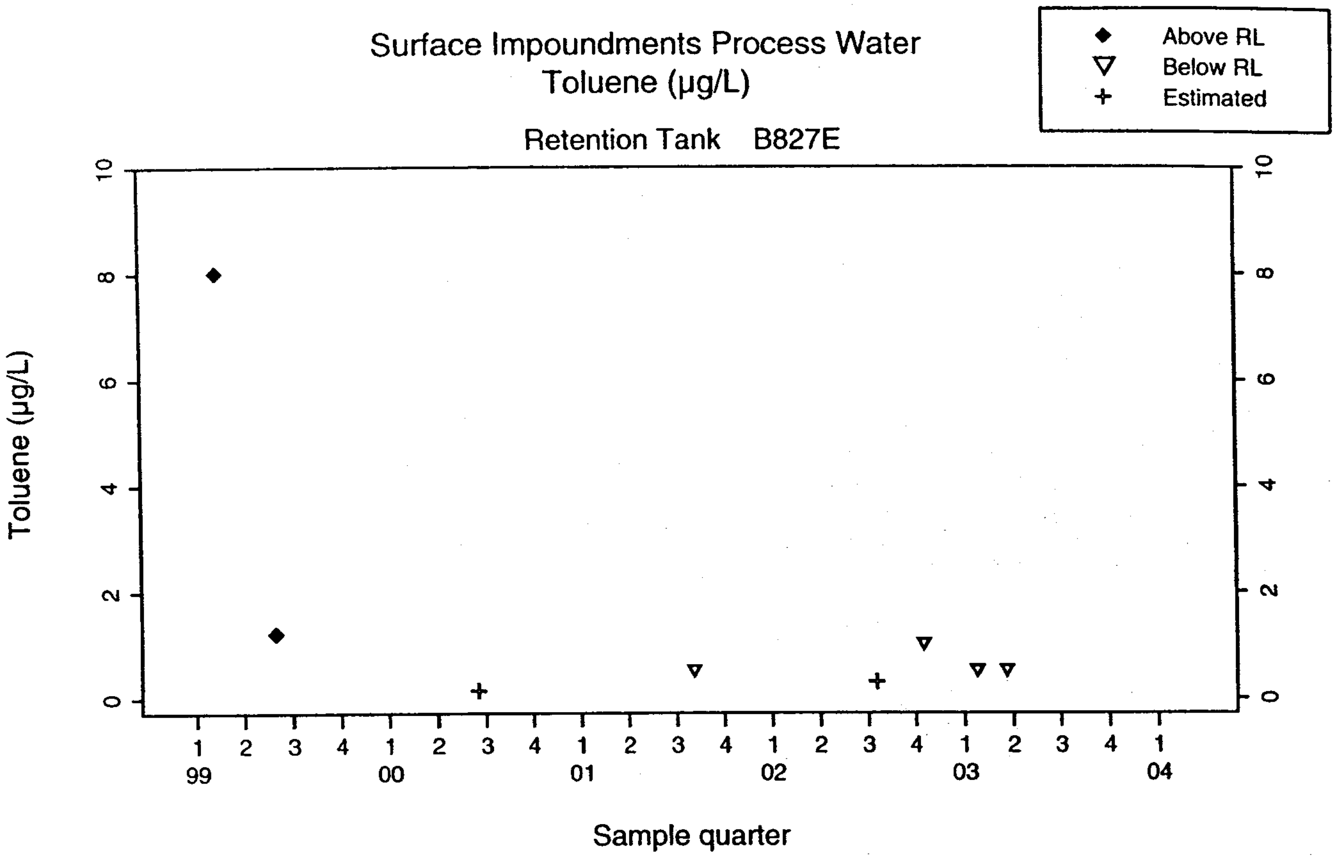

Surface Impoundments Process Water
Bromoform (µg/L)
Above RL
Below RL
Estimated
Retention Tank B806/807
Bromoform (µg/L)
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1
99 00 01 02 03 04
Sample quarter


Retention Tank B817
Bromoform (µg/L)
0.0
0.5
1.0
1.5
2.0
2.5
1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1
99 00 01 02 03 04
Sample quarter

Surface Impoundments Process Water
Toluene (µg/L)

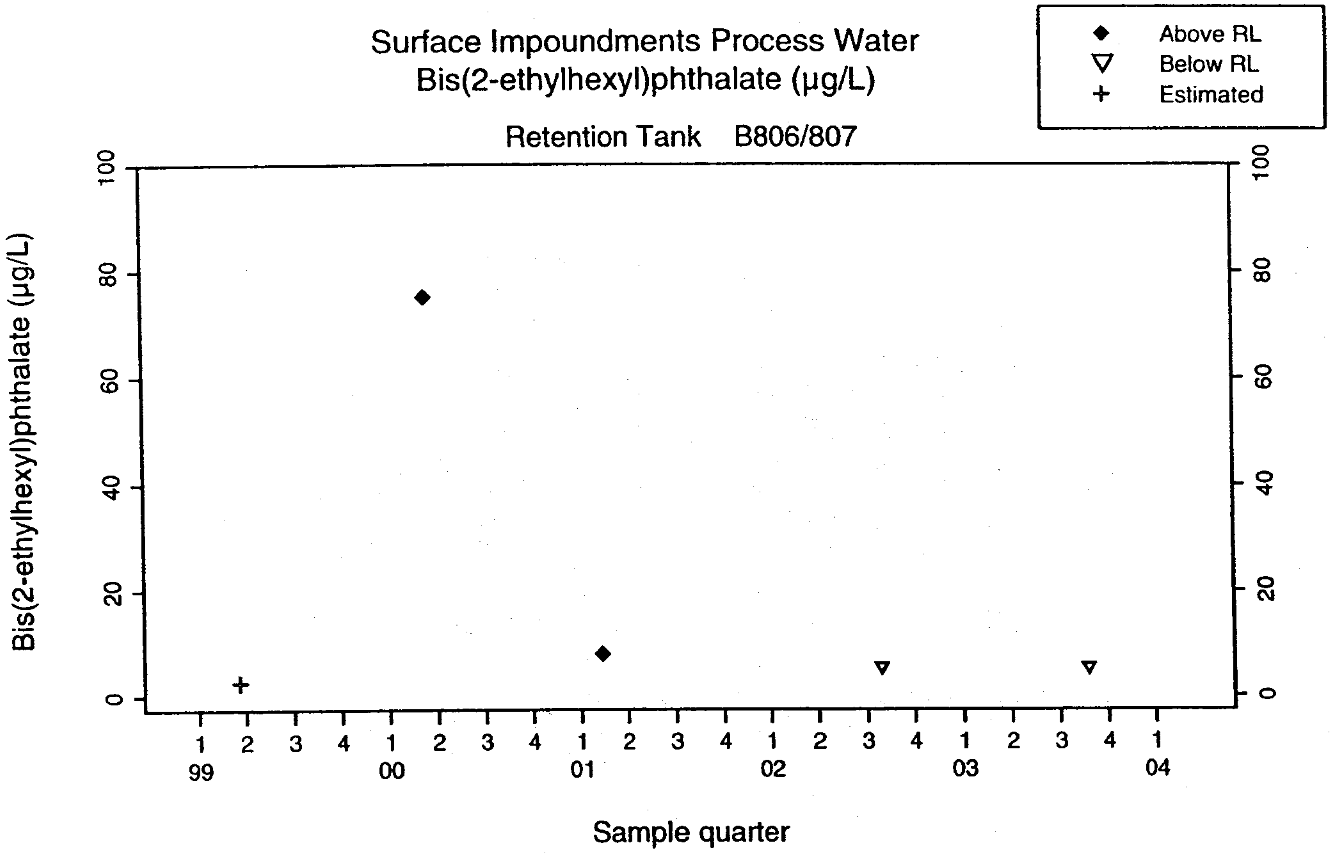




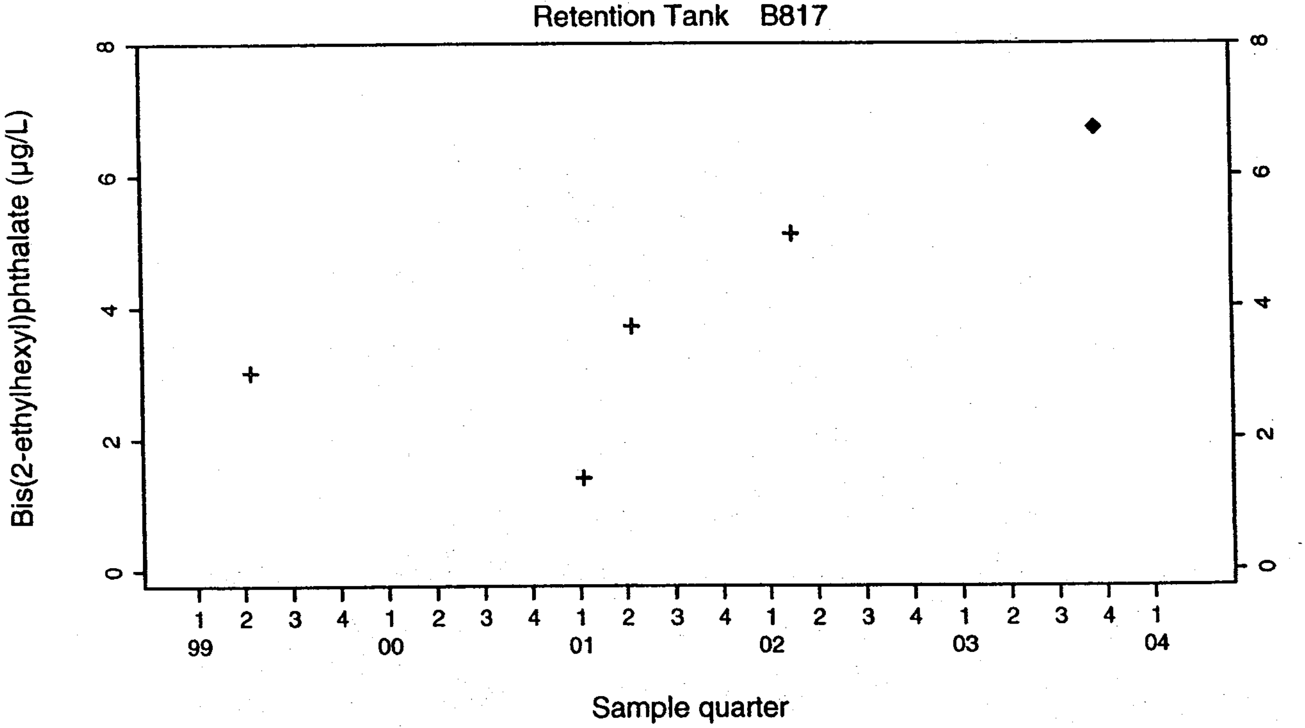

Surface Impoundments Process Water
Toluene (µg/L)
Above RL
Below RL
Estimated
Retention Tank B827E
Toluene (µg/L)
0
2
4
6
8
10
1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1
99
00
01
02
03
04
Sample quarter

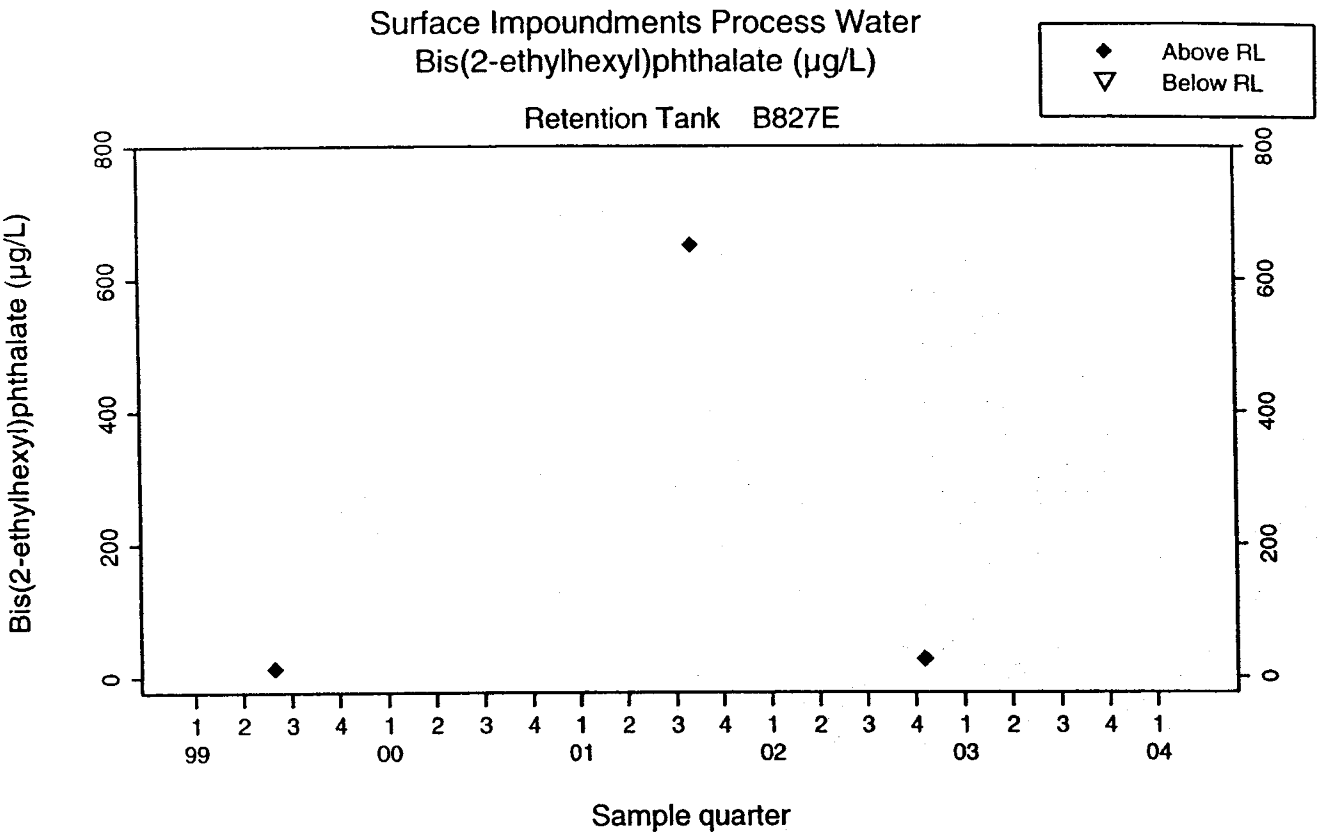
Surface Impoundments Process Water
Bis(2-ethylhexyl)phthalate (µg/L)

Retention Tank B806/807



Retention Tank B817




Surface Impoundments Process Water
Bis(2-ethylhexyl)phthalate (µg/L)
Retention Tank B827E
Above RL
Below RL
Bis(2-ethylhexyl)phthalate (µg/L)
0
200
400
600
800
1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1
99
00
01
02
03
04
Sample quarter

Annual Summary Tables of Surface Impoundments Process Water Monitoring Data

Table A-1.1. Photographic process rinsewater monitoring, Building 801, constituents of concern required by WDR 96-248.

Parameter	MDL[a] range	Reporting limit range	1/28/03 result	8/27/03 result	WDR effluent limits[b]
General					
pH (unitless)	2	2	7.39	6.87	2<pH≤12.5
Metals (mg/L)					
Antimony	0.00037 - 0.0017	0.002 - 0.01	0.00068 est.[c]	< 0.01	15[d]
Arsenic	0.0006 - 0.0011	0.001 - 0.005	0.0012	< 0.005	5
Barium	0.00024 - 0.0012	0.001 - 0.1	0.0125	< 0.1	100
Beryllium	0.00002 - 0.00016	0.0002 - 0.001	0.00006 est.	< 0.001	0.75[d]
Cadmium	0.00006 - 0.00022	0.0005	0.0015	< 0.0005	1
Chromium	0.0002 - 0.005	0.001 - 0.005	0.002	< 0.005	5
Cobalt	0.00012 - 0.003	0.001 - 0.05	0.00024 est.	< 0.05	80
Copper	0.00017 - 0.1	0.002 - 0.1	0.706	0.29	25
Lead	0.00018 - 0.0009	0.001 - 0.005	0.0055	< 0.005	5
Lithium	0.001 - 0.01	0.01	0.052	0.061	NL[e]
Manganese	0.00011 - 0.0008	0.001 - 0.01	0.0119	0.019	NL
Molybdenum	0.000075 - 0.006	0.001 - 0.05	0.0212	< 0.05	350
Nickel	0.00017 - 0.005	0.002 - 0.005	0.0141	0.023	20
Potassium	0.082 - 0.3	1	27	29	NL
Silver	0.00049 - 0.025	0.005 - 0.038	0.311	0.046	5
Thallium	0.00011 - 0.001	0.001 - 0.005	0.00031 est.	< 0.005	7[d]
Vanadium	0.0015 - 0.003	0.003 - 0.05	0.0017 est.	< 0.05	24[d]
Zinc	0.00065 - 0.008	0.005 - 0.05	0.171	0.061	250

a MDL = Method detection limit.

b These discharge limits are found in Monitoring and Reporting Program No. 96-248, adopted on September 20, 1996, or in Appendix C of the *Amended Report of Waste Discharge* (Fisher, 1995).

c Results followed by "est." have estimated values between the MDL and the reporting limit for that compound.

d California soluble threshold limit concentration (STLC), i.e., hazardous waste limit, not noted in WDR 96-248.

e NL = No limit.

Table A-1.2 Photographic process rinsewater monitoring, Building 823, constituents of concern required by WDR 96-248.

Parameter	MDL range[a]	Reporting limit range	2/12/03 result	5/19/03 result	9/8/03 result	12/30/03 results	WDR effluent limits[b]
General							
pH (unitless)	2	2	NA[c]	7.55	8.7	9.6	2<pH≤12.5
Metals (mg/L)							
Antimony	0.000042 - 0.0017	0.001 - 0.01	< 0.002	< 0.01	< 0.01	0.00015 est.[d]	15[e]
Arsenic	0.00019 - 0.0011	0.001 - 0.005	< 0.001	< 0.005	< 0.005	< 0.002	5
Barium	0.000015 - 0.0012	0.001 - 0.1	0.0109	< 0.1	0.012	0.022	100
Beryllium	0.000034 - 0.00016	0.0002 - 0.004	< 0.0008	< 0.004	< 0.001	< 0.0002	0.75[e]
Cadmium	0.000014 - 0.0044	0.0005 - 0.01	0.0067	0.057	< 0.0005	0.0029	1
Chromium	0.0002 - 0.005	0.001 - 0.005	0.0007 est.	< 0.005	< 0.005	0.0024 est.	5
Cobalt	0.000009 - 0.003	0.001 - 0.05	< 0.001	< 0.05	< 0.05	0.000084 est.	80
Copper	0.00011 - 0.005	0.002 - 0.01	0.0374	0.089	0.0097	0.081	25
Lead	0.000046 - 0.0009	0.001 - 0.005	0.0012	< 0.005	< 0.005	0.0016 est.	5
Lithium	0.001 - 0.01	0.01	0.053	0.058	0.059	0.054	NL[f]
Manganese	0.00011 - 0.0008	0.001 - 0.01	0.0062	< 0.01	< 0.01	0.0084 est.	NL
Molybdenum	0.000075 - 0.006	0.001 - 0.05	0.0196	< 0.05	0.059	0.019 est.	350
Nickel	0.000098 - 0.008	0.001 - 0.05	0.0011 est.	< 0.05	< 0.005	0.0056	20
Potassium	0.082 - 0.3	1.0	9.1	22	8.6	21	NL
Silver	0.00049 - 0.08	0.005 - 0.10	0.381	2.9	0.14	0.21	5
Thallium	0.000005 - 0.001	0.001 - 0.005	< 0.001	< 0.005	< 0.005	0.000039 est.	7[e]
Vanadium	0.0013 - 0.003	0.003 - 0.05	< 0.003	< 0.05	< 0.05	< 0.010	24[e]
Zinc	0.00065 - 0.008	0.005 - 0.05	0.0213	0.12	< 0.05	0.057	250

a MDL = Method detection limit
b These discharge limits are found in Monitoring and Reporting Program No. 96-248, adopted on September 20, 1996, or in Appendix C of the *Amended Report of Waste Discharge* (Fisher 1995)
c NA = Not applicable
d Results followed by "est." have estimated values between the MDL and the reporting limit for that compound
e California soluble threshold limit concentration (STLC), i.e., hazardous waste limit, not noted in WDR 96-248
f NL = No limit

Table A-1.3. Photographic process rinsewater monitoring, Building 851, constituents of concern required by WDR 96-248.

Parameter	MDL range[a]	Reporting limit range	1/23/03 result	4/10/03 result	6/12/03 result	8/6/03 result	10/20/03 result	WDR effluent limits[b]
General								
pH (unitless)	2	2	NA[c]	7.83	7.89	7.76	7.84	2<pH≤12.5
Metals (mg/L)								
Antimony	0.000042 - 0.02	0.001 - 0.1	< 0.002	< 0.001	< 0.002	< 0.1	< 0.001	15[d]
Arsenic	0.00019 - 0.06	0.001 - 0.1	0.0037	0.0045	< 0.001	< 0.1	0.0049	5
Barium	0.000015 - 0.0012	0.001 - 0.1	0.0092	0.0085	0.0097	< 0.1	0.012	100
Beryllium	0.00002 - 0.003	0.0002 - 0.01	< 0.0002	< 0.001	0.0001 est.[e]	< 0.01	< 0.001	0.75[d]
Cadmium	0.000014 - 0.003	0.0005 - 0.01	0.0014	< 0.001	0.0001 est.	< 0.01	< 0.001	1
Chromium	0.0002 - 0.003	0.001 - 0.01	0.002	0.013	0.0074	< 0.01	0.007	5
Cobalt	0.000008 - 0.003	0.001 - 0.05	0.00037 est.	< 0.05	0.00011 est.	< 0.05	< 0.001	80
Copper	0.00011 - 0.004	0.002 - 0.01	0.0704	0.15	0.0572	0.026	0.052	25
Lead	0.000046 - 0.008	0.001 - 0.1	0.0029	< 0.005	0.0021	< 0.1	< 0.005	5
Lithium	0.0008 - 0.01	0.01 - 0.02	0.049	< 0.01	0.059	0.053	0.053	NL[f]
Manganese	0.00011 - 0.0008	0.001 - 0.01	0.0144	0.022	0.0089	0.015	0.014	NL
Molybdenum	0.000033 - 0.006	0.001 - 0.05	0.0214	< 0.05	0.0217	< 0.05	0.019	350
Nickel	0.000098 - 0.008	0.001 - 0.05	0.0034	< 0.05	0.0049	< 0.05	0.0021	20
Potassium	0.044 - 0.3	1.0	19	21	14	17	18	NL
Silver	0.00028 - 0.003	0.01 - 0.02	0.809	0.23	0.713	0.13	0.34	5
Thallium	0.000005 - 0.06	0.001 - 0.1	< 0.001	< 0.001	< 0.001	< 0.1	< 0.001	7[d]
Vanadium	0.0013 - 0.003	0.003 - 0.05	0.0024 est.	< 0.05	< 0.003	< 0.05	< 0.003	24[d]
Zinc	0.00065 - 0.008	0.005 - 0.05	0.04	0.1	0.0641	0.2	0.031	250

a MDL = Method detection limit

b These discharge limits are found in the Monitoring and Reporting Program No. 96-248, adopted on September 20, 1996, or in Appendix C of the *Amended Report of Waste Discharge* (Fisher 1995)

c NA = Not applicable

d California soluble threshold limit concentration (STLC), i.e., hazardous waste limit, not noted in WDR 96-248

e Results followed by "est" have estimated values between the MDL and the reporting limit for that compound

f NL = No limit

Table A-2.1 Chemistry area process wastewater monitoring, Building 827C/D, constituents of concern required by WDR 96-248.

Parameter	MDL[a]	Reporting limit	7/14/03 Portable tank 1	7/14/03 Portable tank 2	WDR effluent limits[b]
Energetic materials (µg/L)					
HMX	3.63	10	640	540	NL[c]
RDX	3.19	5	6.5	29	NL
TATB[d]	5.13	10.3	< 10.3	< 10.3	NL
Volatile organic compounds (µg/L)[e]					
1,1,1-Trichloroethane	0.11	0.5	< 0.5	< 0.5	100,000
1,2-Dichloroethane	0.063	0.5	< 0.5	< 0.5	500
2-Butanone	1.3	20	< 20	< 20	200,000
Acetone	2.8	10	< 10	< 10	1,000,000
Bromoform	0.08	0.5	< 0.5	0.11 est.[f]	100,000
Chlorobenzene	0.064	0.5	< 0.5	< 0.5	100,000
Chloroform	0.055	0.5	0.09 est.	< 0.5	100,000
Dibromochloromethane	0.063	0.5	< 0.5	0.08 est.	100,000
Ethanol	40	1000	< 1000	< 1000	1,000,000
Freon 113	0.05	0.5	< 0.5	< 0.5	100,000
Methylene chloride	0.17	1	< 1	< 1	100,000
Methyl isobutyl ketone	1.1	20	< 20	< 20	1,000,000
Styrene	0.091	0.5	< 0.5	< 0.5	1,000,000
Tetrachloroethene	0.11	0.5	< 0.5	< 0.5	700
Toluene	0.069	0.5	< 0.5	< 0.5	200,000
Vinyl chloride	0.064	0.5	< 0.5	< 0.5	200
Semi-volatile organic compounds (µg/L)[e]					
Dimethyl sulfoxide (DMSO)	0.038 - 0.04	10	< 10	< 10	1,000,000

a MDL = Method detection limit.

b These discharge limits are found in Monitoring and Reporting Program No. 96-248, adopted on September 20, 1996, or in Appendix C of the *Amended Report of Waste Discharge* (Fisher 1995).

c NL = No limit

d Analyzed using an uncertified method (there is no certified method for analysis of TATB).

e No other volatile or semi-volatile organic compounds were detected using EPA Methods 624 or 625.

f Results followed by "est." are compounds detected with concentrations estimated between the MDL and the reporting limit for that compound.

Table A-2.2 Chemistry area process wastewater monitoring, Building 827E, constituents of concern required by WDR 96-248.

Parameter	MDL[a] range	Reporting limit range	7/15/02 result[b]	10/14/02 result[b]	1/21/03 result[b]	3/17/03 result[b]	WDR effluent limits[c]
Energetic materials (µg/L)							
HMX	0.259 - 3.63	5 - 500	300	1900	490	550	NL[d]
RDX	0.522 - 3.19	5	< 5	980	150	200	NL
TATB[e]	5 - 25	10 - 50	< 50	37.5	< 20	< 10	NL
Volatile organic compounds (µg/L)[f]							
1,1,1-Trichloroethane	0.057 - 0.35	0.5 - 1	< 0.5	< 1	< 0.5	< 0.5	100,000
1,2-Dichloroethane	0.048 - 0.18	0.5 - 1	< 0.5	< 1	< 0.5	< 0.5	500
2-Butanone	0.62 - 2.5	5 - 20	< 20	< 5	< 20	< 20	200,000
Acetone	1.6 - 8.2	10 - 20	13 est.[g]	< 10	< 20	< 20	1,000,000
Bromoform	0.043 - 0.14	0.5 - 1	< 0.5	< 1	< 0.5	< 0.5	100,000
Chlorobenzene	0.048 - 0.19	0.5 - 1	< 0.5	< 1	< 0.5	< 0.5	100,000
Ethanol	38 - 49	1000	< 1000	NA[h]	< 1000	< 1000	1,000,000
Freon 113	0.074 - 0.48	0.5 - 1	< 0.5	< 1	< 0.5	< 0.5	100,000
Methylene chloride	0.076 - 0.78	1 - 3	< 1	< 3	< 1	< 1	100,000
Methyl isobutyl ketone	0.58 - 0.93	5 - 20	< 20	< 5	< 20	< 20	1,000,000
Styrene	0.049 - 0.25	0.5 - 1	< 0.5	< 1	< 0.5	< 0.5	1,000,000
Tetrachloroethene	0.079 - 0.32	0.5 - 1	< 0.5	< 1	< 0.5	< 0.5	700
Toluene	0.044 - 0.25	0.5 - 1	0.29 est.	< 1	< 0.5	< 0.5	200,000
Trichloroethene	0.075 - 0.29	0.5 - 1	< 0.5	< 1	0.15 est.	< 0.5	500
Vinyl chloride	0.057 - 0.34	0.5 - 1	< 0.5	< 1	< 0.5	< 0.5	200
Semi-volatile organic compounds (µg/L)[f]							
Benzyl alcohol	0.3	10	NA	< 10	NA	NA	1,000,000
Bis(2-ethylhexyl)phthalate	0.3	5	NA	26	NA	NA	1,000,000
Dimethyl sulfoxide (DMSO)	0.031 - 0.037	10 - 20	< 10	< 20	< 10	< 10	1,000,000
Naphthalene	0.085 - 0.7	0.5 - 5	< 0.5	< 5	< 0.5	< 0.5	200,000
ortho-Cresol	0.5	5	NA	< 5	NA	NA	200,000
meta- & *para*-Cresol	0.5	5	NA	< 5	NA	NA	200,000

a MDL = Method.
b Sample date.
c These discharge limits are found in Monitoring and Reporting Program No. 96-248, adopted on September 20, 1996, or in Appendix C of the *Amended Report of Waste Discharge* (Fisher 1995).
d NL = No limit.
e Analyzed using an uncertified method (there is no certified method for analysis of TATB).
f No other volatile or semi-volatile organic compounds were detected using EPA Methods 624 or 625.
g Results followed by "est." are compounds detected with concentrations estimated between the MDL and the reporting limit for that compound.
h NA = Not applicable.

Table A-2.3 Chemistry area process wastewater monitoring, Building 827C/D, other constituents.

Parameter	MDL[a]	Reporting limit	7/14/03		WDR effluent limits[b]
			Portable tank 1	Portable tank 2	
General					
pH (unitless)	NAFL[c]	NAFL	9.4	8.8	2<pH≤12.5
Metals (mg/L)					
Antimony	0.016	0.016	< 0.016	< 0.016	15[d]
Arsenic	0.02	0.02	< 0.02	< 0.02	5
Barium	0.001	0.001	0.0044	0.033	100
Beryllium	0.0086	0.0086	< 0.0086	< 0.0086	0.75[d]
Cadmium	0.0008	0.0008	< 0.0008	0.007	1
Chromium	0.0015	0.0015	0.002	0.025	5
Cobalt	0.0014	0.0014	< 0.0014	0.002	80
Copper	0.0049	0.0049	0.026	0.17	25
Lead	0.014	0.014	< 0.014	0.015	5
Manganese	0.0063	0.0063	0.0063	0.072	NL[e]
Mercury	0.00045	0.00045	< 0.00045	0.0012	0.2[d]
Molybdenum	0.003	0.003	0.022	0.025	350
Nickel	0.023	0.023	< 0.023	< 0.023	20
Potassium	0.095	0.095	3.7	4.5	NL
Selenium	0.024	0.024	< 0.024	< 0.024	1[d]
Silver	0.0025	0.0025	< 0.0025	< 0.0025	5
Thallium	0.055	0.055	< 0.055	< 0.055	7[d]
Vanadium	0.002	0.002	< 0.002	< 0.002	24[d]
Zinc	0.014	0.014	0.018	0.3	250

a MDL = Method detection limit.

b These discharge limits are found in Monitoring and Reporting Program No. 96-248, adopted on September 20, 1996, or in Appendix C of the *Amended Report of Waste Discharge* (Fisher 1995).

c NAFL = Not available from laboratory.

d California soluble threshold limit concentration (STLC), i.e., hazardous waste limit, not noted in WDR 96-248.

e NL = No limit.

Table A-2.4 Chemistry area process wastewater monitoring, Building 827E, other constituents.

Parameter	MDL[a]	Reporting limit	7/15/02 result[b]	10/14/02 result[b]	1/21/03 result[b]	3/17/03 result[b]	WDR effluent limits[c]
General							
pH (unitless)	NAFL[d]	NAFL	10.5	9.3	8.7	7.3	2<pH≤12.5
Metals (mg/L)							
Antimony	0.016	0.016	< 0.016	< 0.016	< 0.016	< 0.016	15[e]
Arsenic	0.02	0.02	< 0.020	0.024	< 0.02	< 0.02	5
Barium	0.001	0.001	0.044	0.1	0.098	0.074	100
Beryllium	0.0086	0.0086	0.014	< 0.0086	< 0.0086	< 0.0086	0.75[e]
Cadmium	0.0008	0.0008	0.012	0.015	0.0043	0.0035	1
Chromium	0.0015	0.0015	0.0057	0.011	0.02	0.008	5
Cobalt	0.0014	0.0014	0.0021	0.0015	0.0015	< 0.0014	80
Copper	0.0049 – 0.008	0.0049 – 0.008	0.12	0.19	0.23	0.19	25
Lead	0.014	0.014	< 0.014	0.036	0.049	0.048	5
Manganese	0.0063	0.0063	0.020	0.042	0.051	0.048	NL[f]
Mercury	0.00045	0.00045	< 0.00045	< 0.00045	0.00058	< 0.00045	0.2[e]
Molybdenum	0.003	0.003	0.041	0.046	0.0096	0.011	350
Nickel	0.023	0.023	0.054	0.034	< 0.023	< 0.023	20
Potassium	0.095	0.095	13.6	16.4	5.4	5.4	NL
Selenium	0.024	0.024	< 0.024	< 0.024	< 0.024	< 0.024	1[e]
Silver	0.0025	0.0025	< 0.0025	< 0.0025	< 0.0025	< 0.0025	5
Thallium	0.055	0.055	< 0.055	< 0.055	< 0.055	< 0.055	7[e]
Vanadium	0.002	0.002	0.0052	0.017	0.023	0.018	24[e]
Zinc	0.014	0.014	0.099	0.39	0.15	0.17	250

a MDL = Method detection limit.

b Sampling date.

c These discharge limits are found in Monitoring and Reporting Program No. 96-248, adopted on September 20, 1996, or in Appendix C of the *Amended Report of Waste Discharge* (Fisher 1995).

d NAFL = Not available from laboratory.

e California soluble threshold limit concentration (STLC), i.e., hazardous waste limit, not noted in WDR 96-248.

f NL = No limit.

Table A-3.1 Explosive process area wastewater monitoring, Building 806/807, constituents of concern required by WDR 96-248.

Parameter	Building 806/807 Sampled: 8/22/03			
	MDL[a]	Reporting limit	Result	WDR effluent limits[b]
Metals (mg/L)				
Aluminum	0.016	0.05	0.14	NL[c]
Arsenic	0.00078	0.001	< 0.001	5
Barium	0.0004	0.001	0.0529	100
Cadmium	0.000018	0.001	< 0.001	1
Chromium	0.0002	0.001	0.001	5
Cobalt	0.000008	0.001	0.00029 est.[d]	80
Copper	0.002	0.02	0.1	25
Lead	0.000067	0.001	0.0022	5
Manganese	0.00031	0.001	0.01	NL
Molybdenum	0.000033	0.001	0.0277	350
Nickel	0.0002	0.002	0.0016 est.	20
Potassium	0.051	1	9.9	NL
Silver	0.000028	0.001	0.0105	5
Zinc	0.0029	0.005	0.0268	250
Energetic materials (µg/L)				
PETN	NAFL[e]	NAFL	NAFL	NL
RDX	3.19	5	130	NL
HMX	3.63	5	3000	NL
TATB[f]	5.0	20	< 20	NL
TNT	3.87	5	< 5	NL
Semi-volatile organic compounds (µg/L)[g]				
Benzyl alcohol	1.1	2	< 2	1,000,000
bis(2-ethylhexyl)phthalate	0.76	5	< 5	1,000,000
Diethyl phthalate	0.35	5	0.41 est.	1,000,000
Dimethyl sulfoxide (DMSO)	0.038	10	< 10	1,000,000
Naphthalene	0.36	5	< 5	200,000
N-Nitrosodiphenylamine	0.32	2	1.2 est.	1,000,000
meta- & *para*-Cresol	0.56	2	< 2	50,000
ortho-Cresol	0.3	5	< 5	50,000

(continued)

Table A-3.1 (concluded)

Parameter	Building 806/807 Sampled: 8/22/03			
	MDL	Reporting limit	Result	WDR effluent limits
Volatile organic compounds (µg/L)[g]				
1,1,1-Trichloroethane	0.11	0.5	< 0.5	100,000
1,2-Dichloroethane	0.063	0.5	< 0.5	500
2-Butanone	1.3	20	< 20	200,000
Acetone	2.8	10	8.4 est.	1,000,000
Bromoform	0.08	0.5	< 0.5	100,000
Chlorobenzene	0.064	0.5	< 0.5	100,000
Ethanol	40.0	1000	< 1000	1,000,000
Freon 113	0.05	0.5	< 0.5	100,000
Methyl isobutyl ketone	1.1	20	< 20	1,000,000
Methylene chloride	0.17	1	< 1	100,000
Styrene	0.091	0.5	< 0.5	1,000,000
Tetrachloroethene	0.11	0.5	< 0.5	700
Toluene	0.069	0.5	< 0.5	200,000
Vinyl chloride	0.064	0.5	< 0.5	200

a MDL = Method detection limit.

b These discharge limits are found either in Monitoring and Reporting Program No. 96-248, adopted on September 20, 1996, or in Appendix C of the Amended Report of Waste Discharge (1995).

c NL = No limit.

d Results followed by "est." are compounds detected with concentrations estimated between the MDL and the reporting limit for that compound.

e NAFL = Not available from laboratory.

f Analyzed using an uncertified method (there is no certified method for analysis of TATB).

g No other volatile or semi-volatile organic compounds were detected using EPA Methods 624 or 625.

Table A-3.2 Explosive process area wastewater monitoring, Building 817, constituents of concern required by WDR 96-248.

Parameter	Building 817 Sampled: 9/10/03			
	MDL[a]	Reporting limit	Result	WDR effluent limits[b]
Metals (mg/L)				
Aluminum	0.014	0.05	1.1	NL[c]
Arsenic	0.00078	0.001	0.0017	5
Barium	0.0004	0.001	0.0245	100
Cadmium	0.000018	0.001	0.0059	1
Chromium	0.00017	0.001	0.012	5
Cobalt	0.000008	0.001	0.003	80
Copper	0.000071	0.001	0.25	25
Lead	0.000067	0.001	0.0166	5
Manganese	0.00031	0.001	0.083	NL
Molybdenum	0.000033	0.001	0.212	350
Nickel	0.0002	0.002	0.114	20
Potassium	0.051	1.0	12	NL
Silver	0.000028	0.001	0.0026	5
Zinc	0.0029	0.005	0.321	250
Energetic materials (μg/L)				
PETN	NAFL[d]	1.7	< 1.7	NL
RDX	3.19	5	7.2	NL
HMX	3.63	5	500	NL
TATB[e]	500	1000	< 1000	NL
TNT	3.87	5	< 5	NL

(continued)

Table A-3.2 (concluded)

Parameter	Building 817 Sampled: 9/10/03			
	MDL	Reporting limit	Result	WDR effluent limits
Semi-volatile organic compounds (µg/L)[f]				
2,4-Dimethylphenol	0.35	5	0.58 est.[g]	1,000,000
Benzyl alcohol	1.2	2	< 2	1,000,000
bis(2-ethylhexyl)phthalate	1.2	5	6.7	1,000,000
Diethyl phthalate	0.29	5	3 est.	1,000,000
Dimethyl phthalate	0.3	5	1 est.	1,000,000
Dimethyl sulfoxide (DMSO)	0.03	10	< 10	1,000,000
Naphthalene	0.38	5	< 5	200,000
meta- & *para*-Cresol	0.39	2	< 2	50,000
ortho-Cresol	0.24	5	1.9 est.	50,000
Volatile organic compounds (µg/L)[f]				
1,1,1-Trichloroethane	0.11	0.5	< 0.5	100,000
1,2-Dichloroethane	0.063	0.5	< 0.5	500
2-Butanone	1.3	20	< 20	200,000
Acetone	2.8	10	320	1,000,000
Bromoform	0.08	0.5	< 0.5	100,000
Carbon disulfide	0.27	5	0.93 est.	1,000,000
Chlorobenzene	0.064	0.5	< 0.5	100,000
Ethanol	40	1000	210 est.	1,000,000
Freon 113	0.05	0.5	< 0.5	100,000
Methyl isobutyl ketone	1.1	20	< 20	1,000,000
Methylene chloride	0.17	1	< 1	100,000
Styrene	0.091	0.5	< 0.5	1,000,000
Tetrachloroethene	0.11	0.5	< 0.5	700
Toluene	0.069	0.5	< 0.5	200,000
Trichloroethene	0.079	0.5	0.13 est.	500
Vinyl chloride	0.064	0.5	< 0.5	200

a MDL = Method detection limit.
b These discharge limits are found either in Monitoring and Reporting Program No. 96-248, adopted on September 20, 1996, or in Appendix C of the Amended Report of Waste Discharge (Fisher1995).
c NL = No limit.
d NAFL = Not available from laboratory.
e Analyzed using an uncertified method (there is no certified method for analysis of TATB).
f No other volatile or semi-volatile organic compounds were detected using EPA Methods 624 or 625.
g Results followed by "est." are compounds detected with concentrations estimated between the MDL and the reporting limit for that compound.

Appendix B

Annual Summary Plots and Tables of Surface Impoundments Ground Water Monitoring Data

Appendix B

This appendix contains graphical and tabular summaries of ground water monitoring data from the surface impoundments ground water monitoring network. The constituents of concern for WDR 96-248 are shown graphically, and the tables at the end of this appendix list all 2003 ground water data. The data plots contain all monitoring data available since LLNL began sampling wells W-817-01, W-817-02, W-817-03, and W-817-04 in 1985.

These plots display the field parameter of ground water elevation, followed by volatile organic compounds (VOCs), trace metals, photographic chemicals (cresols), minerals and nutrients, energetic compounds, and finally, semi-volatile organic compounds (SVOCs). The upgradient (background) monitoring well W-817-01 is always plotted first for each analyte.

Each two-dimensional graph shows concentration plotted on the vertical axis versus time (years divided into four quarterly sampling periods) on the horizontal axis. Units of measure are given on the vertical axis label and in the header at the top of each page. Values above the analytical reporting limit for each analyte are plotted as solid diamonds, values below the reporting limit are plotted as open inverted triangles, and estimated values between the reporting limit and the method detection limit are plotted as crosses. The current statistical limits (SLs) for constituents of concern specified in WDR 96-248 are shown as horizontal dashed lines on the graph.

In order to provide more useful plot scales, some analytes at high concentrations are not plotted. **Table B-1.0** shows those concentrations. Some pre-1990 non-detection results have also been omitted from the plots.

Table B-1.0. Ground water analytes that are not plotted.

Type	Analyte	Location	Date	Result
VOCs	Methylene chloride	W-817-04	07/27/89	3.6 µg/L
Metals	Barium	W-817-01	02/09/87	0.1 mg/L
Metals	Potassium	W-817-03	04/17/89	37 mg/L
Metals	Zinc	W-817-02	02/06/89	1 mg/L
Metals	Zinc	W-817-03	02/06/89	1 mg/L
Metals	Zinc	W-817-03	06/16/99	0.79 mg/L
Metals	Zinc	W-817-04	02/06/89	0.75 mg/L

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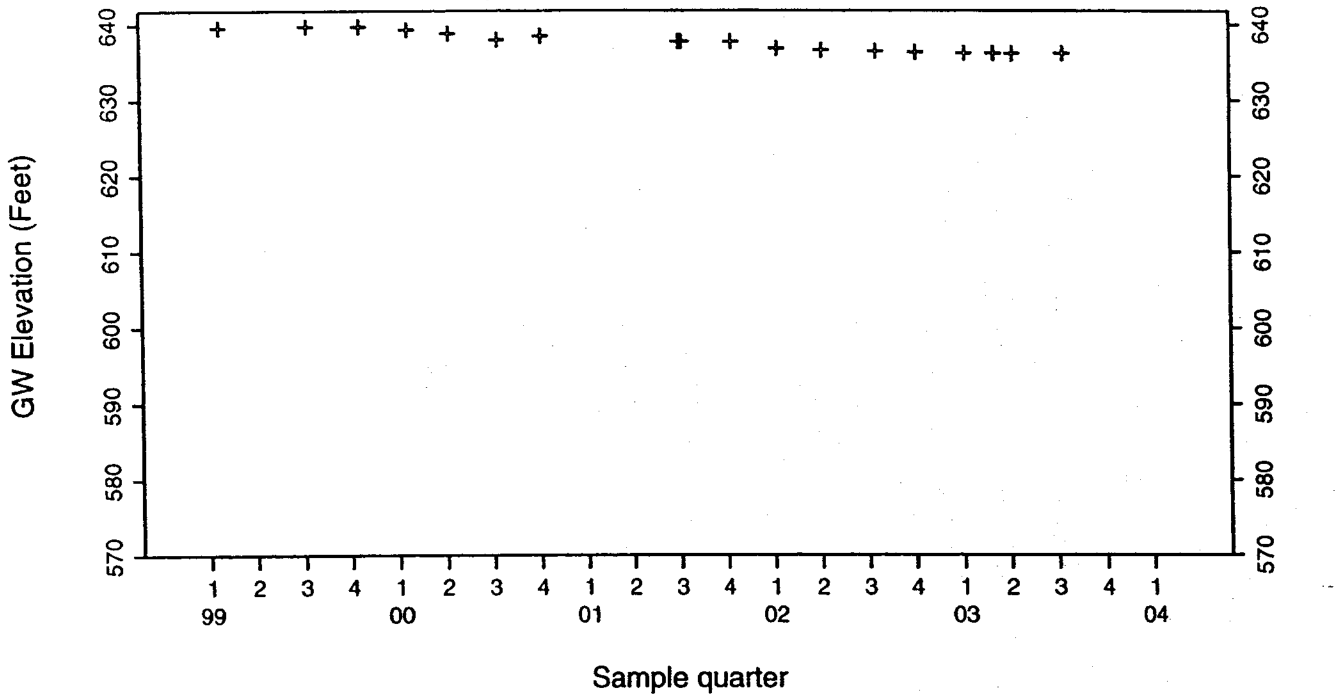
Annual Plots of Surface Impoundments Ground Water Monitoring Data

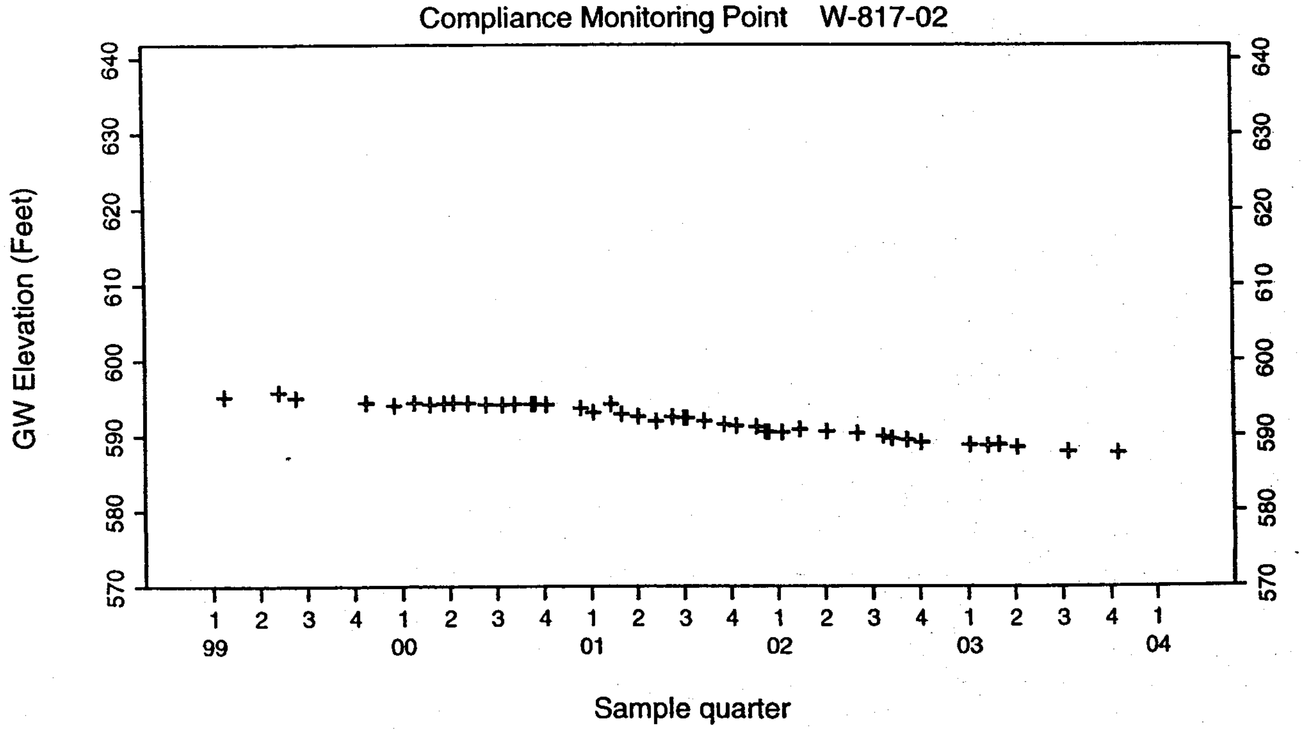
WGMG04:030:ER:DL:bld

Surface Impoundments Ground Water
GW Elevation (Feet)

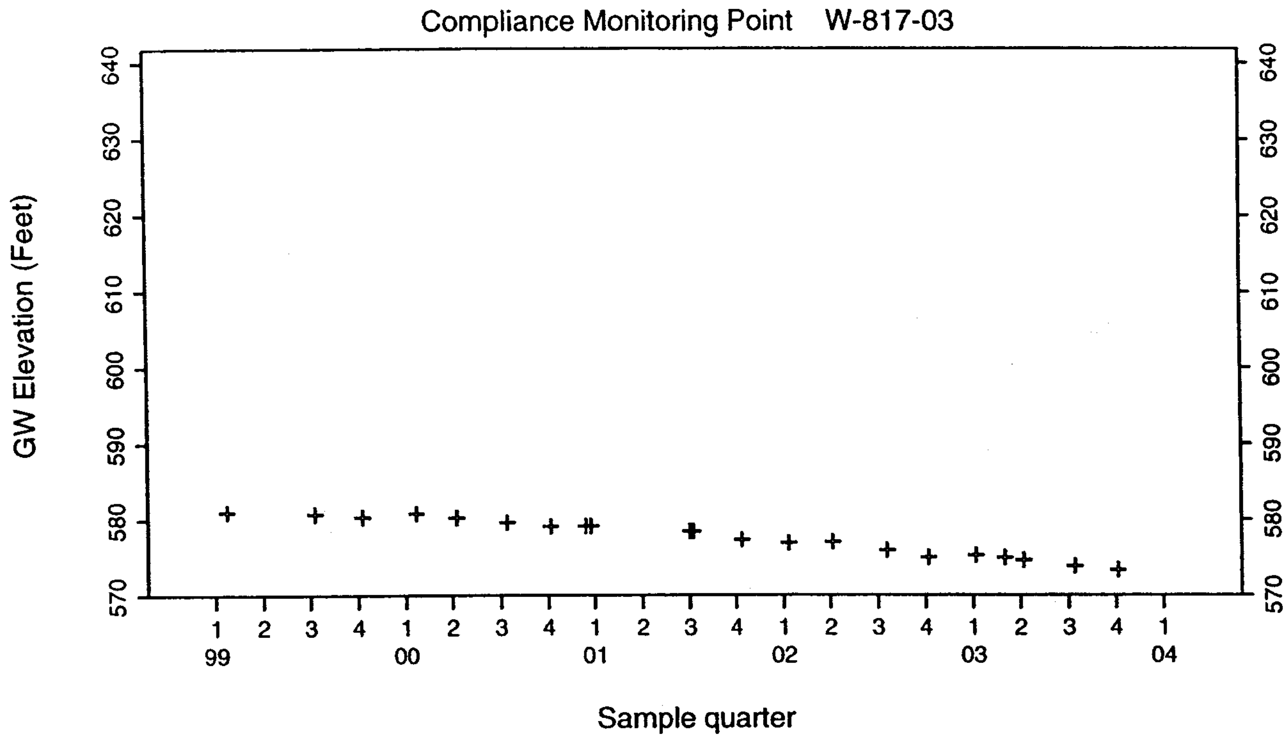
Background Monitoring Point W-817-01

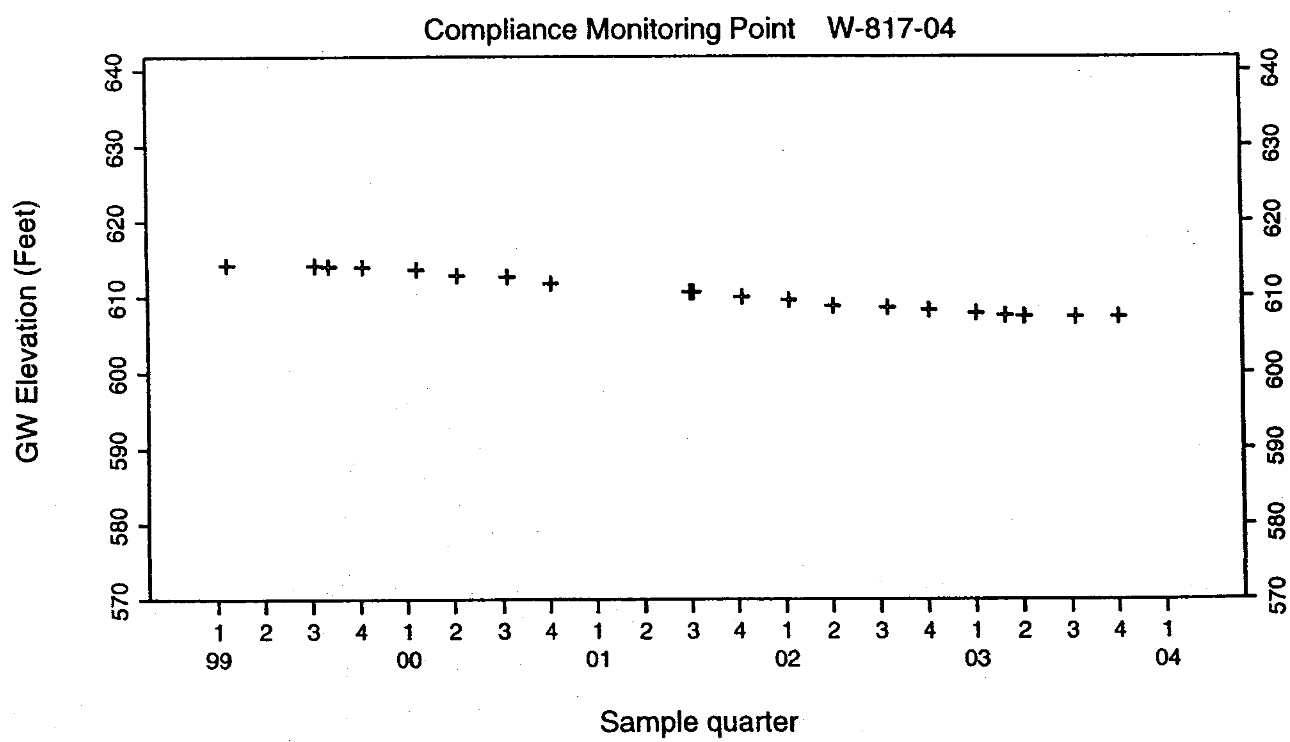


Compliance Monitoring Point W-817-02

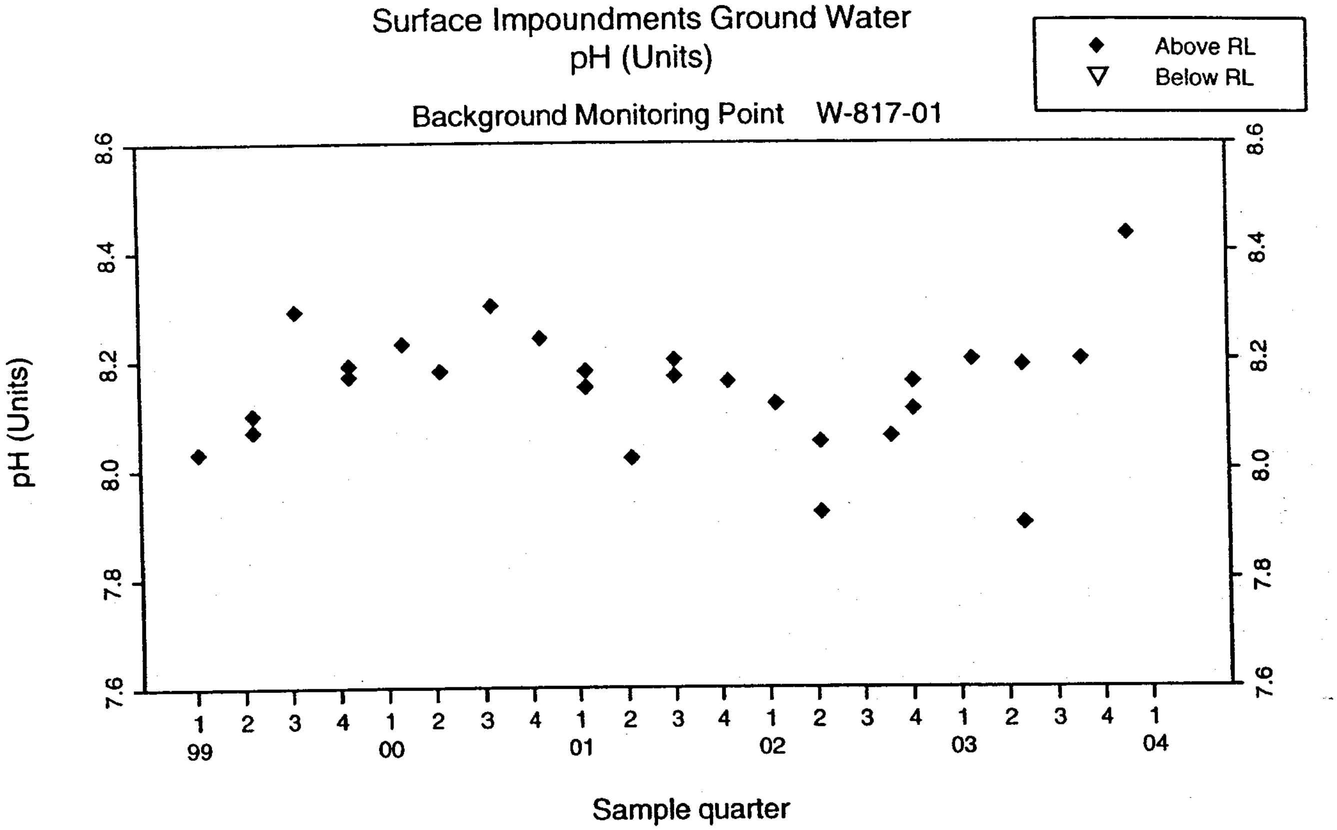


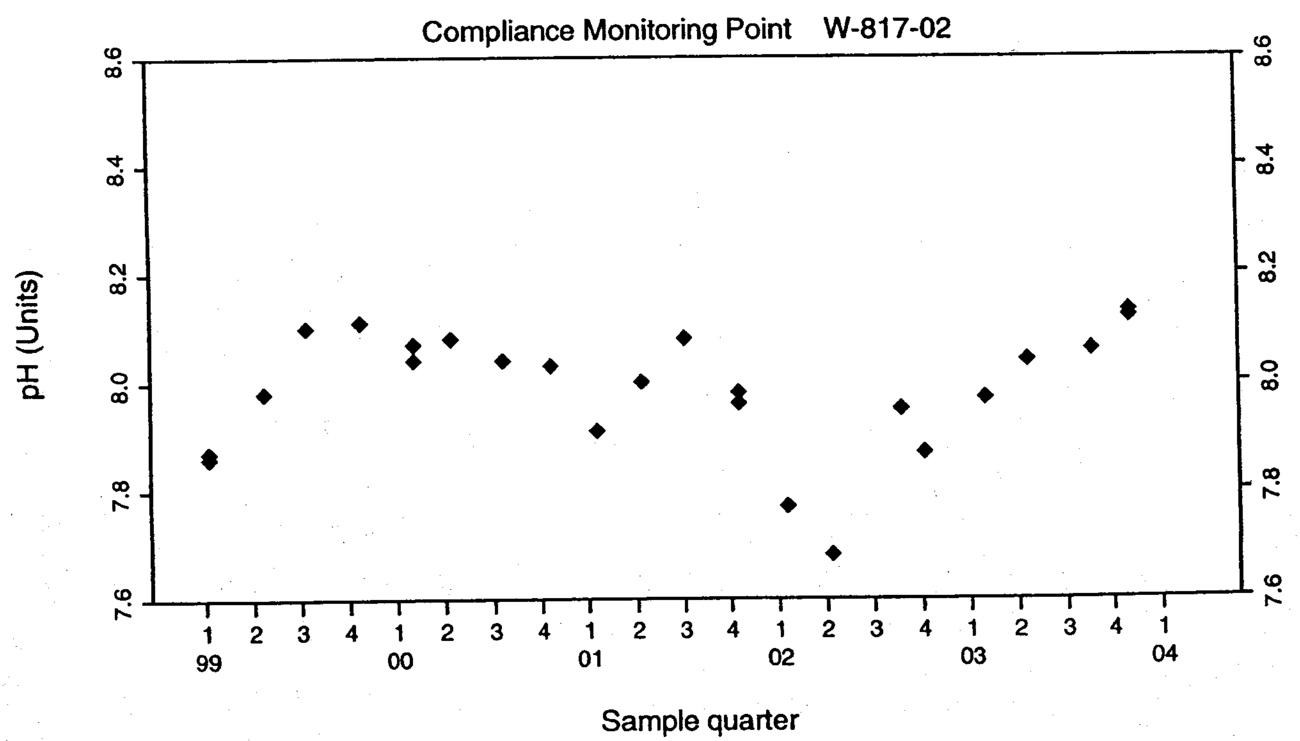
Surface Impoundments Ground Water
GW Elevation (Feet)



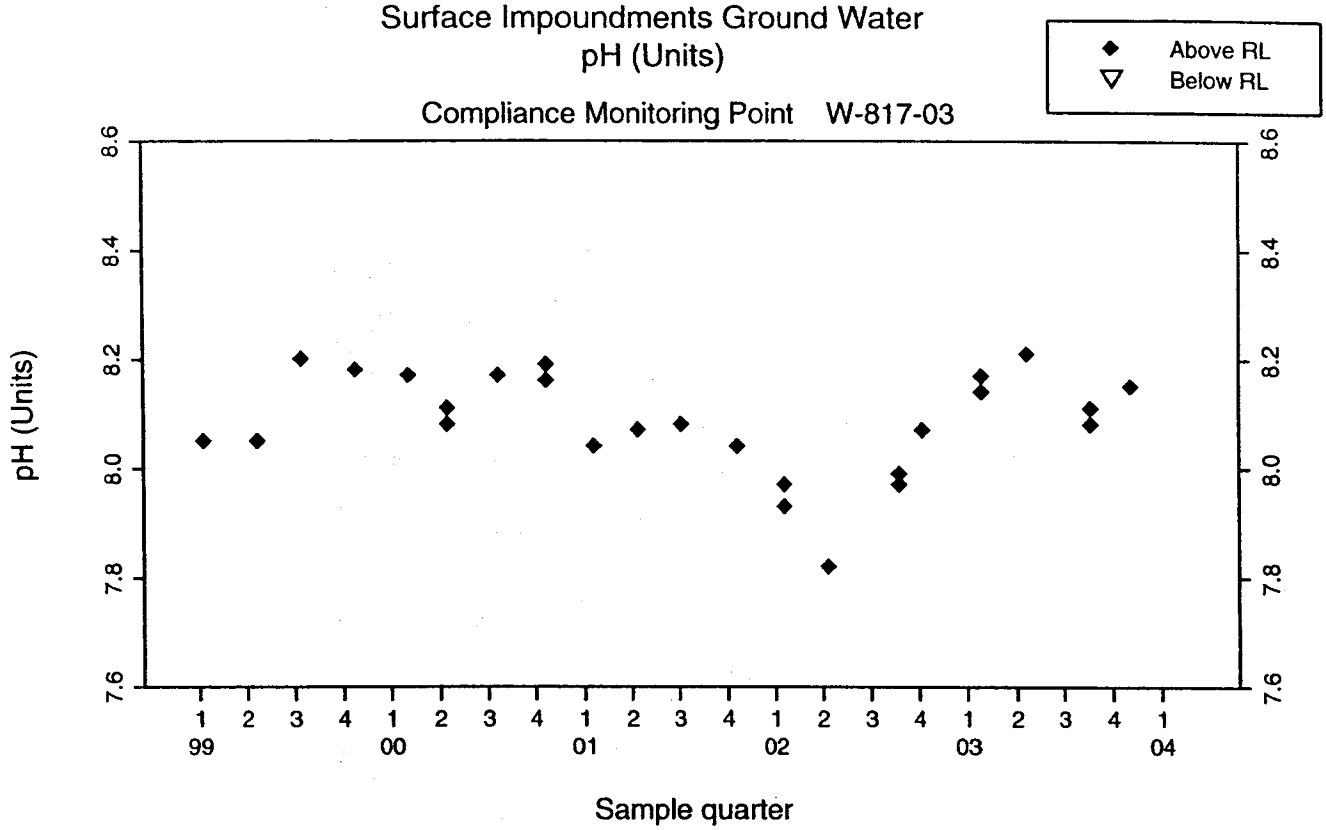


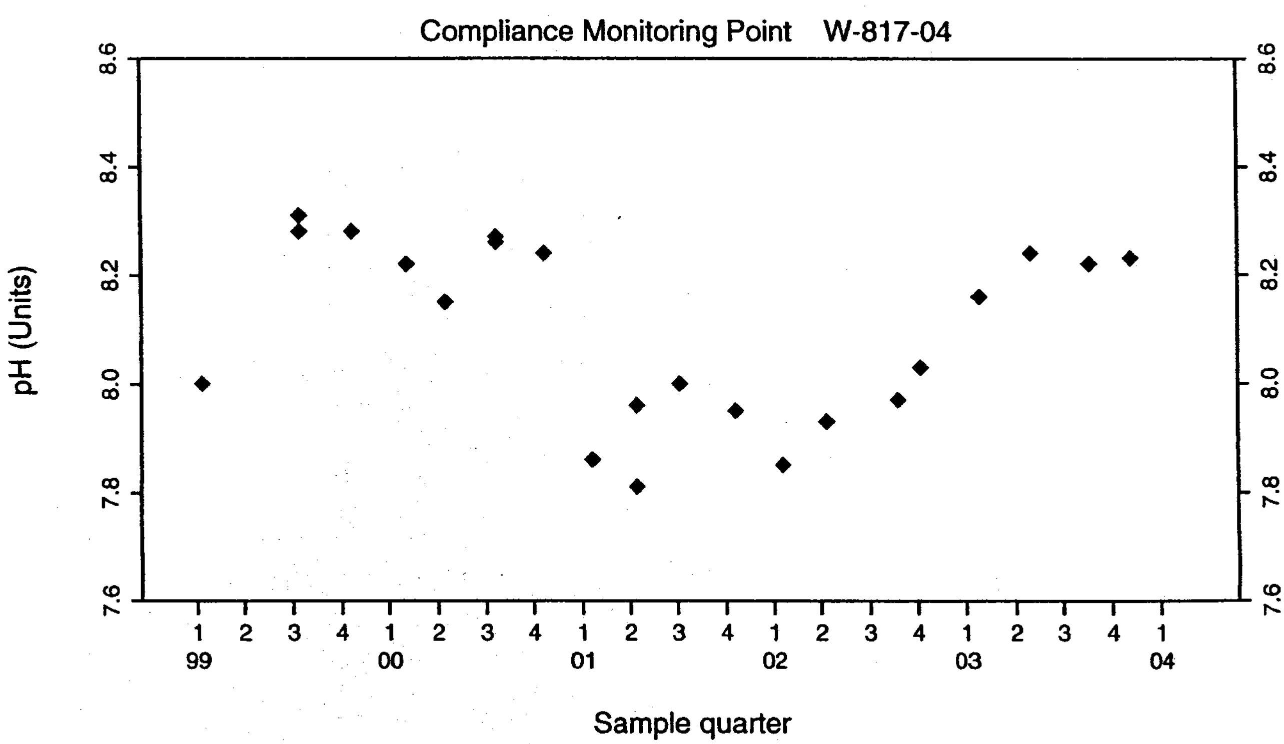
Surface Impoundments Ground Water
pH (Units)



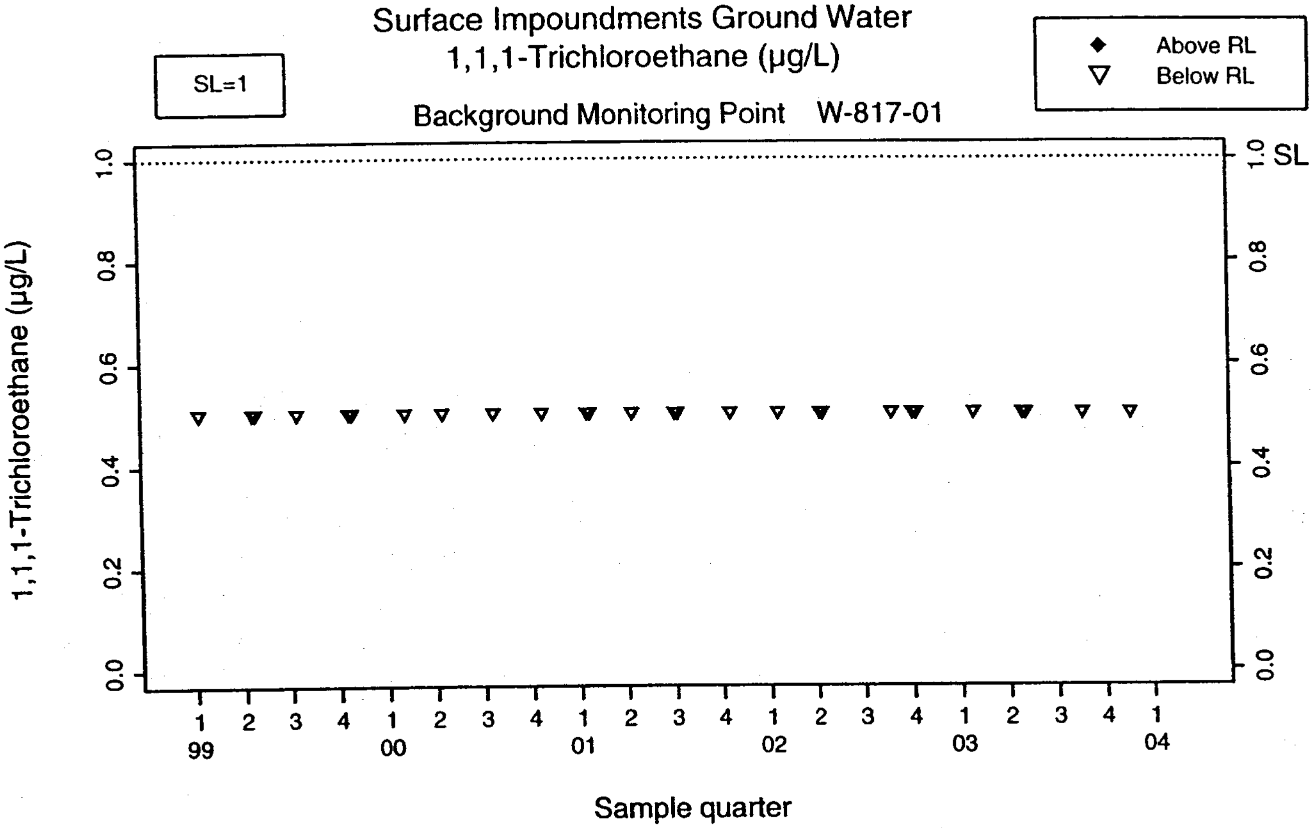


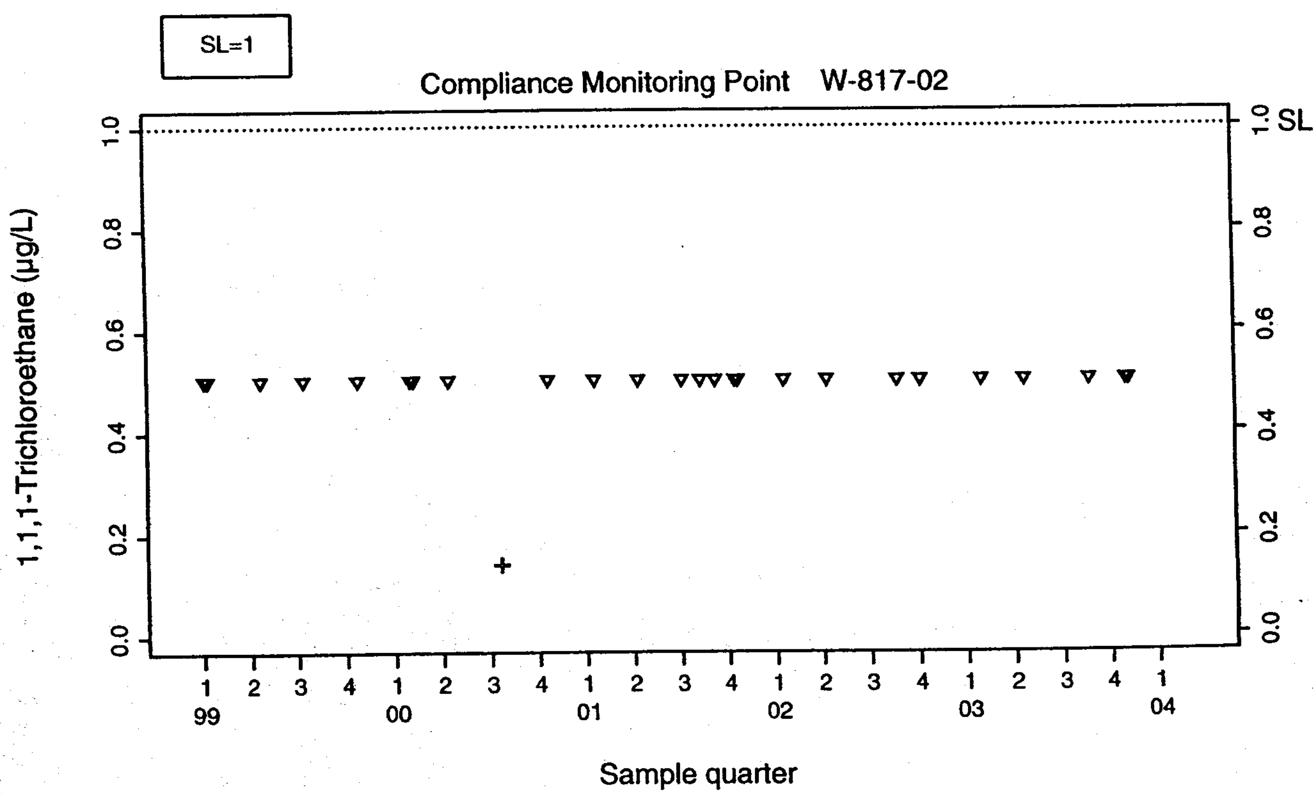
Surface Impoundments Ground Water
pH (Units)



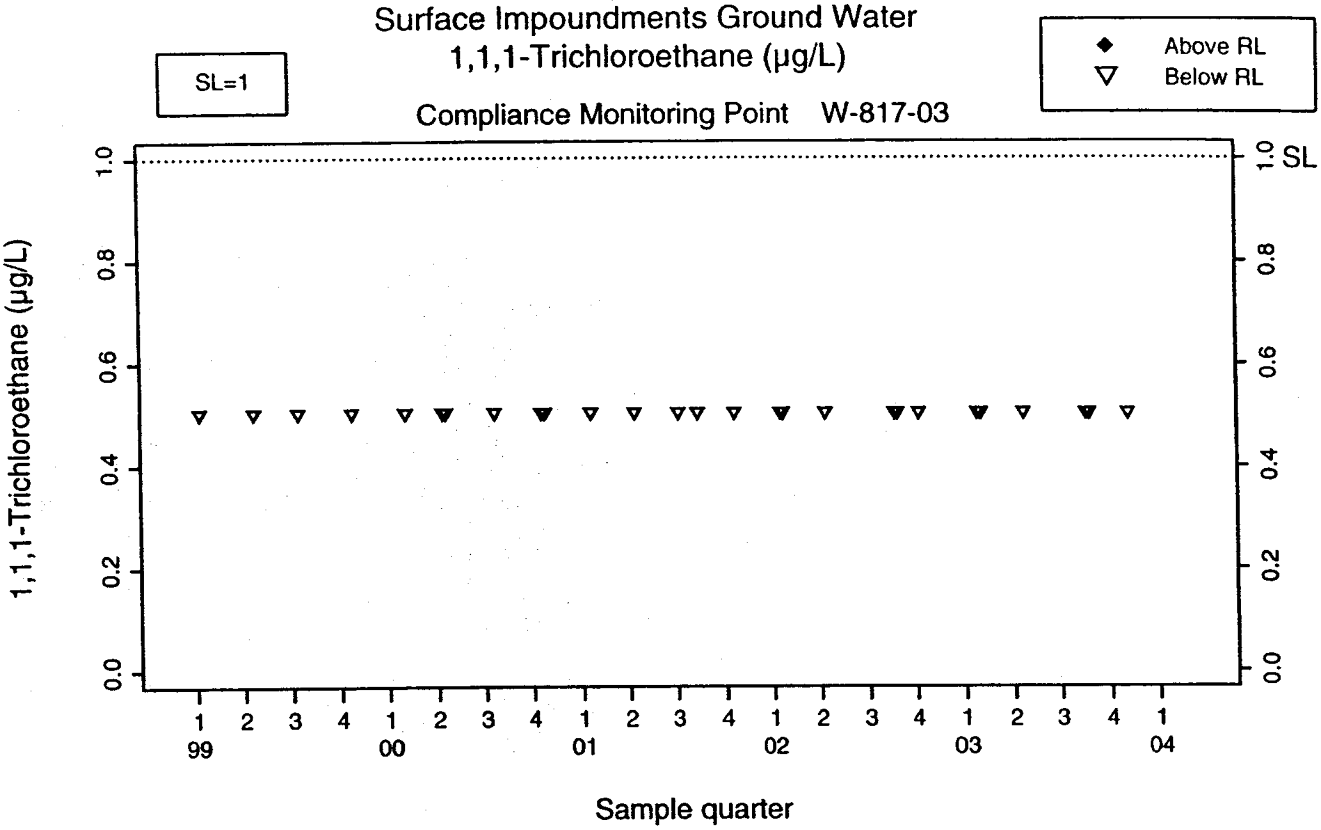


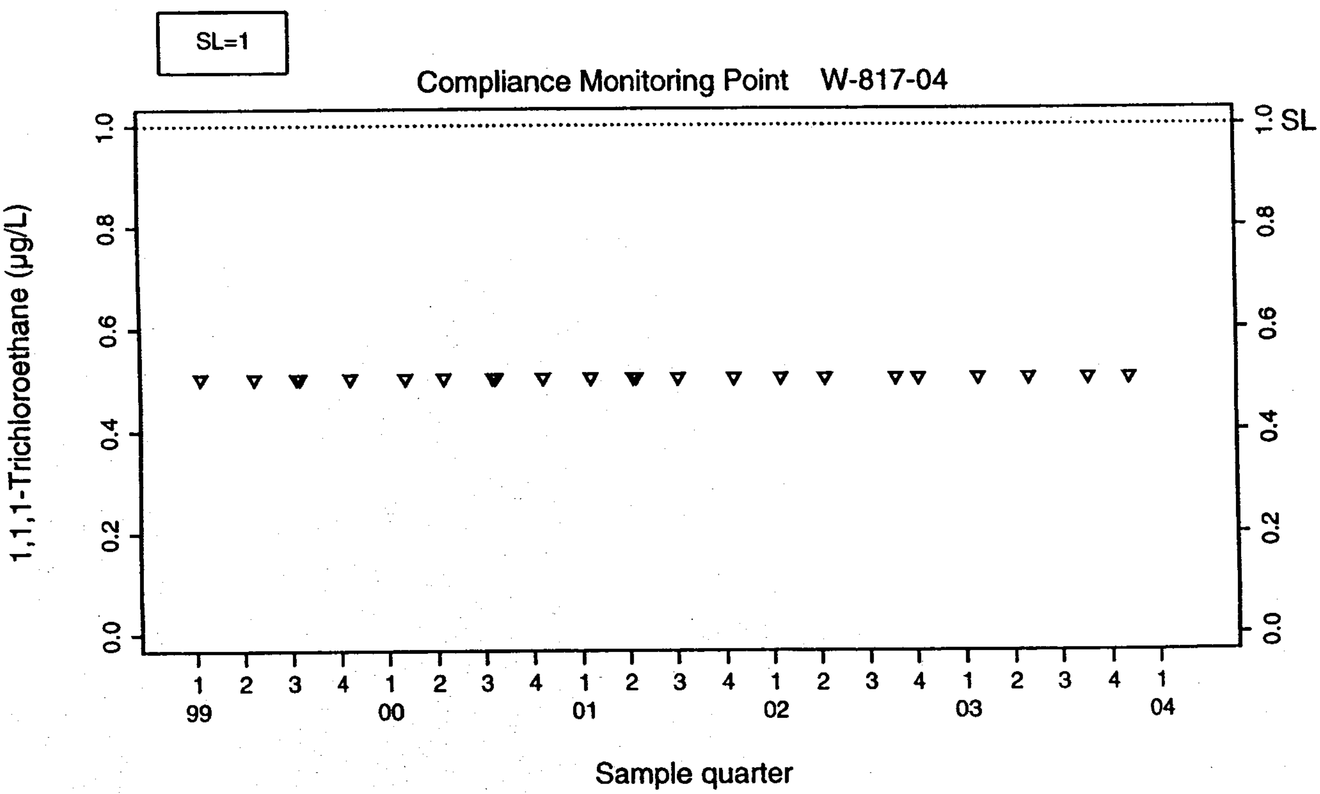
Surface Impoundments Ground Water
1,1,1-Trichloroethane (µg/L)



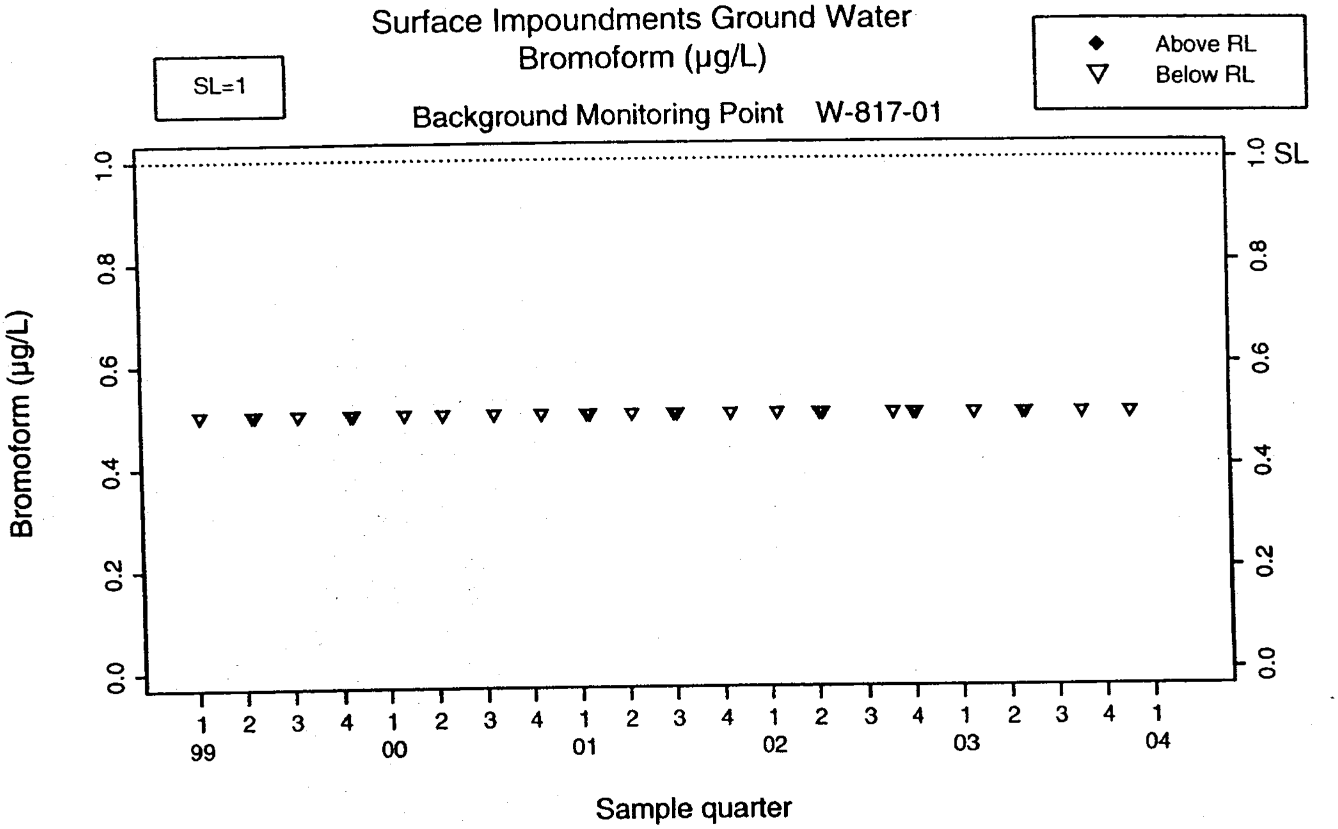


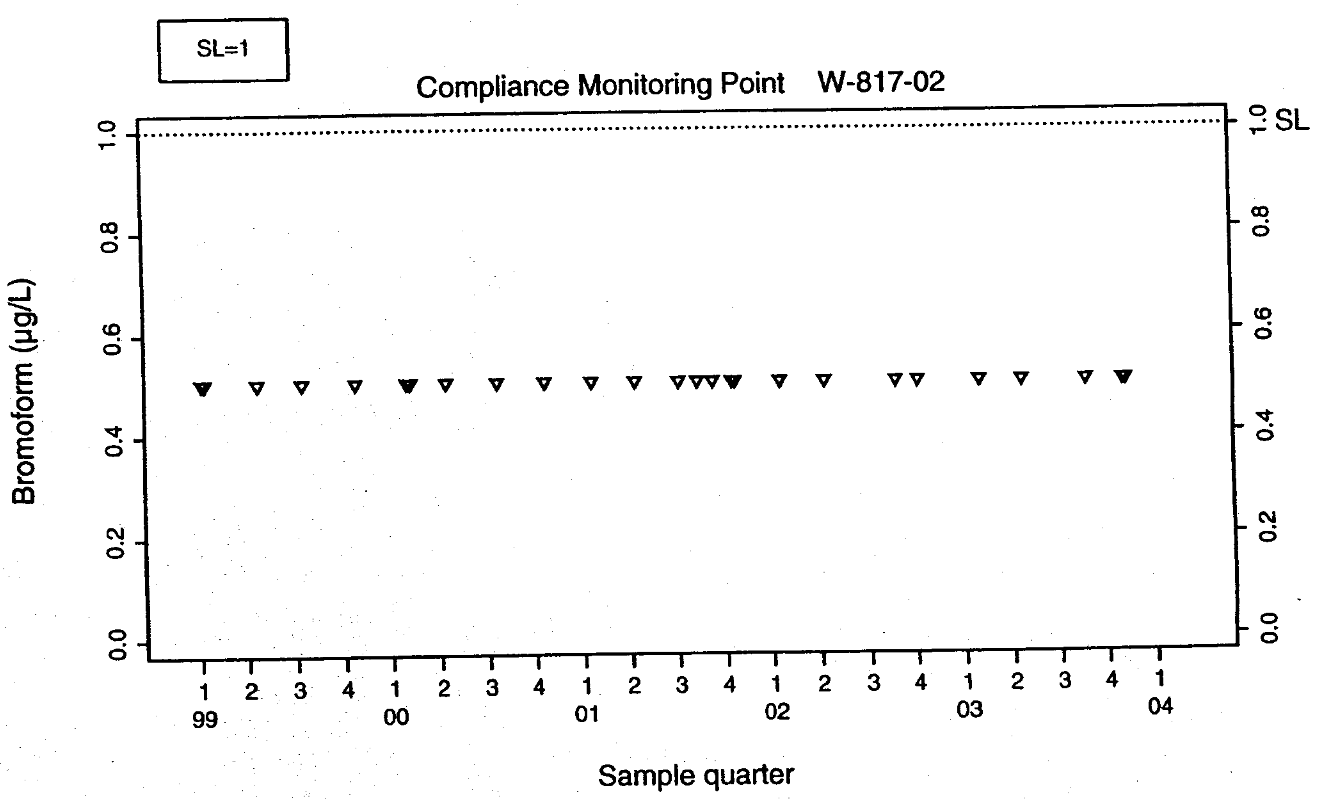
Surface Impoundments Ground Water
1,1,1-Trichloroethane (µg/L)



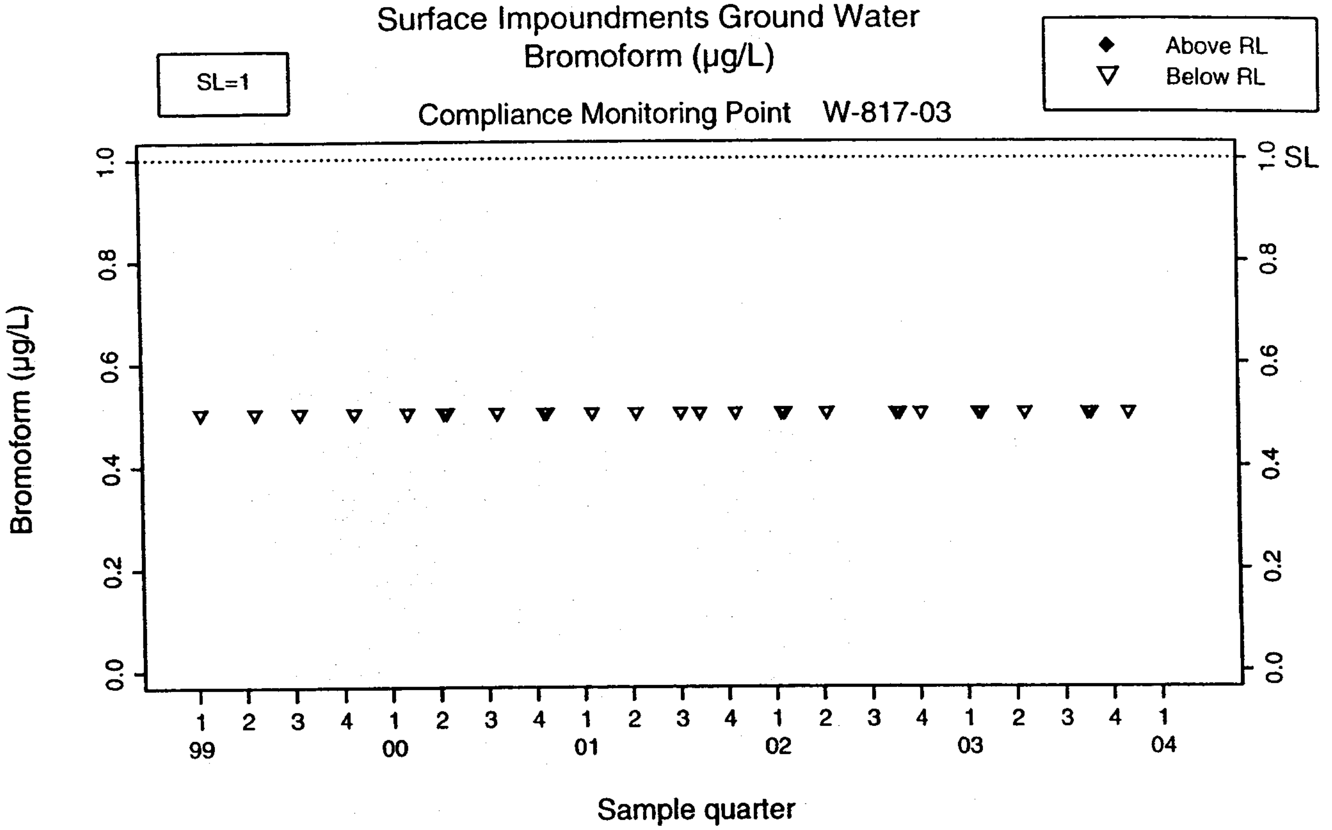


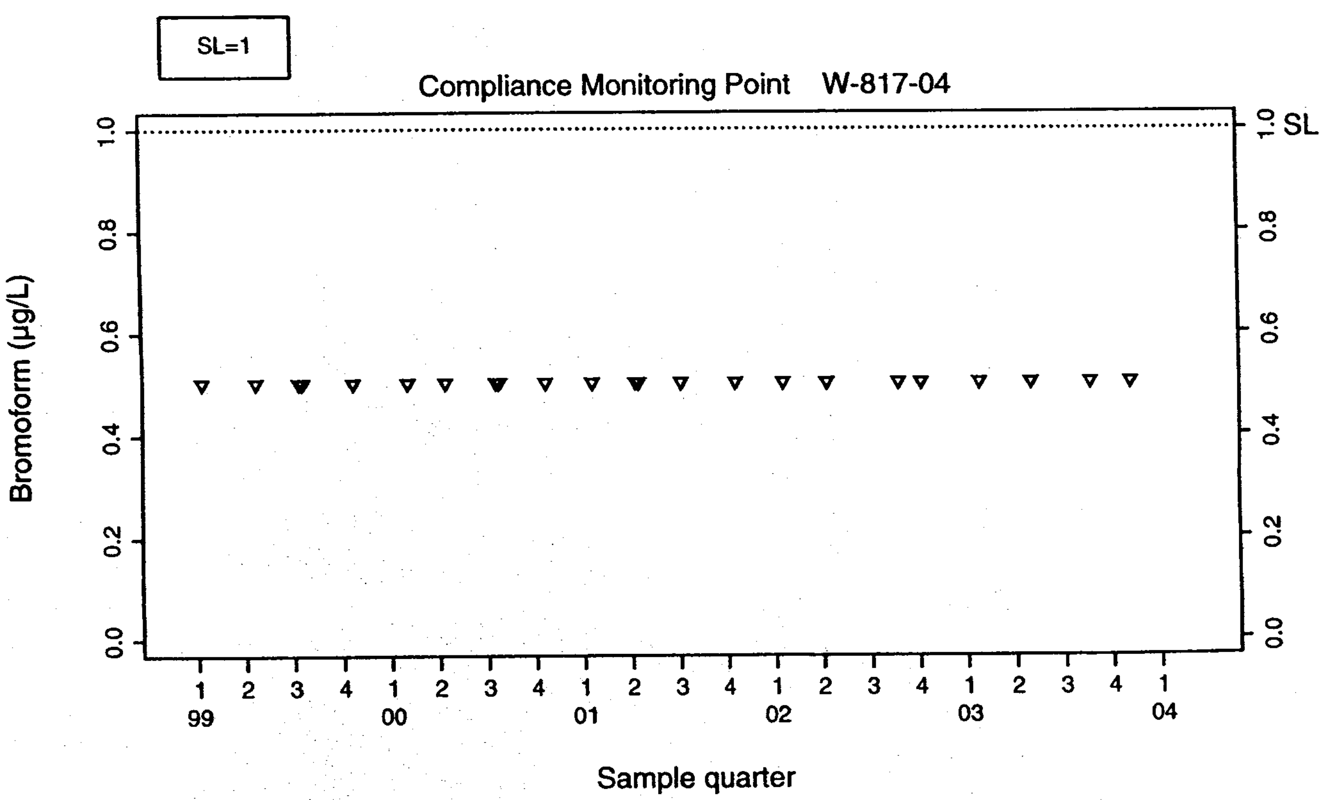
Surface Impoundments Ground Water
Bromoform (µg/L)



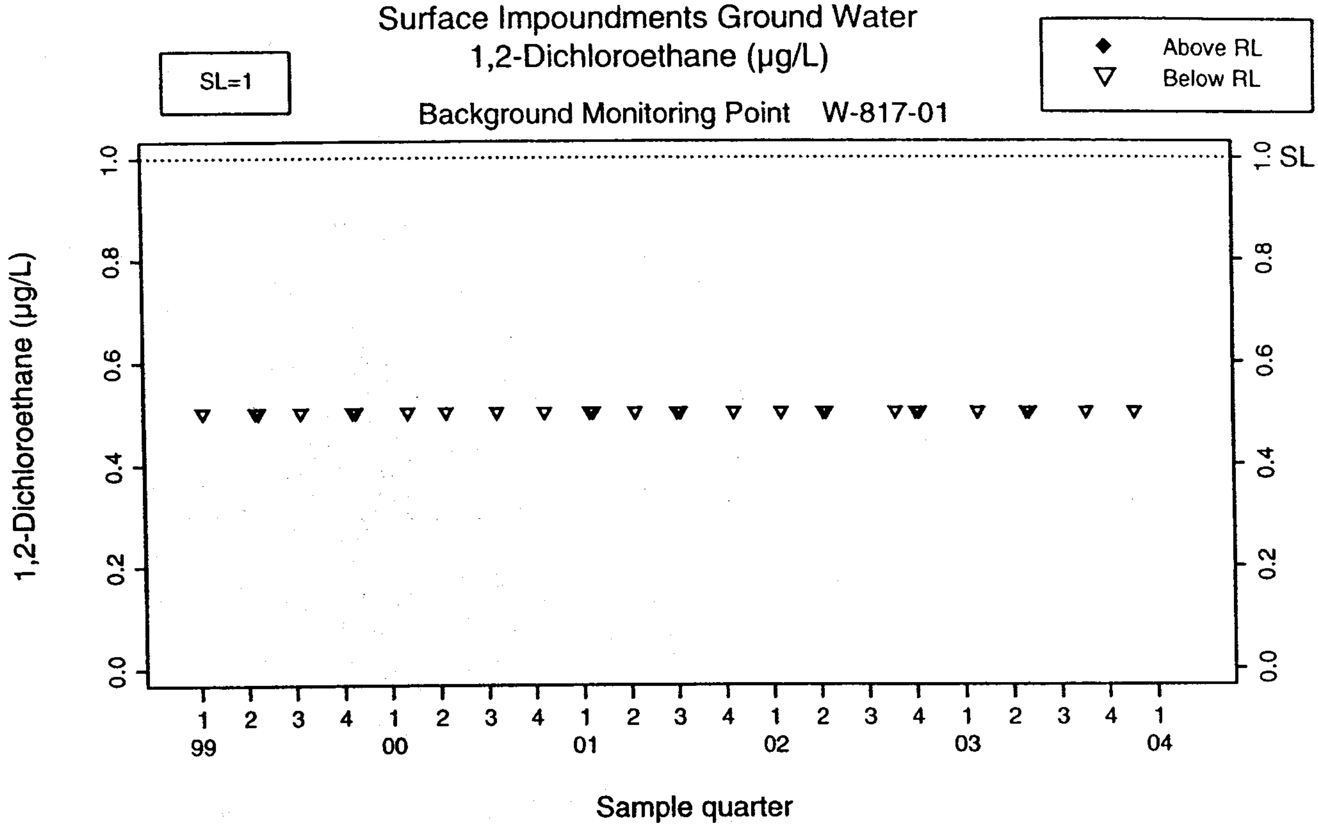


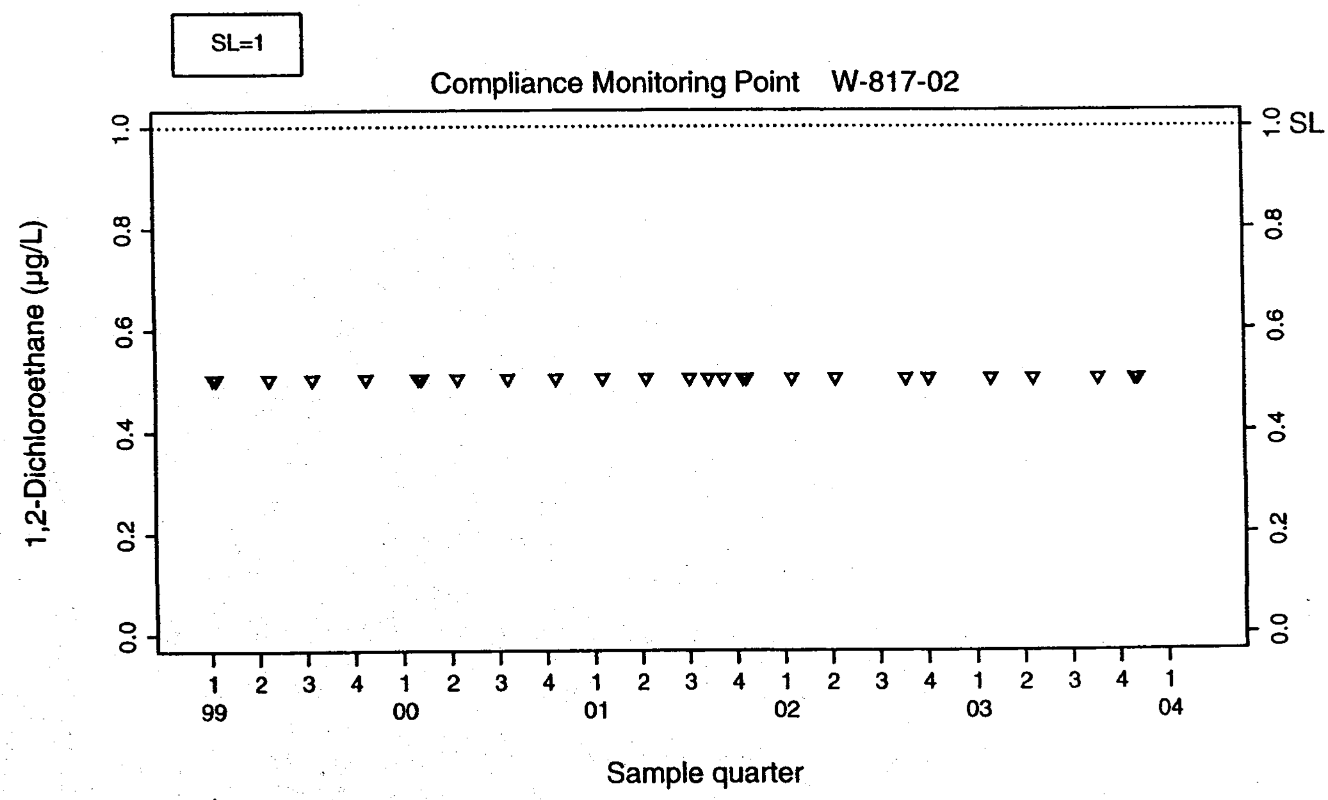
Surface Impoundments Ground Water
Bromoform (µg/L)



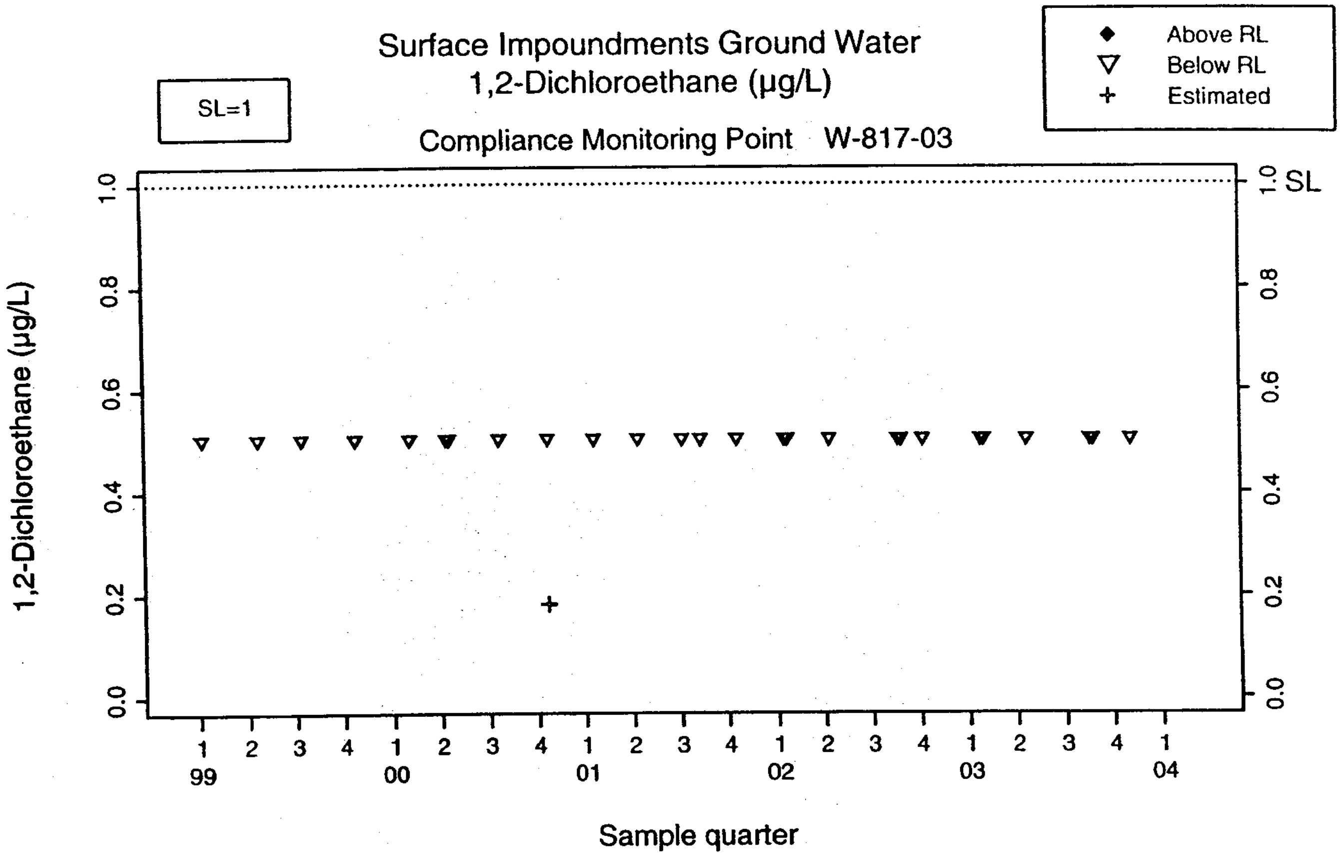


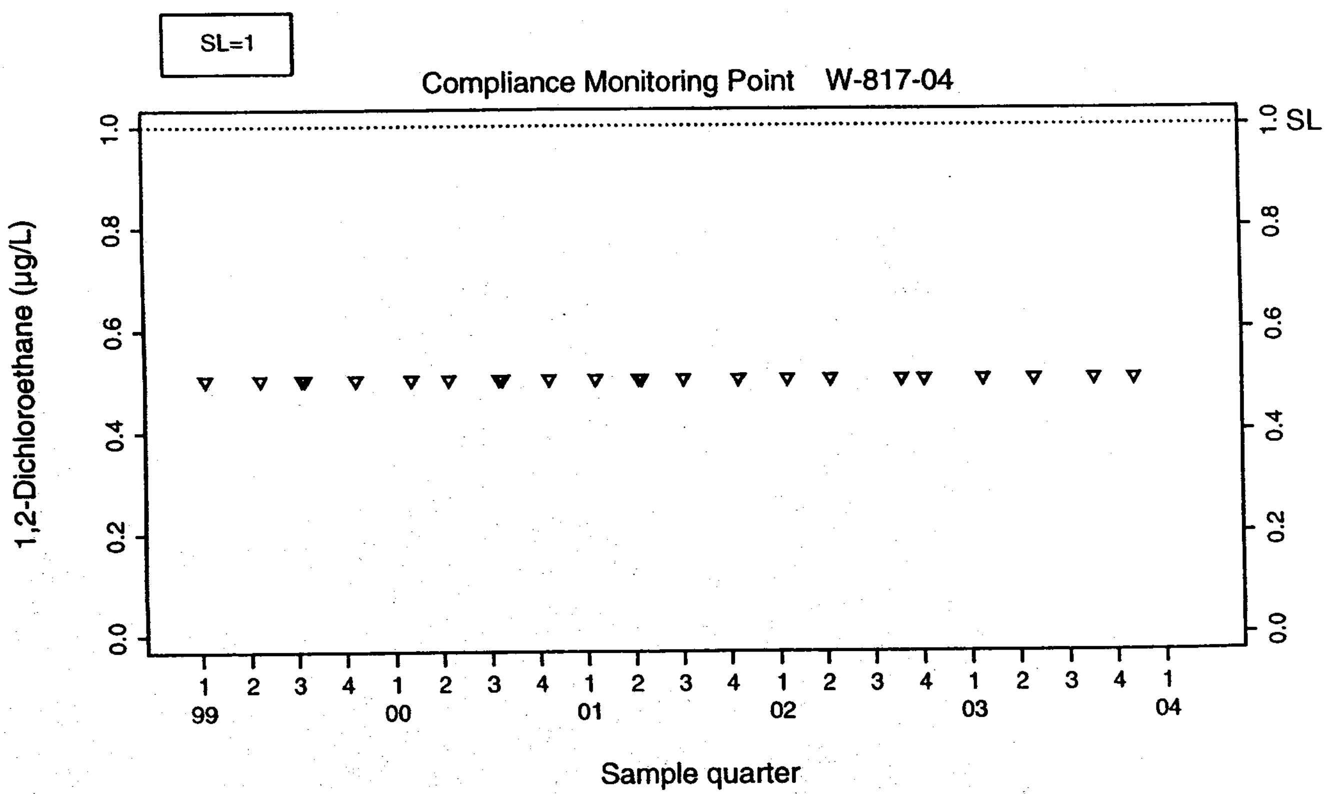
Surface Impoundments Ground Water
1,2-Dichloroethane (µg/L)



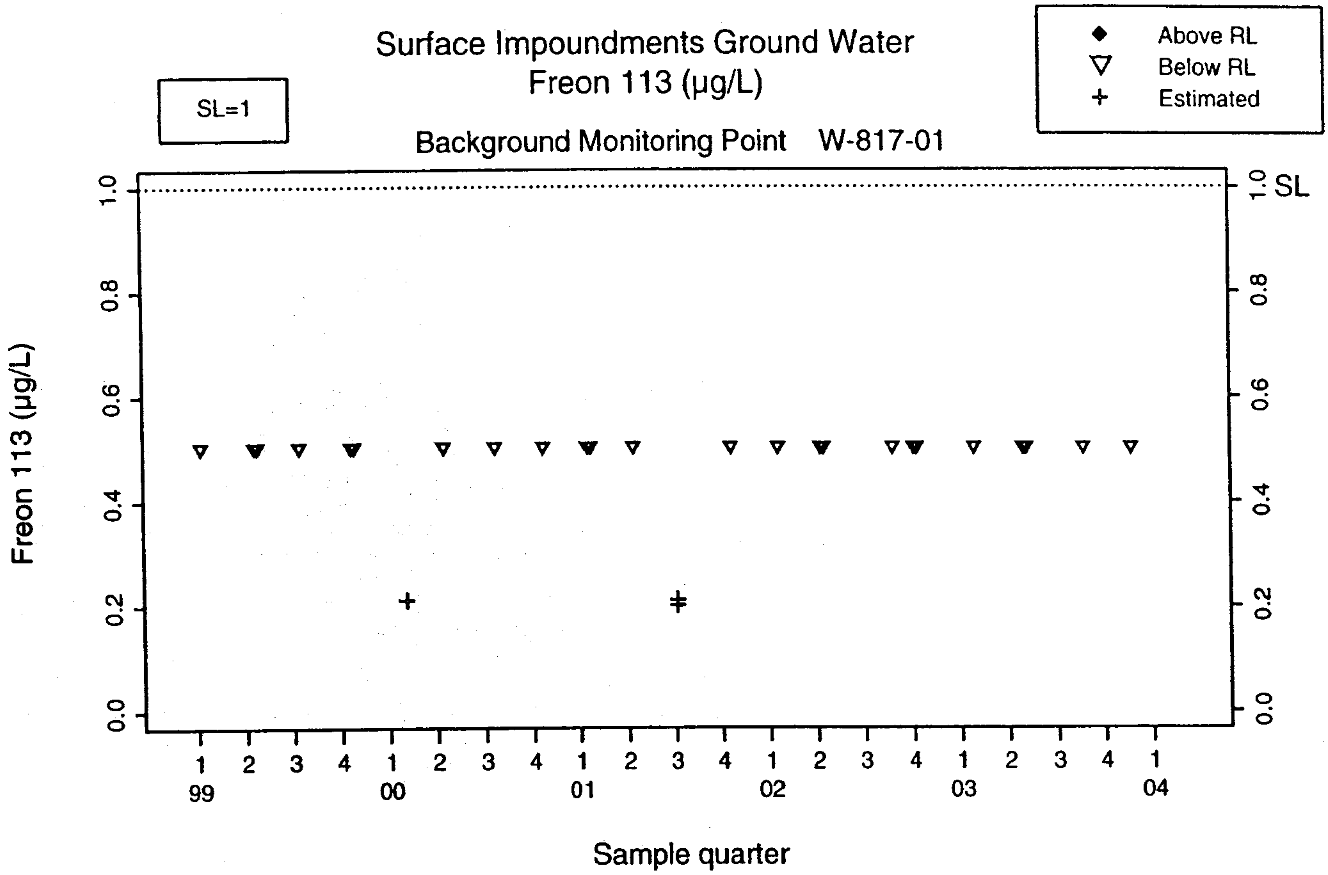


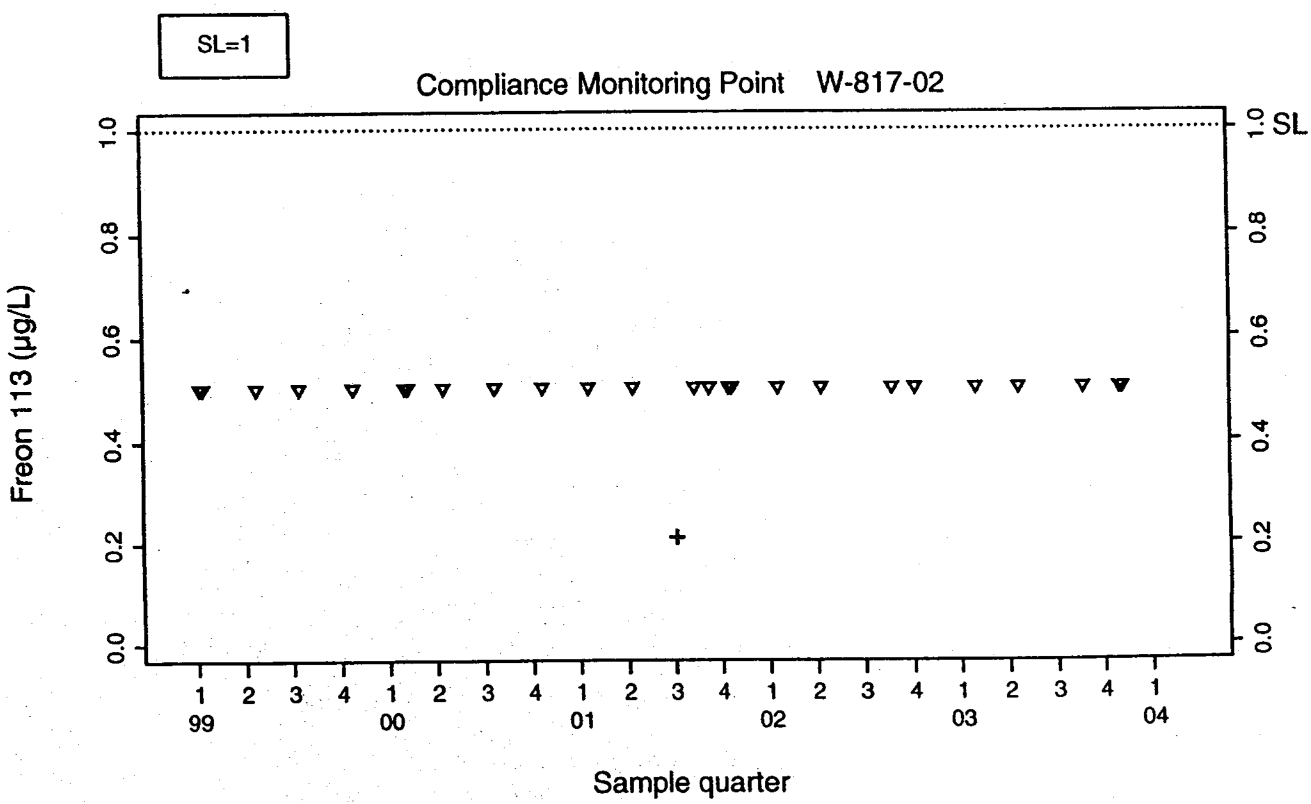
Surface Impoundments Ground Water
1,2-Dichloroethane (µg/L)



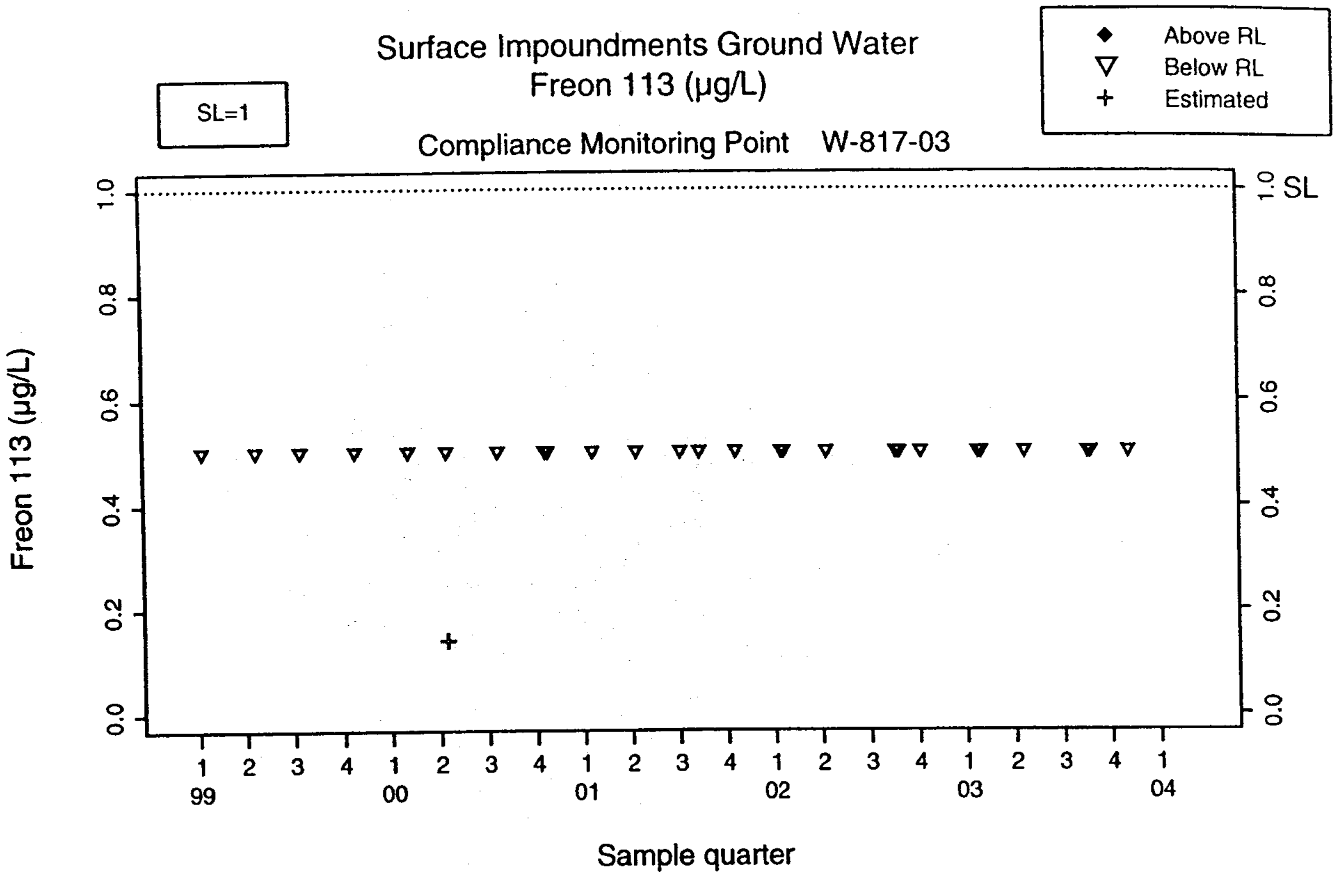


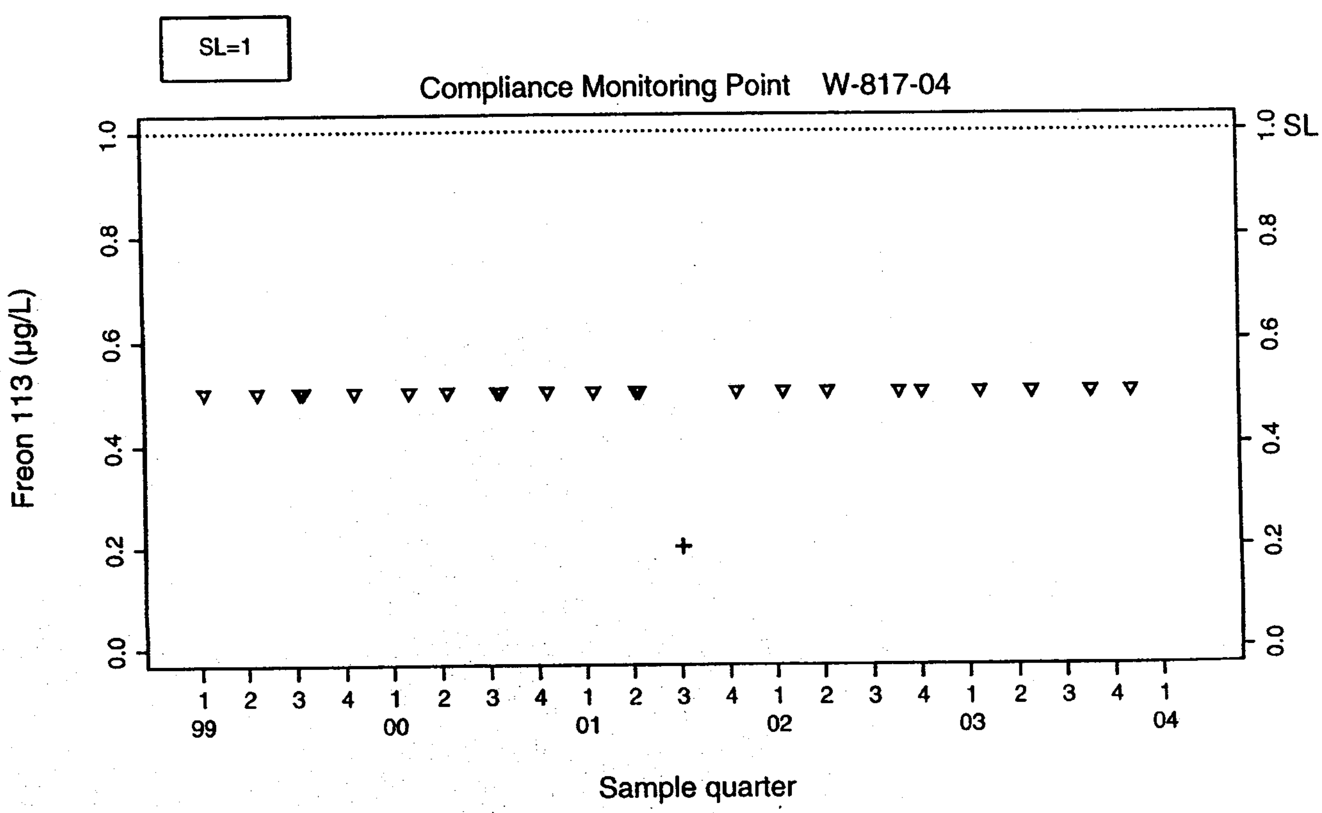
Surface Impoundments Ground Water
Freon 113 (μg/L)



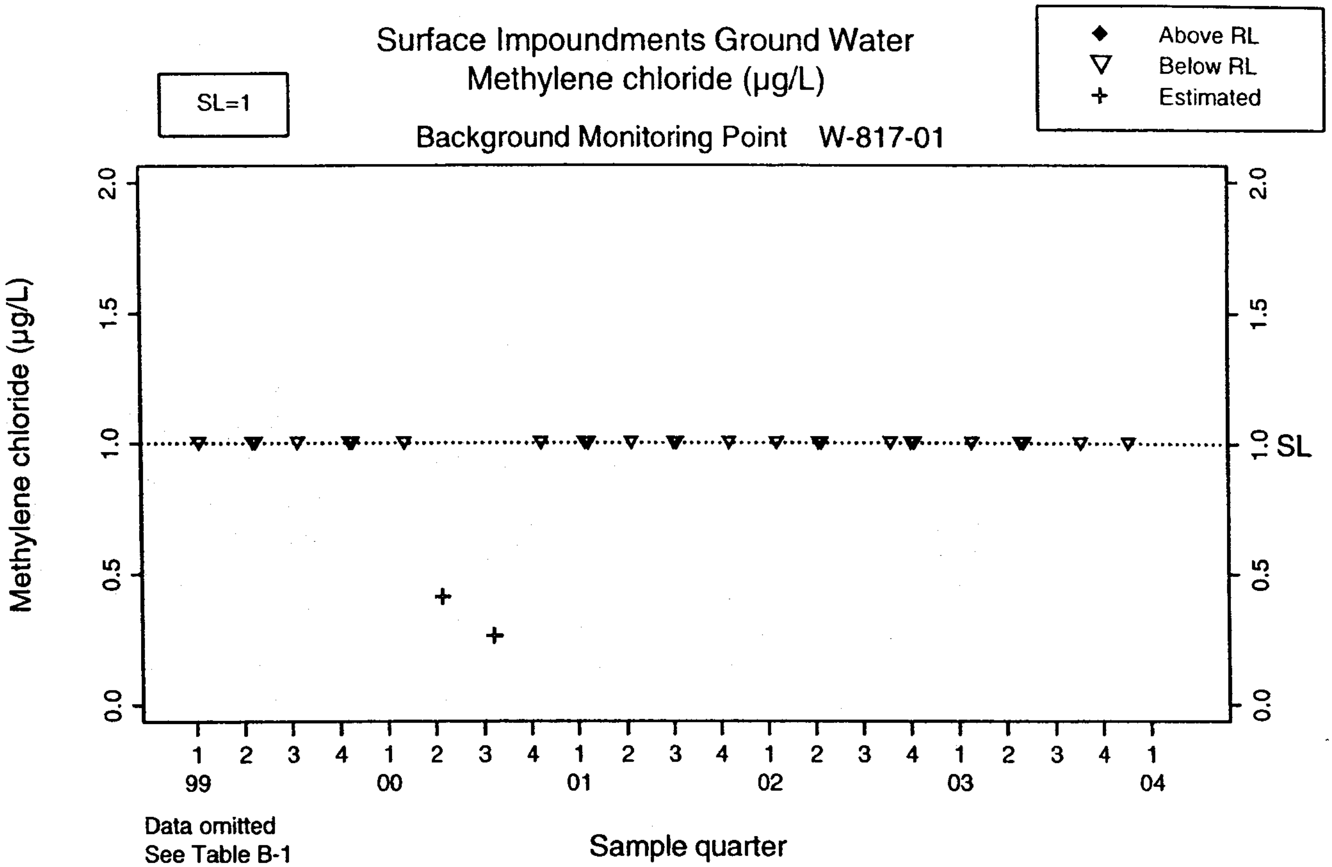


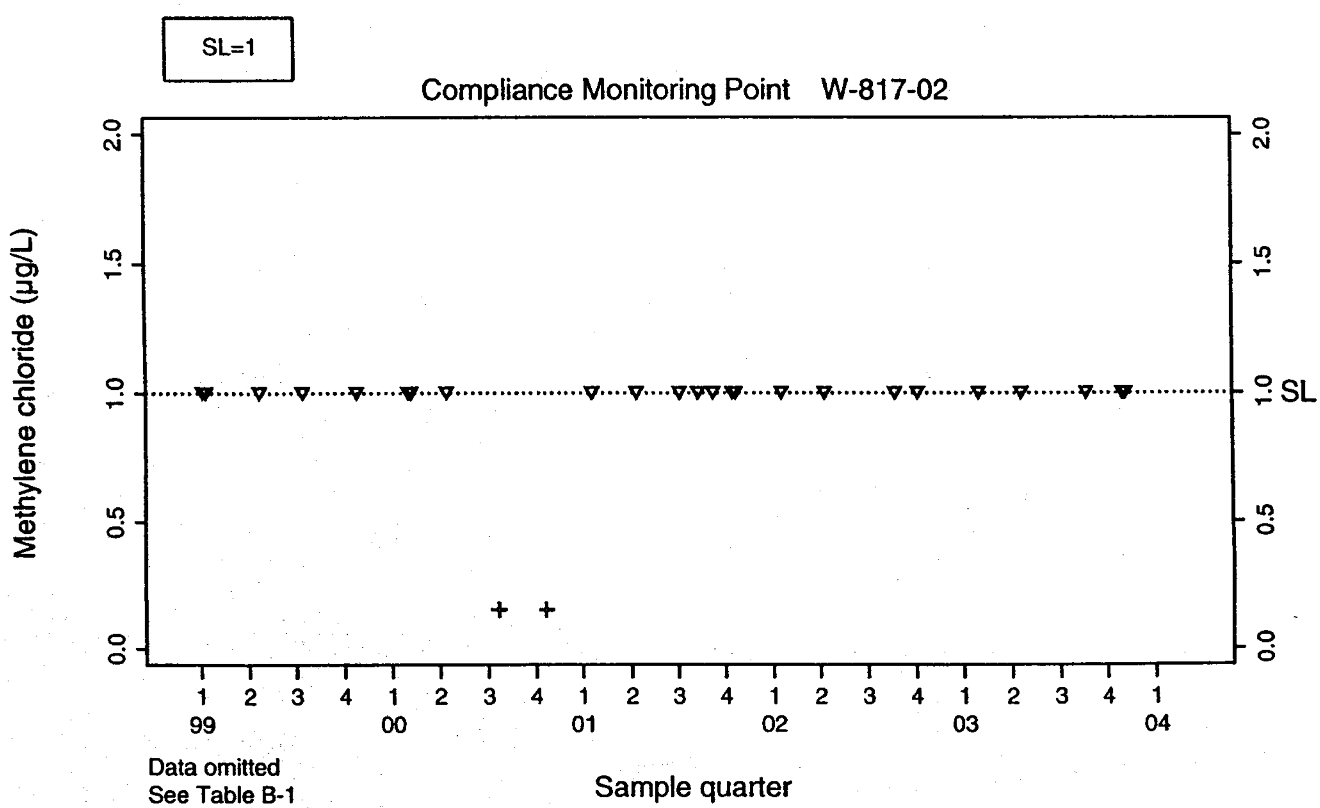
Surface Impoundments Ground Water
Freon 113 (µg/L)

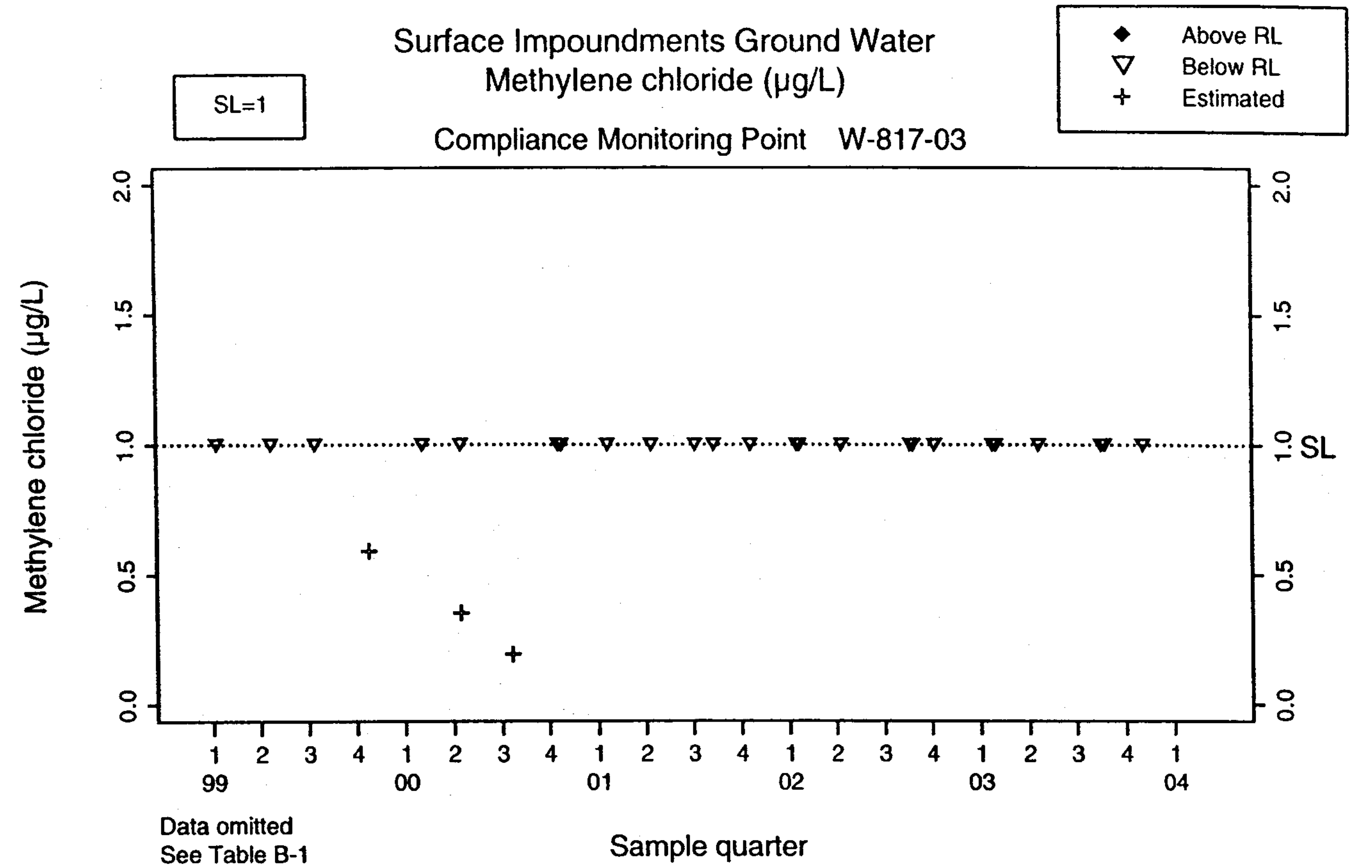


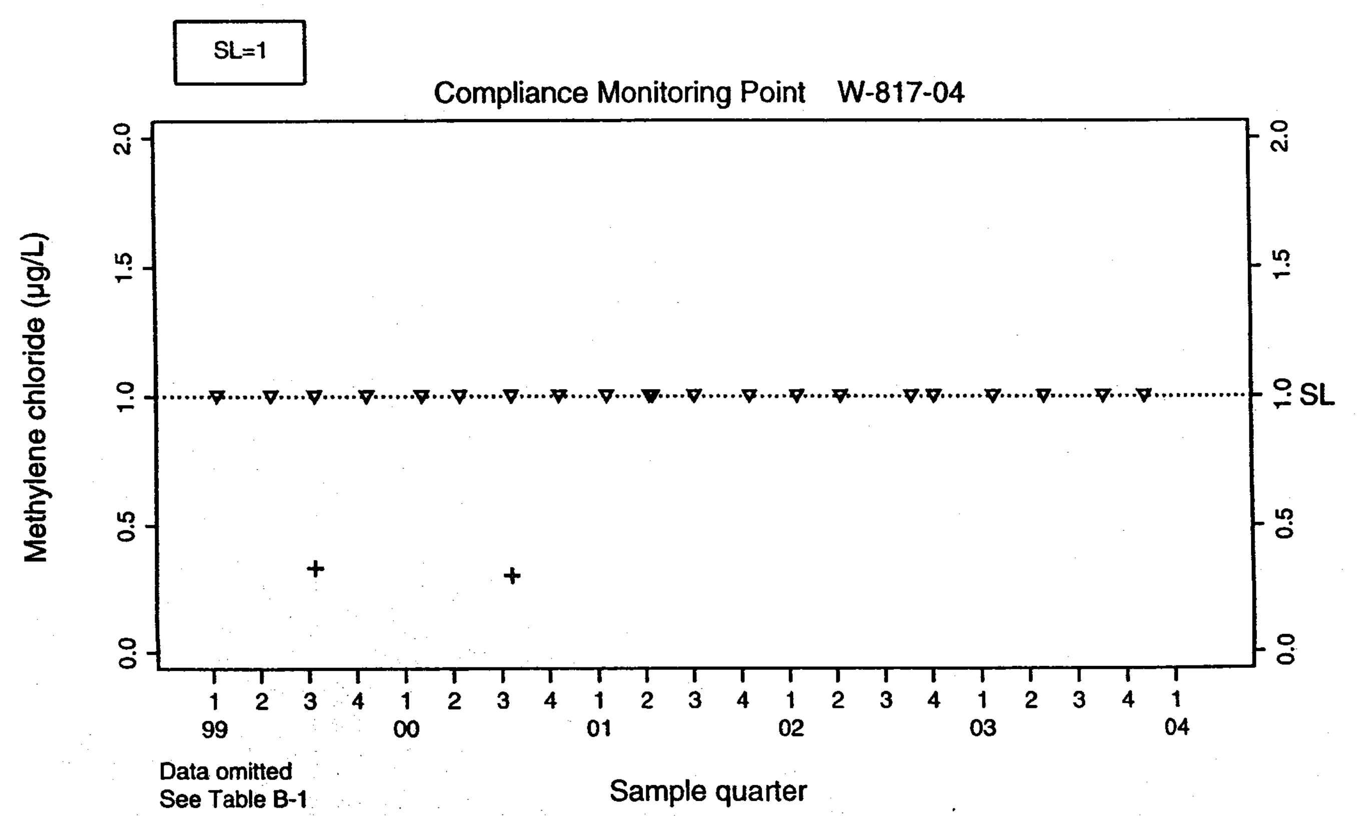


Surface Impoundments Ground Water
Methylene chloride (µg/L)

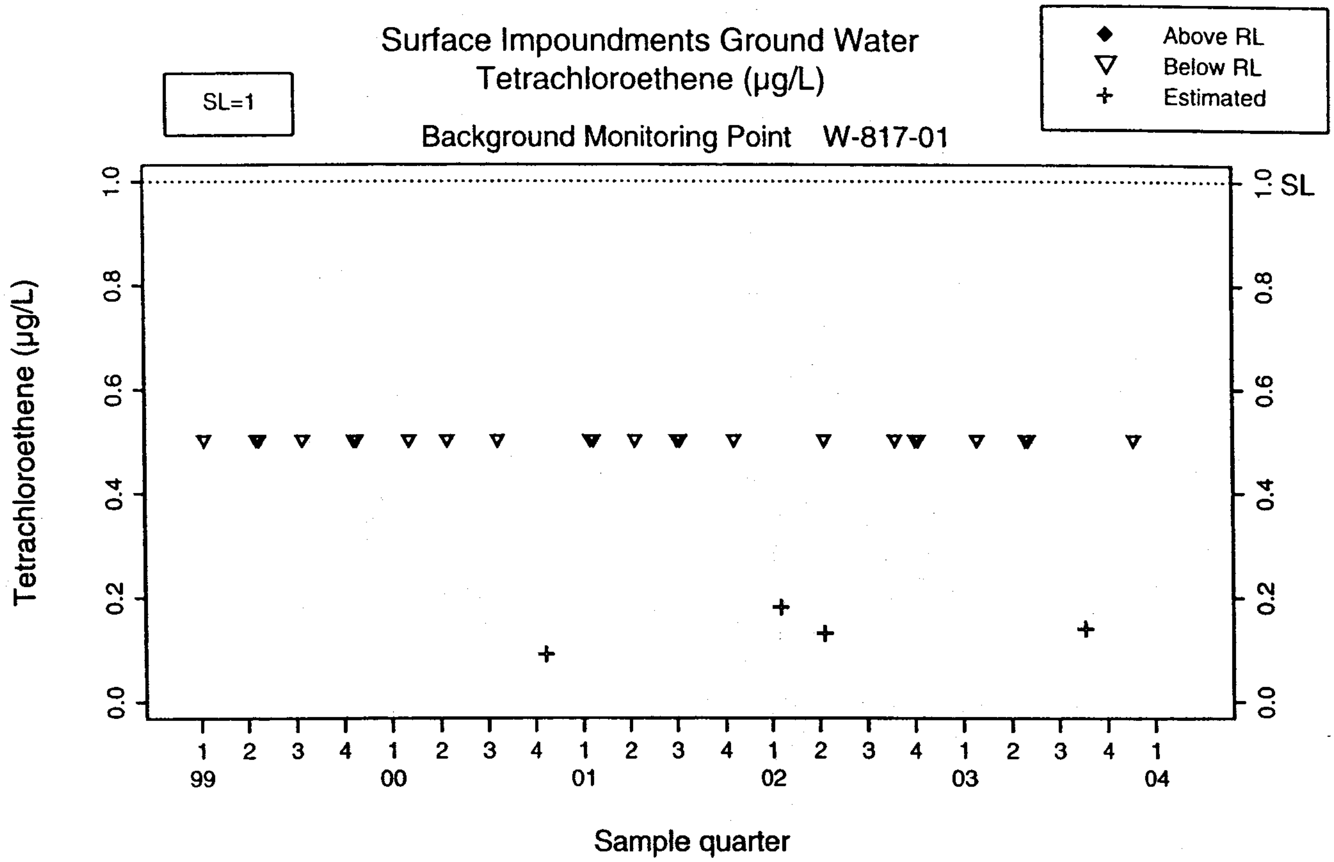


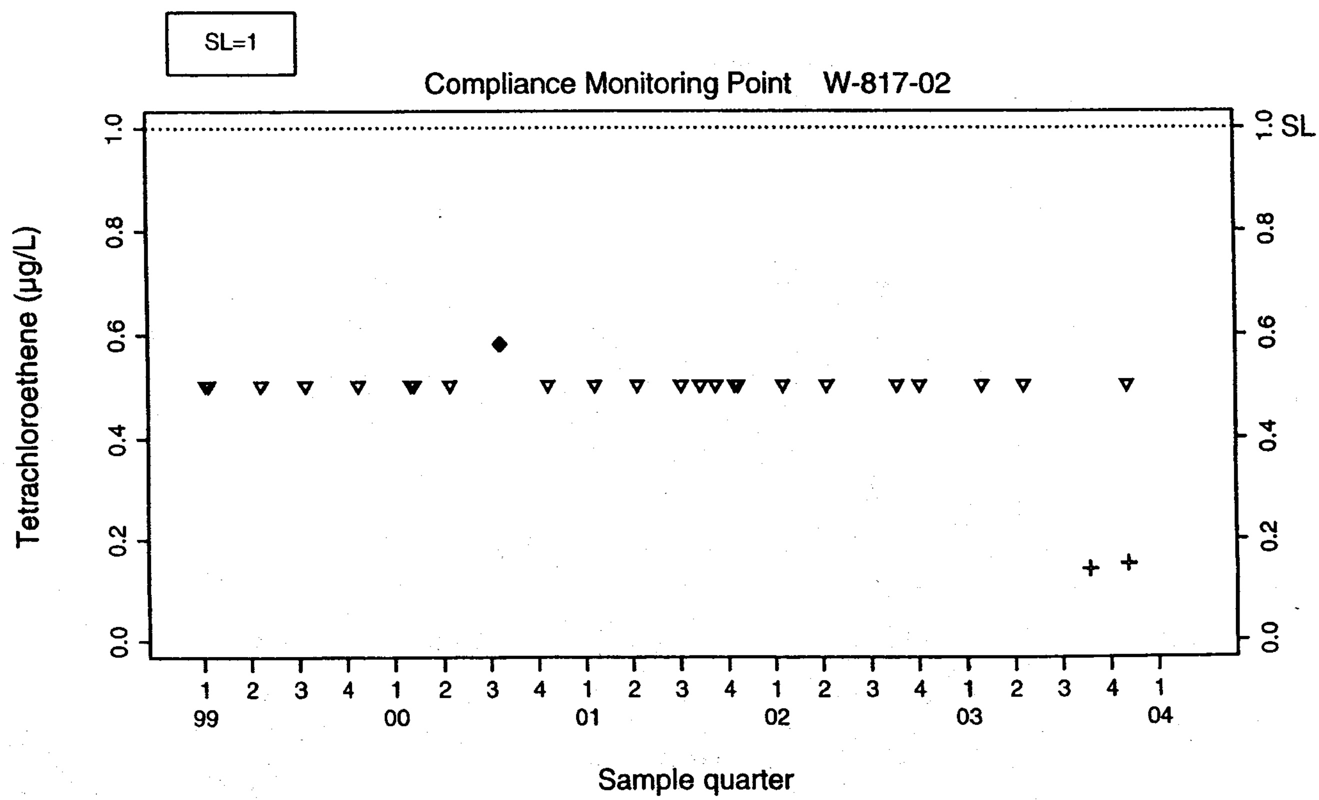


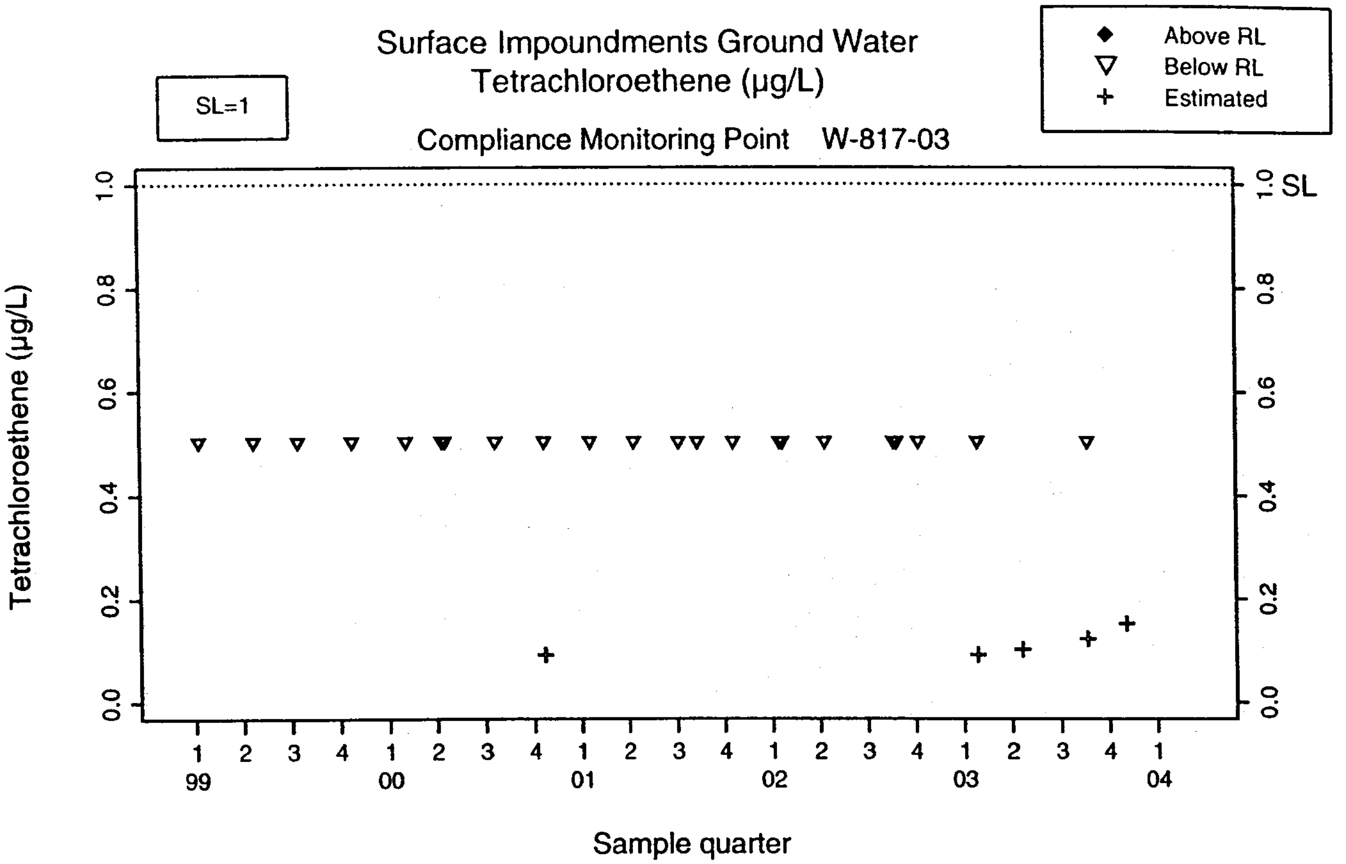

Surface Impoundments Ground Water
Methylene chloride (µg/L)
Above RL
Below RL
Estimated
SL=1
Compliance Monitoring Point W-817-03
Methylene chloride (µg/L)
0.0
0.5
1.0
1.5
2.0
SL
1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1
99 00 01 02 03 04
Data omitted
See Table B-1
Sample quarter

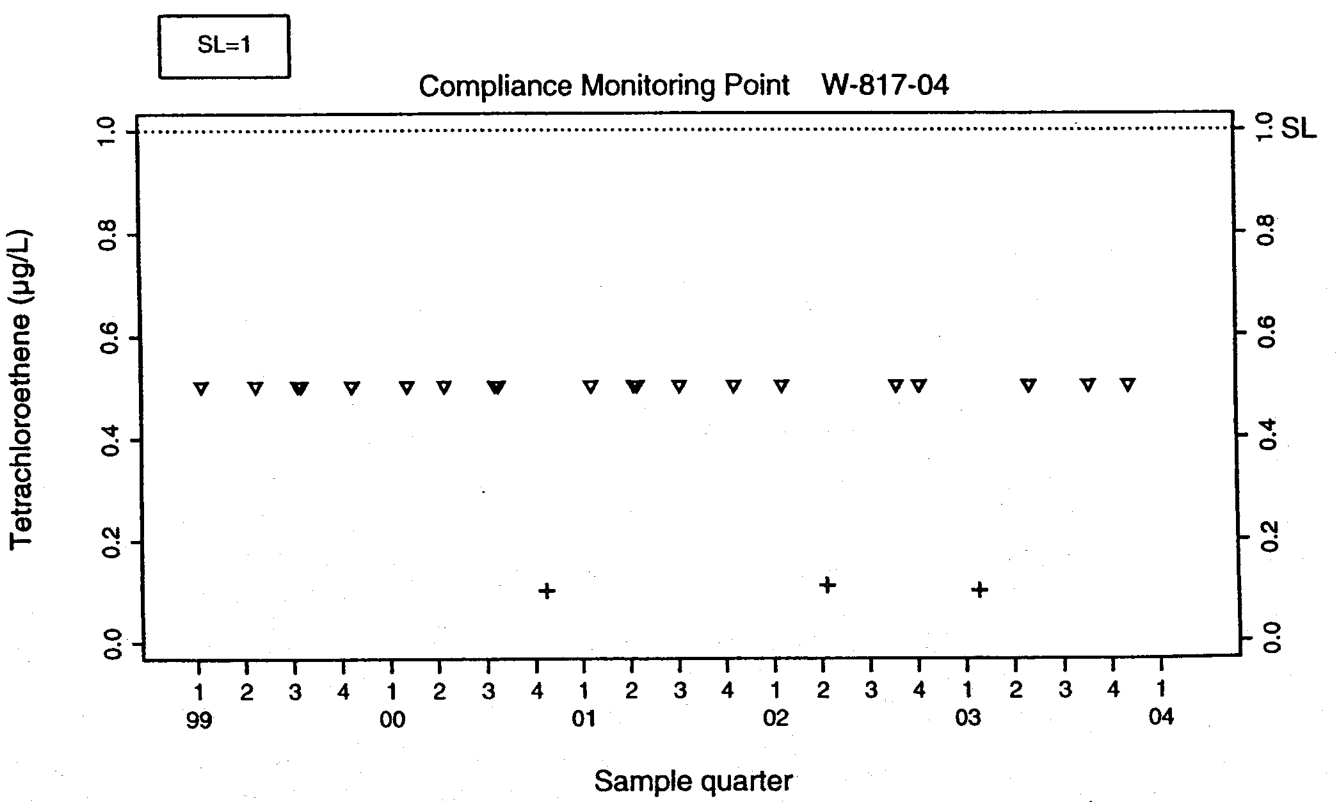

SL=1
Compliance Monitoring Point W-817-04
Methylene chloride (µg/L)
0.0
0.5
1.0
1.5
2.0
SL
1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1
99 00 01 02 03 04
Data omitted
See Table B-1
Sample quarter

Surface Impoundments Ground Water
Tetrachloroethene (µg/L)

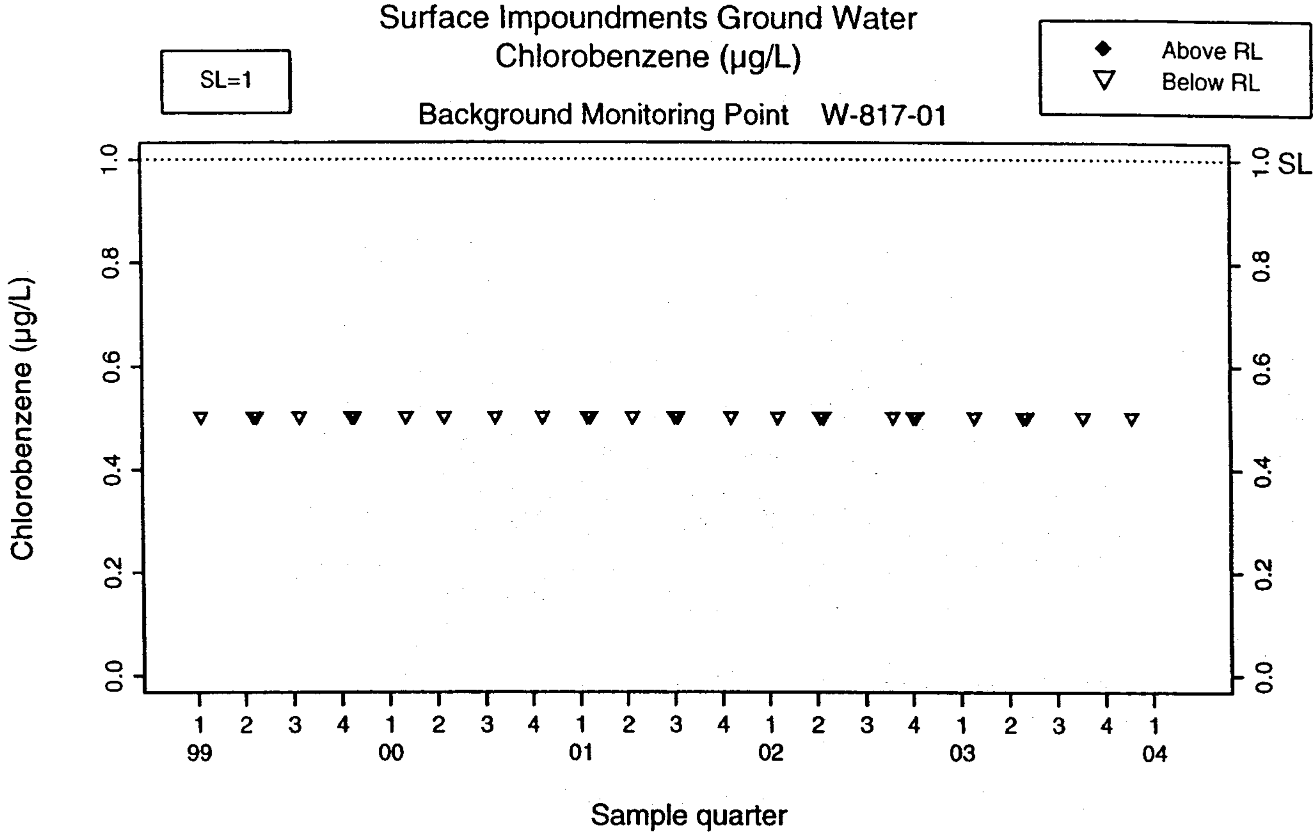


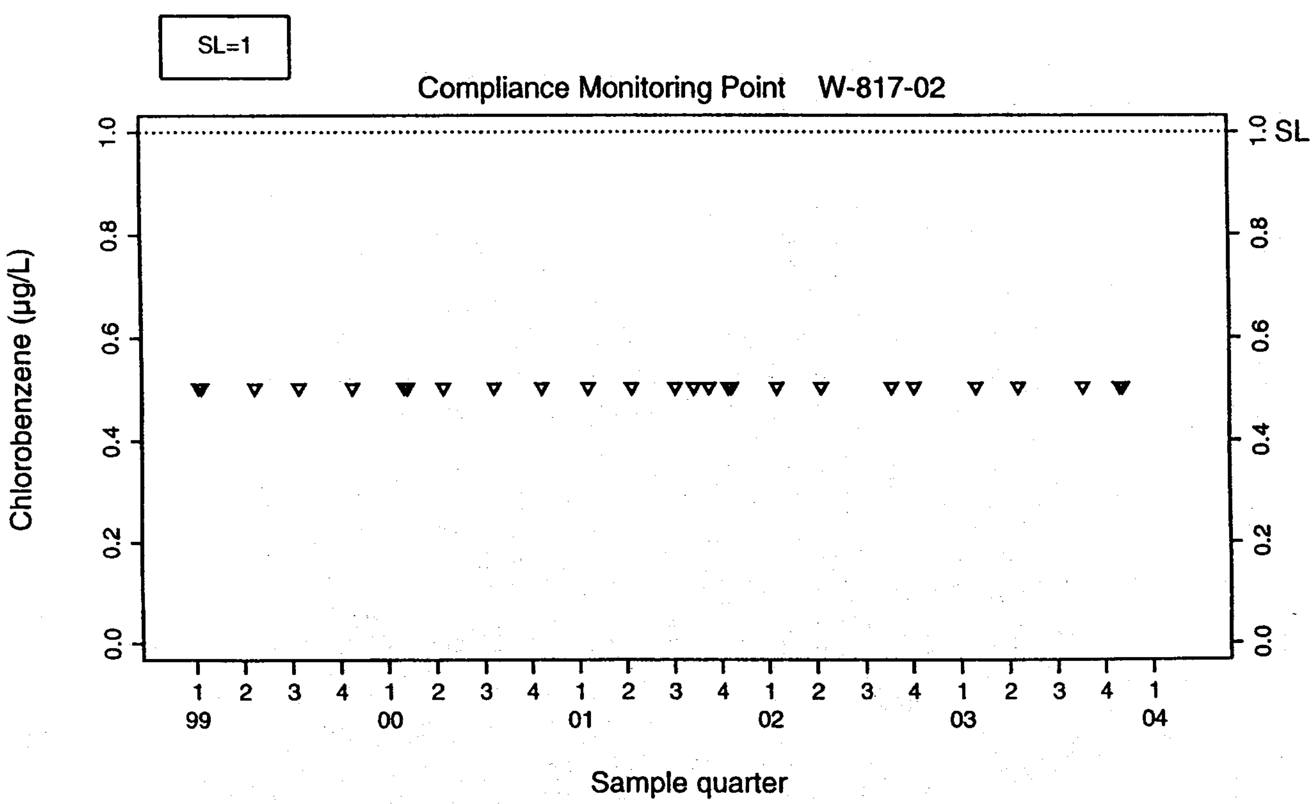


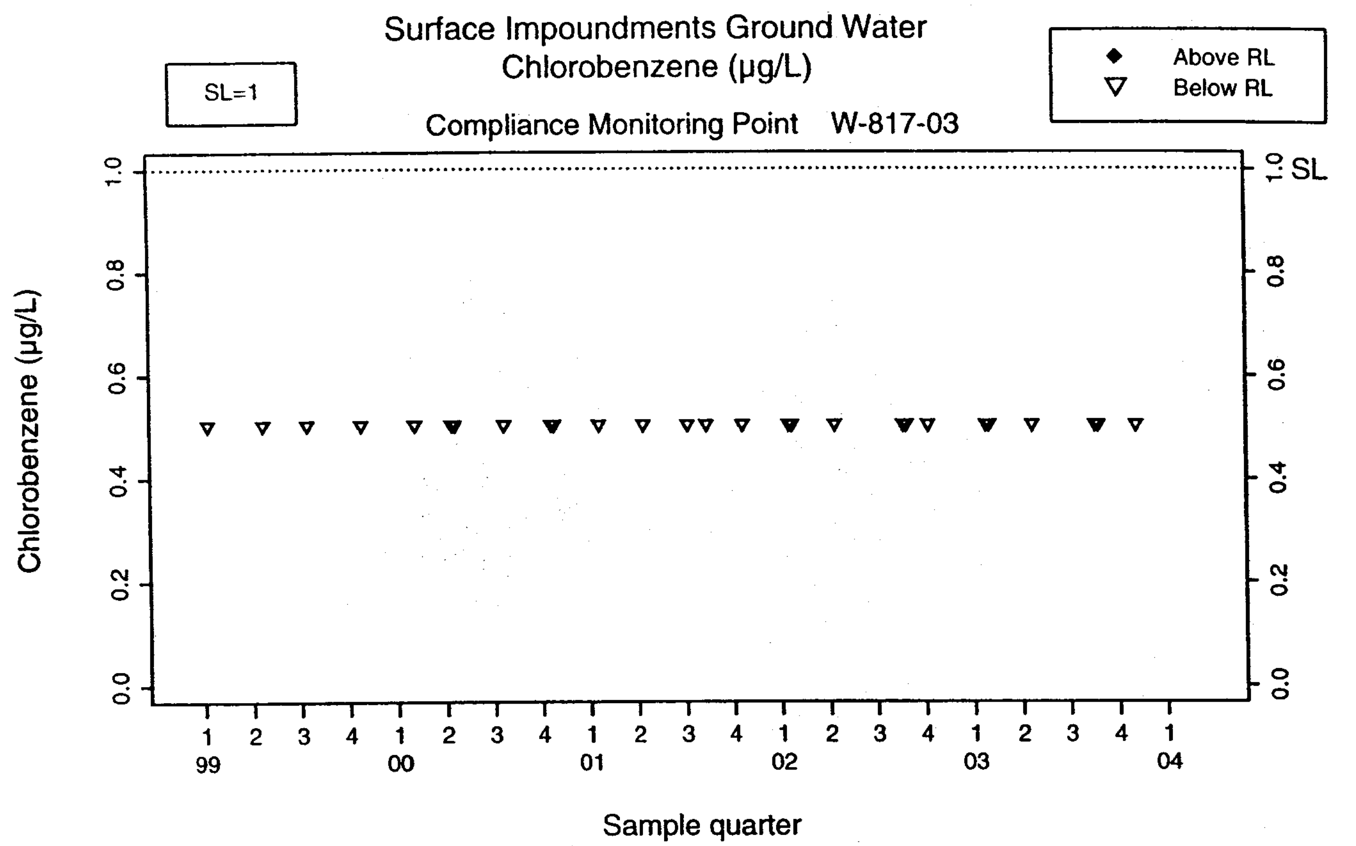

Surface Impoundments Ground Water
Tetrachloroethene (µg/L)
Above RL
Below RL
Estimated
SL=1
Compliance Monitoring Point W-817-03
SL
Tetrachloroethene (µg/L)
0.0
0.2
0.4
0.6
0.8
1.0
1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1
99 00 01 02 03 04
Sample quarter

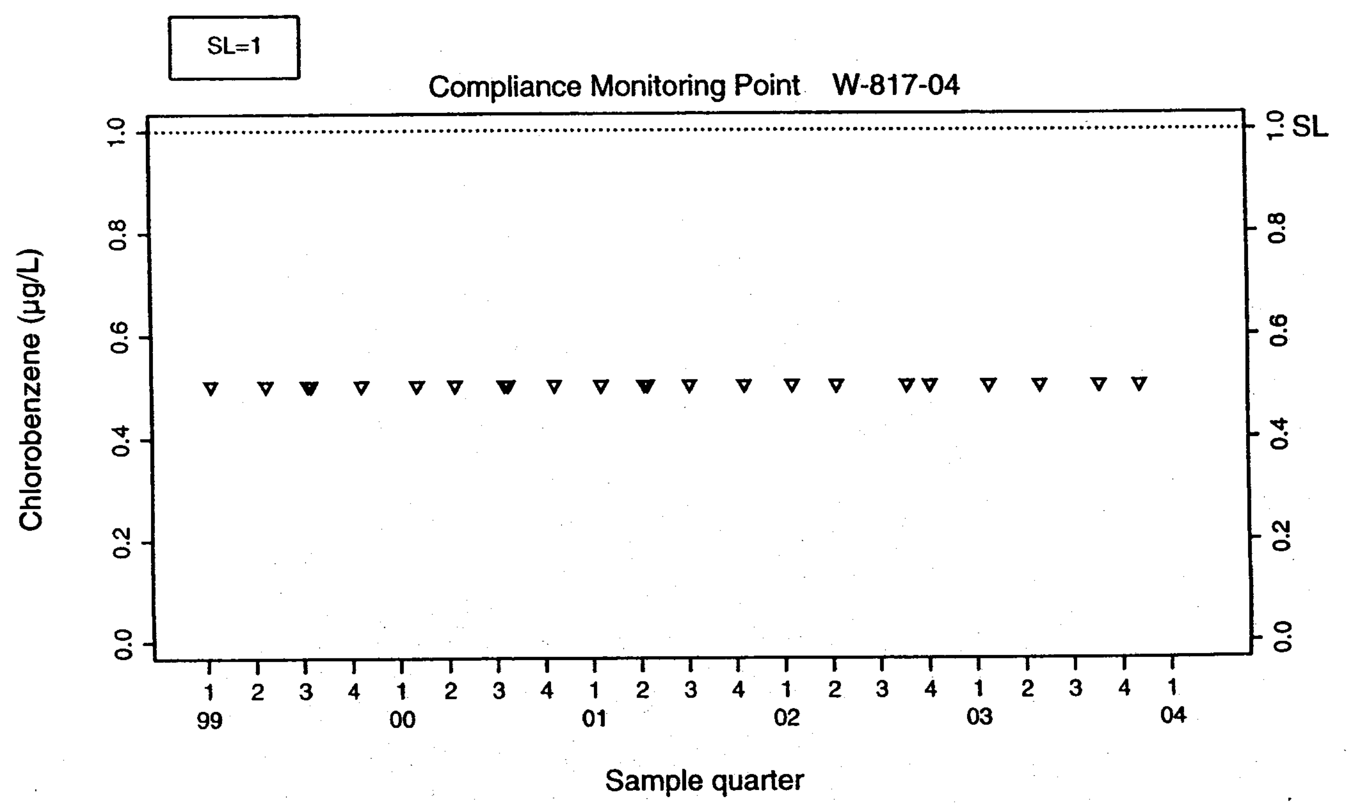

SL=1
Compliance Monitoring Point W-817-04
SL
Tetrachloroethene (µg/L)
0.0
0.2
0.4
0.6
0.8
1.0
1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1
99 00 01 02 03 04
Sample quarter

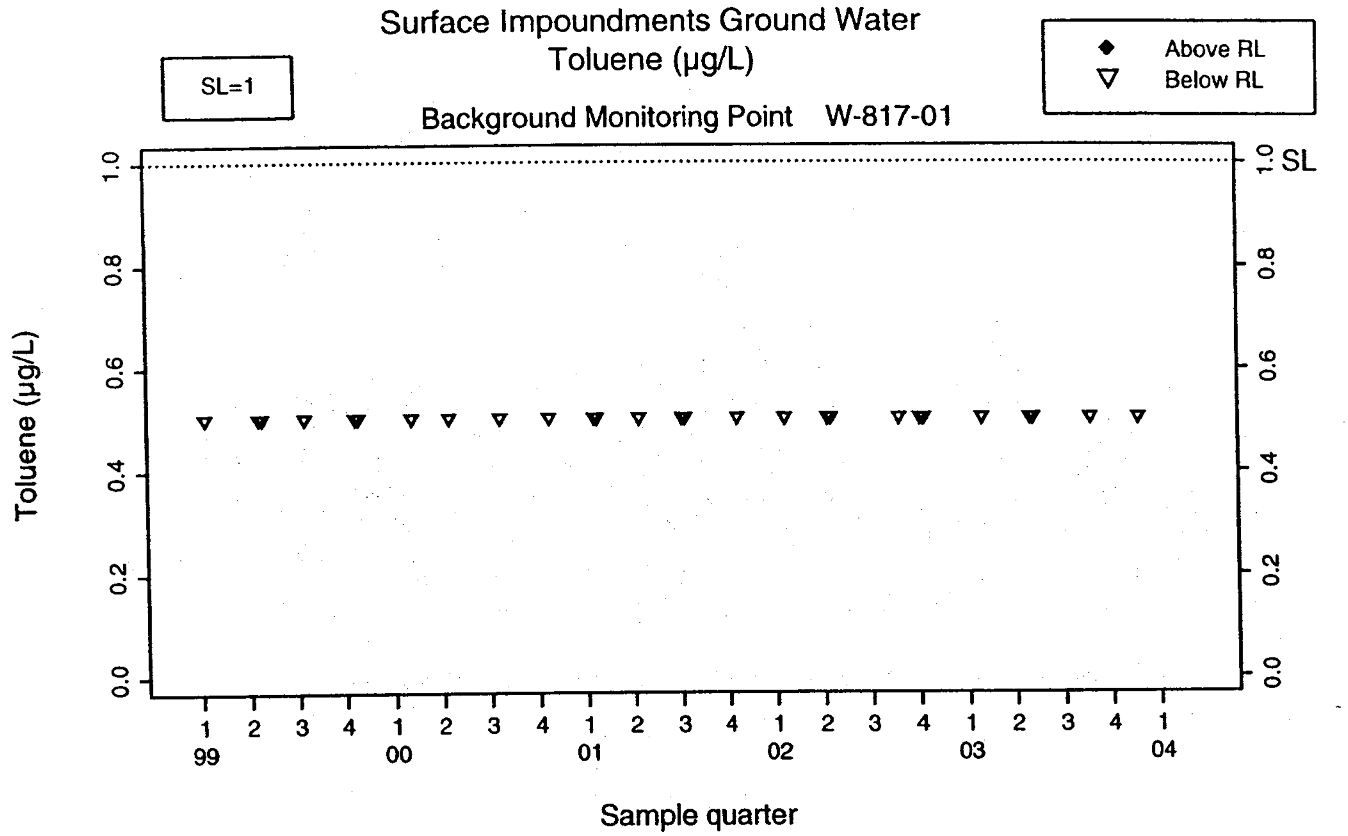
Surface Impoundments Ground Water
Chlorobenzene (µg/L)



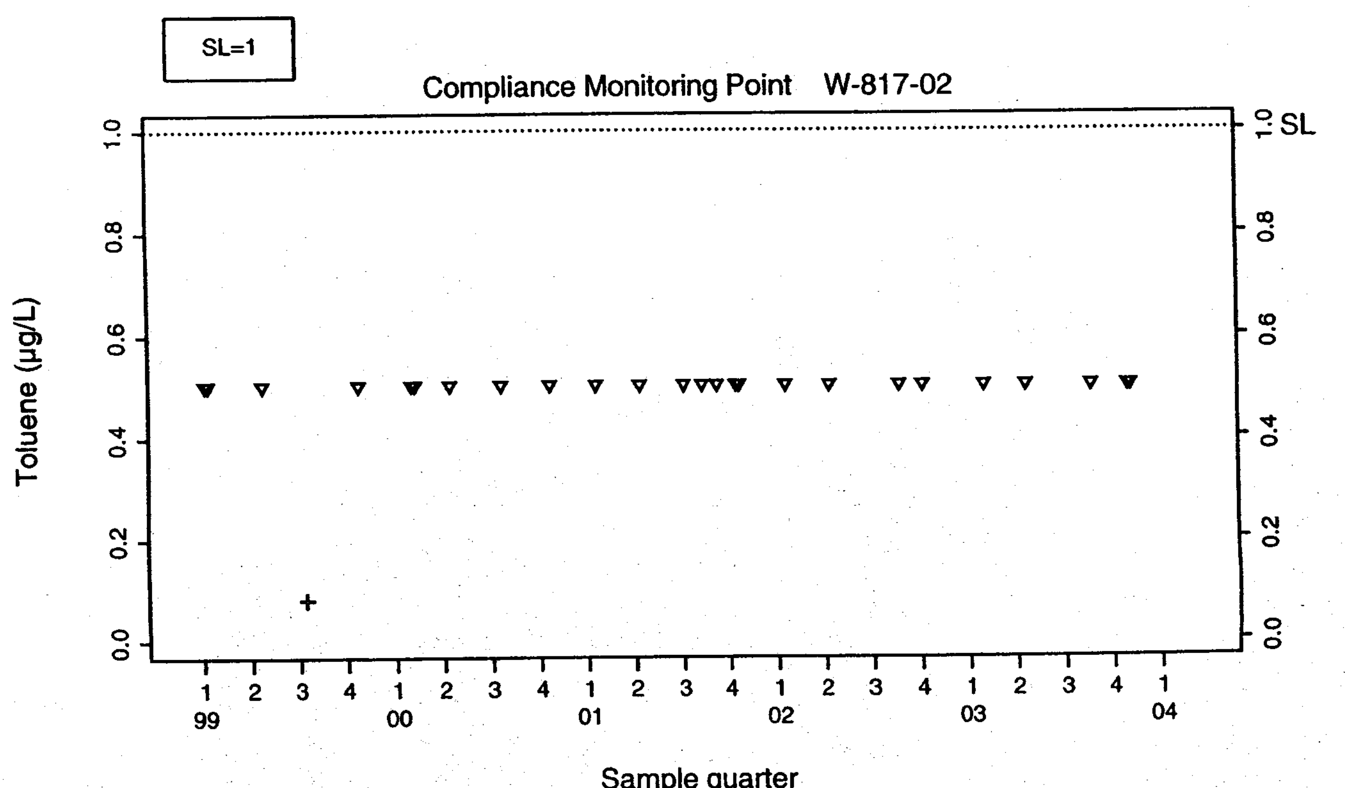



Surface Impoundments Ground Water
Chlorobenzene (µg/L)
SL=1
Above RL
Below RL
Compliance Monitoring Point W-817-03
SL
Chlorobenzene (µg/L)
0.0
0.2
0.4
0.6
0.8
1.0
1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1
99 00 01 02 03 04
Sample quarter


SL=1
Compliance Monitoring Point W-817-04
SL
Chlorobenzene (µg/L)
0.0
0.2
0.4
0.6
0.8
1.0
1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1
99 00 01 02 03 04
Sample quarter

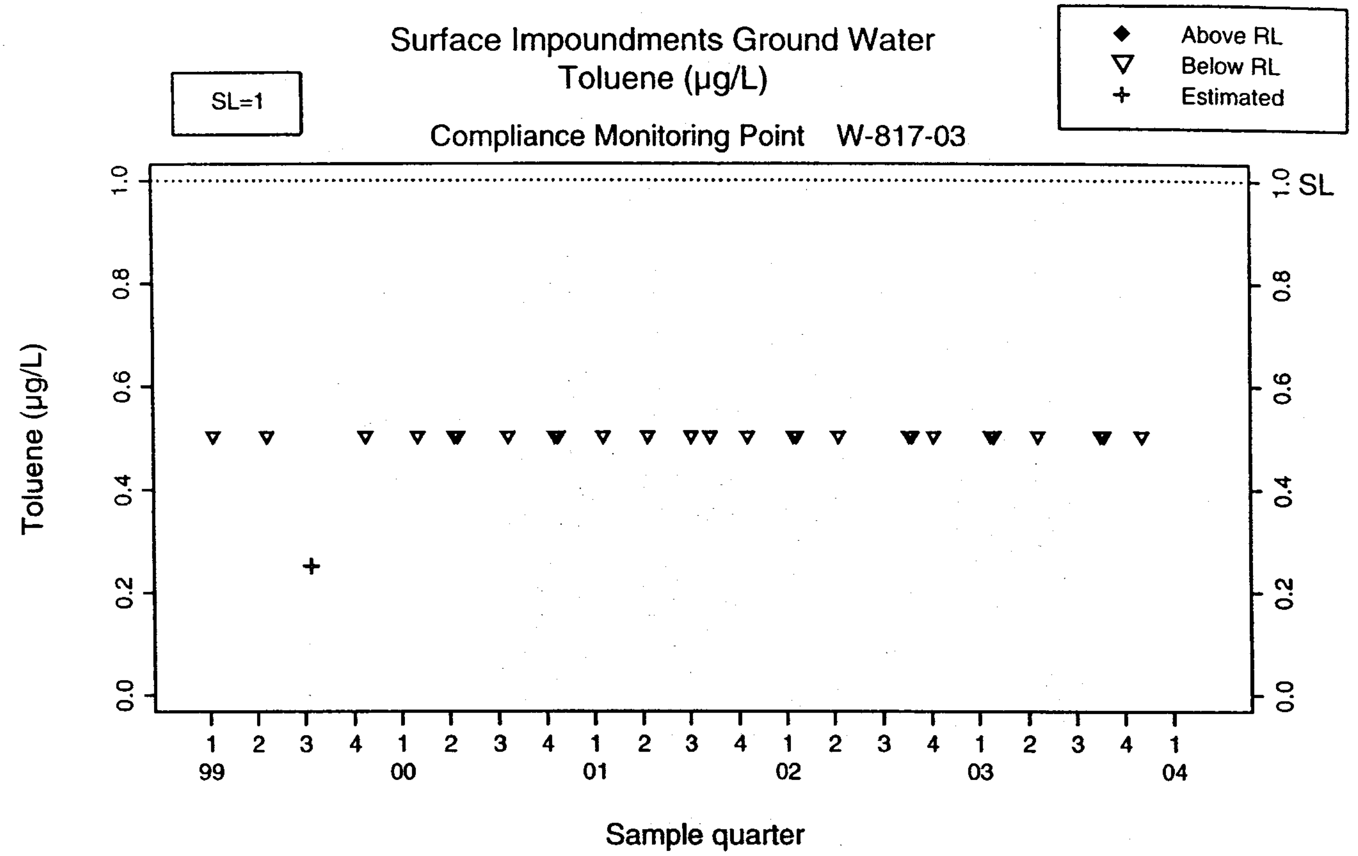


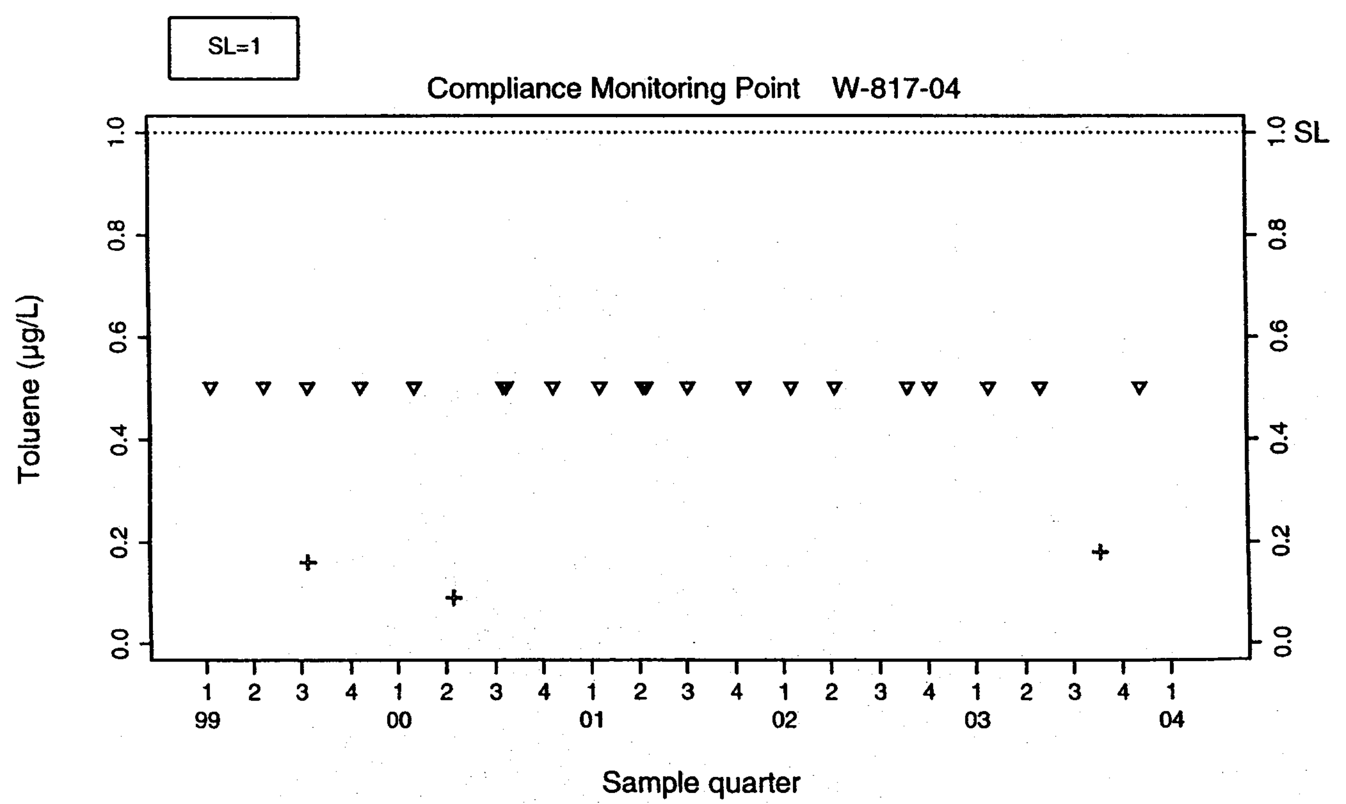
Surface Impoundments Ground Water
Toluene (µg/L)
SL=1
Above RL
Below RL
Background Monitoring Point W-817-01
Toluene (µg/L)
SL
Sample quarter



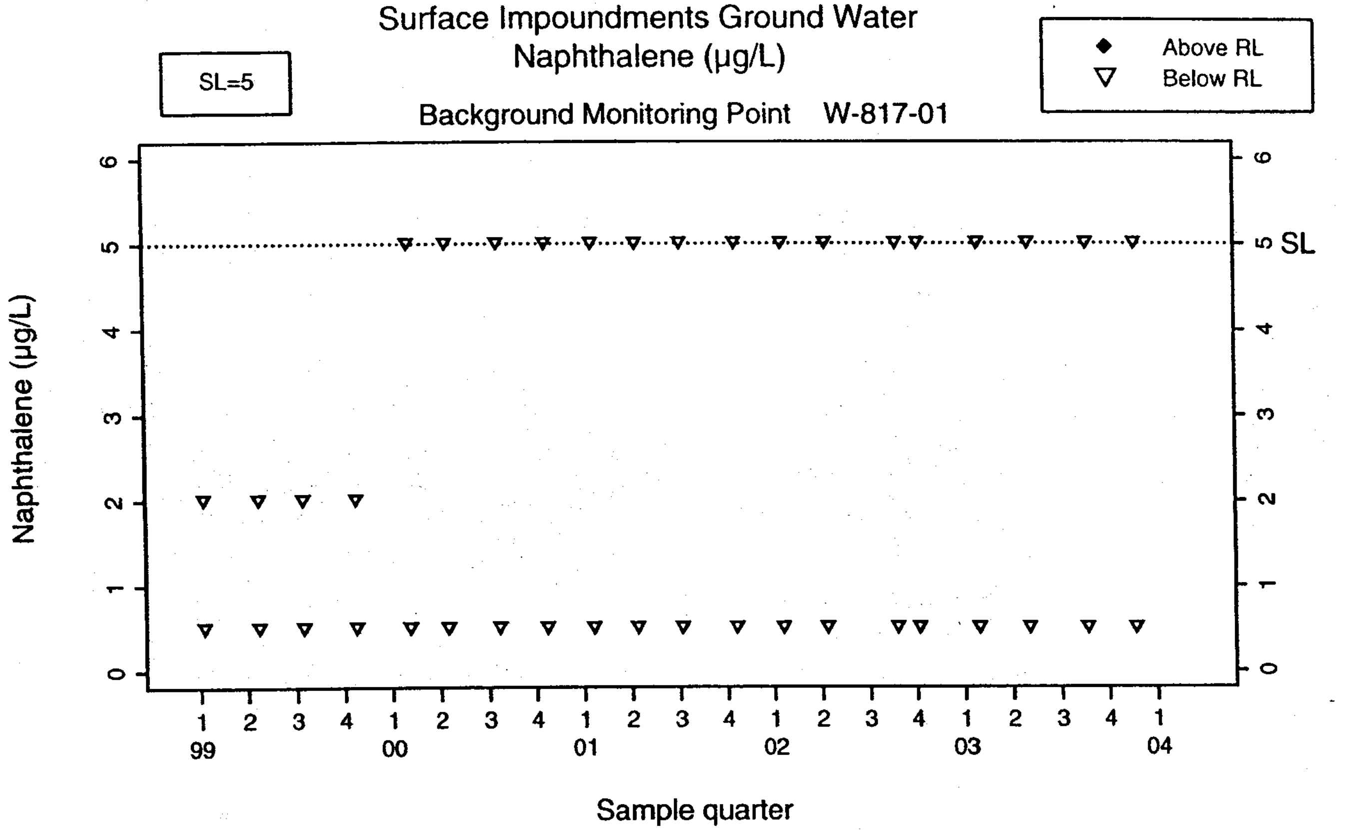
SL=1
Compliance Monitoring Point W-817-02
Toluene (µg/L)
SL
Sample quarter

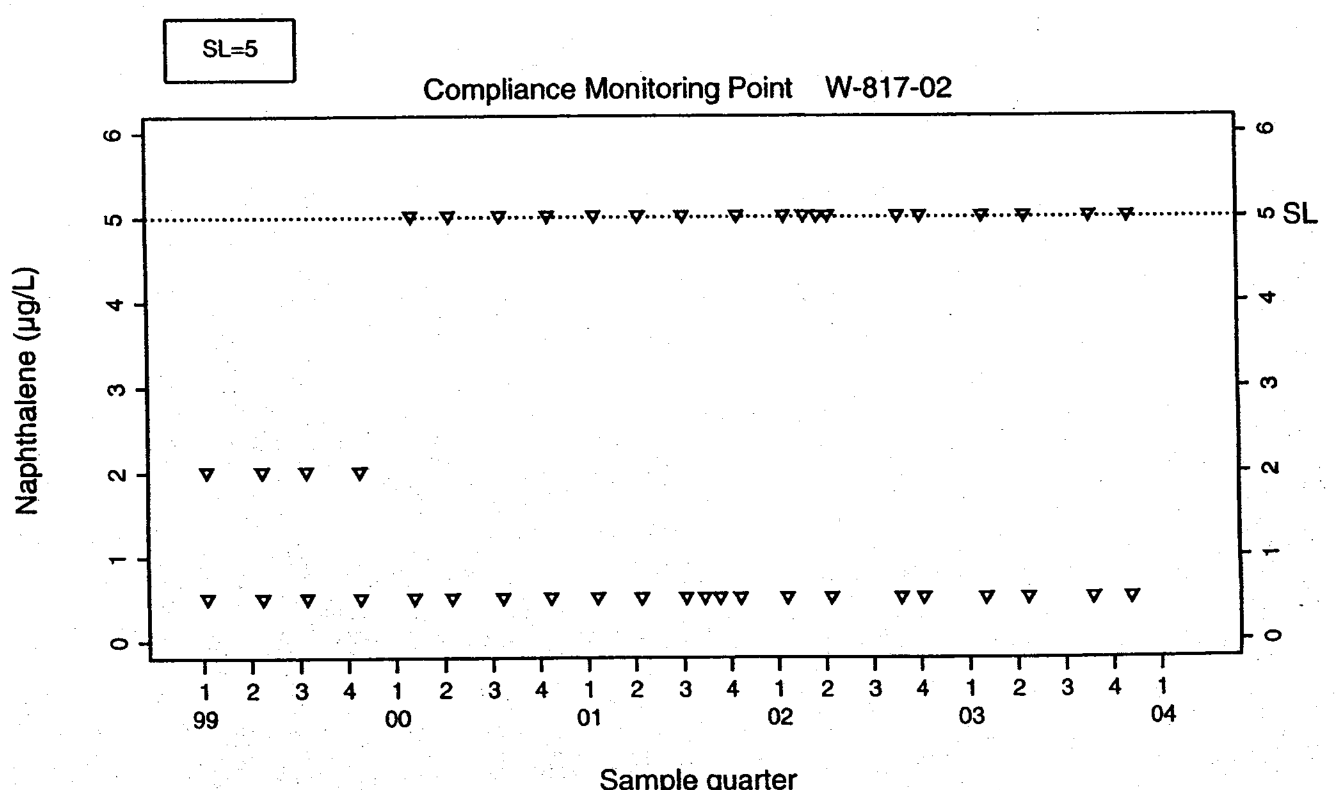
Surface Impoundments Ground Water
Toluene (µg/L)

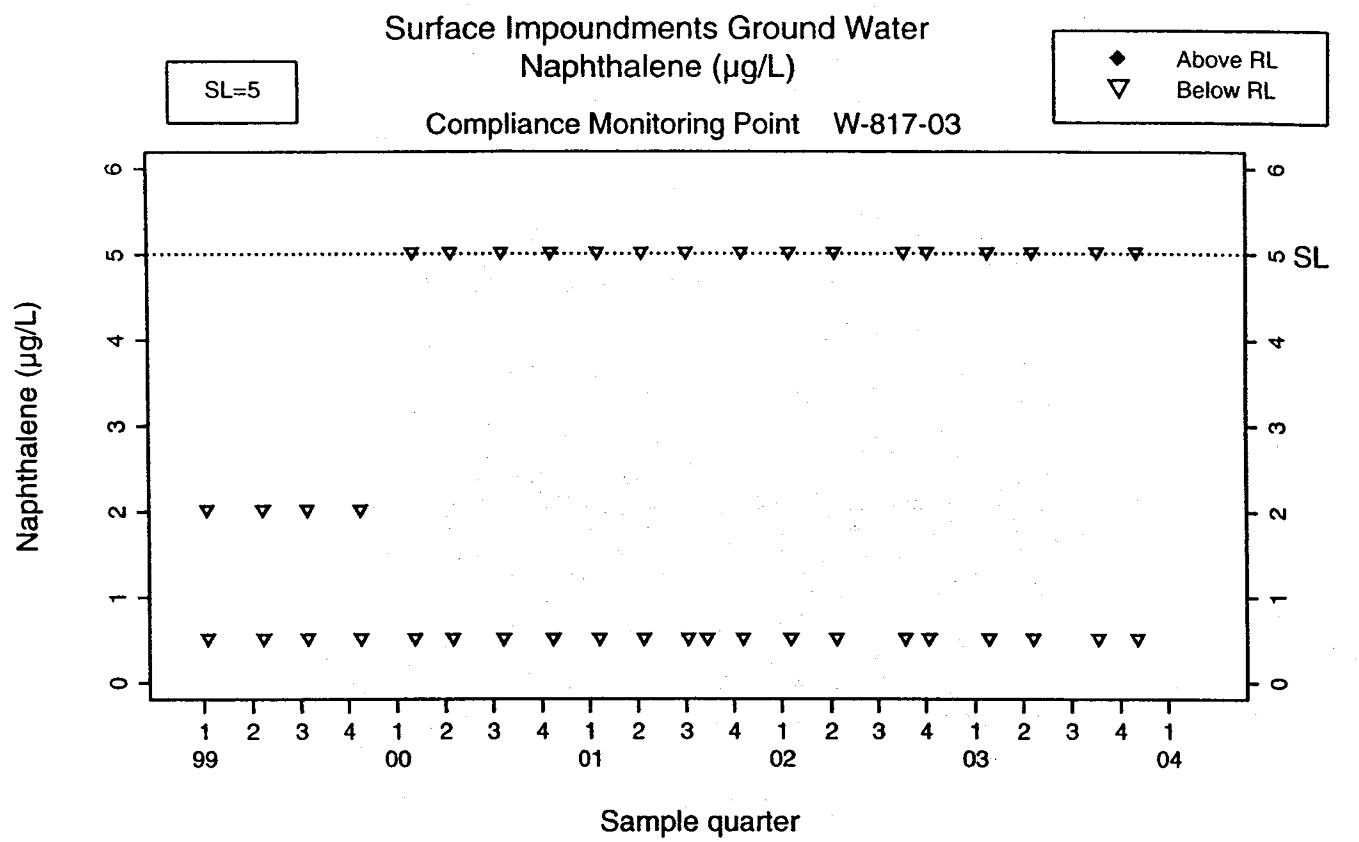


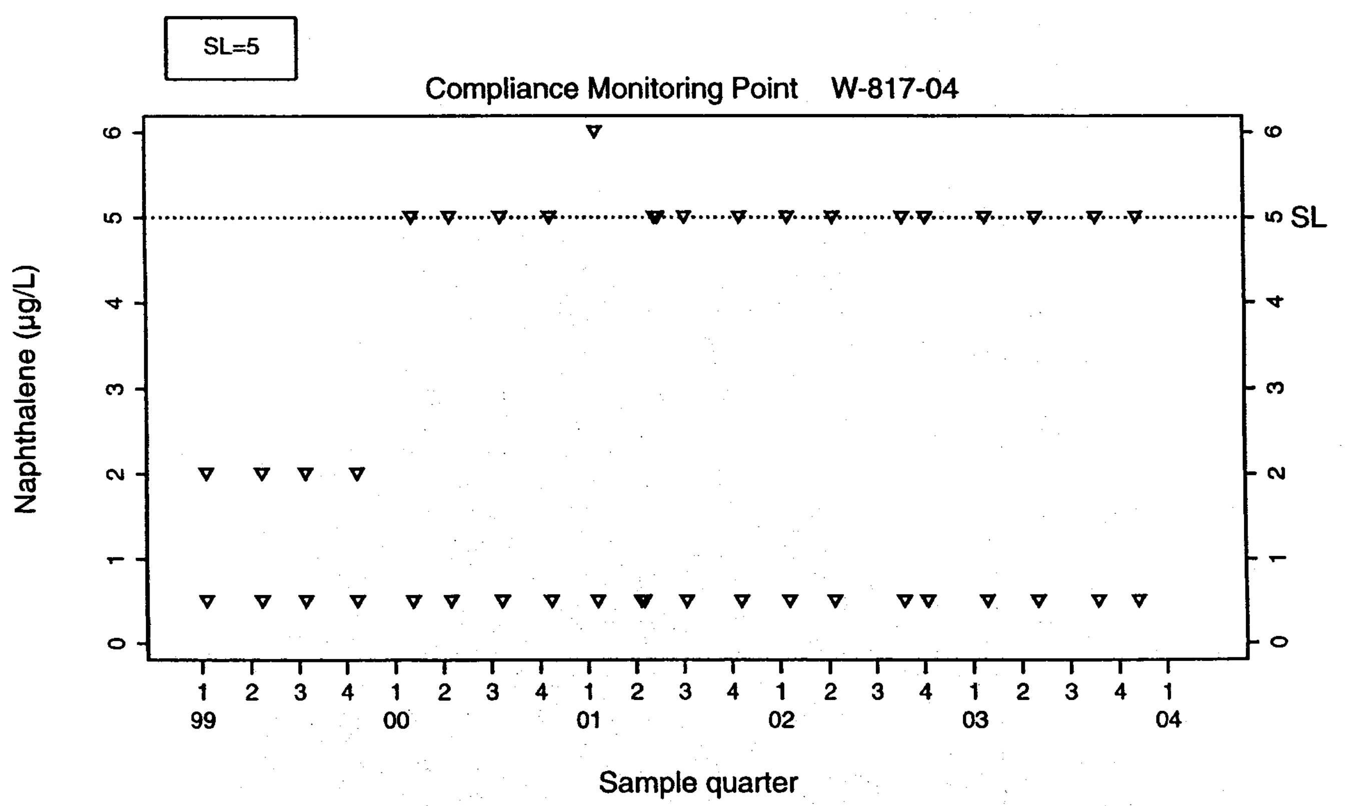


Surface Impoundments Ground Water
Naphthalene (µg/L)

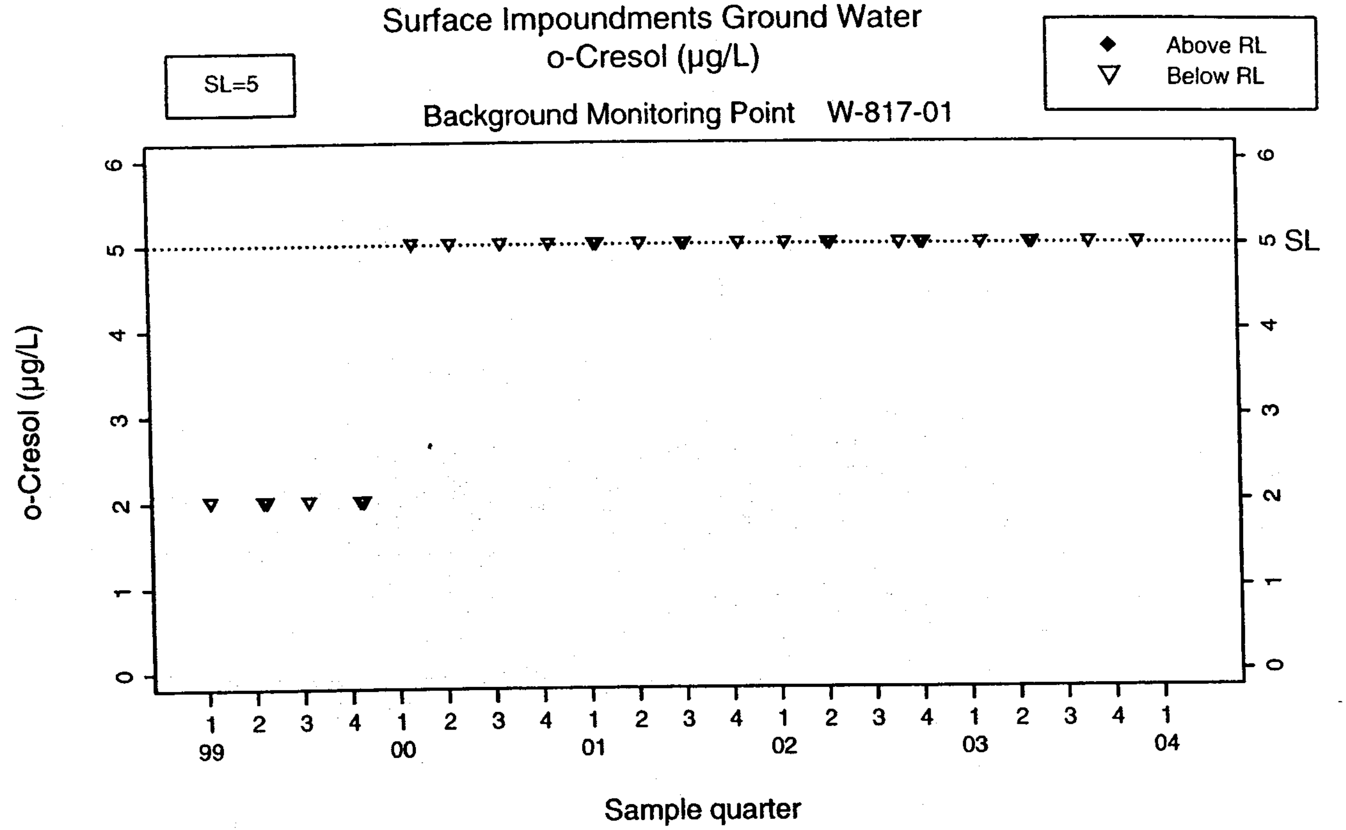


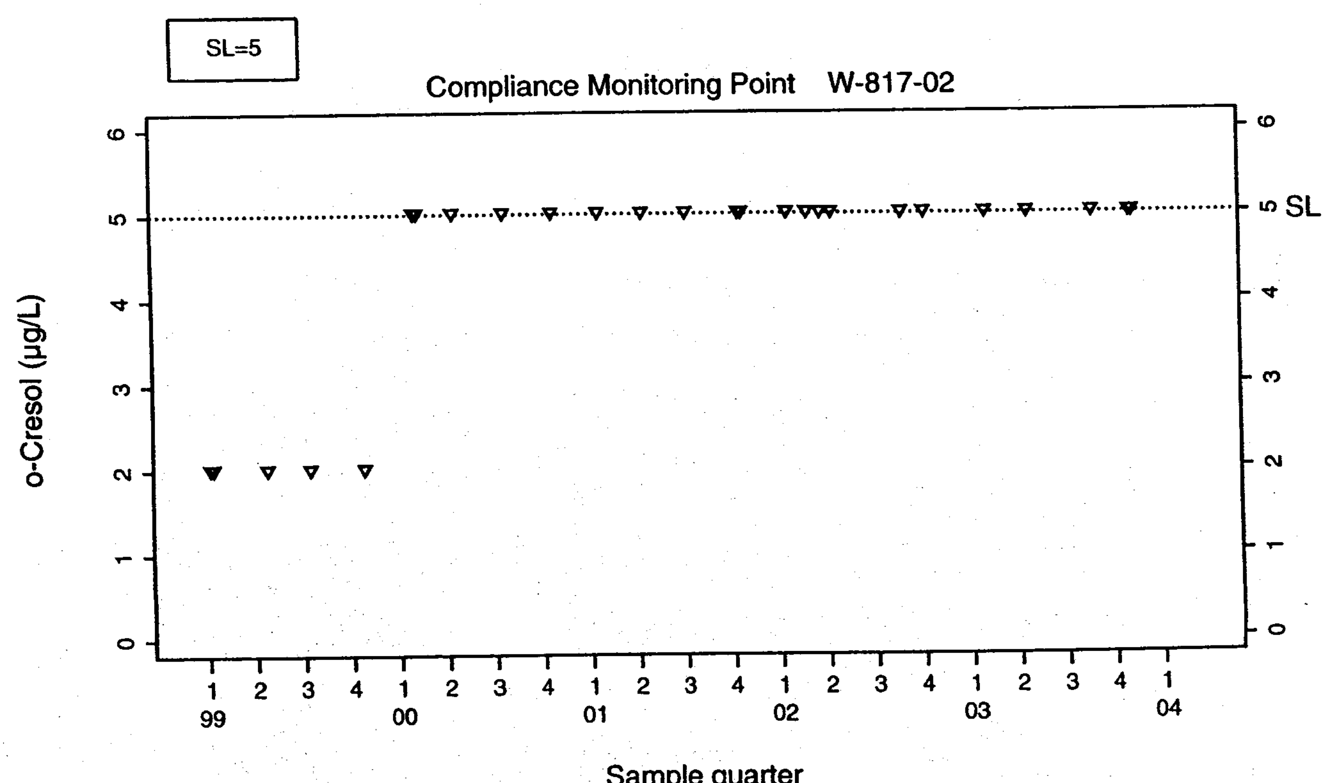



Surface Impoundments Ground Water
Naphthalene (µg/L)
SL=5
Above RL
Below RL
Compliance Monitoring Point W-817-03
Naphthalene (µg/L)
0
1
2
3
4
5
6
SL
1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1
99 00 01 02 03 04
Sample quarter

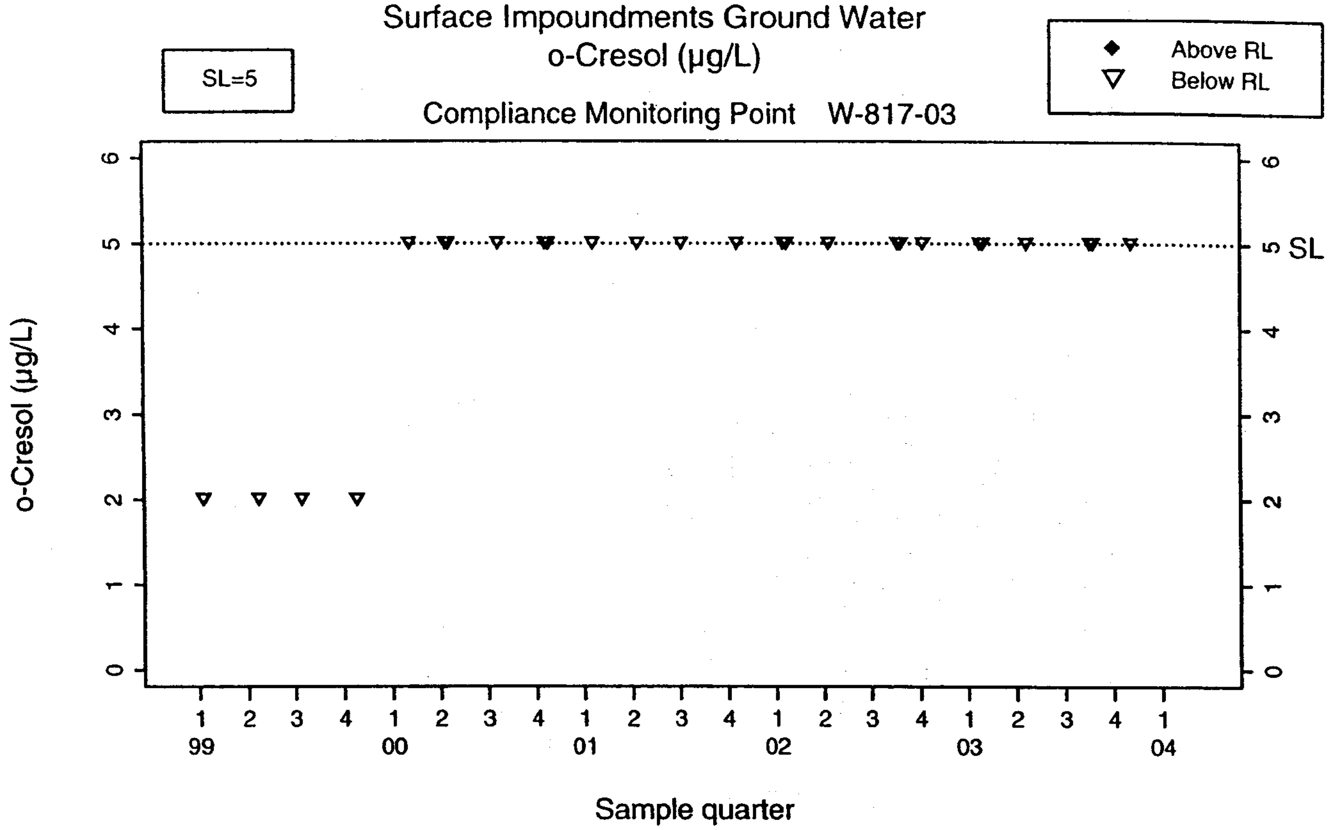

SL=5
Compliance Monitoring Point W-817-04
Naphthalene (µg/L)
0
1
2
3
4
5
6
SL
1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1
99 00 01 02 03 04
Sample quarter

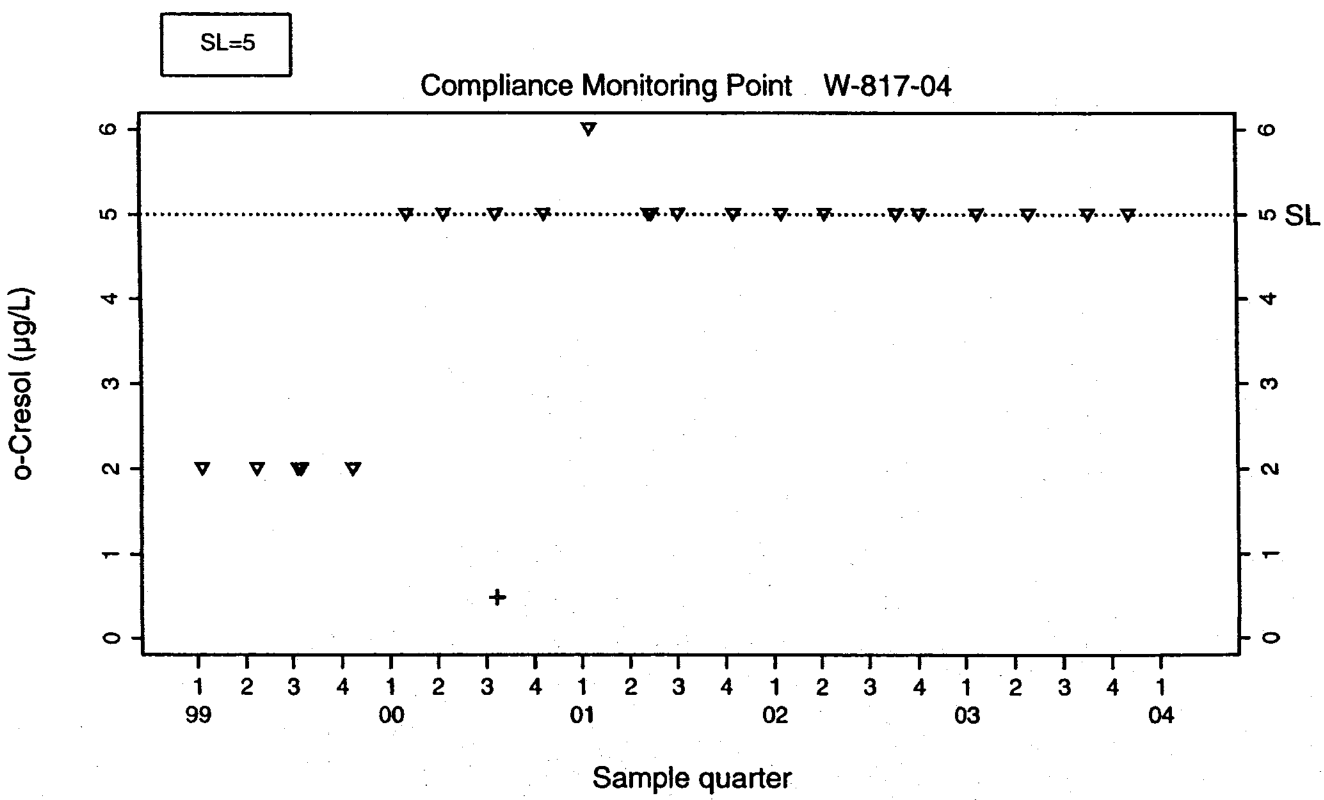
Surface Impoundments Ground Water
o-Cresol (µg/L)



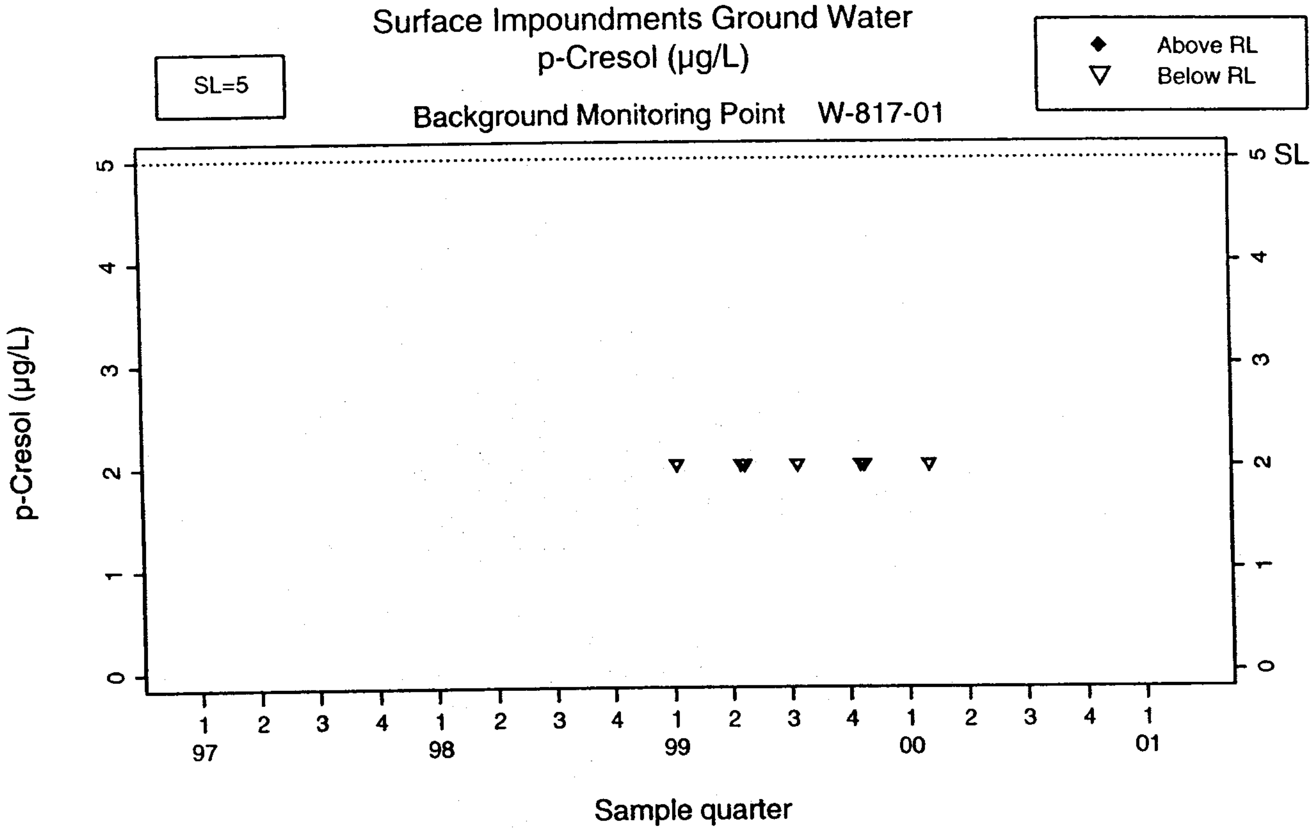


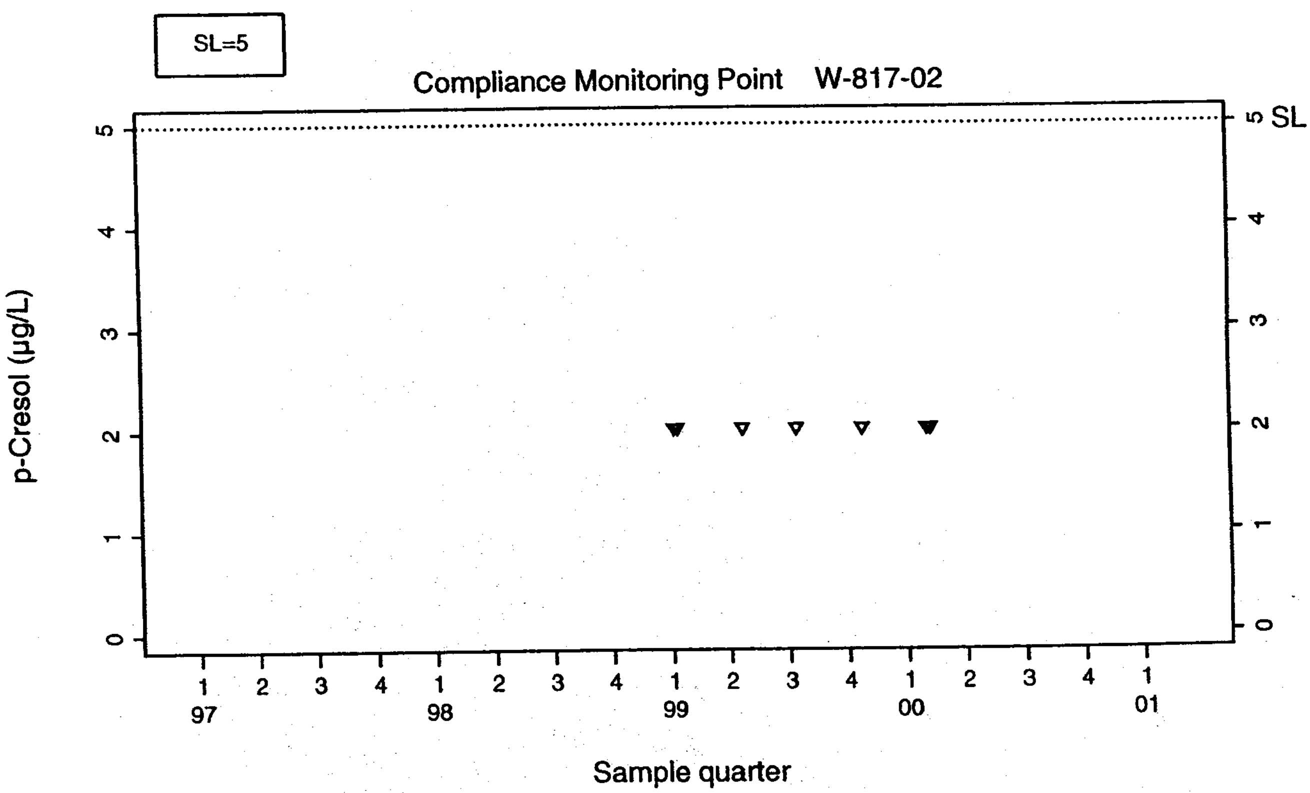
Surface Impoundments Ground Water
o-Cresol (µg/L)



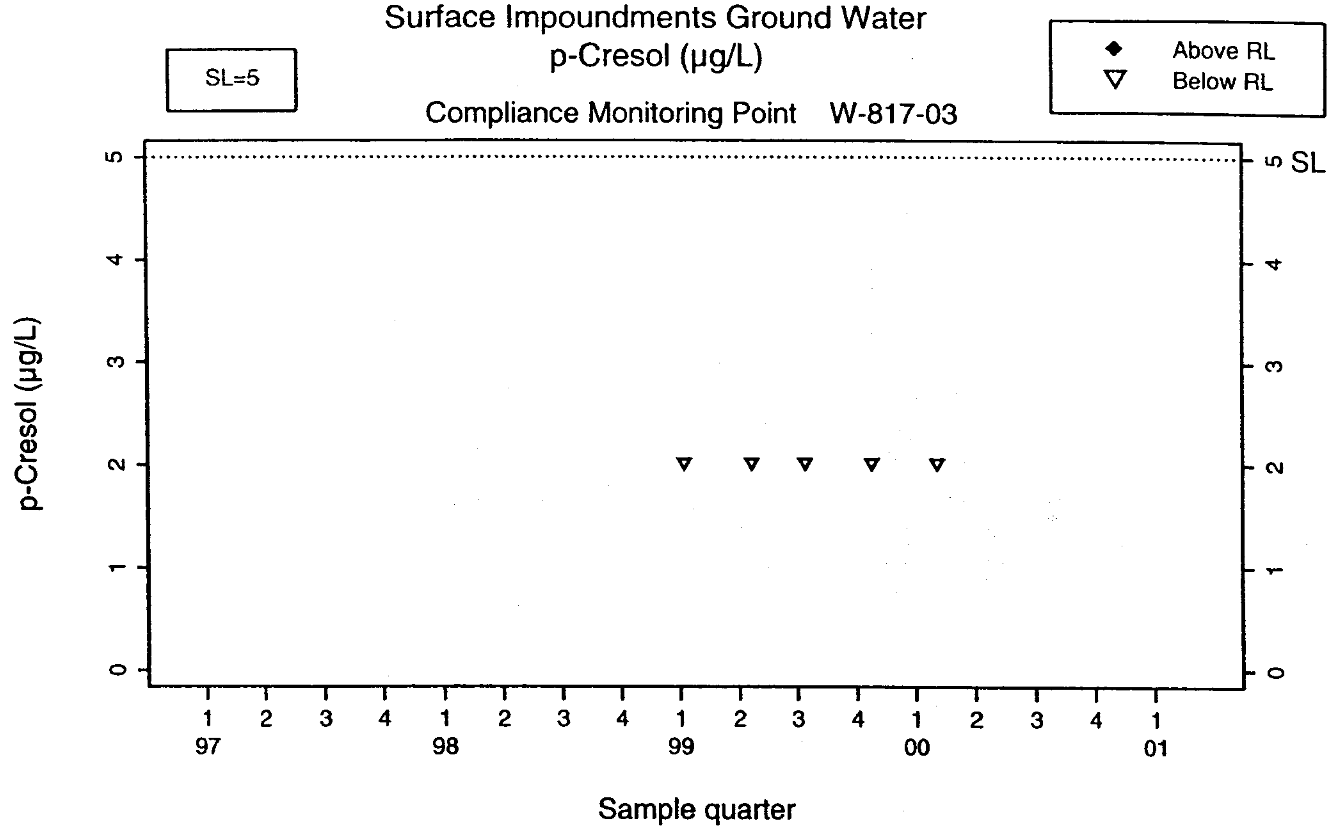


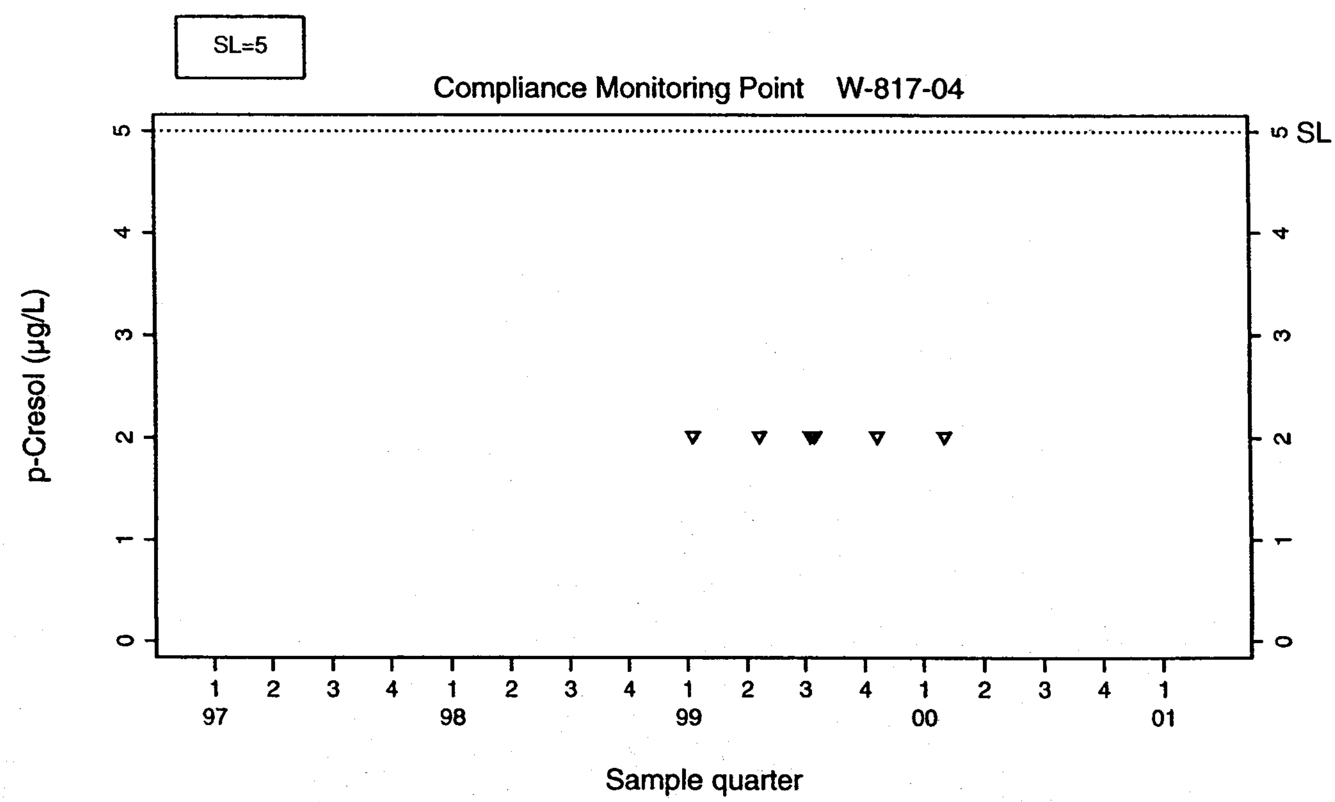
Surface Impoundments Ground Water
p-Cresol (µg/L)



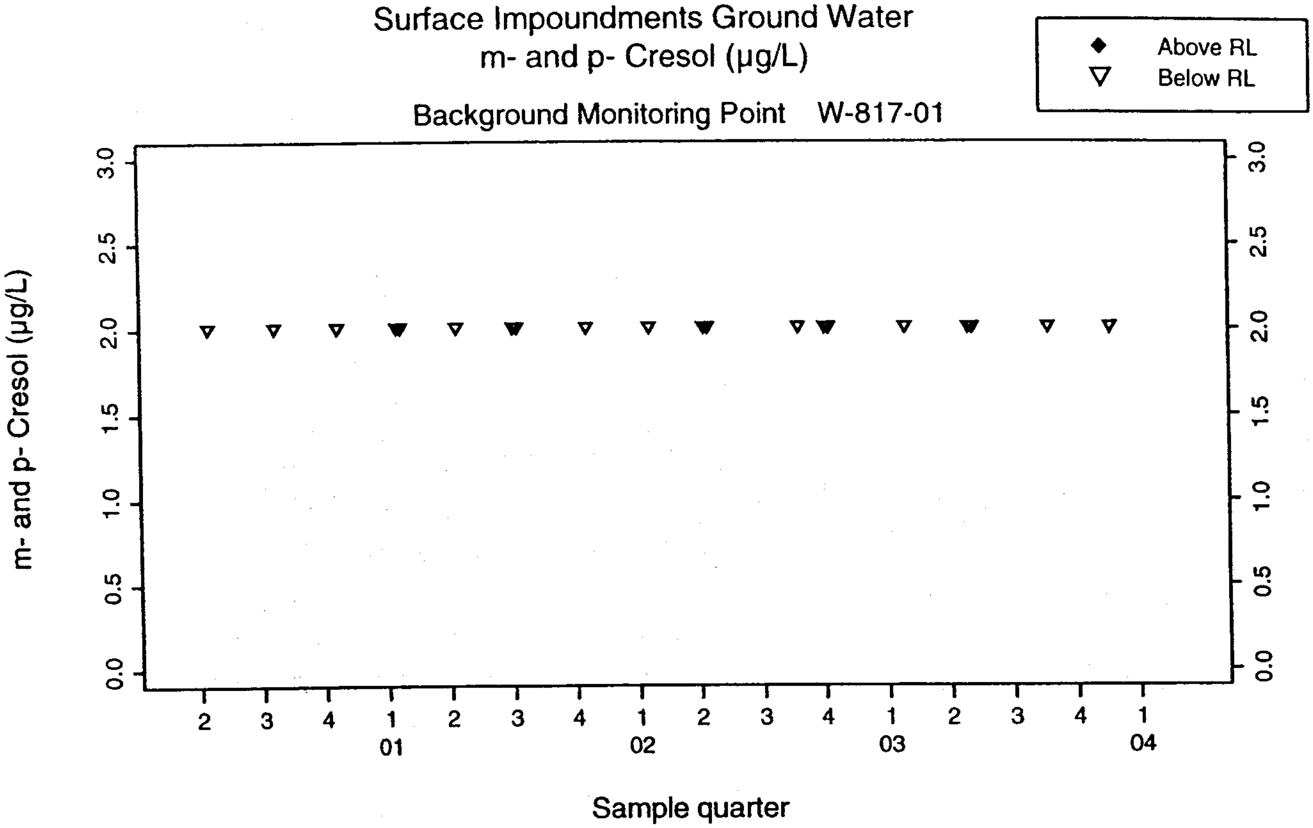


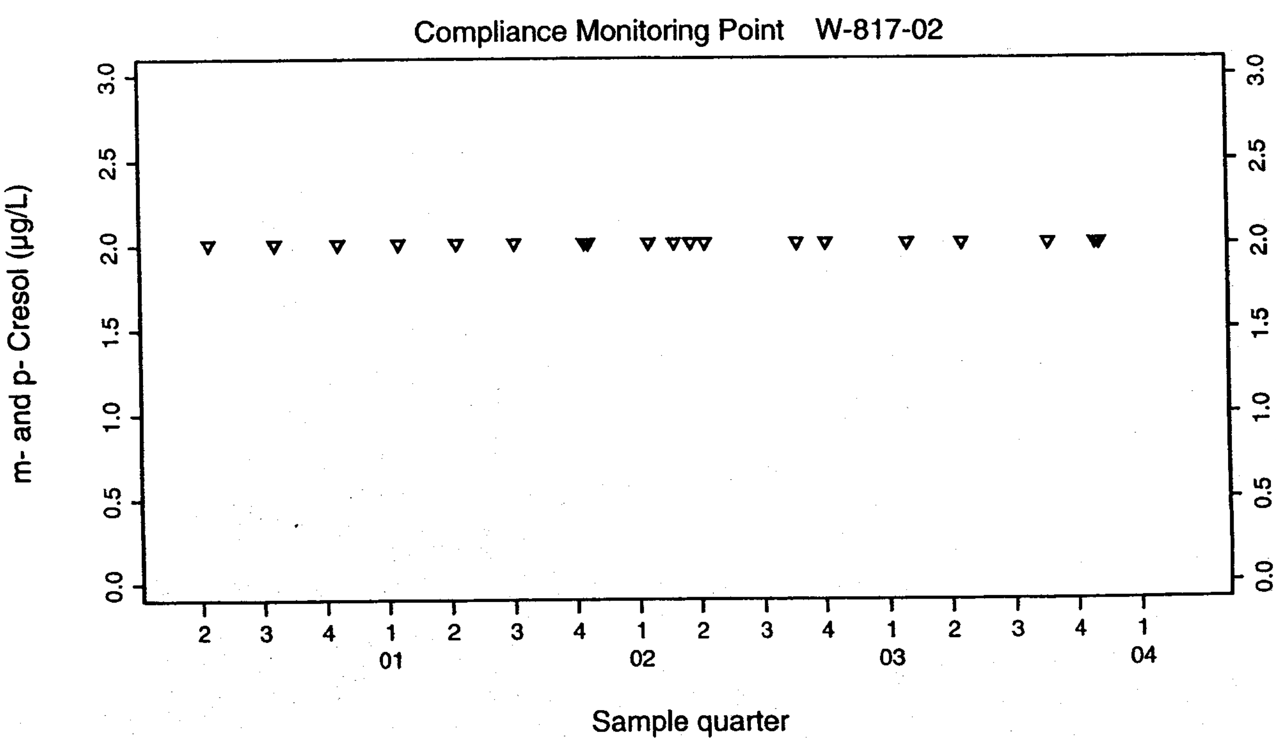
Surface Impoundments Ground Water
p-Cresol (µg/L)



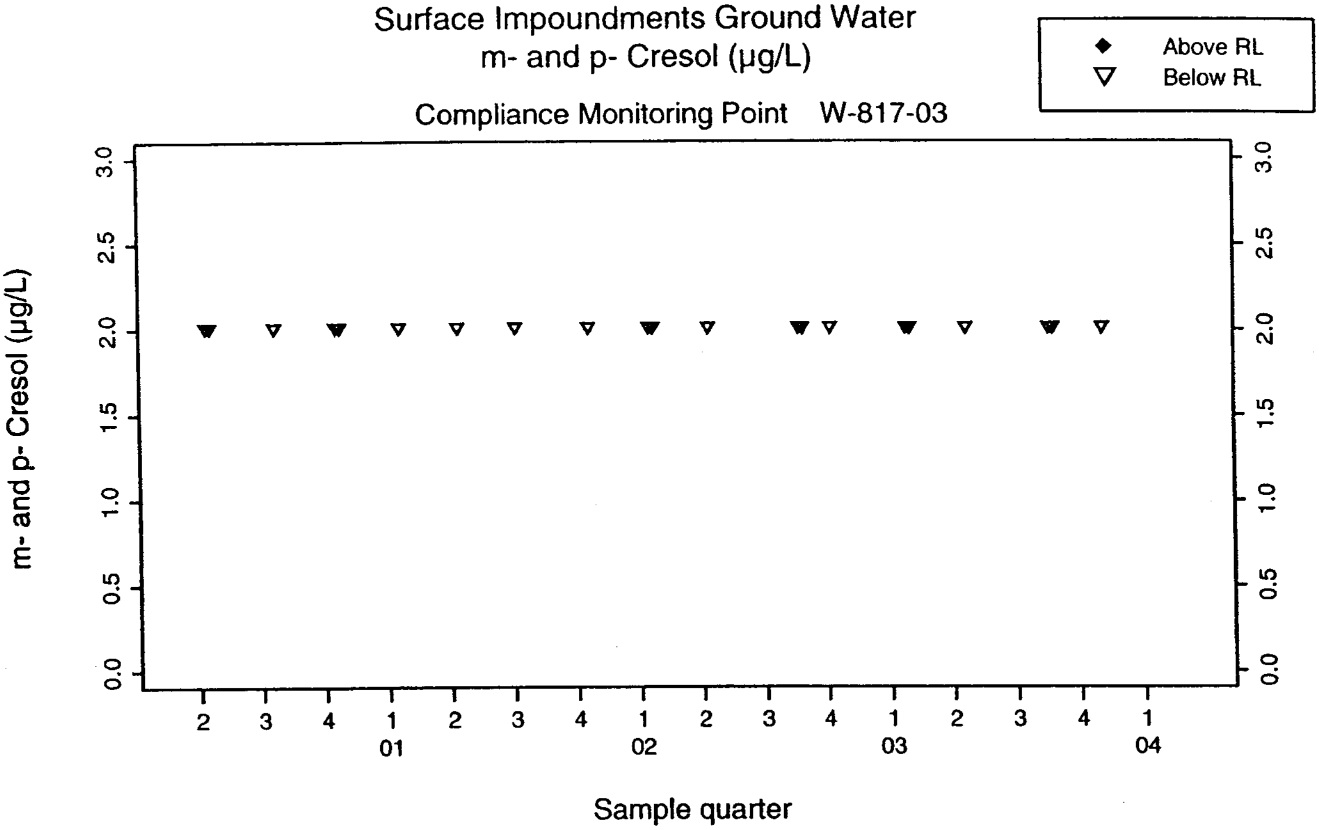


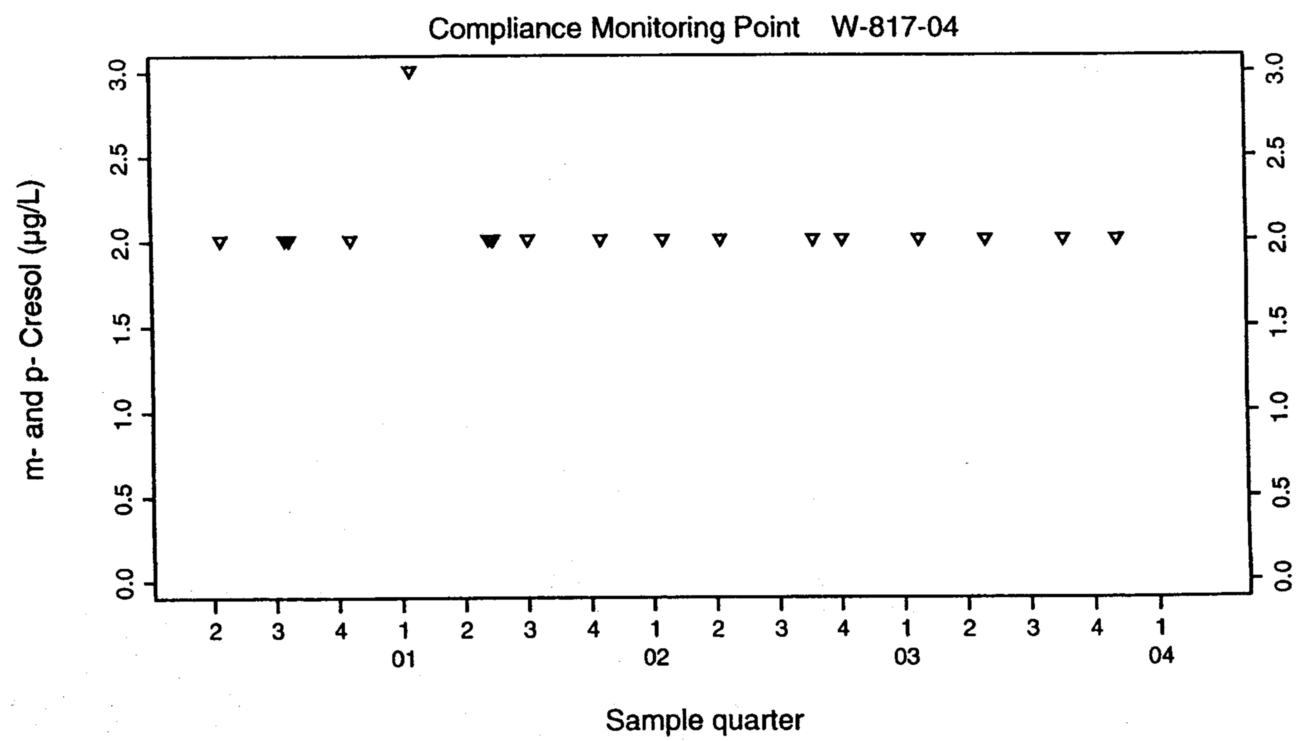
Surface Impoundments Ground Water
m- and p- Cresol (µg/L)



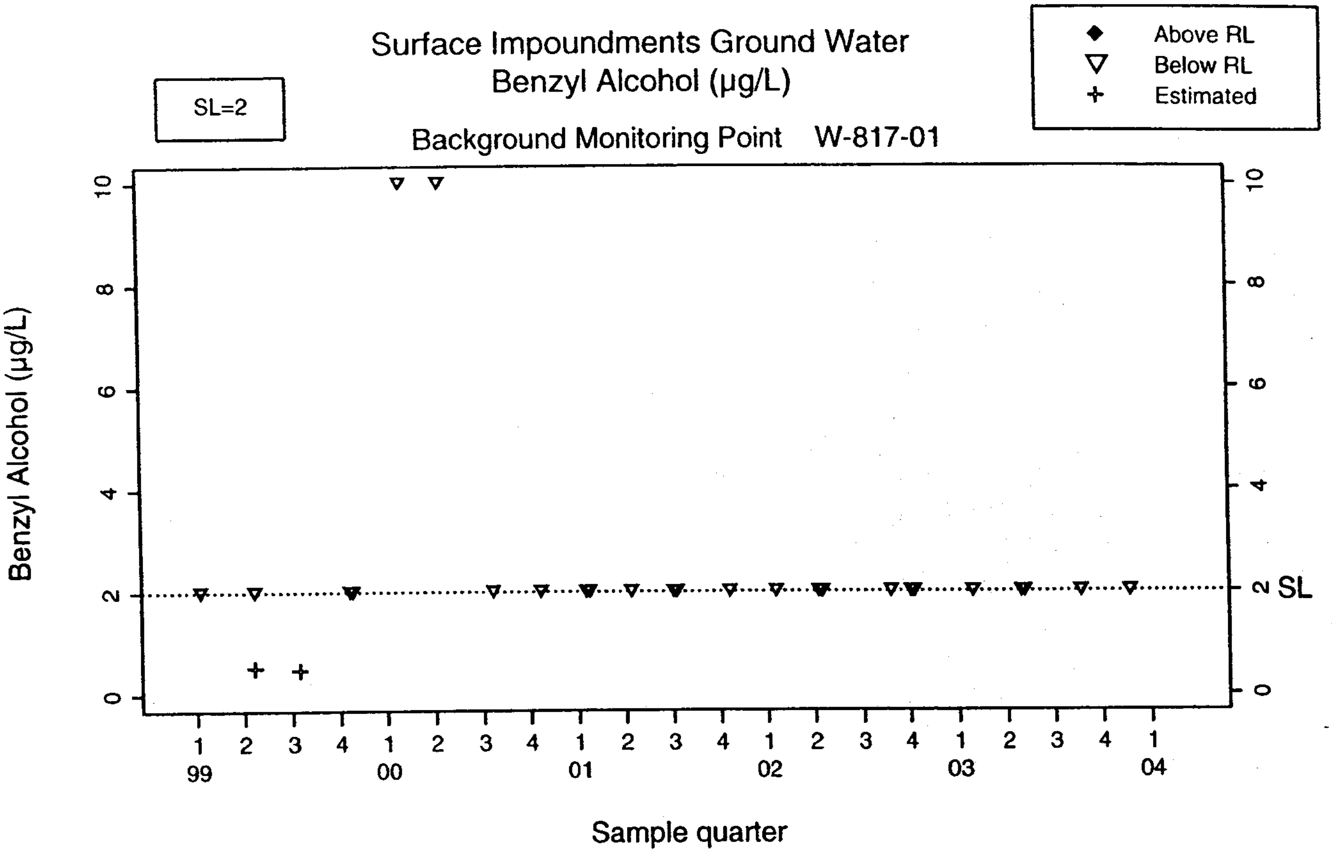


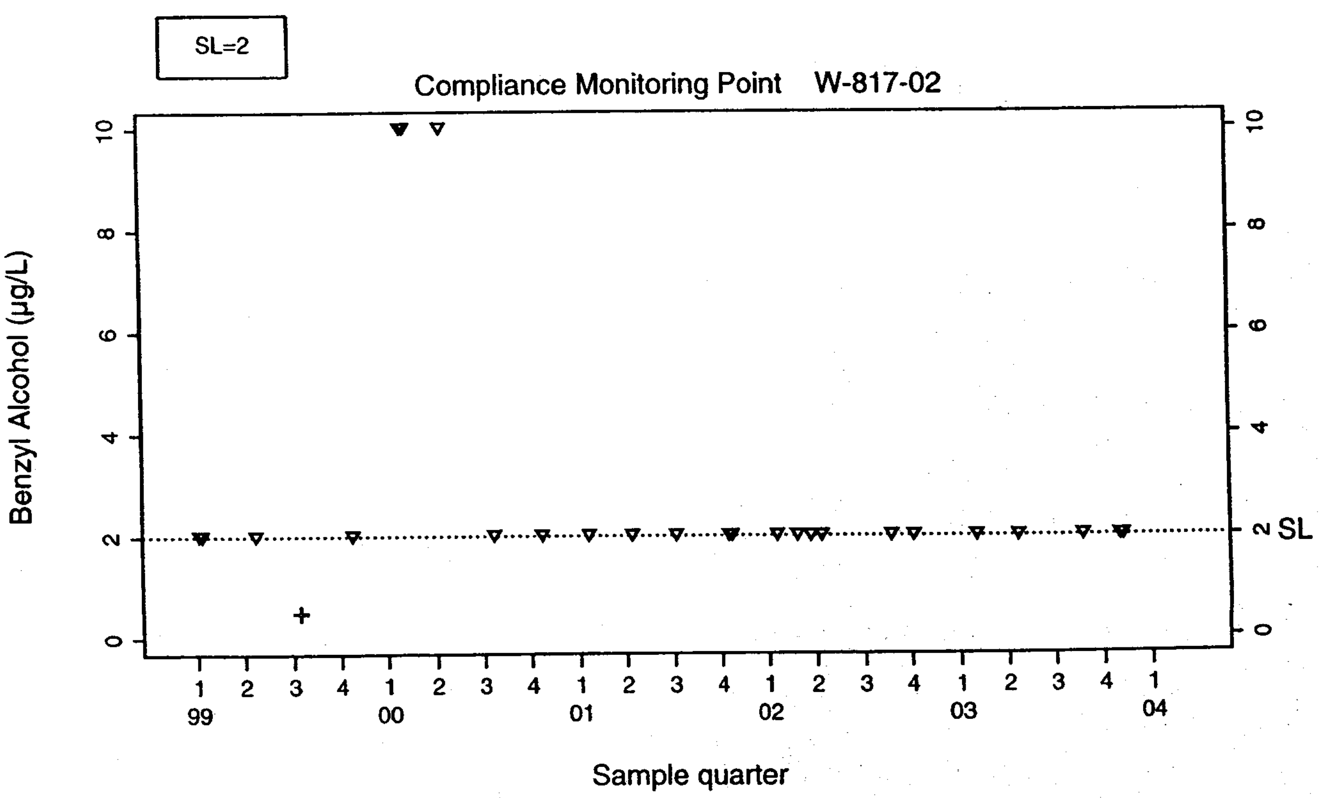
Surface Impoundments Ground Water
m- and p- Cresol (µg/L)



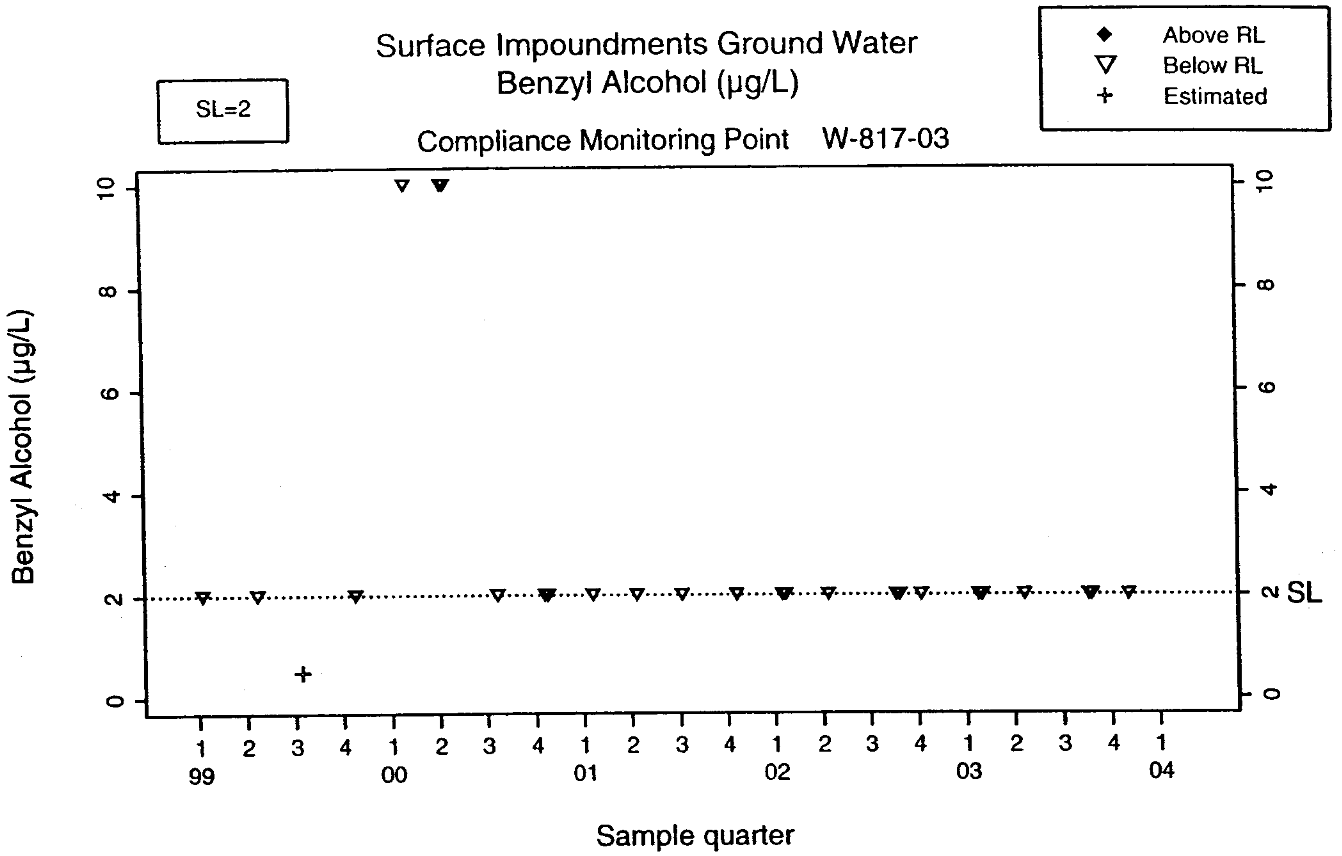


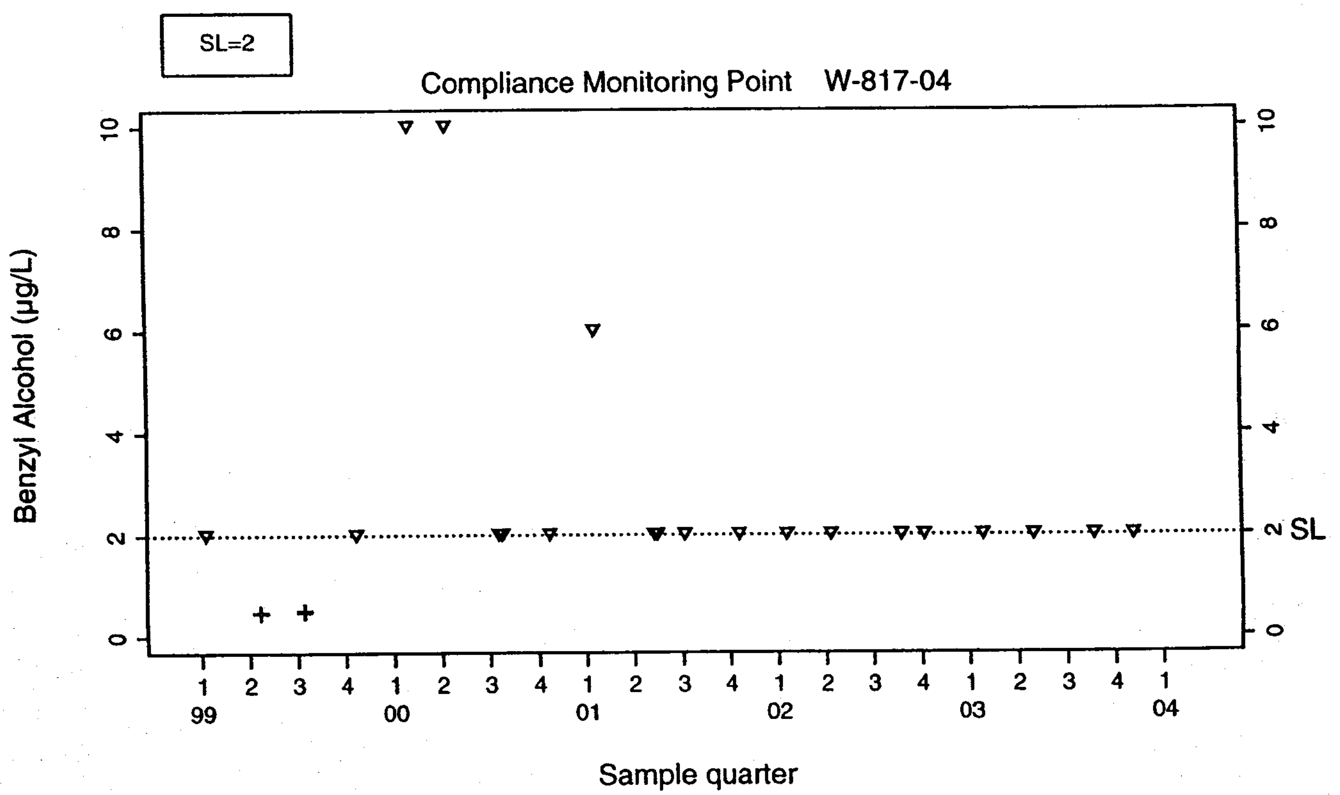
Surface Impoundments Ground Water
Benzyl Alcohol (µg/L)

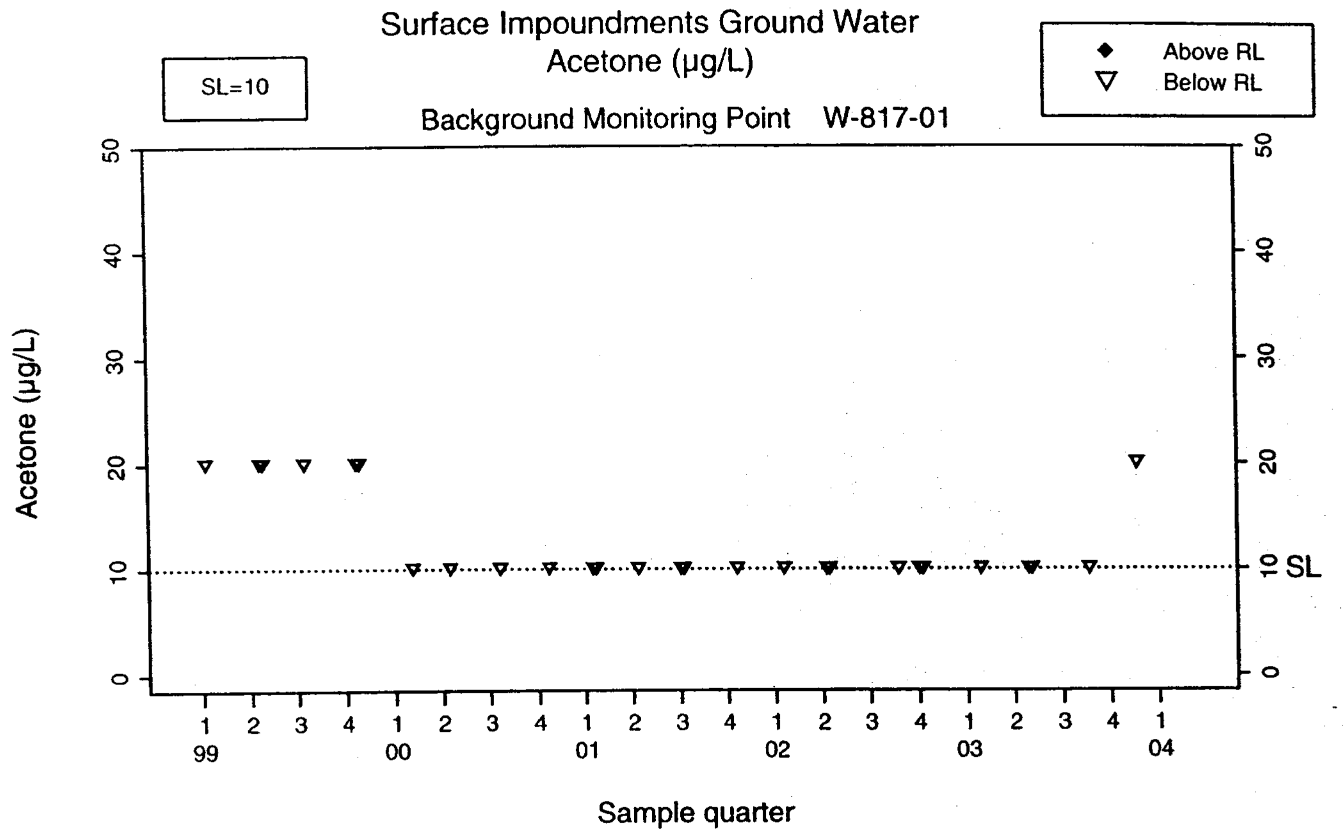


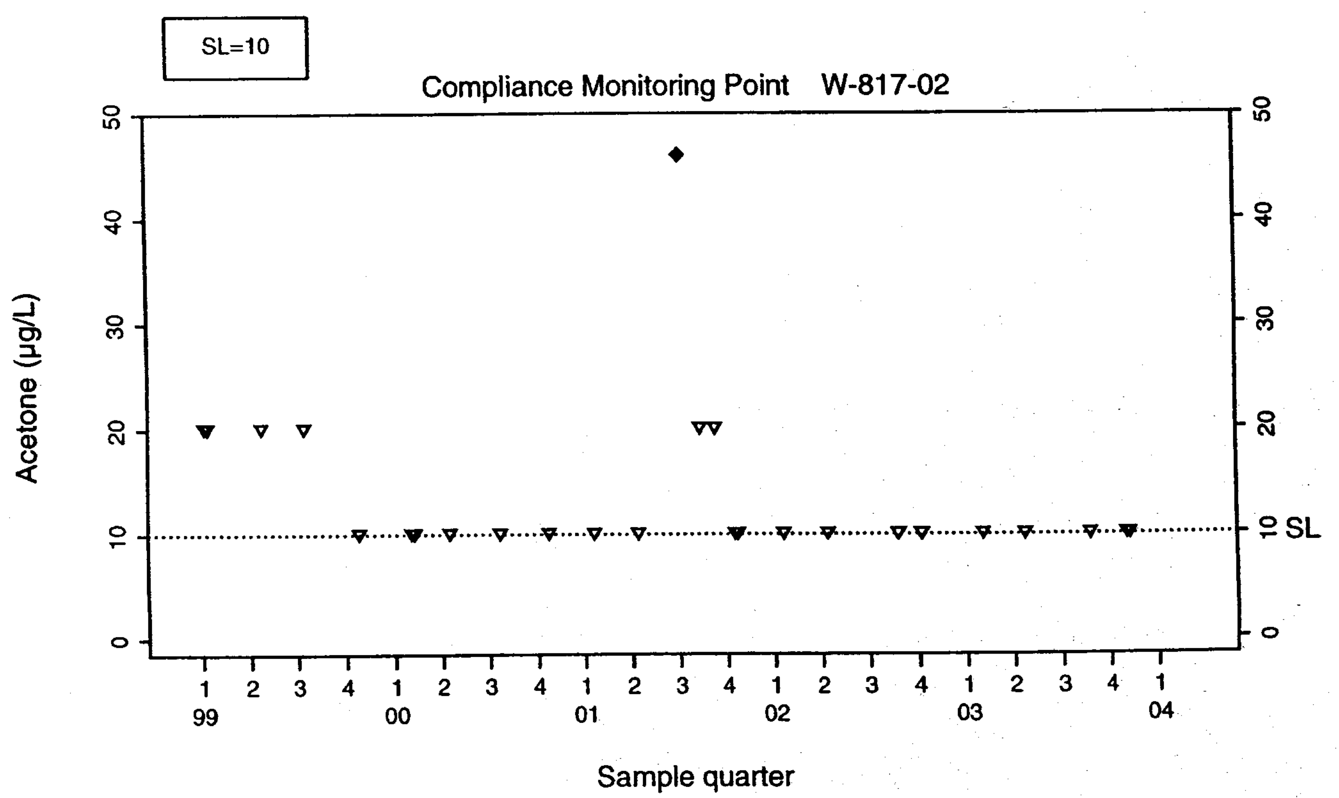


Surface Impoundments Ground Water
Benzyl Alcohol (µg/L)

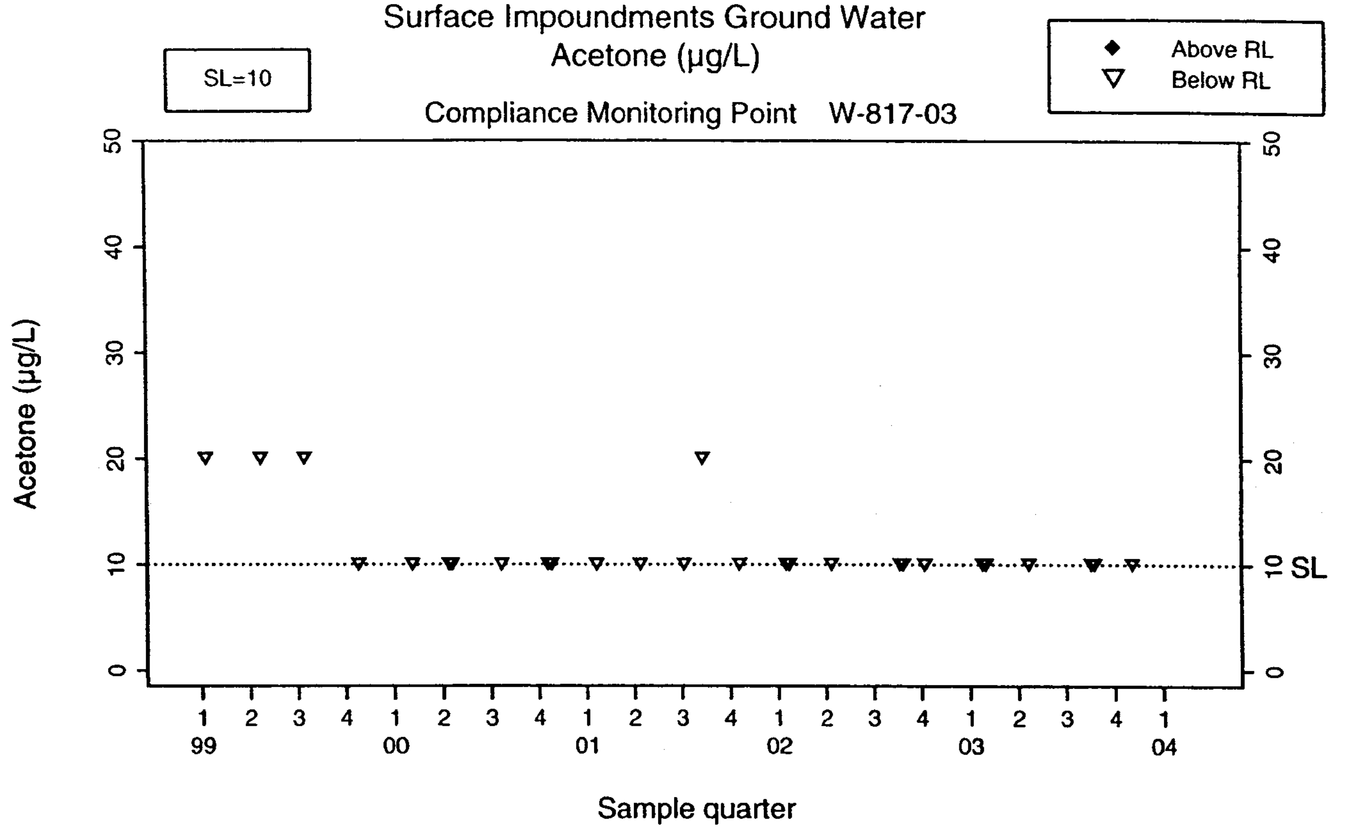


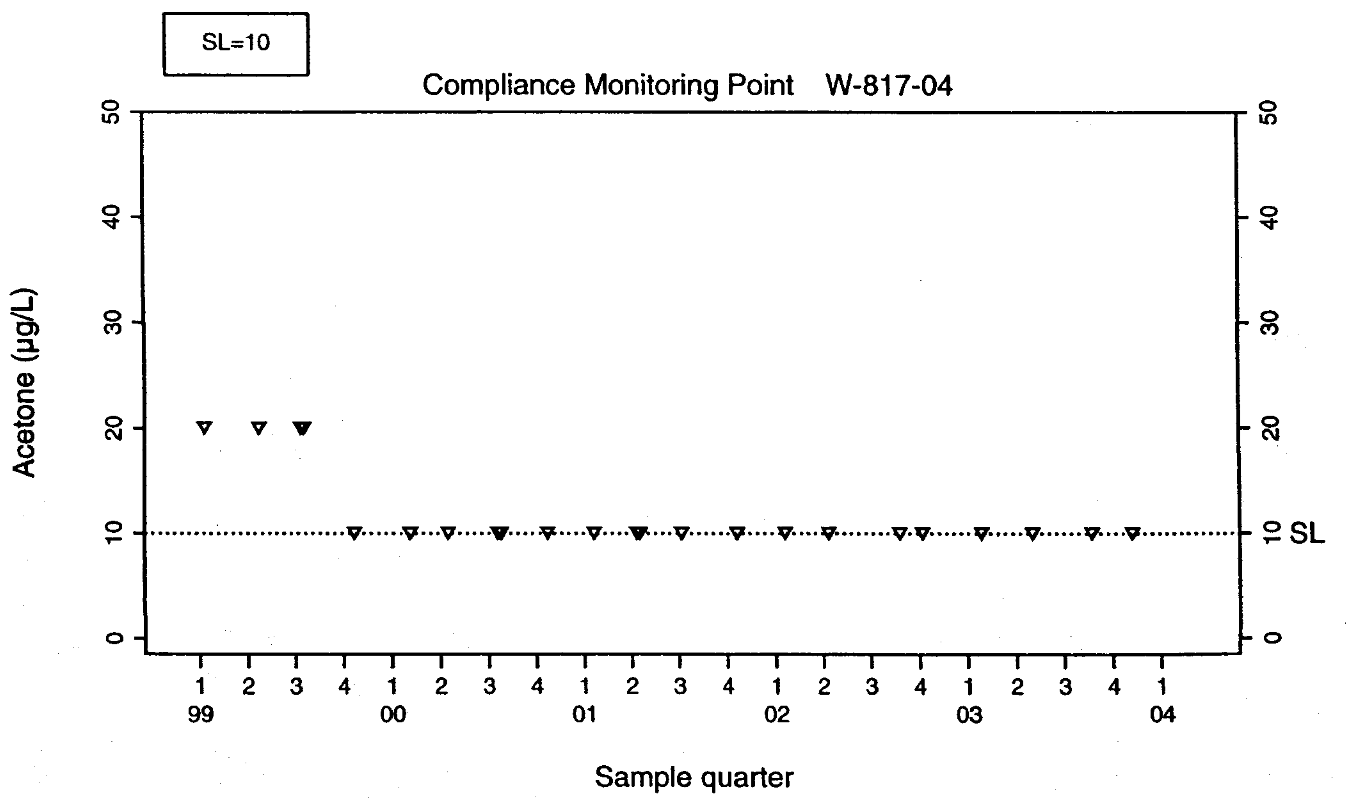



Surface Impoundments Ground Water
Acetone (µg/L)
SL=10
Above RL
Below RL
Background Monitoring Point W-817-01
Acetone (µg/L)
0
10
20
30
40
50
SL
1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1
99 00 01 02 03 04
Sample quarter

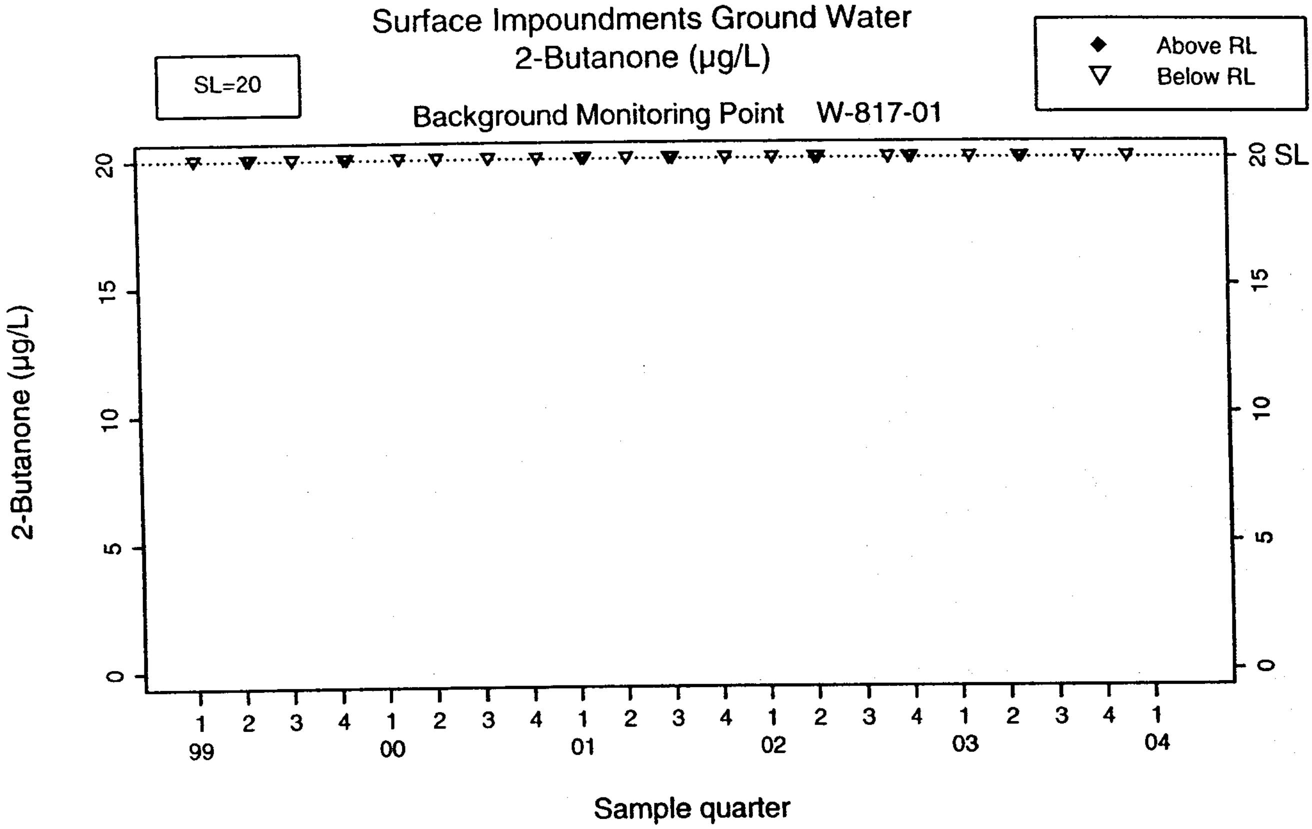

SL=10
Compliance Monitoring Point W-817-02
Acetone (µg/L)
0
10
20
30
40
50
SL
1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1
99 00 01 02 03 04
Sample quarter

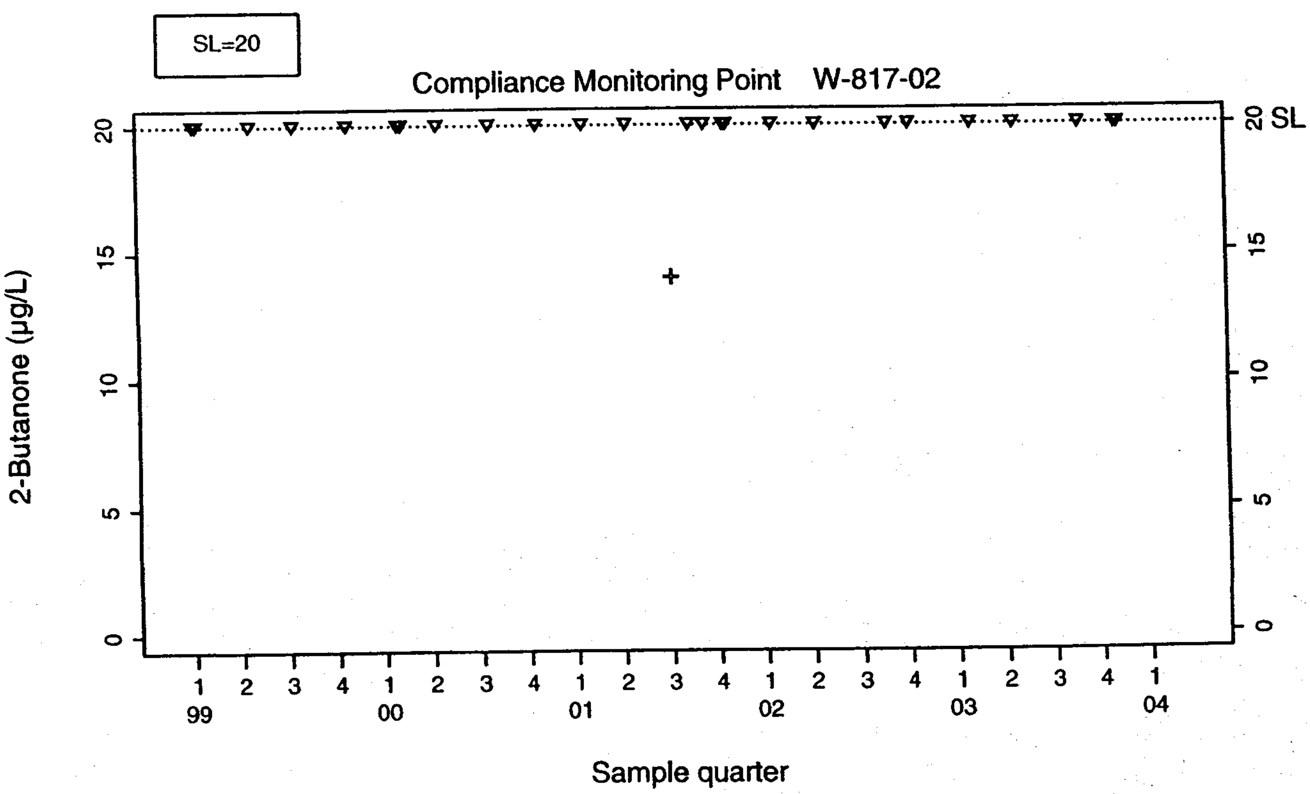
Surface Impoundments Ground Water
Acetone (µg/L)



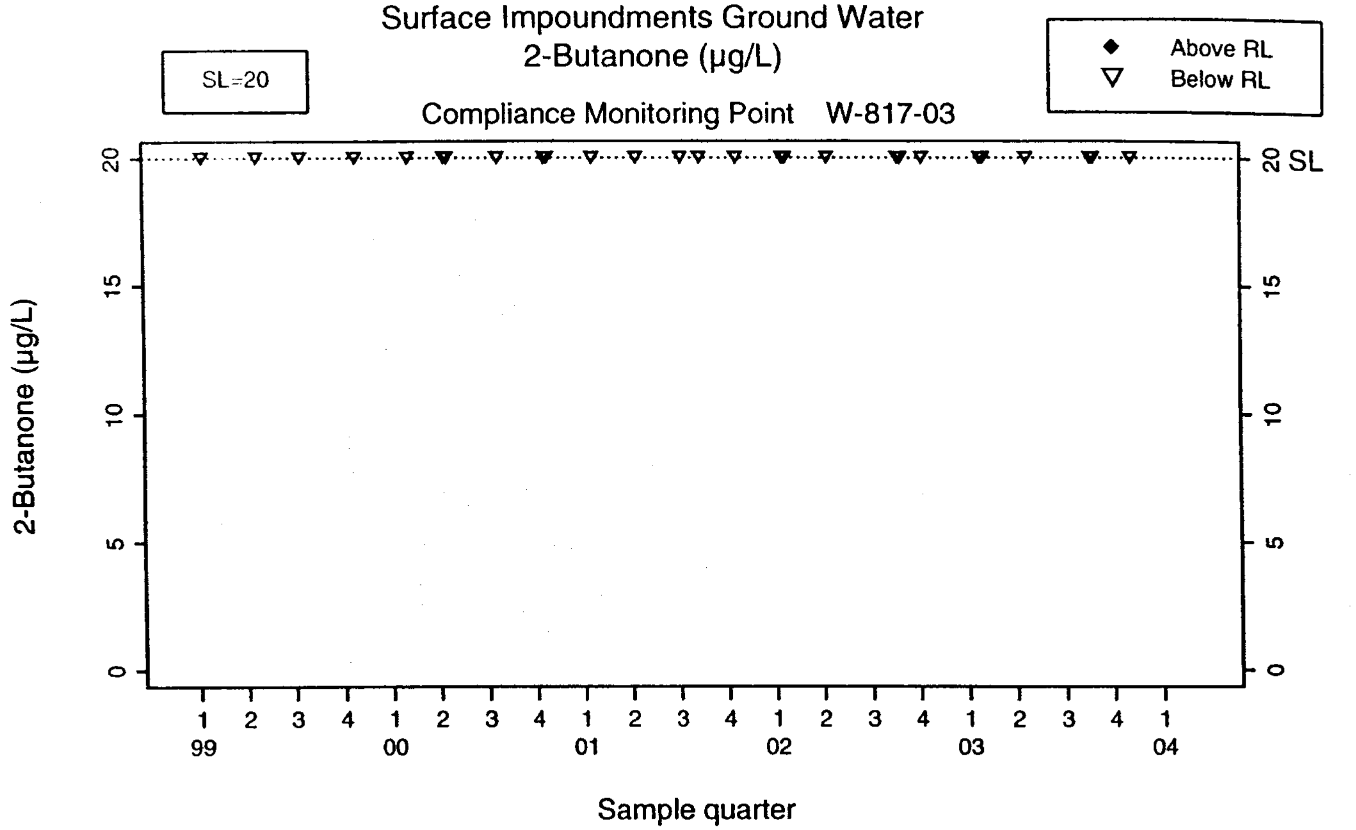


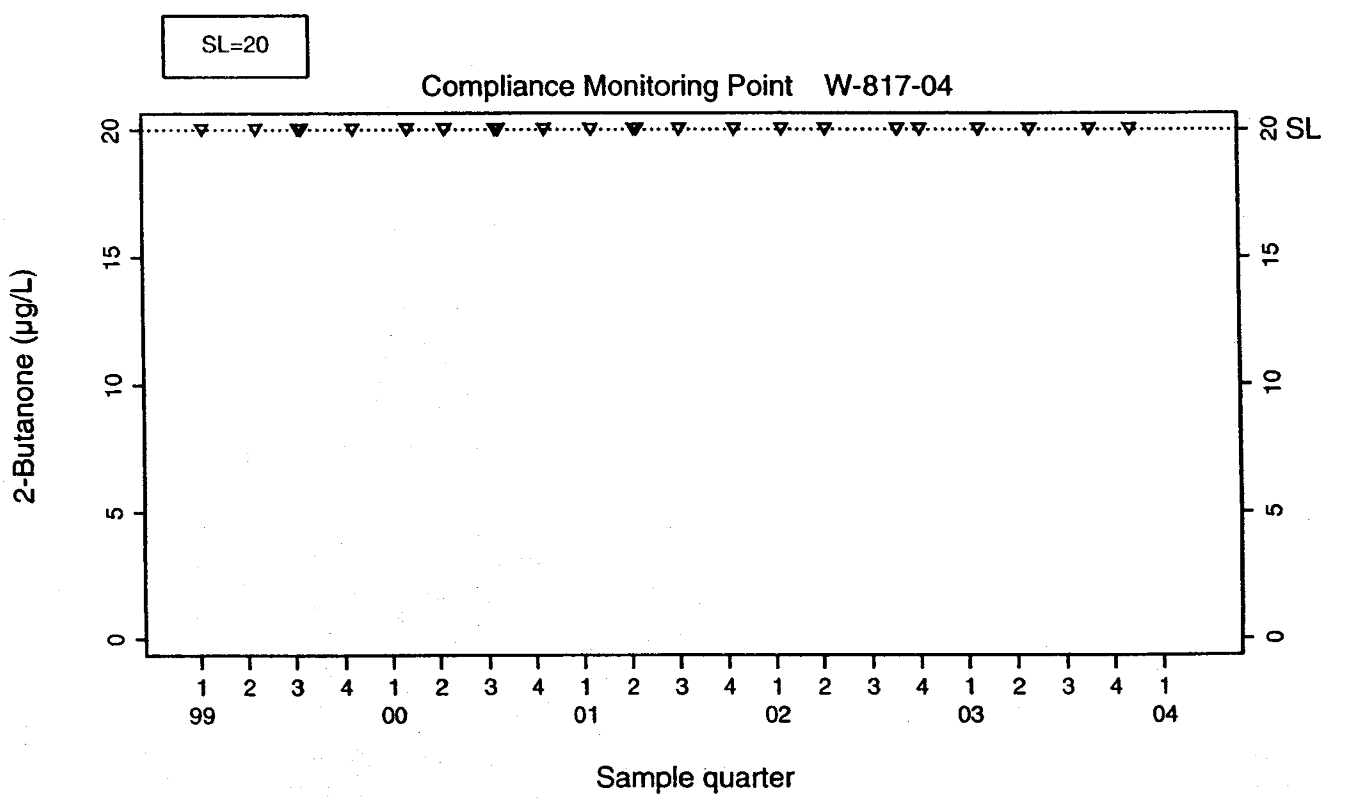
Surface Impoundments Ground Water
2-Butanone (µg/L)



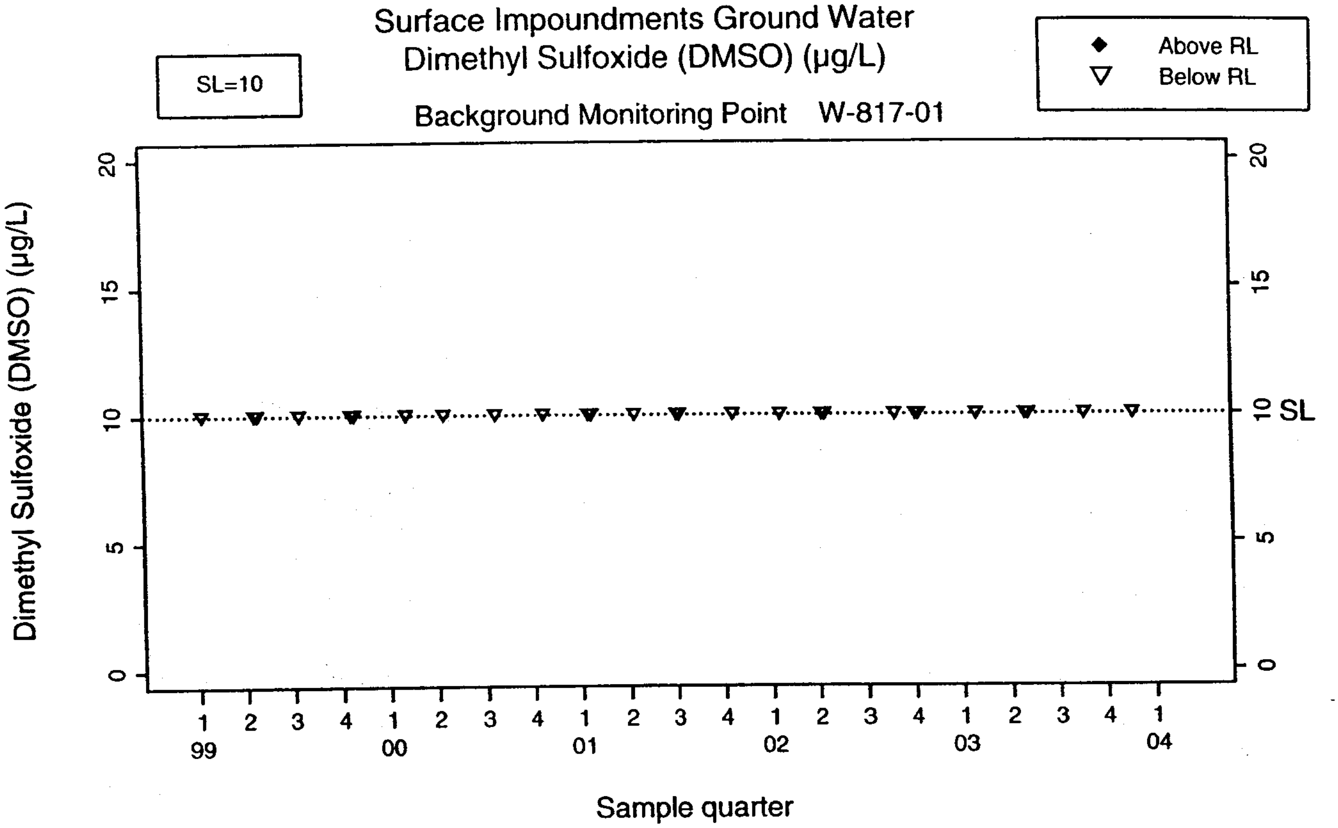


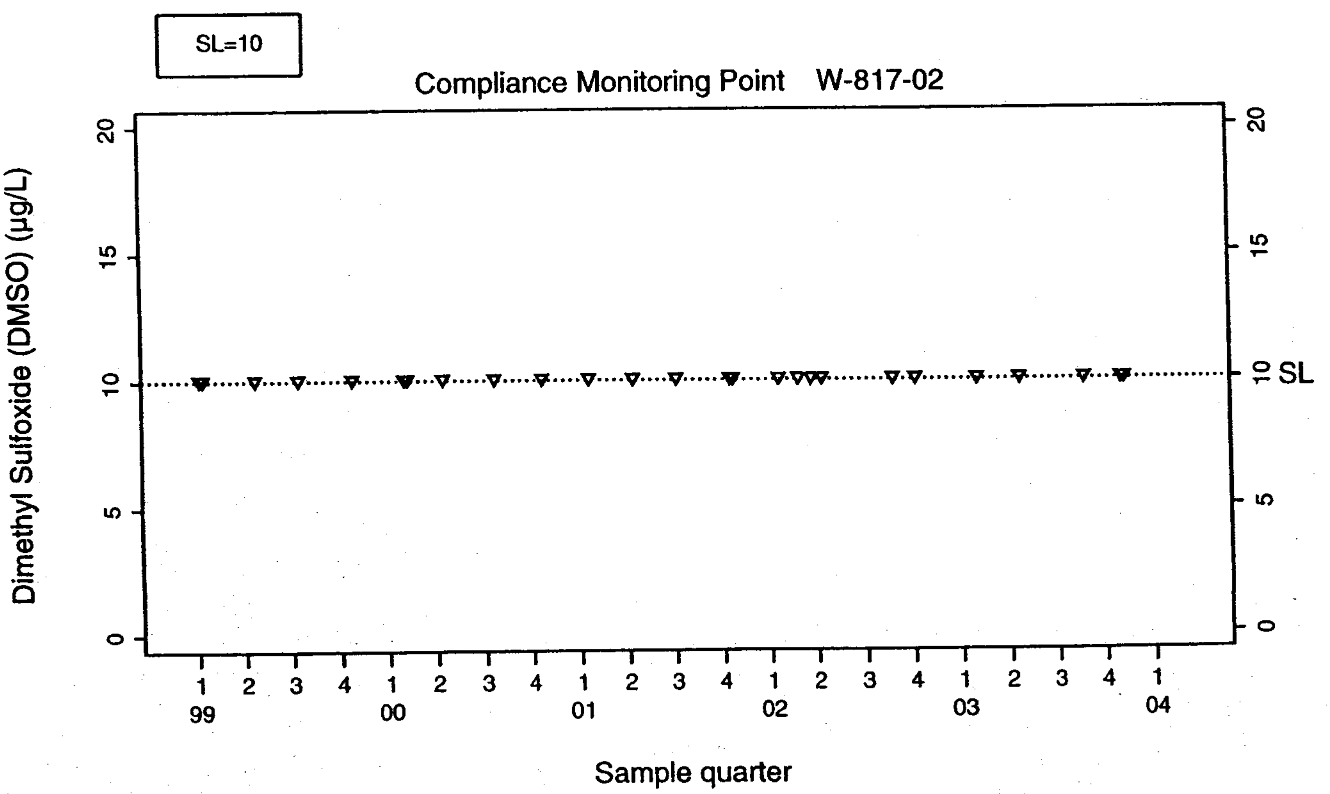
Surface Impoundments Ground Water
2-Butanone (µg/L)



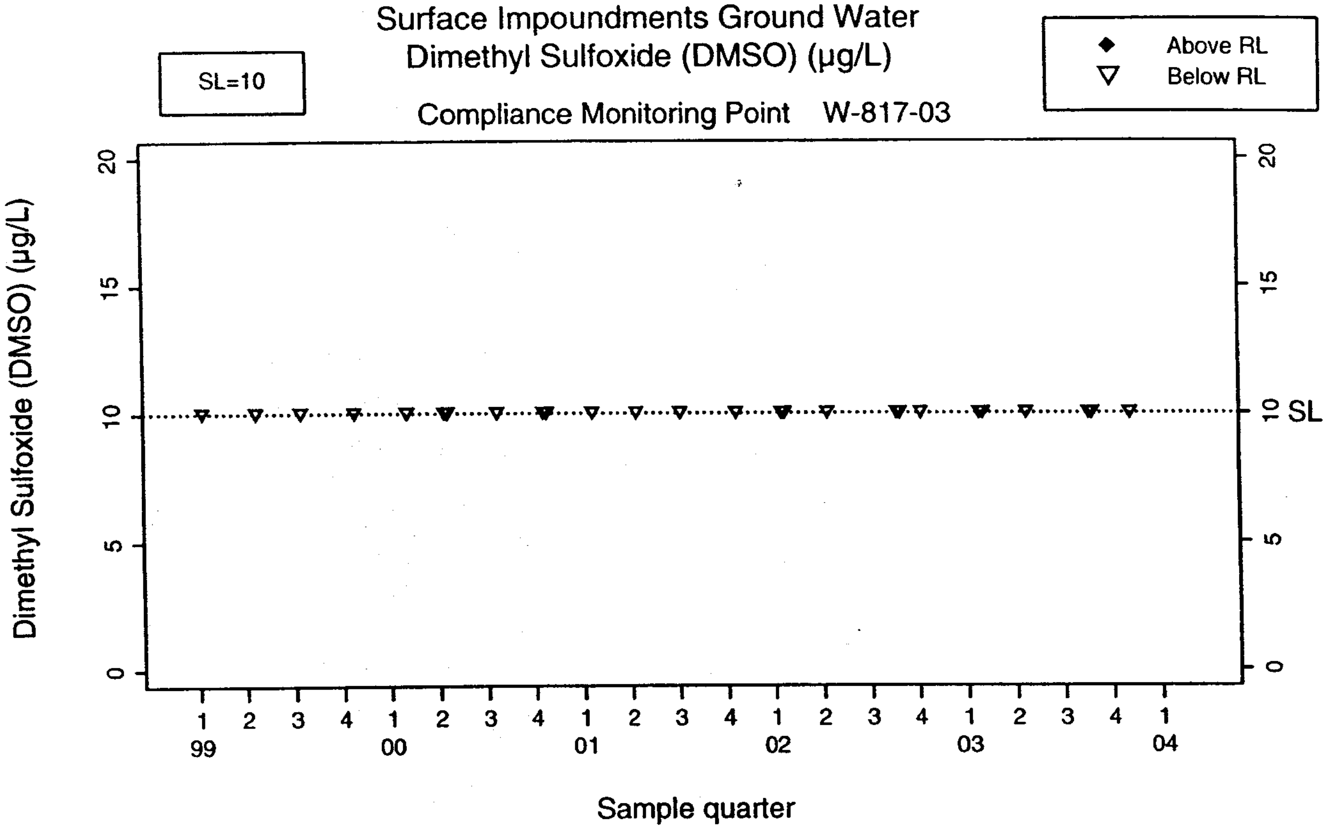


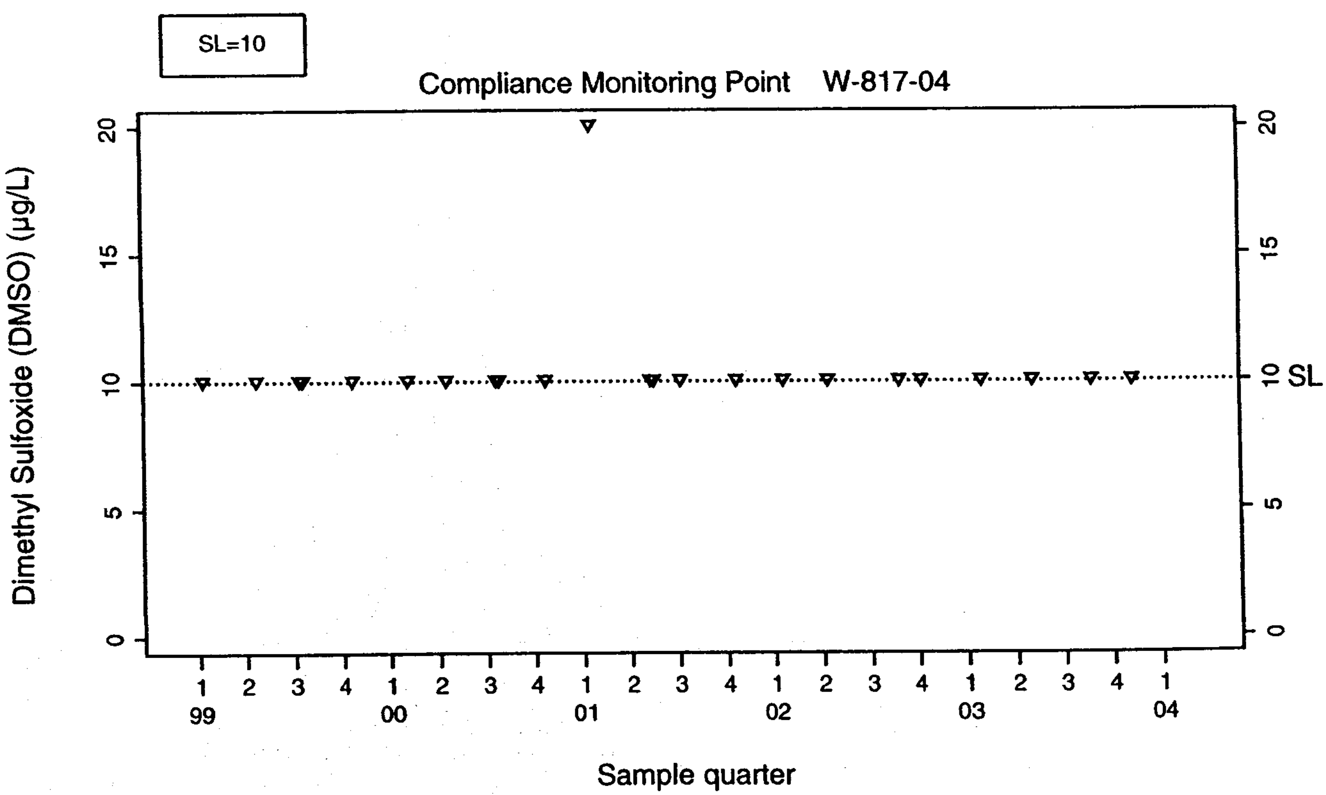
Surface Impoundments Ground Water
Dimethyl Sulfoxide (DMSO) (µg/L)



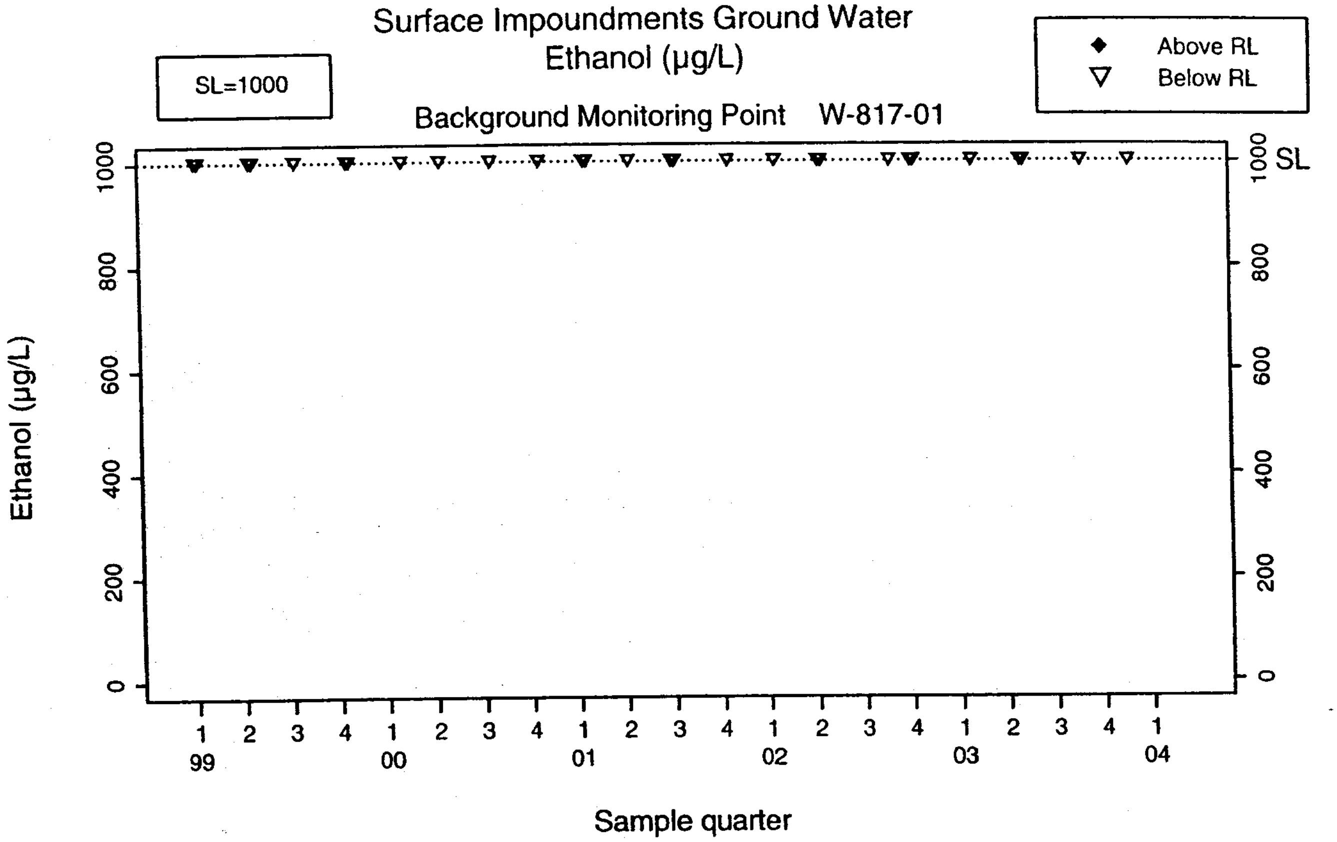


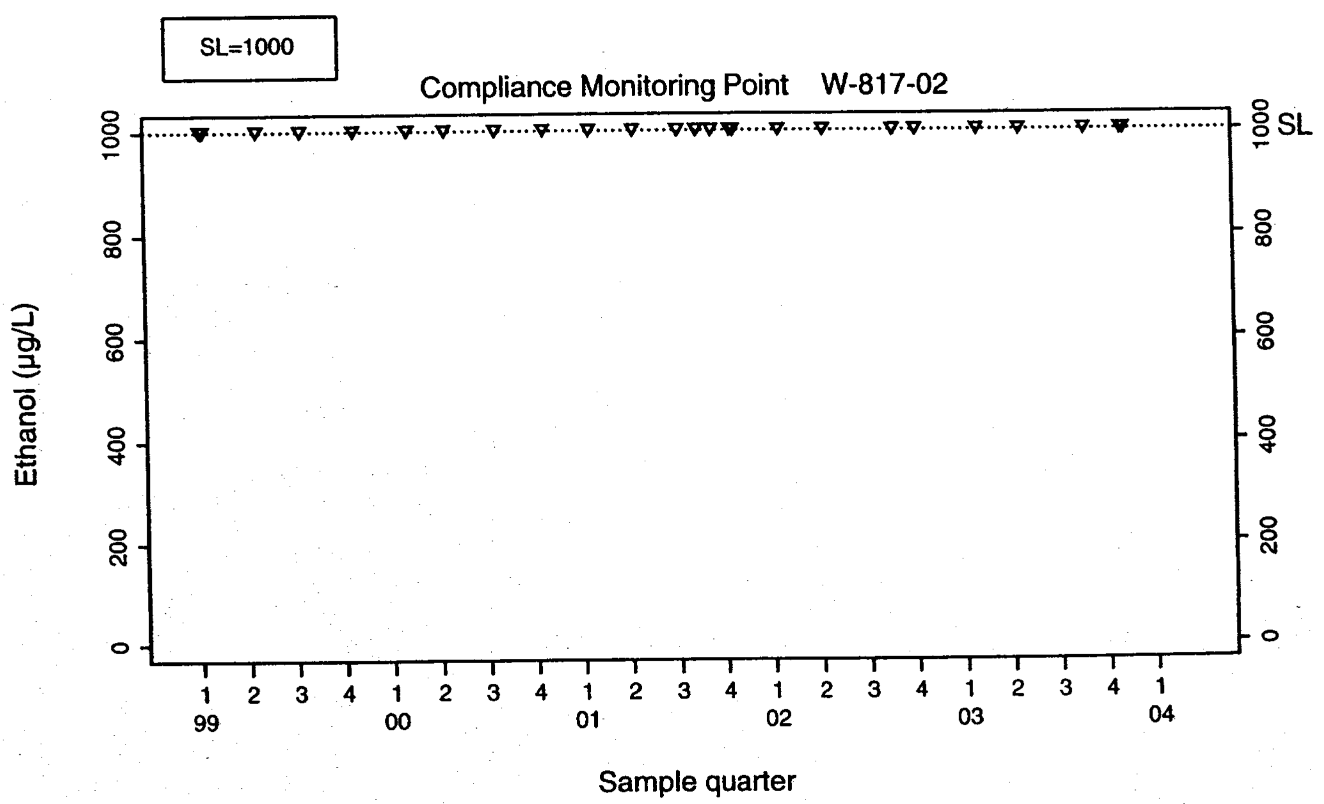
Surface Impoundments Ground Water
Dimethyl Sulfoxide (DMSO) (µg/L)

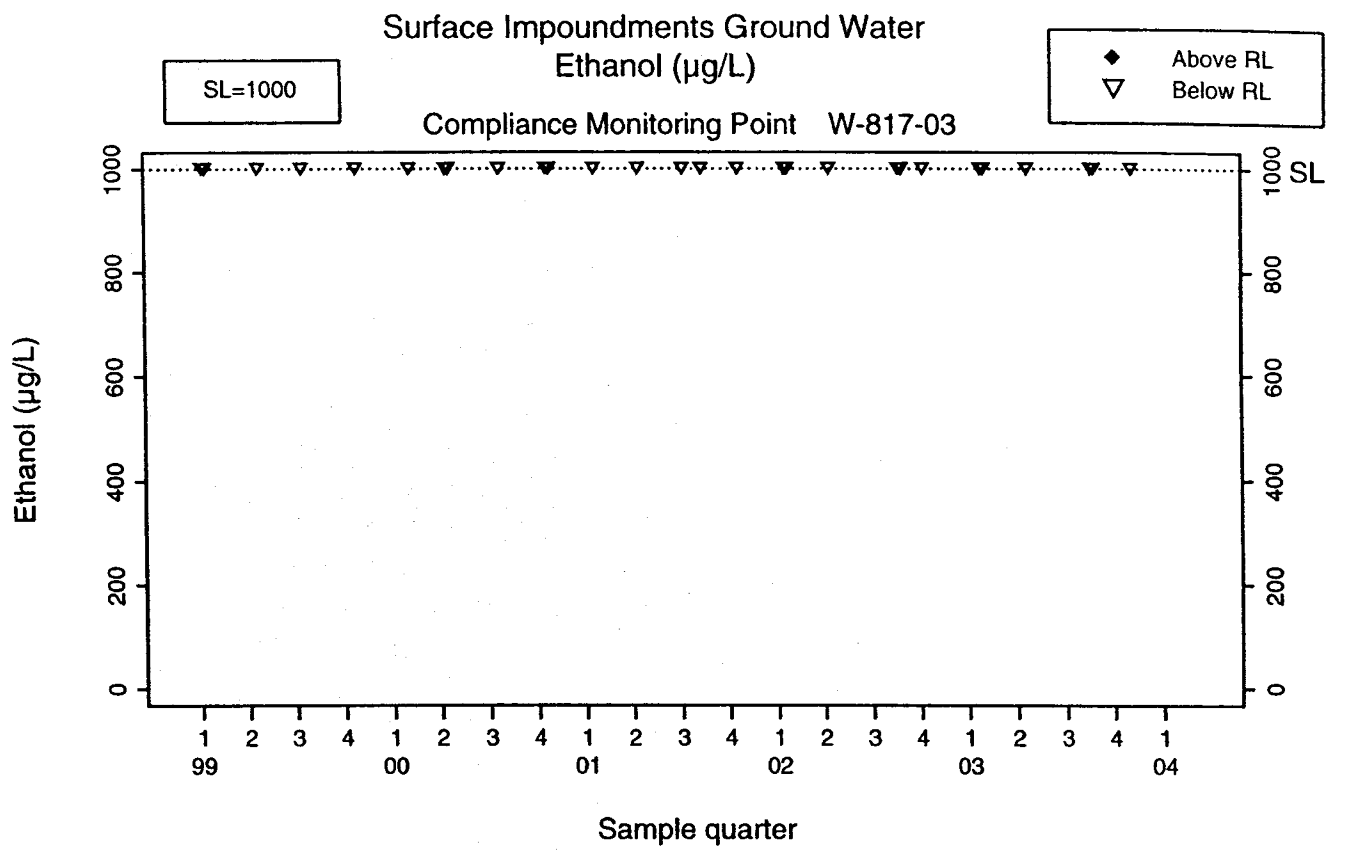


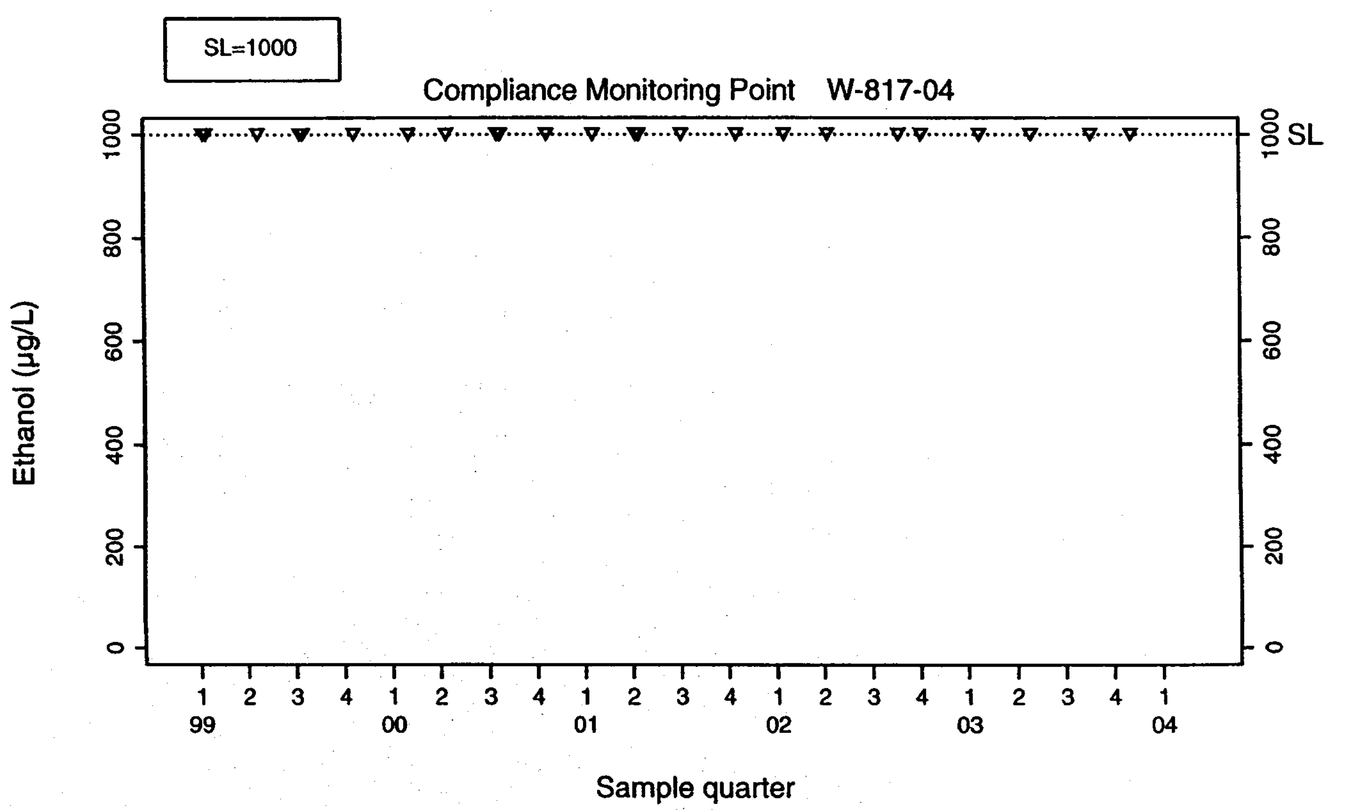


Surface Impoundments Ground Water
Ethanol (µg/L)

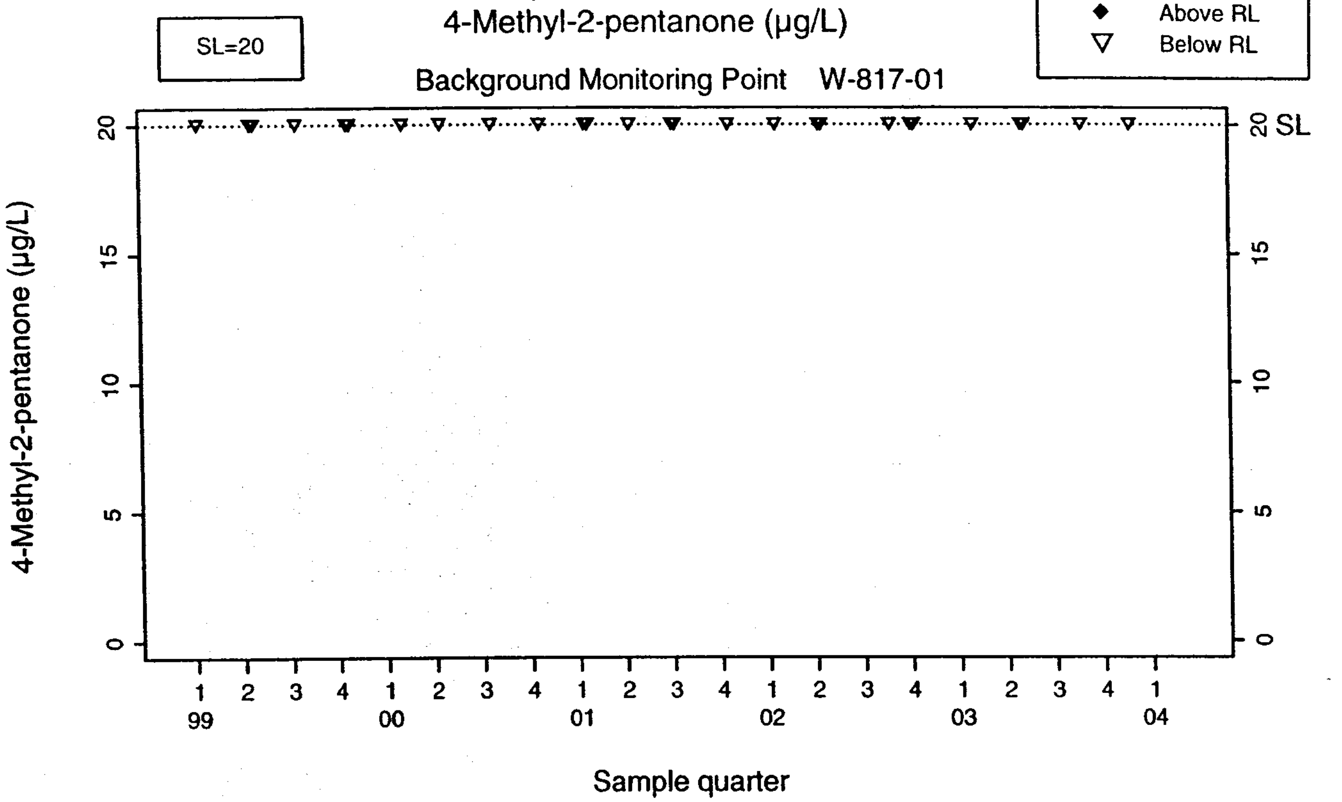


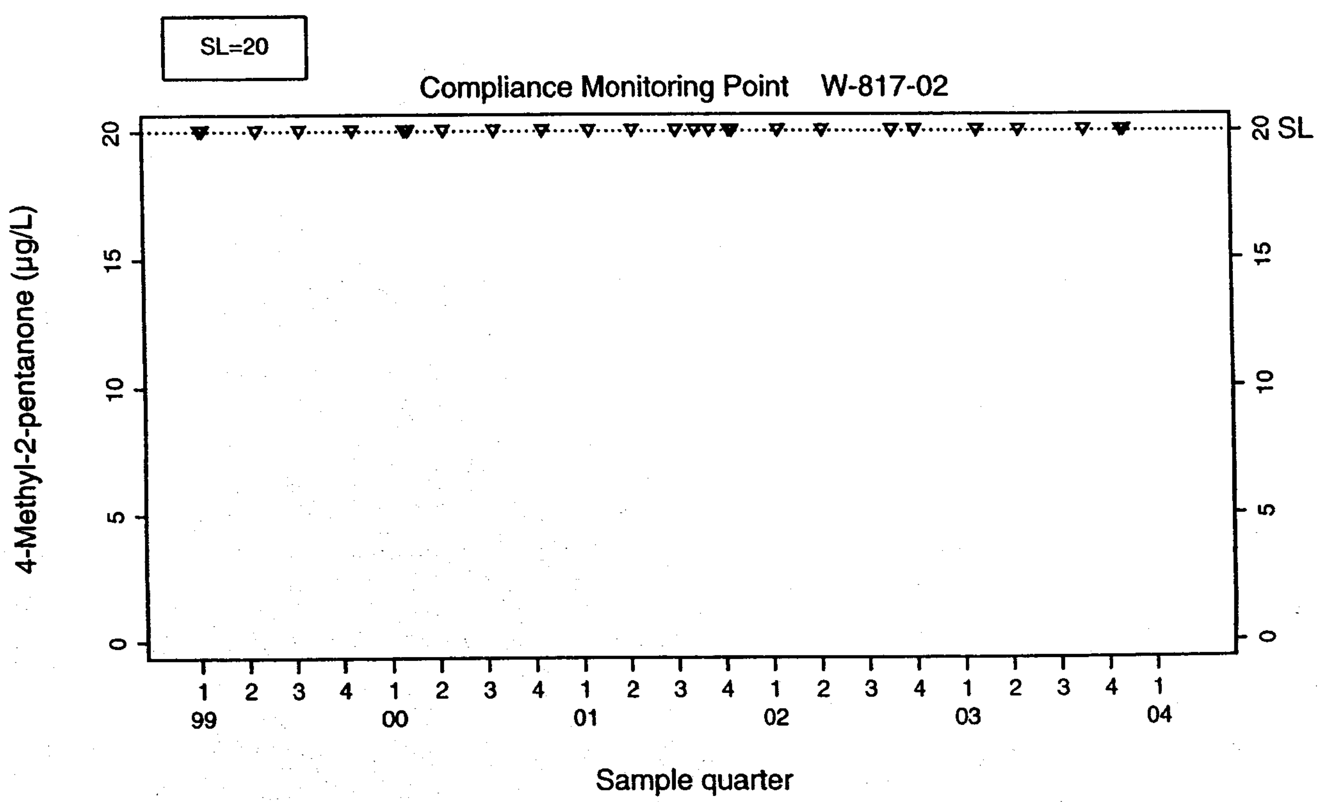


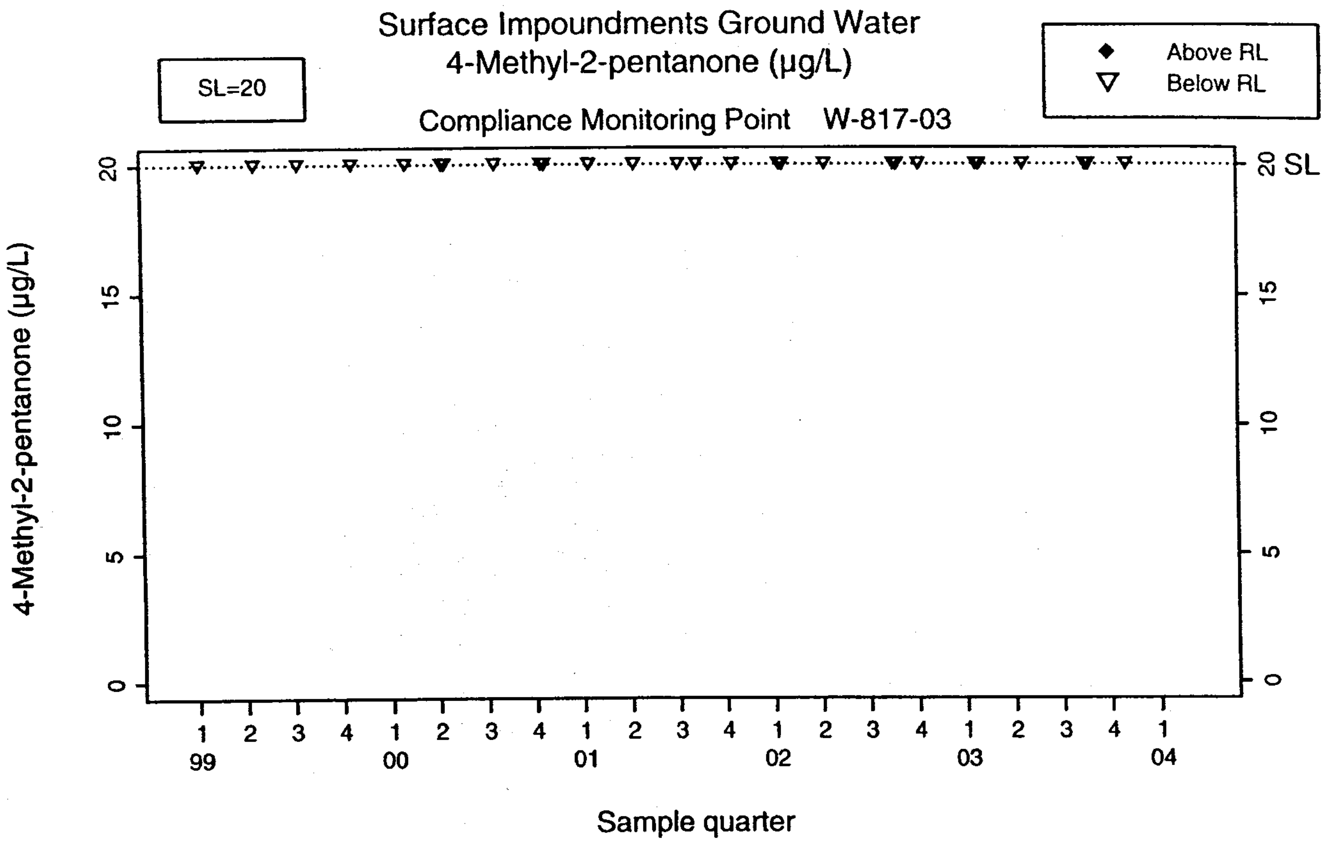

Surface Impoundments Ground Water
Ethanol (µg/L)
SL=1000
Above RL
Below RL
Compliance Monitoring Point W-817-03
Ethanol (µg/L)
0
200
400
600
800
1000
SL
1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1
99 00 01 02 03 04
Sample quarter

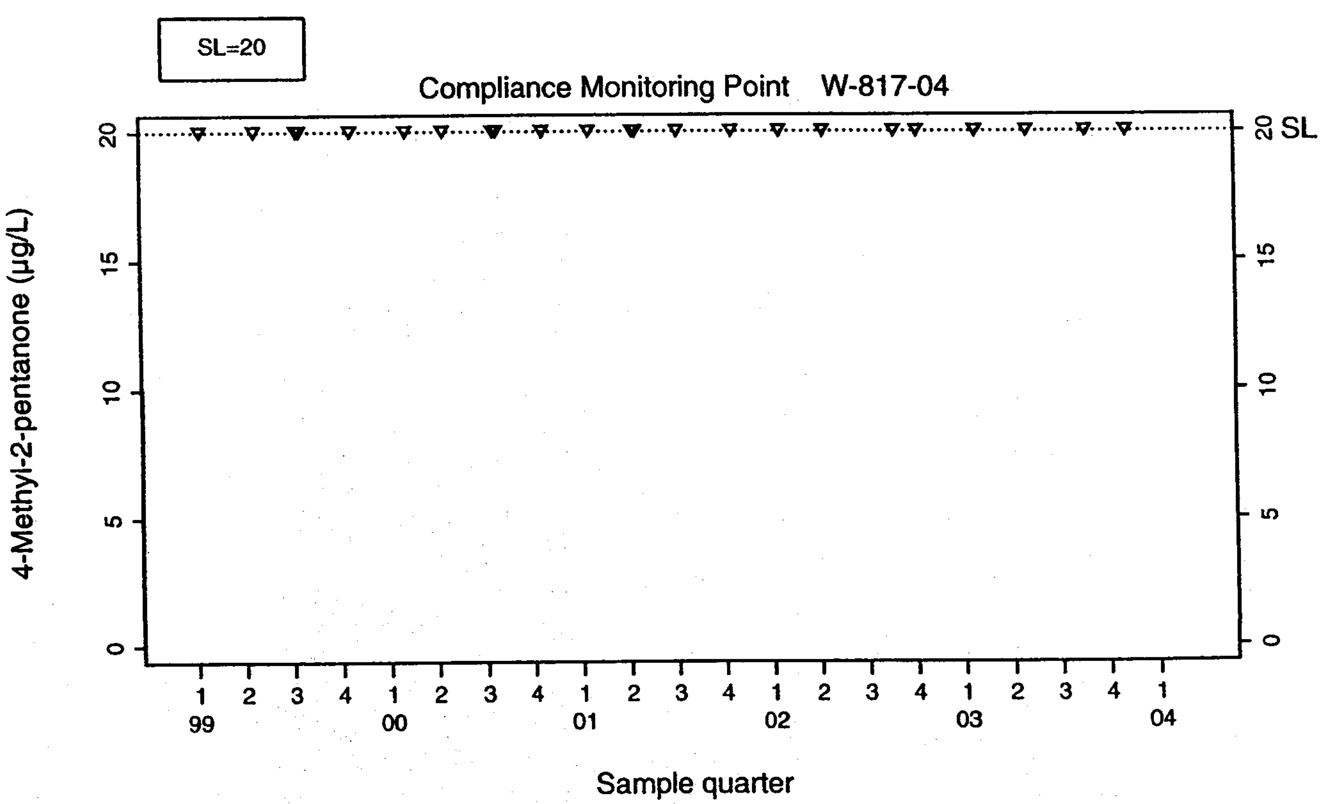

SL=1000
Compliance Monitoring Point W-817-04
Ethanol (µg/L)
0
200
400
600
800
1000
SL
1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1
99 00 01 02 03 04
Sample quarter

Surface Impoundments Ground Water
4-Methyl-2-pentanone (µg/L)

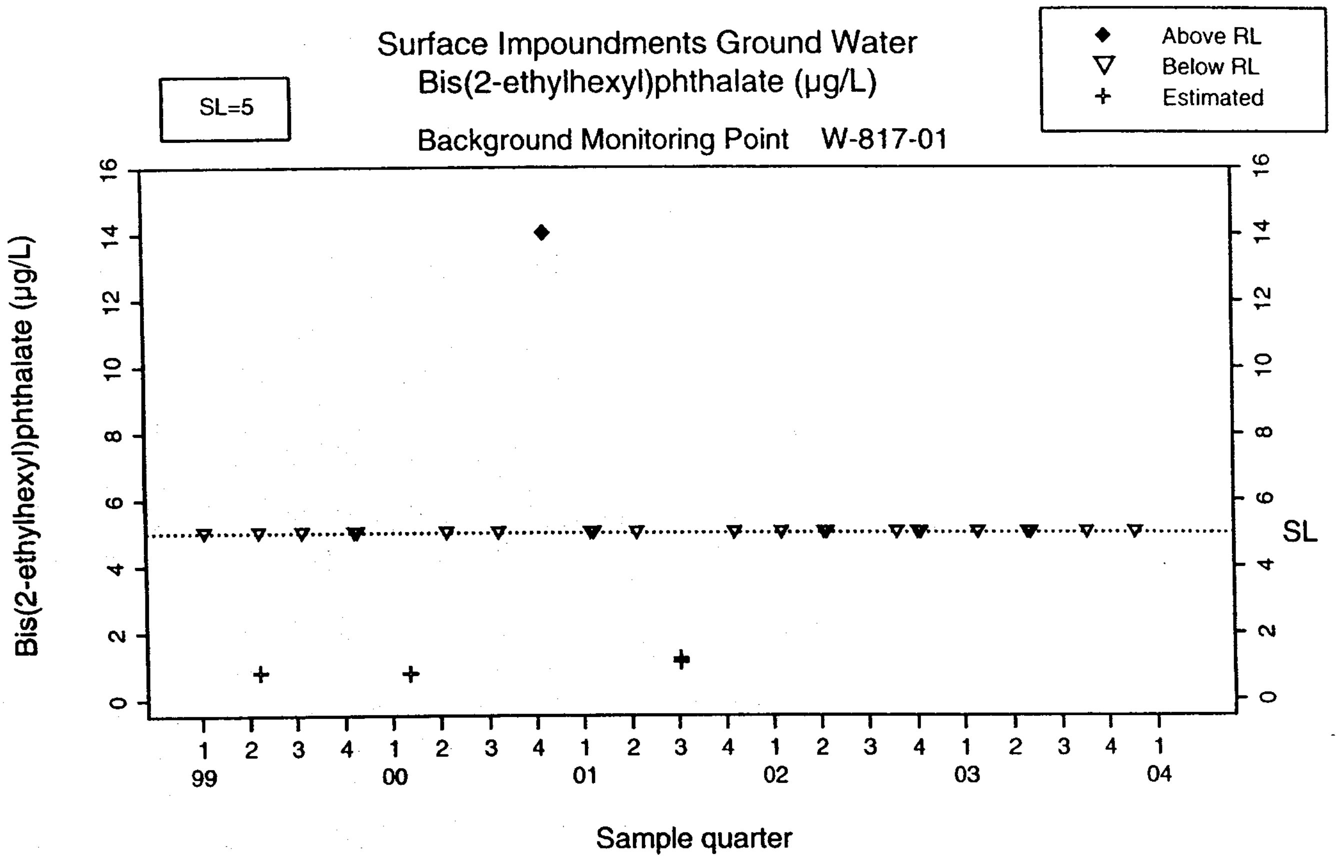


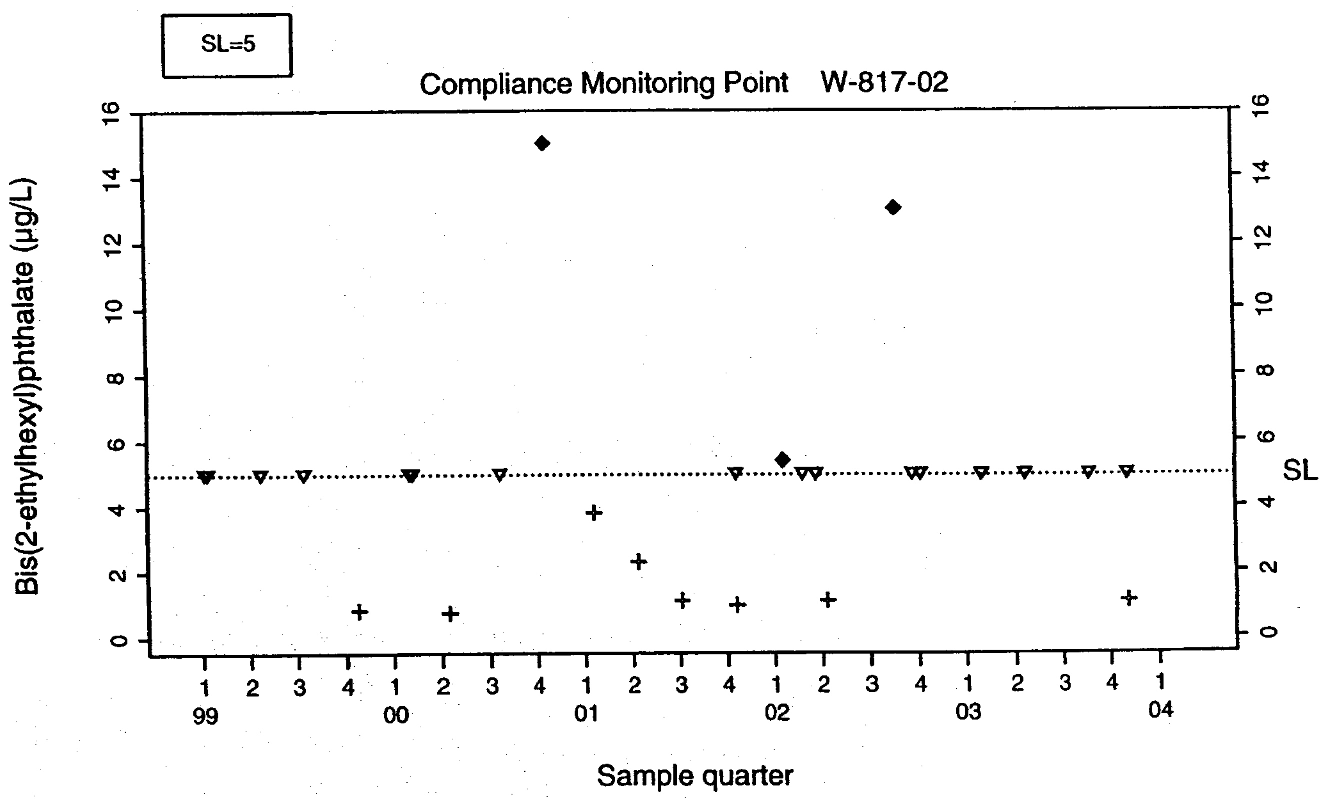



Surface Impoundments Ground Water
4-Methyl-2-pentanone (µg/L)
SL=20
Above RL
Below RL
Compliance Monitoring Point W-817-03
4-Methyl-2-pentanone (µg/L)
0
5
10
15
20
20 SL
1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1
99
00
01
02
03
04
Sample quarter

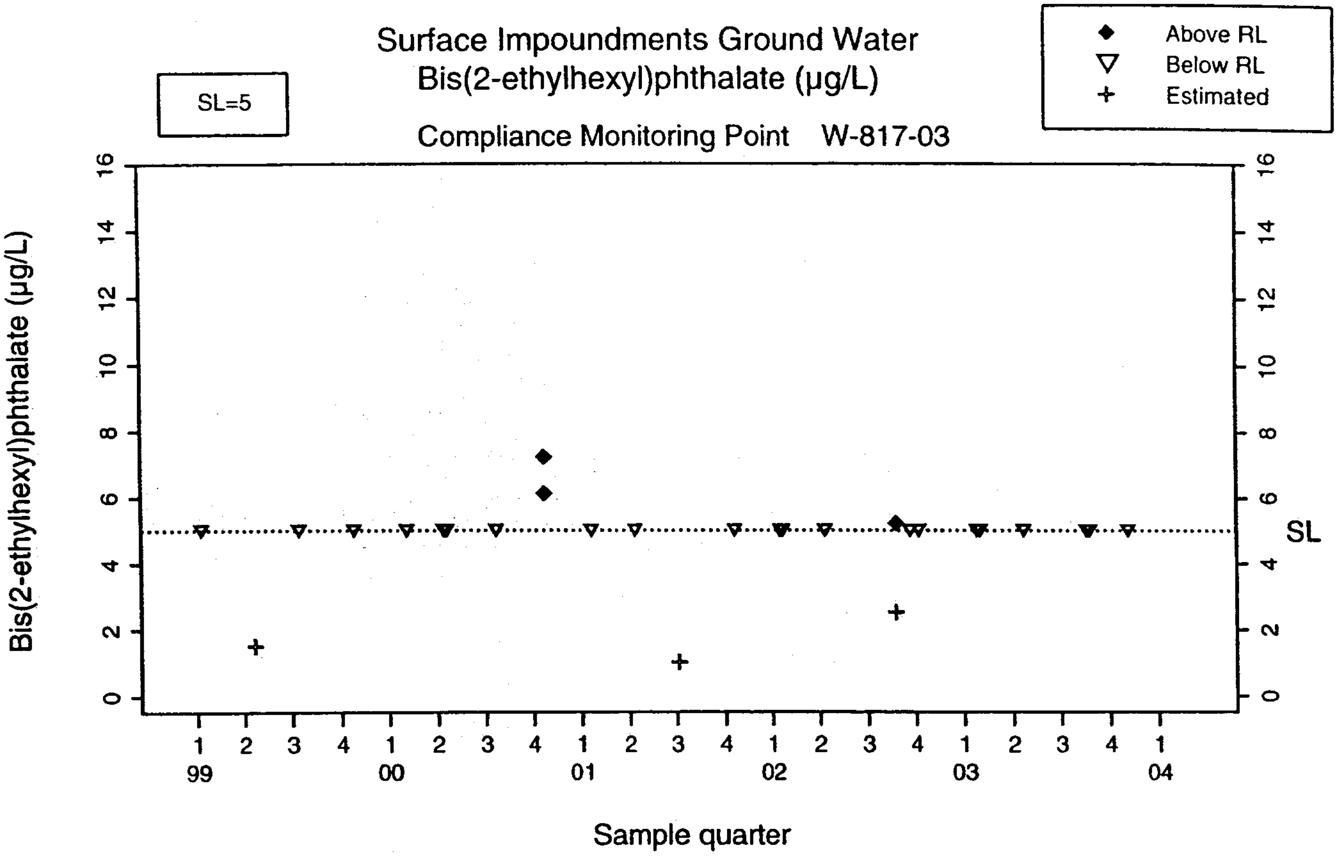

SL=20
Compliance Monitoring Point W-817-04
4-Methyl-2-pentanone (µg/L)
0
5
10
15
20
20 SL
1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1
99
00
01
02
03
04
Sample quarter

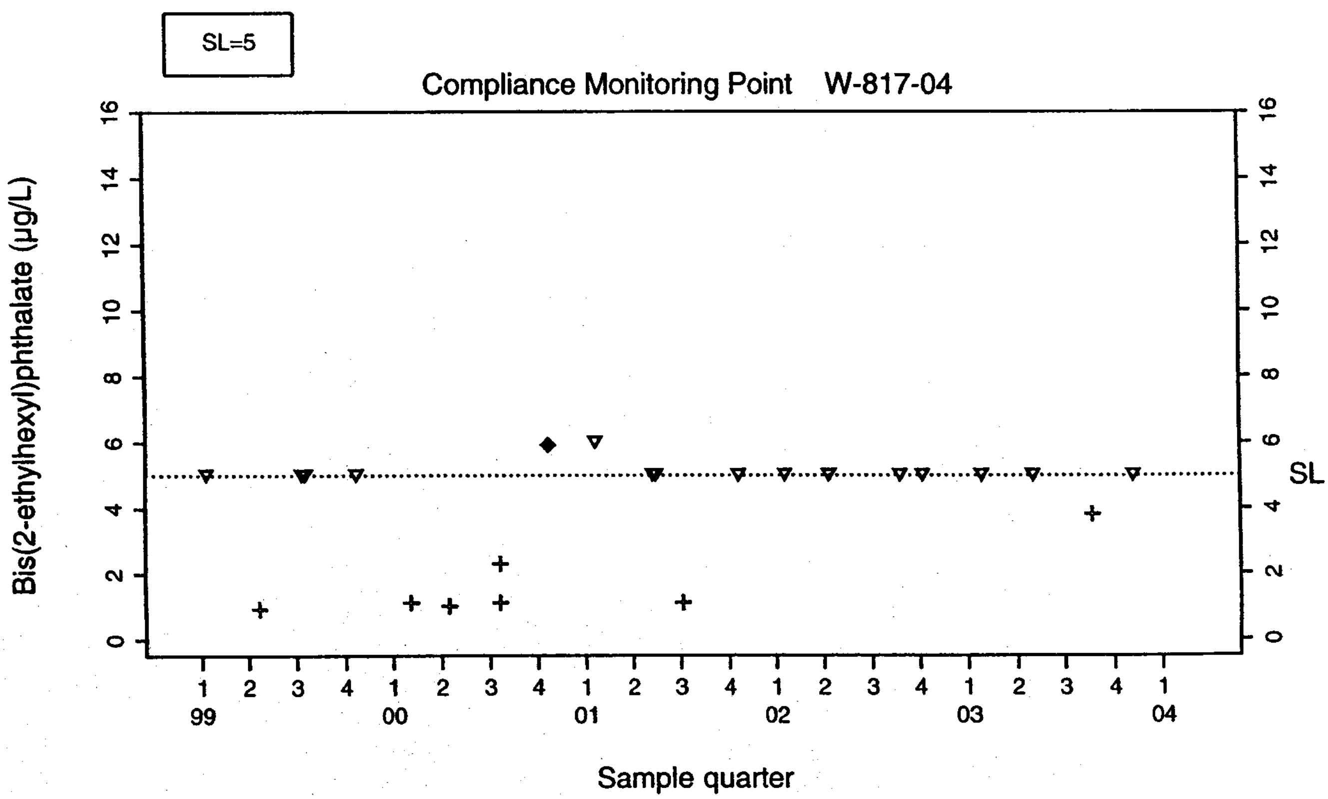
Surface Impoundments Ground Water
Bis(2-ethylhexyl)phthalate (µg/L)



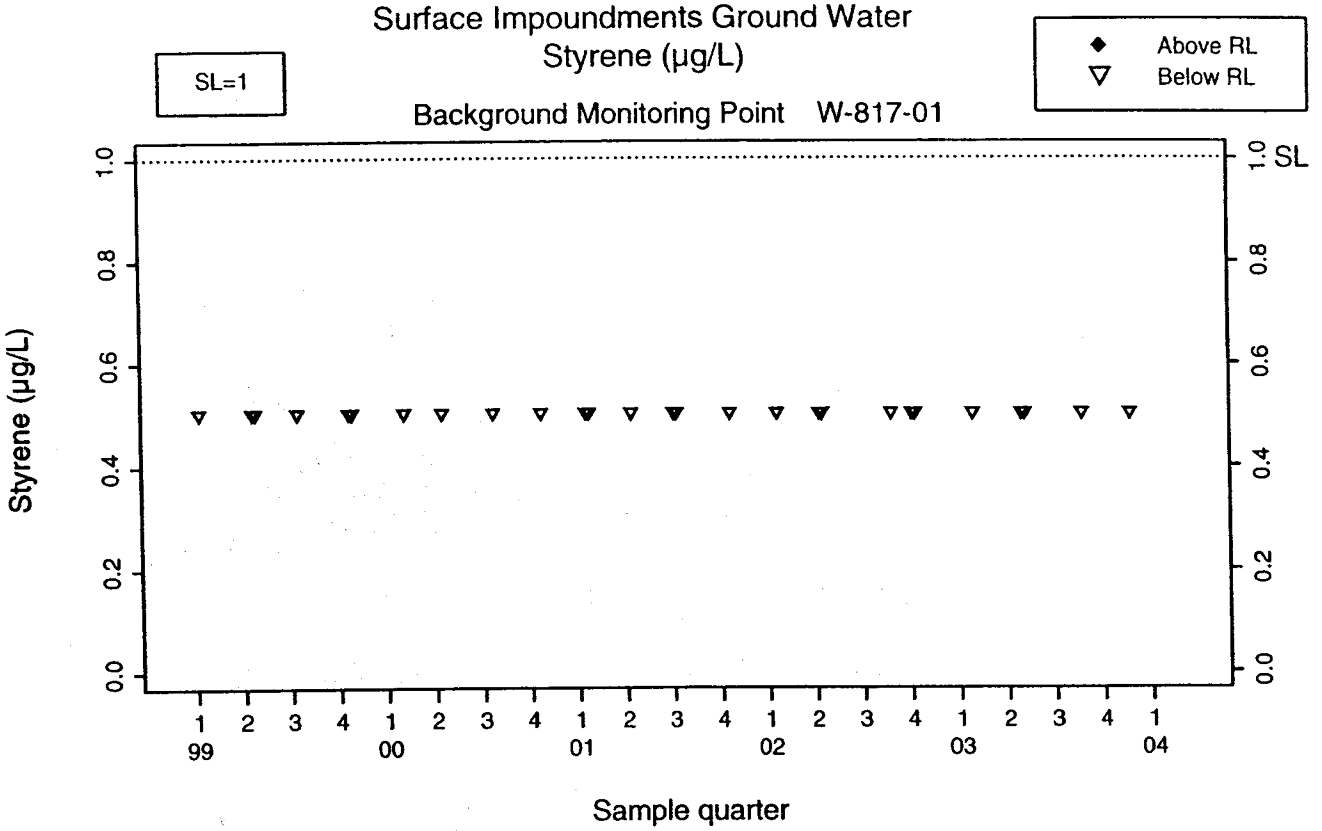


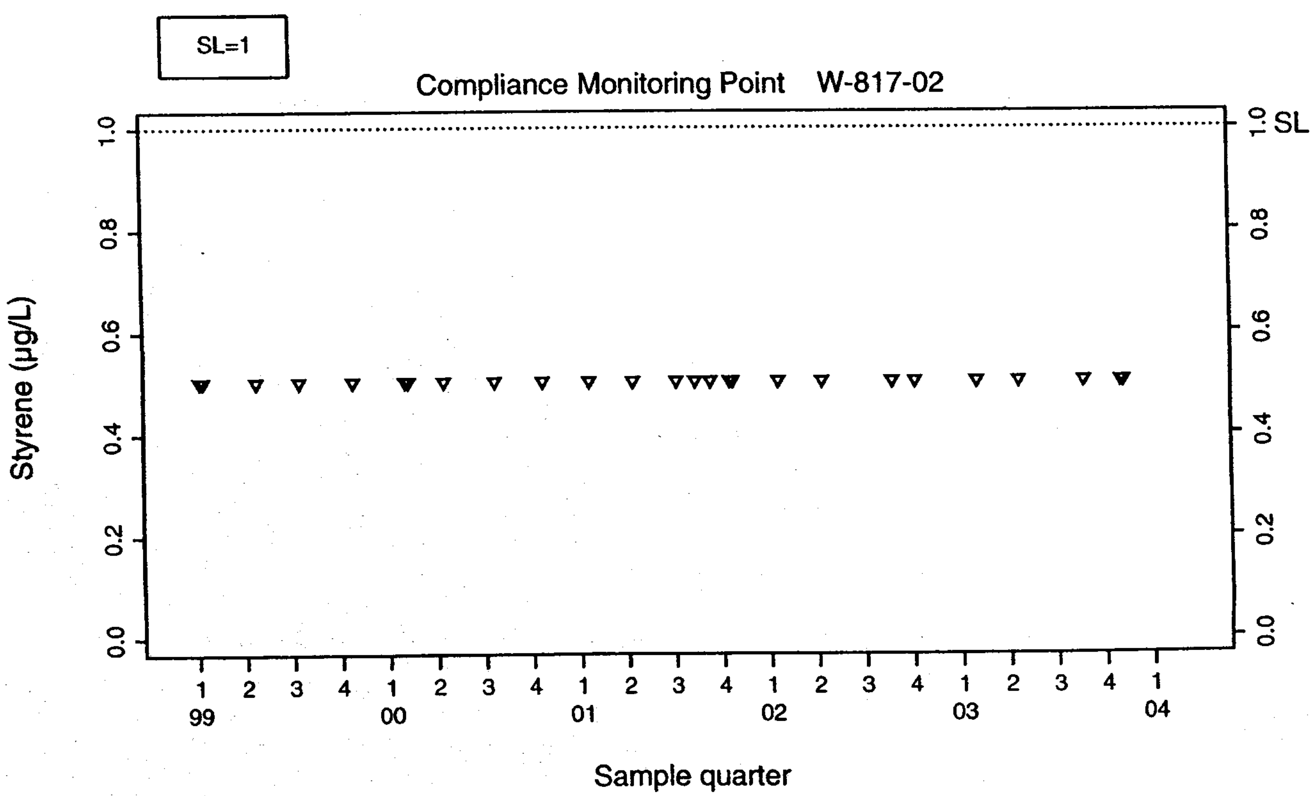
Surface Impoundments Ground Water
Bis(2-ethylhexyl)phthalate (µg/L)



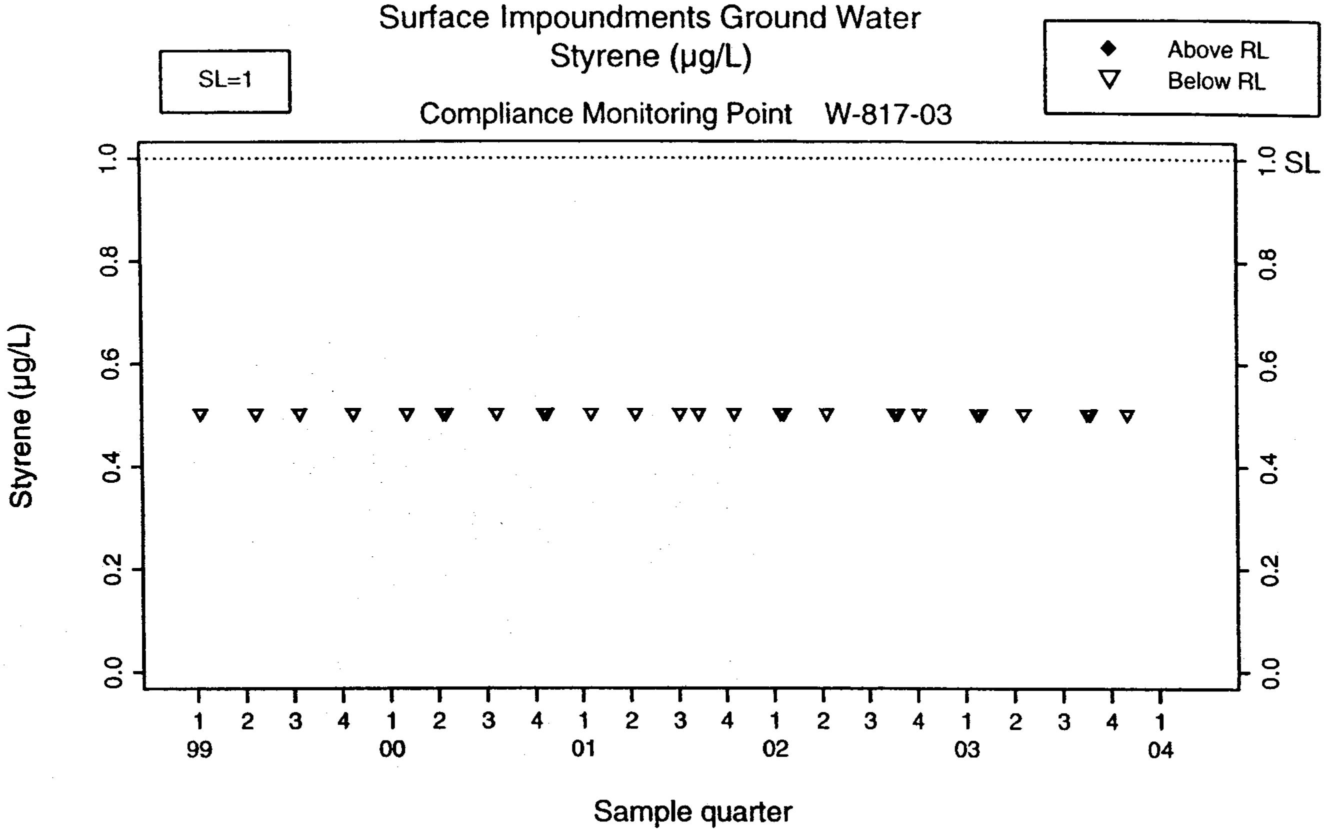


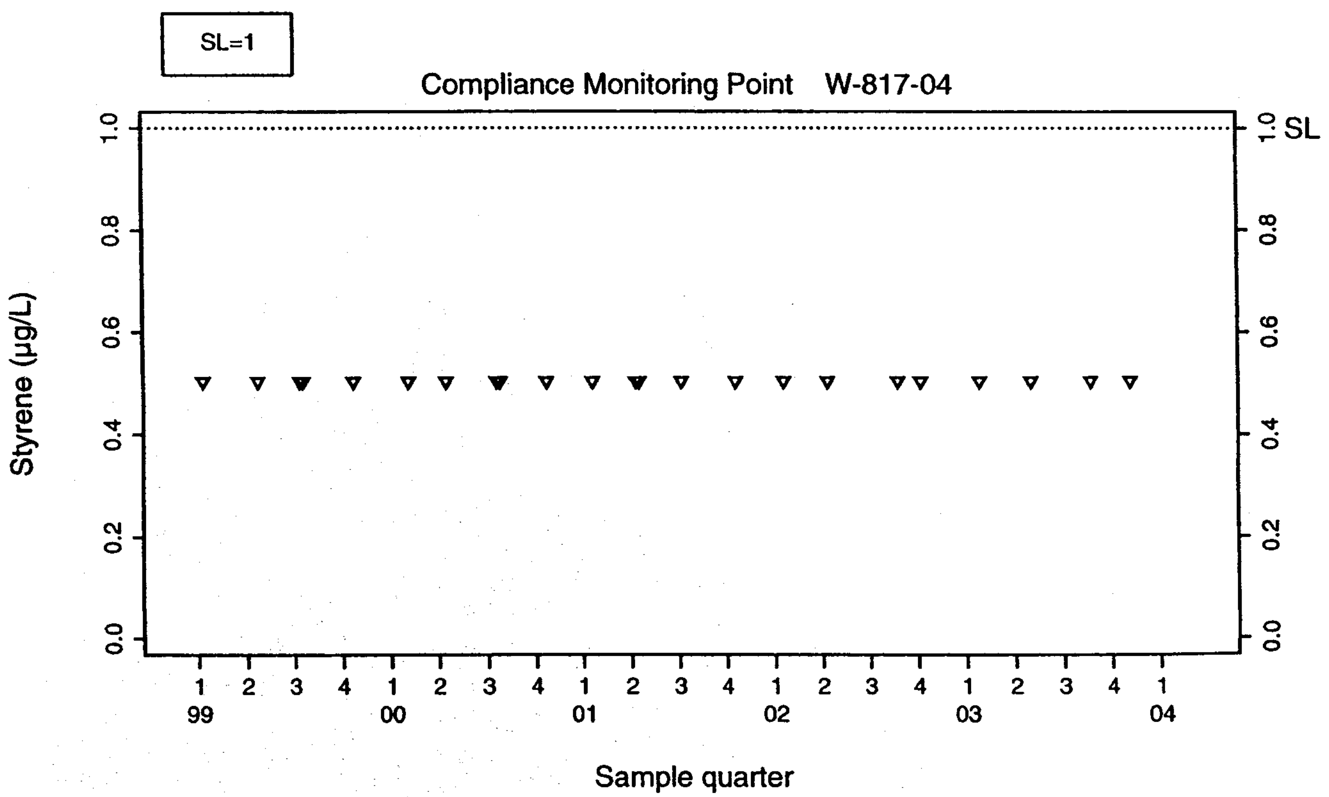
Surface Impoundments Ground Water
Styrene (µg/L)

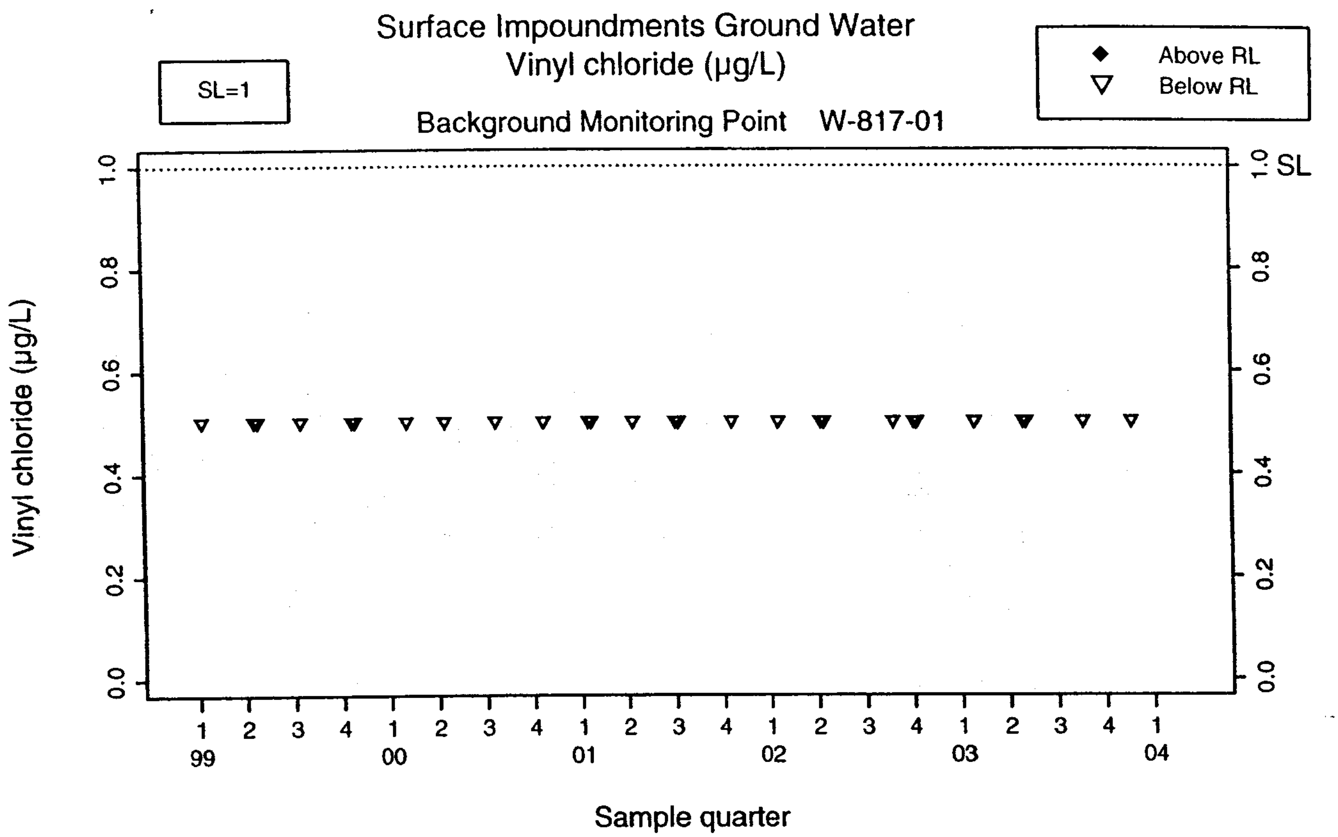


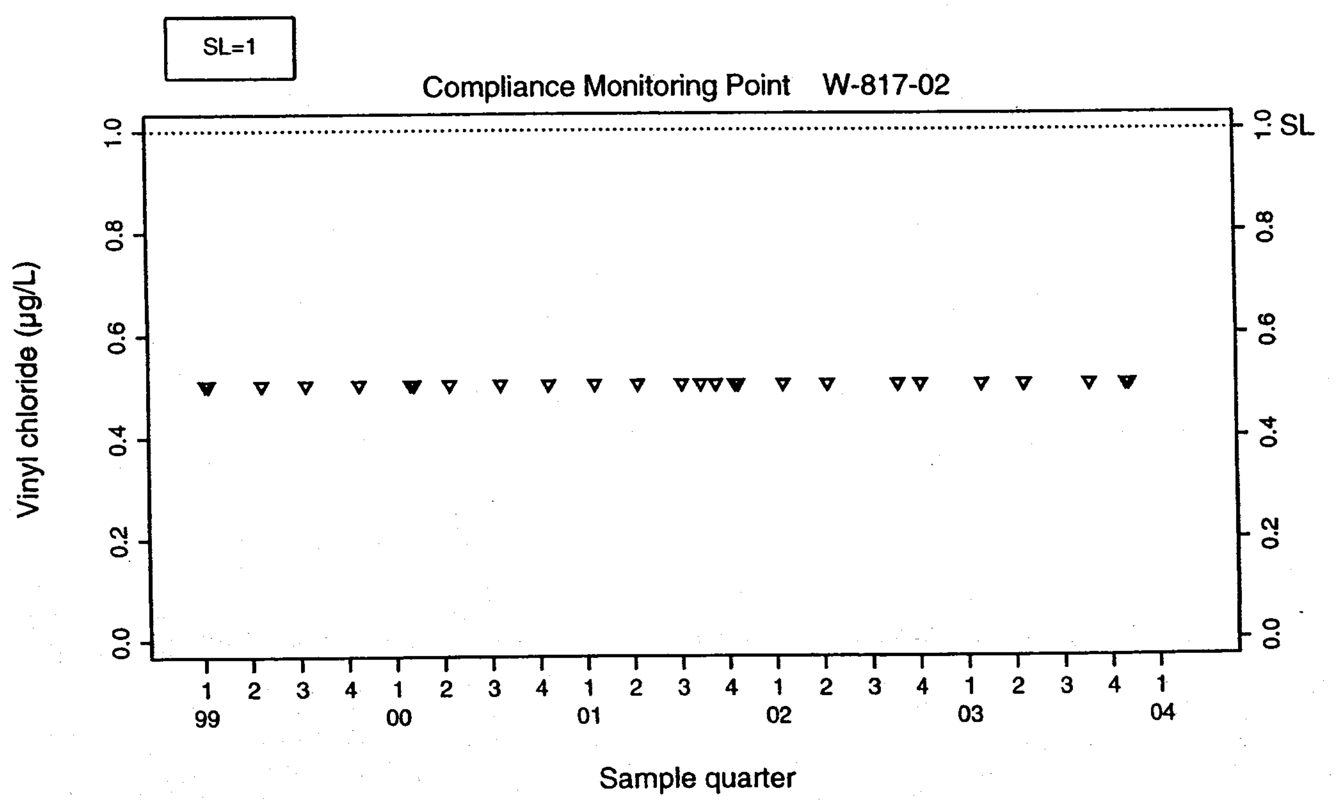


Surface Impoundments Ground Water
Styrene (µg/L)

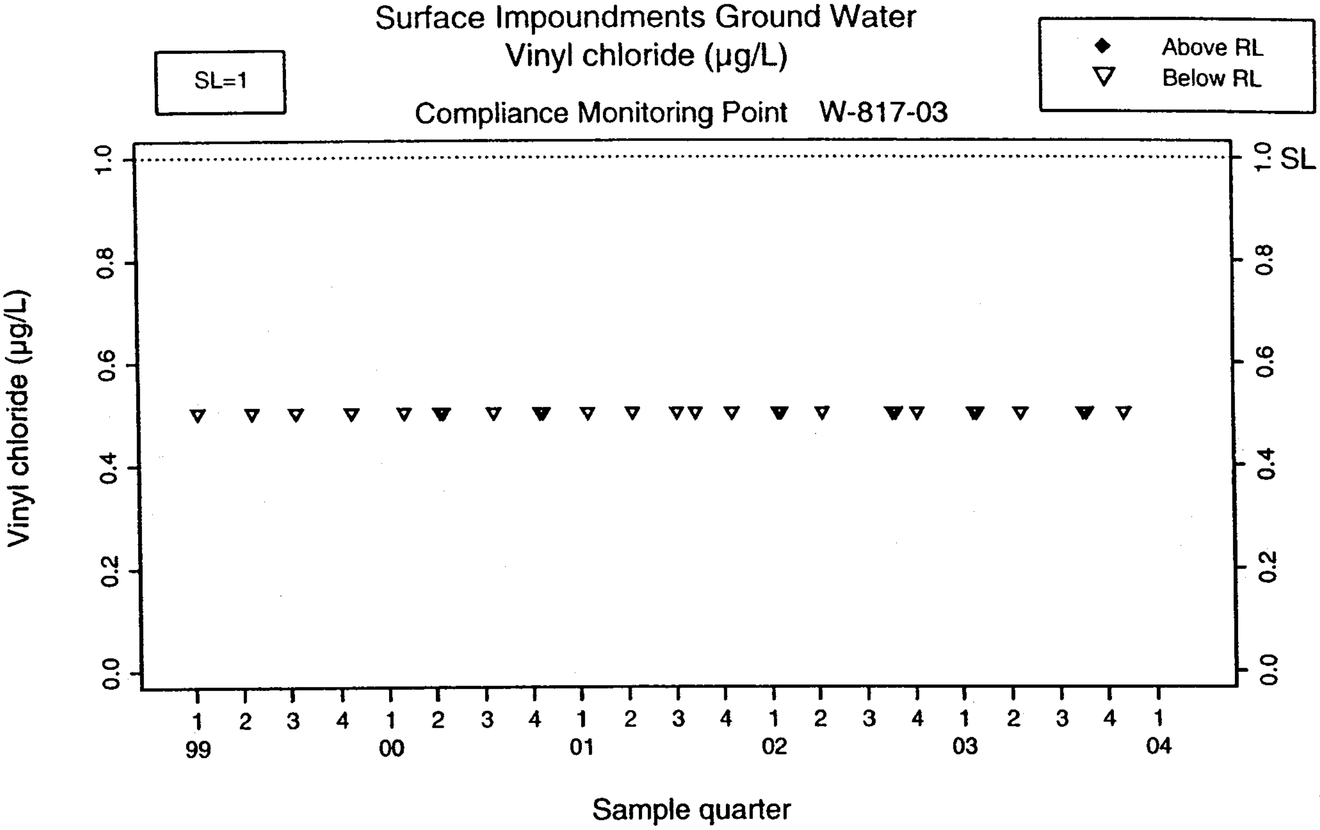


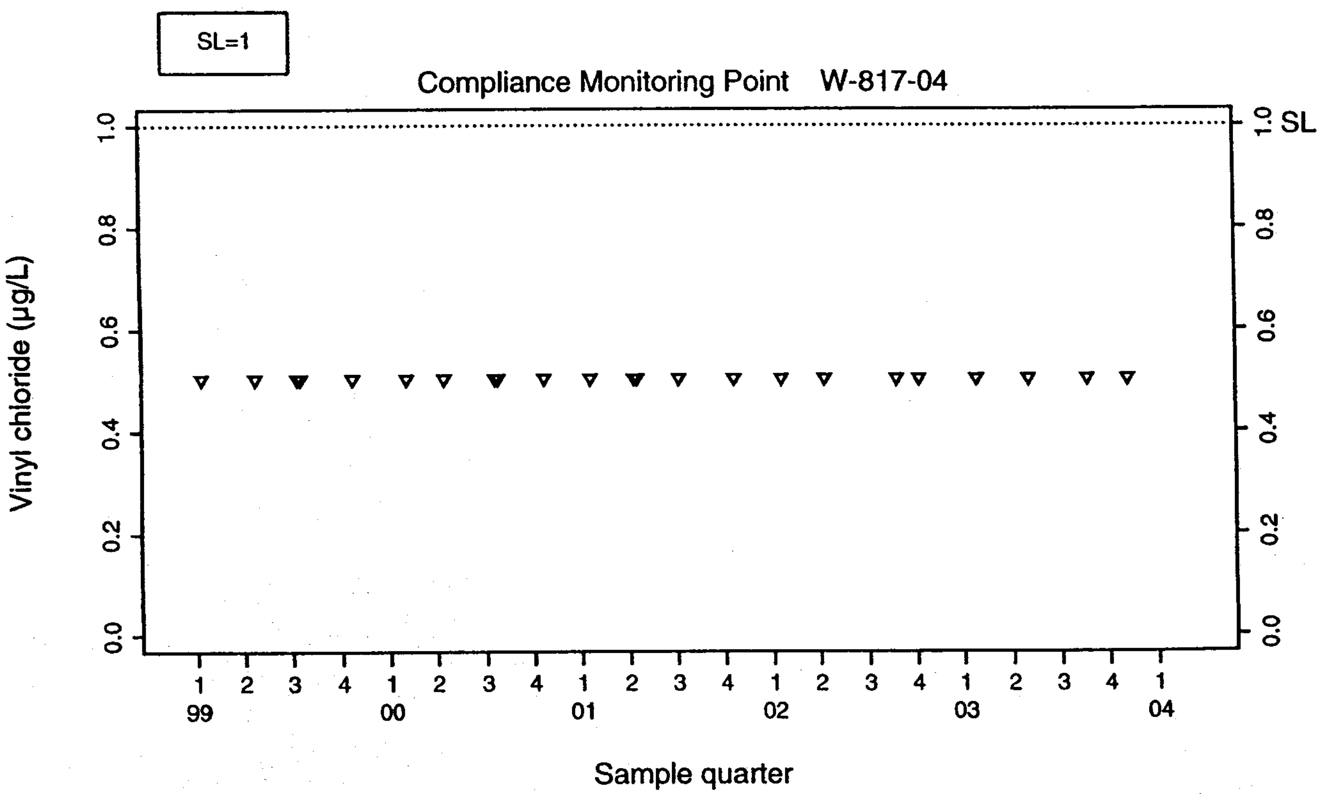



Surface Impoundments Ground Water
Vinyl chloride (µg/L)
SL=1
Above RL
Below RL
Background Monitoring Point W-817-01
Vinyl chloride (µg/L)
SL
0.0
0.2
0.4
0.6
0.8
1.0
1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1
99
00
01
02
03
04
Sample quarter

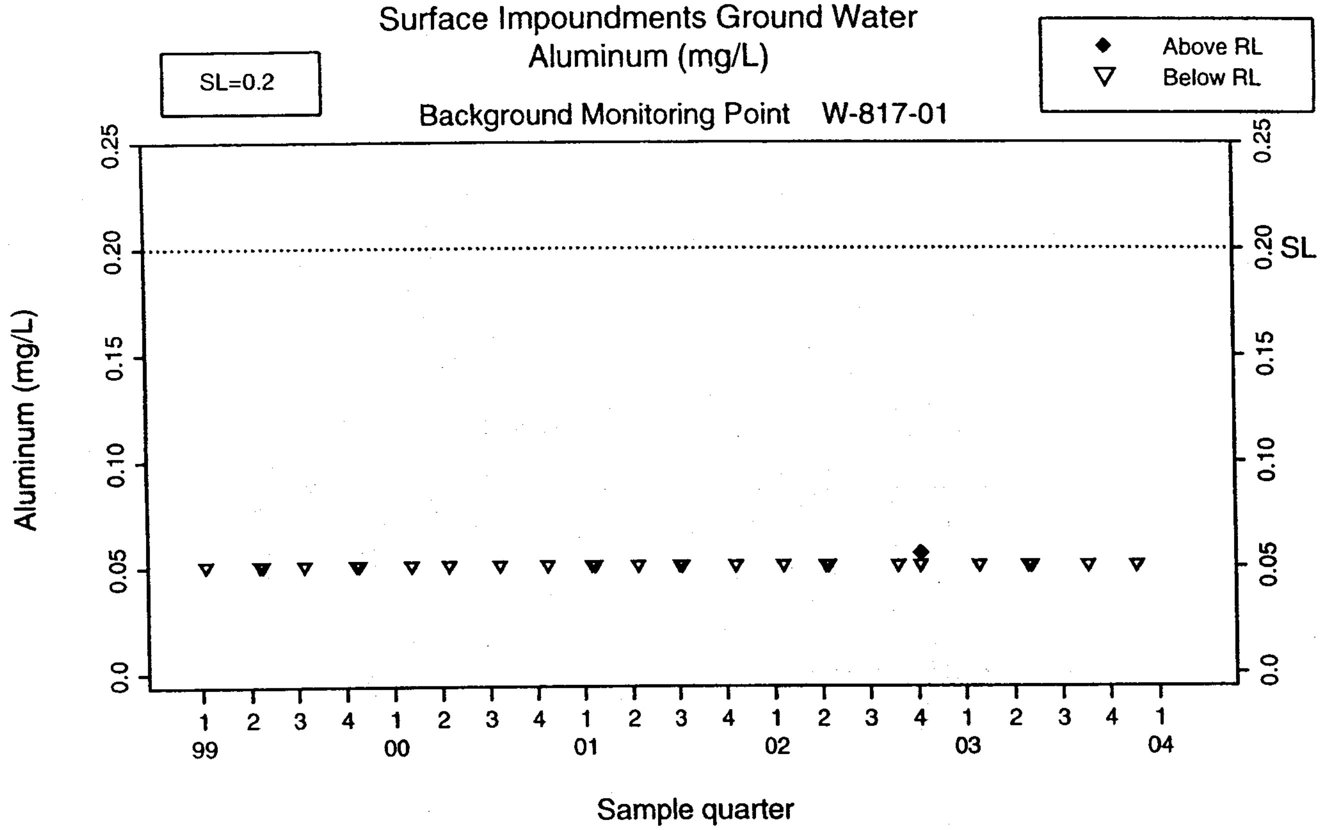

SL=1
Compliance Monitoring Point W-817-02
Vinyl chloride (µg/L)
SL
0.0
0.2
0.4
0.6
0.8
1.0
1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1
99
00
01
02
03
04
Sample quarter

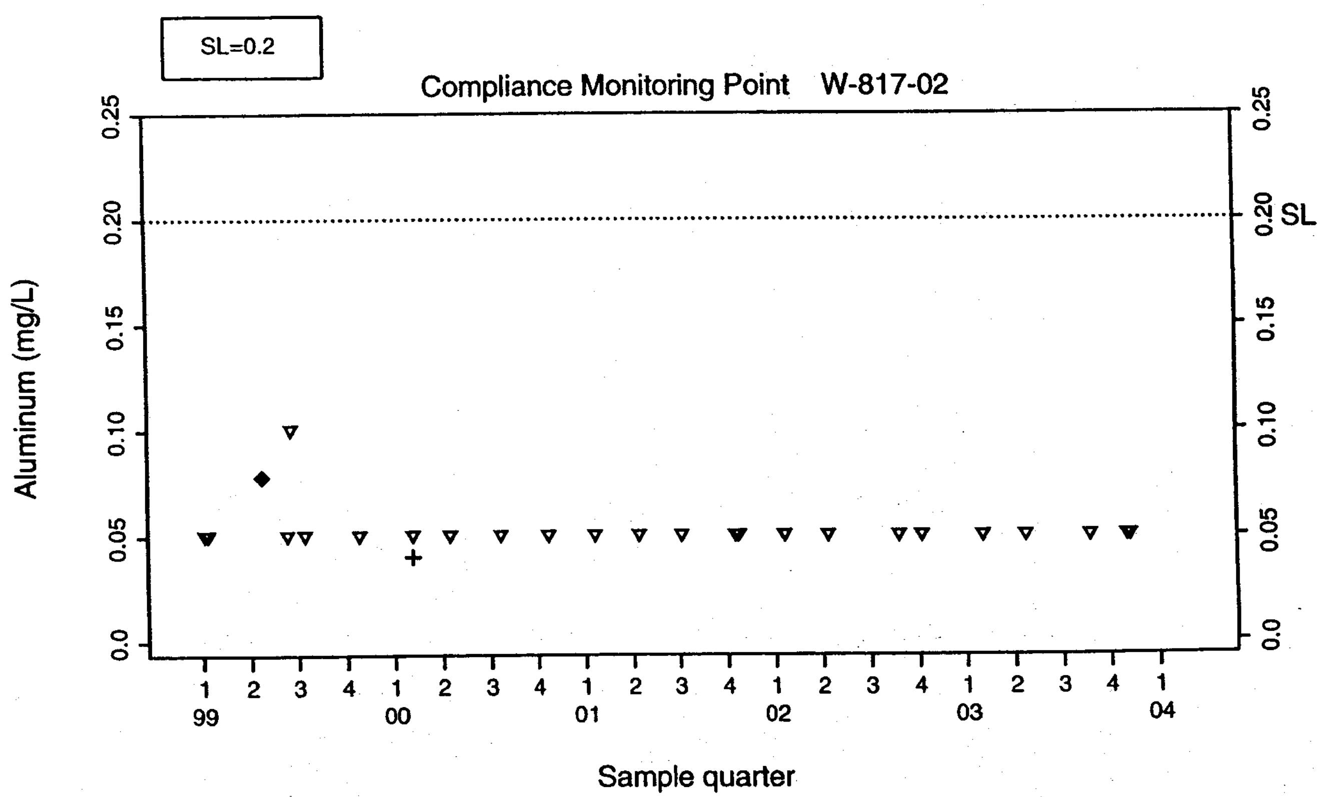
Surface Impoundments Ground Water
Vinyl chloride (µg/L)

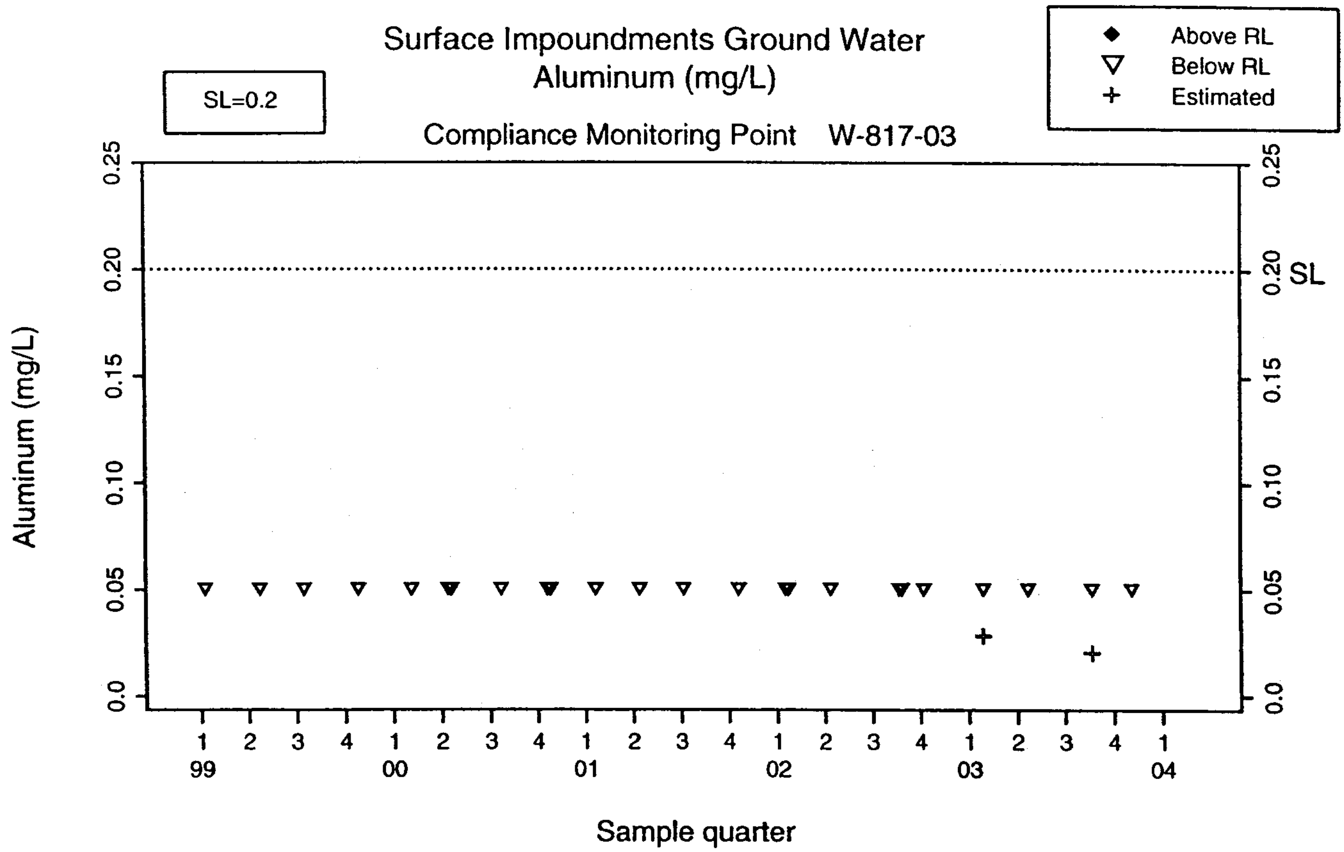


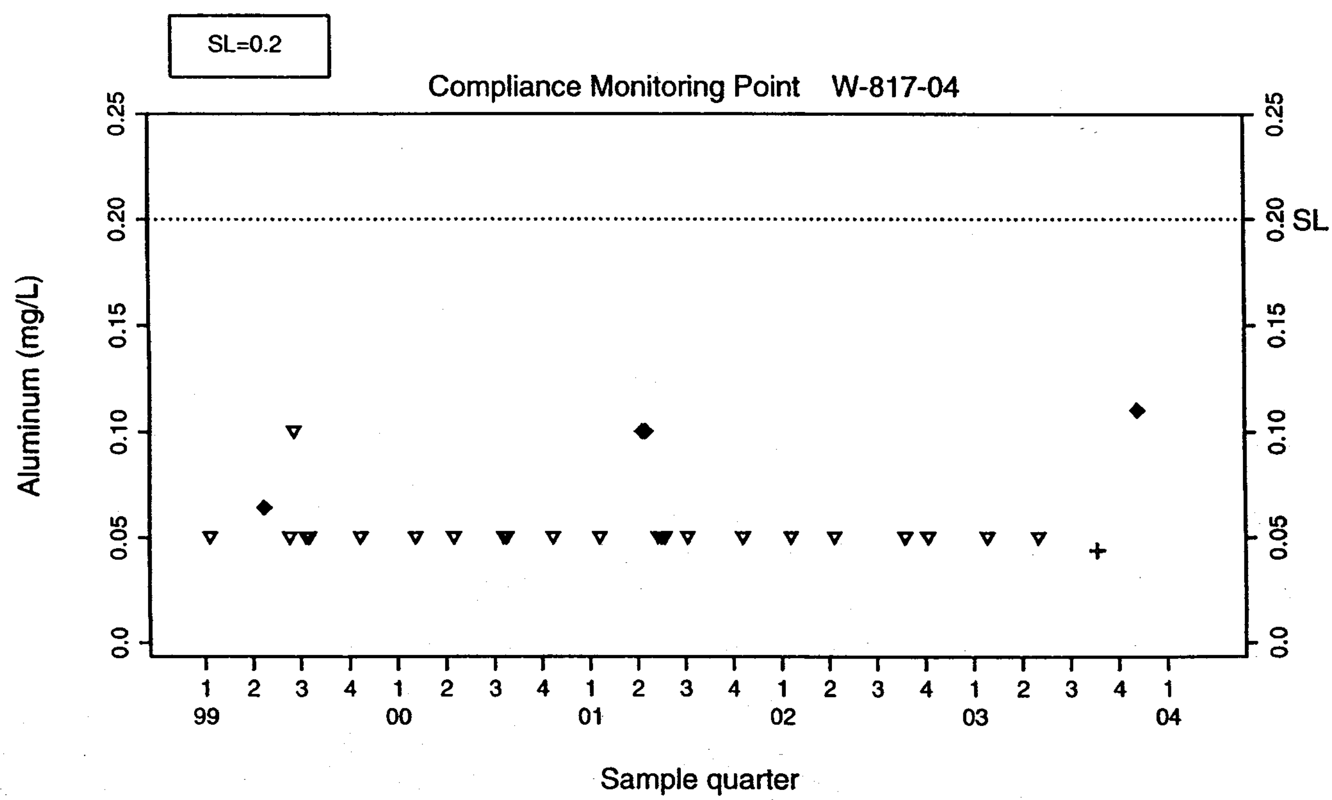


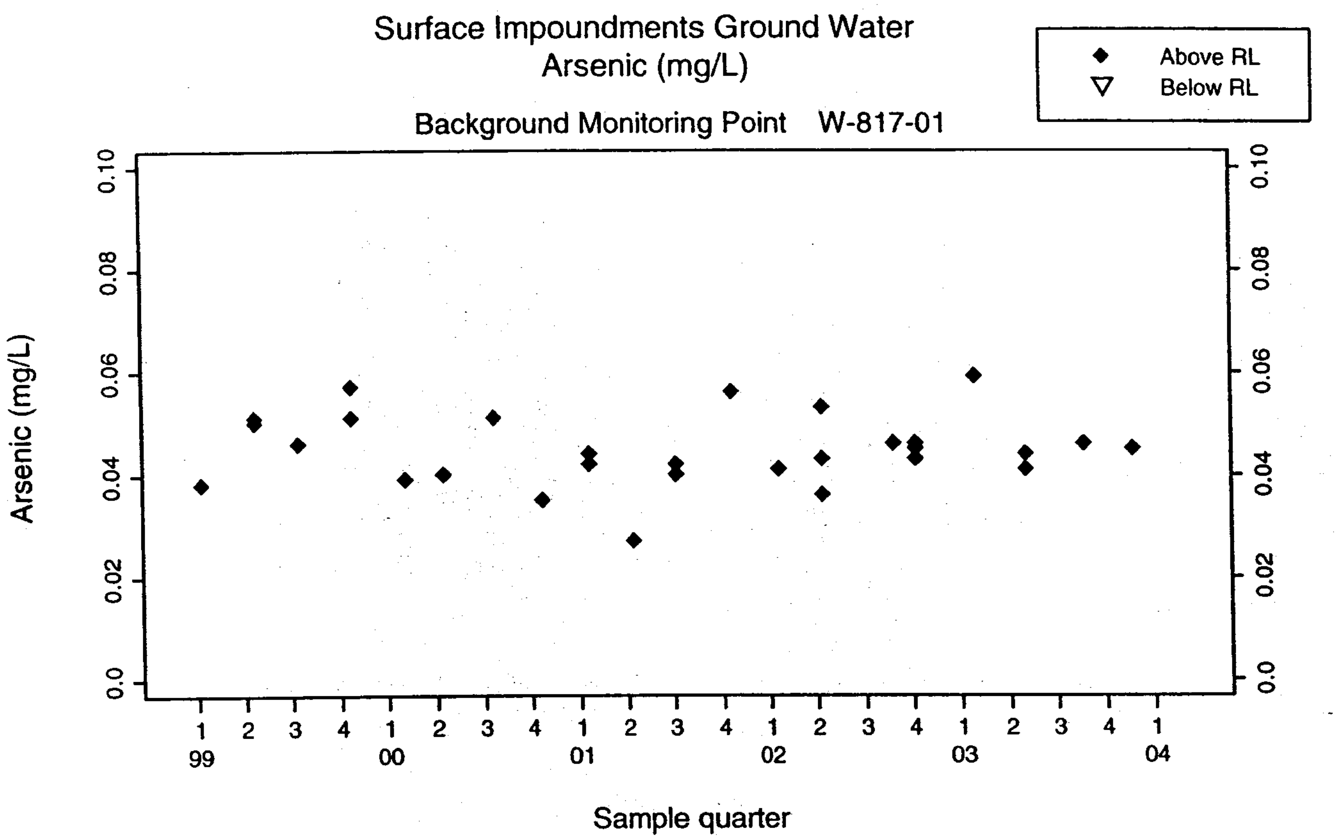
Surface Impoundments Ground Water
Aluminum (mg/L)

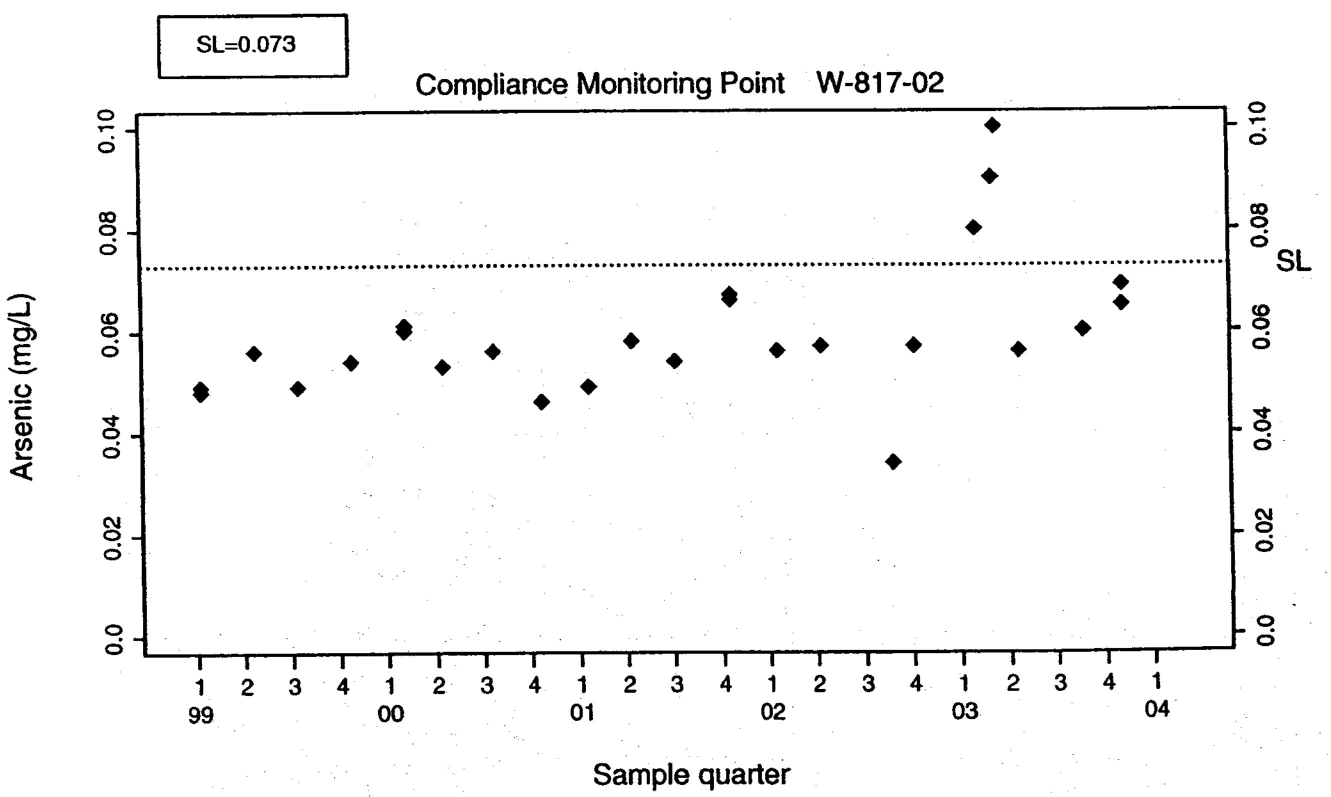




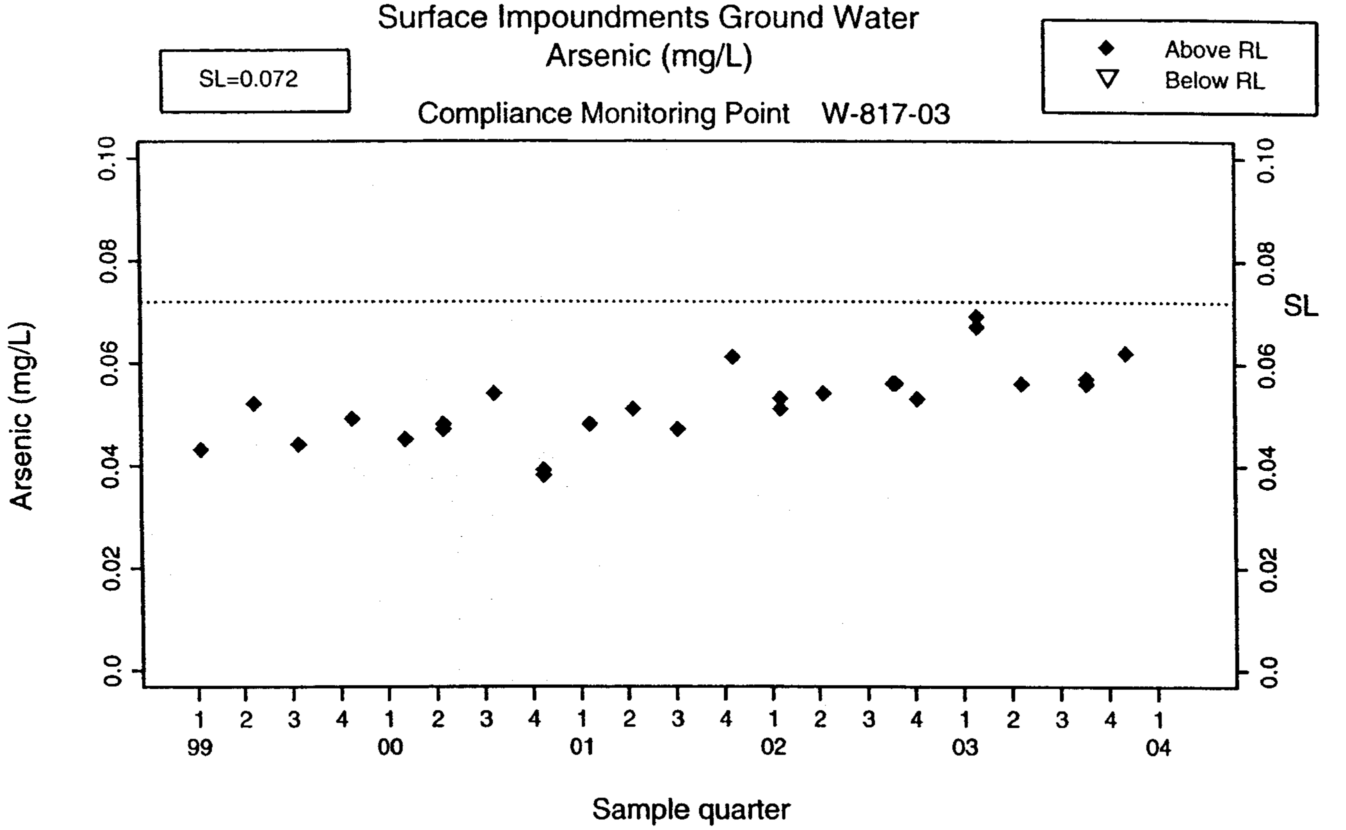

Surface Impoundments Ground Water
Aluminum (mg/L)
SL=0.2
Above RL
Below RL
Estimated
Compliance Monitoring Point W-817-03
Aluminum (mg/L)
0.0
0.05
0.10
0.15
0.20
0.25
SL
1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1
99 00 01 02 03 04
Sample quarter

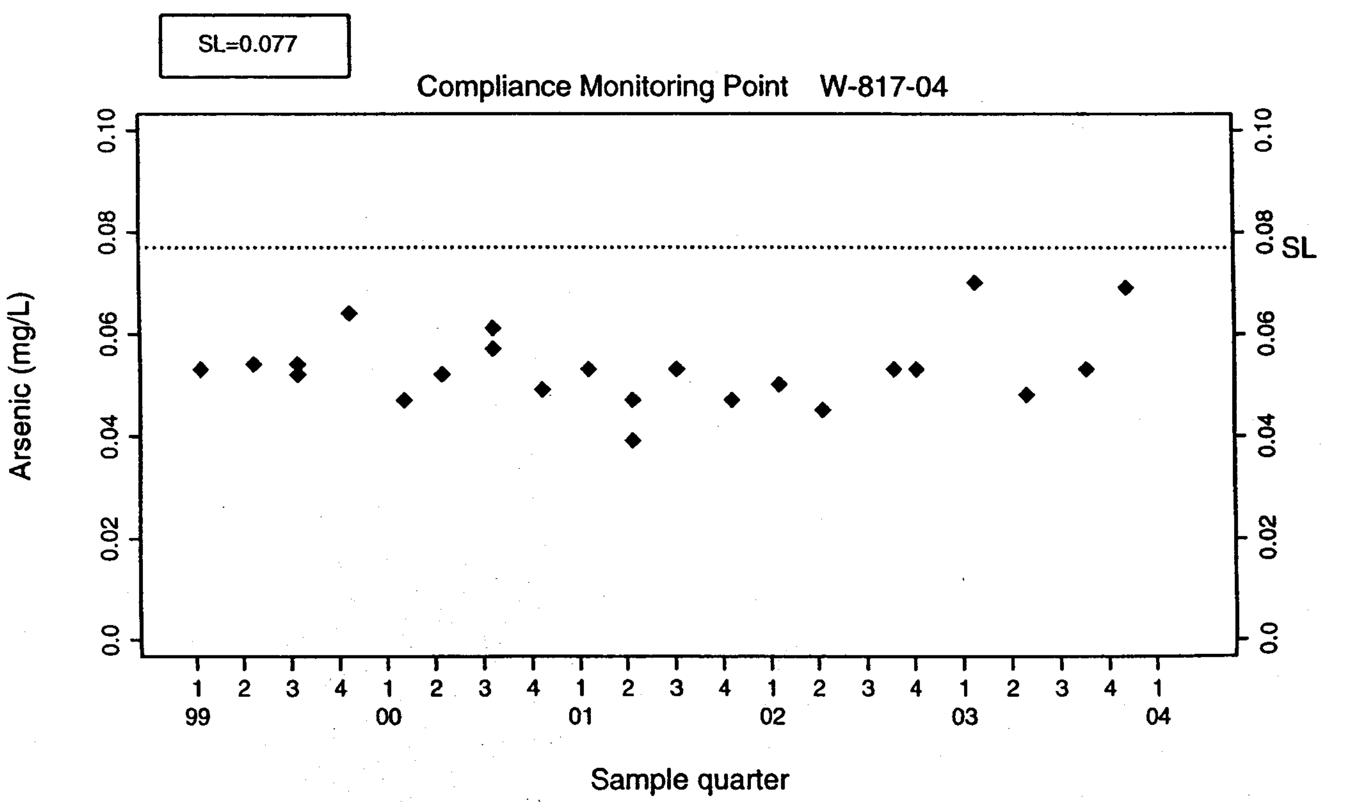

SL=0.2
Compliance Monitoring Point W-817-04
Aluminum (mg/L)
0.0
0.05
0.10
0.15
0.20
0.25
SL
1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1
99 00 01 02 03 04
Sample quarter


Surface Impoundments Ground Water
Arsenic (mg/L)
Above RL
Below RL
Background Monitoring Point W-817-01
Arsenic (mg/L)
0.0
0.02
0.04
0.06
0.08
0.10
1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1
99
00
01
02
03
04
Sample quarter

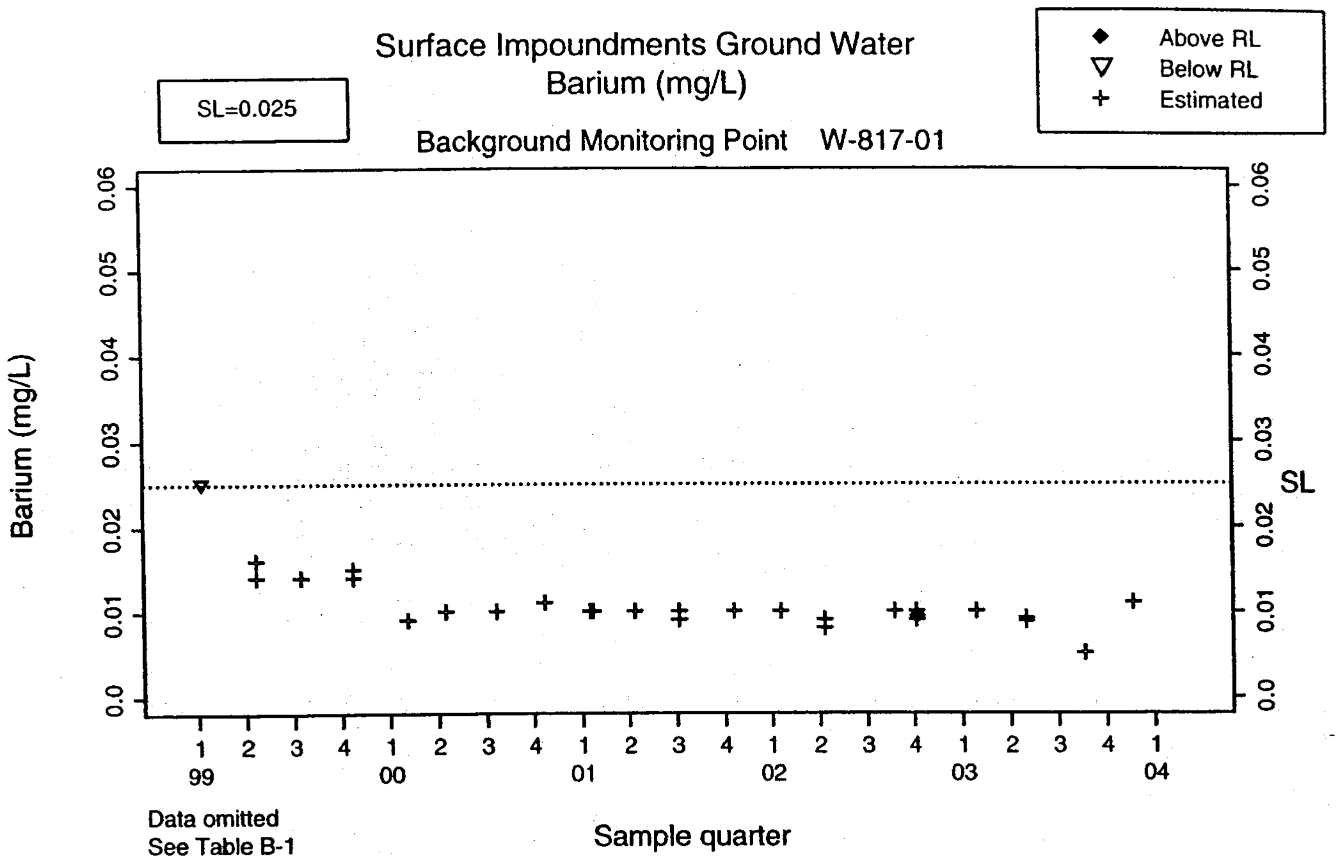

SL=0.073
Compliance Monitoring Point W-817-02
Arsenic (mg/L)
0.0
0.02
0.04
0.06
0.08
0.10
SL
1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1
99
00
01
02
03
04
Sample quarter

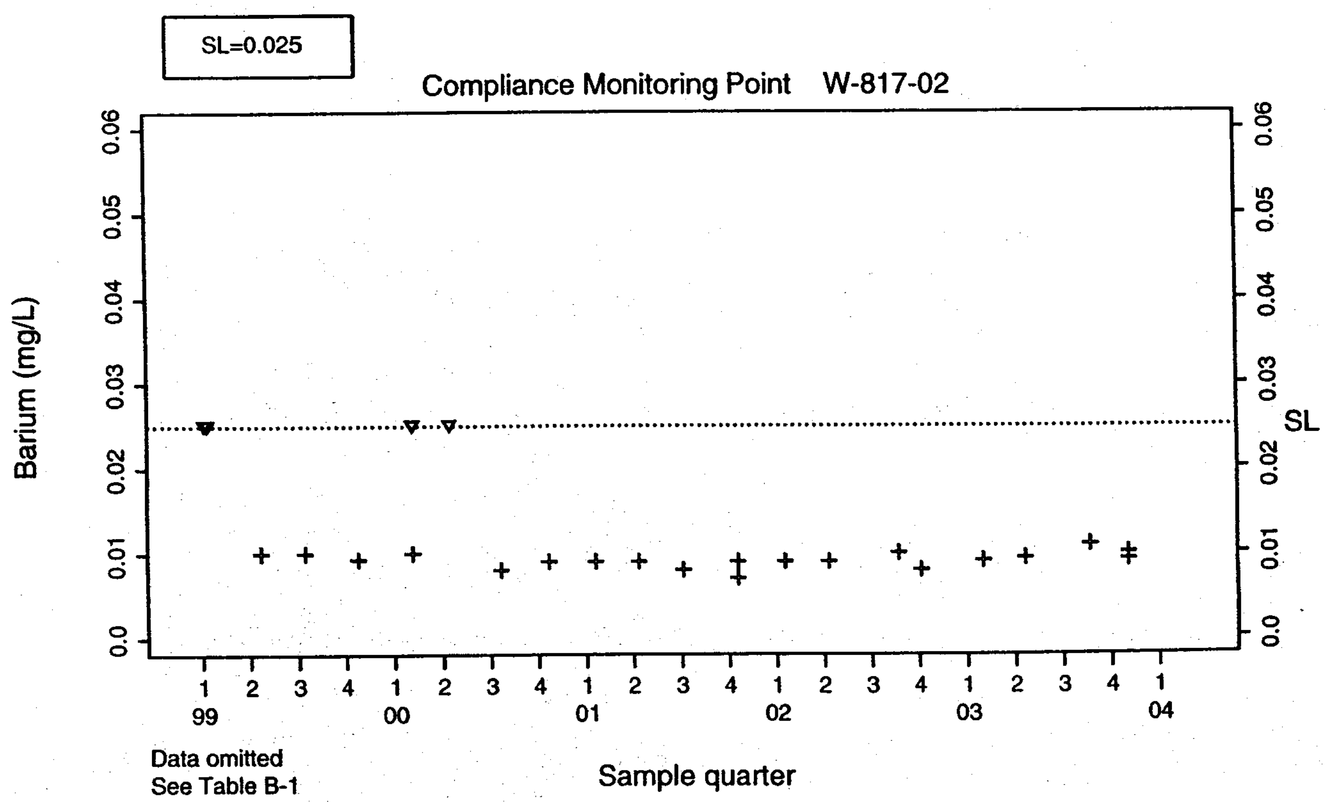
Surface Impoundments Ground Water
Arsenic (mg/L)

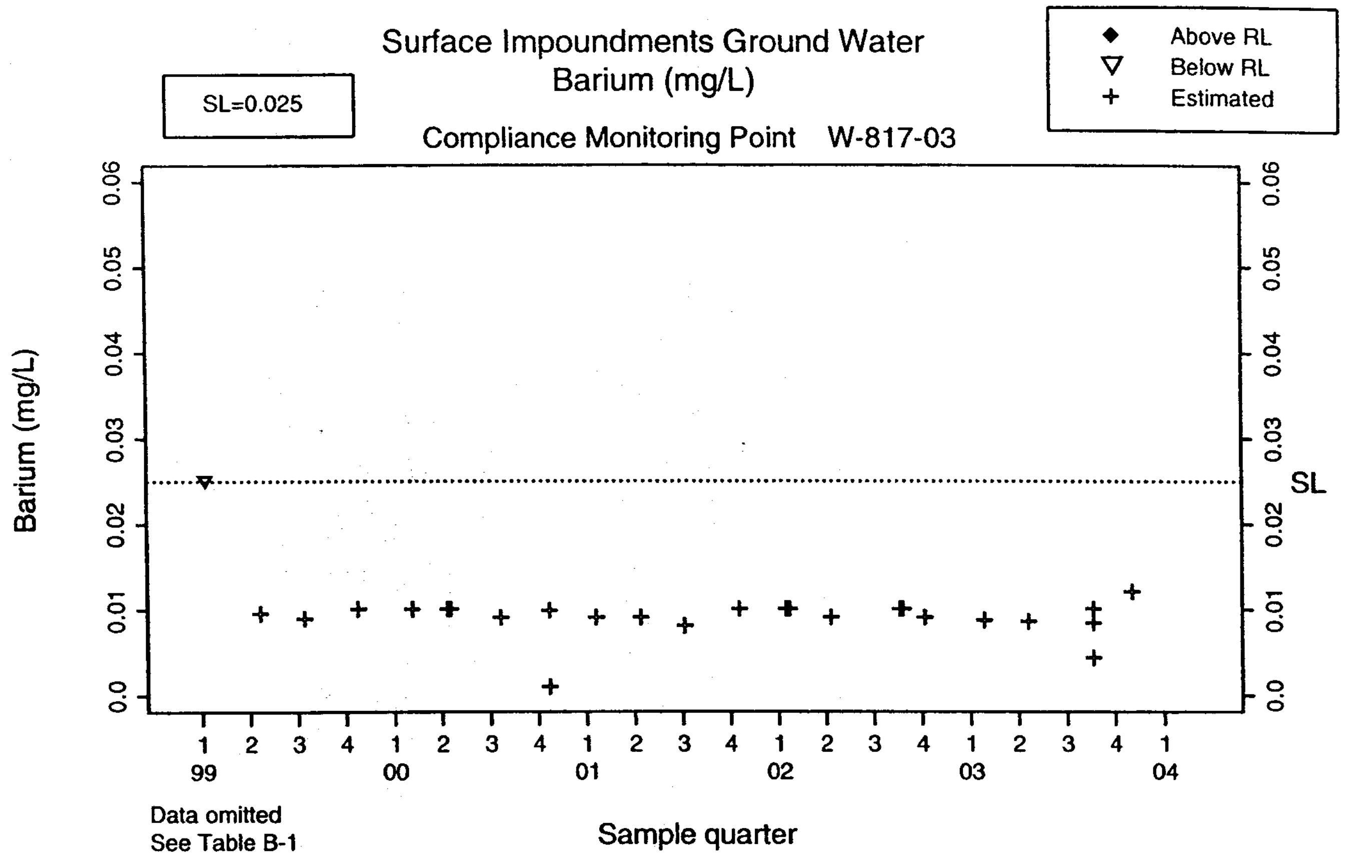


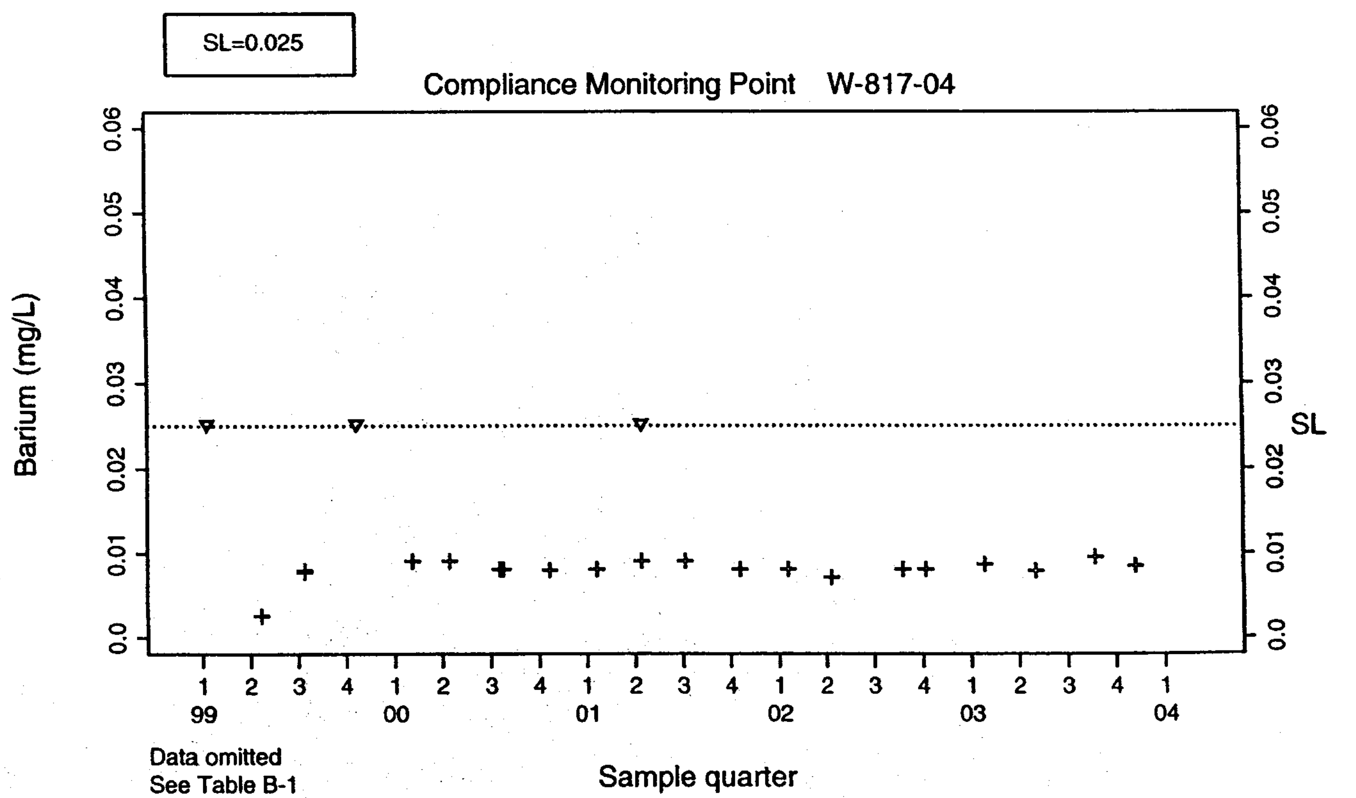


Surface Impoundments Ground Water
Barium (mg/L)

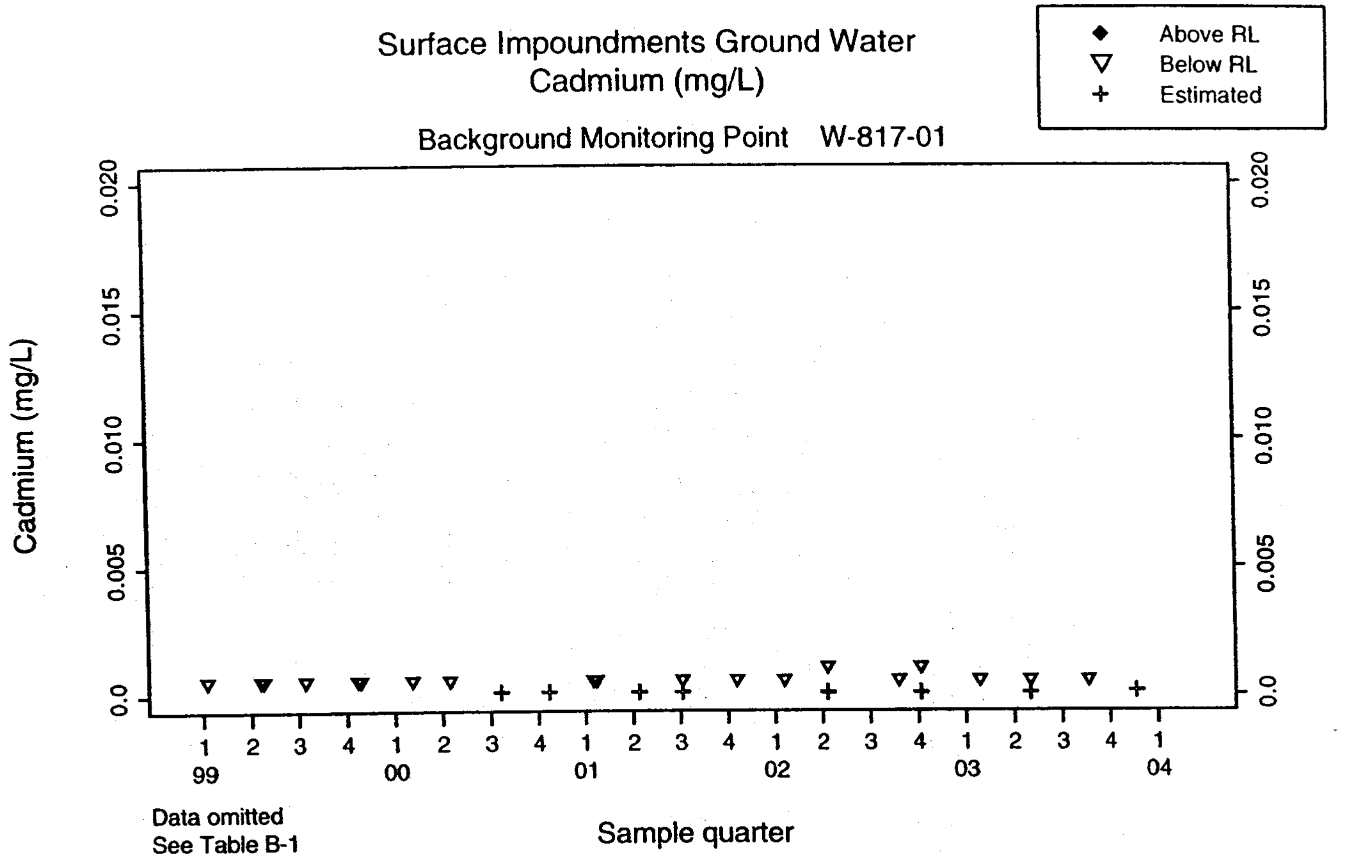


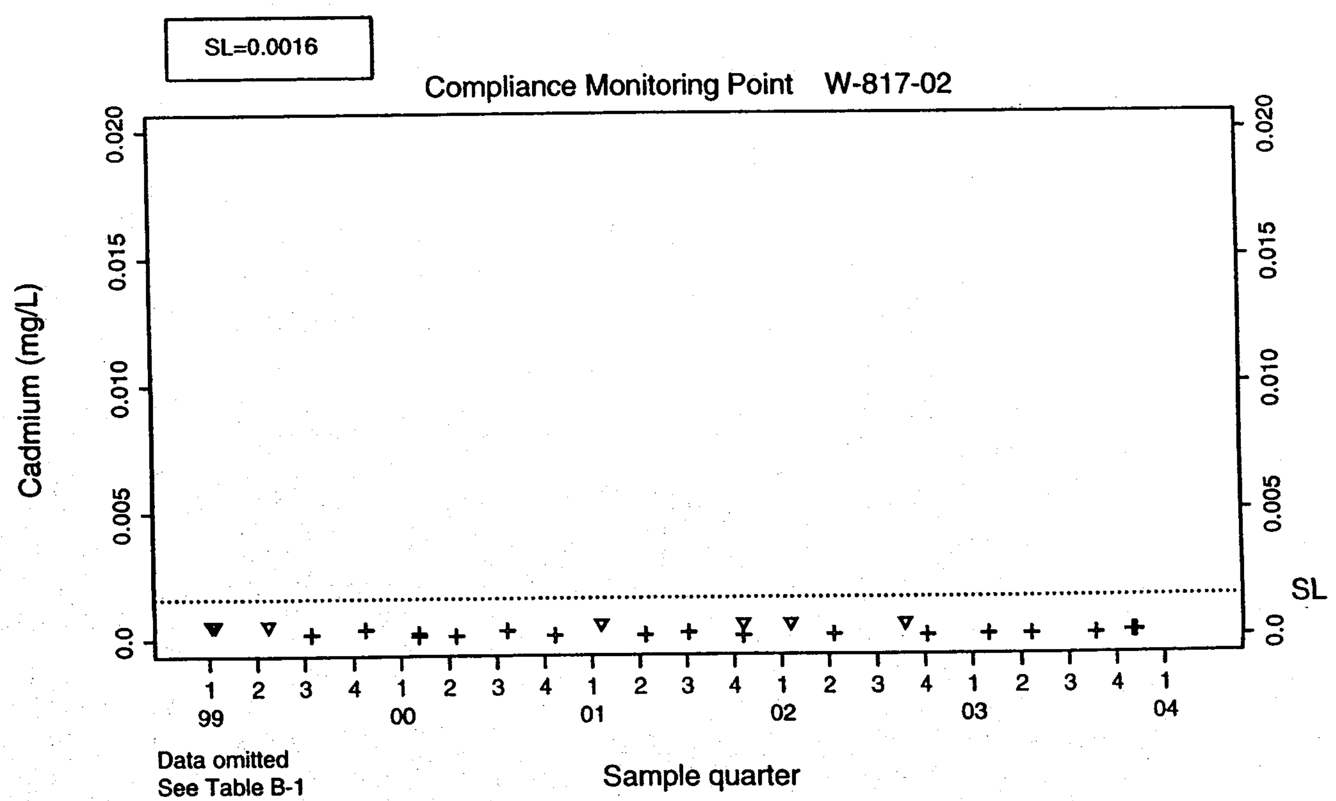



Surface Impoundments Ground Water
Barium (mg/L)
SL=0.025
Above RL
Below RL
Estimated
Compliance Monitoring Point W-817-03
Barium (mg/L)
0.0
0.01
0.02
0.03
0.04
0.05
0.06
SL
1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1
99 00 01 02 03 04
Data omitted
See Table B-1
Sample quarter

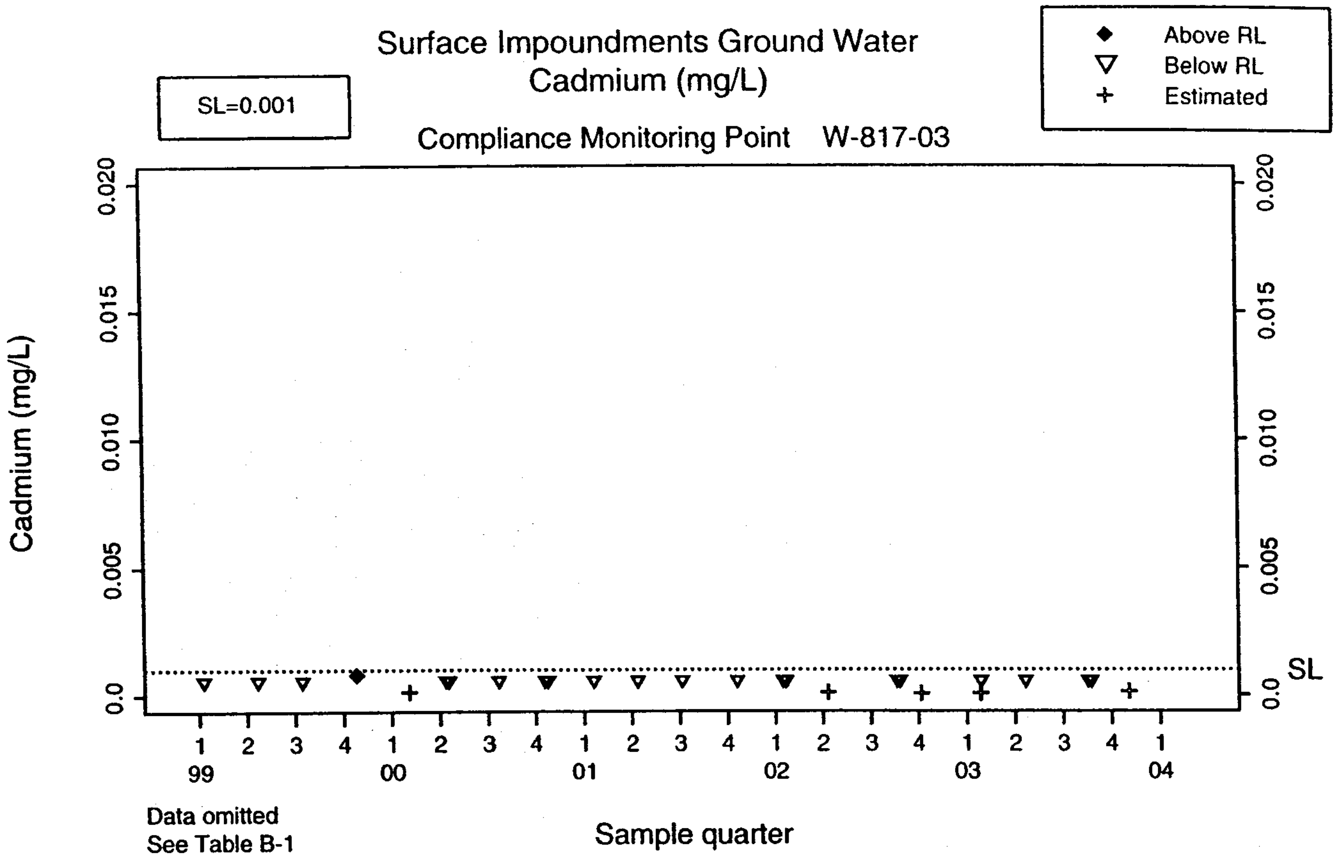

SL=0.025
Compliance Monitoring Point W-817-04
Barium (mg/L)
0.0
0.01
0.02
0.03
0.04
0.05
0.06
SL
1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1
99 00 01 02 03 04
Data omitted
See Table B-1
Sample quarter

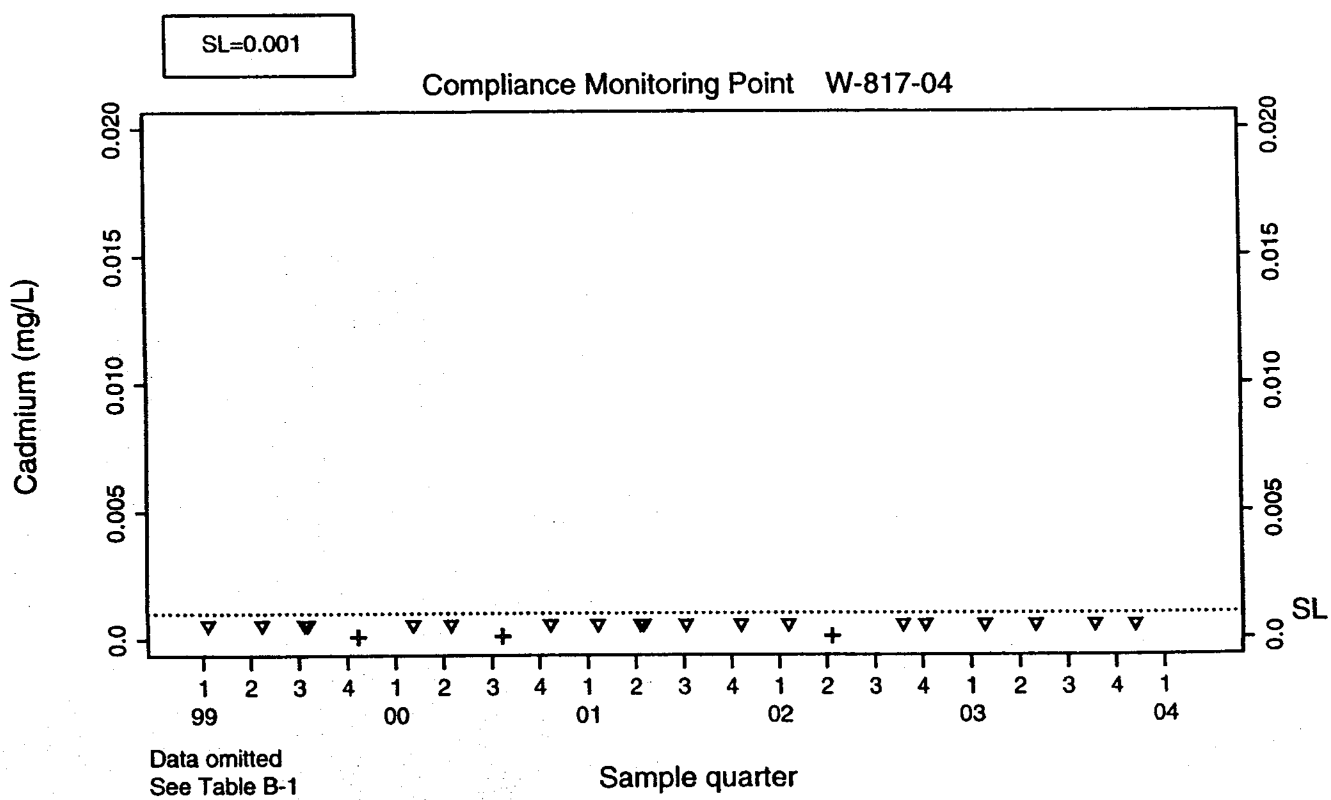
Surface Impoundments Ground Water
Cadmium (mg/L)



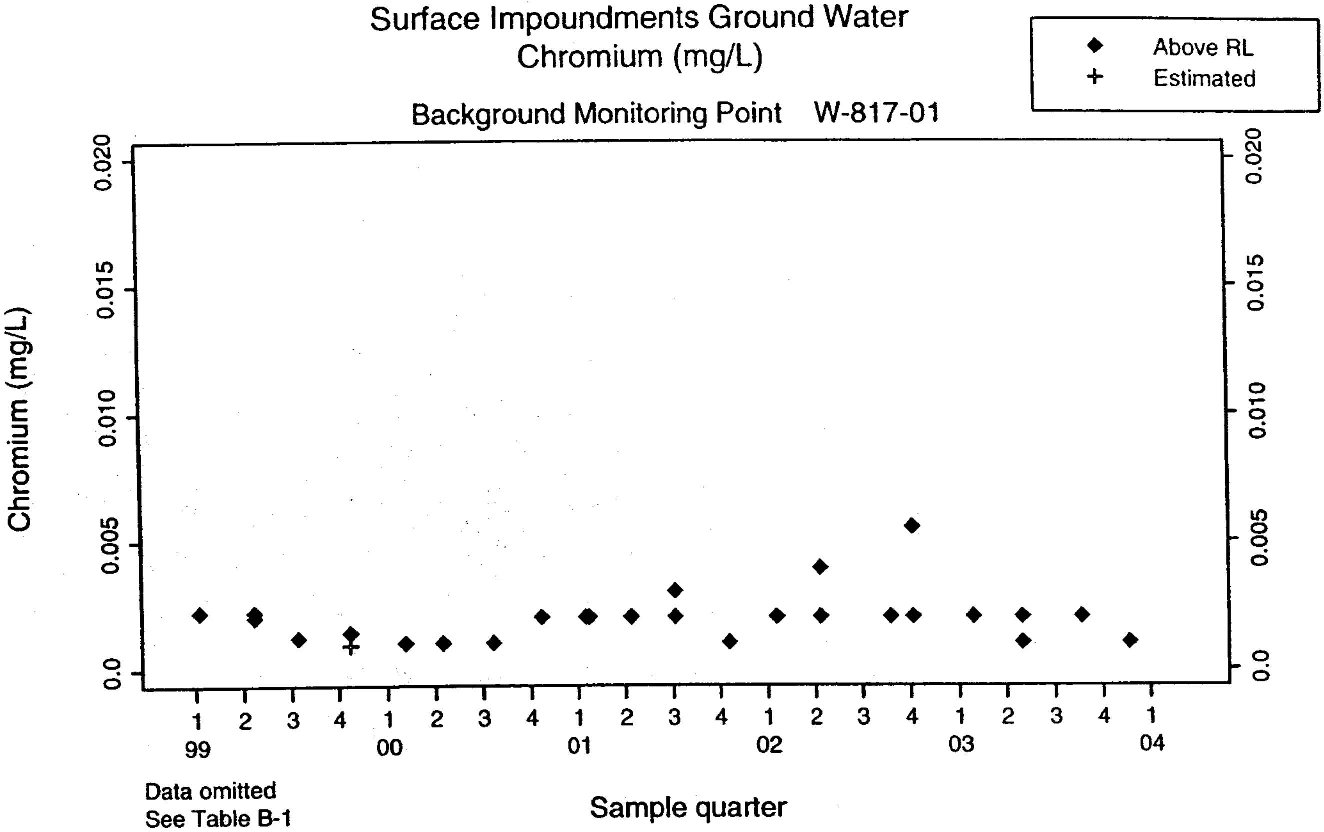


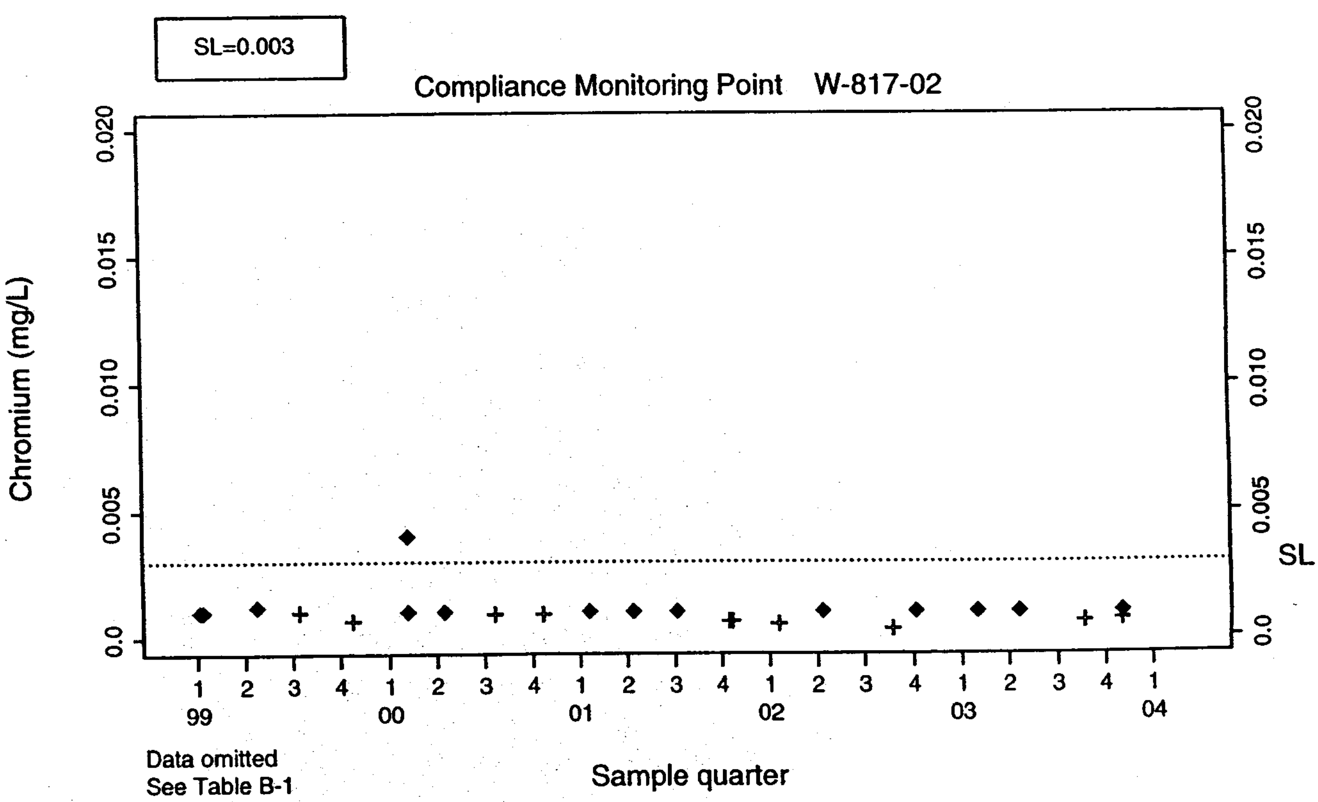
Surface Impoundments Ground Water
Cadmium (mg/L)

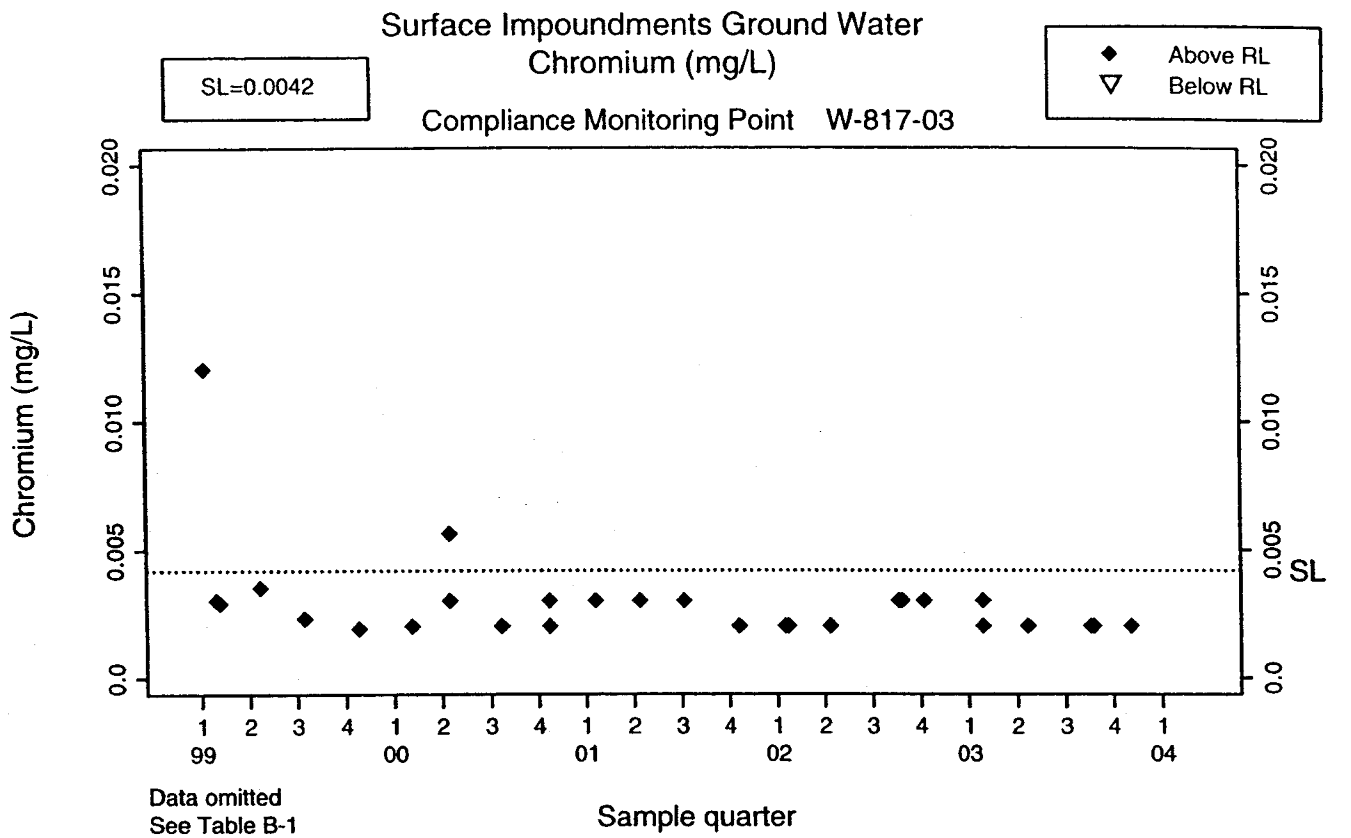


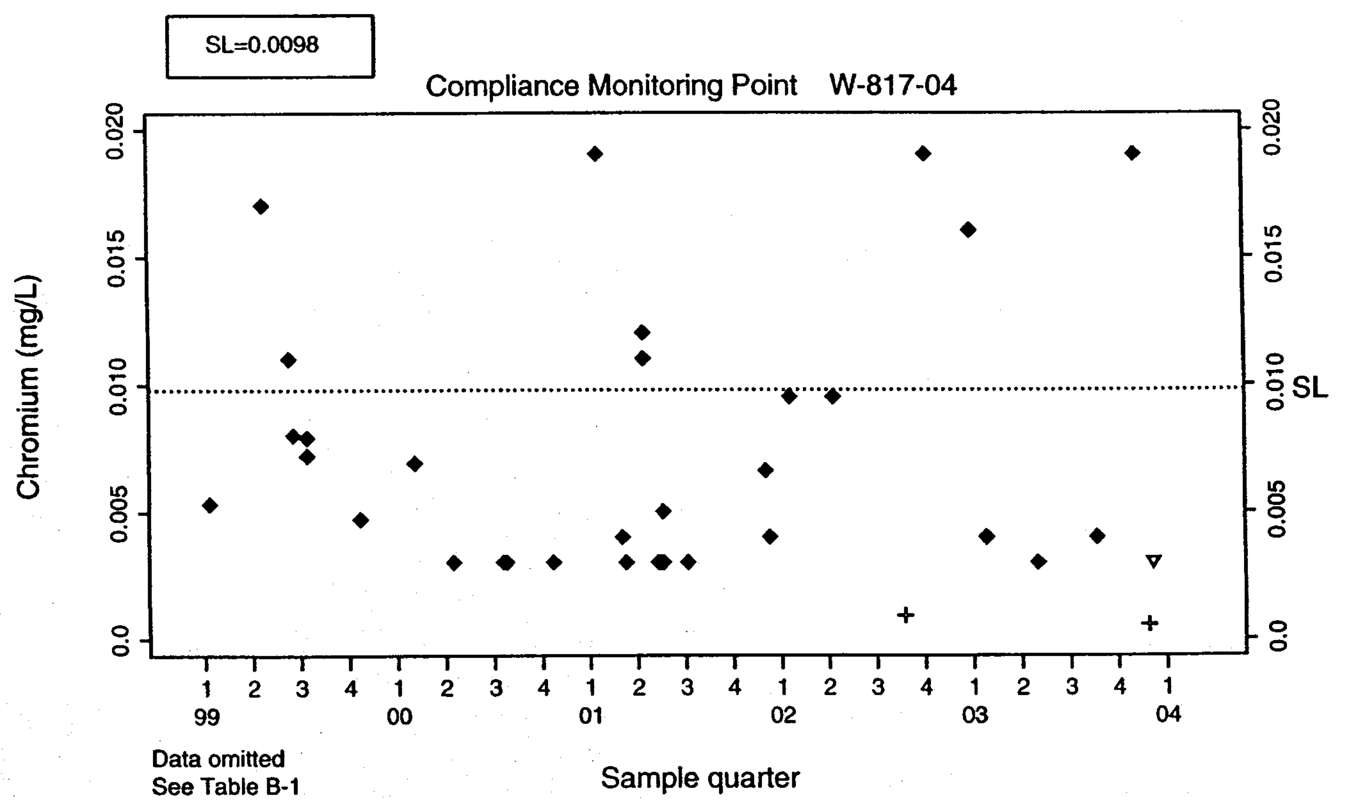


Surface Impoundments Ground Water
Chromium (mg/L)

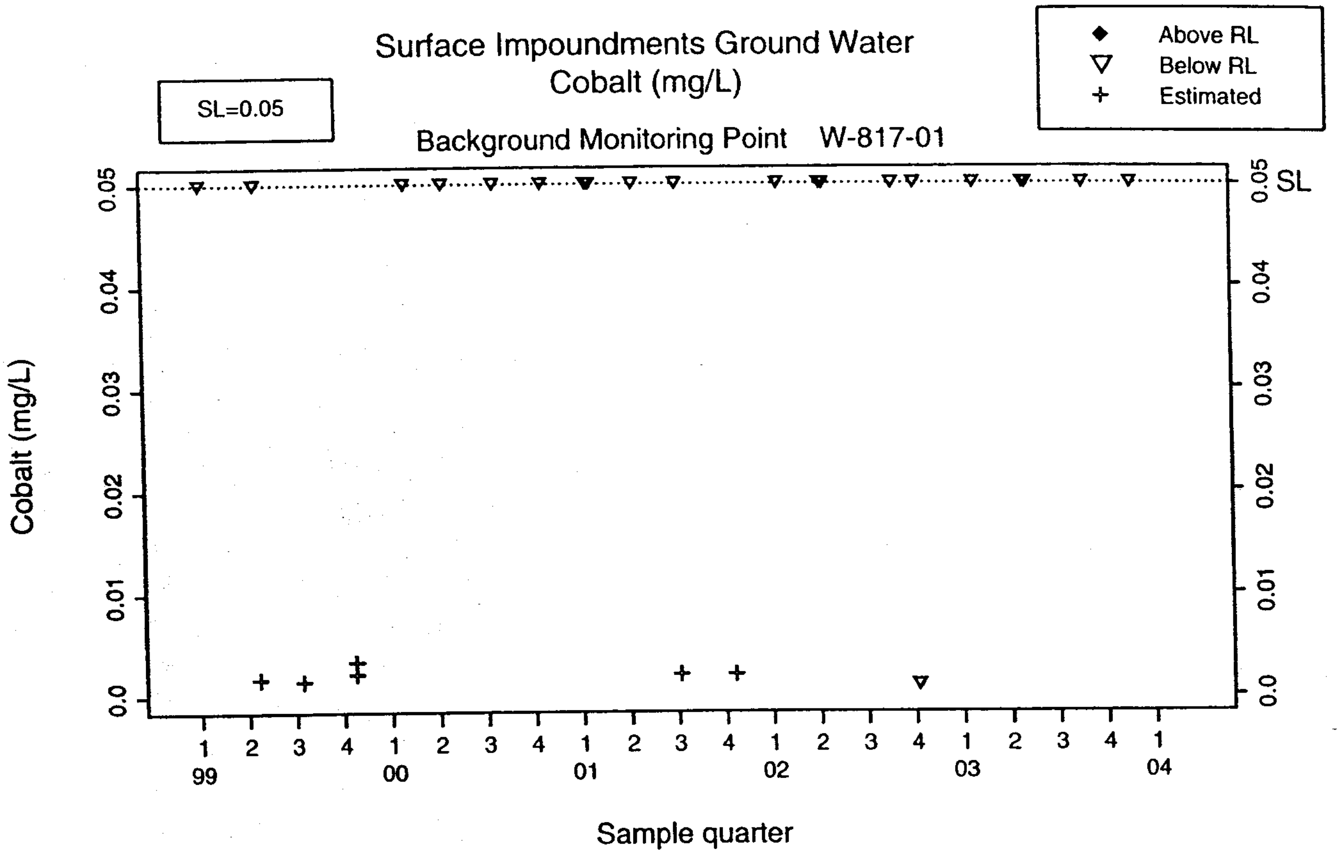


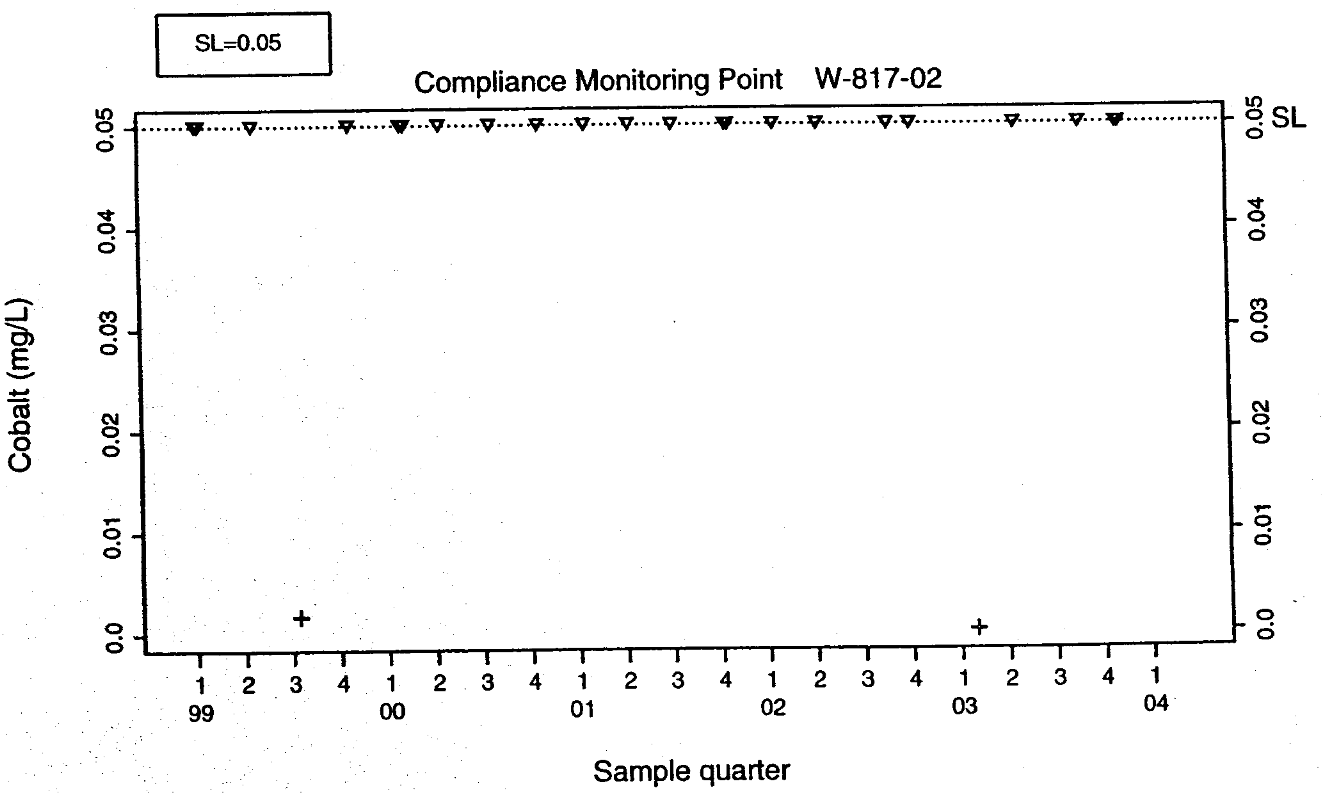



Surface Impoundments Ground Water
Chromium (mg/L)
SL=0.0042
Above RL
Below RL
Compliance Monitoring Point W-817-03
Chromium (mg/L)
0.0
0.005
0.010
0.015
0.020
SL
1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1
99 00 01 02 03 04
Data omitted
See Table B-1
Sample quarter

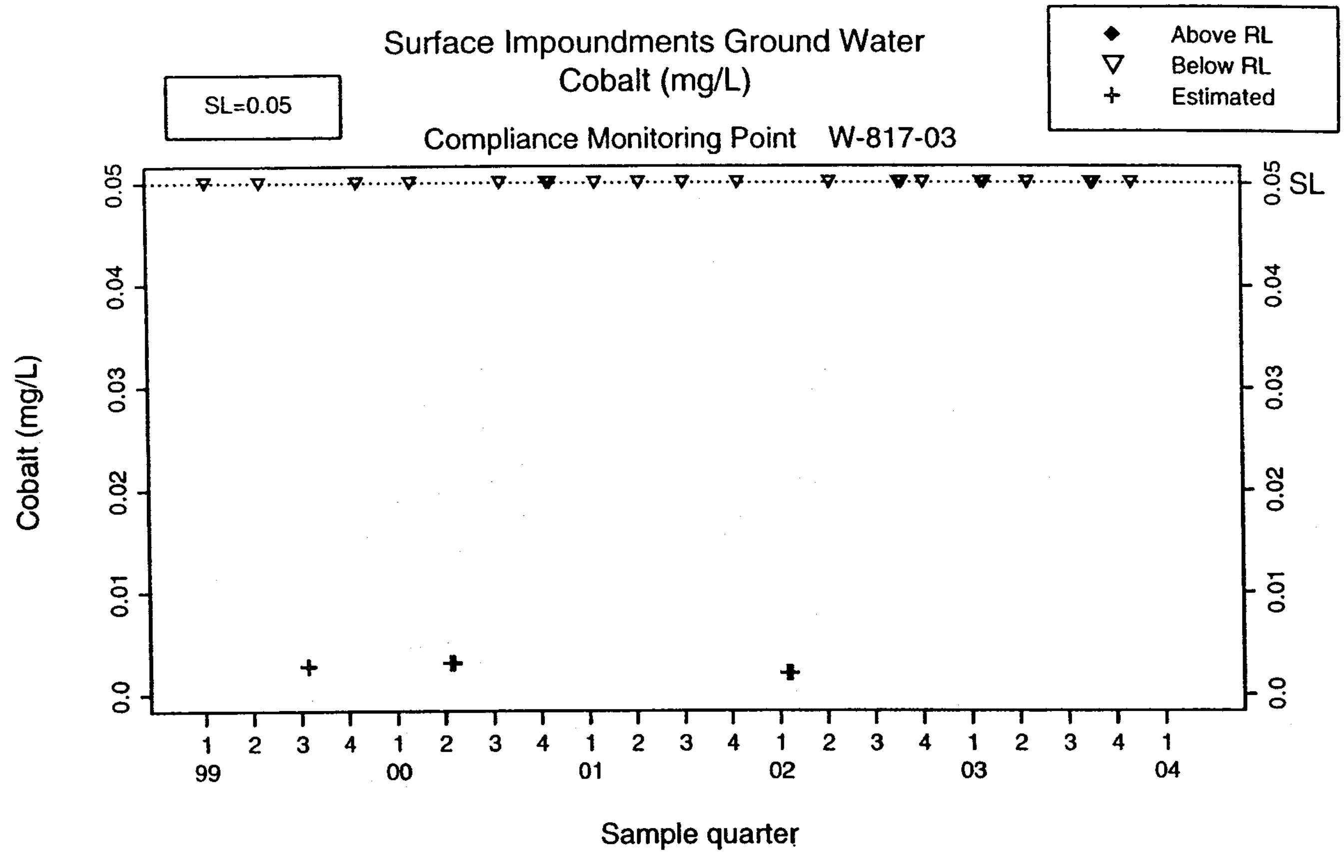

SL=0.0098
Compliance Monitoring Point W-817-04
Chromium (mg/L)
0.0
0.005
0.010
0.015
0.020
SL
1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1
99 00 01 02 03 04
Data omitted
See Table B-1
Sample quarter

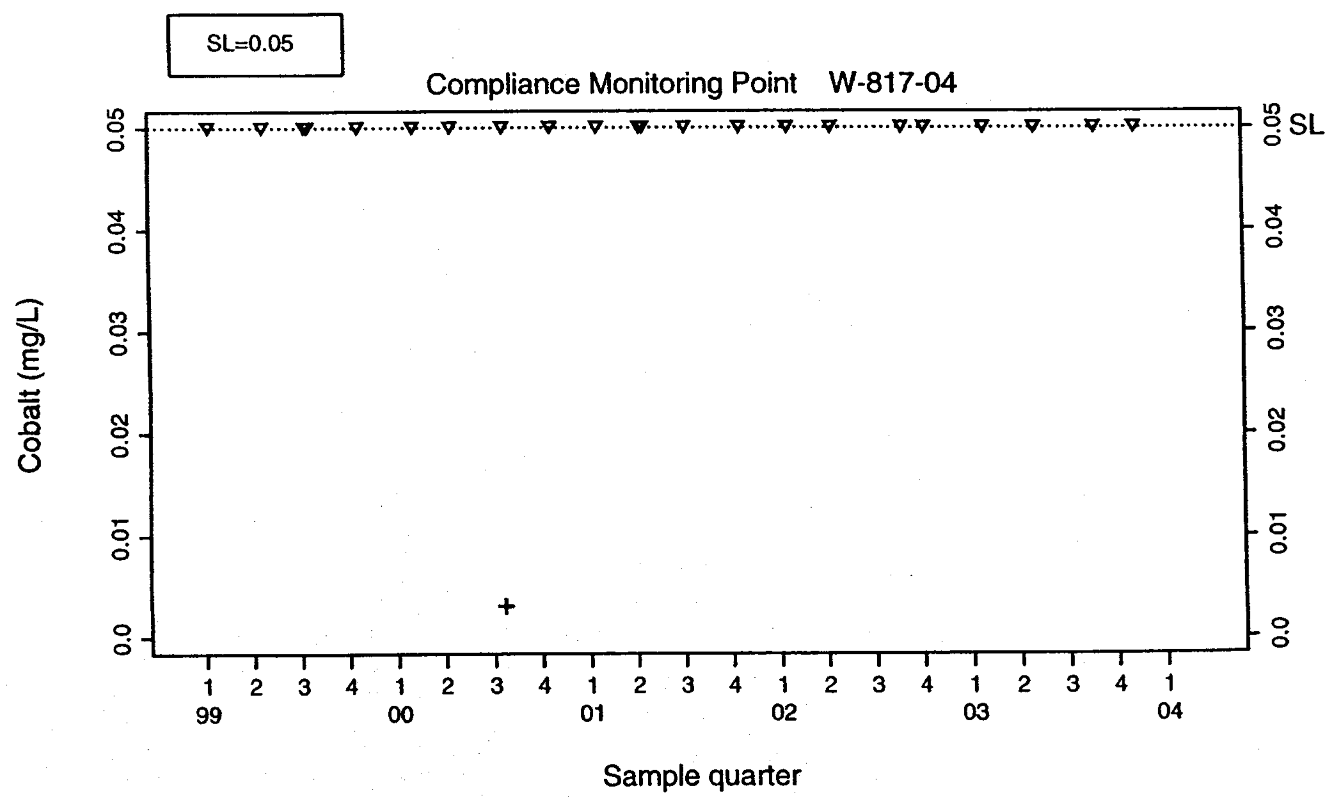
Surface Impoundments Ground Water
Cobalt (mg/L)



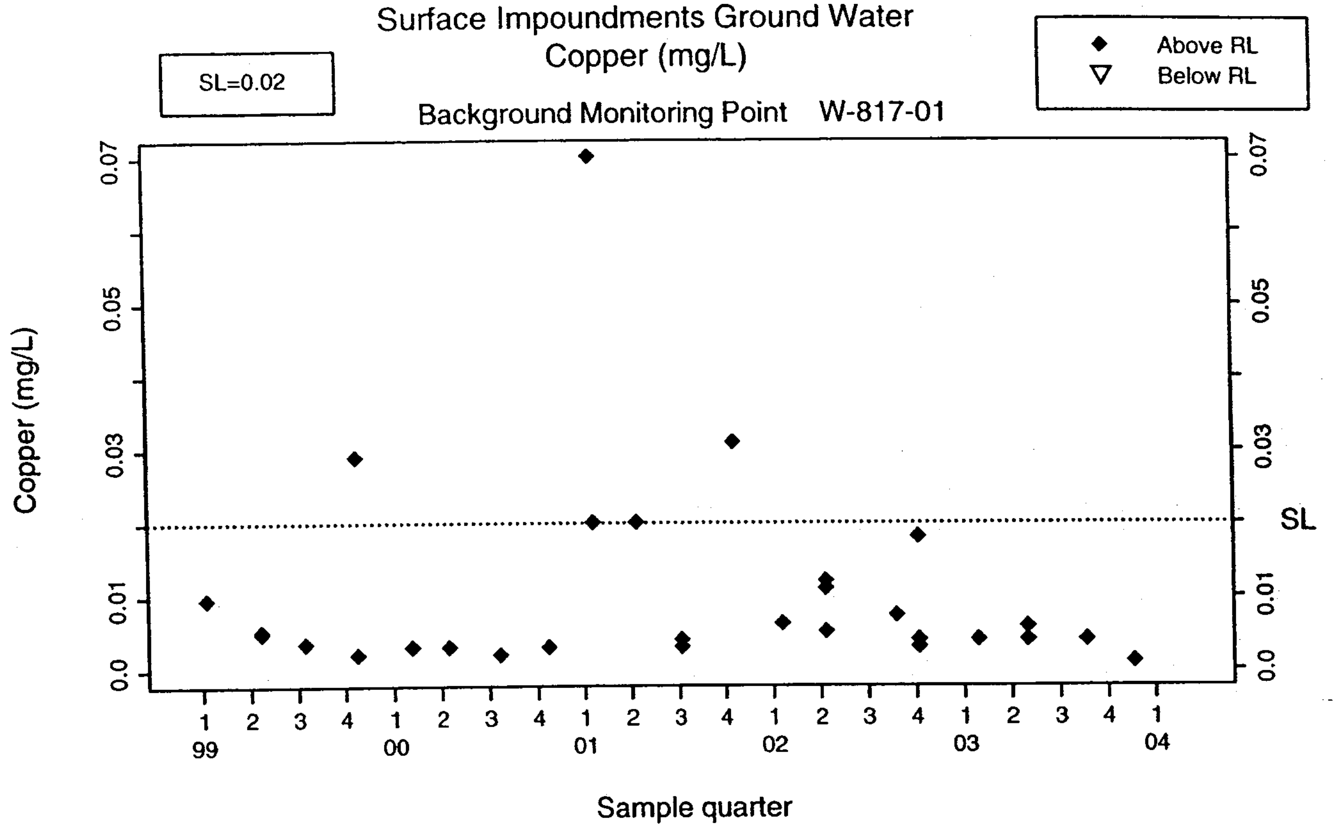


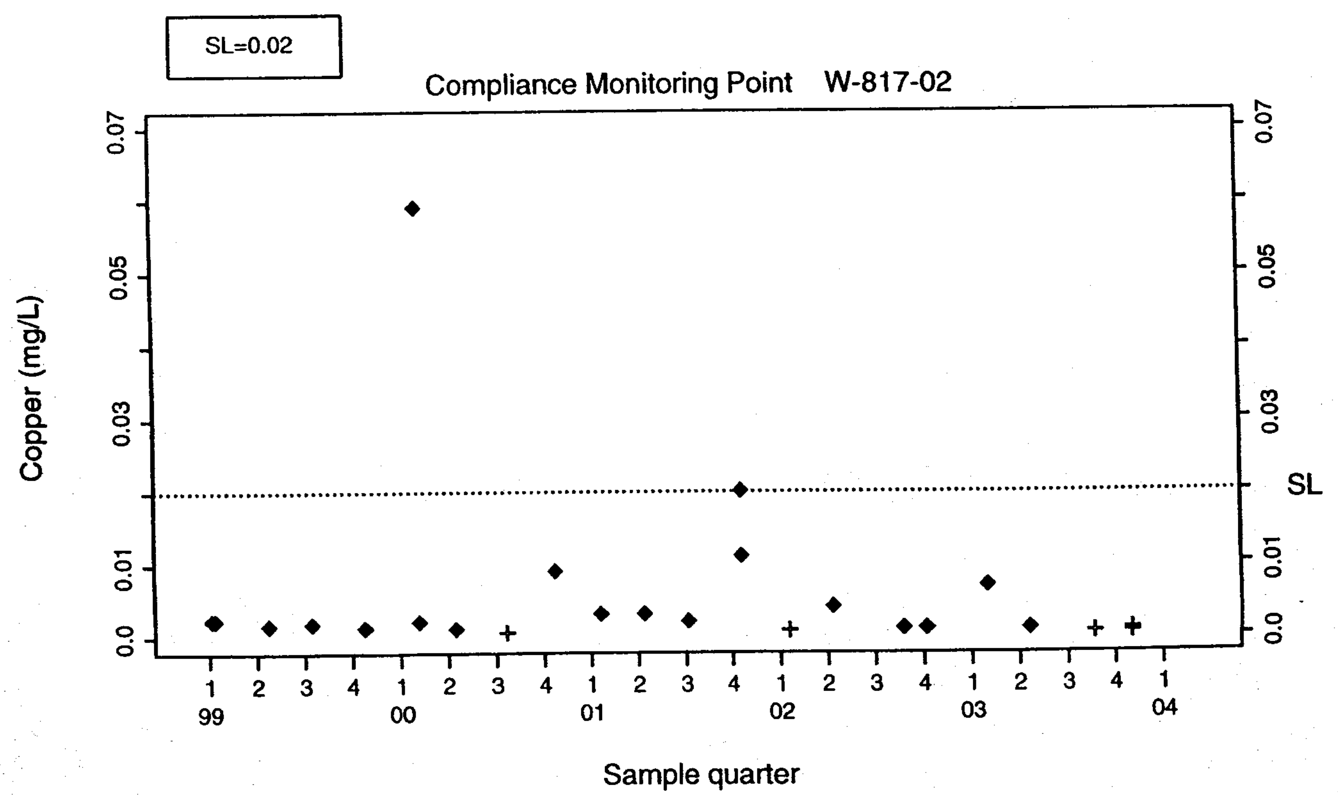
Surface Impoundments Ground Water
Cobalt (mg/L)



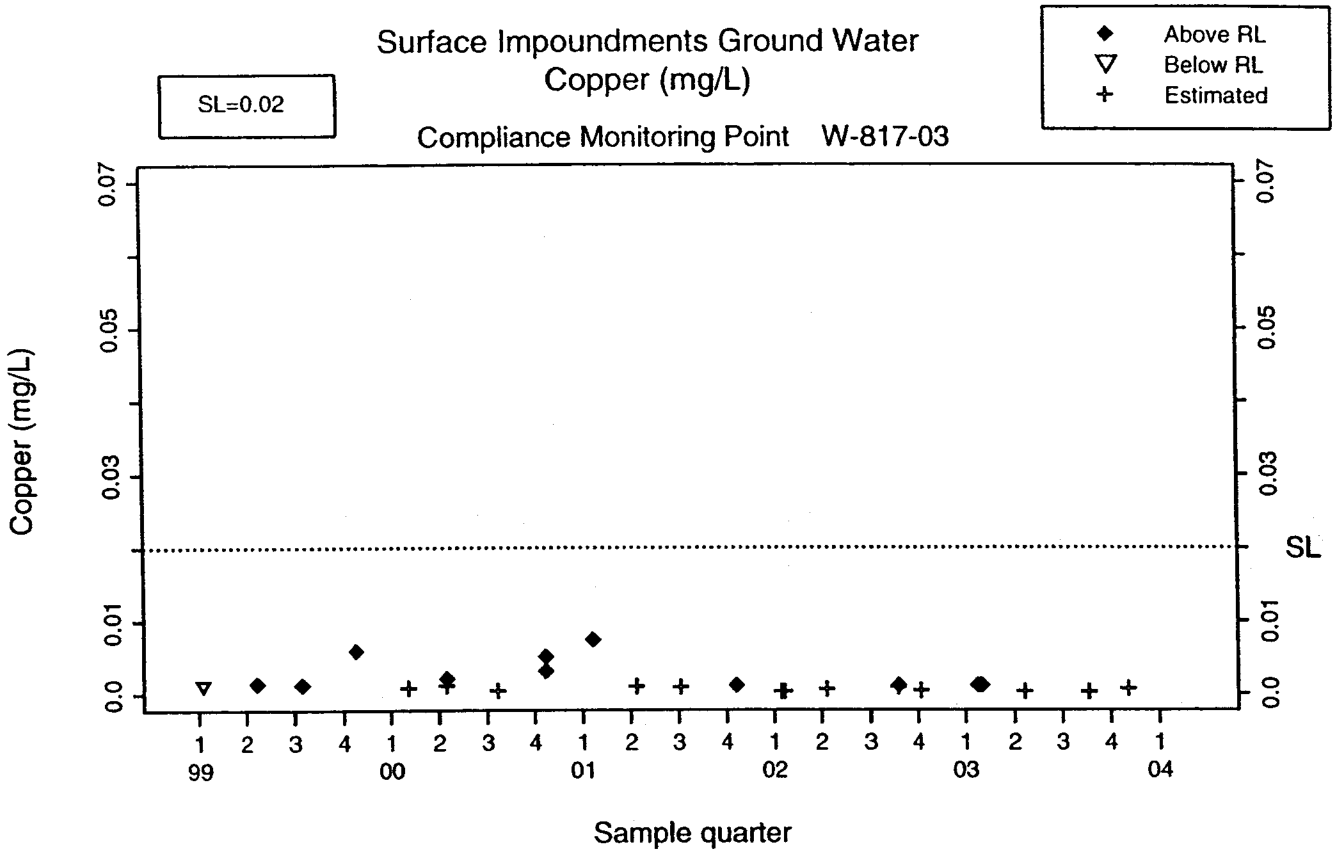


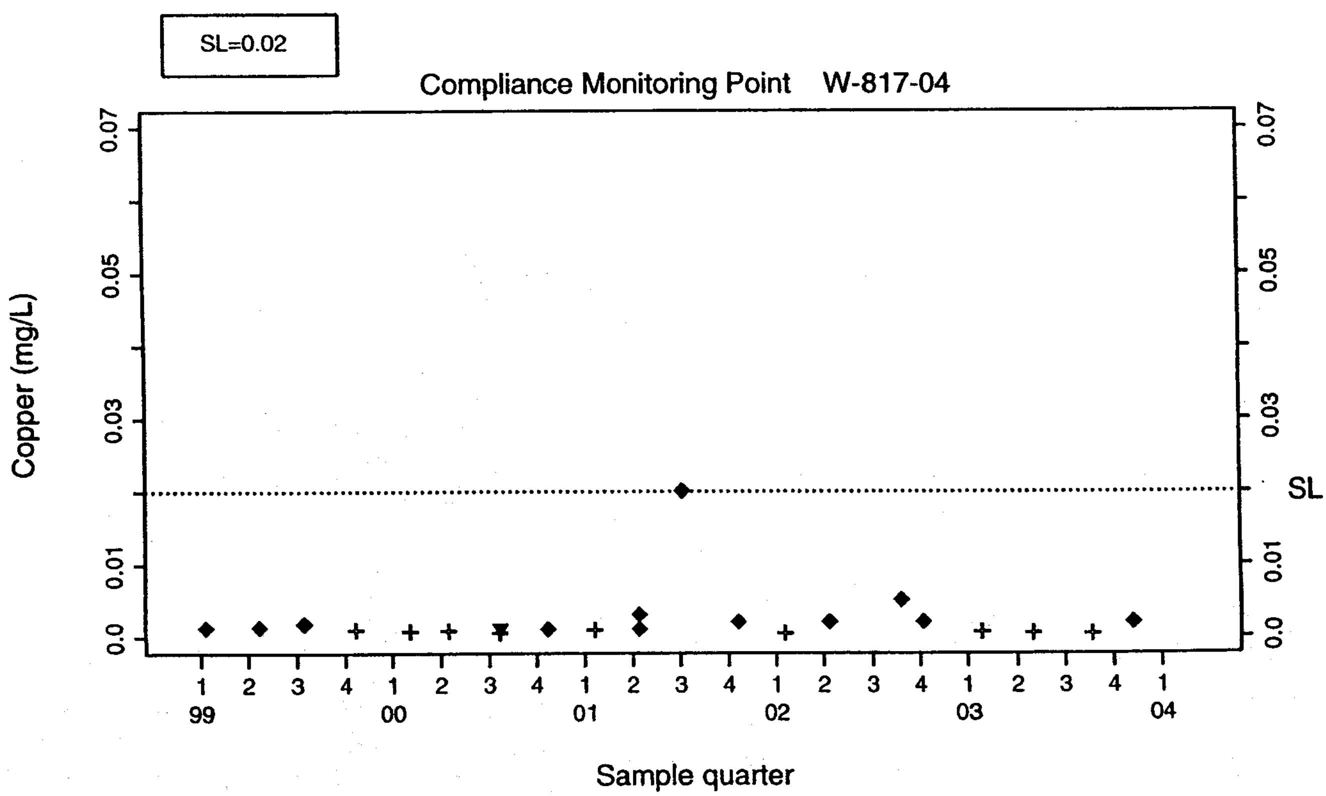
Surface Impoundments Ground Water
Copper (mg/L)



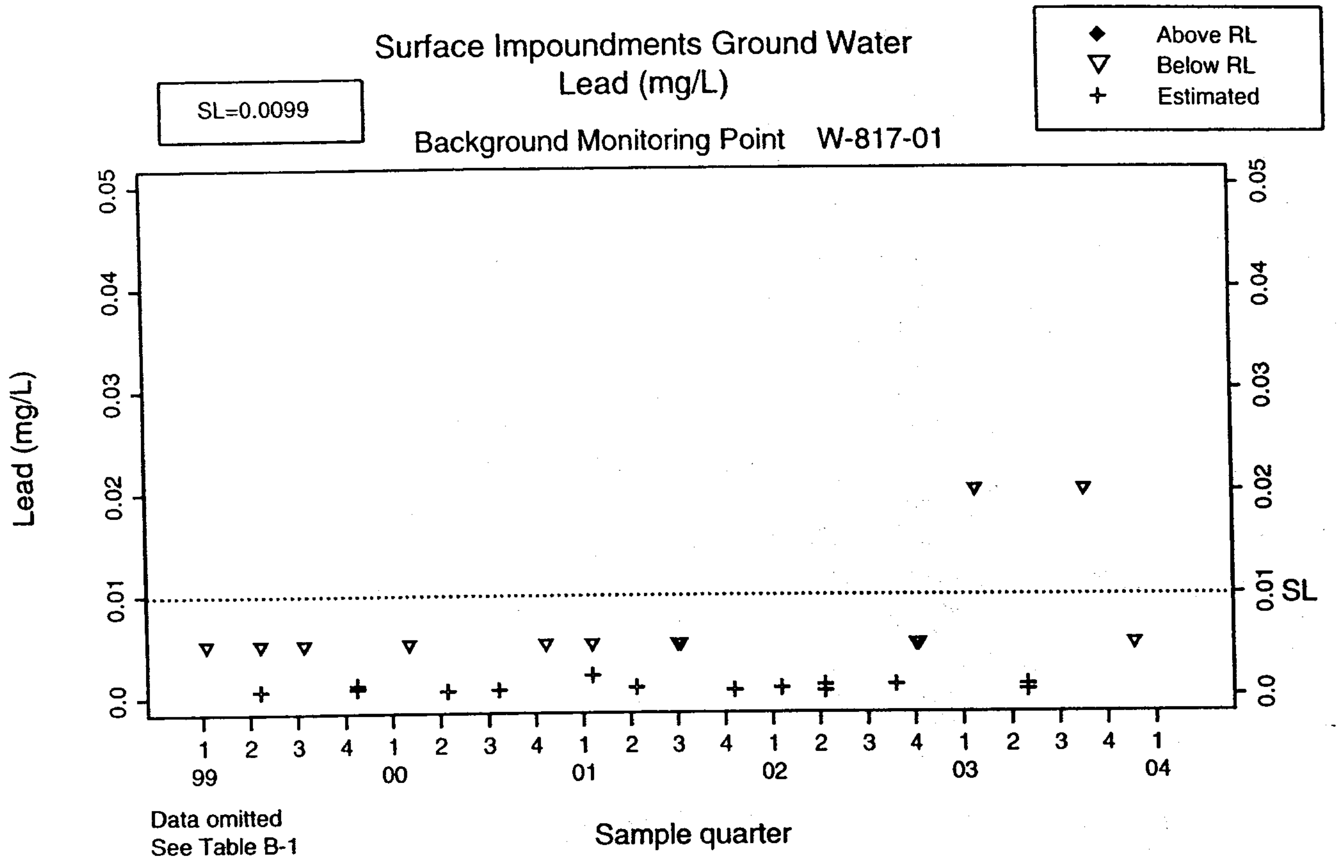


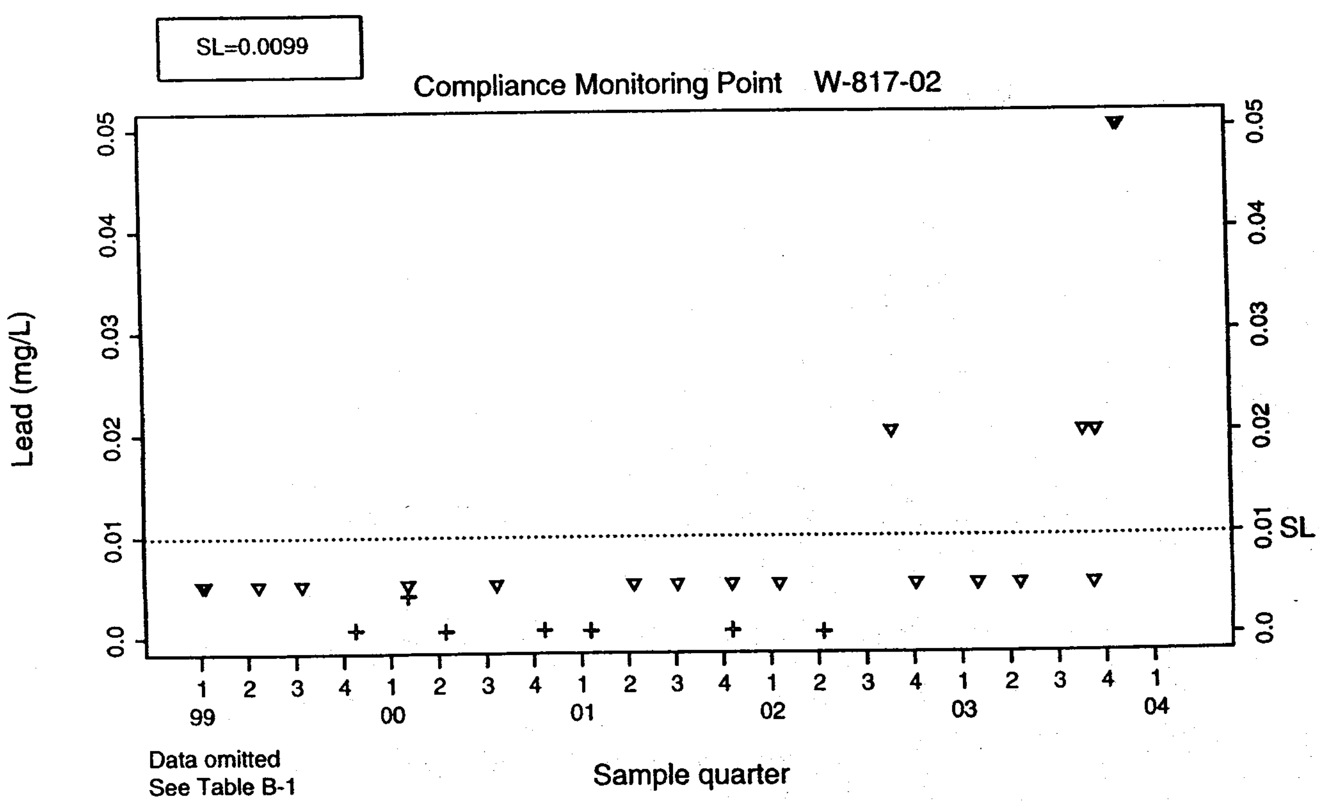
Surface Impoundments Ground Water
Copper (mg/L)



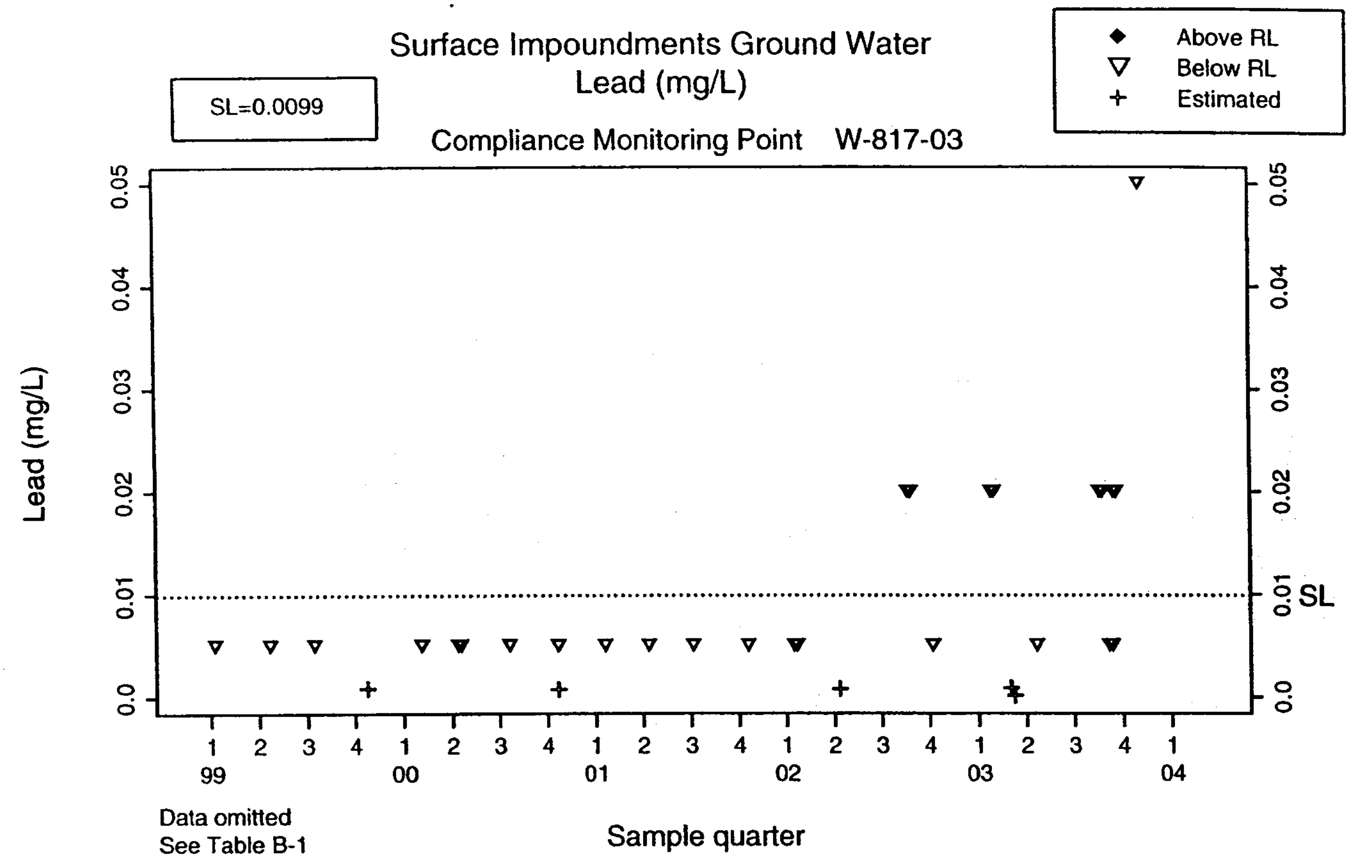


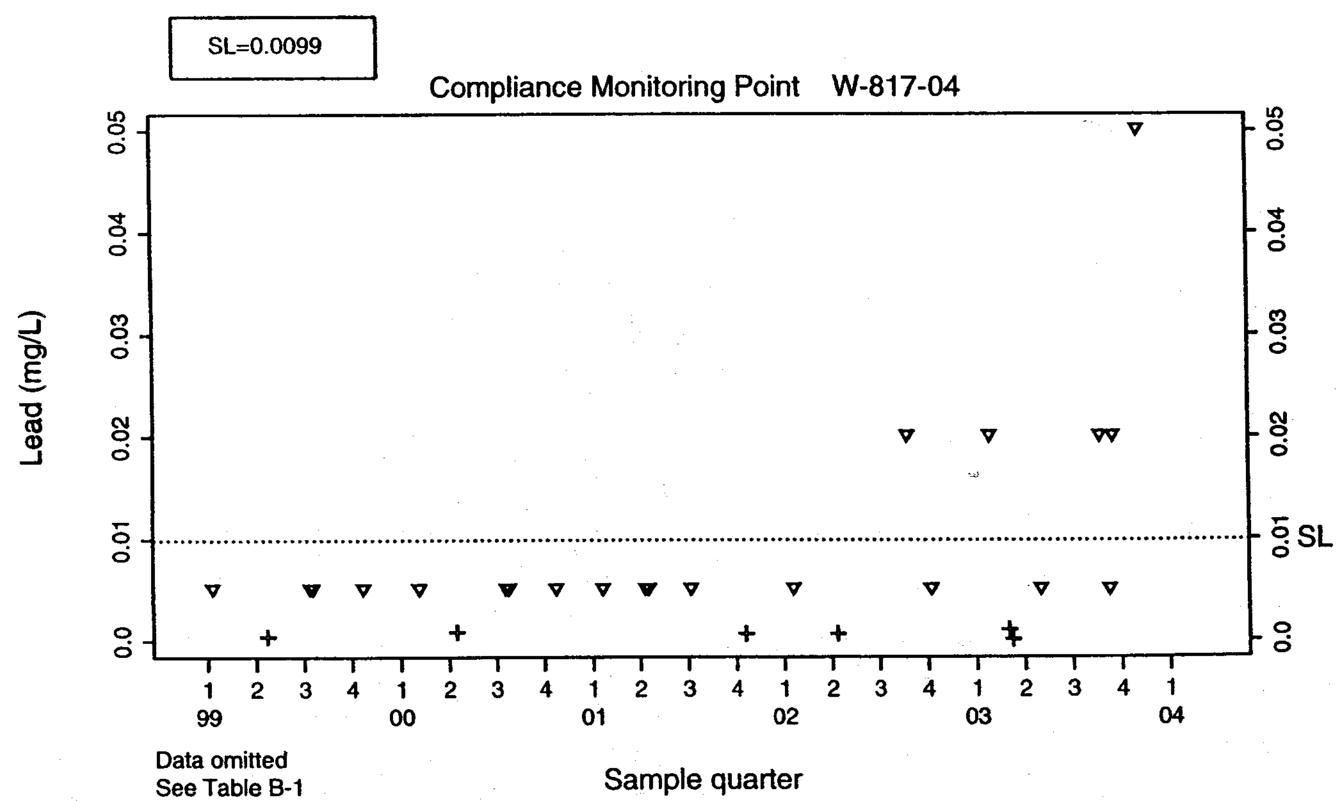
Surface Impoundments Ground Water
Lead (mg/L)



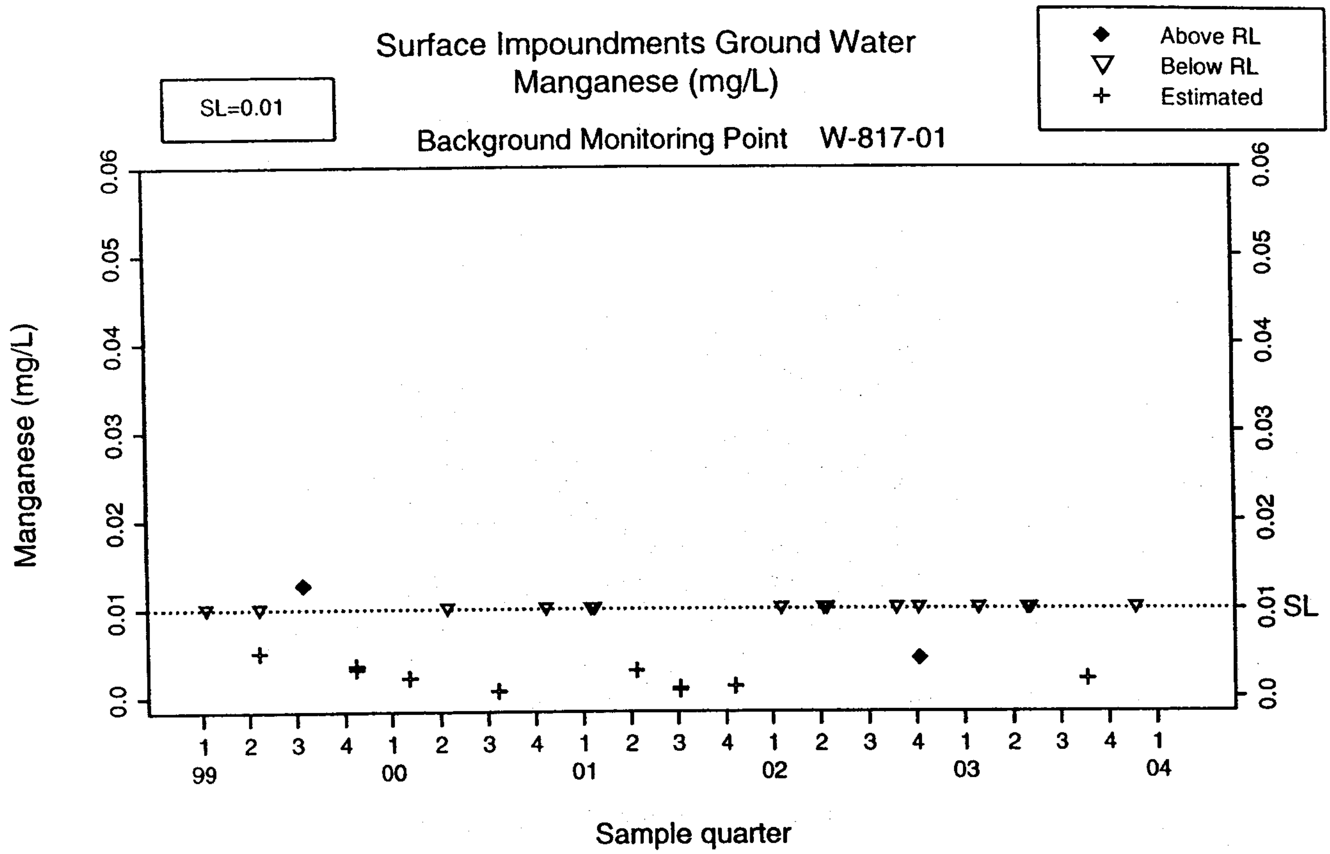


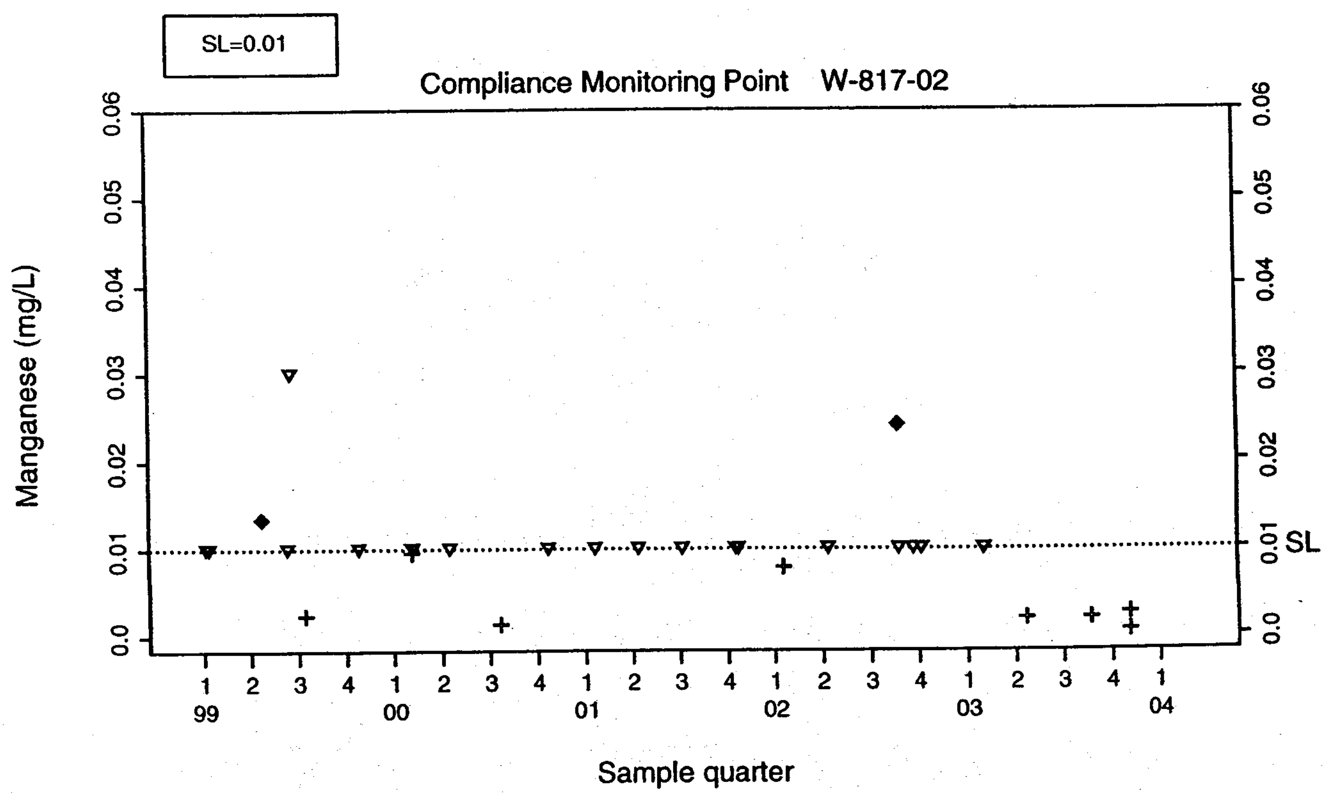
Surface Impoundments Ground Water
Lead (mg/L)

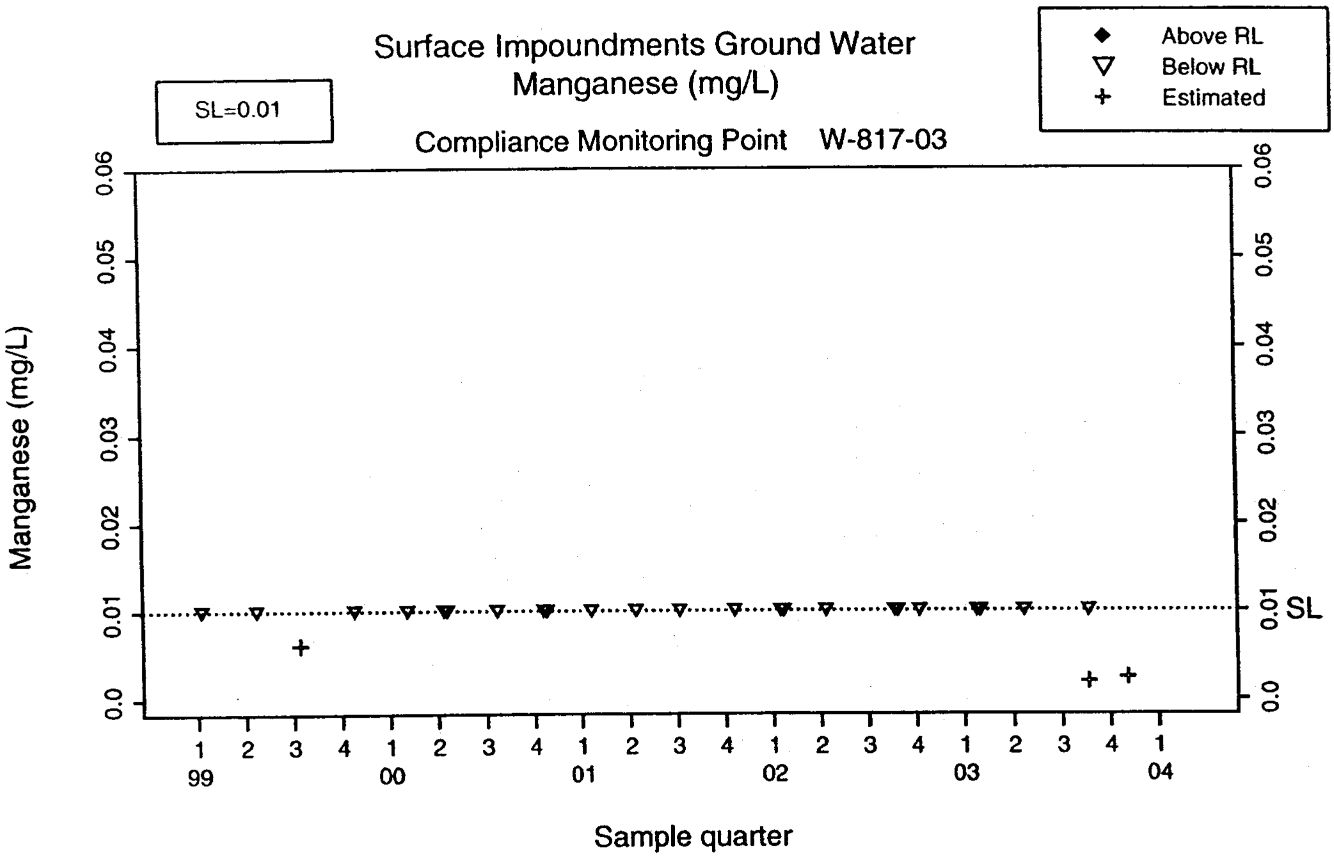


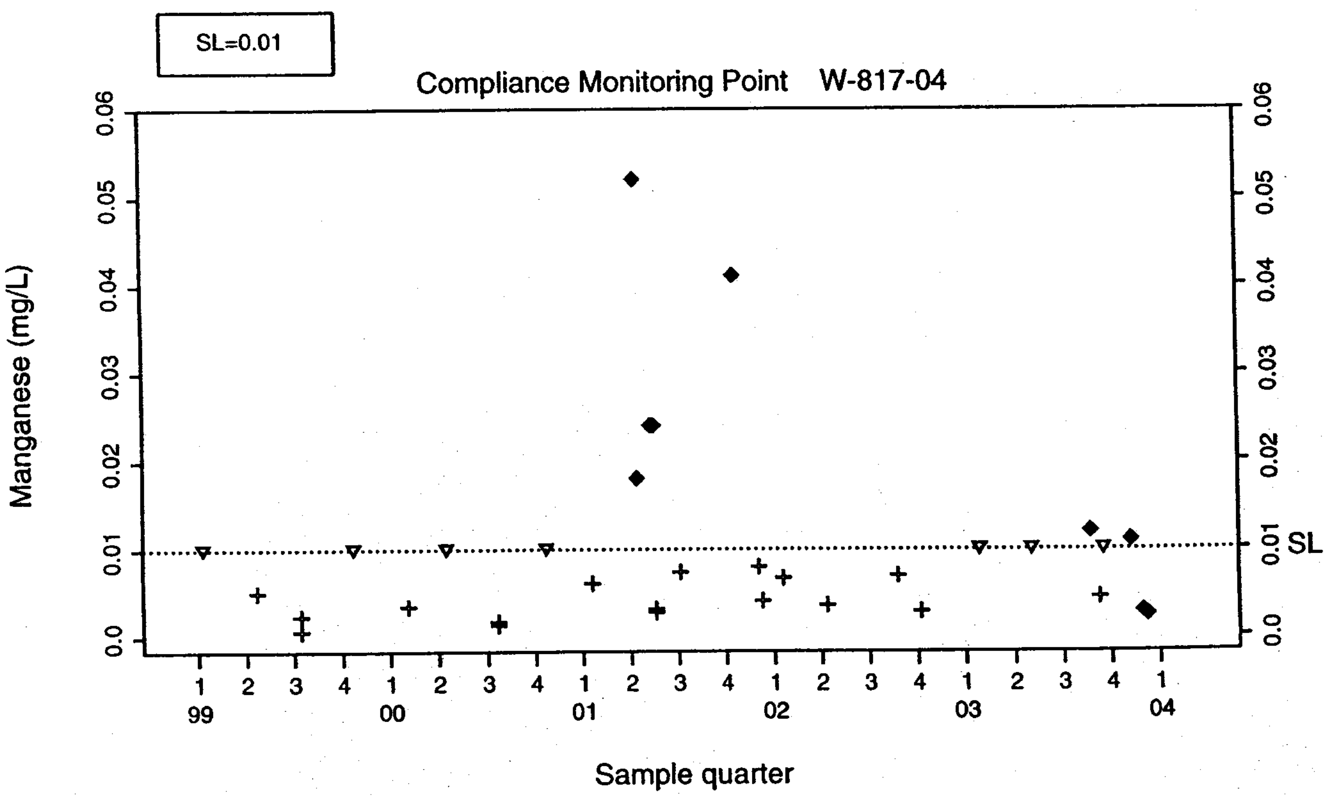


Surface Impoundments Ground Water Manganese (mg/L)

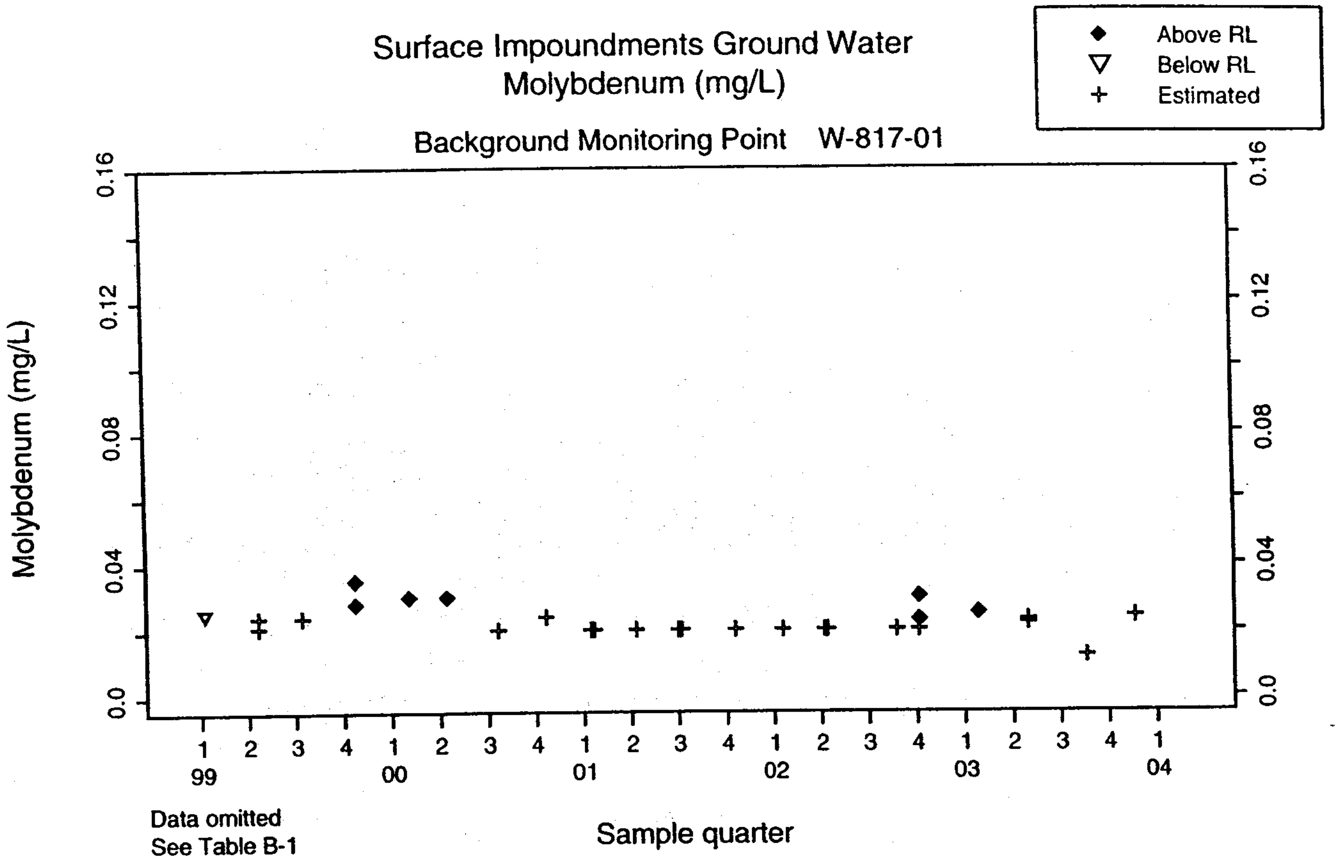


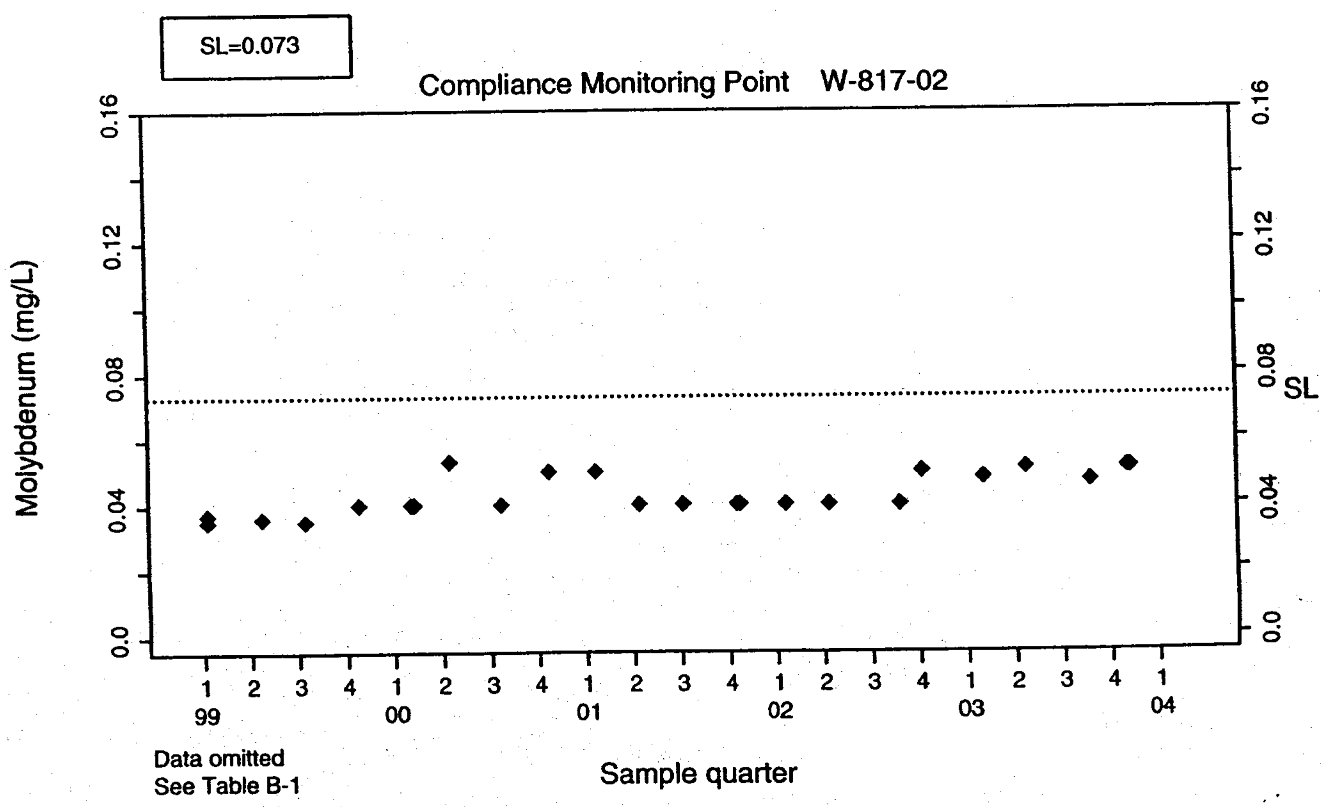


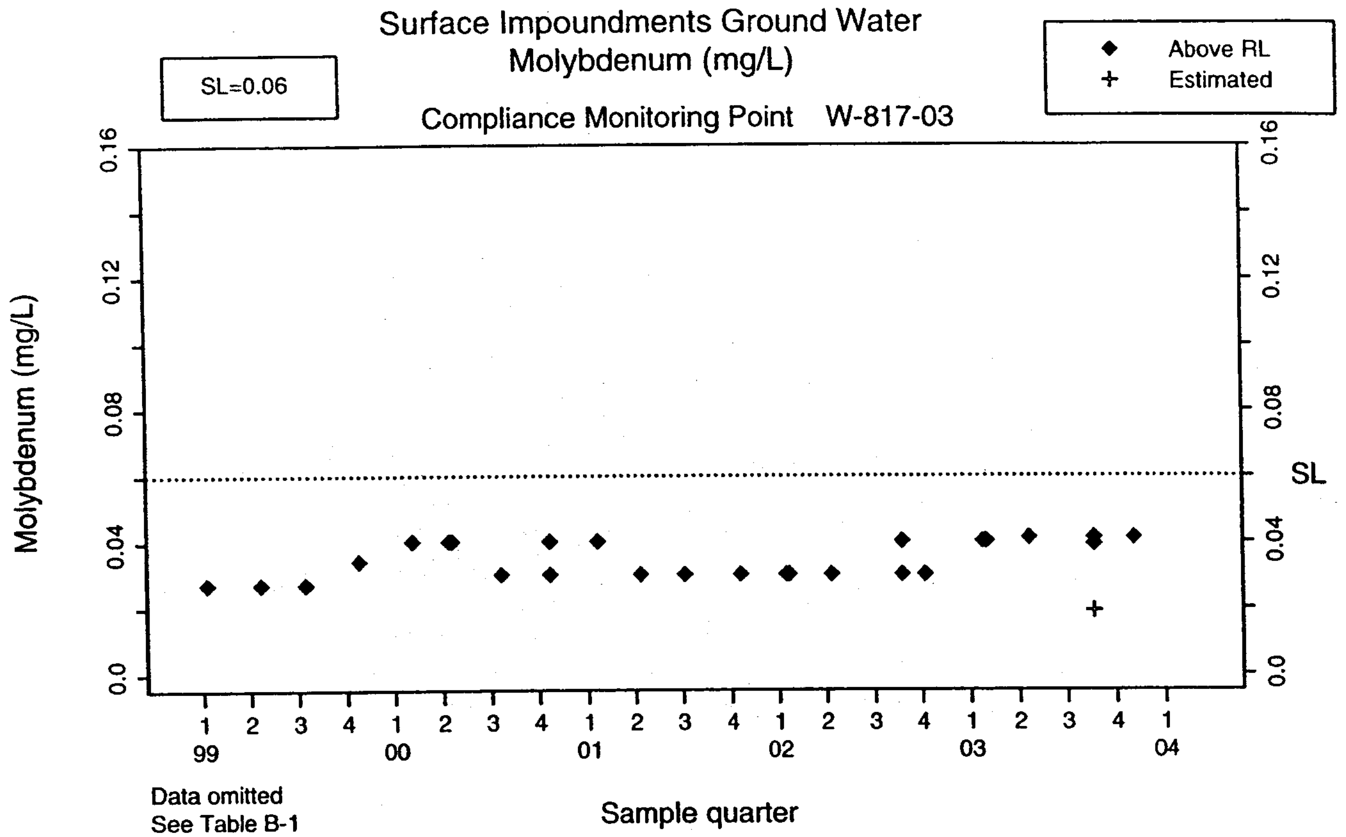

Surface Impoundments Ground Water
Manganese (mg/L)
Above RL
Below RL
Estimated
SL=0.01
Compliance Monitoring Point W-817-03
Manganese (mg/L)
0.0
0.01
0.02
0.03
0.04
0.05
0.06
SL
1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1
99
00
01
02
03
04
Sample quarter

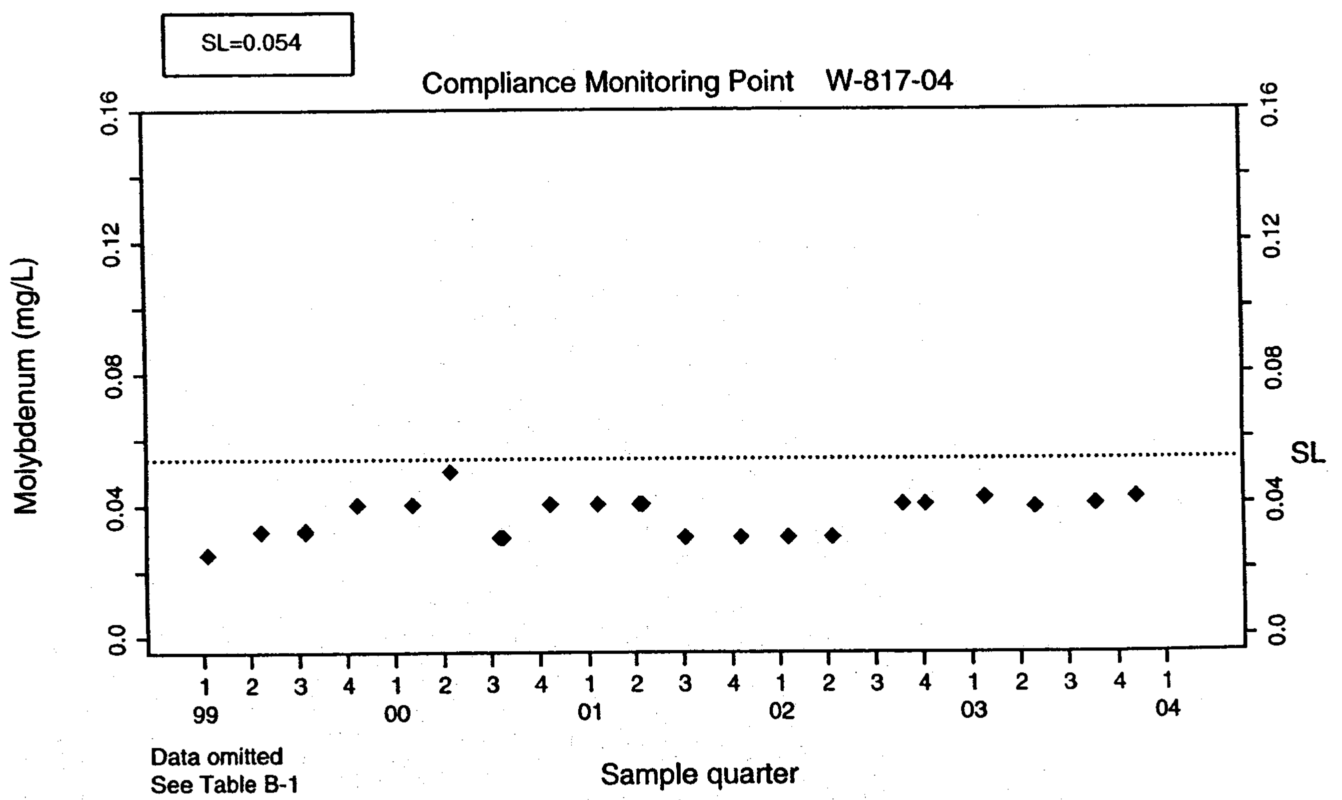

SL=0.01
Compliance Monitoring Point W-817-04
Manganese (mg/L)
0.0
0.01
0.02
0.03
0.04
0.05
0.06
SL
1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1
99
00
01
02
03
04
Sample quarter

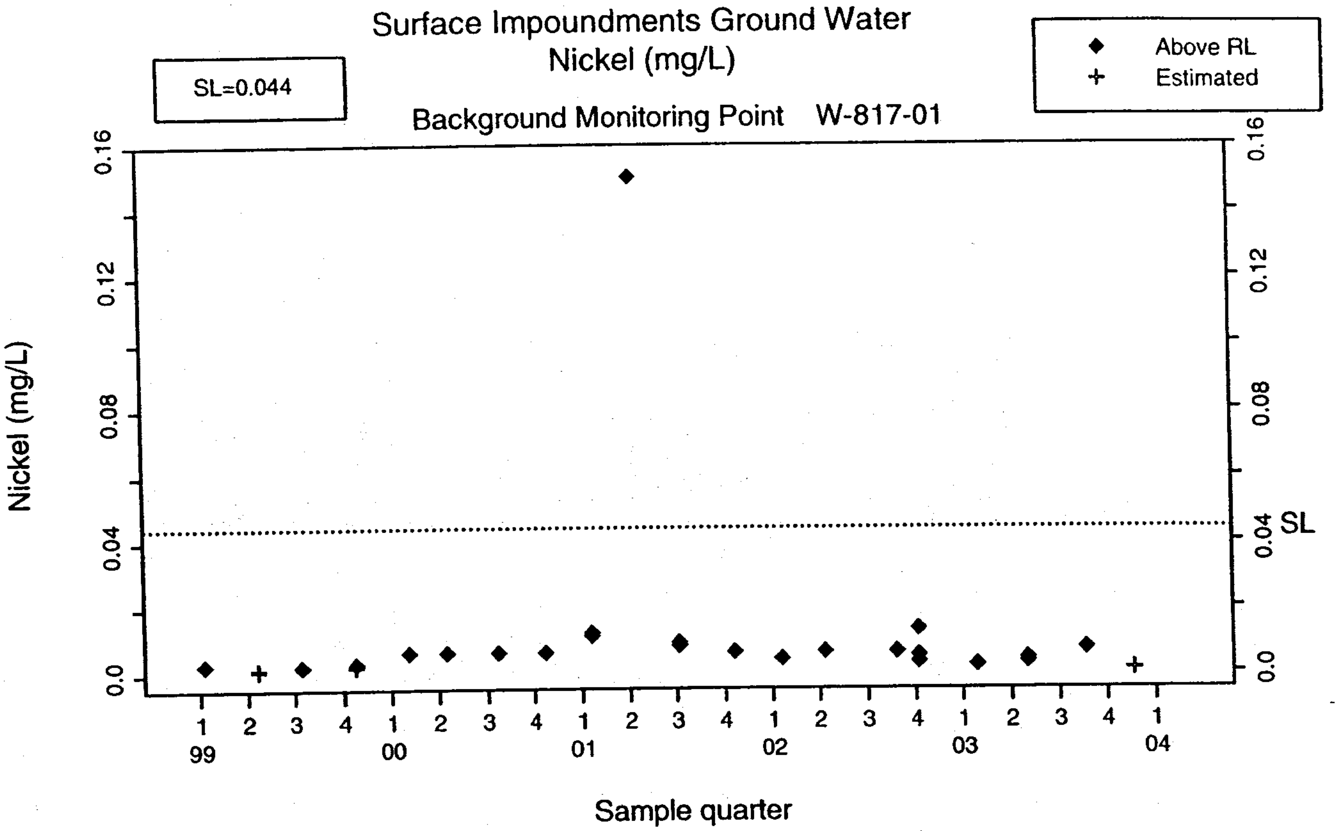
Surface Impoundments Ground Water
Molybdenum (mg/L)

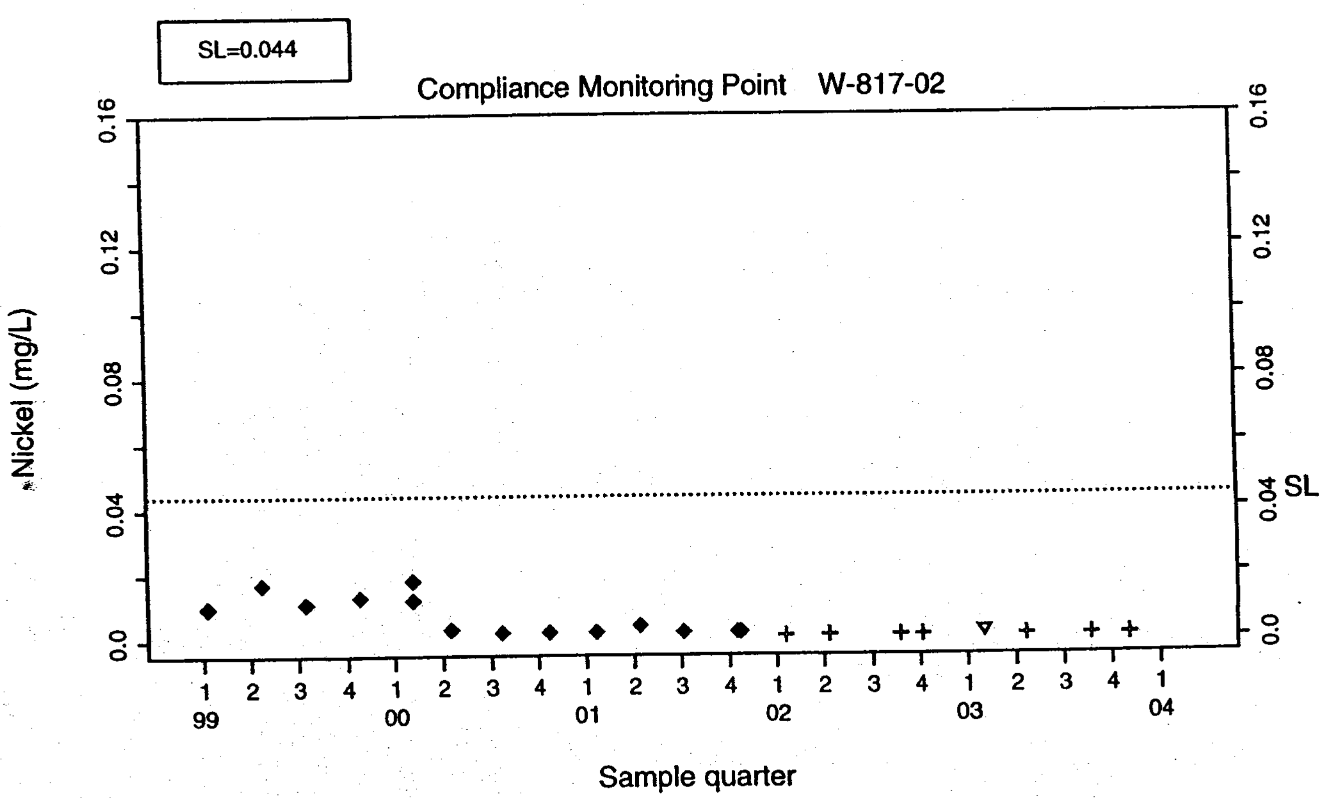




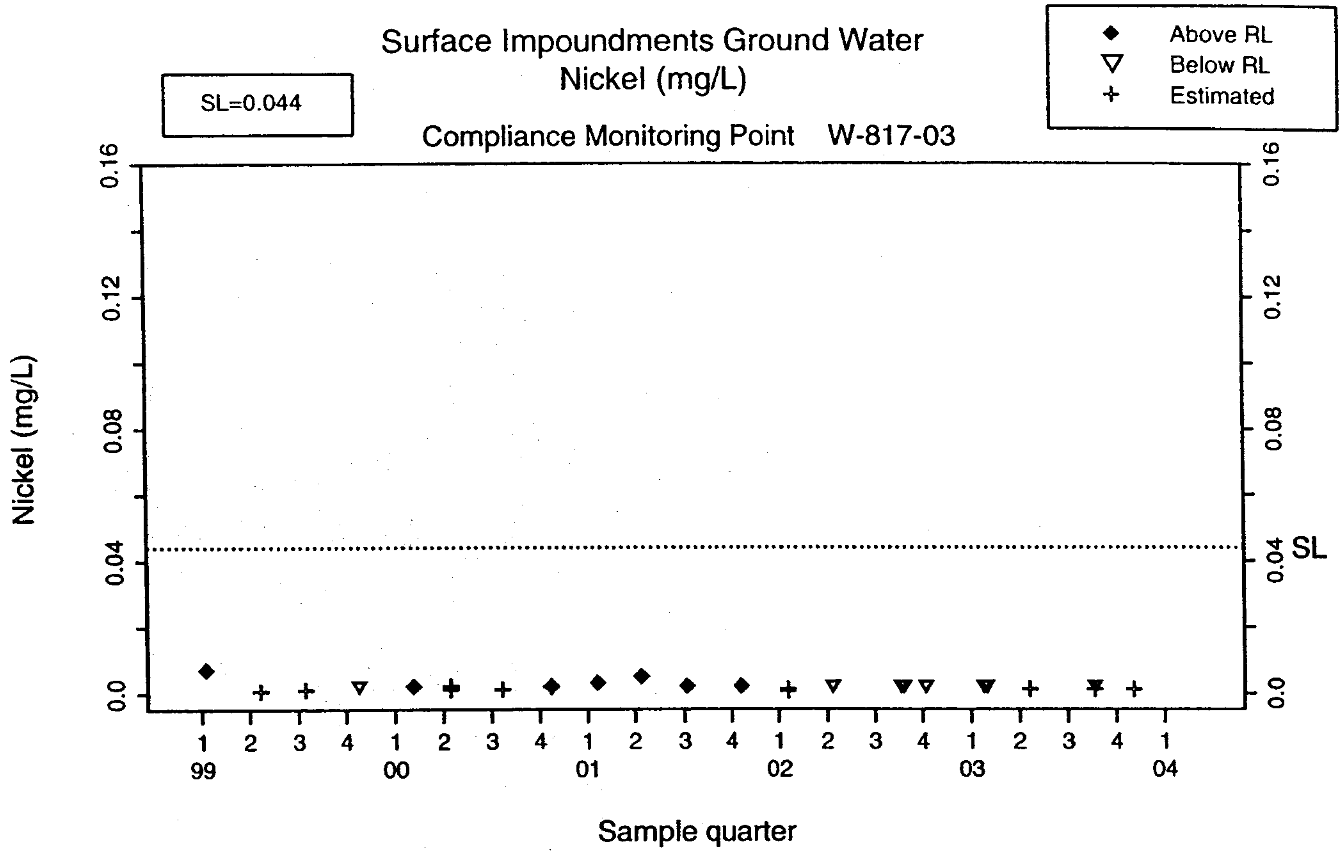

Surface Impoundments Ground Water
Molybdenum (mg/L)
SL=0.06
Above RL
Estimated
Compliance Monitoring Point W-817-03
Molybdenum (mg/L)
0.0
0.04
0.08
0.12
0.16
SL
1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1
99 00 01 02 03 04
Data omitted
See Table B-1
Sample quarter

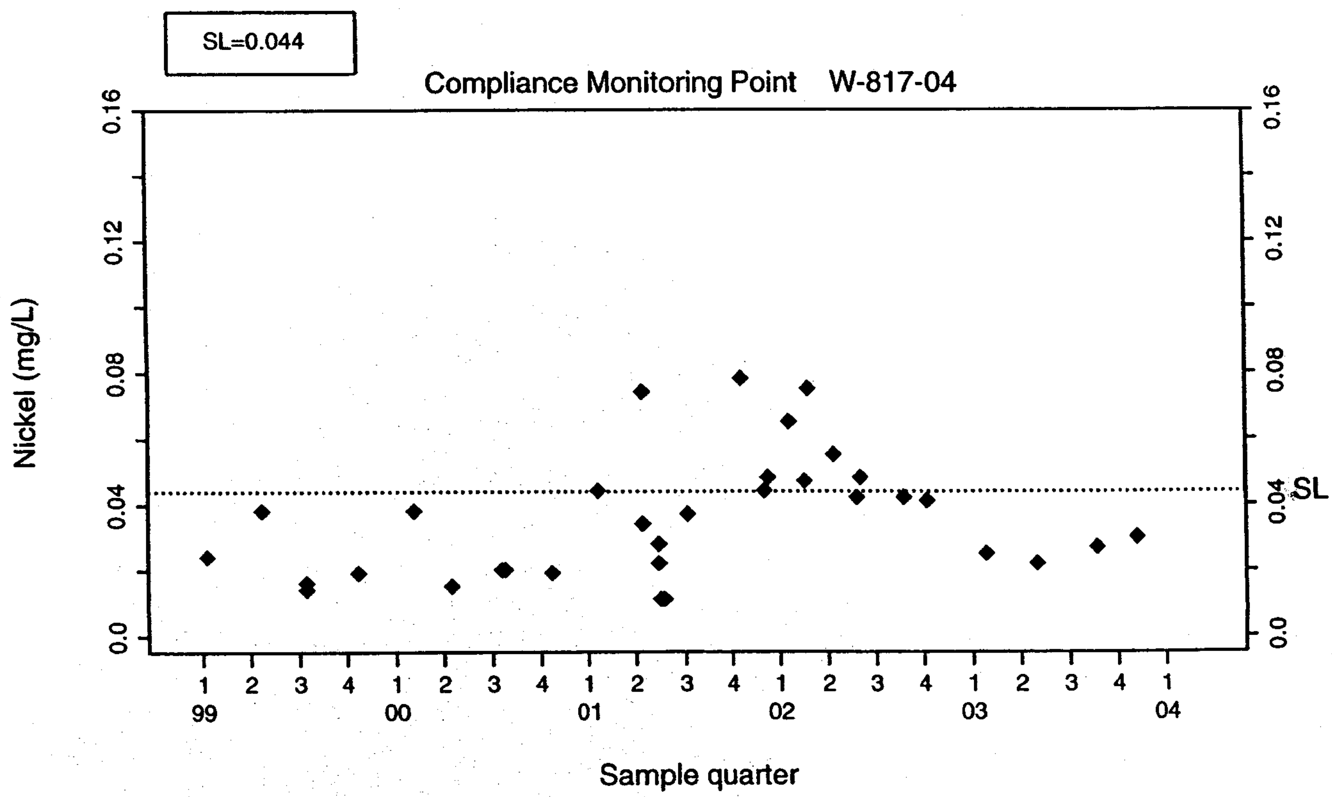

SL=0.054
Compliance Monitoring Point W-817-04
Molybdenum (mg/L)
0.0
0.04
0.08
0.12
0.16
SL
1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1
99 00 01 02 03 04
Data omitted
See Table B-1
Sample quarter


Surface Impoundments Ground Water
Nickel (mg/L)
SL=0.044
Above RL
Estimated
Background Monitoring Point W-817-01
Nickel (mg/L)
0.0
0.04
0.08
0.12
0.16
SL
1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1
99 00 01 02 03 04
Sample quarter

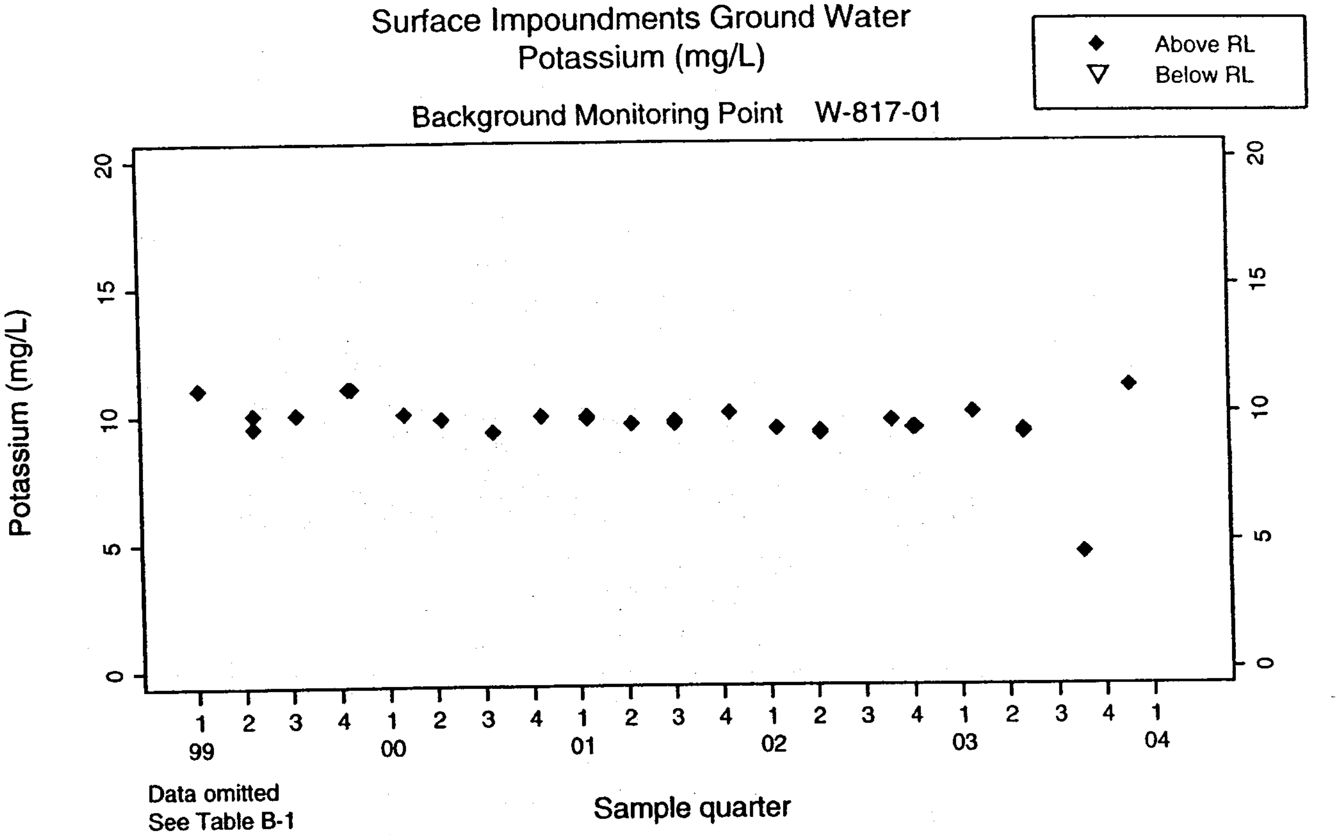

SL=0.044
Compliance Monitoring Point W-817-02
Nickel (mg/L)
0.0
0.04
0.08
0.12
0.16
SL
1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1
99 00 01 02 03 04
Sample quarter

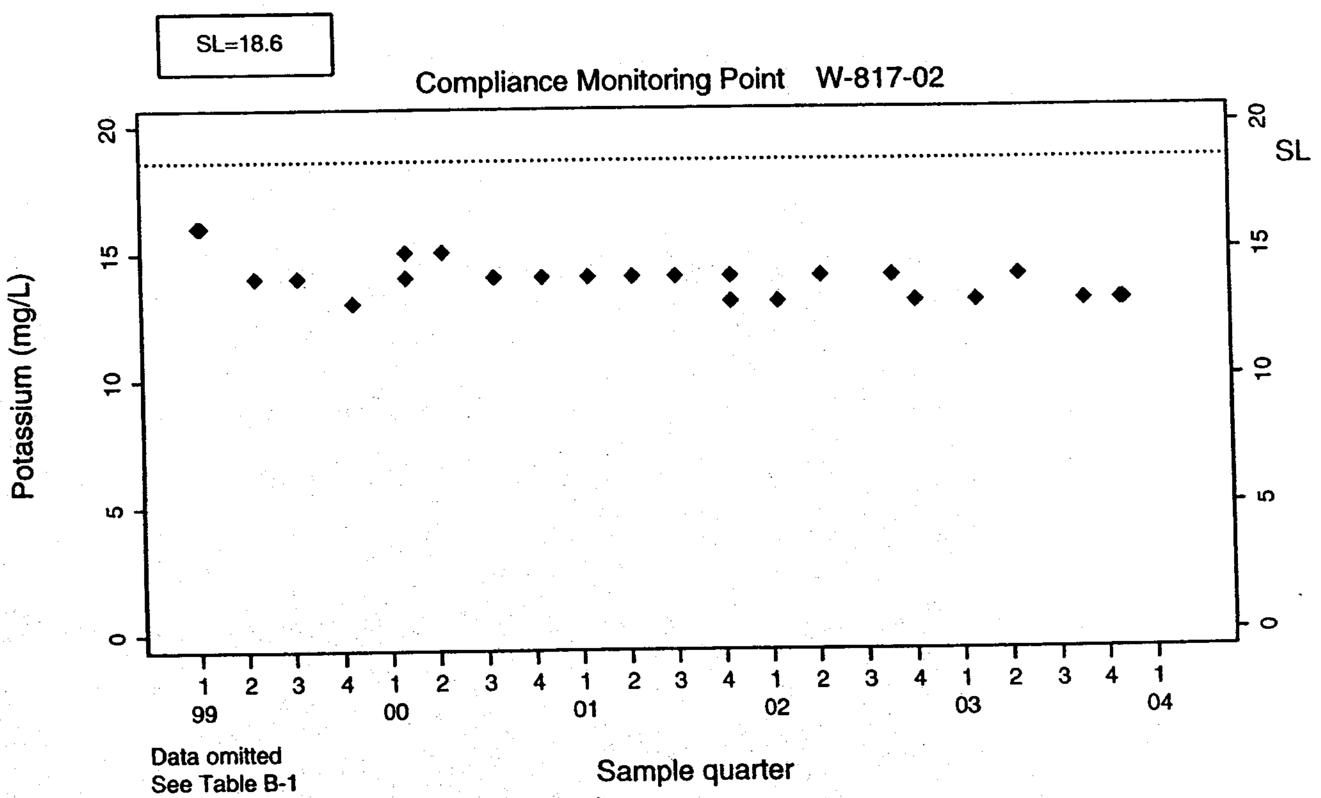
Surface Impoundments Ground Water
Nickel (mg/L)

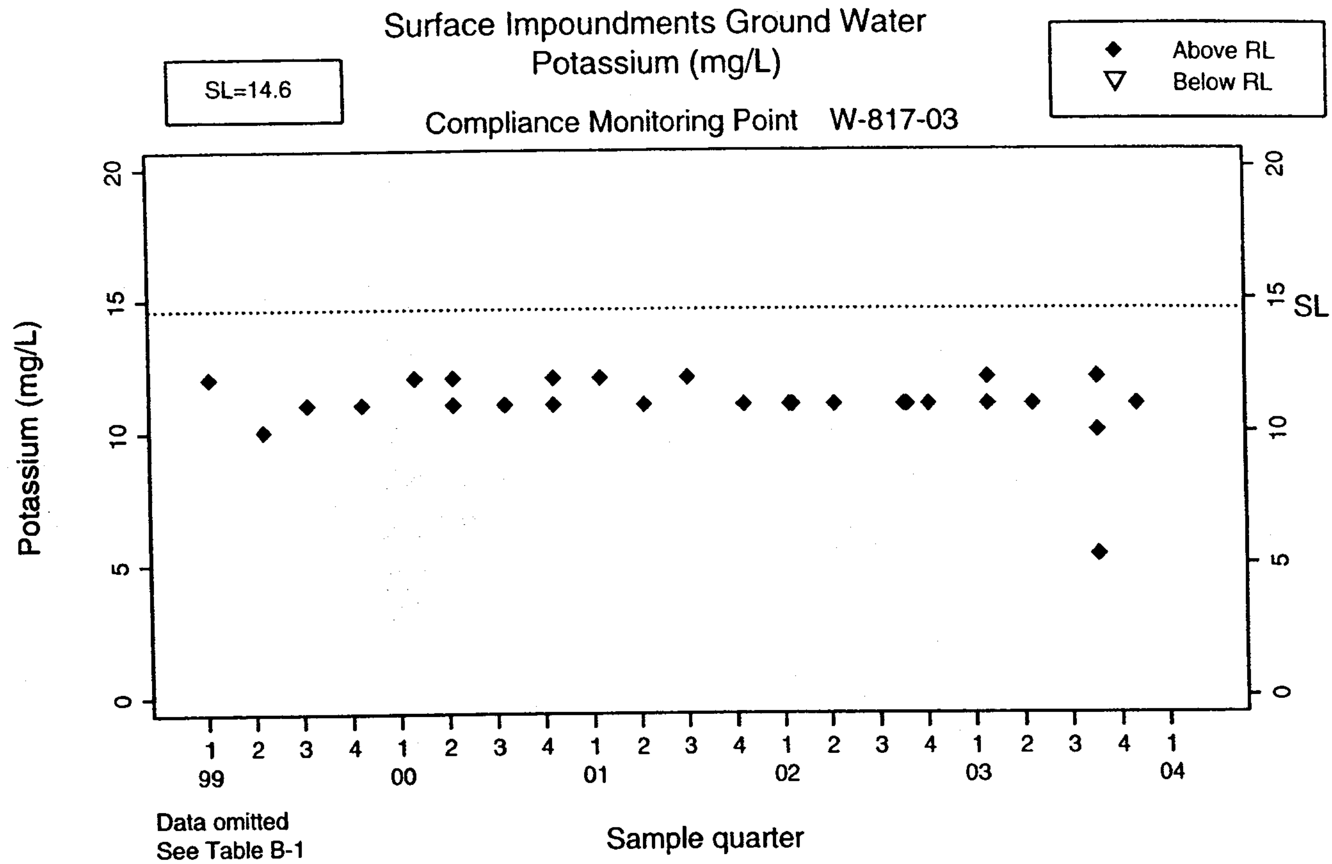


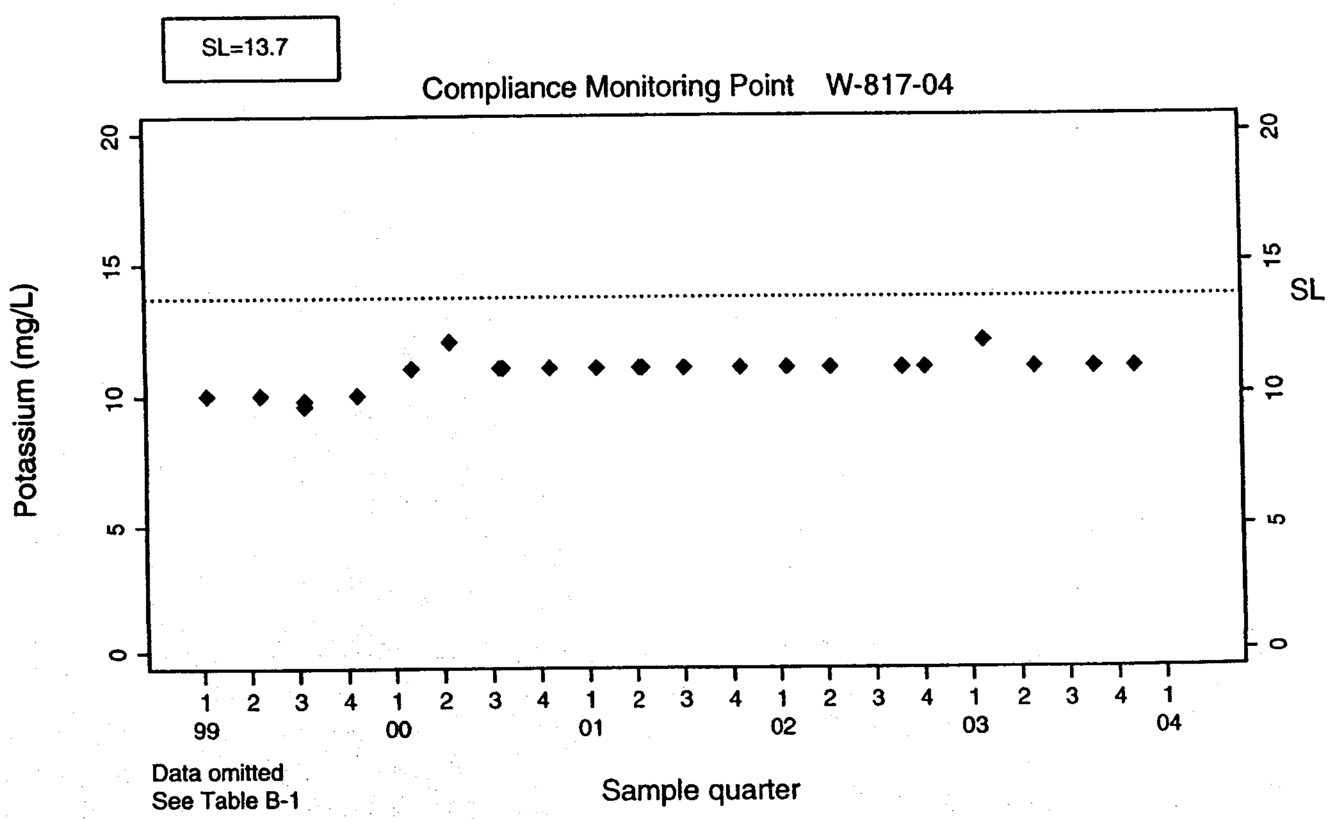


Surface Impoundments Ground Water
Potassium (mg/L)

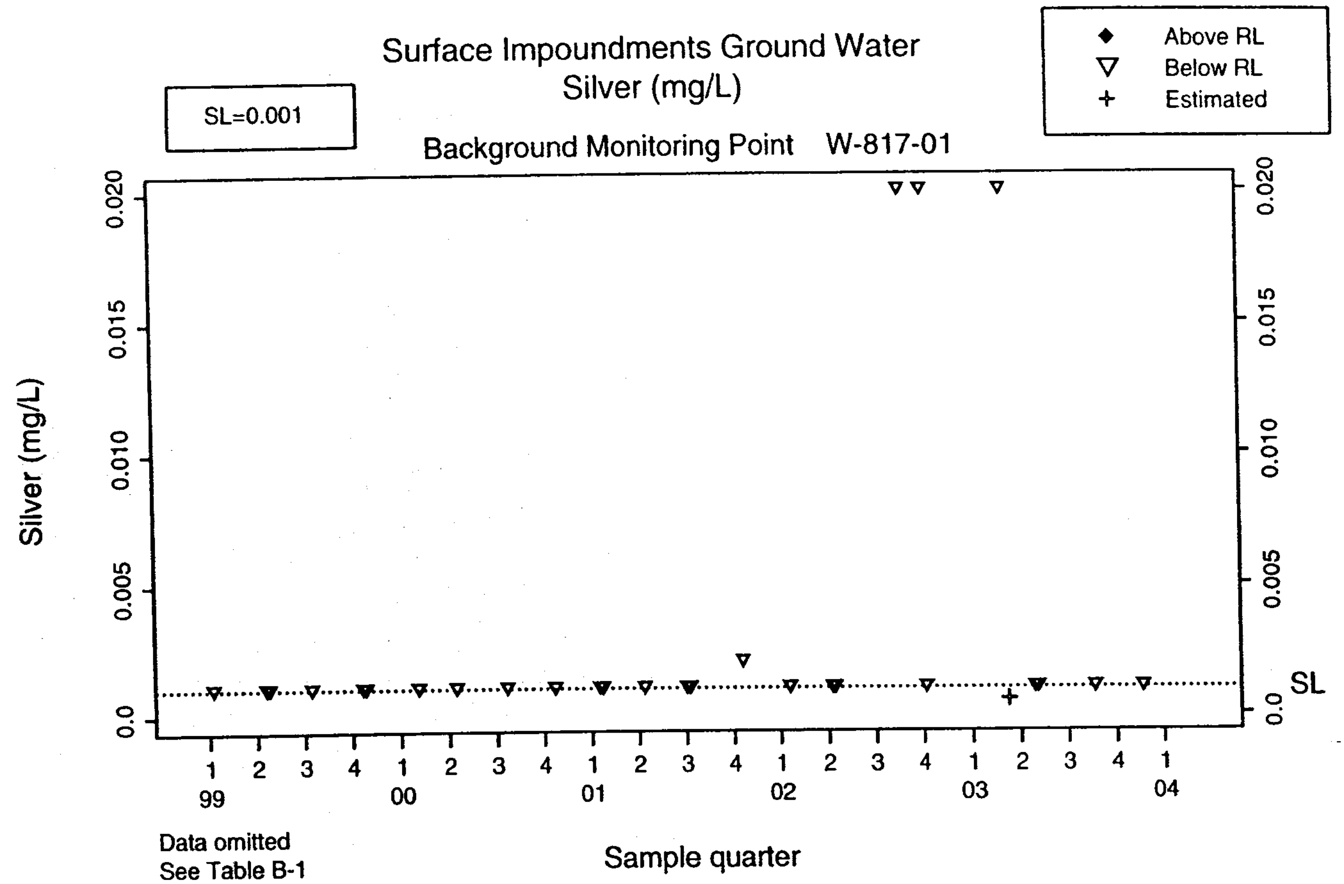


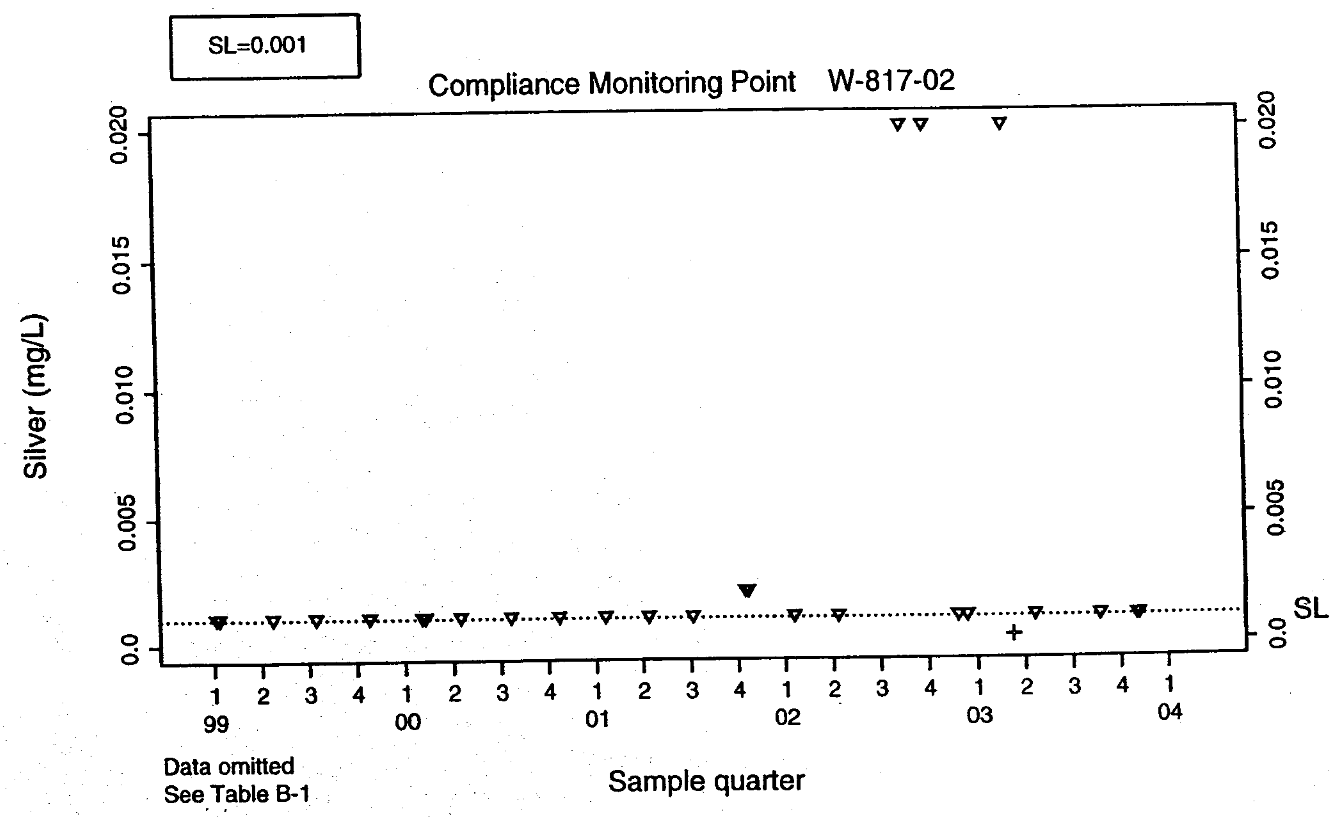



Surface Impoundments Ground Water
Potassium (mg/L)
SL=14.6
Above RL
Below RL
Compliance Monitoring Point W-817-03
Potassium (mg/L)
0
5
10
15
20
SL
1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1
99 00 01 02 03 04
Data omitted
See Table B-1
Sample quarter

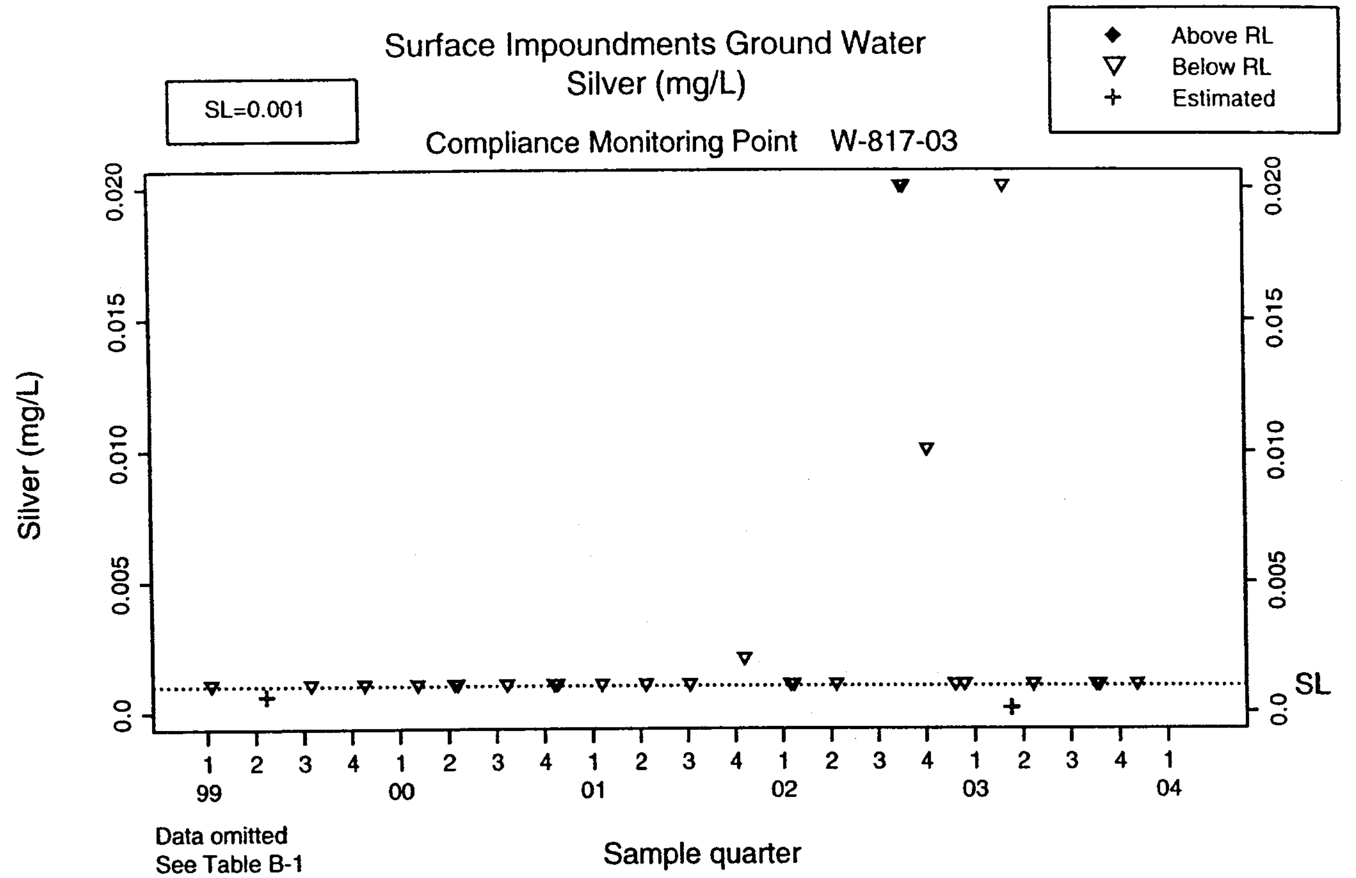

SL=13.7
Compliance Monitoring Point W-817-04
Potassium (mg/L)
0
5
10
15
20
SL
1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1
99 00 01 02 03 04
Data omitted
See Table B-1
Sample quarter

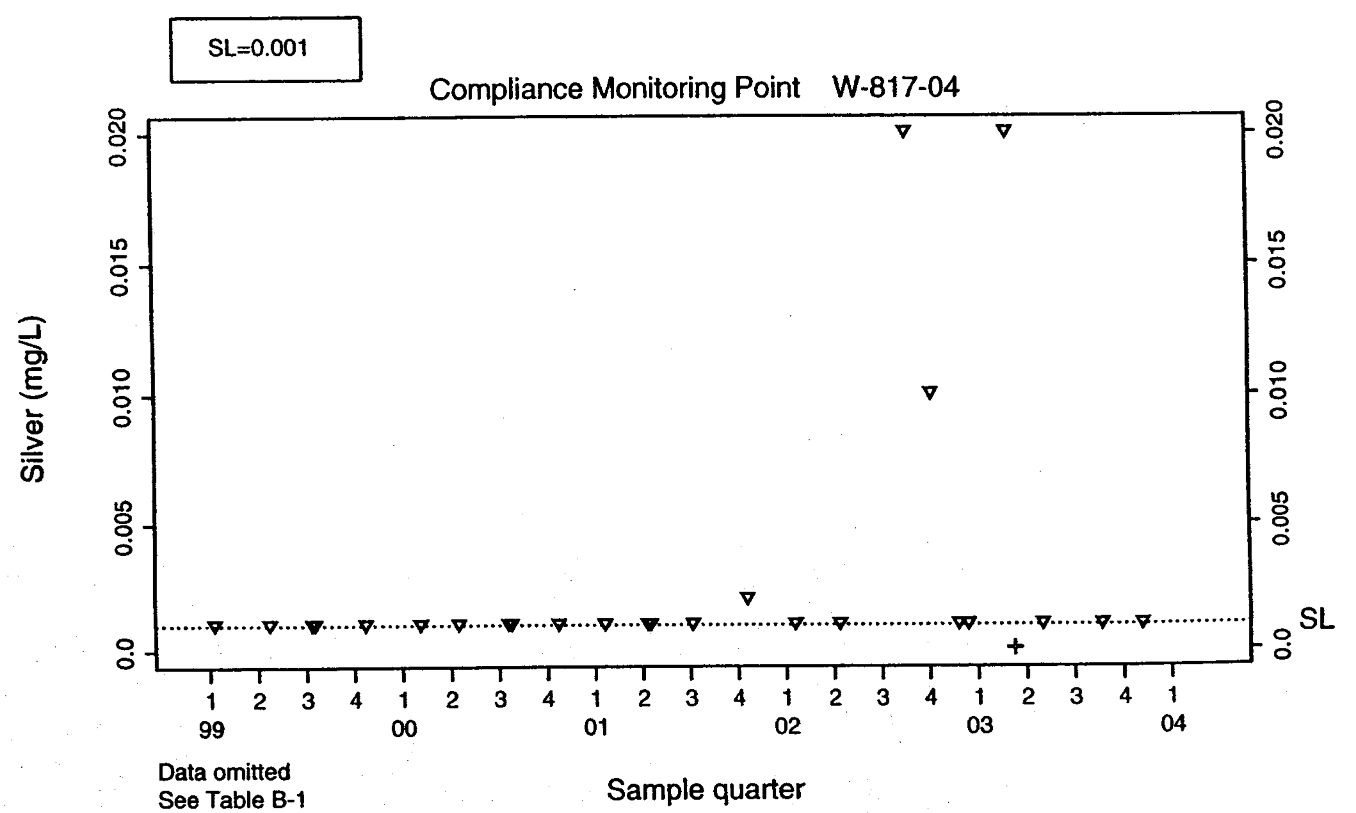
Surface Impoundments Ground Water
Silver (mg/L)



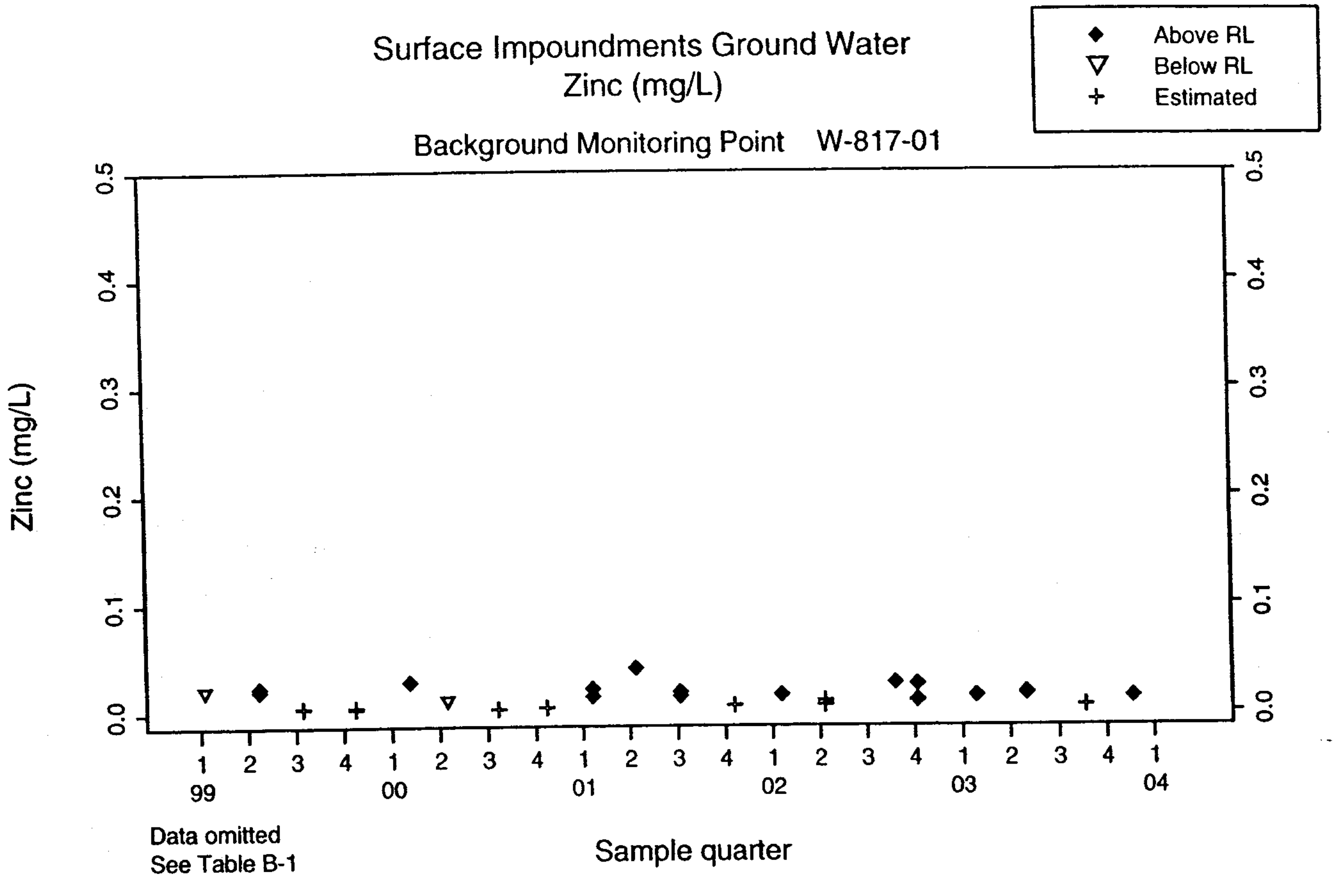


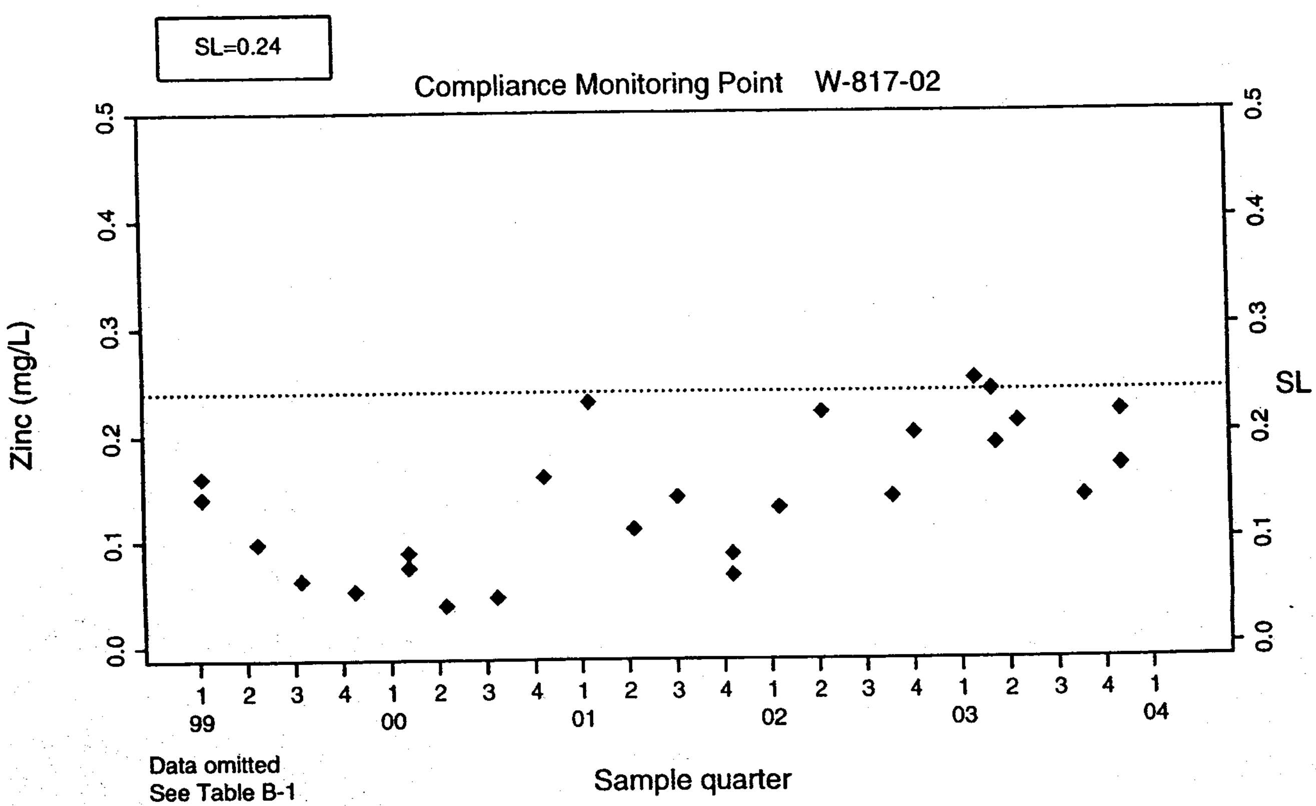
Surface Impoundments Ground Water
Silver (mg/L)



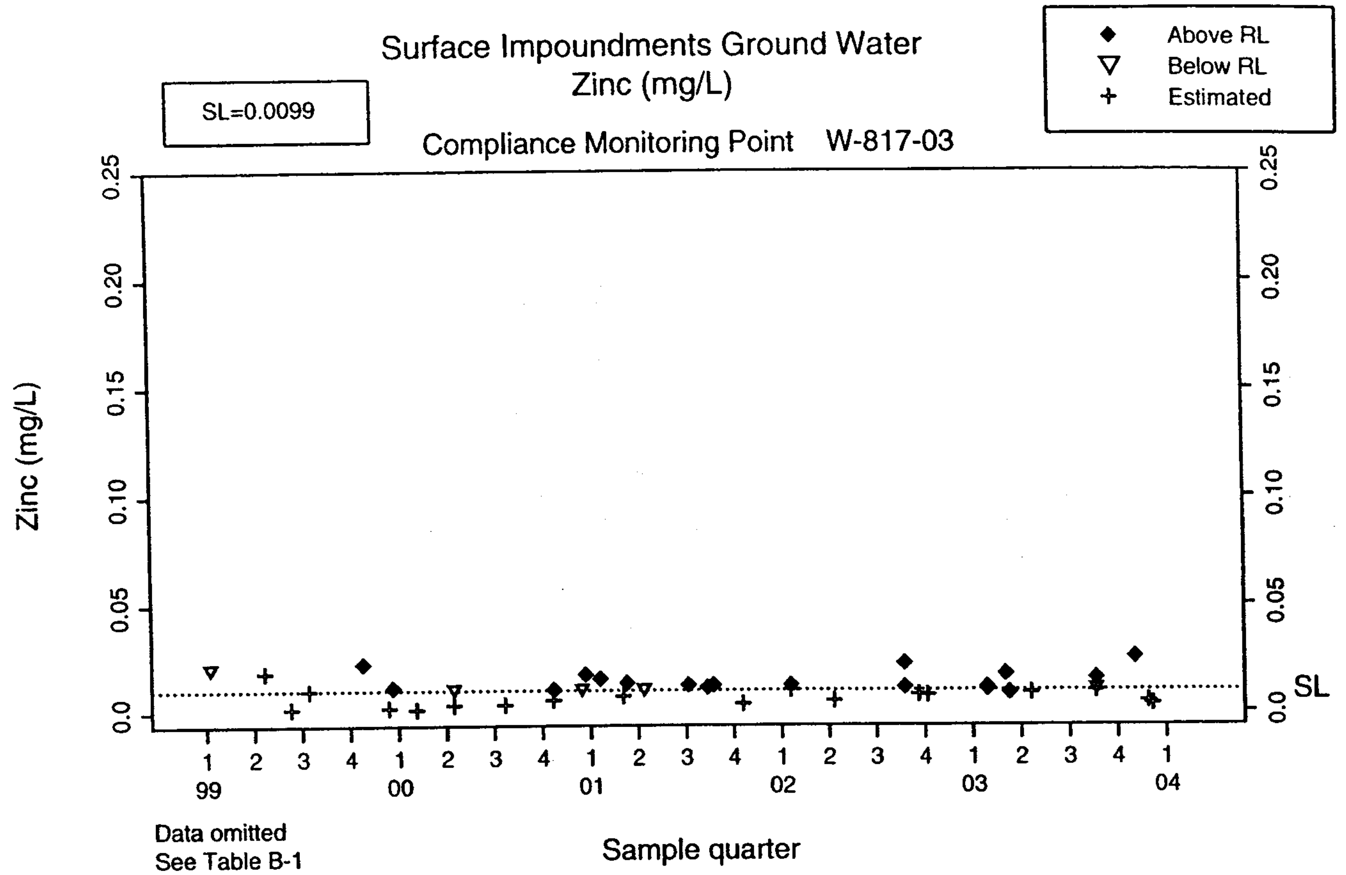


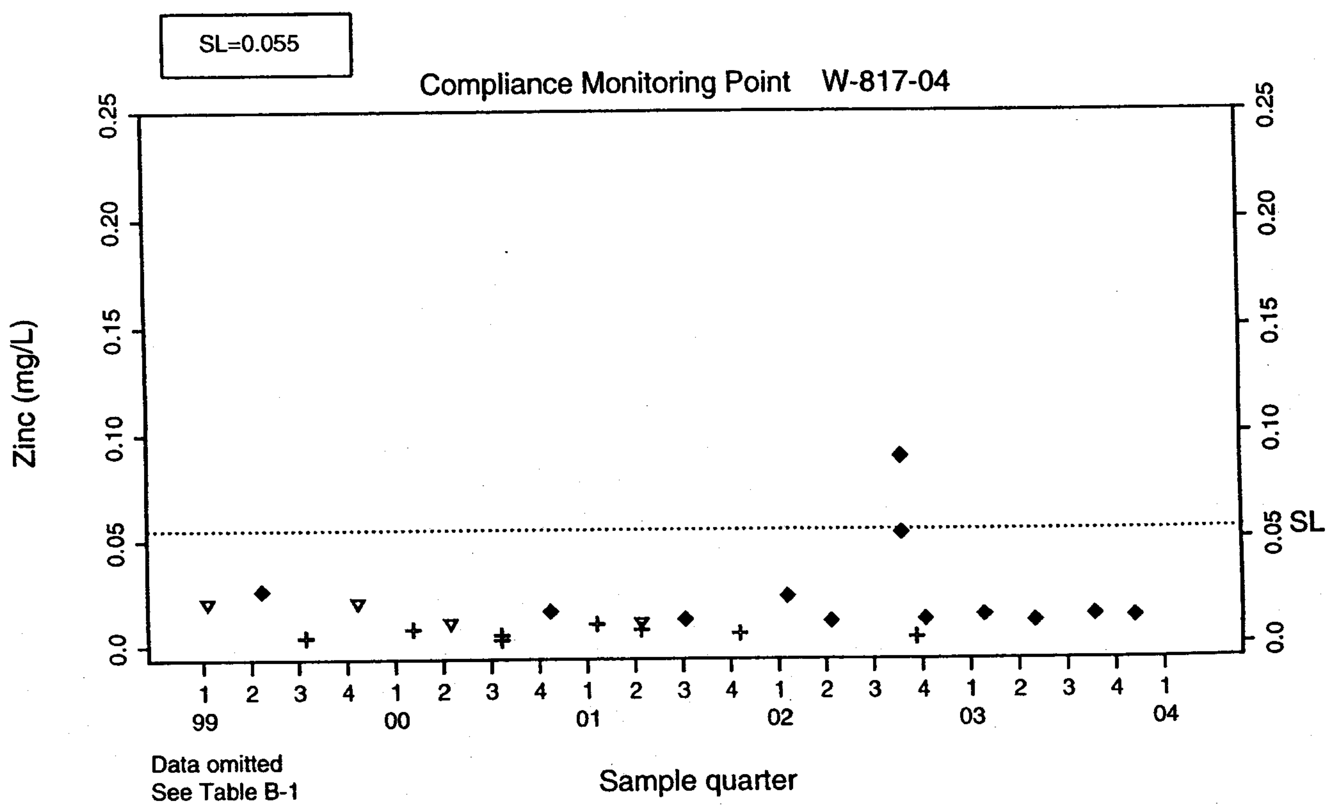
Surface Impoundments Ground Water
Zinc (mg/L)



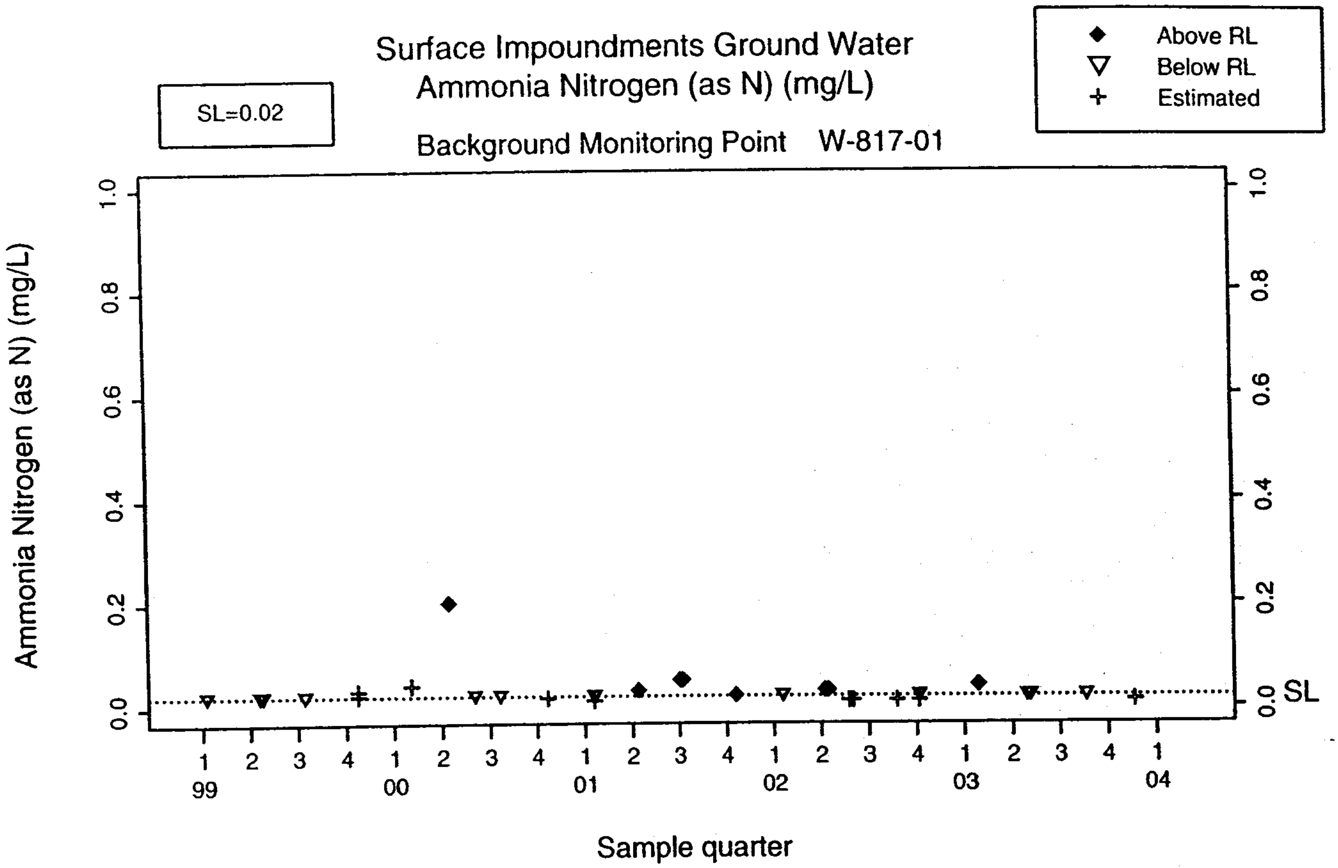


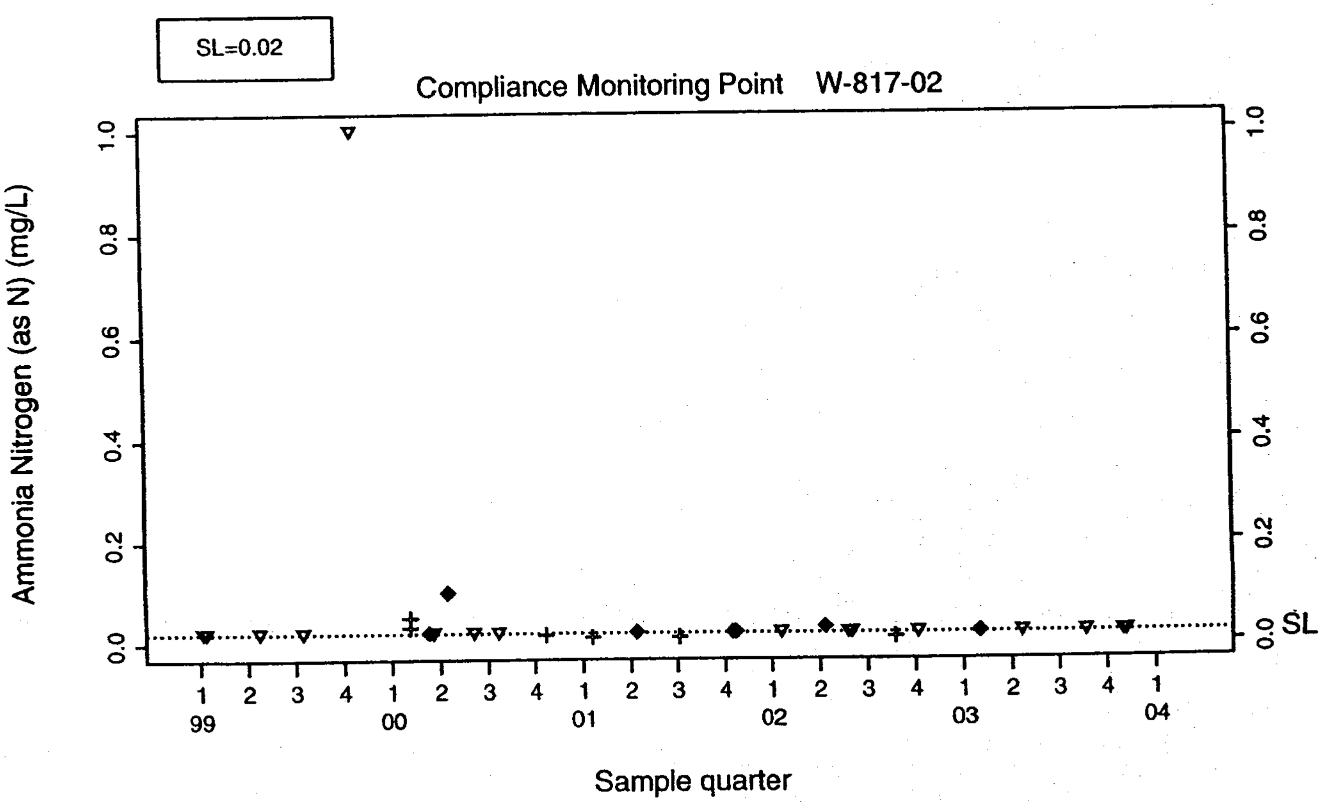
Surface Impoundments Ground Water
Zinc (mg/L)

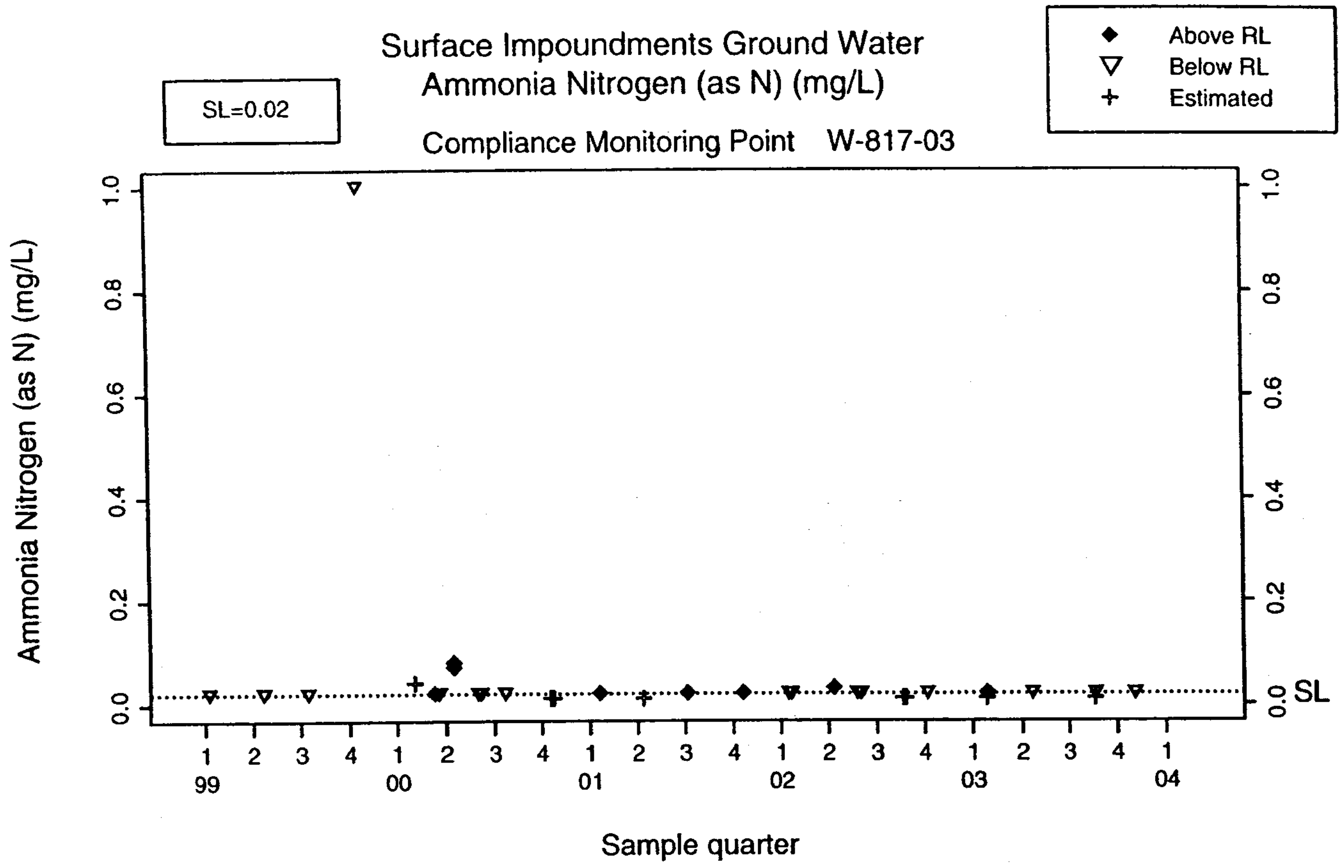


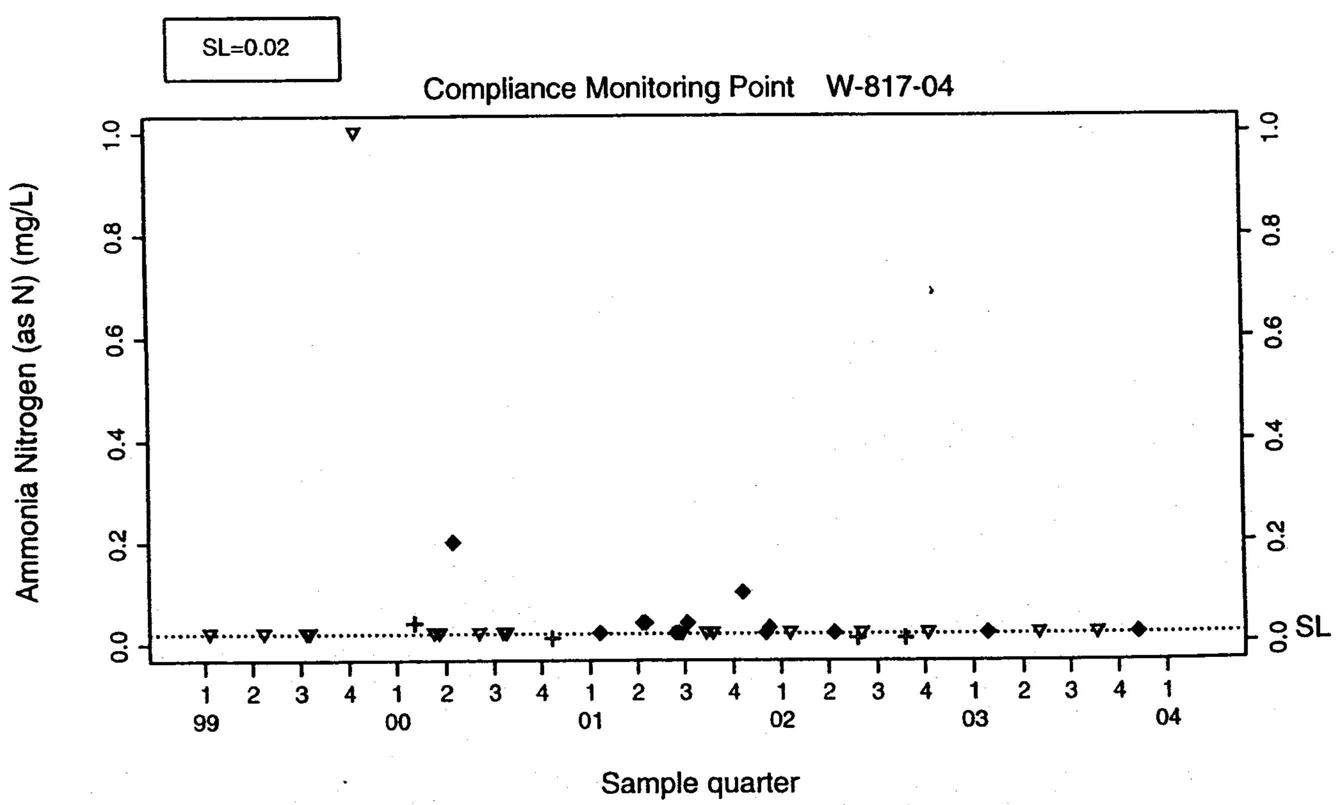


Surface Impoundments Ground Water
Ammonia Nitrogen (as N) (mg/L)

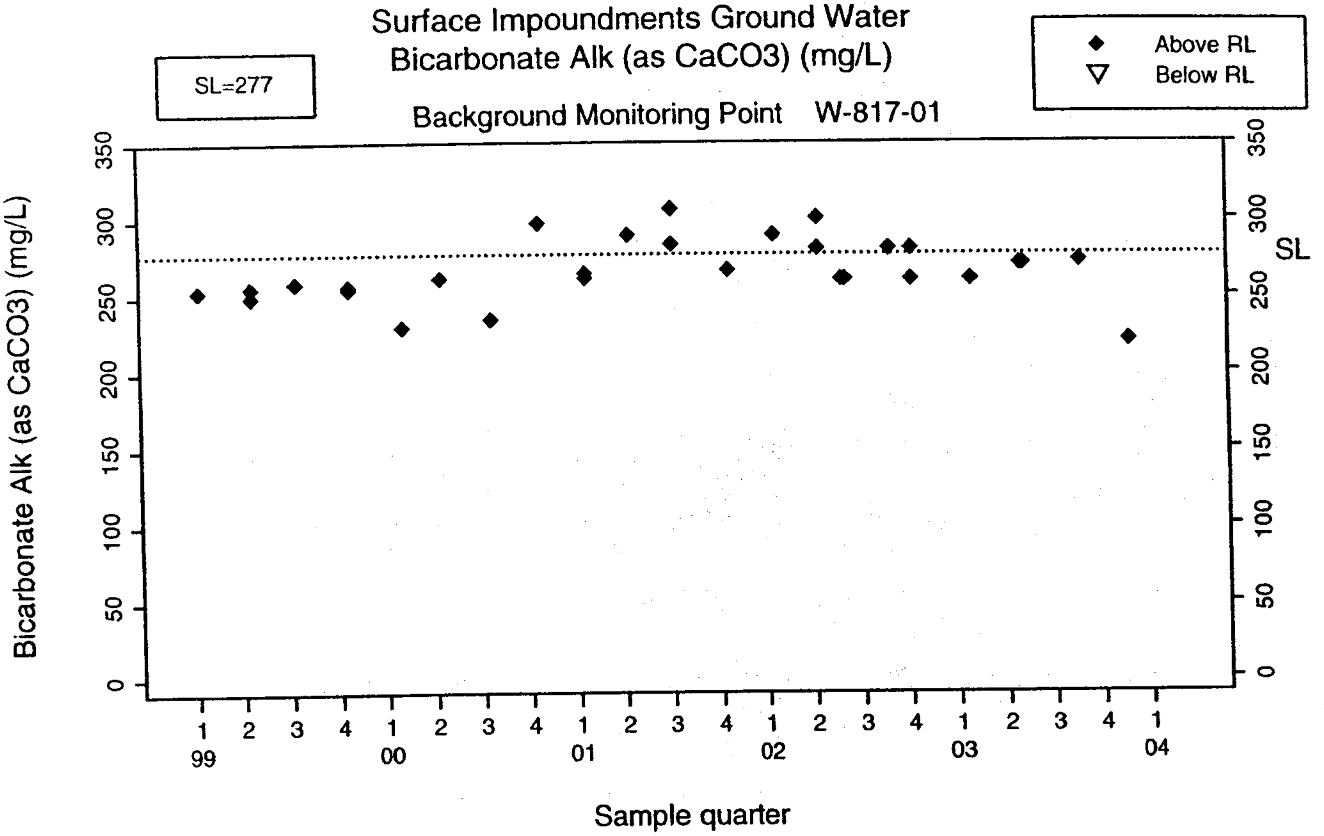


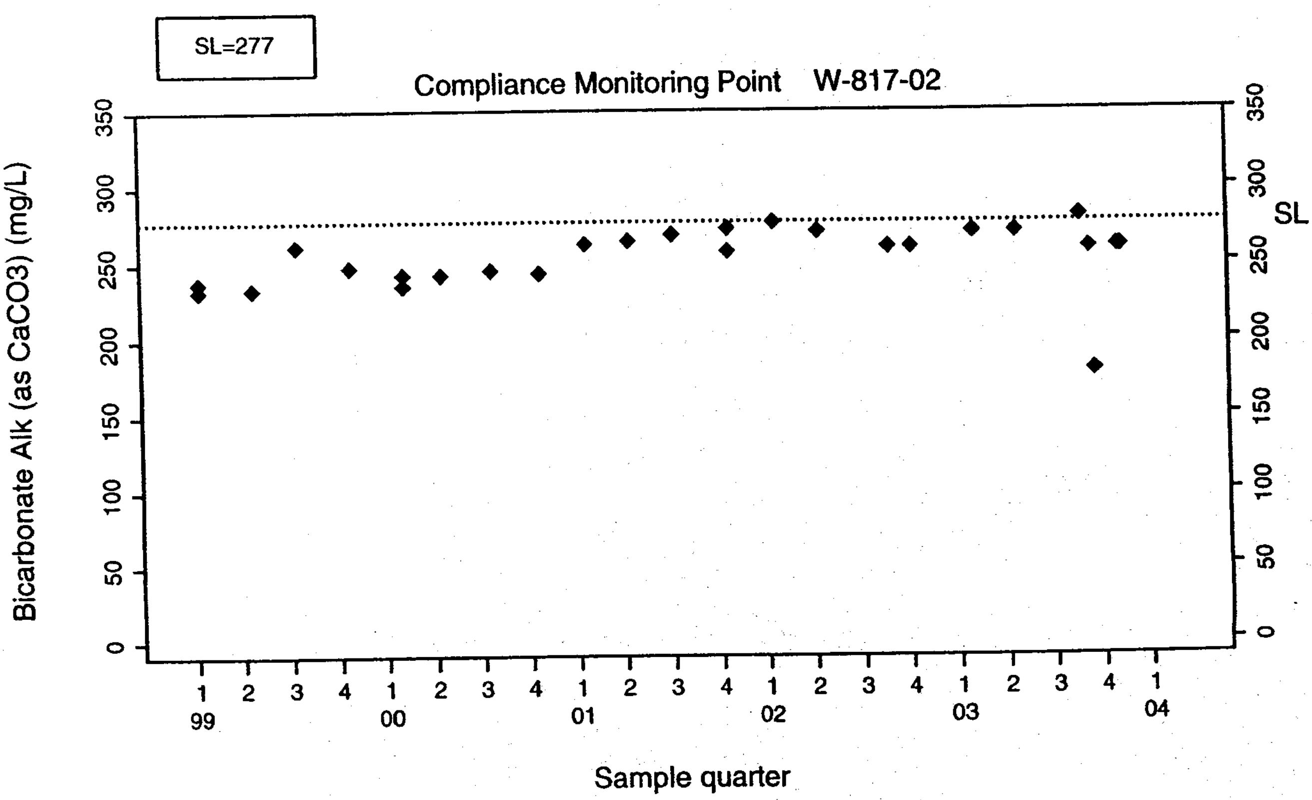


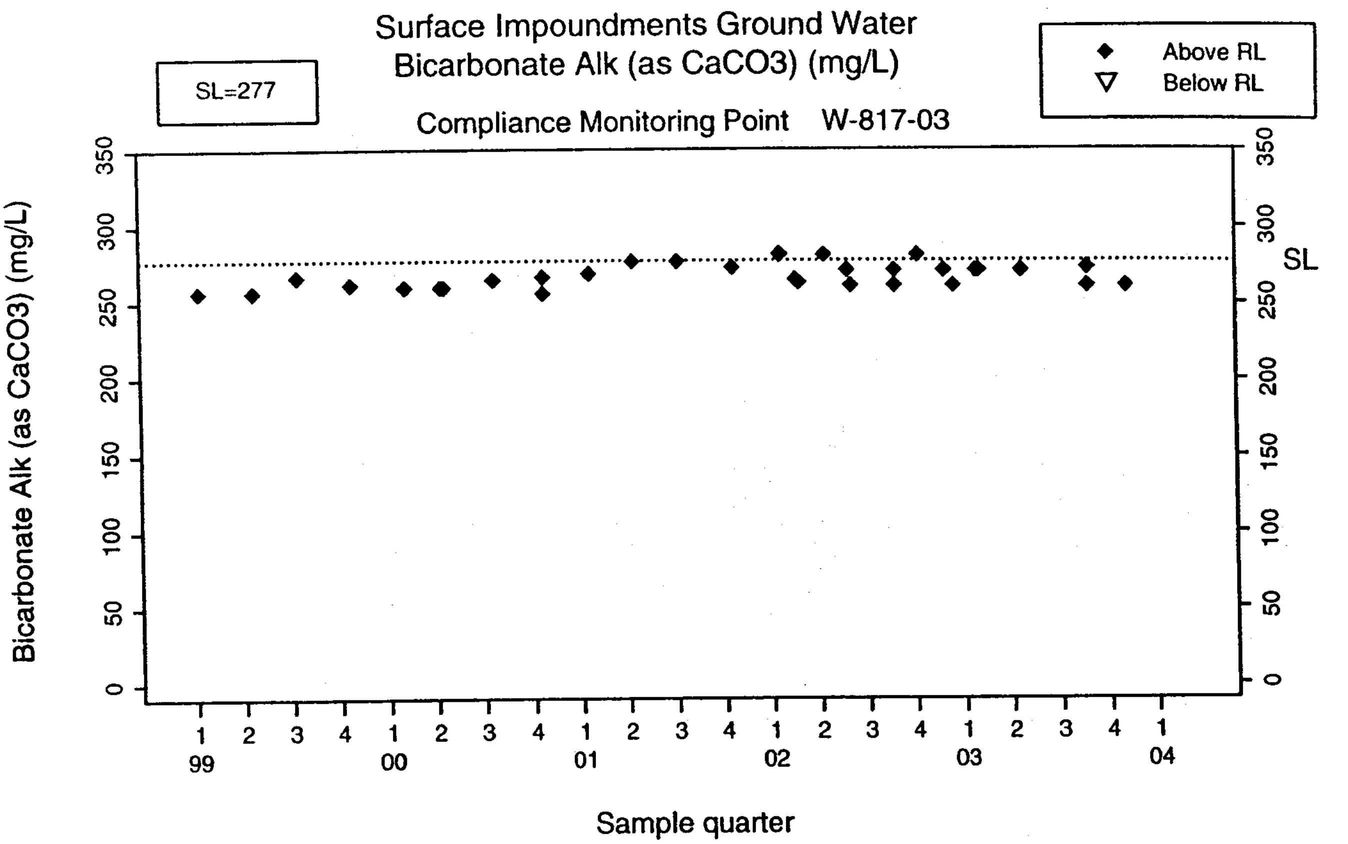

Surface Impoundments Ground Water
Ammonia Nitrogen (as N) (mg/L)
SL=0.02
Above RL
Below RL
Estimated
Compliance Monitoring Point W-817-03
Ammonia Nitrogen (as N) (mg/L)
0.0
0.2
0.4
0.6
0.8
1.0
SL
1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1
99 00 01 02 03 04
Sample quarter

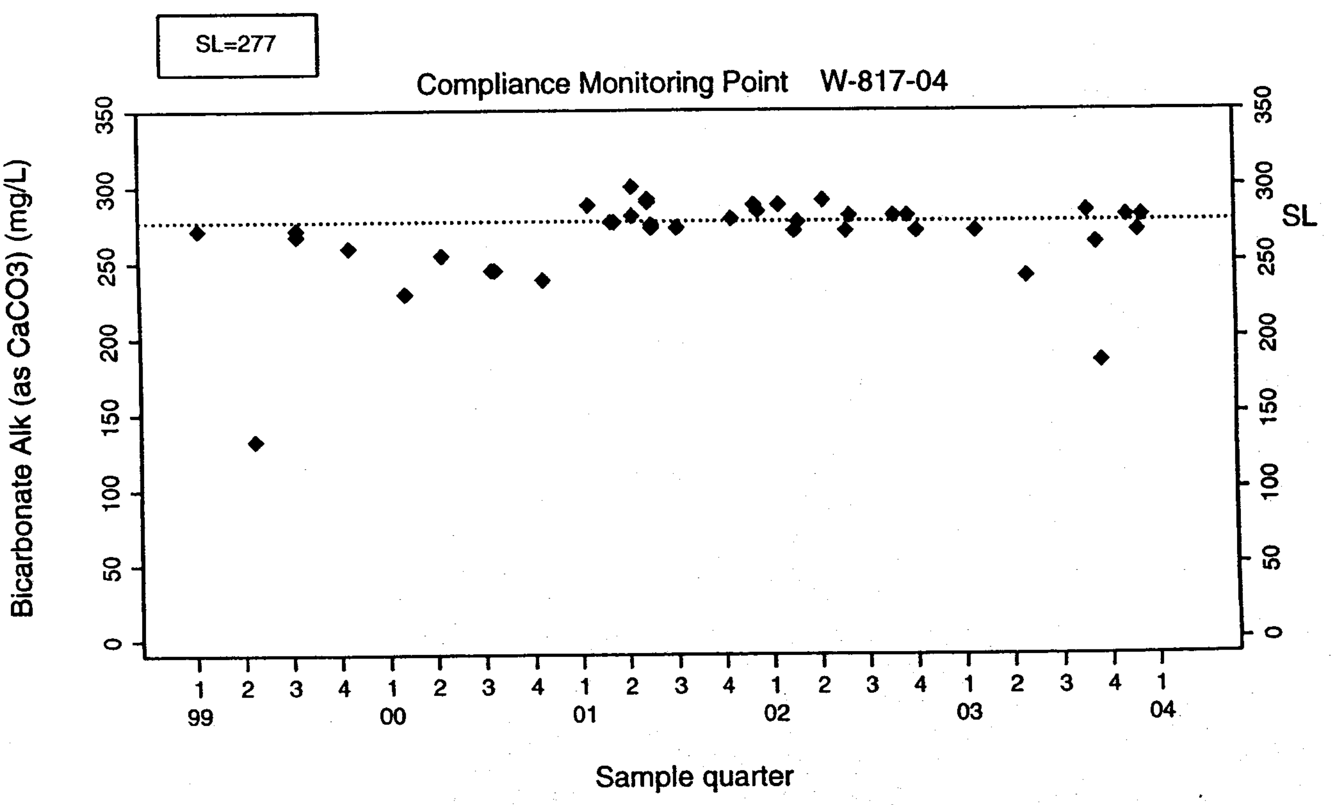

SL=0.02
Compliance Monitoring Point W-817-04
Ammonia Nitrogen (as N) (mg/L)
0.0
0.2
0.4
0.6
0.8
1.0
SL
1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1
99 00 01 02 03 04
Sample quarter

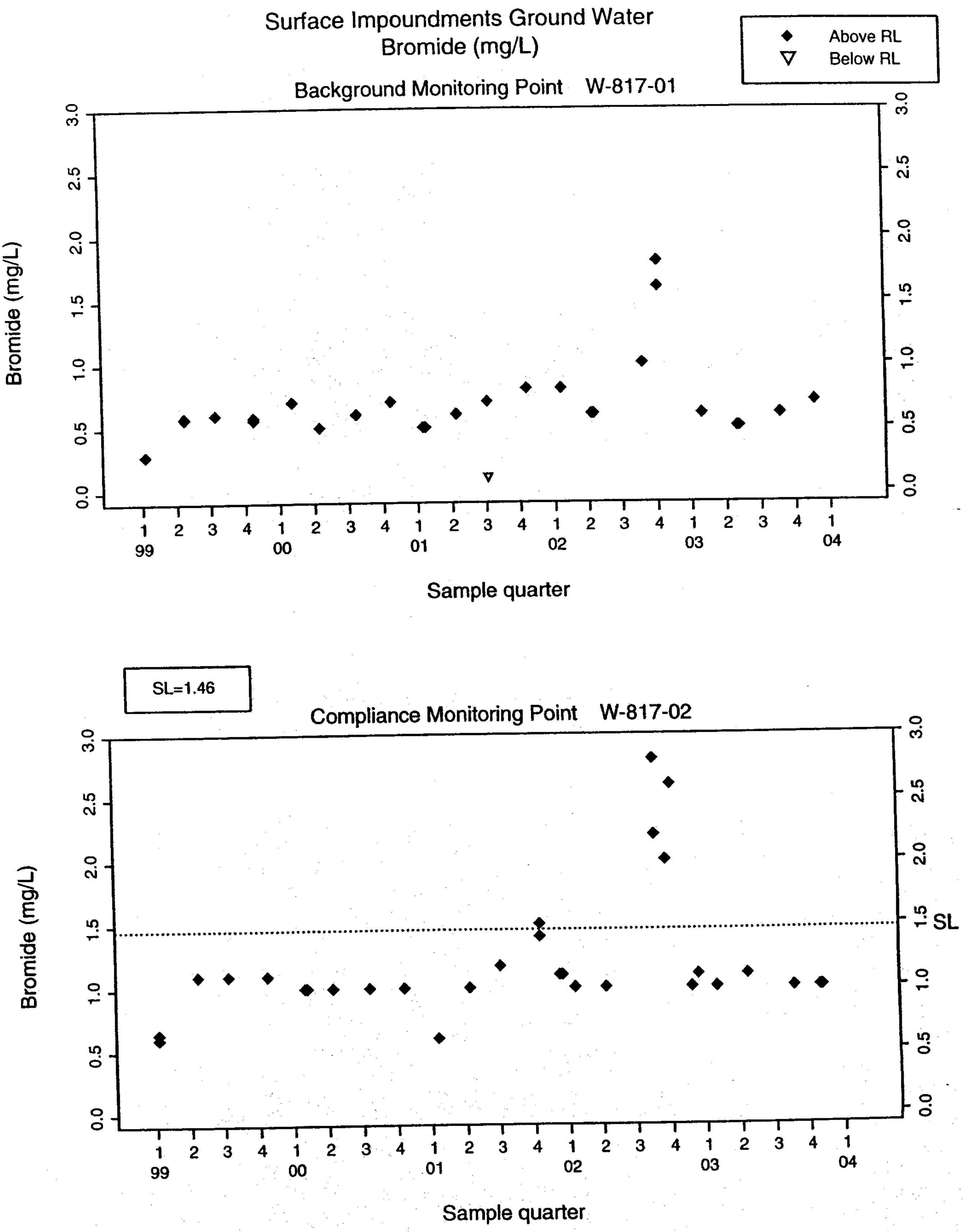
Surface Impoundments Ground Water
Bicarbonate Alk (as CaCO3) (mg/L)

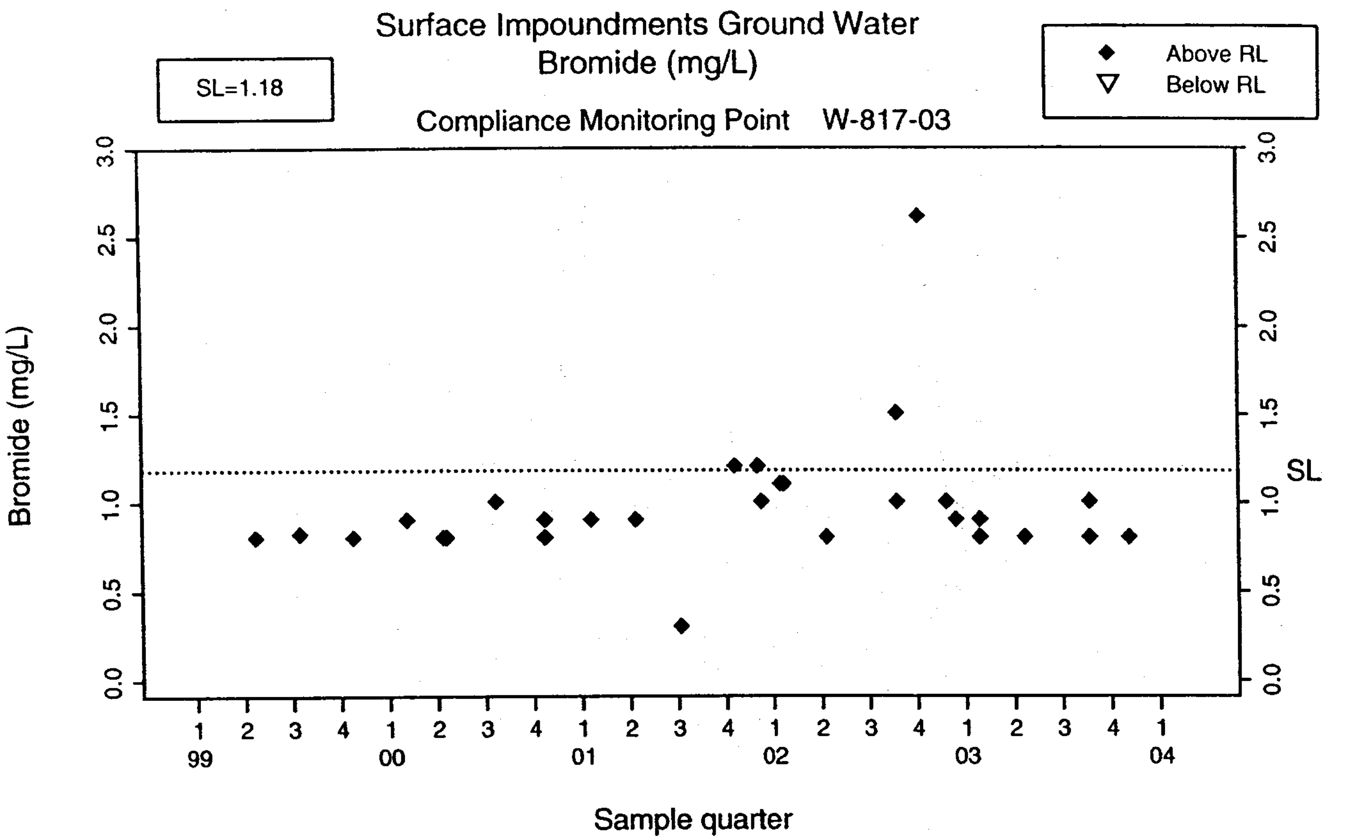


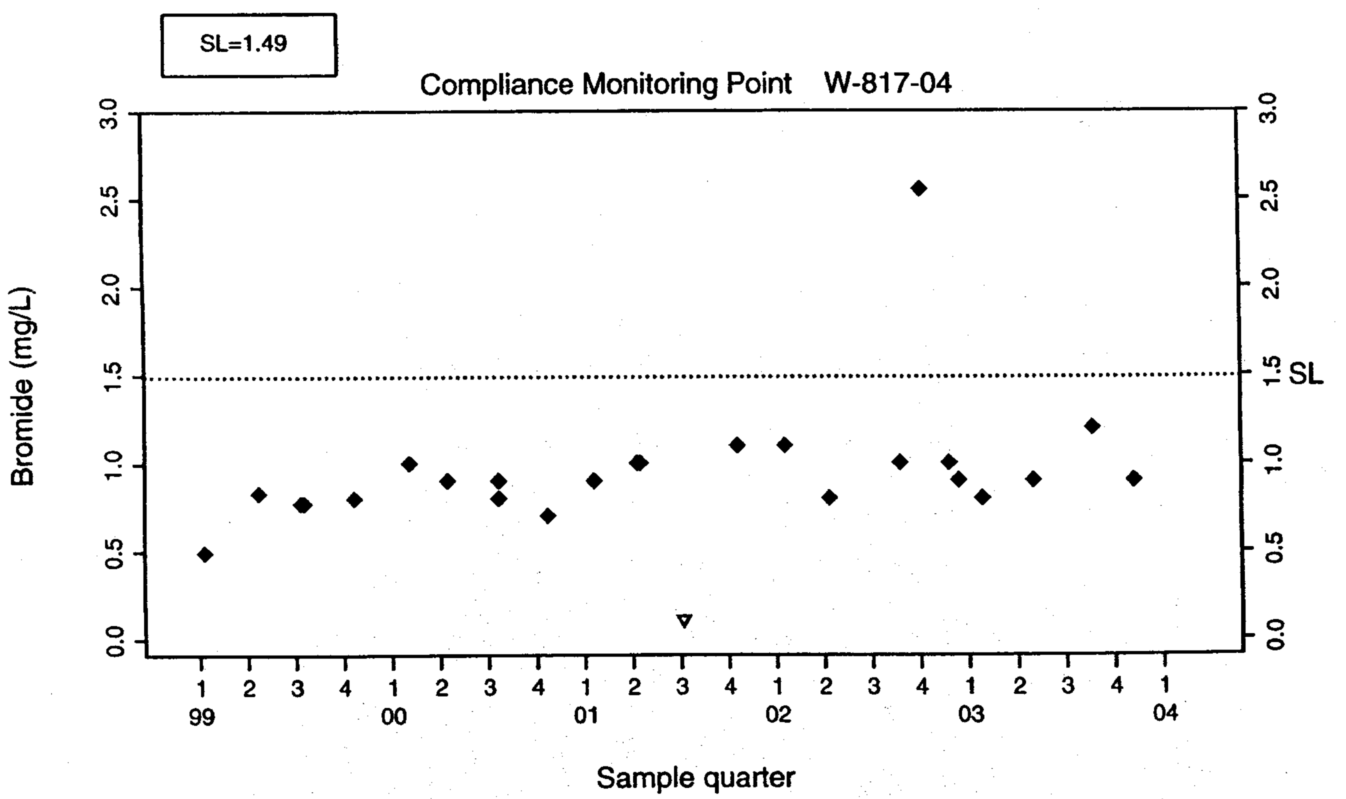



Surface Impoundments Ground Water
Bicarbonate Alk (as CaCO3) (mg/L)
SL=277
Above RL
Below RL
Compliance Monitoring Point W-817-03
Bicarbonate Alk (as CaCO3) (mg/L)
SL
0
50
100
150
200
250
300
350
1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1
99
00
01
02
03
04
Sample quarter

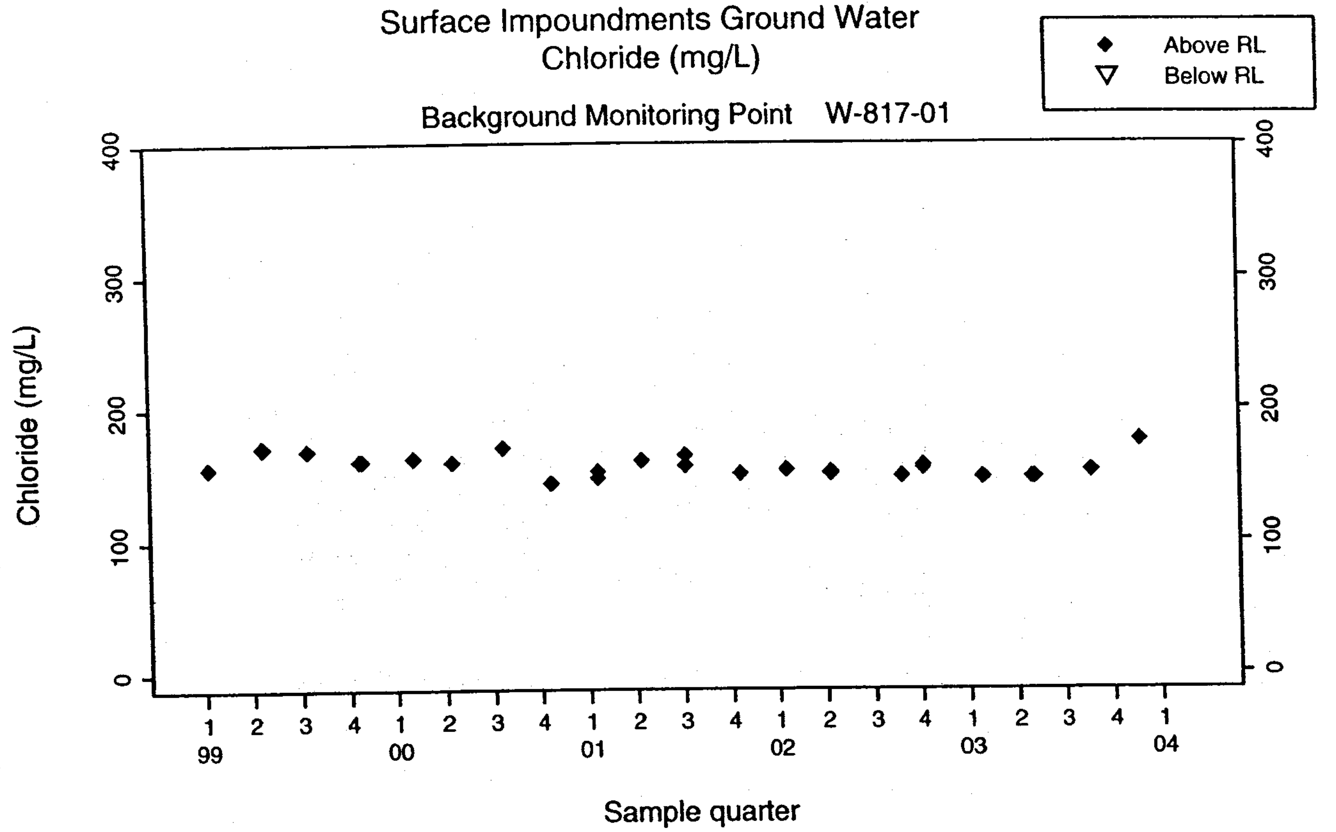

SL=277
Compliance Monitoring Point W-817-04
Bicarbonate Alk (as CaCO3) (mg/L)
SL
0
50
100
150
200
250
300
350
1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1
99
00
01
02
03
04
Sample quarter

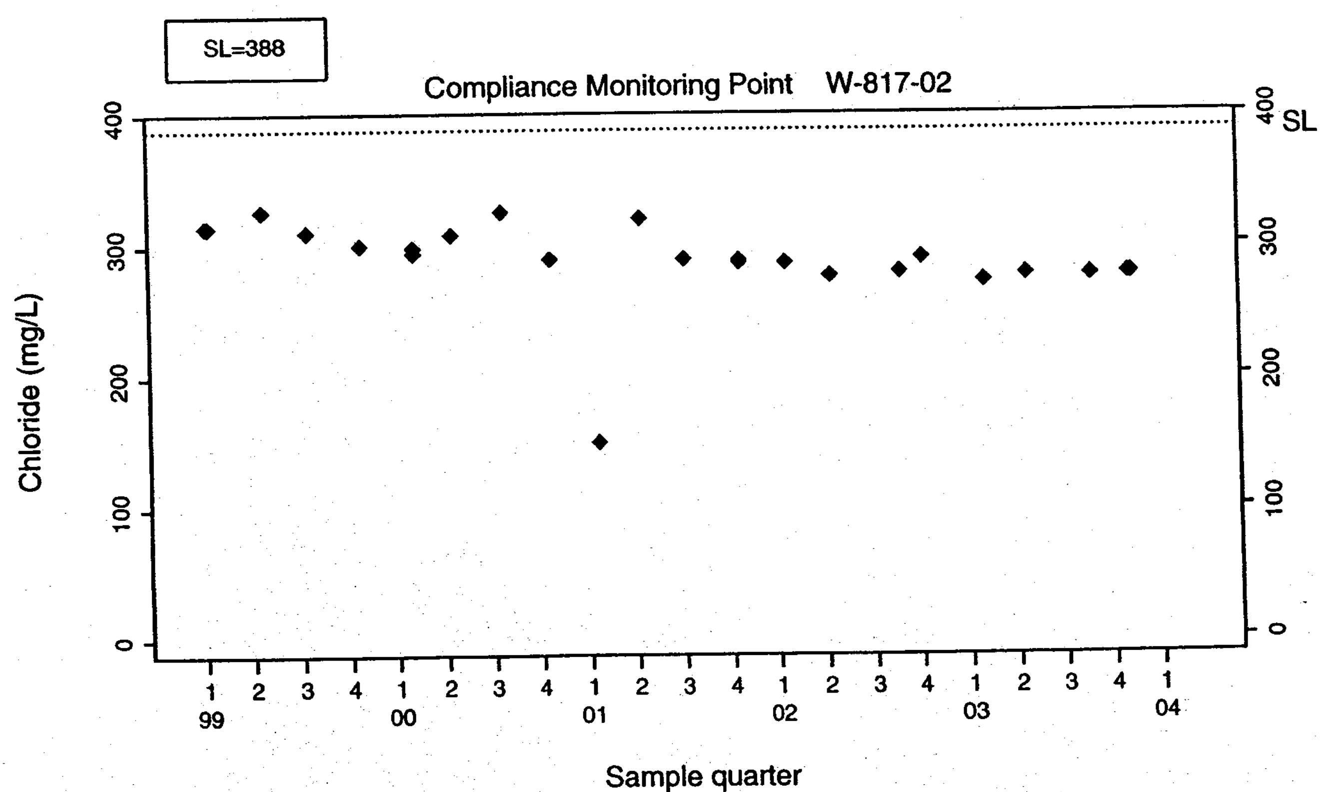

Surface Impoundments Ground Water
Bromide (mg/L)
Above RL
Below RL
Background Monitoring Point W-817-01
Bromide (mg/L)
Sample quarter
SL=1.46
Compliance Monitoring Point W-817-02
SL
Bromide (mg/L)
Sample quarter

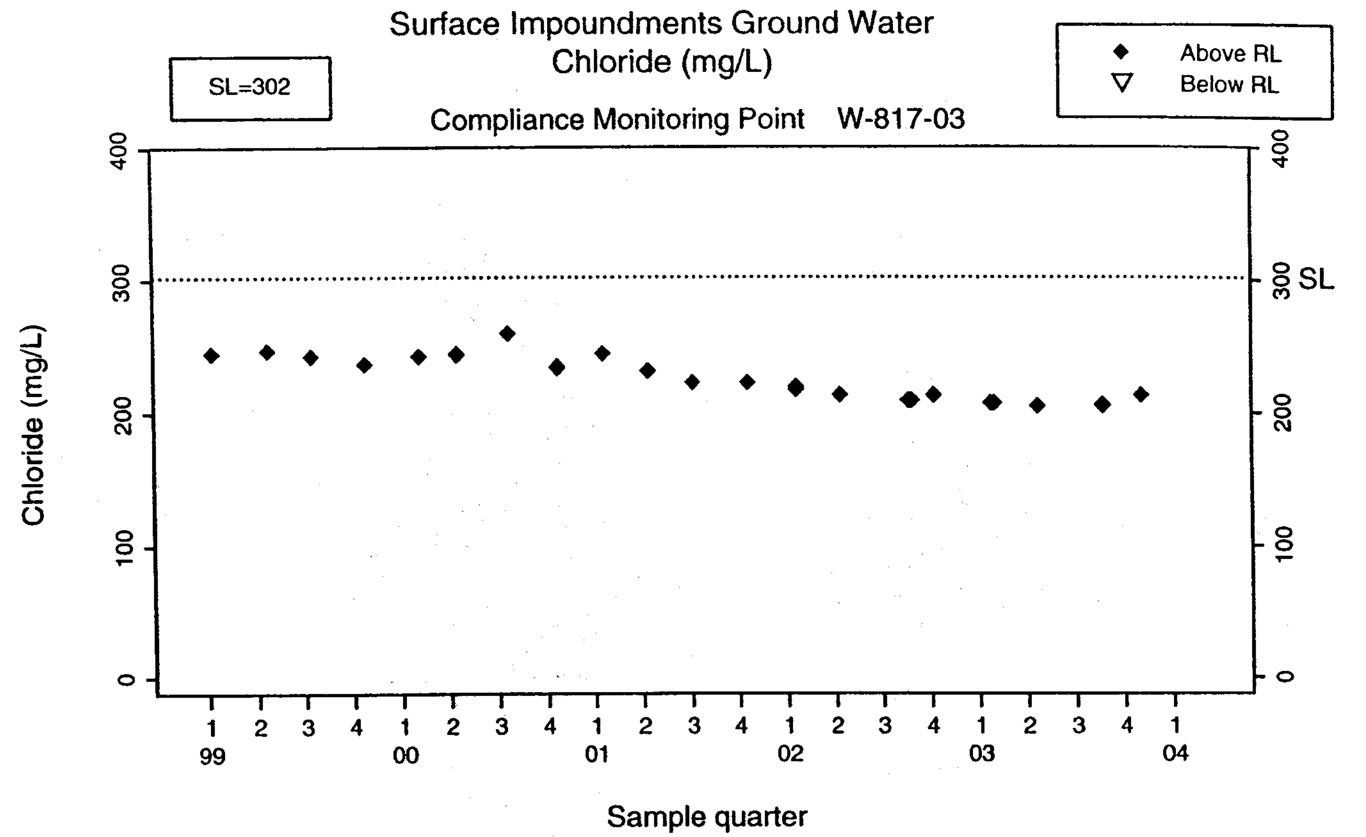

Surface Impoundments Ground Water
Bromide (mg/L)
SL=1.18
Above RL
Below RL
Compliance Monitoring Point W-817-03
Bromide (mg/L)
0.0
0.5
1.0
1.5
2.0
2.5
3.0
SL
1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1
99 00 01 02 03 04
Sample quarter

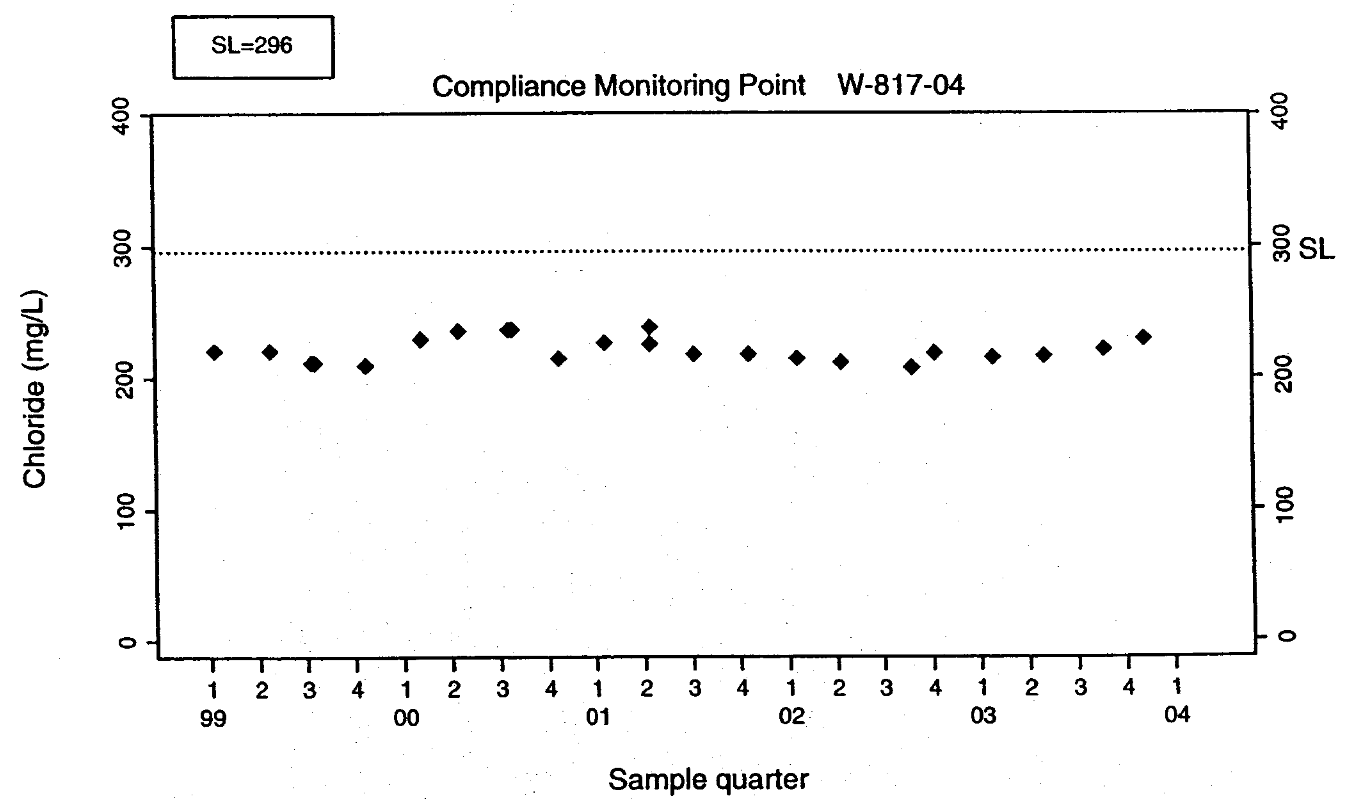

SL=1.49
Compliance Monitoring Point W-817-04
Bromide (mg/L)
0.0
0.5
1.0
1.5
2.0
2.5
3.0
SL
1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1
99 00 01 02 03 04
Sample quarter

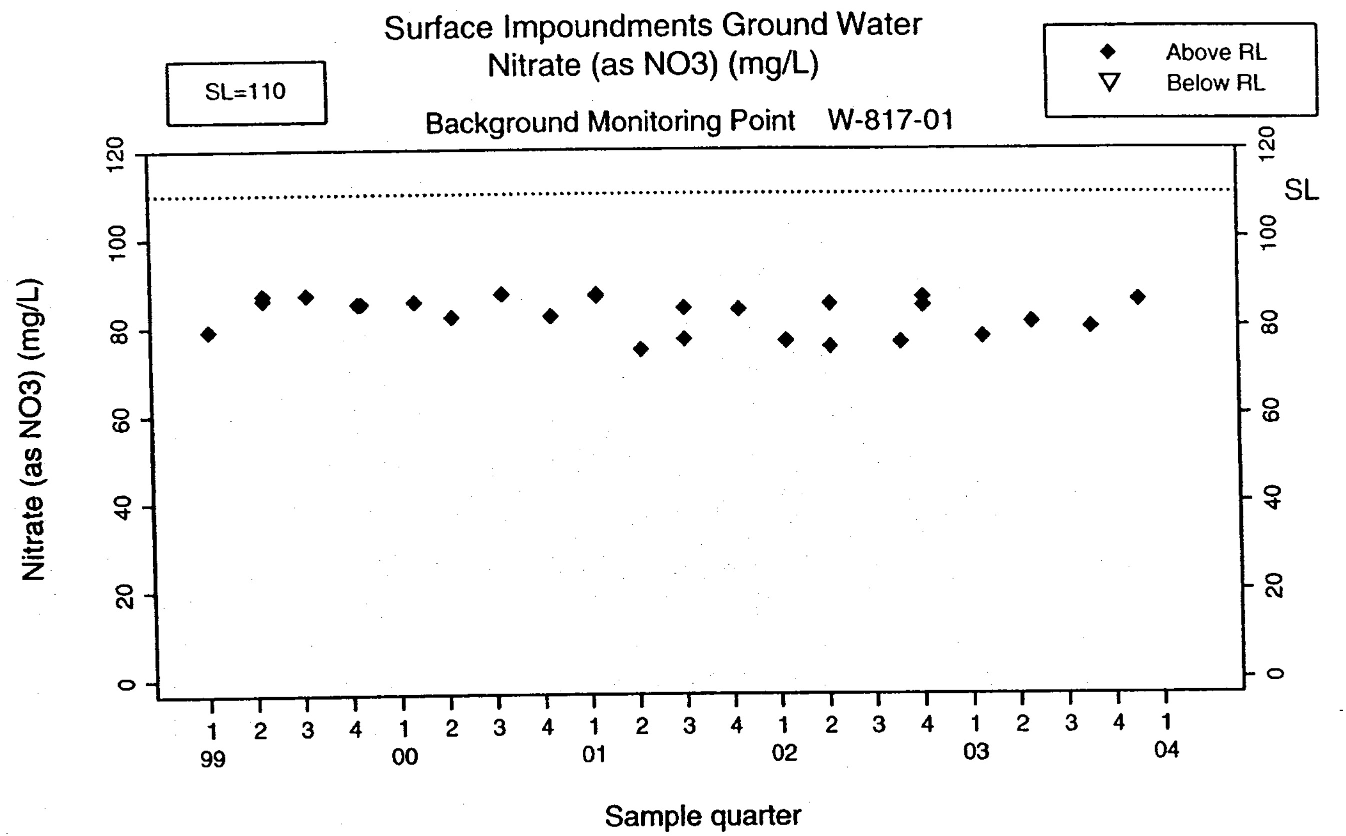
Surface Impoundments Ground Water
Chloride (mg/L)

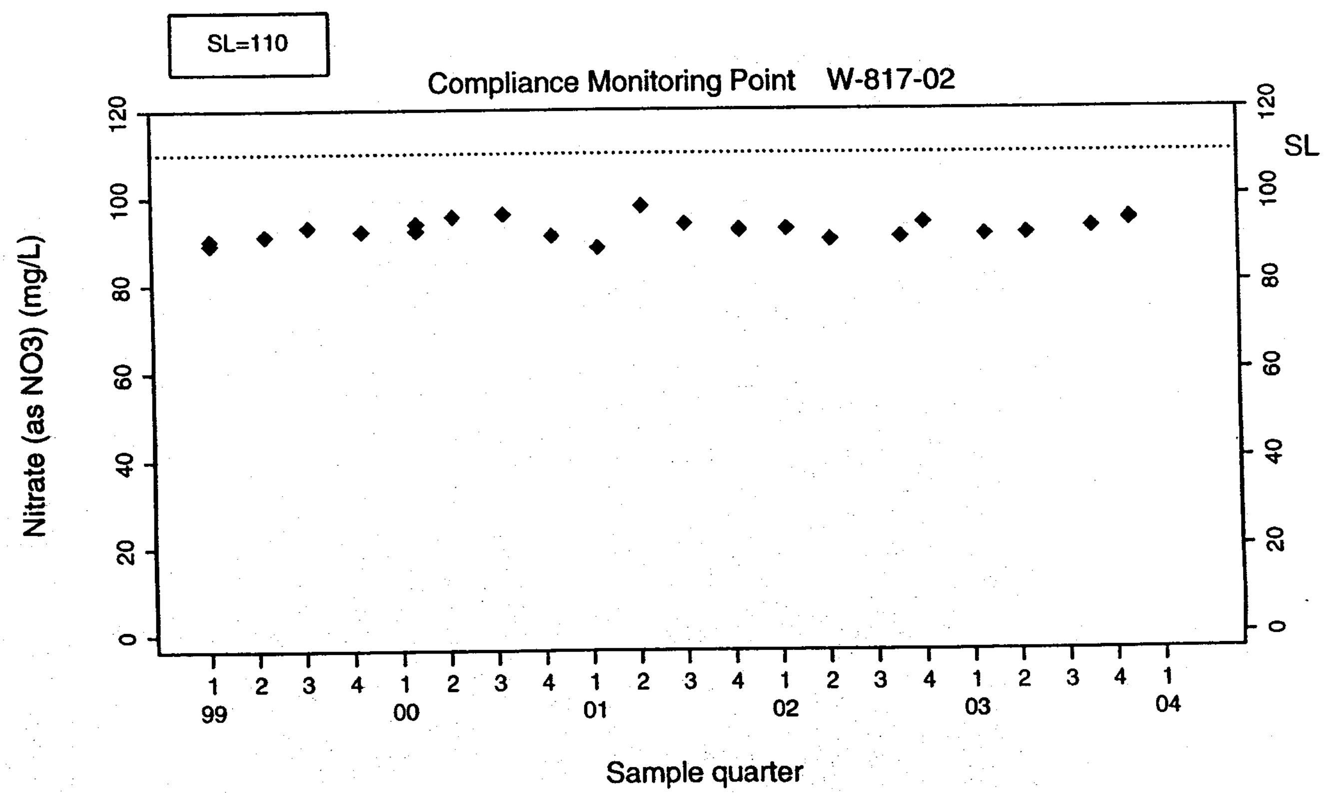


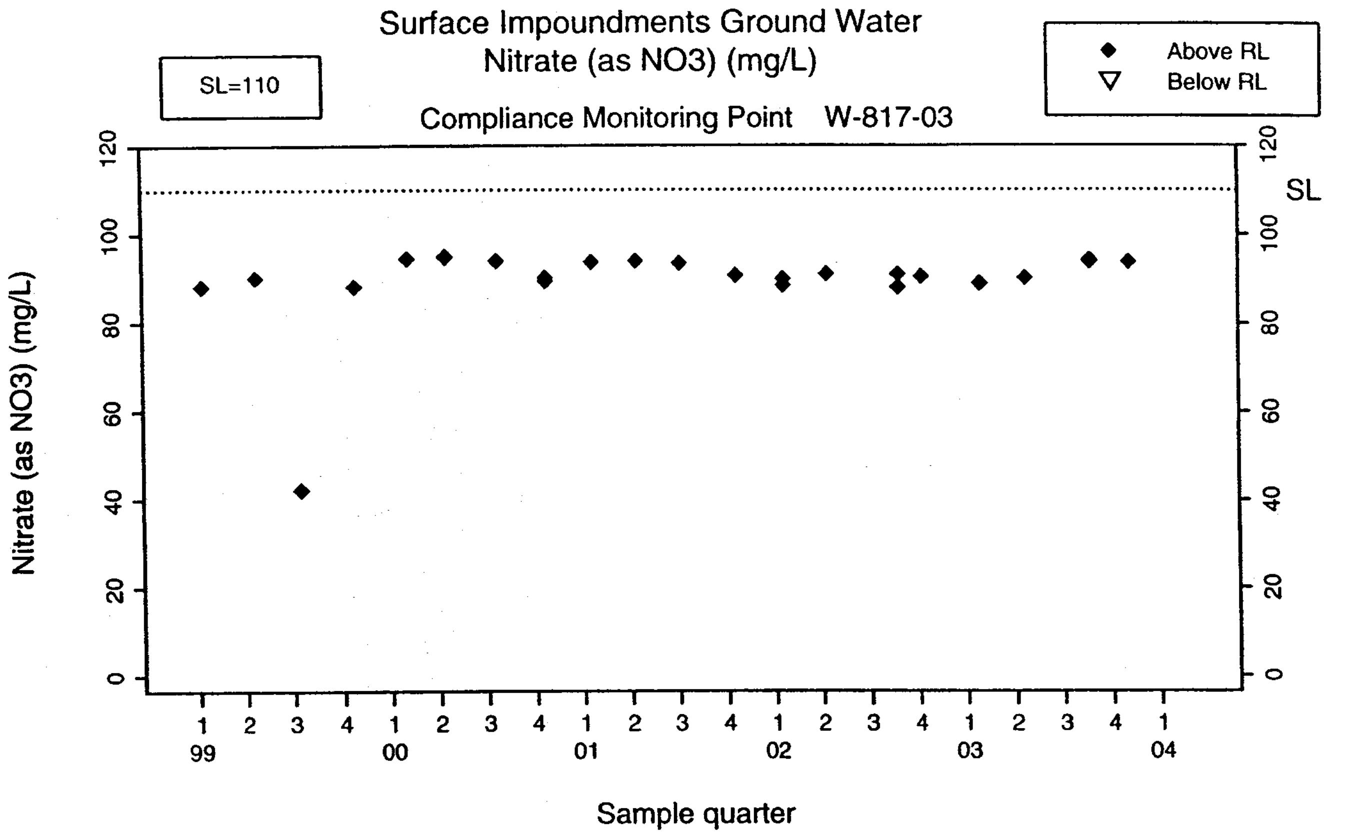


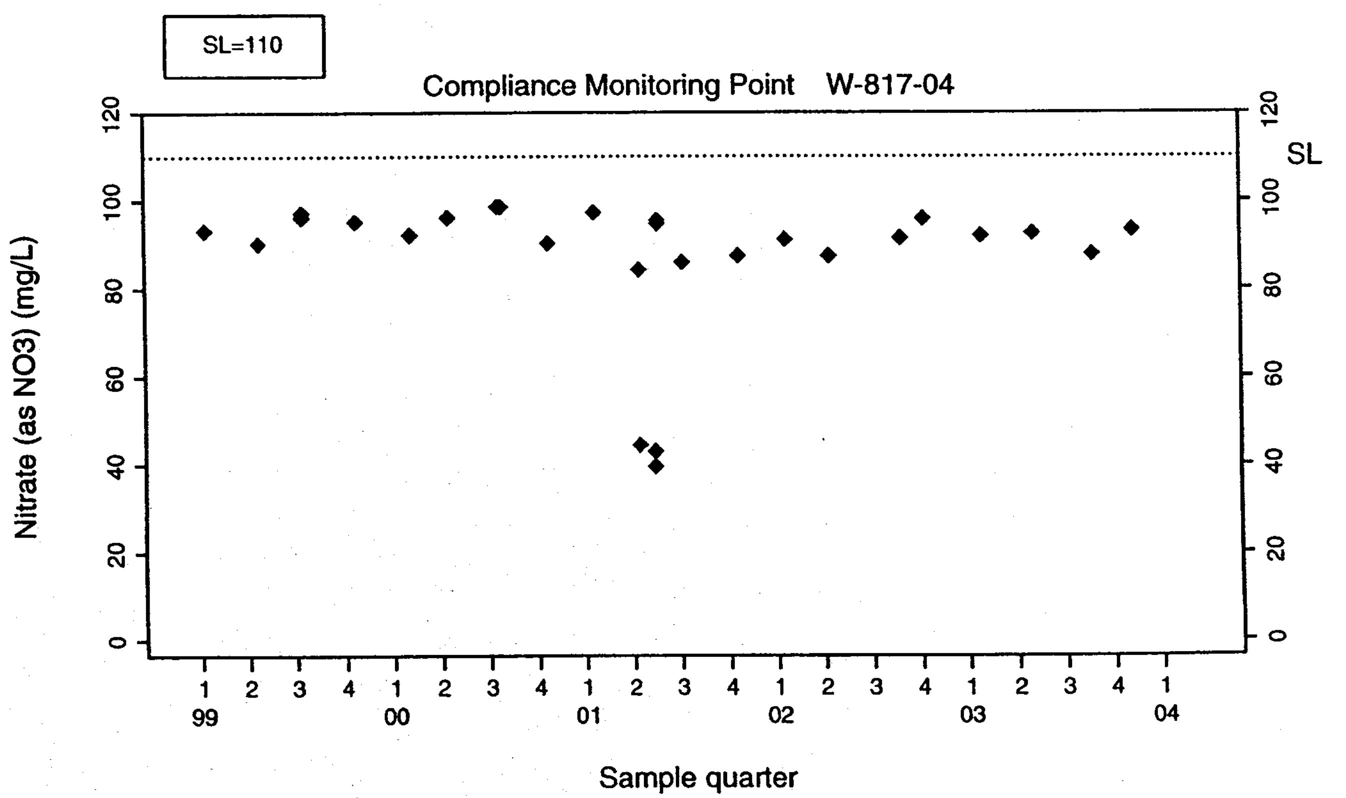

Surface Impoundments Ground Water
Chloride (mg/L)
SL=302
Above RL
Below RL
Compliance Monitoring Point W-817-03
Chloride (mg/L)
0
100
200
300
400
SL
1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1
99
00
01
02
03
04
Sample quarter


SL=296
Compliance Monitoring Point W-817-04
Chloride (mg/L)
0
100
200
300
400
SL
1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1
99
00
01
02
03
04
Sample quarter

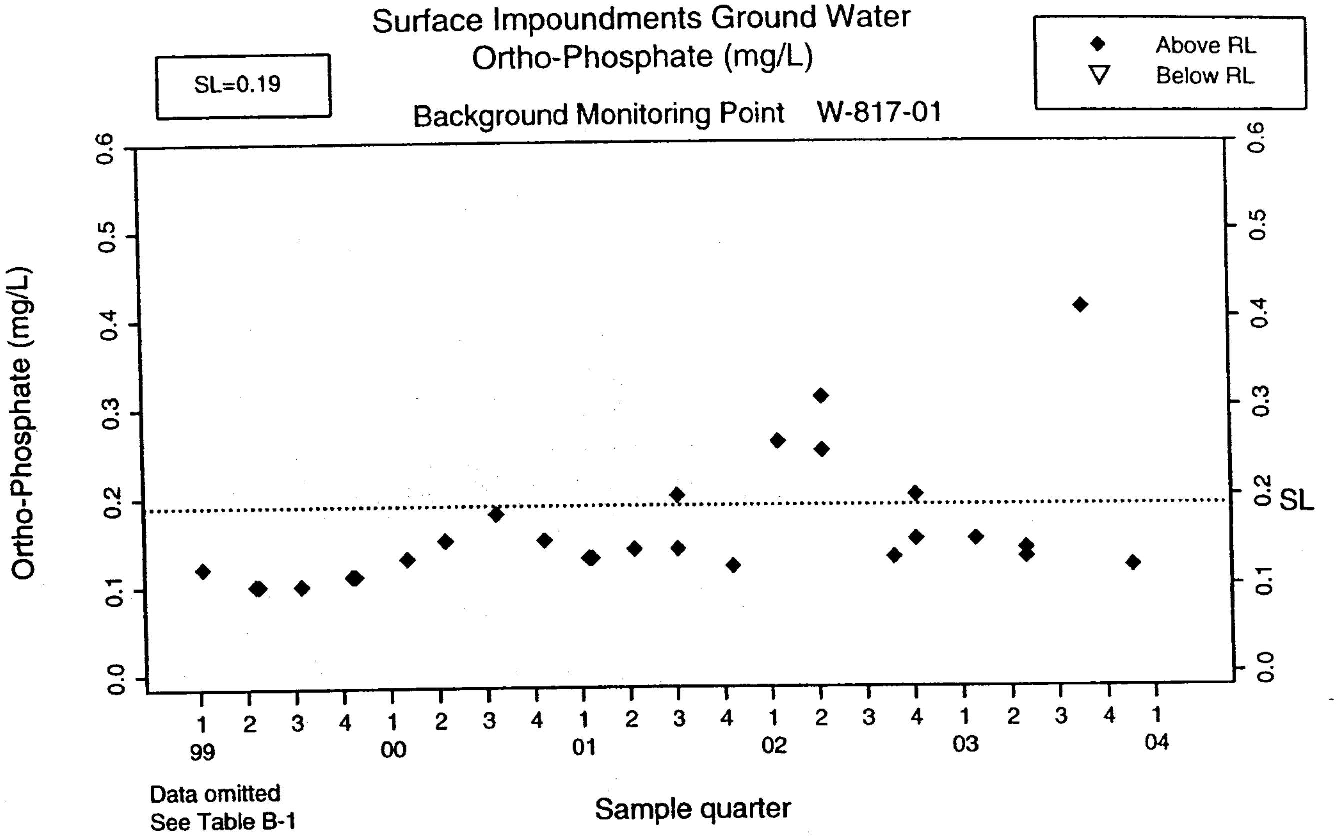

Surface Impoundments Ground Water
Nitrate (as NO3) (mg/L)
SL=110
Above RL
Below RL
Background Monitoring Point W-817-01
Nitrate (as NO3) (mg/L)
0
20
40
60
80
100
120
SL
1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1
99 00 01 02 03 04
Sample quarter

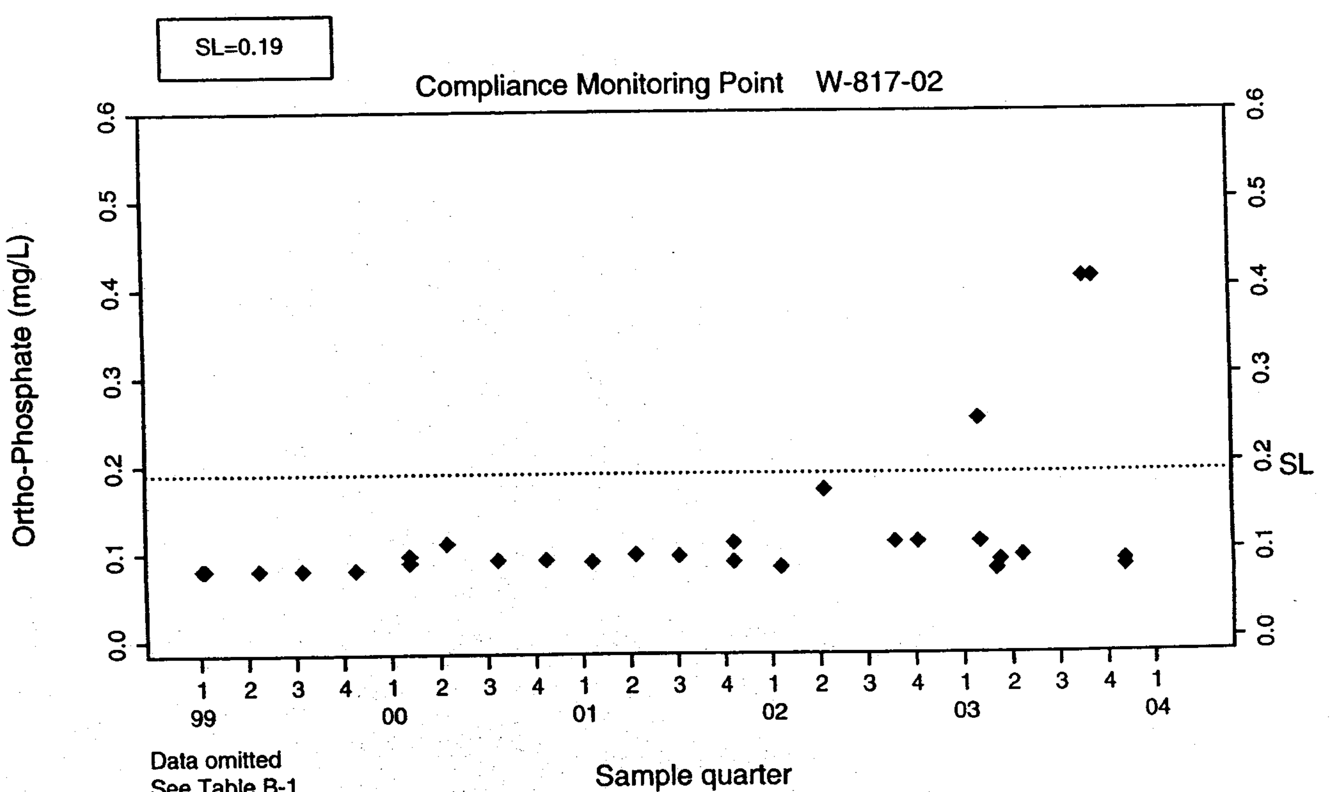

SL=110
Compliance Monitoring Point W-817-02
Nitrate (as NO3) (mg/L)
0
20
40
60
80
100
120
SL
1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1
99 00 01 02 03 04
Sample quarter


Surface Impoundments Ground Water
Nitrate (as NO3) (mg/L)
SL=110
Above RL
Below RL
Compliance Monitoring Point W-817-03
SL
Nitrate (as NO3) (mg/L)
0
20
40
60
80
100
120
1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1
99 00 01 02 03 04
Sample quarter

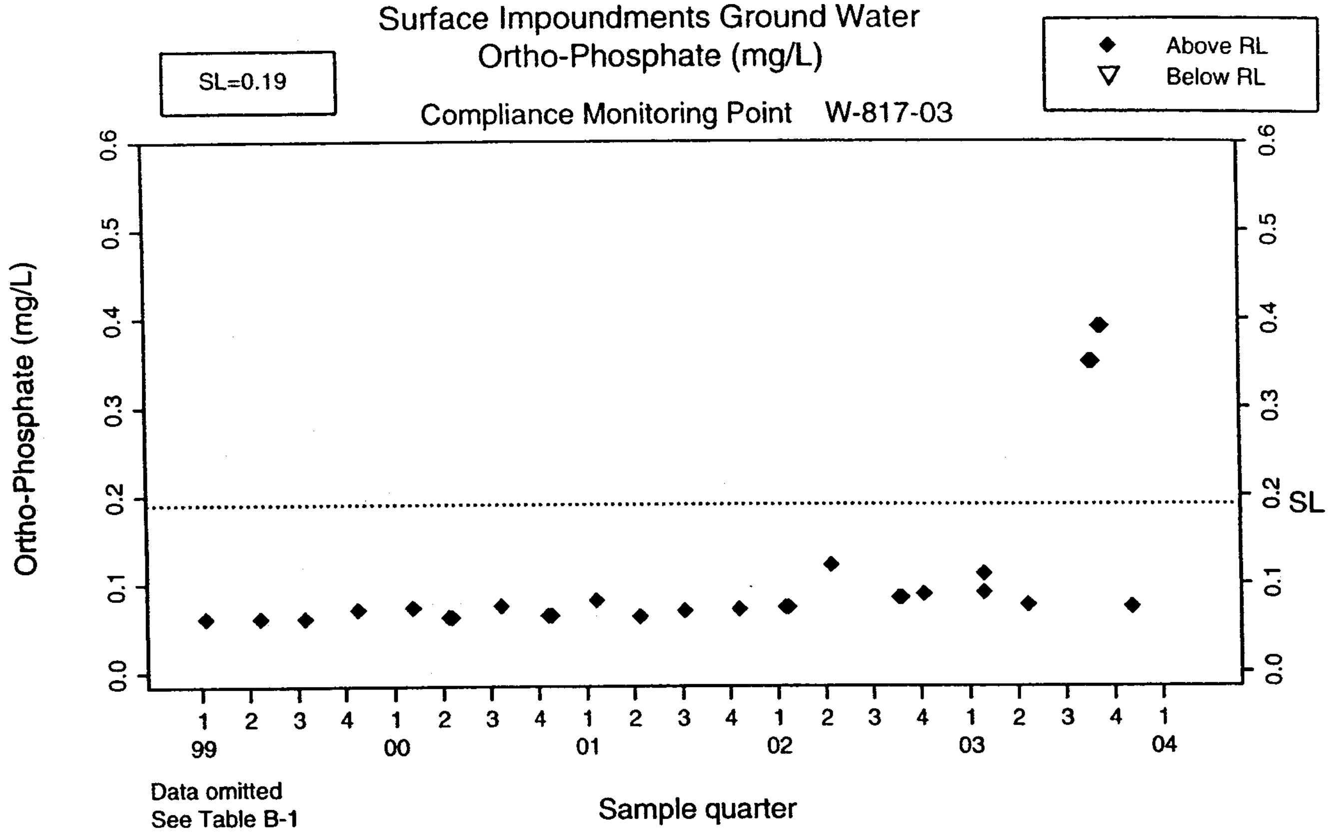

SL=110
Compliance Monitoring Point W-817-04
SL
Nitrate (as NO3) (mg/L)
0
20
40
60
80
100
120
1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1
99 00 01 02 03 04
Sample quarter

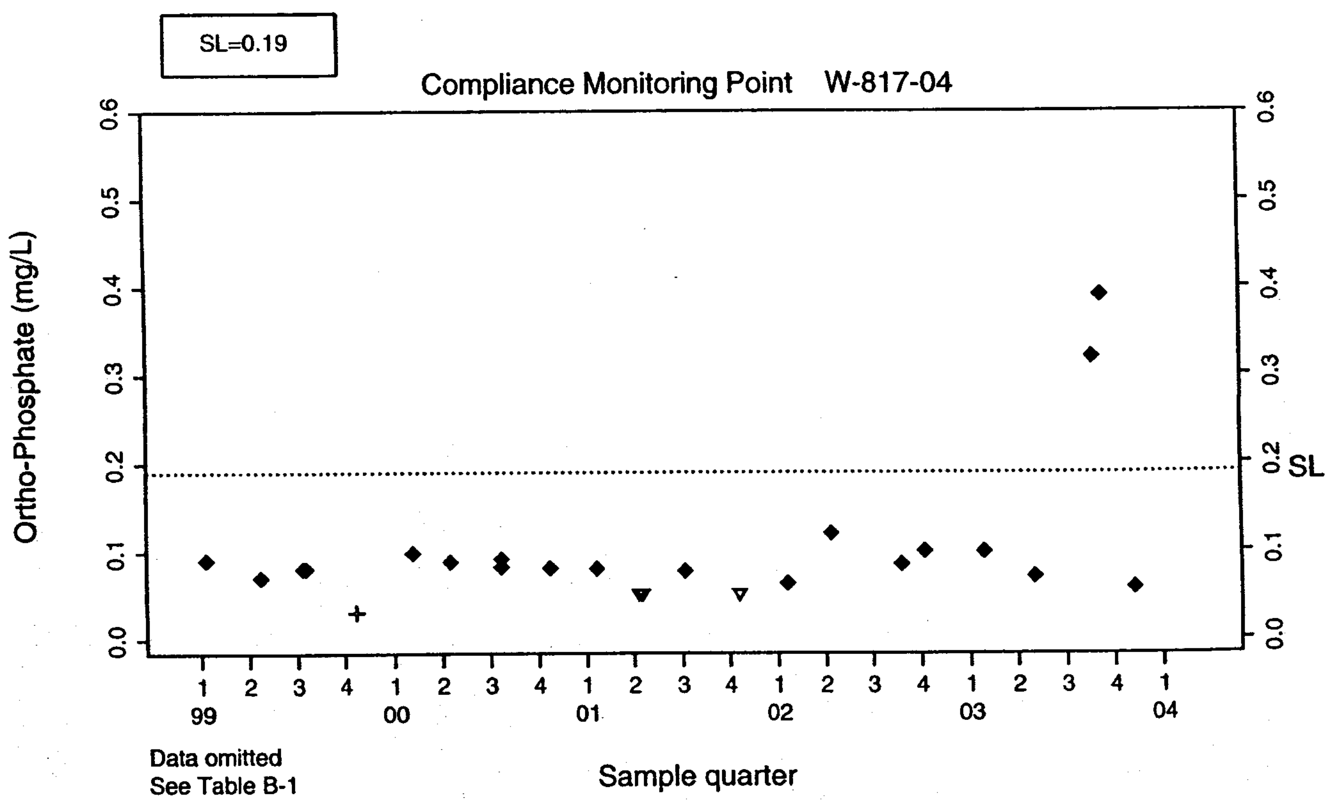
Surface Impoundments Ground Water
Ortho-Phosphate (mg/L)



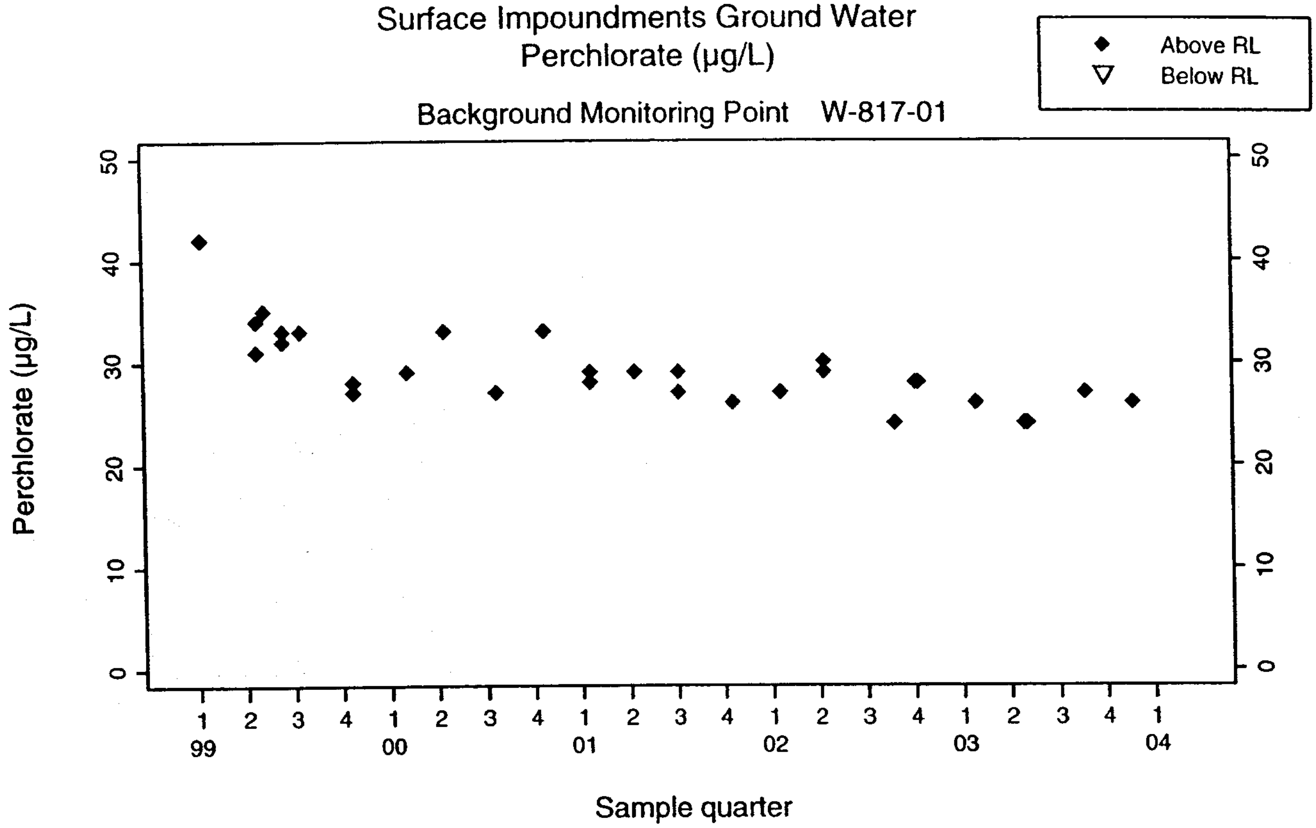


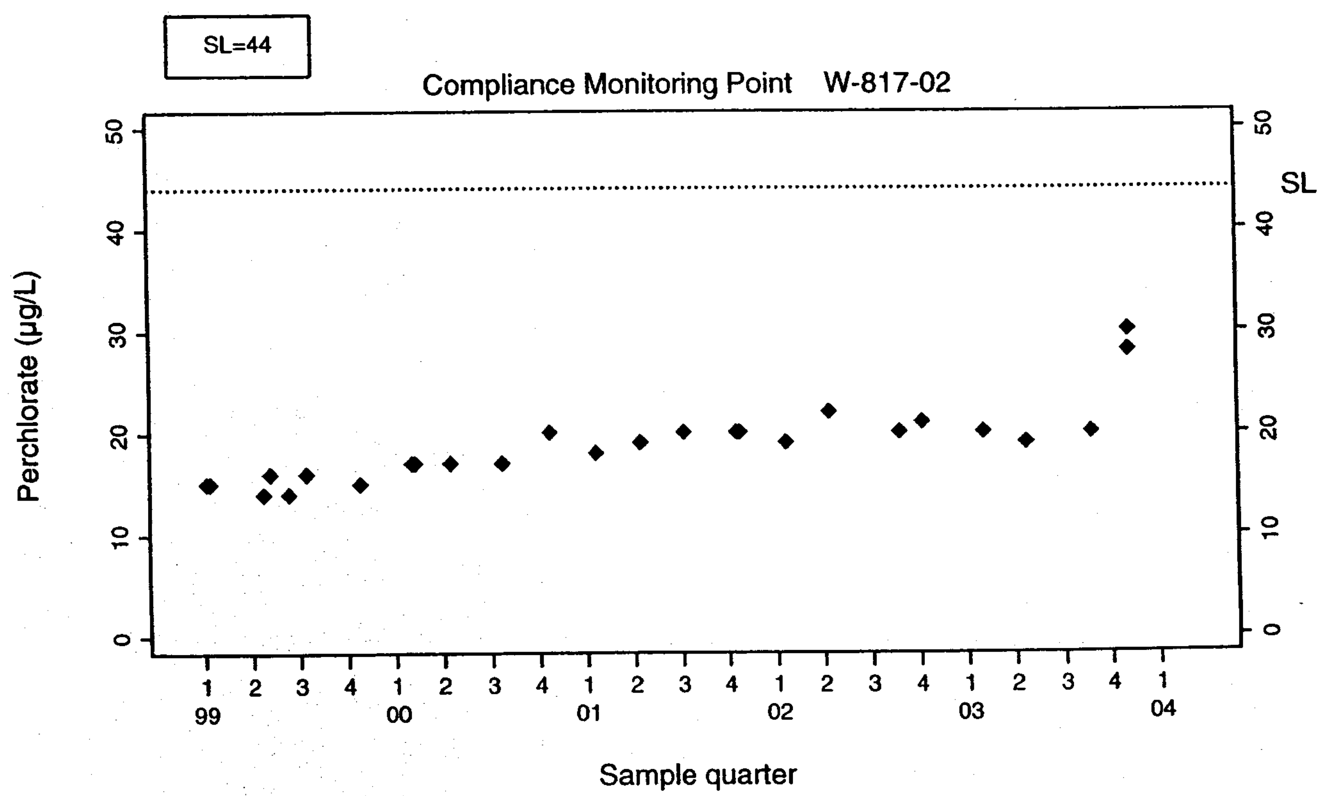
Surface Impoundments Ground Water Ortho-Phosphate (mg/L)





Surface Impoundments Ground Water
Perchlorate (µg/L)



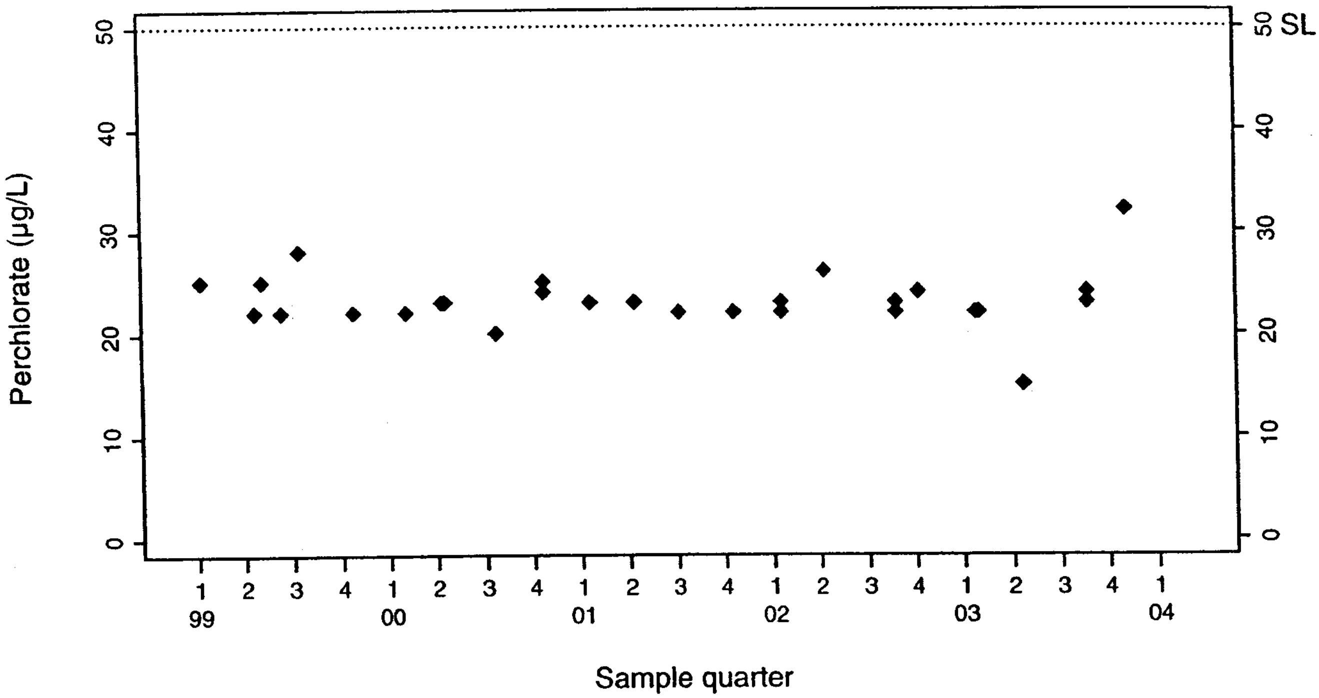


Surface Impoundments Ground Water Perchlorate (µg/L)

◆ Above RL
▽ Below RL

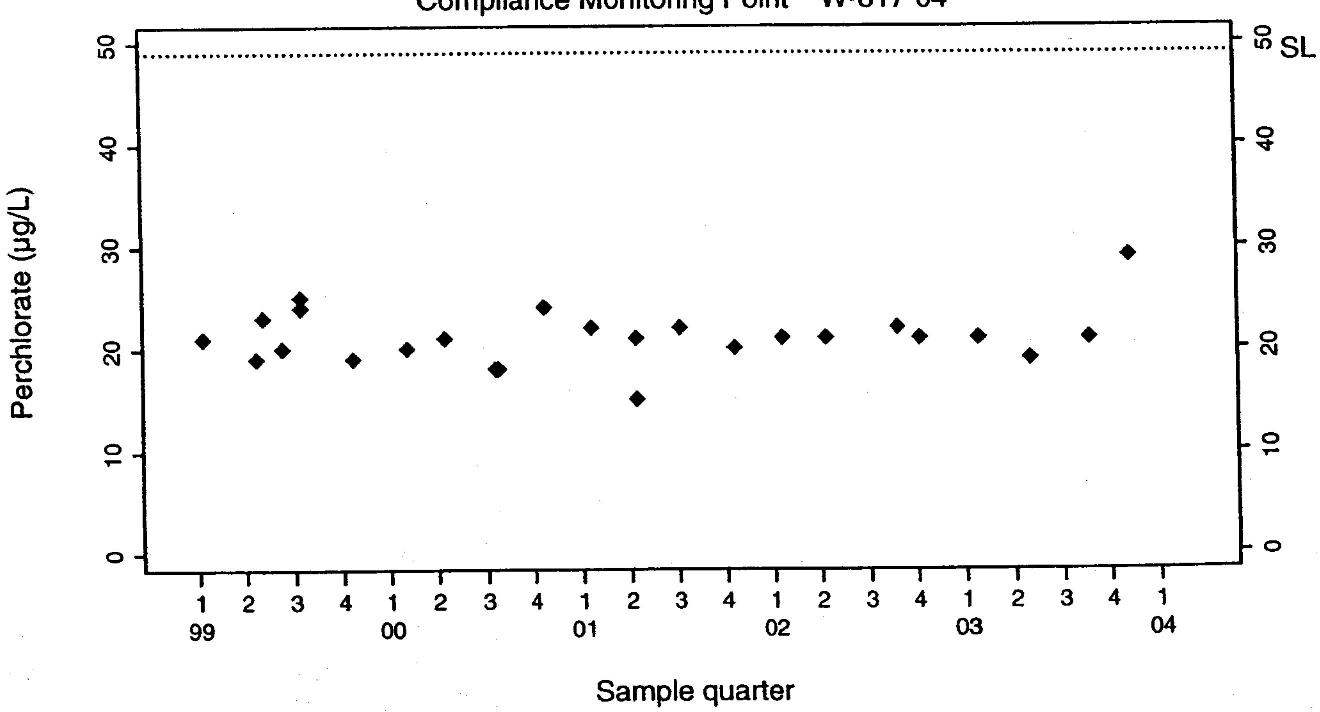
SL=50

Compliance Monitoring Point W-817-03

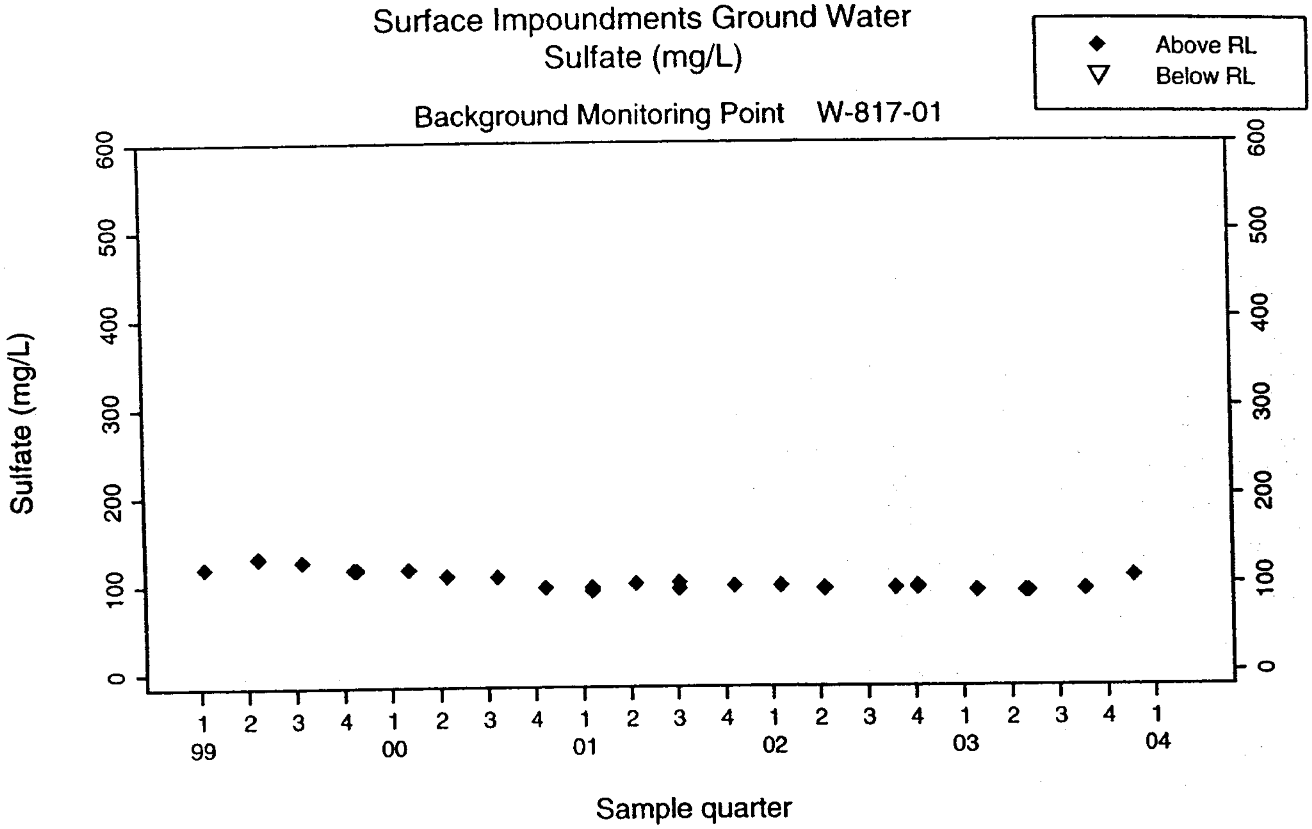


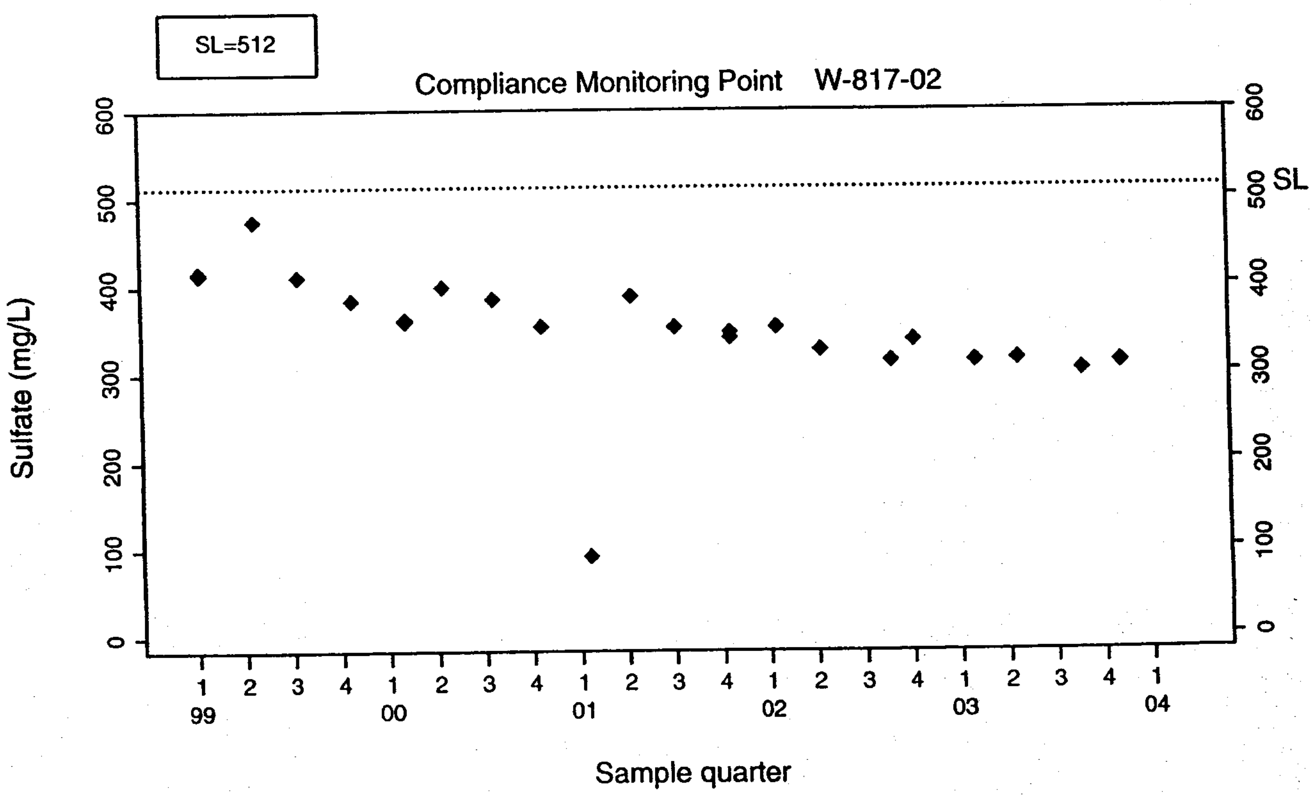
SL=49

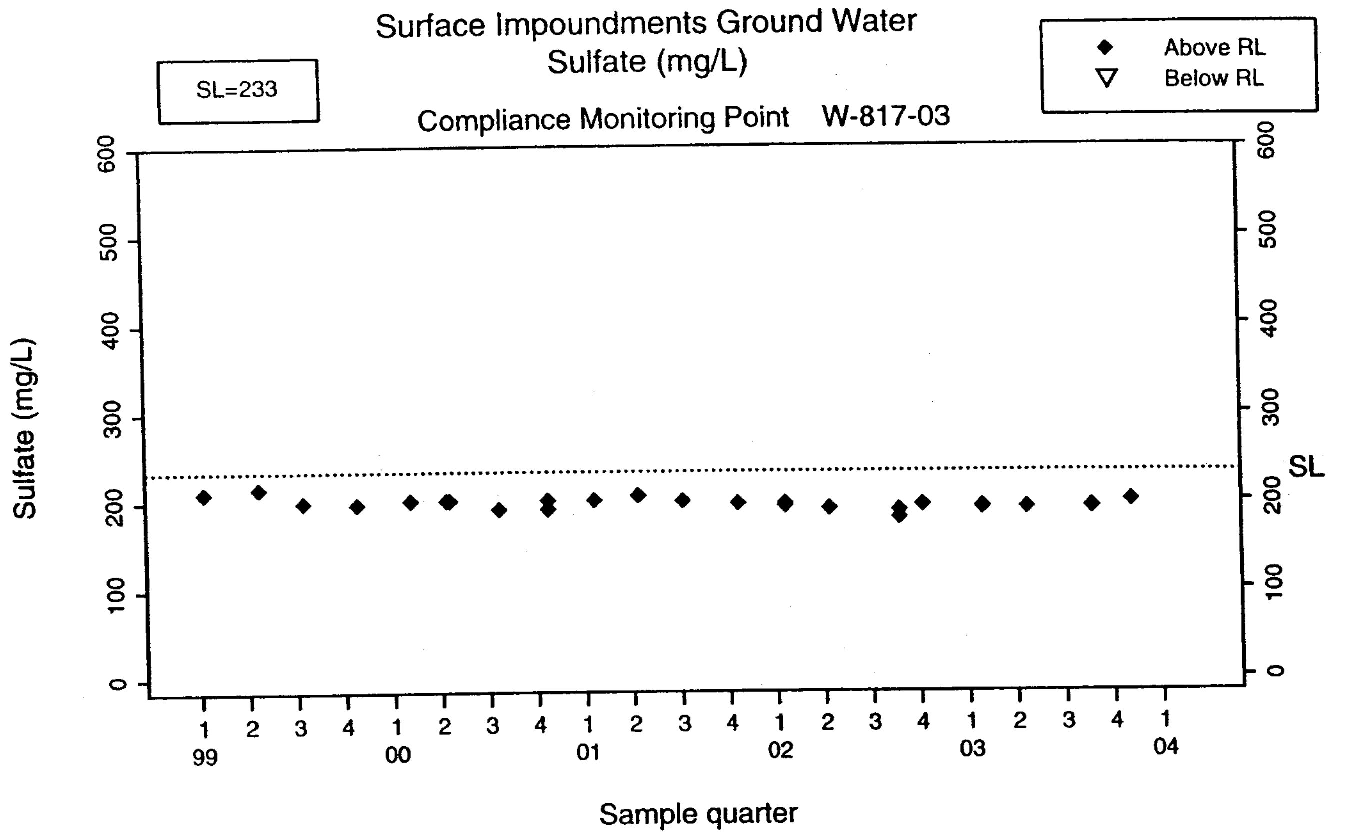
Compliance Monitoring Point W-817-04

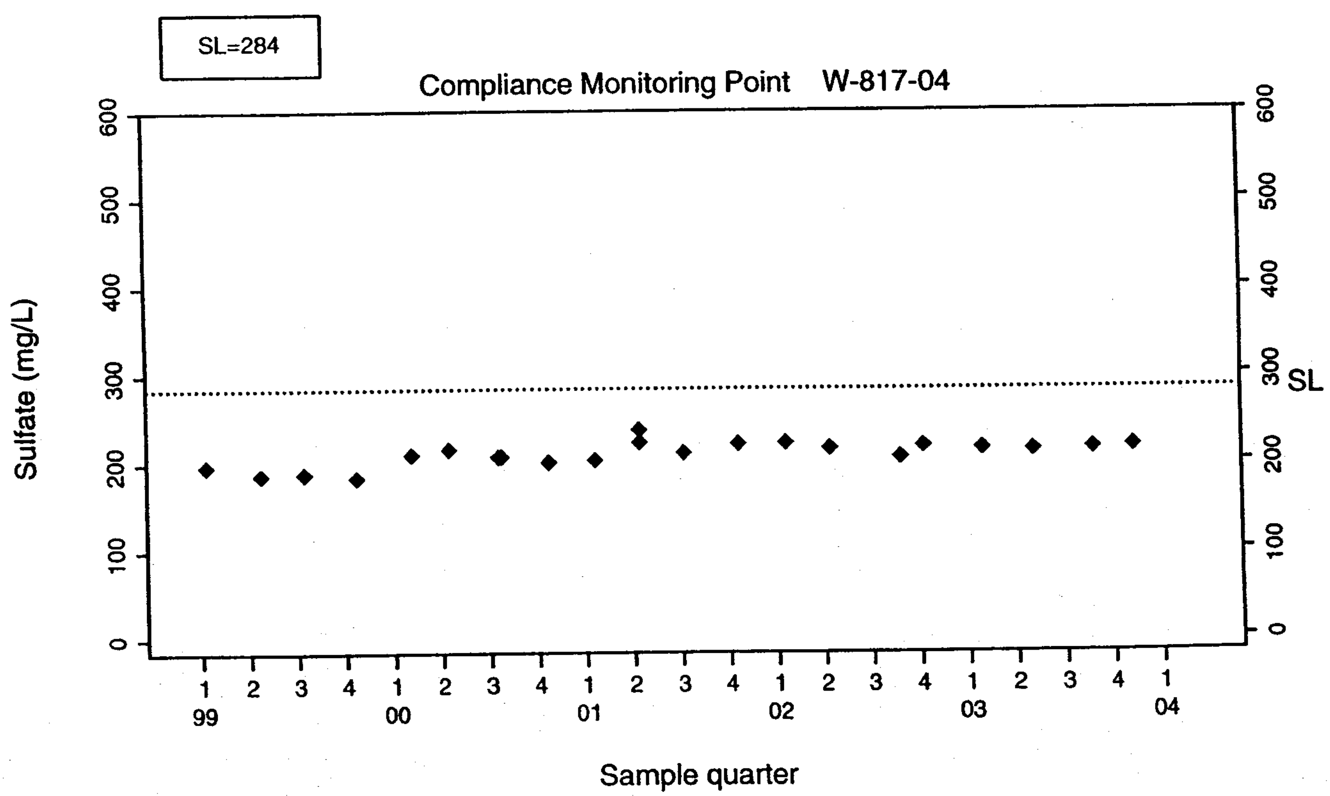


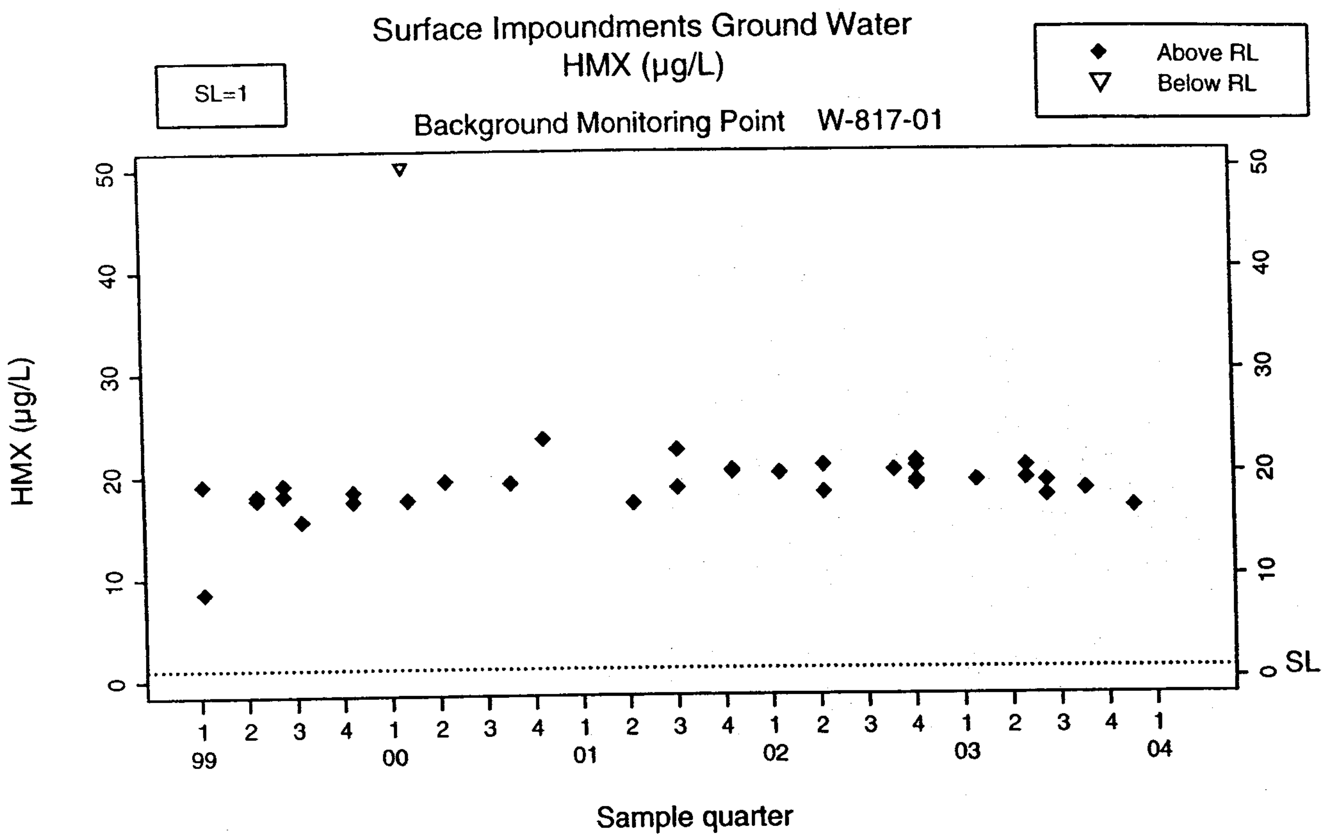
Surface Impoundments Ground Water
Sulfate (mg/L)

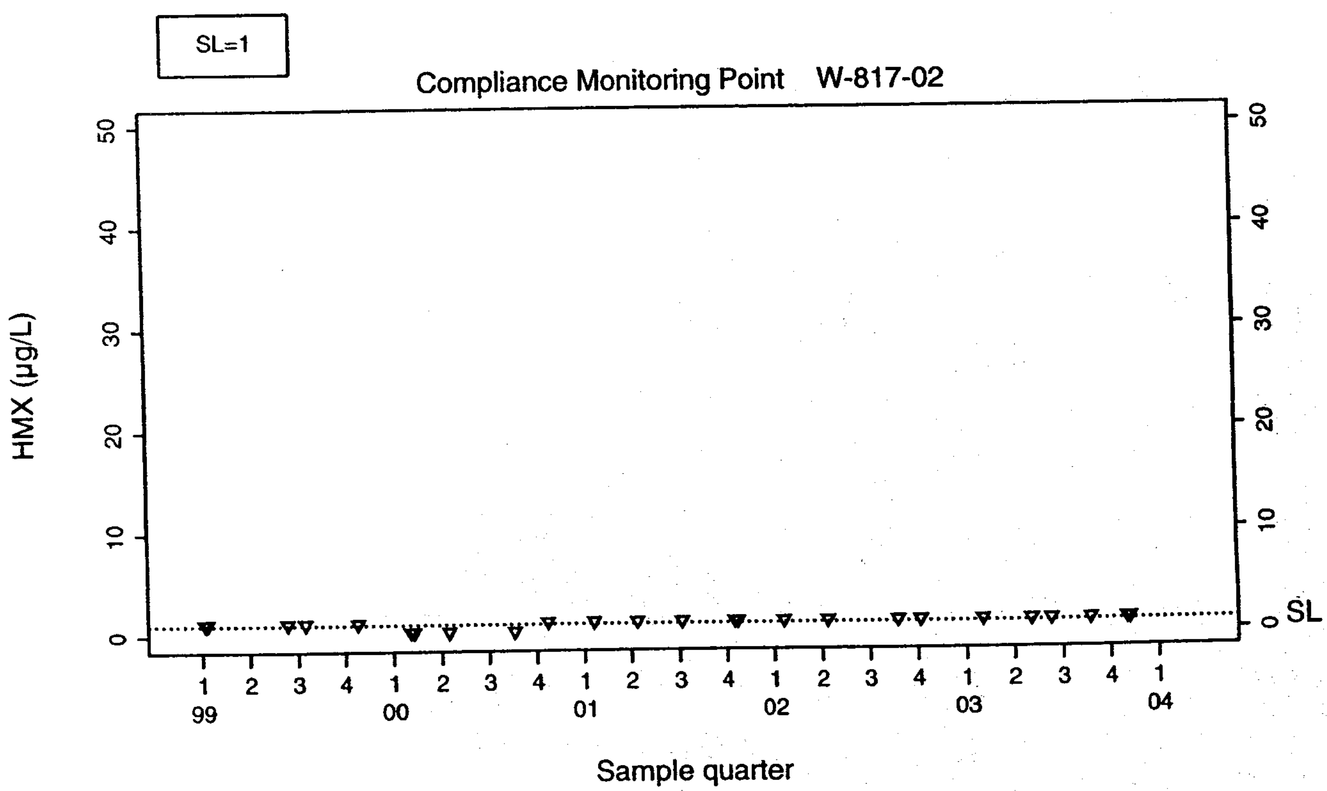




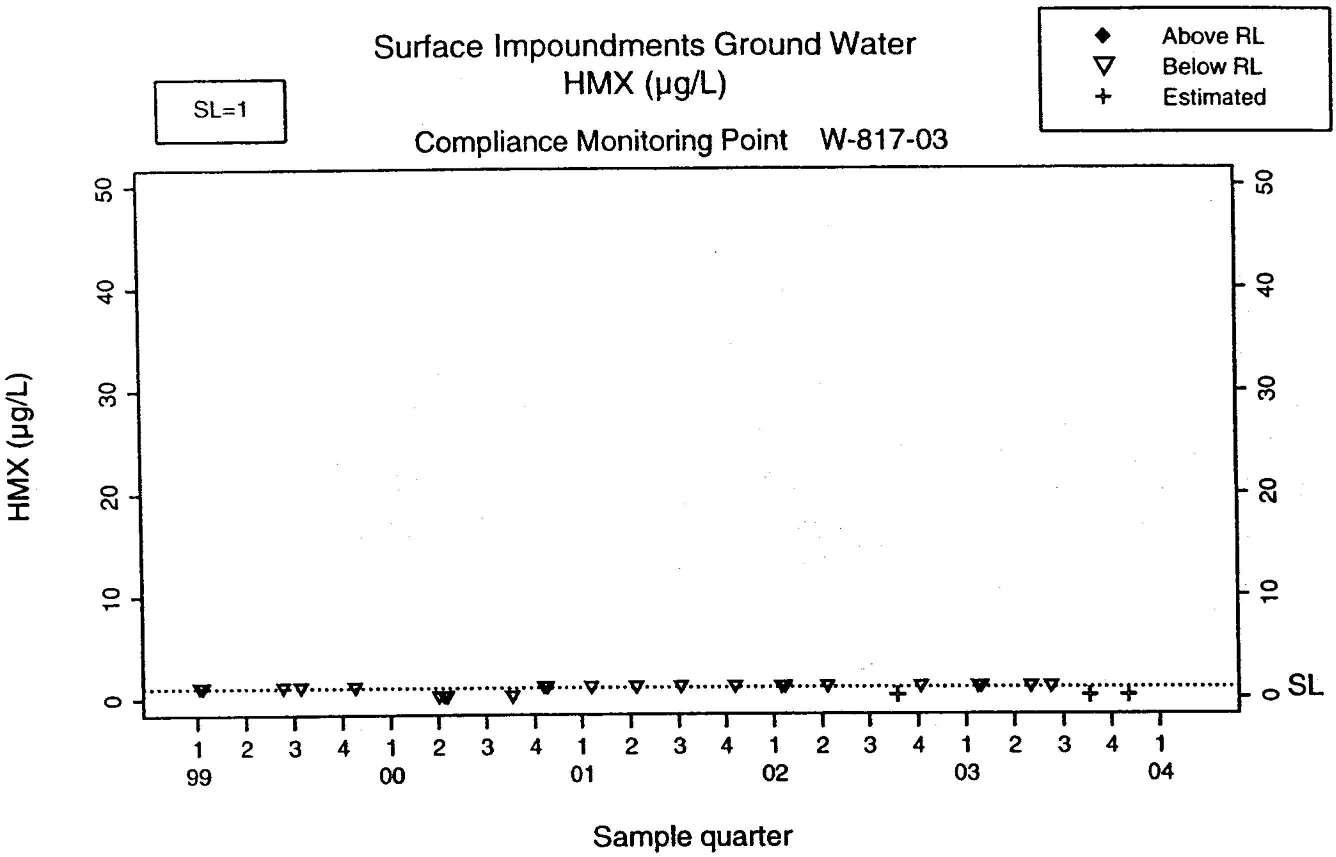

Surface Impoundments Ground Water
Sulfate (mg/L)
SL=233
Above RL
Below RL
Compliance Monitoring Point W-817-03
Sulfate (mg/L)
0
100
200
300
400
500
600
SL
1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1
99
00
01
02
03
04
Sample quarter

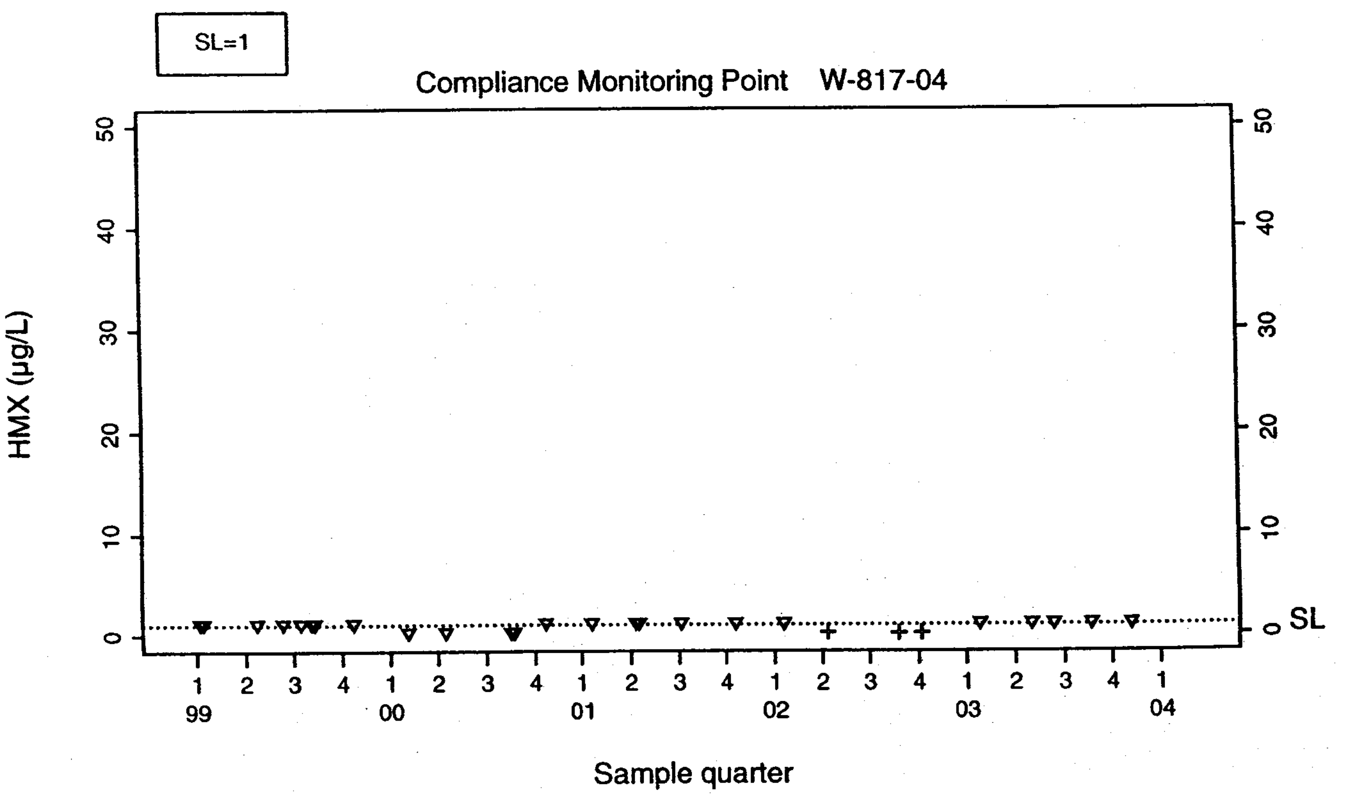

SL=284
Compliance Monitoring Point W-817-04
Sulfate (mg/L)
0
100
200
300
400
500
600
SL
1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1
99
00
01
02
03
04
Sample quarter


Surface Impoundments Ground Water
HMX (µg/L)
SL=1
Above RL
Below RL
Background Monitoring Point W-817-01
HMX (µg/L)
0
10
20
30
40
50
SL
1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1
99 00 01 02 03 04
Sample quarter

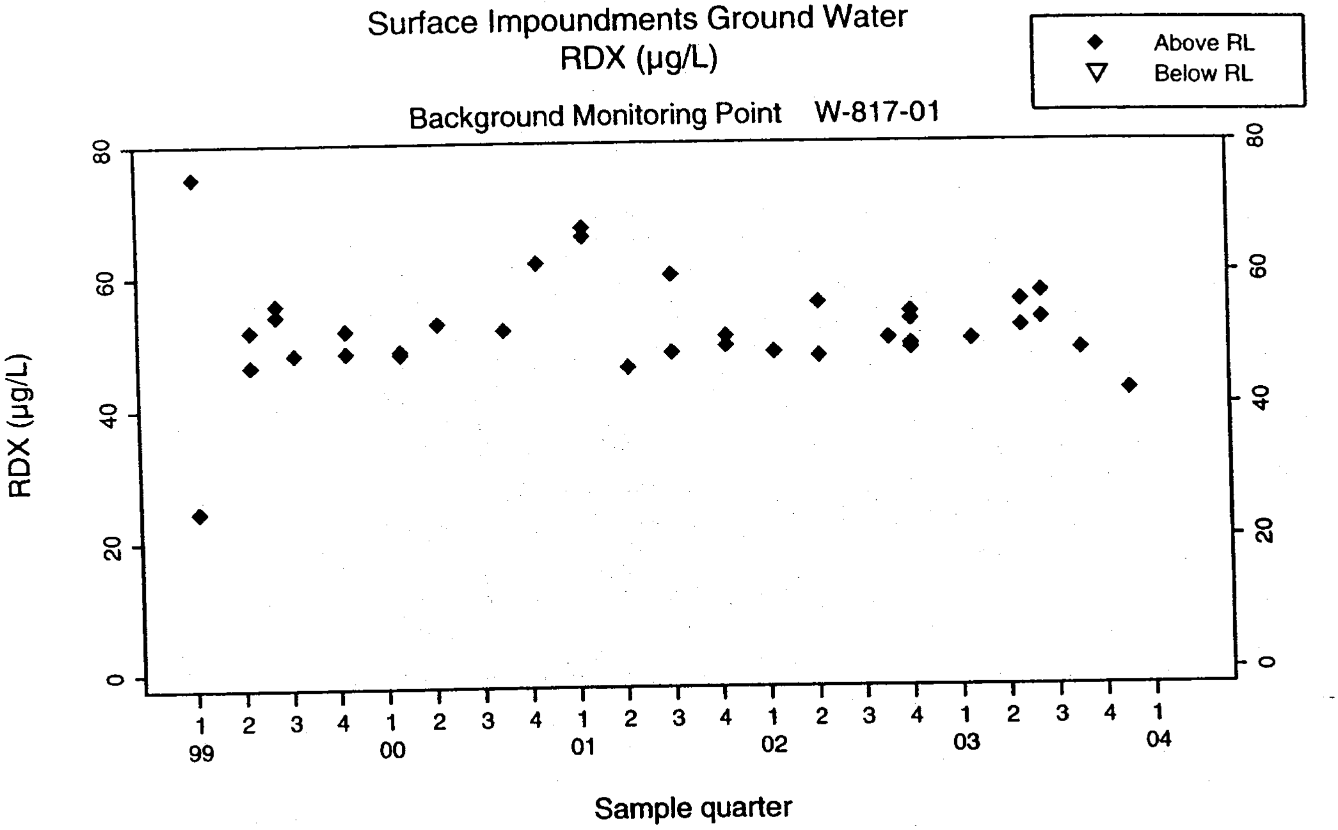

SL=1
Compliance Monitoring Point W-817-02
HMX (µg/L)
0
10
20
30
40
50
SL
1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1
99 00 01 02 03 04
Sample quarter

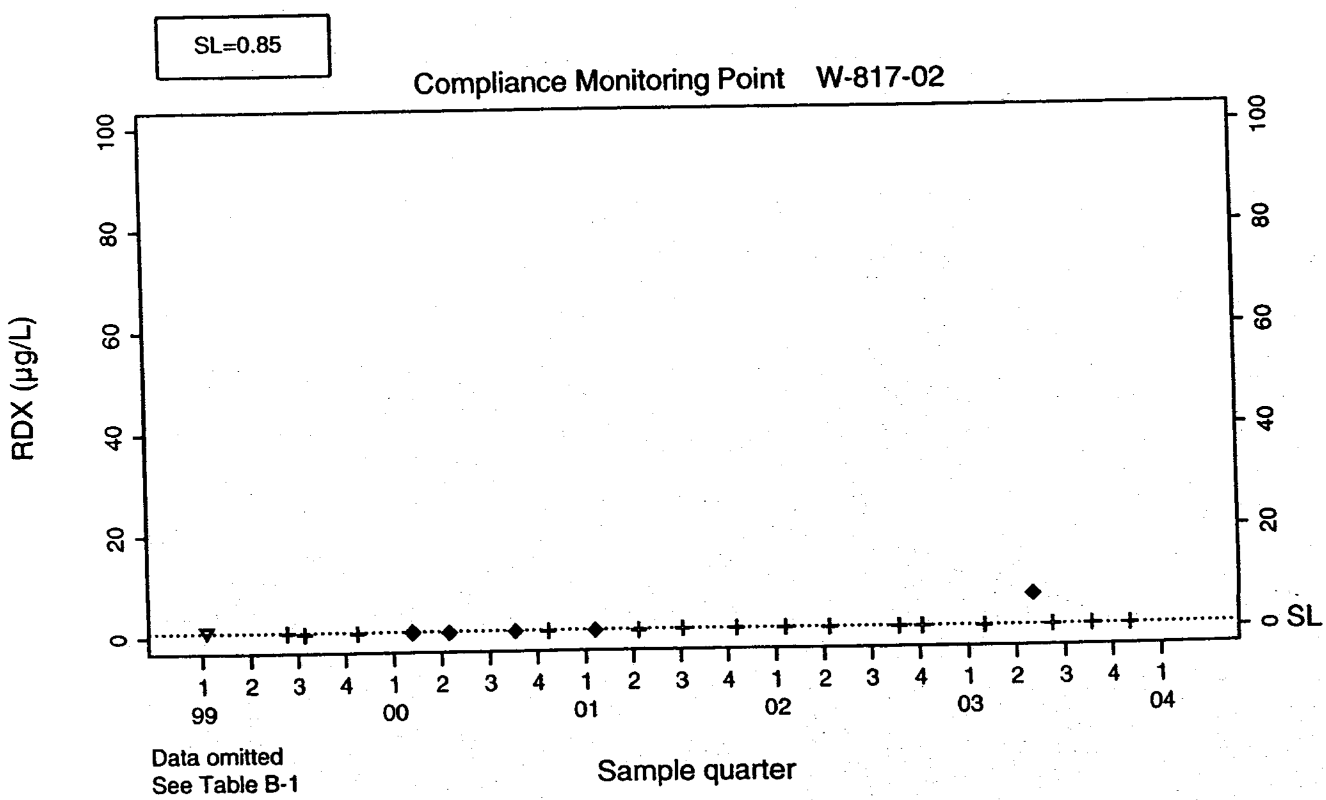
Surface Impoundments Ground Water
HMX (µg/L)



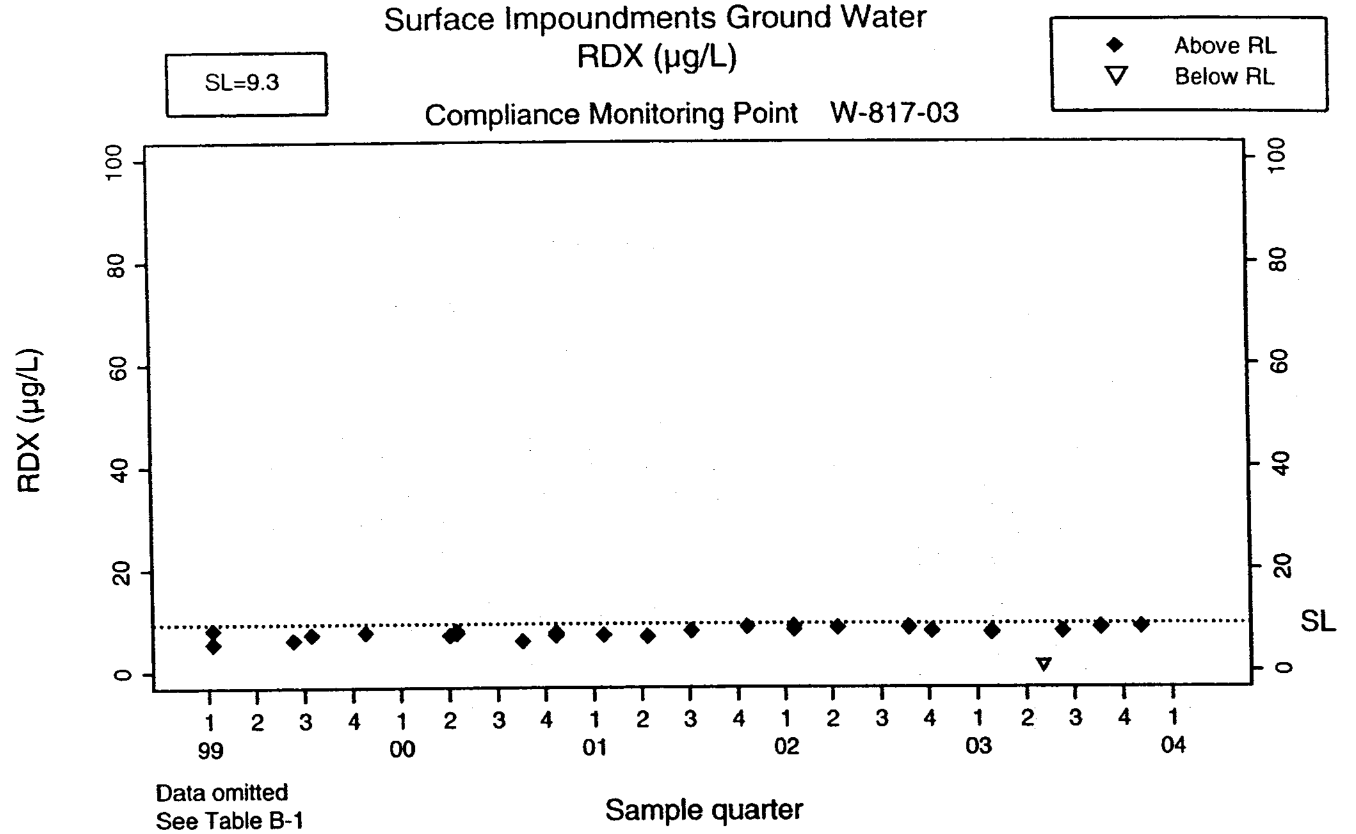


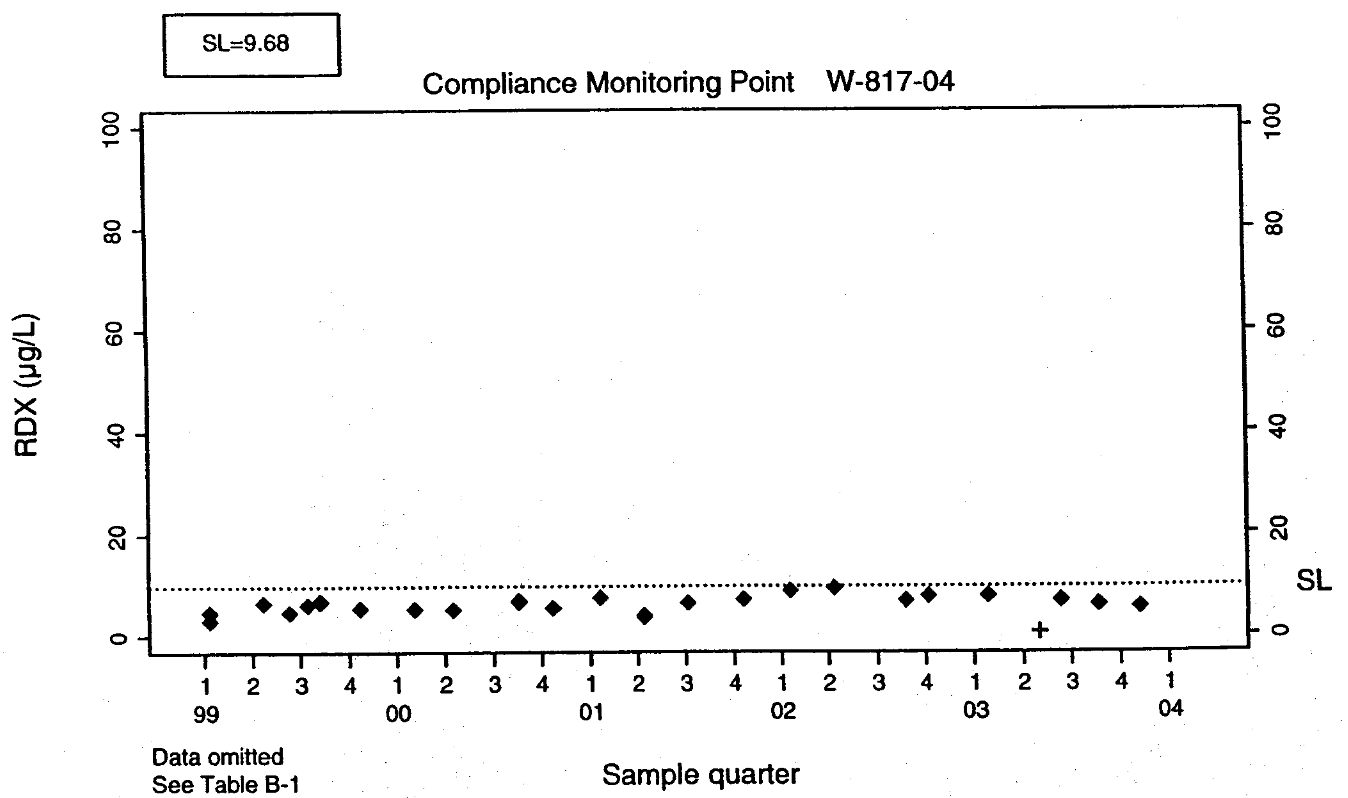
Surface Impoundments Ground Water
RDX (µg/L)



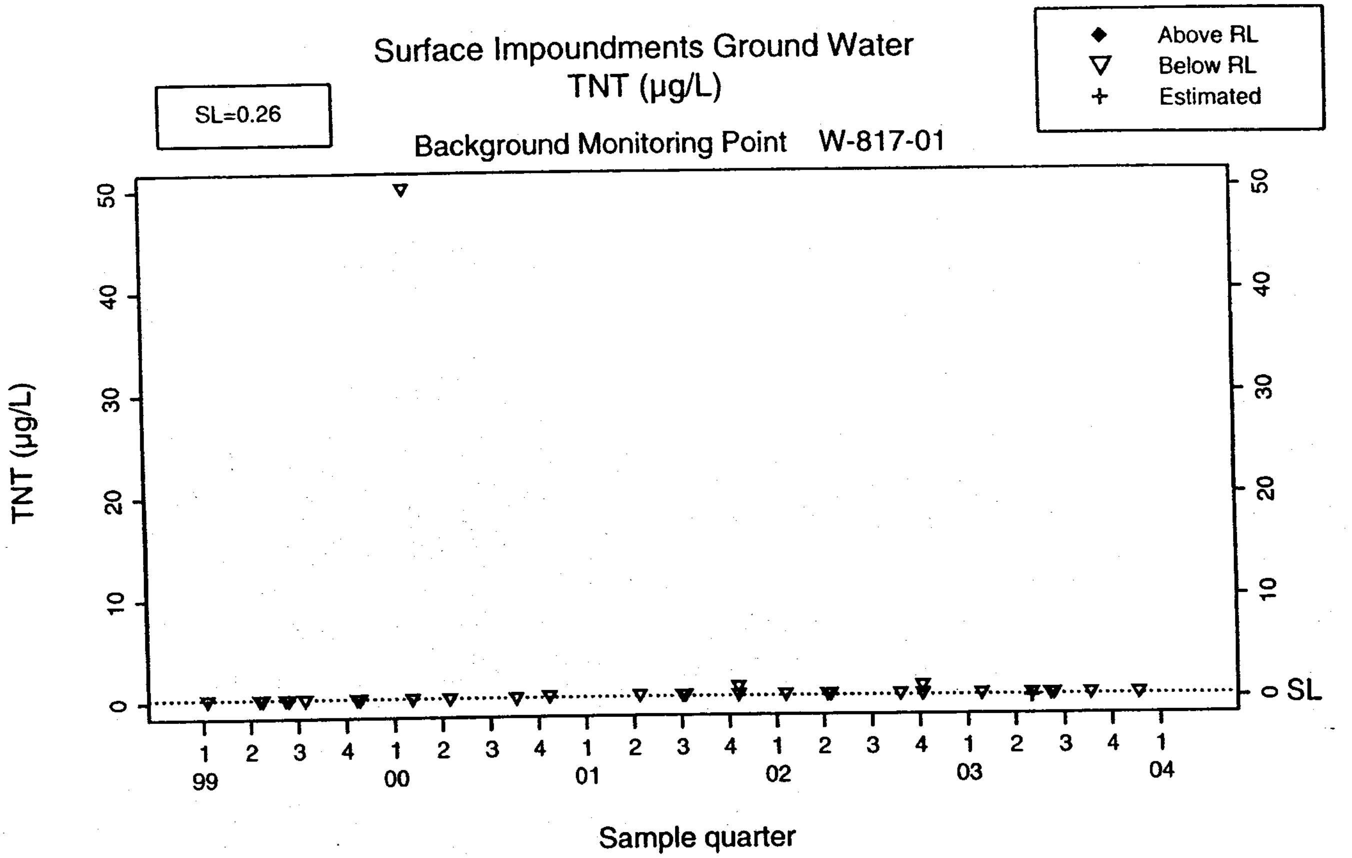


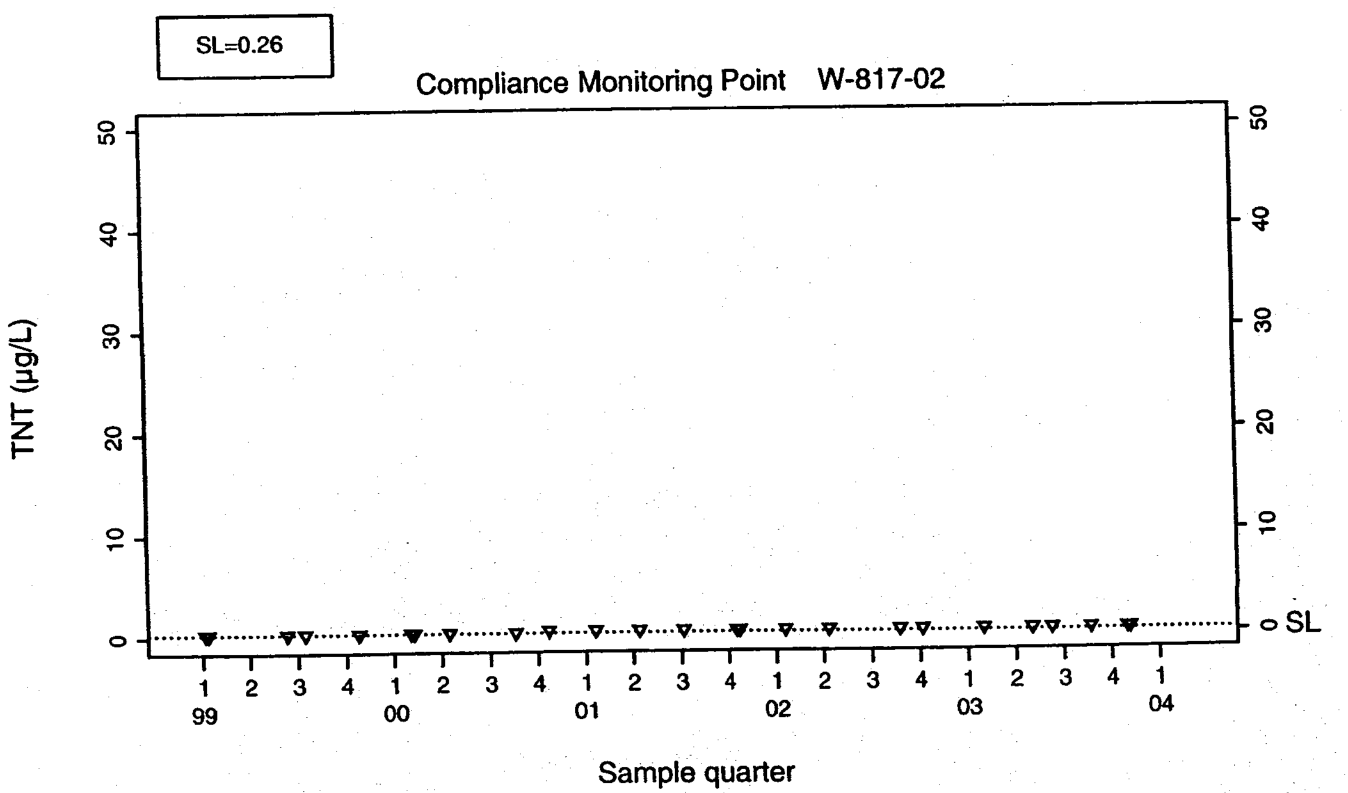
Surface Impoundments Ground Water
RDX (μg/L)



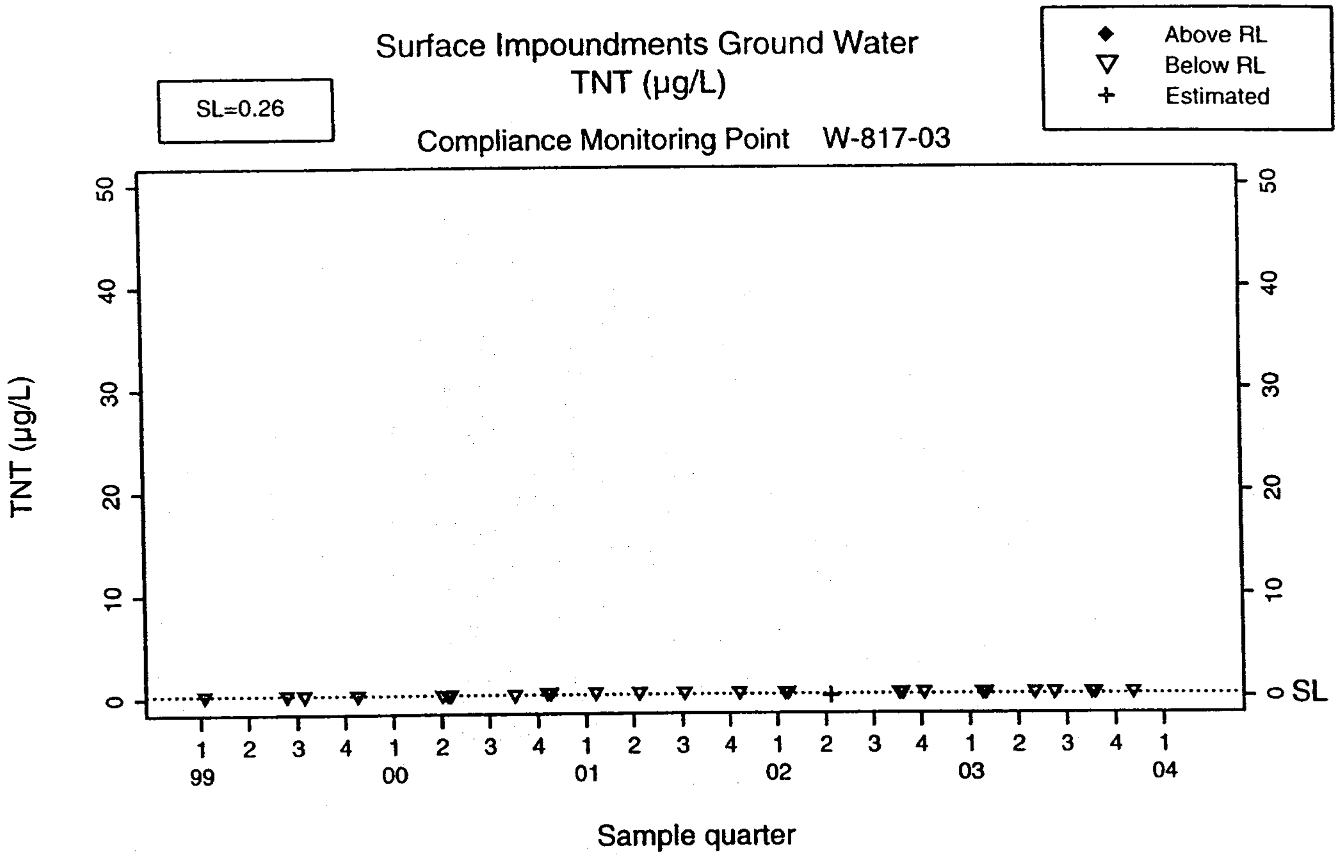


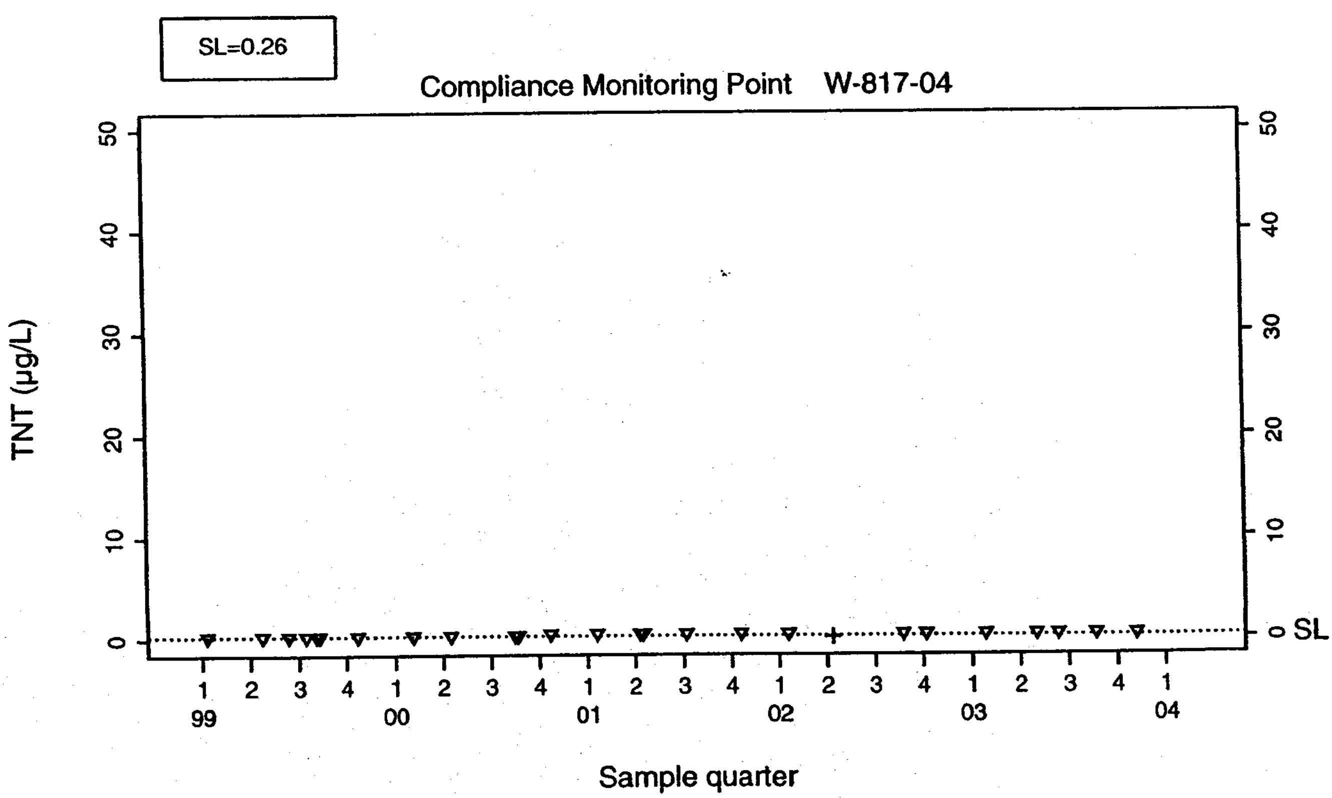
Surface Impoundments Ground Water TNT (µg/L)

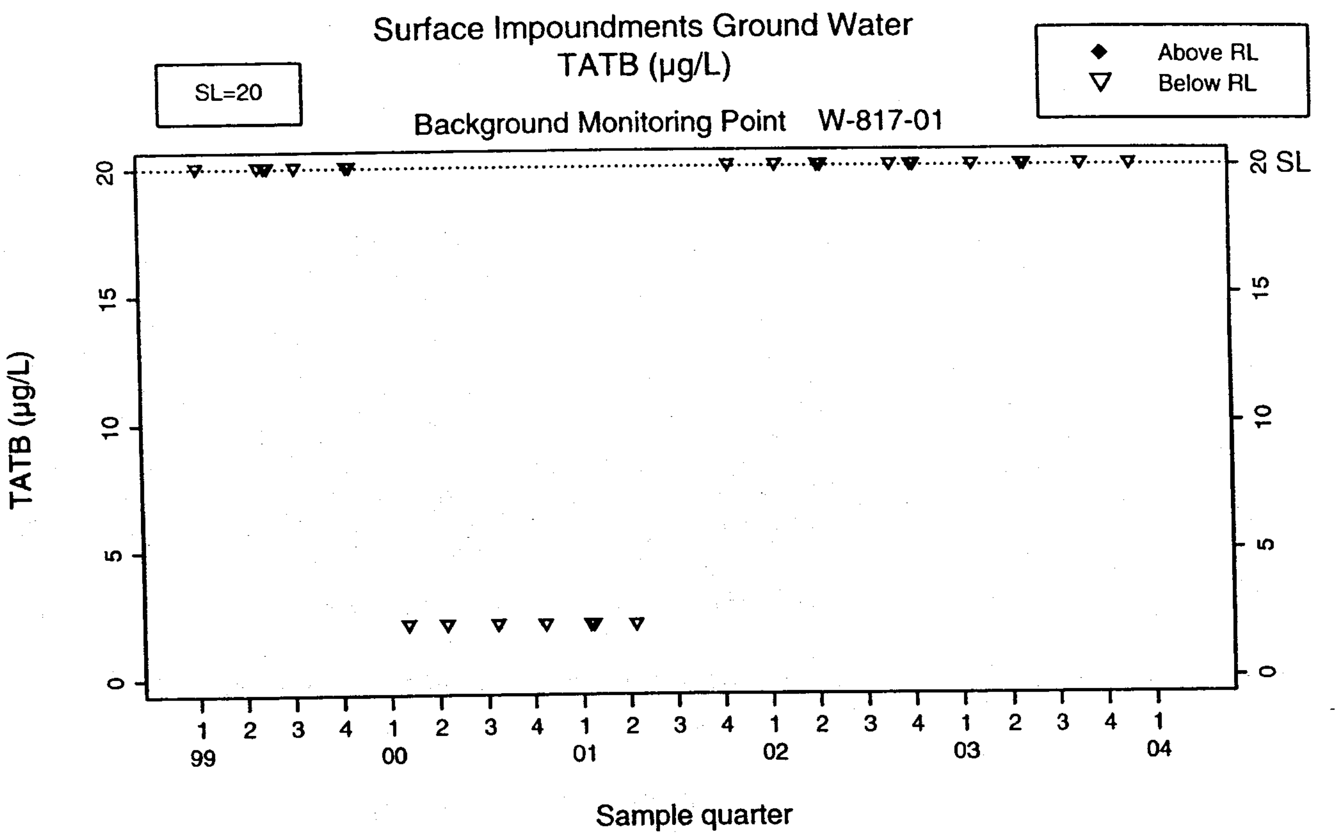


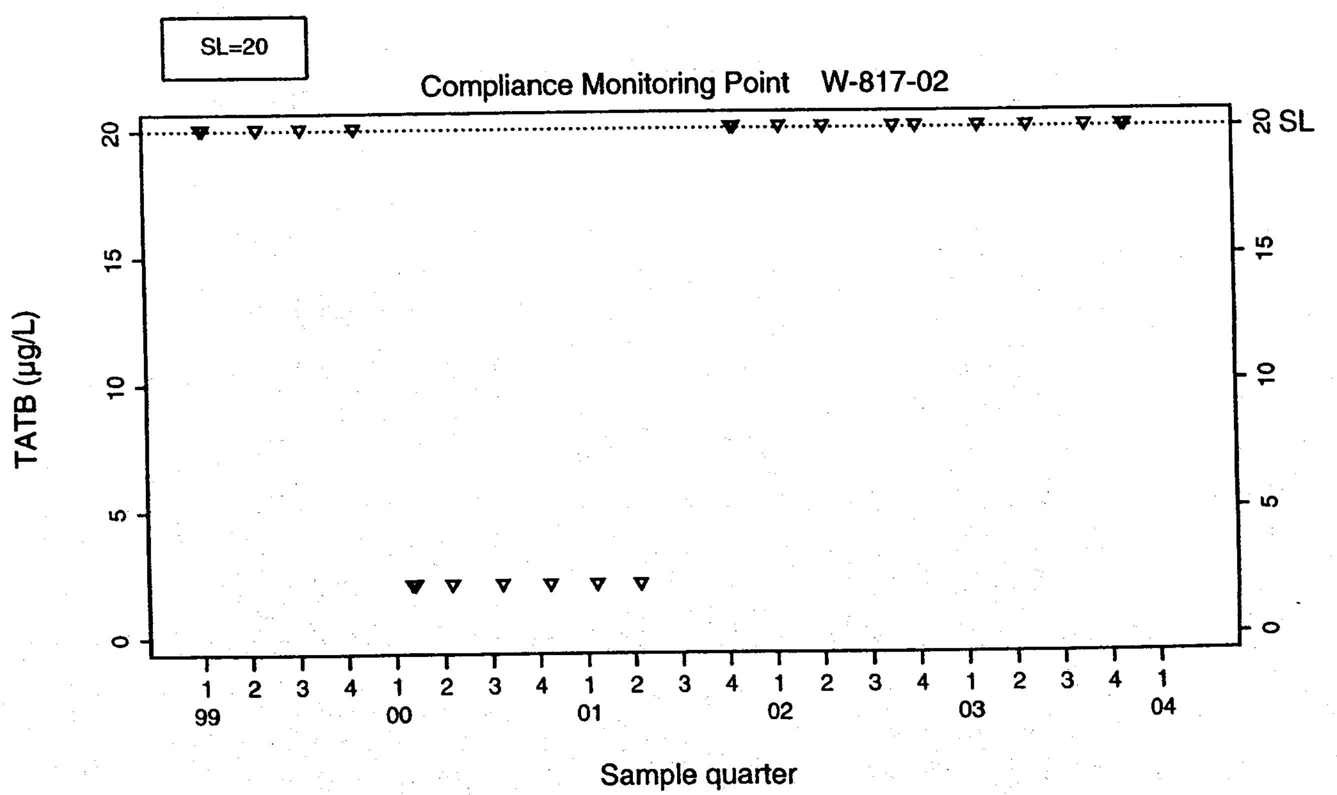


Surface Impoundments Ground Water
TNT (µg/L)

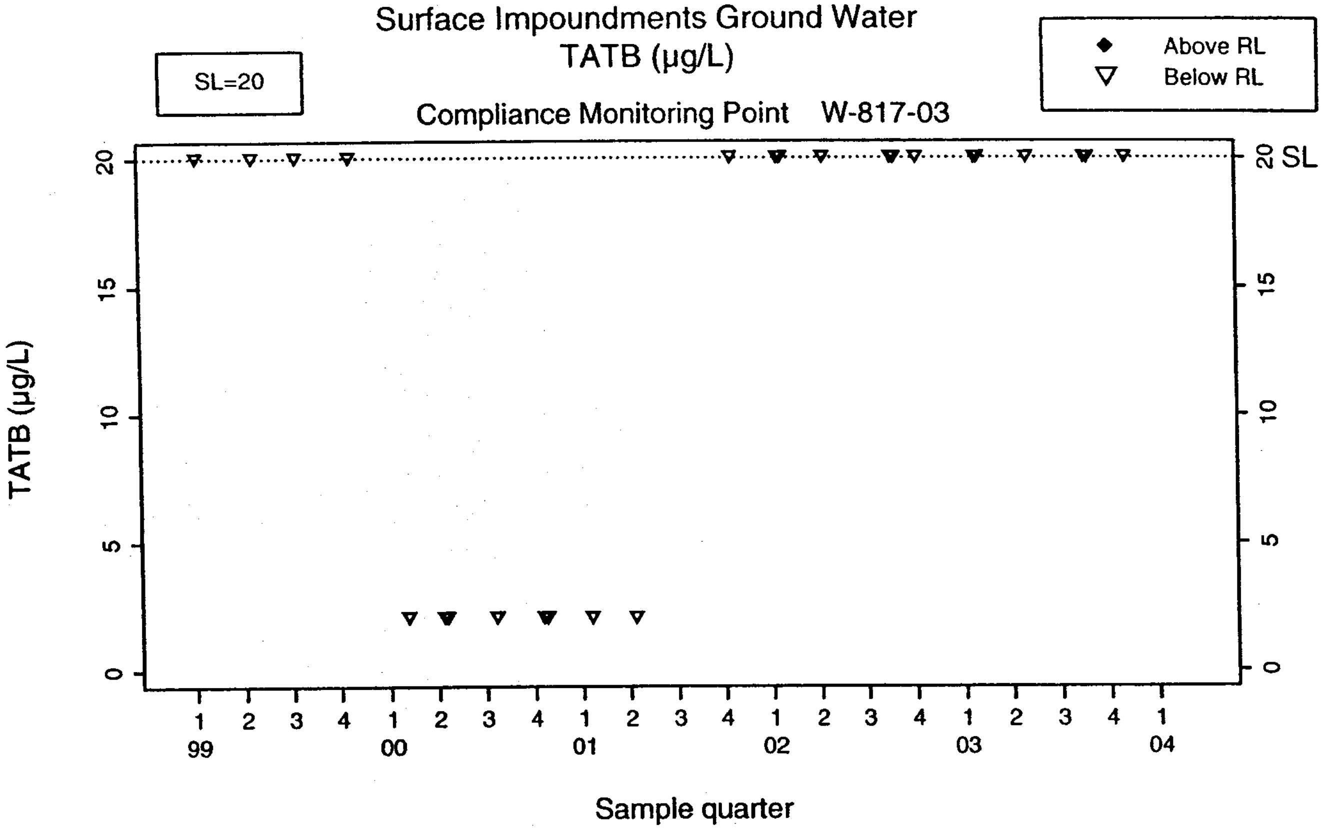


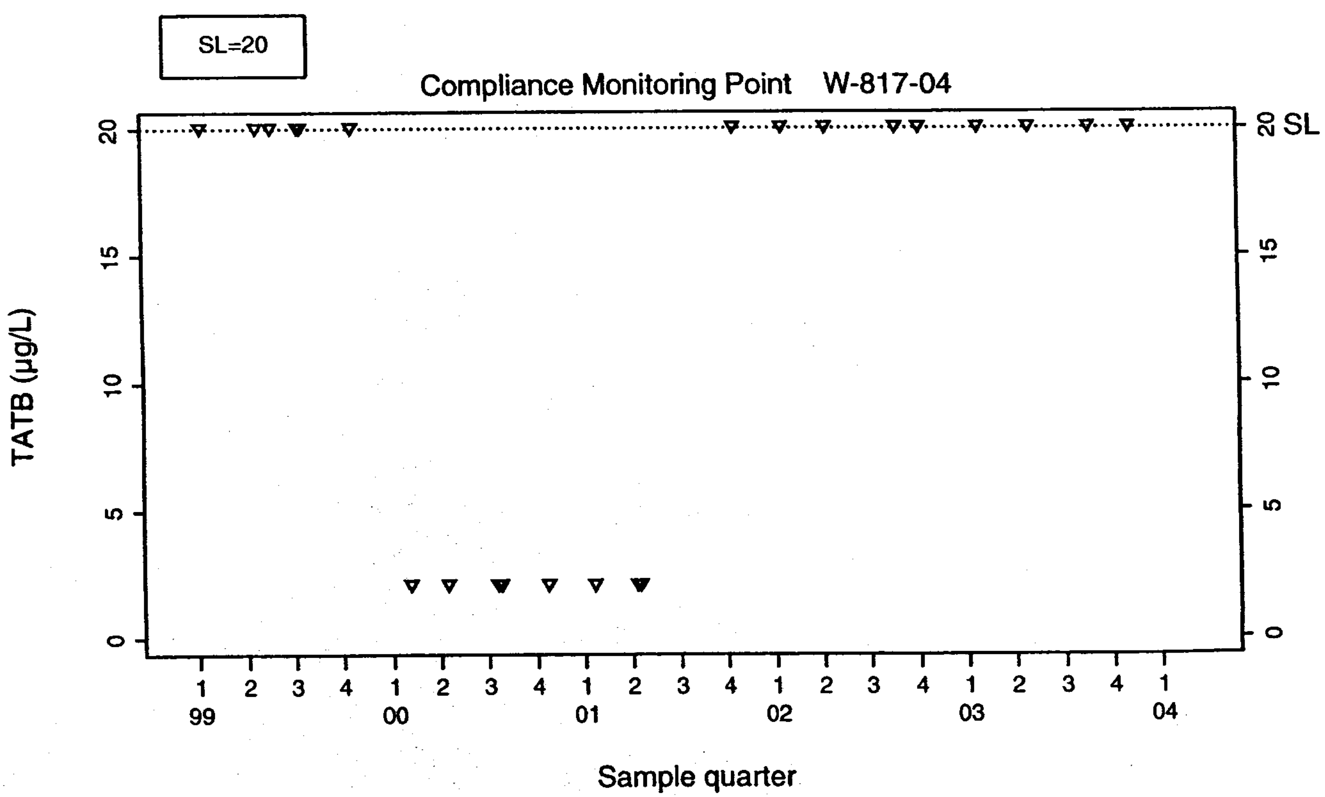



Surface Impoundments Ground Water
TATB (µg/L)
SL=20
Above RL
Below RL
Background Monitoring Point W-817-01
TATB (µg/L)
0
5
10
15
20
20 SL
1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1
99
00
01
02
03
04
Sample quarter

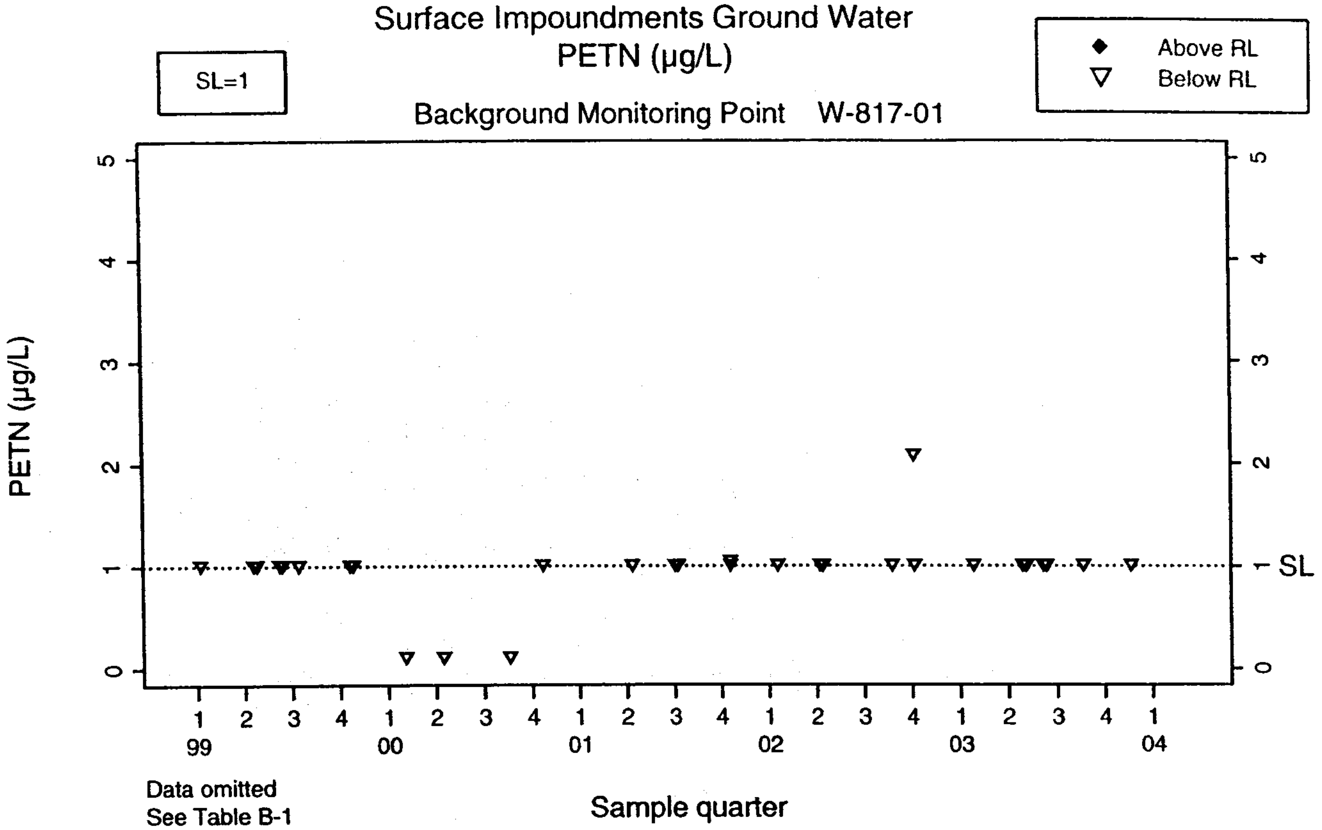

SL=20
Compliance Monitoring Point W-817-02
TATB (µg/L)
0
5
10
15
20
20 SL
1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1
99
00
01
02
03
04
Sample quarter

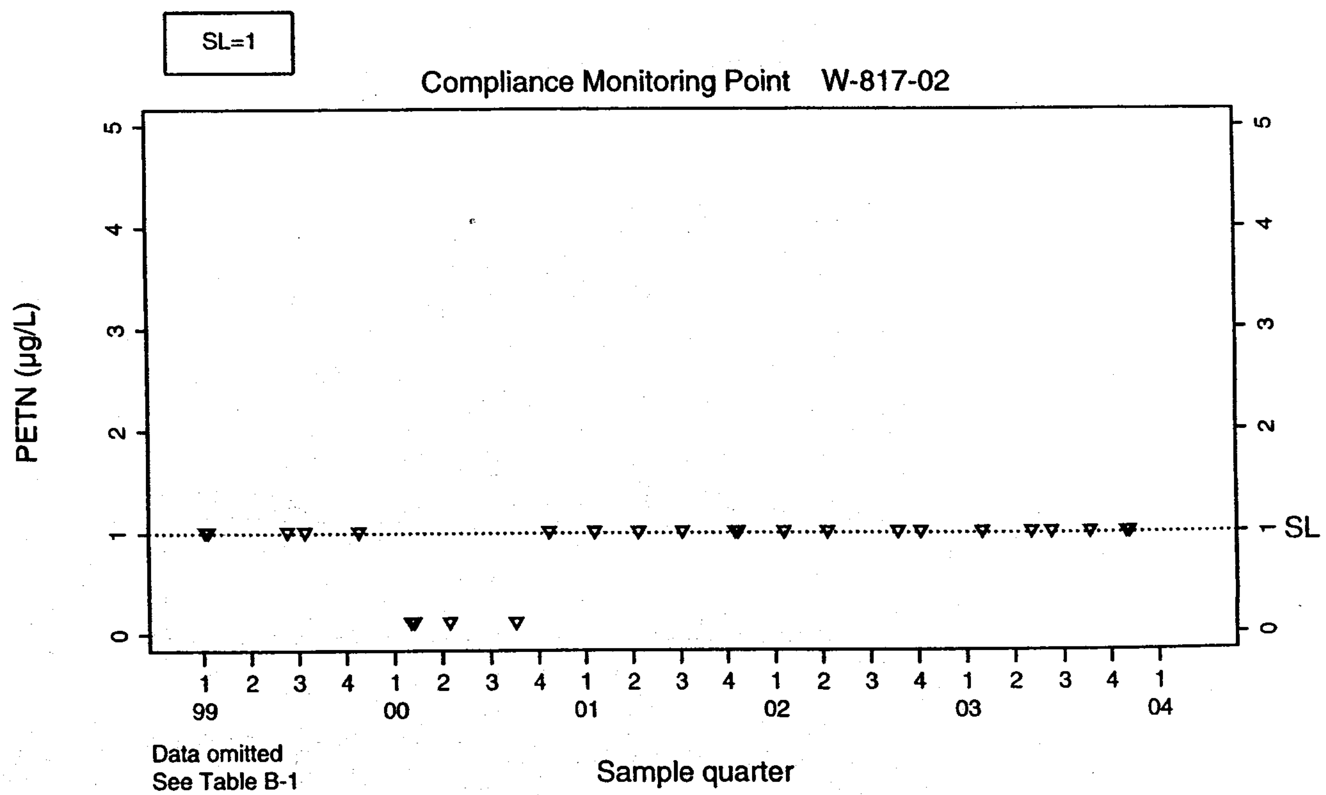
Surface Impoundments Ground Water
TATB (µg/L)

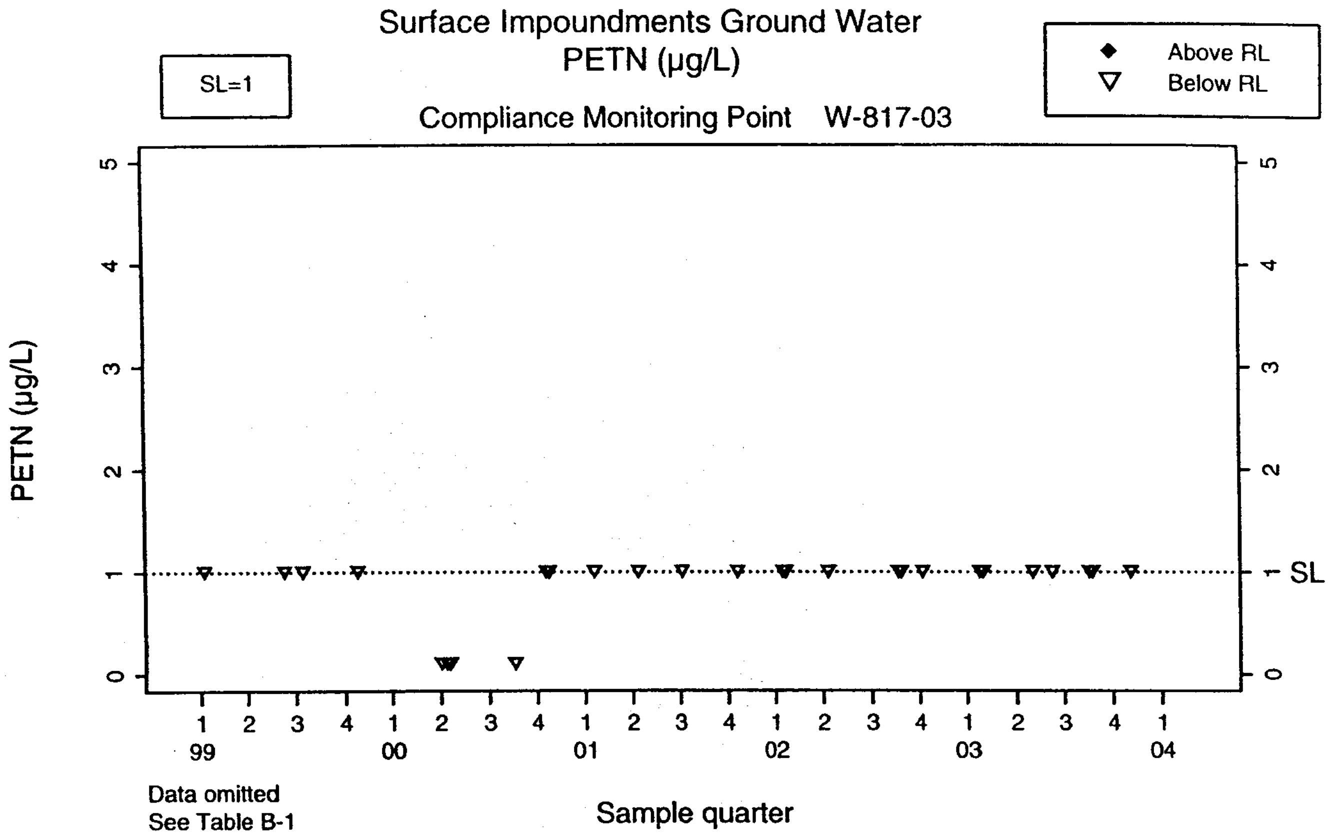


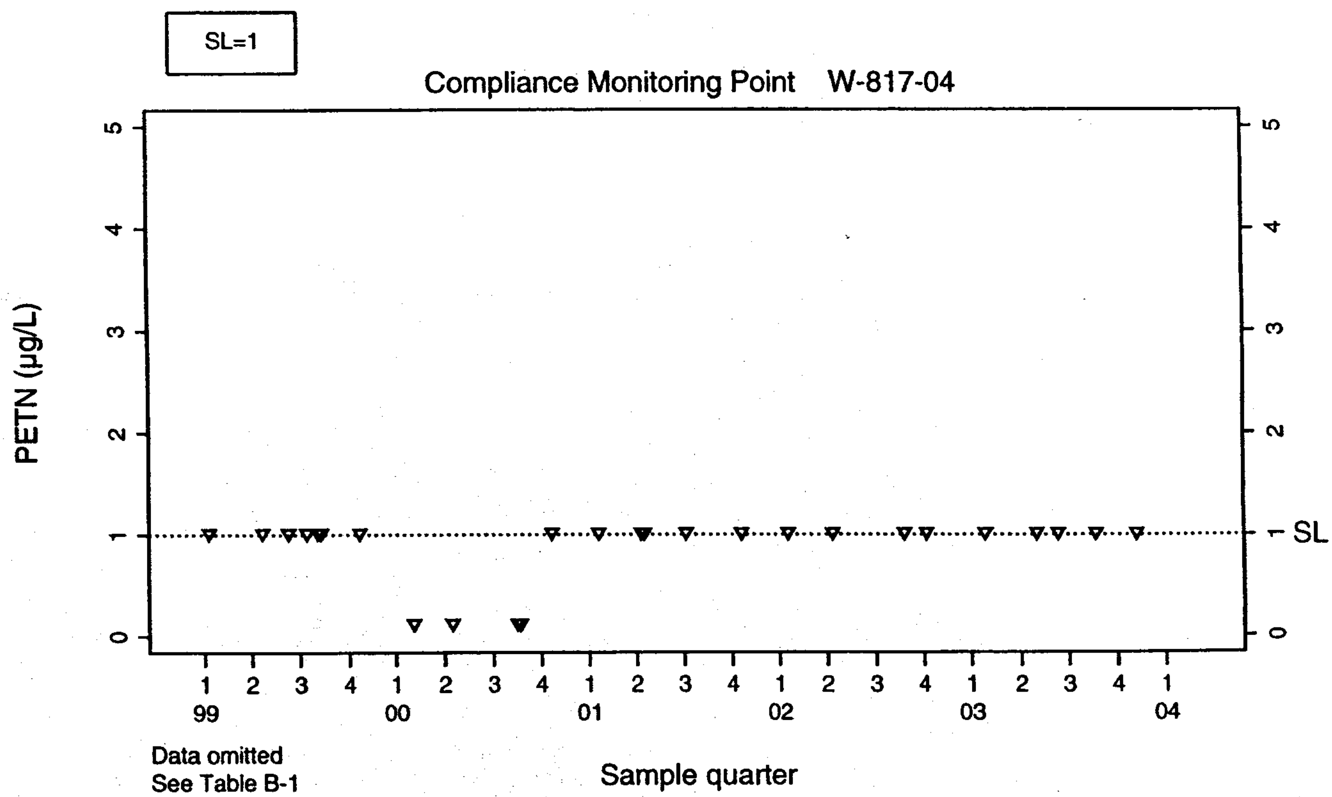


Surface Impoundments Ground Water
PETN (µg/L)

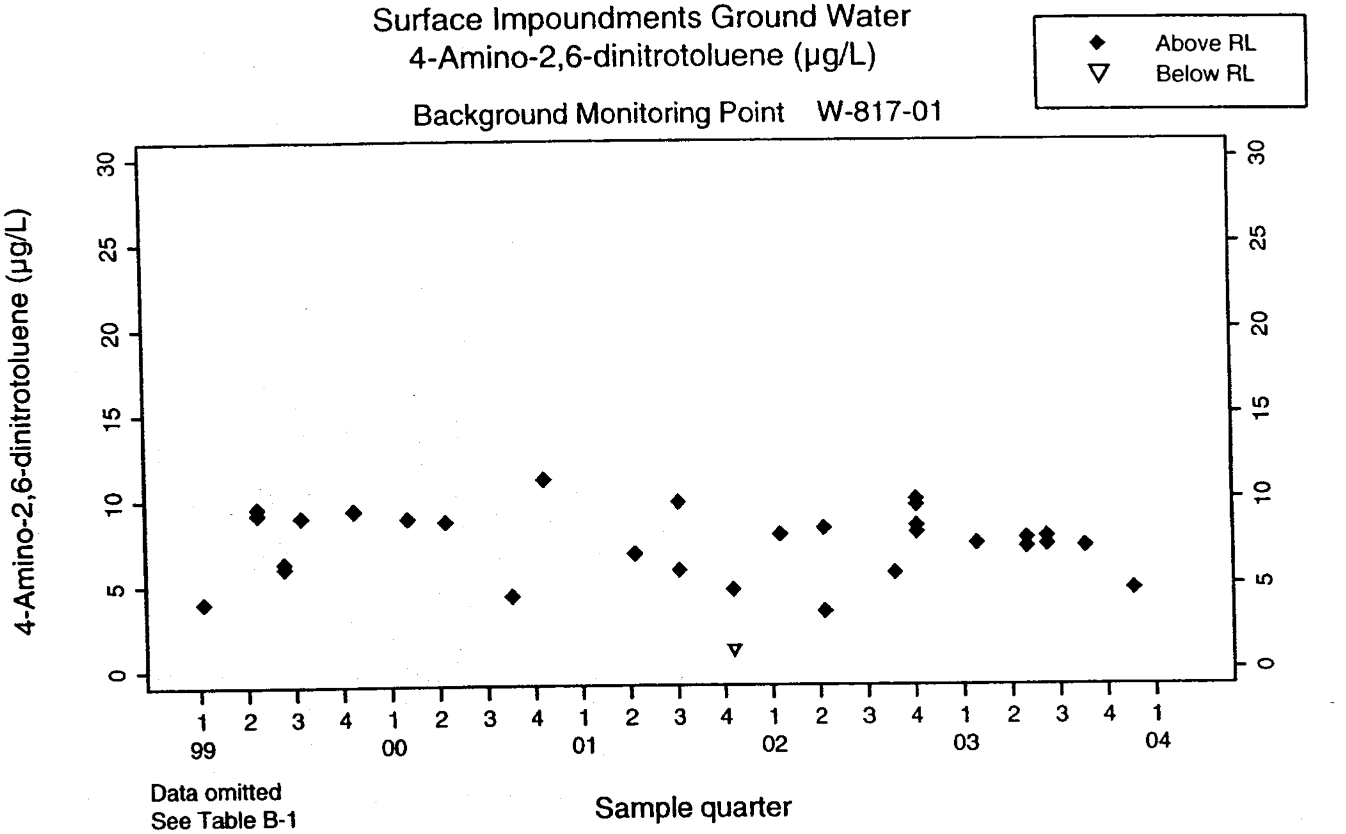


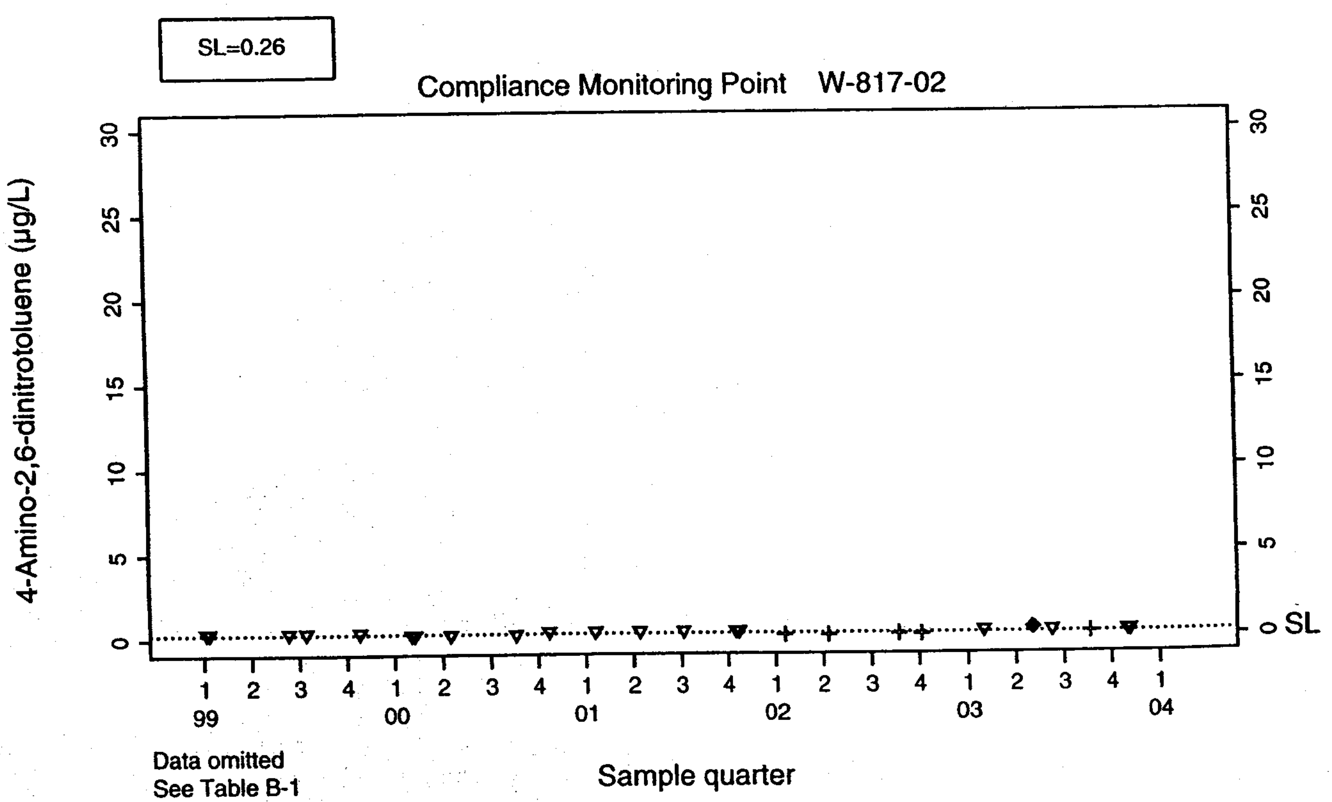



Surface Impoundments Ground Water
PETN (µg/L)
SL=1
Above RL
Below RL
Compliance Monitoring Point W-817-03
PETN (µg/L)
0
1
2
3
4
5
SL
1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1
99 00 01 02 03 04
Data omitted
See Table B-1
Sample quarter

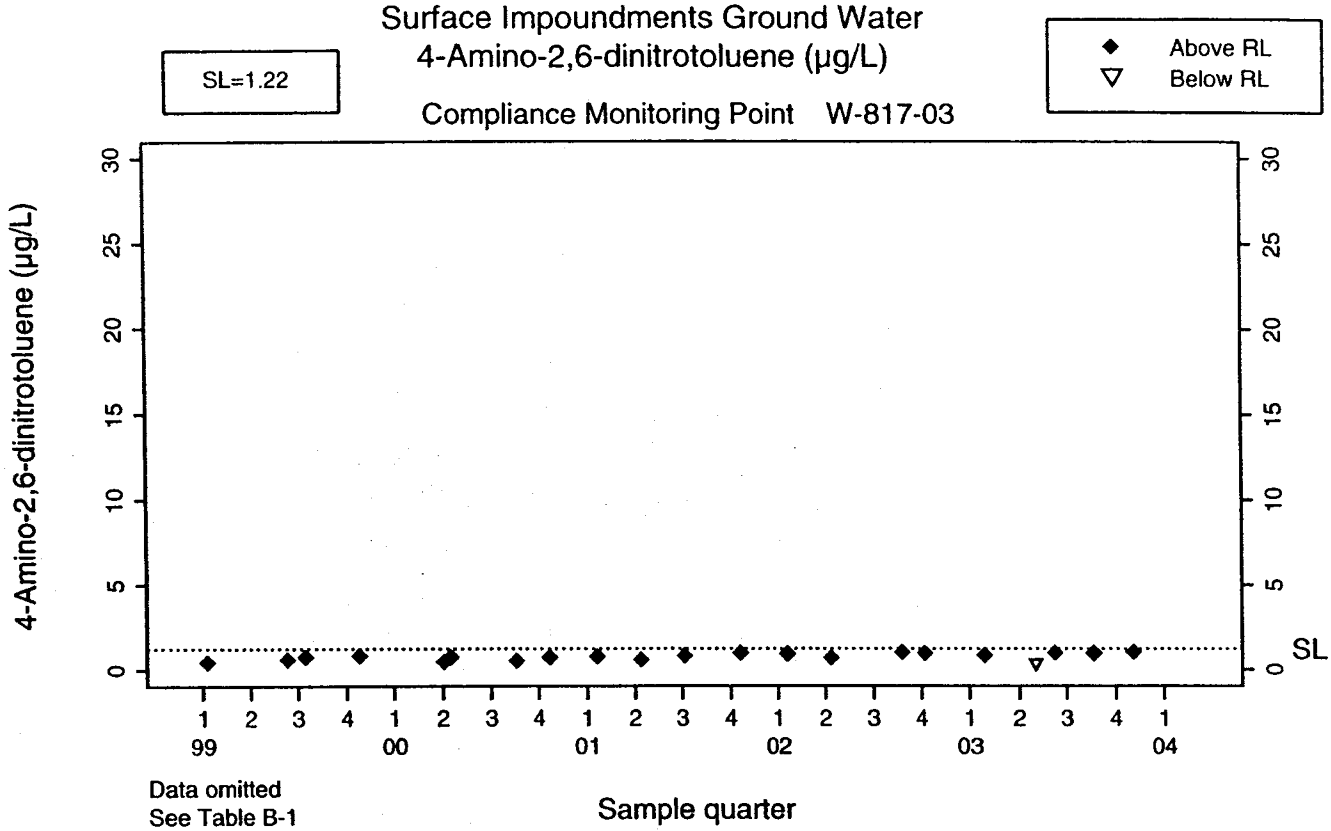

SL=1
Compliance Monitoring Point W-817-04
PETN (µg/L)
0
1
2
3
4
5
SL
1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1
99 00 01 02 03 04
Data omitted
See Table B-1
Sample quarter

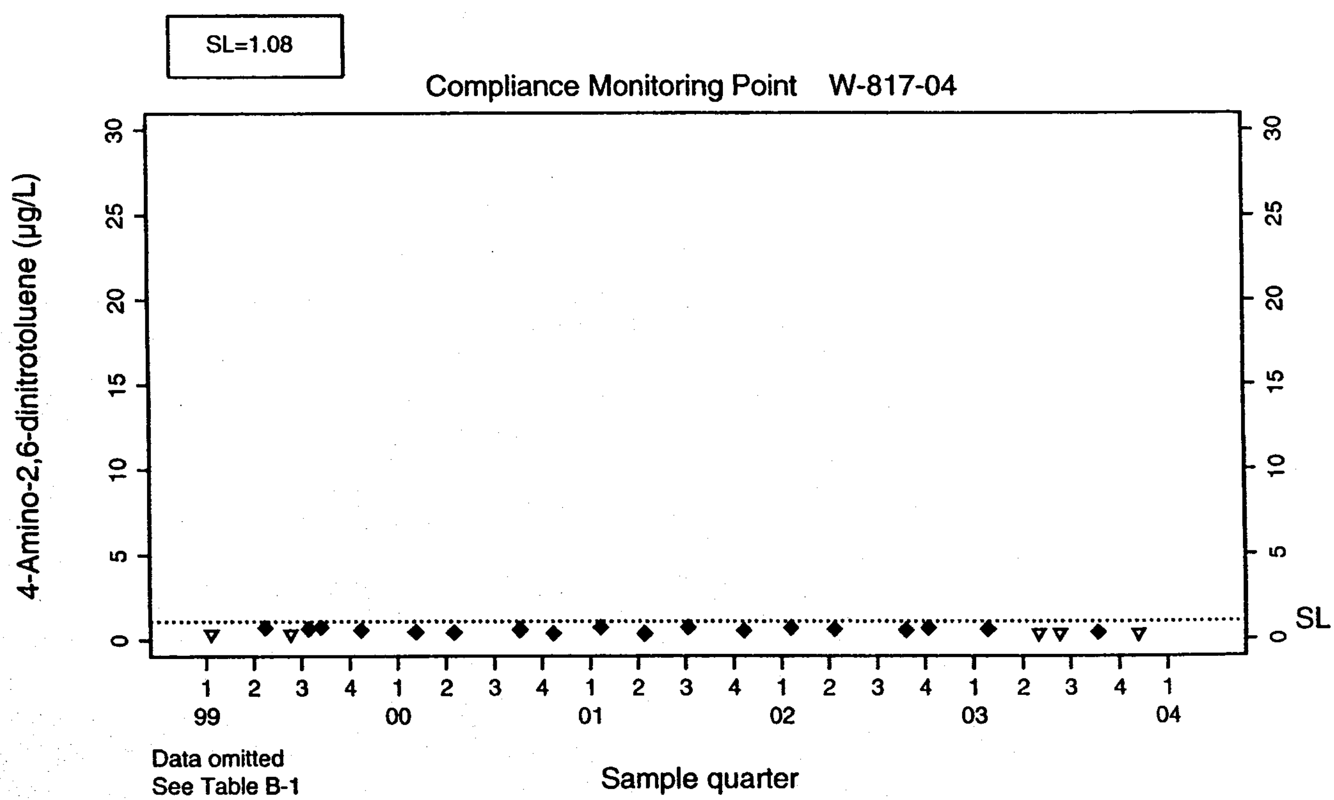
Surface Impoundments Ground Water
4-Amino-2,6-dinitrotoluene (μg/L)





Surface Impoundments Ground Water
4-Amino-2,6-dinitrotoluene (μg/L)





Annual Summary Tables of Surface Impoundments Ground Water Monitoring Data

WGMG04:030:ER:DL:bld

Table B-1.1. Summary of ground water analytical results, surface impoundments, constituents of concern required by WDR 96-248.

Parameter	Well	Statistical limit [a]	1st Quarter result	2nd Quarter result	3rd Quarter result	4th Quarter result
General						
pH (unitless)	W-817-01	None	8. 20	7. 90	8. 20	8. 43
	W-817-02	None	7. 97	8. 04	8. 06	8. 12
	W-817-03	None	8. 14	8. 21	8. 11	8. 15
	W-817-04	None	8. 16	8. 24	8. 22	8. 23
Halocarbons (µg/L)						
1,1,1-Trichloroethane	W-817-01	NA [b]	<0. 5	<0. 5	<0. 5	<0. 5
	W-817-02	1. 0	<0. 5	<0. 5	<0. 5	<0. 5
	W-817-03	1. 0	<0. 5	<0. 5	<0. 5	<0. 5
	W-817-04	1. 0	<0. 5	<0. 5	<0. 5	<0. 5
Bromoform	W-817-01	NA	<0. 5	<0. 5	<0. 5	<0. 5
	W-817-02	1. 0	<0. 5	<0. 5	<0. 5	<0. 5
	W-817-03	1. 0	<0. 5	<0. 5	<0. 5	<0. 5
	W-817-04	1. 0	<0. 5	<0. 5	<0. 5	<0. 5
1,2-Dichloroethane	W-817-01	NA	<0. 5	<0. 5	<0. 5	<0. 5
	W-817-02	1. 0	<0. 5	<0. 5	<0. 5	<0. 5
	W-817-03	1. 0	<0. 5	<0. 5	<0. 5	<0. 5
	W-817-04	1. 0	<0. 5	<0. 5	<0. 5	<0. 5
Freon 113	W-817-01	NA	<0. 5	<0. 5	<0. 5	<0. 5
	W-817-02	1. 0	<0. 5	<0. 5	<0. 5	<0. 5
	W-817-03	1. 0	<0. 5	<0. 5	<0. 5	<0. 5
	W-817-04	1. 0	<0. 5	<0. 5	<0. 5	<0. 5
Methylene chloride	W-817-01	NA	<1. 0	<1. 0	<1. 0	<1. 0
	W-817-02	1. 0	<1. 0	<1. 0	<1. 0	<1. 0
	W-817-03	1. 0	<1. 0	<1. 0	<1. 0	<1. 0
	W-817-04	1. 0	<1. 0	<1. 0	<1. 0	<1. 0

(continued)

Table B-1.1. Summary of ground water analytical results, surface impoundments, constituents of concern required by WDR 96-248.

Parameter	Well	Statistical limit [a]	1st Quarter result	2nd Quarter result	3rd Quarter result	4th Quarter result
Halocarbons (µg/L) (continued)						
Tetrachloroethene	W-817-01	NA	<0. 5	<0. 5	0 14 est. [c]	<0. 5
	W-817-02	1. 0	<0. 5	<0. 5	0 14 est.	<0. 5
	W-817-03	1. 0	<0. 5	0. 10 est.	0 12 est.	0 15 est.
	W-817-04	1. 0	<0. 5	<0. 5	<0. 5	<0. 5
Chlorobenzene	W-817-01	NA	<0. 5	<0. 5	<0. 5	<0. 5
	W-817-02	1. 0	<0. 5	<0. 5	<0. 5	<0. 5
	W-817-03	1. 0	<0. 5	<0. 5	<0. 5	<0. 5
	W-817-04	1. 0	<0. 5	<0. 5	<0. 5	<0. 5
Hydrocarbons (µg/L)						
Toluene	W-817-01	NA	<0. 5	<0. 5	<0. 5	<0. 5
	W-817-02	1. 0	<0. 5	<0. 5	<0. 5	<0. 5
	W-817-03	1. 0	<0. 5	<0. 5	<0. 5	<0. 5
	W-817-04	1. 0	<0. 5	<0. 5	0 18 est.	<0. 5
Naphthalene	W-817-01	NA	<5	<5	<5	<5
	W-817-02	5	<5	<5	<5	<5
	W-817-03	5	<5	<5	<5	<5
	W-817-04	5	<5	<5	<5	<5
Photographic chemicals (µg/L)						
meta and *para*- Cresol	W-817-01	NA	<2	<2	<2	<2
	W-817-02	2	<2	<2	<2	<2
	W-817-03	2	<2	<2	<2	<2
	W-817-04	2	<2	<2	<2	<2
Benzyl alcohol	W-817-01	NA	<2	<2	<2	<2
	W-817-02	2	<2	<2	<2	<2
	W-817-03	2	<2	<2	<2	<2
	W-817-04	2	<2	<2	<2	<2

(continued)

Table B-1.1. Summary of ground water analytical results, surface impoundments, constituents of concern required by WDR 96-248.

Parameter	Well	Statistical limit [a]	1st Quarter result	2nd Quarter result	3rd Quarter result	4th Quarter result
Volatile/semivolatile organic compounds (µg/L)						
Acetone	W-817-01	NA	<10	<10	<10	<10
	W-817-02	10	<10	<10	<10	<10
	W-817-03	10	<10	<10	<10	<10
	W-817-04	10	<10	<10	<10	<10
2-Butanone (methyl ethyl ketone)	W-817-01	NA	<20	<20	<20	<20
	W-817-02	20	<20	<20	<20	<20
	W-817-03	20	<20	<20	<20	<20
	W-817-04	20	<20	<20	<20	<20
Dimethyl sulfoxide (DMSO)	W-817-01	NA	<10	<10	<10	<10
	W-817-02	10	<10	<10	<10	<10
	W-817-03	10	<10	<10	<10	<10
	W-817-04	10	<20	<10	<10	<10
Ethyl alcohol (ethanol)	W-817-01	NA	<1000	<1000	<1000	<1000
	W-817-02	1000	<1000	<1000	<1000	<1000
	W-817-03	1000	<1000	<1000	<1000	<1000
	W-817-04	1000	<1000	<1000	<1000	<1000
Methyl isobutyl ketone	W-817-01	NA	<20	<20	<20	<20
	W-817-02	20	<20	<20	<20	<20
	W-817-03	20	<20	<20	<20	<20
	W-817-04	20	<20	<20	<20	<20
Additives to energetic compounds (µg/L)						
Bis(2-ethylhexyl)phthalate	W-817-01	NA	<5	<5	<5	<5
	W-817-02	5	<5	<5	<5	1. 1 est.
	W-817-03	5	<5	<5	<5	<5
	W-817-04	5	<5	<5	3. 8 est.	<5

(continued)

Table B-1.1. Summary of ground water analytical results, surface impoundments, constituents of concern required by WDR 96-248.

Parameter	Well	Statistical limit [a]	1st Quarter result	2nd Quarter result	3rd Quarter result	4th Quarter result
Unreactive polymers (µg/L)						
Styrene	W-817-01	NA	<0. 5	<0. 5	<0. 5	<0. 5
	W-817-02	1. 0	<0. 5	<0. 5	<0. 5	<0. 5
	W-817-03	1. 0	<0. 5	<0. 5	<0. 5	<0. 5
	W-817-04	1. 0	<0. 5	<0. 5	<0. 5	<0. 5
Vinyl chloride	W-817-01	NA	<0. 5	<0. 5	<0. 5	<0. 5
	W-817-02	1. 0	<0. 5	<0. 5	<0. 5	<0. 5
	W-817-03	1. 0	<0. 5	<0. 5	<0. 5	<0. 5
	W-817-04	1. 0	<0. 5	<0. 5	<0. 5	<0. 5
Metals (mg/L)						
Aluminum	W-817-01	NA	<0. 05	<0. 05	<0. 05	<0. 05
	W-817-02	0. 20	<0. 05	<0. 05	<0. 05	<0. 05
	W-817-03	0. 20	<0. 05	<0. 05	<0. 05	<0. 05
	W-817-04	0. 20	<0. 05	<0. 05	0. 044 est.	0. 11
Arsenic	W-817-01	NA	0. 059	0 041	0. 046	0. 045
	W-817-02	0. 073	0. 080 est. [d]	0 056	0. 060	0. 065
	W-817-03	0. 072	0. 069	0 056	0. 056	0. 062
	W-817-04	0. 077	0. 070	0 048	0. 053	0. 069
Barium	W-817-01	NA	0. 010 est.	0 0088 est.	0. 0051 est.	0. 011 est.
	W-817-02	0. 025	0. 0091 est.	0 0094 est.	0. 011 est.	0. 0092 est.
	W-817-03	0. 025	0. 0086 est.	0 0085 est.	0. 0083 est.	0. 012 est.
	W-817-04	0. 025	0. 0086 est.	0 0078 est.	0. 0095 est.	0. 0084 est.
Cadmium	W-817-01	NA	<0. 0005	0 00004 est.	<0. 0005	0 0001 est.
	W-817-02	0. 0016	0. 0001 est.	0 0001 est.	0. 0001 est.	0. 0002 est.
	W-817-03	0. 001	0. 00003 est	<0. 0005	<0. 0005	0. 0001 est.
	W-817-04	0. 001	<0. 0005	<0. 0005	<0. 0005	<0. 0005

(continued)

Table B-1.1. Summary of ground water analytical results, surface impoundments, constituents of concern required by WDR 96-248.

Parameter	Well	Statistical limit [a]	1st Quarter result	2nd Quarter result	3rd Quarter result	4th Quarter result
Metals (mg/L) (continued)						
Chromium	W-817-01	NA	0. 002	0. 002	0. 002	0. 001
	W-817-02	0. 003	0. 001	0. 001	0. 0006 est.	0. 0007 est.
	W-817-03	0. 0042	0. 002	0. 002	0. 002	0. 002
	W-817-04	0. 0098	0. 004	0. 003	0. 004	0. 019 [d]
Cobalt	W-817-01	NA	<0. 05	<0. 05	<0. 05	<0. 05
	W-817-02	0. 05	0. 0002 est.	<0. 05	<0. 05	<0. 05
	W-817-03	0. 05	<0. 05	<0. 05	<0. 05	<0. 05
	W-817-04	0. 05	<0. 05	<0. 05	<0. 05	<0. 05
Copper	W-817-01	NA	0. 004	0. 0058	0. 004	0. 001
	W-817-02	0. 02	0. 0069	0. 001	0. 0005 est.	0. 0005 est.
	W-817-03	0. 02	0. 001	0. 0002 est.	0. 00009 est.	0. 0006 est.
	W-817-04	0. 02	0. 0006 est.	0. 0005 est.	0. 0004 est.	0. 002
Lead	W-817-01	NA	<0. 02	0. 001 est.	<0. 02	<0. 005
	W-817-02	0. 0099	<0. 005	<0. 005	<0. 02	<0. 05
	W-817-03	0. 0099	<0. 02	<0. 005	<0. 02	<0. 05
	W-817-04	0. 0099	<0. 02	<0. 005	<0. 02	<0. 05
Manganese	W-817-01	NA	<0. 01	<0. 01	0 0019 est.	<0. 01
	W-817-02	0. 01	<0. 01	0. 0019 est.	0 0019 est.	0. 0005 est.
	W-817-03	0. 01	<0. 01	<0. 01	<0. 01	0. 0024 est.
	W-817-04	0. 01	<0. 01	<0. 01	0. 012 est. [d]	0. 011 est. [d]
Molybdenum	W-817-01	NA	0. 025	0. 022 est.	0. 012 est.	0. 024 est.
	W-817-02	0. 073	0. 048	0. 051	0. 047	0. 051
	W-817-03	0. 060	0. 040	0. 041	0. 039	0. 041
	W-817-04	0. 054	0. 042	0. 039	0. 040	0. 042
Nickel	W-817-01	NA	0. 002	0. 004	0. 007	0. 0008 est.
	W-817-02	0. 044	<0. 002	0. 001 est.	0. 001 est.	0. 0008 est.
	W-817-03	0. 044	<0. 002	0. 001 est.	<0. 002	0. 001 est.
	W-817-04	0. 044	0. 025	0. 022	0. 027	0. 030

(continued)

Table B-1.1. Summary of ground water analytical results, surface impoundments, constituents of concern required by WDR 96-248.

Parameter	Well	Statistical limit [a]	1st Quarter result	2nd Quarter result	3rd Quarter result	4th Quarter result
Metals (mg/L) (continued)						
Potassium	W-817-01	NA	10	9 2	4. 5	11
	W-817-02	18. 6	13	14	13	13
	W-817-03	14. 6	12	11	10	11
	W-817-04	13. 7	12	11	11	11
Silver	W-817-01	NA	<0. 05	<0. 1	<0. 001	<0. 001
	W-817-02	0. 001	<0. 05	<0. 1	<0. 001	<0. 001
	W-817-03	0. 001	<0. 05	<0. 1	<0. 001	<0. 001
	W-817-04	0. 001	<0. 05	<0. 1	<0. 001	<0. 001
Zinc	W-817-01	NA	0. 014	0 16	0. 0049 est.	0. 013
	W-817-02	0. 24	0. 25	0 21	0. 14	0. 17
	W-817-03	0. 0099	0. 010 est. [e]	0 0083 est.	0. 0092 est.	0 025 est. [d]
	W-817-04	0. 055	0. 014	0 11	0. 014	0. 013
Salts (mg/L)						
Ammonia nitrogen (as N)	W-817-01	NA	0. 04	<0. 02	<0. 02	0. 01 est.
	W-817-02	0. 02	0. 02	<0. 02	<0. 02	<0. 02
	W-817-03	0. 02	0. 02	<0. 02	<0. 02	<0. 02
	W-817-04	0. 02	0. 02	<0. 02	<0. 02	0. 02
Bicarbonate alkalinity (as $CaCO_3$)	W-817-01	NA	260	270	270	220
	W-817-02	277	270	270	280	260
	W-817-03	277	270	270	270	260
	W-817-04	277	270	240	280 [d]	280 [e]
Bromide	W-817-01	NA	0. 6	0. 5	0. 6	0. 7
	W-817-02	1. 46	1. 0	1. 1	1. 0	1. 0
	W-817-03	1. 18	0. 9	0. 8	0. 8	0. 8
	W-817-04	1. 49	0. 8	0. 9	1. 2	0. 9
Chloride	W-817-01	NA	147	147	152	175
	W-817-02	388	272	277	276	277
	W-817-03	302	207	205	205	213
	W-817-04	296	215	216	221	229

(continued)

Table B-1.1. Summary of ground water analytical results, surface impoundments, constituents of concern required by WDR 96-248.

Parameter	Well	Statistical limit [a]	1st Quarter result	2nd Quarter result	3rd Quarter result	4th Quarter result
Salts (mg/L) (continued)						
Nitrate (as NO_3)	W-817-01	NA	77. 3	80. 6	79. 5	85. 6
	W-817-02	110	91 0	91. 2	92. 6	94. 2
	W-817-03	110	88. 6	89. 9	93. 9	93. 5
	W-817-04	110	91. 8	92. 4	87. 6	93. 1
Ortho-phosphate	W-817-01	NA	0. 15	0. 14	0. 41 [e]	0. 12
	W-817-02	0. 19	0. 25 [d]	0. 094	0. 41 [e]	0. 088
	W-817-03	0. 19	0. 089	0. 075	0. 35 [e]	0. 073
	W-817-04	0. 19	0. 099	0. 071	0. 32 [e]	0. 058
Perchlorate	W-817-01	NA	0. 026	0. 024	0. 027	0. 026
	W-817-02	0. 044	0. 020	0. 019	0. 020	0. 028
	W-817-03	0. 050	0. 022	0. 015	0. 024	0. 032
	W-817-04	0. 049	0. 021	0. 019	0. 021	0. 029
Sulfate	W-817-01	NA	91	90	92	107
	W-817-02	512	313	315	302	310
	W-817-03	233	191	191	191	199
	W-817-04	284	215	213	215	217
Energetic materials (µg/L)						
HMX	W-817-01	NA	19. 2	19. 1	18. 3	16. 6
	W-817-02	1. 0	<1. 00	<1. 00	<1. 00	<1. 00
	W-817-03	1. 0	<1. 00	<1. 00	0. 127 est.	0. 166 est.
	W-817-04	1. 0	<1. 00	<1. 00	<1. 00	<1. 00
RDX	W-817-01	NA	49. 9	57. 0	48. 3	42. 1
	W-817-02	0. 85	0. 479 est.	0. 637 est.	0. 709 est.	0. 605 est.
	W-817-03	9. 30	7. 45	7. 61	8. 43	8. 46
	W-817-04	9. 68	7. 67	6. 76	5. 93	5. 44
TNT	W-817-01	NA	<0. 260	<0. 260	<0. 260	<0. 260
	W-817-02	0. 26	<0. 260	<0. 260	<0. 260	<0. 260
	W-817-03	0. 26	<0. 260	<0. 260	<0. 260	<0. 260
	W-817-04	0. 26	<0. 260	<0. 260	<0. 260	<0. 260

(continued)

Table B-1.1. Summary of ground water analytical results, surface impoundments, constituents of concern required by WDR 96-248.

Parameter	Well	Statistical limit [a]	1st Quarter result	2nd Quarter result	3rd Quarter result	4th Quarter result
Energetic materials (µg/L) (concluded)						
TATB	W-817-01	NA	<20	<20	<20	<20
	W-817-02	20	<20	<20	<20	<20
	W-817-03	20	<20	<20	<20	<20
	W-817-04	20	<20	<20	<20	<20
PETN	W-817-01	NA	<1. 00	<1. 00	<1. 00	<1. 00
	W-817-02	1. 0	<1. 00	<1. 00	<1. 00	<1. 00
	W-817-03	1. 0	<1. 00	<1. 00	<1. 00	<1. 00
	W-817-04	1. 0	<1. 00	<1. 00	<1. 00	<1. 00
Tetryl	W-817-01	NA	<1. 00	<1. 00	<1. 00	<1. 00
	W-817-02	1. 0	<1. 00	<1. 00	<1. 00	<1. 00
	W-817-03	1. 0	<1. 00	<1. 00	<1. 00	<1. 00
	W-817-04	1. 0	<1. 00	<1. 00	<1. 00	<1. 00
4-amino-2,6-dinitrotoluene	W-817-01	NA	7. 28	7. 69	7. 14	4. 64
	W-817-02	0. 26	<0. 260	<0. 260	<0. 260	<0. 260
	W-817-03	1. 22	0. 797	0. 934	0. 947	0. 996
	W-817-04	1. 08	0. 564	<0. 260	<0. 260	<0. 260

(concluded)

a Statistical limit as listed in MRP 96-248, Table 5, modified by CVRWQCB letter (Cohen 1998) dated September 25, 1998.

b NA = Not applicable.

c Results followed by an "est." have estimated concentrations between the MDL and the reporting limit for that analyte.

d The exceedances of the SLs footnoted in ground water samples were not confirmed by results from two retest samples for each.

e The exceedances of the SLs footnoted in ground water samples were confirmed by retest sample results.

Table B-1.2. Fourth quarter ground water analytical results, surface impoundments, constituents of concern required by WDR 96-248.

Parameter	Well	Sample date	MDL [a]	Reporting limit	Statistical limit [b]	Result	Retest 1 result 11/25/03	Retest 2 result 12/3/03
General								
pH (unitless)	W-817-01	18-Nov-03	NA[c]	None	None	8. 43		
	W-817-02	31-Oct-03	NA	None	None	8. 12		
	W-817-03	31-Oct-03	NA	None	None	8. 15		
	W-817-04	3-Nov-03	NA	None	None	8. 23		
Halocarbons (µg/L)								
1,1,1-Trichloroethane	W-817-01	18-Nov-03	0. 074	0. 5	NA [c]	<0. 5		
	W-817-02	31-Oct-03	0. 074	0. 5	1. 0	<0. 5		
	W-817-03	31-Oct-03	0. 06	0. 5	1. 0	<0. 5		
	W-817-04	3-Nov-03	0. 06	0. 5	1. 0	<0. 5		
Bromoform	W-817-01	18-Nov-03	0. 12	0. 5	NA	<0. 5		
	W-817-02	31-Oct-03	0. 12	0. 5	1. 0	<0. 5		
	W-817-03	31-Oct-03	0. 076	0. 5	1. 0	<0. 5		
	W-817-04	3-Nov-03	0. 076	0. 5	1. 0	<0. 5		
1,2-Dichloroethane	W-817-01	18-Nov-03	0. 068	0. 5	NA	<0. 5		
	W-817-02	31-Oct-03	0. 068	0. 5	1. 0	<0. 5		
	W-817-03	31-Oct-03	0. 11	0. 5	1. 0	<0. 5		
	W-817-04	3-Nov-03	0. 11	0. 5	1. 0	<0. 5		
Freon 113	W-817-01	18-Nov-03	0. 085	0. 5	NA	<0. 5		
	W-817-02	31-Oct-03	0. 085	0. 5	1. 0	<0. 5		
	W-817-03	31-Oct-03	0. 11	0. 5	1. 0	<0. 5		
	W-817-04	3-Nov-03	0. 11	0. 5	1. 0	<0. 5		
Methylene chloride	W-817-01	18-Nov-03	0. 12	1. 0	NA	<1. 0		
	W-817-02	31-Oct-03	0. 12	1. 0	1. 0	<1. 0		
	W-817-03	31-Oct-03	0. 12	1. 0	1. 0	<1. 0		
	W-817-04	3-Nov-03	0. 12	1. 0	1. 0	<1. 0		

(continued)

Table B-1.2. Fourth quarter ground water analytical results, surface impoundments, constituents of concern required by WDR 96-248.

Parameter	Well	Sample date	MDL [a]	Reporting limit	Statistical limit [b]	Result	Retest 1 result 11/25/03	Retest 2 result 12/3/03
Halocarbons (µg/L) (continued)								
Tetrachloroethene	W-817-01	18-Nov-03	0. 094	0. 5	NA [c]	<0. 5		
	W-817-02	31-Oct-03	0. 094	0. 5	1. 0	<0. 5		
	W-817-03	31-Oct-03	0. 11	0. 5	1. 0	0 15 est.[d]		
	W-817-04	3-Nov-03	0. 16	0. 5	1. 0	<0. 5		
Chlorobenzene	W-817-01	18-Nov-03	0. 049	0. 5	NA	<0. 5		
	W-817-02	31-Oct-03	0. 049	0. 5	1. 0	<0. 5		
	W-817-03	31-Oct-03	0. 072	0. 5	1. 0	<0. 5		
	W-817-04	3-Nov-03	0. 072	0. 5	1. 0	<0. 5		
Hydrocarbons (µg/L)								
Toluene	W-817-01	18-Nov-03	0. 042	0. 5	NA	<0. 5		
	W-817-02	18-Nov-03	0. 042	0. 5	1. 0	<0. 5		
	W-817-03	31-Oct-03	0. 064	0. 5	1. 0	<0. 5		
	W-817-04	3-Nov-03	0. 064	0. 5	1. 0	<0. 5		
Naphthalene	W-817-01	18-Nov-03	0. 348	5	NA	<5		
	W-817-02	18-Nov-03	0. 35	5	5	<5		
	W-817-03	18-Nov-03	0. 35	5	5	<5		
	W-817-04	3-Nov-03	0. 38	5	5	<5		
Photographic chemicals (µg/L)								
meta and para-Cresol	W-817-01	18-Nov-03	0. 542	2	NA	<2		
	W-817-02	31-Oct-03	0. 36	2	2	<2		
	W-817-03	31-Oct-03	0. 36	2	2	<2		
	W-817-04	3-Nov-03	0. 40	2	2	<2		
Benzyl alcohol	W-817-01	18-Nov-03	1. 04	2	NA	<2		
	W-817-02	31-Oct-03	1. 1	2	2	<2		
	W-817-03	31-Oct-03	0. 98	2	2	<2		
	W-817-04	3-Nov-03	1. 2	2	2	<2		

(continued)

Table B-1.2. Fourth quarter ground water analytical results, surface impoundments, constituents of concern required by WDR 96-248.

Parameter	Well	Sample date	MDL [a]	Reporting limit	Statistical limit [b]	Result	Retest 1 result 11/25/03	Retest 2 result 12/3/03
Volatile/semivolatile organic compounds (µg/L)								
Acetone	W-817-01	18-Nov-03	3. 3	20	NA [c]	<10		
	W-817-02	31-Oct-03	1. 9	10	10	<10		
	W-817-03	31-Oct-03	2. 8	10	10	<10		
	W-817-04	3-Nov-03	1. 6	10	10	<10		
2-Butanone (methyl ethyl ketone)	W-817-01	18-Nov-03	1. 1	20	NA	<20		
	W-817-02	31-Oct-03	1. 1	20	20	<20		
	W-817-03	31-Oct-03	1. 3	20	20	<20		
	W-817-04	3-Nov-03	0. 62	20	20	<20		
Dimethyl sulfoxide (DMSO)	W-817-01	18-Nov-03	0. 036	10	NA	<10		
	W-817-02	31-Oct-03	0. 038	10	10	<10		
	W-817-03	31-Oct-03	0. 036	10	10	<10		
	W-817-04	3-Nov-03	0. 036	10	10	<10		
Ethyl alcohol (ethanol)	W-817-01	18-Nov-03	29	1000	NA	<1000		
	W-817-02	31-Oct-03	44	1000	1000	<1000		
	W-817-03	31-Oct-03	40	1000	1000	<1000		
	W-817-04	3-Nov-03	38	1000	1000	<1000		
Methyl isobutyl ketone	W-817-01	18-Nov-03	0. 42	20	NA	<20		
	W-817-02	31-Oct-03	0. 59	20	20	<20		
	W-817-03	31-Oct-03	0. 58	20	20	<20		
	W-817-04	3-Nov-03	0. 58	20	20	<20		
Additives to energetic compounds (µg/L)								
Bis(2-ethylhexyl)phthalate	W-817-01	18-Nov-03	1. 08	5	NA	<5		
	W-817-02	31-Oct-03	0. 76	5	5	1. 1 est.		
	W-817-03	31-Oct-03	0. 74	5	5	<5		
	W-817-04	3-Nov-03	1. 2	5	5	<5		

(continued)

Table B-1.2. Fourth quarter ground water analytical results, surface impoundments, constituents of concern required by WDR 96-248.

Parameter	Well	Sample date	MDL [a]	Reporting limit	Statistical limit [b]	Result	Retest 1 result 11/25/03	Retest 2 result 12/3/03
Unreactive polymers (µg/L)								
Styrene	W-817-01	18-Nov-03	0. 025	0. 5	NA [c]	<0. 5		
	W-817-02	31-Oct-03	0. 068	0. 5	1. 0	<0. 5		
	W-817-03	31-Oct-03	0. 079	0. 5	1. 0	<0. 5		
	W-817-04	3-Nov-03	0. 079	0. 5	1. 0	<0. 5		
Vinyl chloride	W-817-01	18-Nov-03	0. 057	0. 5	NA	<0. 5		
	W-817-02	31-Oct-03	0. 092	0. 5	1. 0	<0. 5		
	W-817-03	31-Oct-03	0. 12	0. 5	1. 0	<0. 5		
	W-817-04	3-Nov-03	0. 12	0. 5	1. 0	<0. 5		
Metals (mg/L)								
Aluminum	W-817-01	18-Nov-03	0. 02	0. 05	NA	<0. 05		
	W-817-02	31-Oct-03	0. 03	0. 05	0. 20	<0. 05		
	W-817-03	31-Oct-03	0. 03	0. 05	0. 20	<0. 05		
	W-817-04	3-Nov-03	0. 03	0. 05	0. 20	0 11		
Arsenic	W-817-01	18-Nov-03	0. 0002	0. 002	NA	0 045		
	W-817-02	31-Oct-03	0. 002	0. 004	0. 073	0 065		
	W-817-03	31-Oct-03	0. 002	0. 004	0. 072	0 062		
	W-817-04	3-Nov-03	0. 002	0. 004	0. 077	0 069		
Barium	W-817-01	18-Nov-03	0. 0004	0. 025	NA	0 011 est.		
	W-817-02	31-Oct-03	0. 004	0. 025	0. 025	0 0092 est.		
	W-817-03	31-Oct-03	0. 004	0. 025	0. 025	0 012 est.		
	W-817-04	3-Nov-03	0. 004	0. 025	0. 025	0 0084 est.		
Cadmium	W-817-01	18-Nov-03	0. 00005	0. 0005	NA	0 0001 est.		
	W-817-02	31-Oct-03	0. 00002	0. 0005	0. 0016	0 0002 est.		
	W-817-03	31-Oct-03	0. 00002	0. 0005	0. 001	0 0001 est.		
	W-817-04	3-Nov-03	0. 00002	0. 0005	0. 001	<0. 0005		

(continued)

Table B-1.2. Fourth quarter ground water analytical results, surface impoundments, constituents of concern required by WDR 96-248.

Parameter	Well	Sample date	MDL [a]	Reporting limit	Statistical limit [b]	Result	Retest 1 result 11/25/03	Retest 2 result 12/3/03
Metals (mg/L) (continued)								
Chromium	W-817-01	18-Nov-03	0. 00006	0. 001	NA [c]	0. 001		
	W-817-02	31-Oct-03	0. 00007	0. 001	0. 003	0. 0007 est.		
	W-817-03	31-Oct-03	0. 00007	0. 001	0. 0042	0. 002		
	W-817-04	3-Nov-03	0. 0002	0. 002	0. 0098	0. 019 [e]	0.00055 est.	< 0.003
Cobalt	W-817-01	18-Nov-03	0. 0021	0. 05	NA	<0. 05		
	W-817-02	31-Oct-03	0. 005	0. 05	0. 05	<0. 05		
	W-817-03	31-Oct-03	0. 005	0. 05	0. 05	<0. 05		
	W-817-04	3-Nov-03	0. 005	0. 05	0. 05	<0. 05		
Copper	W-817-01	18-Nov-03	0. 0002	0. 001	NA	0. 001		
	W-817-02	31-Oct-03	0. 00008	0. 001	0. 02	0. 0005 est.		
	W-817-03	31-Oct-03	0. 00008	0. 001	0. 02	0. 0006 est.		
	W-817-04	3-Nov-03	0. 00008	0. 001	0. 02	0. 002		
Lead	W-817-01	18-Nov-03	0. 0003	0. 005	NA	<0. 005		
	W-817-02	31-Oct-03	0. 0004	0. 005	0. 0099	<0. 05		
	W-817-03	31-Oct-03	0. 0004	0. 005	0. 0099	<0. 05		
	W-817-04	3-Nov-03	0. 0004	0. 005	0. 0099	<0. 05		
Manganese	W-817-01	18-Nov-03	0. 00068	0. 01	NA	<0. 01		
	W-817-02	31-Oct-03	0. 00073	0. 01	0. 01	0. 0005 est.		
	W-817-03	31-Oct-03	0. 00073	0. 01	0. 01	0. 0024 est.		
	W-817-04	3-Nov-03	0. 00073	0. 01	0. 01	0. 011 [e]	0.0028	0.0024
Molybdenum	W-817-01	18-Nov-03	0. 0022	0. 025	NA	0. 024 est.		
	W-817-02	31-Oct-03	0. 004	0. 025	0. 073	0. 051		
	W-817-03	31-Oct-03	0. 004	0. 025	0. 060	0. 041		
	W-817-04	3-Nov-03	0. 004	0. 025	0. 054	0. 042		
Nickel	W-817-01	18-Nov-03	0. 0005	0. 002	NA	0. 0008 est.		
	W-817-02	31-Oct-03	0. 0008	0. 002	0. 044	0. 0008 est.		
	W-817-03	31-Oct-03	0. 0008	0. 002	0. 044	0. 001 est.		
	W-817-04	3-Nov-03	0. 0008	0. 002	0. 044	0. 030		

(continued)

Table B-1.2. Fourth quarter ground water analytical results, surface impoundments, constituents of concern required by WDR 96-248.

Parameter	Well	Sample date	MDL [a]	Reporting limit	Statistical limit [b]	Result	Retest 1 result 11/25/03	Retest 2 result 12/3/03
Metals (mg/L) (continued)								
Potassium	16-Oct-01	18-Nov-03	0. 056	1. 0	NA [c]	11		
	16-Oct-01	31-Oct-03	0. 3	1. 0	18. 6	13		
	16-Oct-01	31-Oct-03	0. 3	1. 0	14. 6	11		
	W-817-04	3-Nov-03	0. 3	1. 0	13. 7	11		
Silver	W-817-01	18-Nov-03	0. 000034	0. 02	NA	<0. 001		
	W-817-02	31-Oct-03	0. 0042	0. 02	0. 001	<0. 001		
	W-817-03	31-Oct-03	0. 0021	0. 01	0. 001	<0. 001		
	W-817-04	3-Nov-03	0. 0021	0. 01	0. 001	<0. 001		
Zinc	W-817-01	18-Nov-03	0. 0035	0. 01	NA	0. 013		
	W-817-02	31-Oct-03	0. 0026	0. 01	0. 24	0. 17		
	W-817-03	31-Oct-03	0. 0026	0. 01	0. 0099	0. 025 [e]	0.0044 est.	0.0031 est.
	W-817-04	3-Nov-03	0. 0026	0. 01	0. 055	0. 013		
Salts (mg/L)								
Ammonia nitrogen (as N)	16-Oct-01	18-Nov-03	0. 01	0. 02	NA	0. 01 est.		
	16-Oct-01	31-Oct-03	0. 01	0. 02	0. 02	<0. 02		
	16-Oct-01	31-Oct-03	0. 01	0. 02	0. 02	<0. 02		
	W-817-04	3-Nov-03	0. 01	0. 02	0. 02	0. 02		
Bicarbonate alkalinity (as $CaCO_3$)	W-817-01	18-Nov-03	2. 5	2. 5	NA	220		
	W-817-02	31-Oct-03	10	10	277	260		
	W-817-03	31-Oct-03	10	10	277	260		
	W-817-04	3-Nov-03	10	10	277	280 [f]	270	280 [f]
Bromide	W-817-01	18-Nov-03	0. 03	0. 1	NA	0. 7		
	W-817-02	31-Oct-03	0. 08	0. 2	1. 46	1. 0		
	W-817-03	31-Oct-03	0. 04	0. 1	1. 18	0. 8		
	W-817-04	3-Nov-03	0. 04	0. 1	1. 49	0. 9		
Chloride	W-817-01	18-Nov-03	0. 048	0. 5	NA	175		
	W-817-02	31-Oct-03	0. 066	1. 0	388	277		
	W-817-03	31-Oct-03	0. 033	0. 5	302	213		
	W-817-04	3-Nov-03	0. 033	0. 5	296	229		

(continued)

Table B-1.2. Fourth quarter ground water analytical results, surface impoundments, constituents of concern required by WDR 96-248.

Parameter	Well	Sample date	MDL [a]	Reporting limit	Statistical limit [b]	Result	Retest 1 result 11/25/03	Retest 2 result 12/3/03
Salts (mg/L) (continued)								
Nitrate (as NO_3)	W-817-01	18-Nov-03	0. 09	0. 5	NA [c]	85. 6		
	W-817-02	31-Oct-03	0. 096	1. 0	110	94. 2		
	W-817-03	31-Oct-03	0. 096	1. 0	110	93. 5		
	W-817-04	3-Nov-03	0. 096	1. 0	110	93. 1		
Ortho-phosphate	W-817-01	18-Nov-03	0. 03	0. 05	NA	0. 12		
	W-817-02	31-Oct-03	0. 03	0. 05	0. 19	0. 088		
	W-817-03	31-Oct-03	0. 03	0. 05	0. 19	0. 073		
	W-817-04	3-Nov-03	0. 03	0. 05	0. 19	0. 058		
Perchlorate	W-817-01	18-Nov-03	0. 0003	0. 003	NA	0. 026		
	W-817-02	31-Oct-03	0. 001	0. 003	0. 044	0. 028		
	W-817-03	31-Oct-03	0. 001	0. 003	0. 050	0. 032		
	W-817-04	3-Nov-03	0. 001	0. 003	0. 049	0. 029		
Sulfate	W-817-01	18-Nov-03	0. 096	1. 0	NA	107		
	W-817-02	31-Oct-03	0. 16	2. 0	512	310		
	W-817-03	31-Oct-03	0. 079	1. 0	233	199		
	W-817-04	3-Nov-03	0. 079	1. 0	284	217		
Energetic materials (µg/L)								
HMX	W-817-01	18-Nov-03	0. 0779	1. 00	NA	16. 6		
	W-817-02	31-Oct-03	0. 0779	1. 00	1. 0	<1. 00		
	W-817-03	31-Oct-03	0. 0779	1. 00	1. 0	0. 166 est.		
	W-817-04	3-Nov-03	0. 0779	1. 00	1. 0	<1. 00		
RDX	W-817-01	18-Nov-03	0. 265	0. 85	NA	42. 1		
	W-817-02	31-Oct-03	0. 053	0. 85	0. 85	0. 605 est.		
	W-817-03	31-Oct-03	0. 053	0. 85	9. 30	8. 46		
	W-817-04	3-Nov-03	0. 053	0. 85	9. 68	5. 44		
TNT	W-817-01	18-Nov-03	0. 0779	0. 260	NA	<0. 260		
	W-817-02	31-Oct-03	0. 0779	0. 260	0. 26	<0. 260		
	W-817-03	31-Oct-03	0. 0779	0. 260	0. 26	<0. 260		
	W-817-04	3-Nov-03	0. 0779	0. 260	0. 26	<0. 260		

(continued)

Table B-1.2. Fourth quarter ground water analytical results, surface impoundments, constituents of concern required by WDR 96-248.

Parameter	Well	Sample date	MDL [a]	Reporting limit	Statistical limit [b]	Result	Retest 1 result 11/25/03	Retest 2 result 12/3/03
Energetic materials (µg/L) (concluded)								
TATB	W-817-01	18-Nov-03	5. 00	20	NA [c]	<20		
	W-817-02	31-Oct-03	5. 00	20	20	<20		
	W-817-03	31-Oct-03	5. 00	20	20	<20		
	W-817-04	3-Nov-03	5. 00	20	20	<20		
PETN	W-817-01	18-Nov-03	0. 104	1. 00	NA	<1. 00		
	W-817-02	31-Oct-03	0. 104	1. 00	1. 0	<1. 00		
	W-817-03	31-Oct-03	0. 104	1. 00	1. 0	<1. 00		
	W-817-04	3-Nov-03	0. 104	1. 00	1. 0	<1. 00		
Tetryl	W-817-01	18-Nov-03	0. 032	1. 00	NA	<1. 00		
	W-817-02	31-Oct-03	0. 032	1. 00	1. 0	<1. 00		
	W-817-03	31-Oct-03	0. 032	1. 00	1. 0	<1. 00		
	W-817-04	3-Nov-03	0. 032	1. 00	1. 0	<1. 00		
4-amino-2,6-dinitrotoluene	W-817-01	18-Nov-03	0. 0409	0. 260	NA	4. 64		
	W-817-02	31-Oct-03	0. 0409	0. 260	0. 26	<0. 260		
	W-817-03	31-Oct-03	0. 0409	0. 260	1. 22	0. 996		
	W-817-04	3-Nov-03	0. 0409	0. 260	1. 08	<0. 260		

(concluded)

a MDL = Method detection limit.

b Statistical limit as listed in MRP 96-248, Table 5, modified by CVRWQCB letter (Cohen 1998) dated September 25, 1998.

c NA = Not applicable.

d Results followed by an "est." have estimated concentrations between the MDL and the reporting limit for that analyte.

e The retest samples collected and analyzed for dissolved chromium, manganese and zinc did not confirm concentrations exceeding the respective SLs.

f The retest sample for bicarbonate alkalinity collected from well W-817-04 on December 3, 2003, confirmed that the concentration exceeded the SL.

Table B-2.1. Summary of ground water analytical results, surface impoundments, other constituents.

Parameter	Well	1st quarter result	2nd quarter result	3rd quarter result	4th quarter result
General					
Ground water elevation (meters above mean sea level)	W-817-01	194. 12	194. 00	193. 87	193. 91
	W-817-02	179. 99	179. 98	179. 17	179. 55
	W-817-03	175. 84	175. 84	174. 74	175. 22
	W-817-04	185. 81	185. 52	178. 99	185. 37
Field pH (unitless)	W-817-01	7. 09	7. 08	8. 07	7. 92
	W-817-02	7. 18	7. 20	7. 86	7. 86
	W-817-03	7. 17	7. 18	7. 95	7. 84
	W-817-04	7. 10	7. 14	8. 07	8. 28
Field Specific conductance (µmhos/cm)	W-817-01	1336	1281	1289	1375
	W-817-02	2192	2159	2115	2114
	W-817-03	1732	1719	1631	1674
	W-817-04	1805	1768	1792	1803
Water temperature (°Celsius)	W-817-01	22. 0	21. 2	25. 3	19. 0
	W-817-02	18. 9	20. 7	25. 7	22. 7
	W-817-03	19. 3	20. 1	22. 9	20. 2
	W-817-04	18. 4	20. 2	26. 7	23. 7
Dissolved Oxygen (mg/L)	W-817-01	9. 4	9. 2	7. 6	9. 2
	W-817-02	9. 4	9. 0	8. 6	9. 5
	W-817-03	9. 8	10. 3	9. 2	9. 5
	W-817-04	7. 8	7. 2	8. 6	9. 1

(continued)

Table B-2.1. Summary of ground water analytical results, surface impoundments, other constituents.

Parameter	Well	1st quarter result	2nd quarter result	3rd quarter result	4th quarter result
Volatile/semivolatile organic compounds (µg/L) [a]					
1,1-Dichloroethene	W-817-01	<0. 5	<0. 5	<0. 5	<0. 5
	W-817-02	<0. 5	<0. 5	<0. 5	<0. 5
	W-817-03	0. 19 est. [b]	0 19 est.	<0. 5	0. 27 est.
	W-817-04	<0. 5	<0. 5	<0. 5	<0. 5
Benzoic Acid	W-817-01	<50	<50	<50	<50
	W-817-02	<50	26 est.	<50	<50
	W-817-03	<50	<50	<50	<50
	W-817-04	<50	<50	<50	5. 3 est.
Chloroform	W-817-01	<0. 5	<0. 5	<0. 5	<0. 5
	W-817-02	<0. 5	<0. 5	<0. 5	<0. 5
	W-817-03	0. 30 est.	0. 30 est.	0. 26 est.	0. 34 est.
	W-817-04	0. 37 est.	0. 33 est.	0. 22 est.	0. 19 est.
Trichloroethene (TCE)	W-817-01	<0. 5	0. 16 est.	0. 17 est.	<0. 5
	W-817-02	0. 63	0. 66	0. 55	0. 73
	W-817-03	16	15	14	14
	W-817-04	14	12	6. 3	6. 6
Metal (mg/L)					
Lithium	W-817-01	0. 022	0. 020	0. 0097 est.	0. 025
	W-817-02	0. 020	0. 021	0. 024	0. 022
	W-817-03	0. 021	0. 016 est.	0. 020	0. 018 est.
	W-817-04	0. 021	0. 019	0. 020	0. 019 est.
Energetic materials (µg/L) [c]					
2-amino-4,6-dinitrotoluene	W-817-01	<1. 00	0. 298 est.	0. 518 est.	<1. 00
	W-817-02	0. 0989 est.	0. 268 est.	0. 687 est.	<1. 00
	W-817-03	<1. 00	0. 185 est.	0. 776 est.	<1. 00
	W-817-04	<1. 00	0. 139 est.	0. 480 est.	<1. 00

(continued)

Table B-2.1. Summary of ground water analytical results, surface impoundments, other constituents.

Parameter	Well	1st quarter result	2nd quarter result	3rd quarter result	4th quarter result
Tentatively identified compounds (µg/L) [d]					
1H-Benzotriazole	W-817-01	ND [e]	ND	ND	ND
	W-817-02	ND	ND	ND	ND
	W-817-03	ND	ND	ND	ND
	W-817-04	80 est.	15 est.	7. 1 est.	10 est.
Unknown with base mass = 71 at 20.62 to 20.98 min	W-817-01	ND	ND	ND	ND
	W-817-02	ND	29 est.	ND	10 est.
	W-817-03	ND	ND	ND	ND
	W-817-04	ND	ND	ND	ND

(concluded)

a No other volatile or semivolatile organic compounds were detected by EPA Methods 624 and 625.
b Results followed by an "est." have estimated concentrations between the MDL and the reporting limit for that analyte.
c No other energetic materials (other than those detected in **Table B-1.1**) were detected by EPA Method 8330.
d Tentatively identified compounds (TICs) identified in ground water analyses using EPA Method 625 for semi-volatile organic compounds. Only those TICs tentatively identified twice or more in the same well in 2003 are included in this table.
e ND = Not detected.

Table B-2.2. Fourth quarter ground water analytical results, surface impoundments, other constituents.

Parameter	Well	Sample date	MDL [a]	Reporting limit	Result
General					
Ground water elevation	W-817-01	18-Nov-03	NA [b]	NA	193. 91
(meters above mean sea level)	W-817-02	31-Oct-03	NA	NA	179. 55
	W-817-03	31-Oct-03	NA	NA	175. 22
	W-817-04	3-Nov-03	NA	NA	185. 37
Field pH (unitless)	W-817-01	18-Nov-03	NA	NA	7. 92
	W-817-02	31-Oct-03	NA	NA	7. 86
	W-817-03	31-Oct-03	NA	NA	7. 84
	W-817-04	3-Nov-03	NA	NA	8. 28
Specific conductance (µmhos/cm)	W-817-01	18-Nov-03	NA	NA	1375
	W-817-02	31-Oct-03	NA	NA	2114
	W-817-03	31-Oct-03	NA	NA	1674
	W-817-04	3-Nov-03	NA	NA	1803
Water temperature (°Celsius)	W-817-01	18-Nov-03	NA	NA	19. 0
	W-817-02	31-Oct-03	NA	NA	22. 7
	W-817-03	31-Oct-03	NA	NA	20. 2
	W-817-04	3-Nov-03	NA	NA	23. 7
Dissolved Oxygen (mg/L)	W-817-01	18-Nov-03	0. 5	0. 5	9. 2
	W-817-02	31-Oct-03	0. 5	0. 5	9. 5
	W-817-03	31-Oct-03	0. 5	0. 5	9. 5
	W-817-04	3-Nov-03	0. 5	0. 5	9. 1
Volatile/semi-volatile organic compounds (µg/L) [c]					
1,1-Dichloroethene	W-817-01	18-Nov-03	0. 054	0. 5	<0. 5
	W-817-02	31-Oct-03	0. 14	0. 5	<0. 5
	W-817-03	31-Oct-03	0. 14	0. 5	0. 27 est. [d]
	W-817-04	3-Nov-03	0. 14	0. 5	<0. 5
Benzoic Acid	W-817-01	18-Nov-03	3. 25	50	<50
	W-817-02	31-Oct-03	3. 3	50	<50
	W-817-03	31-Oct-03	3. 3	50	<50
	W-817-04	3-Nov-03	0. 31	50	5. 3 est.

(continued)

Table B-2.2. Fourth quarter ground water analytical results, surface impoundments, other constituents.

Parameter	Well	Sample date	MDL [a]	Reporting limit	Result
Volatile/semi-volatile organic compounds (µg/L) (continued) [c]					
Chloroform [e]	W-817-01	18-Nov-03	0.19	0.5	<0.5
	W-817-02	31-Oct-03	0.055	0.5	<0.5
	W-817-03	31-Oct-03	0.055	0.5	0.34 est.
	W-817-04	3-Nov-03	0.055	0.5	0.19 est.
Trichloroethene (TCE)	W-817-01	18-Nov-03	0.070	0.5	<0.5
	W-817-02	31-Oct-03	0.079	0.5	0.73
	W-817-03	31-Oct-03	0.079	0.5	14
	W-817-04	3-Nov-03	0.079	0.5	6.6
Metal (mg/L)					
Lithium	W-817-01	18-Nov-03	0.0036	0.02	0.025
	W-817-02	31-Oct-03	0.0018	0.02	0.022
	W-817-03	31-Oct-03	0.0018	0.02	0.018 est.
	W-817-04	3-Nov-03	0.0018	0.02	0.019 est.
Energetic materials (µg/L) [f]					
2,6-dinitrotoluene	W-817-01	18-Nov-03	0.0501	1.00	0.547 est.
	W-817-02	31-Oct-03	0.0501	1.00	<1.00
	W-817-03	31-Oct-03	0.0501	1.00	<1.00
	W-817-04	3-Nov-03	0.0501	1.00	<1.00
2-amino-4,6-dinitrotoluene	W-817-01	18-Nov-03	0.0779	1.00	<1.00
	W-817-02	31-Oct-03	0.0779	1.00	<1.00
	W-817-03	31-Oct-03	0.0779	1.00	<1.00
	W-817-04	3-Nov-03	0.0779	1.00	<1.00

(continued)

Table B-2.2. Fourth quarter ground water analytical results, surface impoundments, other constituents.

Parameter	Well	Sample date	MDL [a]	Reporting limit	Result
Tentatively identified compounds (µg/L) [g]					
1H-Benzotriazole	W-817-01	18-Nov-03	NA	NA	ND [h]
	W-817-02	31-Oct-03	NA	NA	ND
	W-817-03	31-Oct-03	NA	NA	ND
	W-817-04	3-Nov-03	NA	NA	10 est.
Unknown with base mass = 71 at 20.98 min	W-817-01	18-Nov-03	NA	NA	ND
	W-817-02	31-Oct-03	NA	NA	10 est.
	W-817-03	31-Oct-03	NA	NA	ND
	W-817-04	3-Nov-03	NA	NA	ND
Unknown with base mass = 71 at 24.96 min	W-817-01	18-Nov-03	NA	NA	ND
	W-817-02	31-Oct-03	NA	NA	6. 4 est.
	W-817-03	31-Oct-03	NA	NA	ND
	W-817-04	3-Nov-03	NA	NA	ND

(concluded)

a MDL = Method detection limit.
b NA = Not applicable.
c No other volatile or semi-volatile organic compounds (other than those listed in **Table B-1.2**) were detected by EPA Methods 624 and 625.
d Results followed by an "est." have estimated concentrations between the MDL and the reporting limit for that analyte.
e Chloroform was detected at concentrations greater than its reporting limit in the field blank sample.
f No other energetic materials (other than those listed in **Table B-1.2**) were detected by EPA Method 8330 in the fourth quarter.
g Tentatively identified compounds (TICs) identified in ground water analyses using EPA Method 625 for semi-volatile organics.
h ND = Not detected.

Appendix C

Annual Summary Plots and Tables of Sewage Evaporation and Percolation Ponds Wastewater Monitoring Data

Appendix C

This appendix contains graphical and tabular summaries of the 2003 sewage evaporation and percolation ponds wastewater monitoring data. The monitoring requirements of WDR 96-248 began in the fourth quarter of 1996. LLNL collected data at the sewage ponds wastewater network prior to the permit issuance in the third quarter of 1996; these data are also plotted.

Wastewater influent monitoring at location ISWP consists of pH, electrical conductivity (EC), and biochemical oxygen demand (BOD). Routine wastewater monitoring at location ESWP consists of pH, EC, and dissolved oxygen (DO). A continuous discharge from the sewage evaporation pond into the percolation pond at location DSWP began in the fourth quarter of 2002 and continued into the first quarter of 2003. Samples of the discharges were collected on February 11, 2003, and analyzed for pH, EC, BOD, and fecal and total coliform. The samples were also analyzed for nitrogen-bearing nutrients not required by the Permit.

Each two-dimensional graph plots concentration on the vertical axis versus time (years divided into four quarterly sampling periods) on the horizontal axis. Units of measure are given on the vertical axis label and in the header at the top of each page. Values above the analytical reporting limit for each analyte are plotted as solid diamonds, and values below the analytical reporting limit are plotted as open inverted triangles. Data determined not to be valid are not plotted.

Tabular summaries of the observations are contained in **Tables C-1** to **C-4**.

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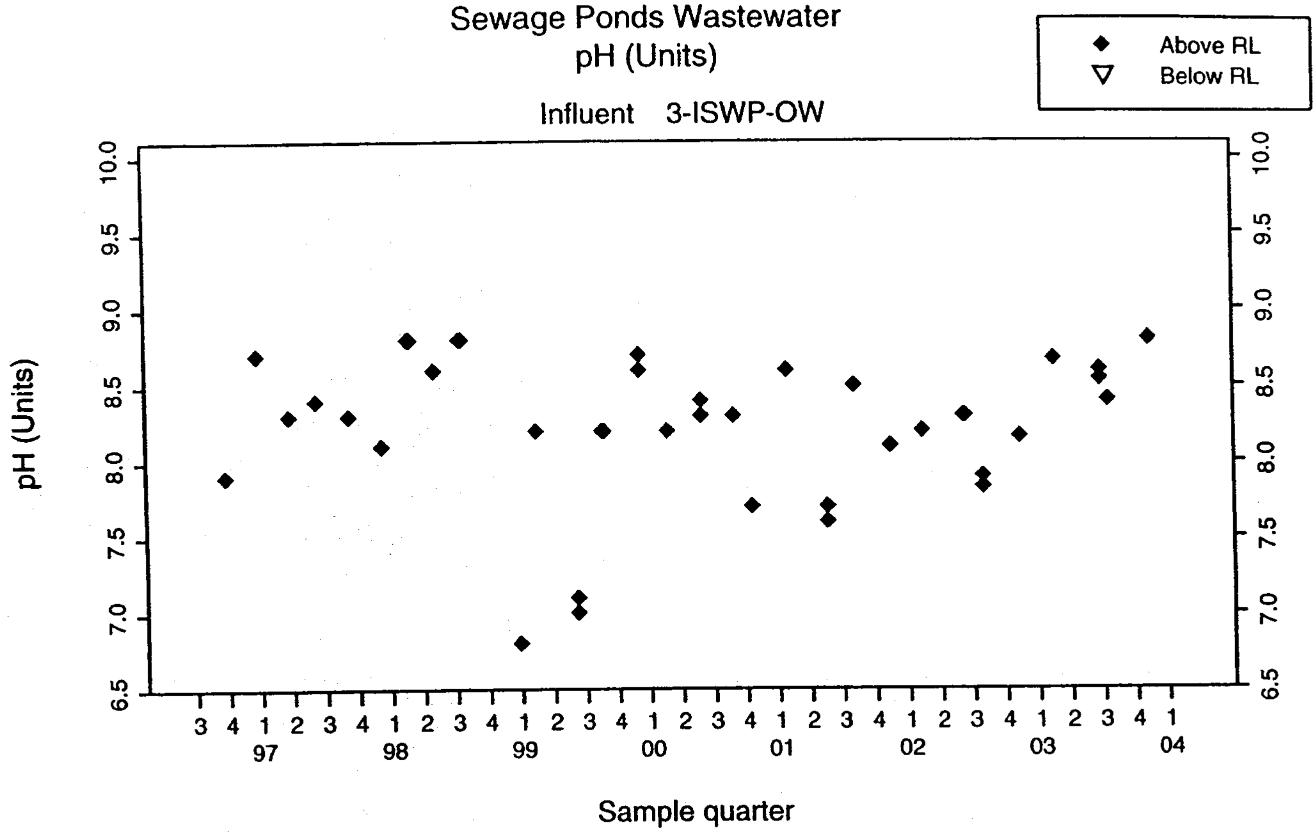
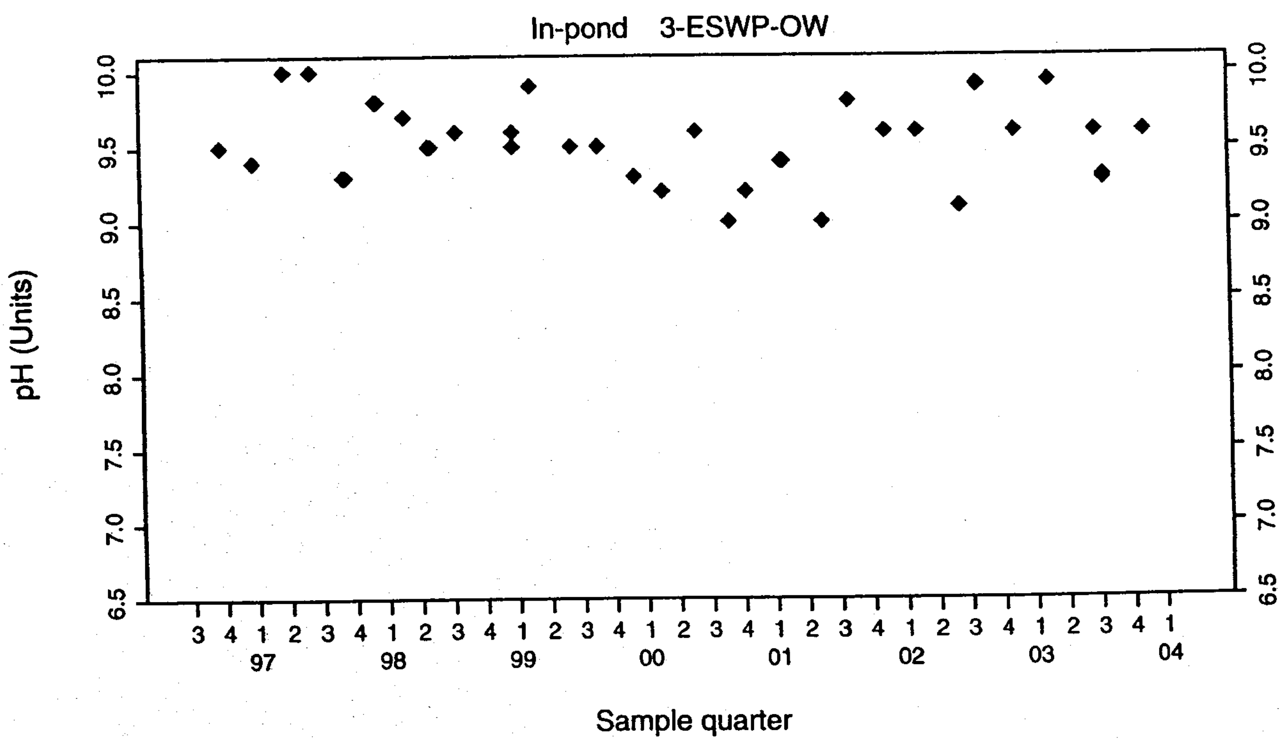
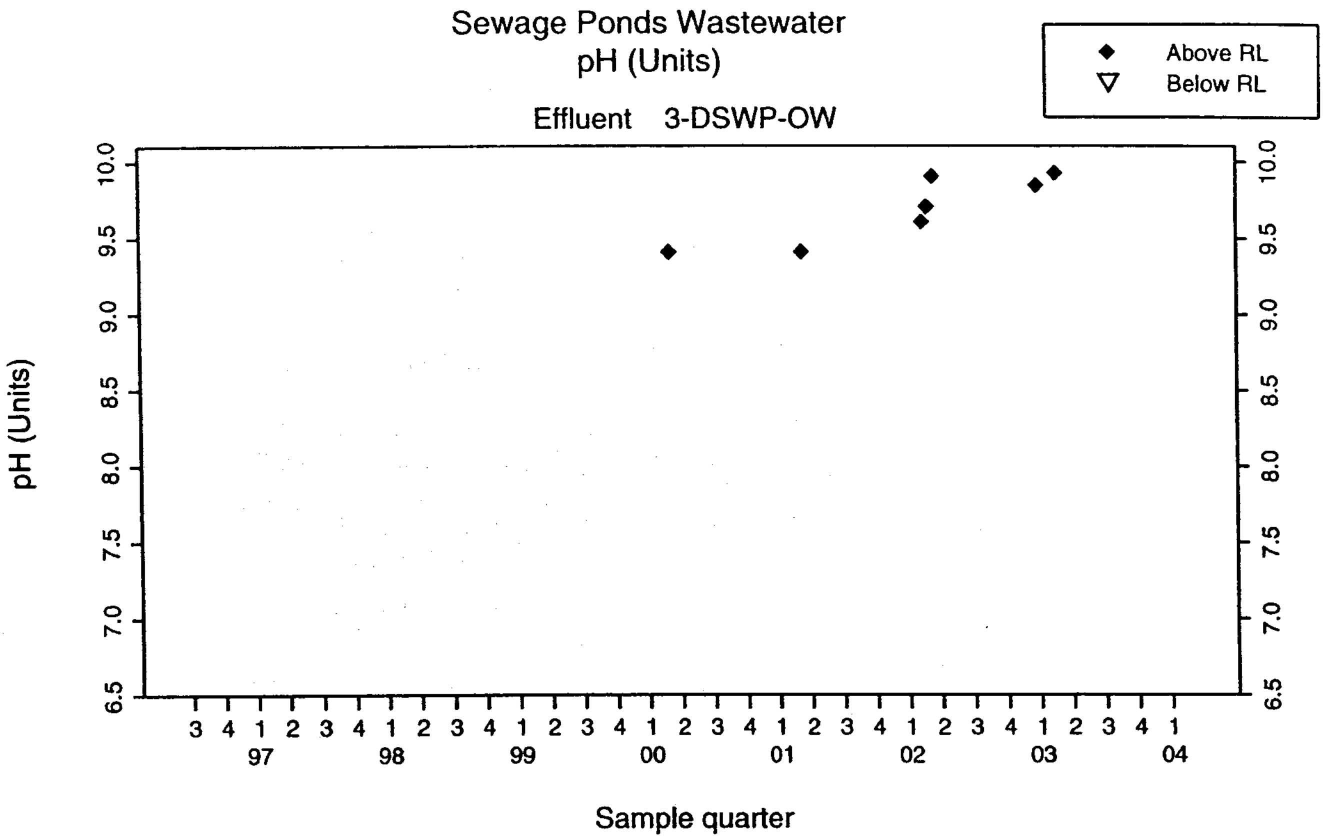
Annual Plots of Sewage Evaporation and Percolation Ponds Wastewater Monitoring Data

Sewage Ponds Wastewater
pH (Units)





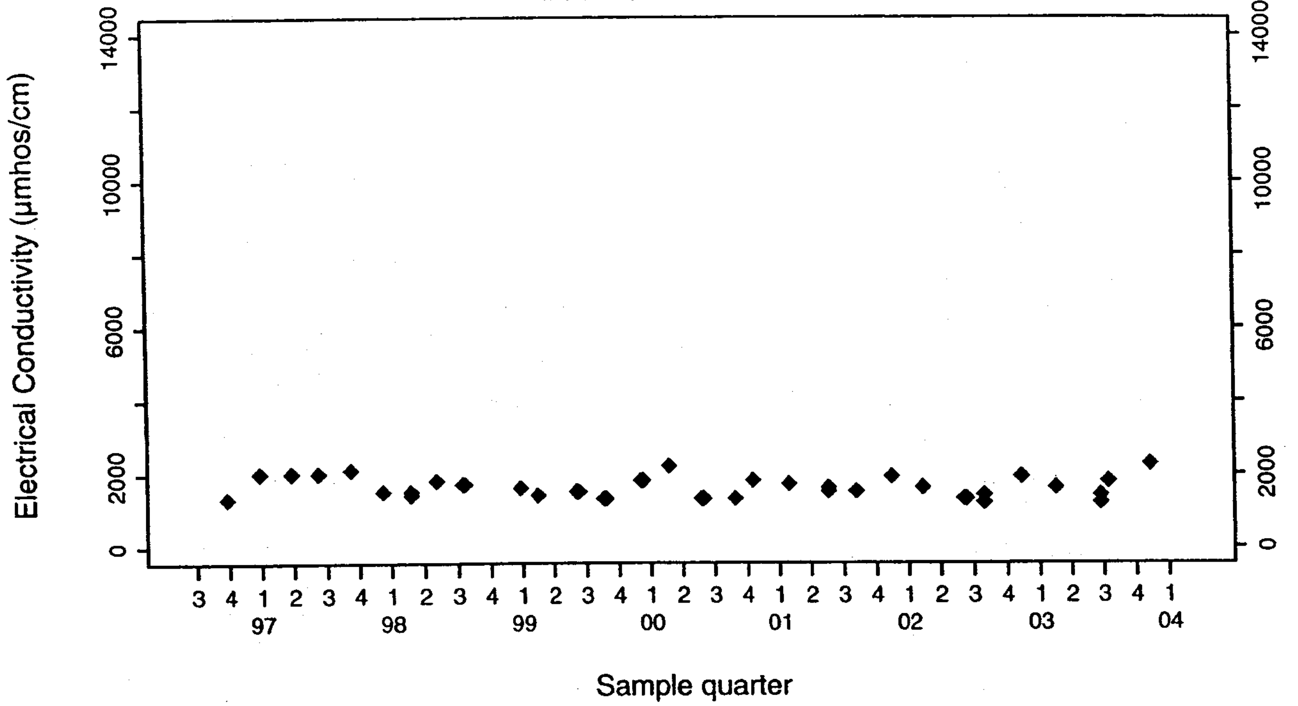


Sewage Ponds Wastewater
pH (Units)
Effluent 3-DSWP-OW
Above RL
Below RL
pH (Units)
6.5
7.0
7.5
8.0
8.5
9.0
9.5
10.0
3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1
97
98
99
00
01
02
03
04
Sample quarter

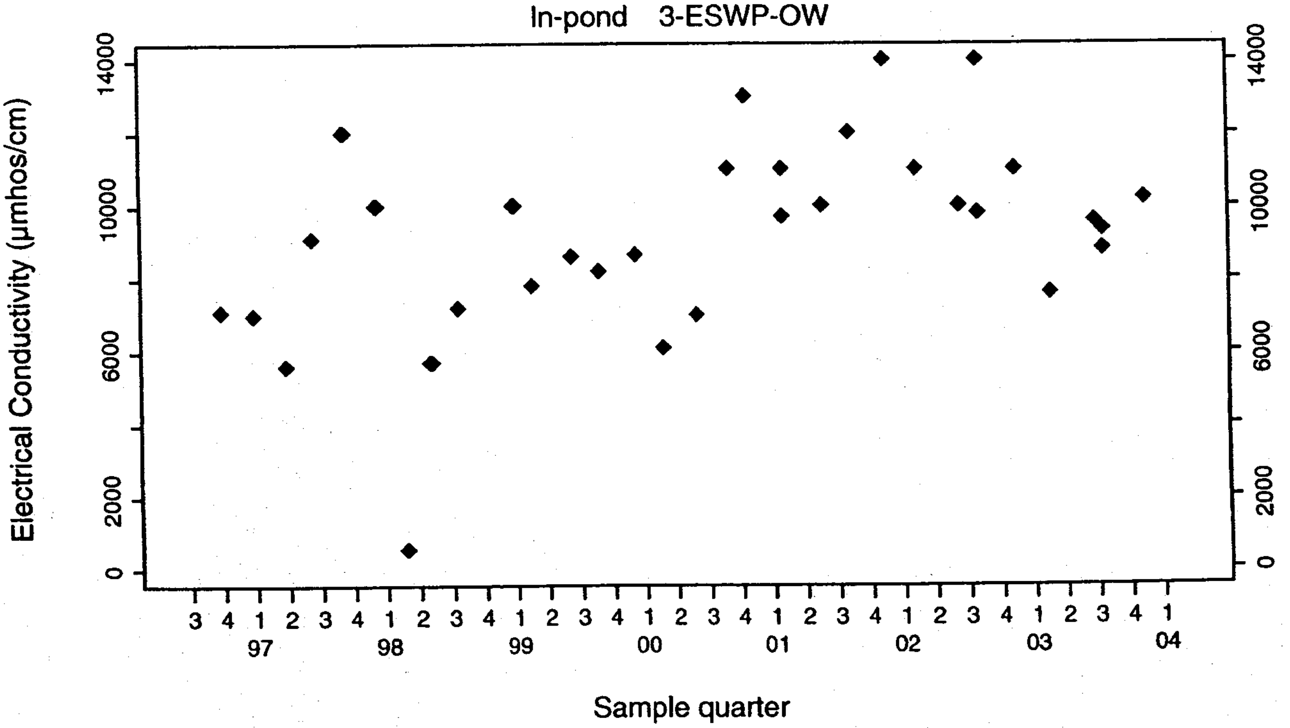
Sewage Ponds Wastewater
Electrical Conductivity (μmhos/cm)

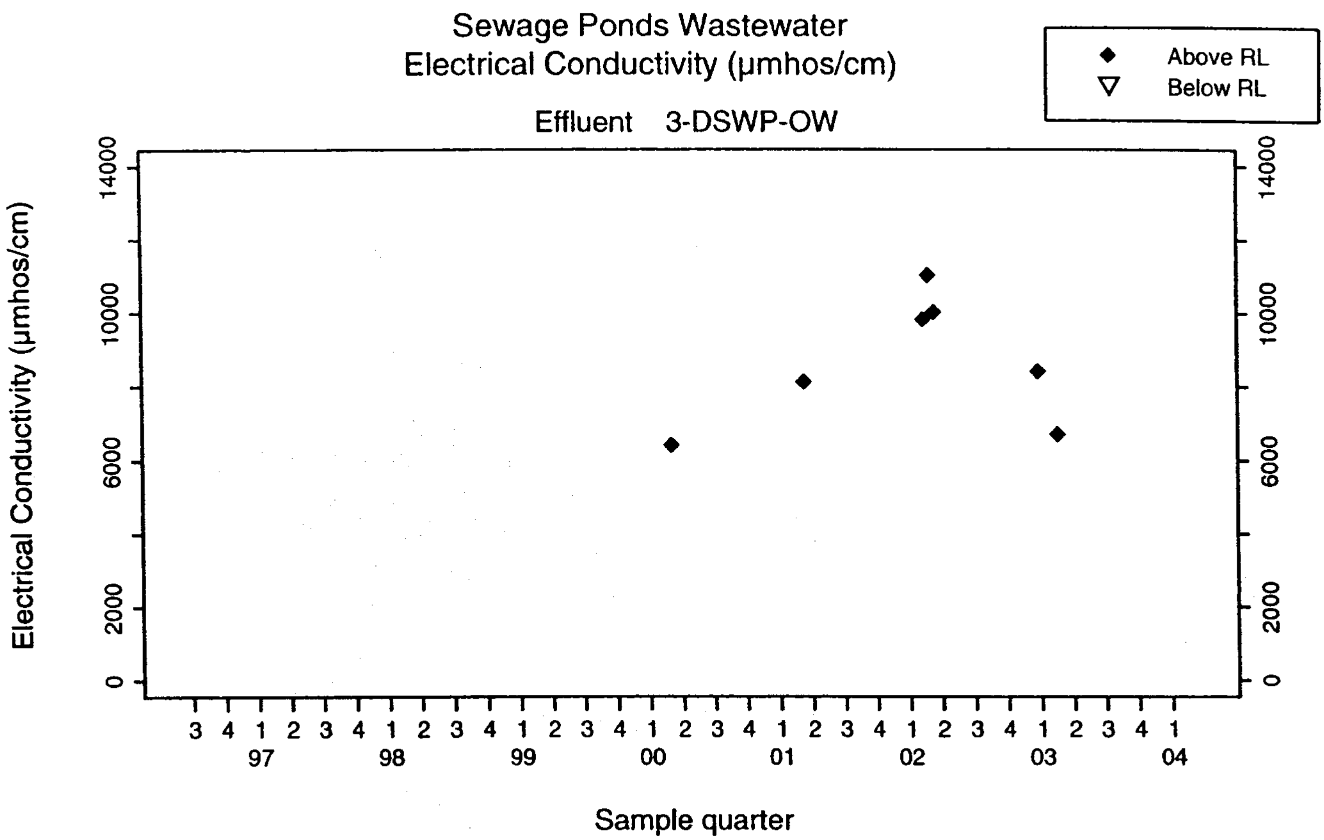
◆ Above RL
▽ Below RL

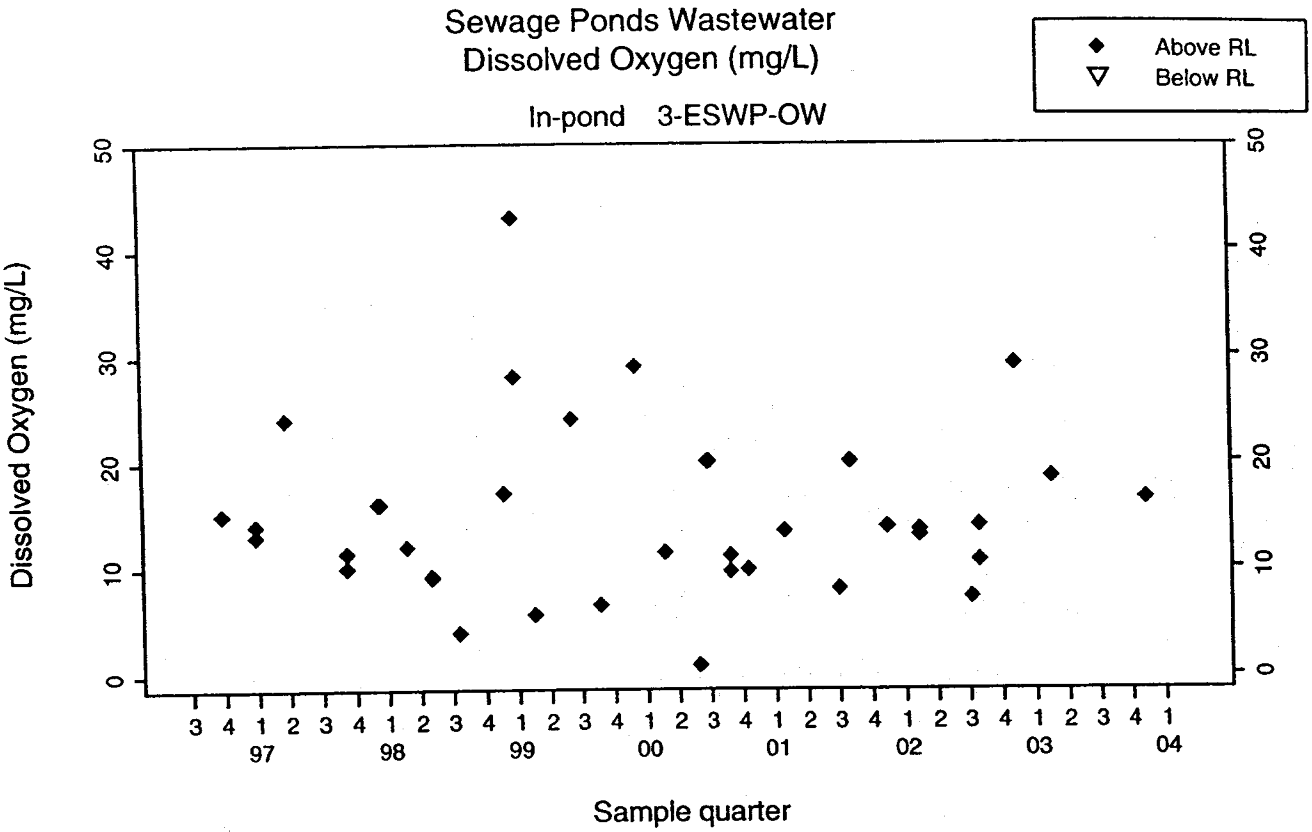
Influent 3-ISWP-OW

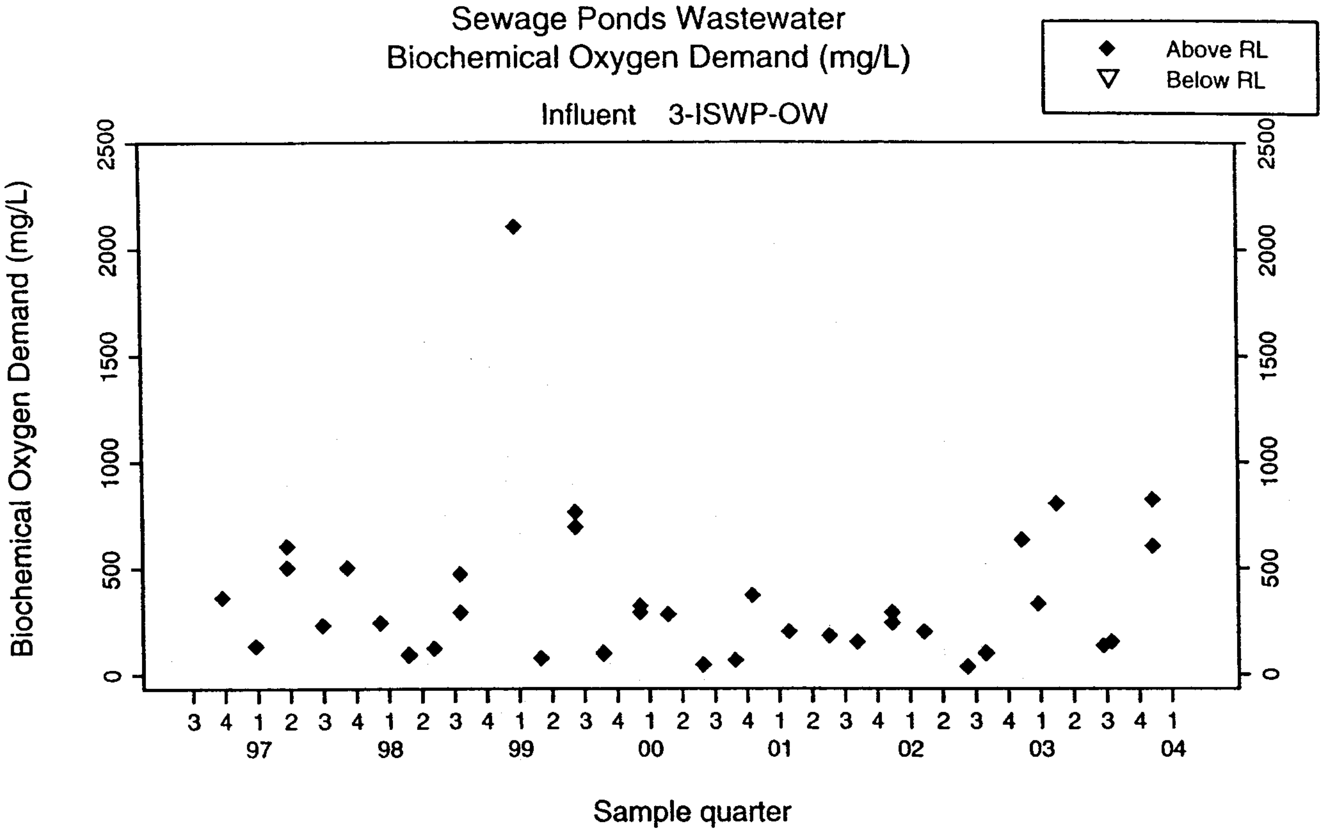


In-pond 3-ESWP-OW

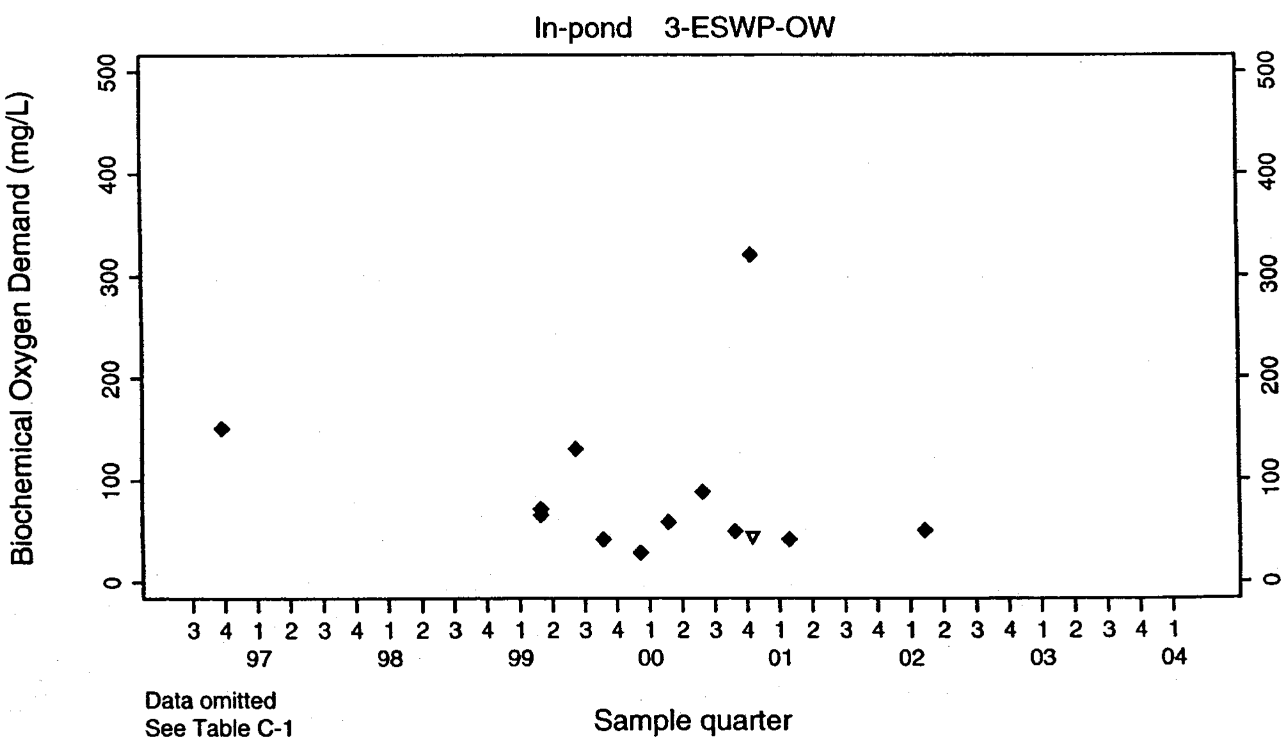



Sewage Ponds Wastewater
Electrical Conductivity (µmhos/cm)
Effluent 3-DSWP-OW
Above RL
Below RL
Electrical Conductivity (µmhos/cm)
0
2000
6000
10000
14000
3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1
97
98
99
00
01
02
03
04
Sample quarter

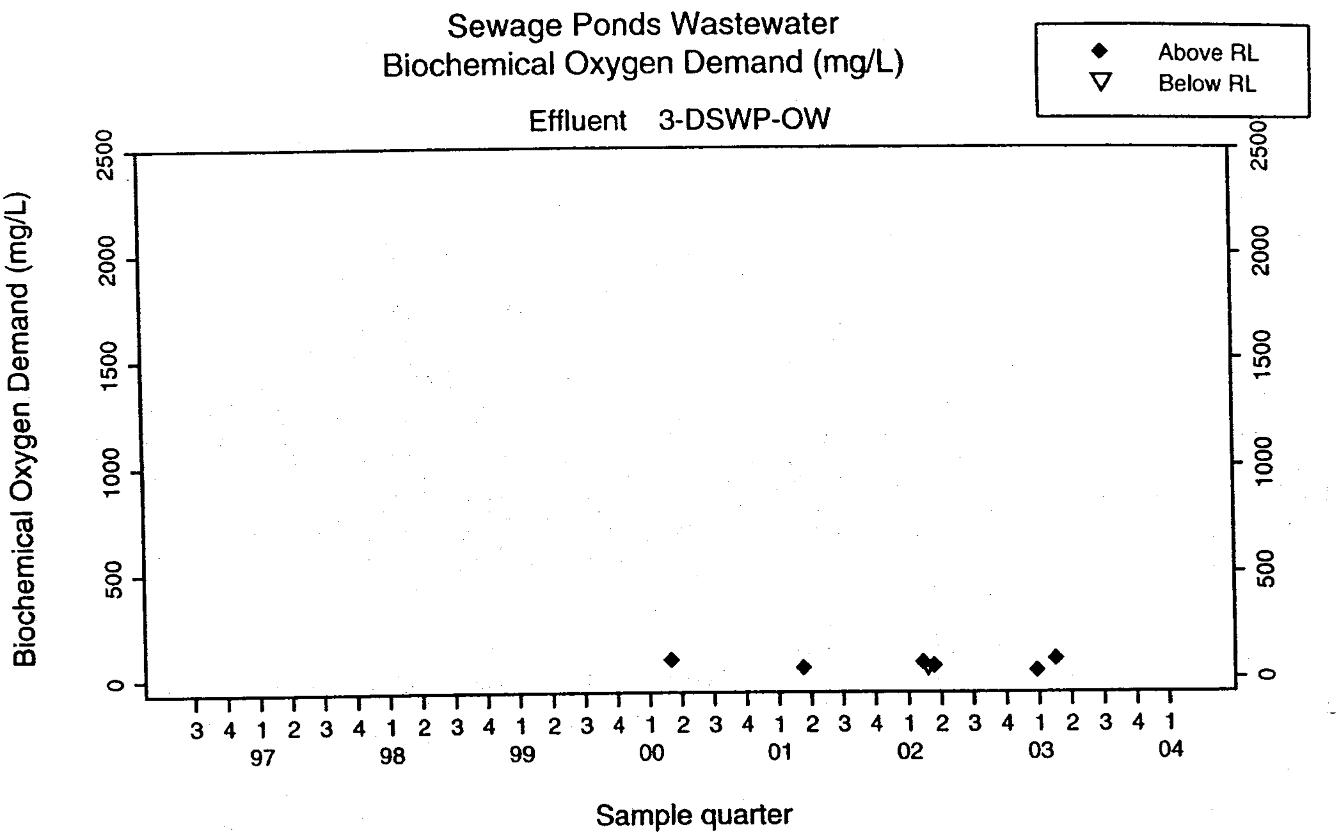

Sewage Ponds Wastewater
Dissolved Oxygen (mg/L)
In-pond 3-ESWP-OW
Above RL
Below RL
Dissolved Oxygen (mg/L)
0
10
20
30
40
50
3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1
97
98
99
00
01
02
03
04
Sample quarter

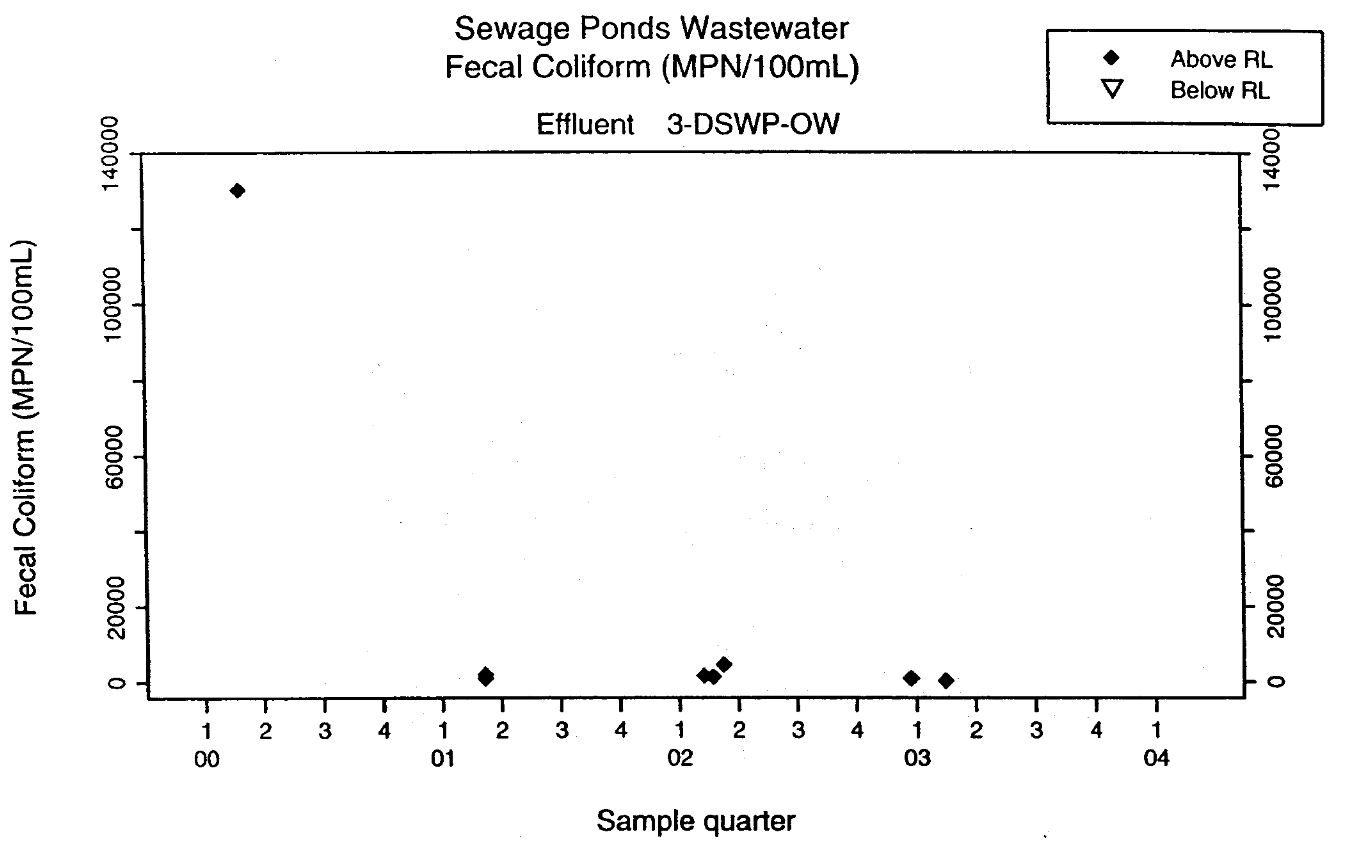


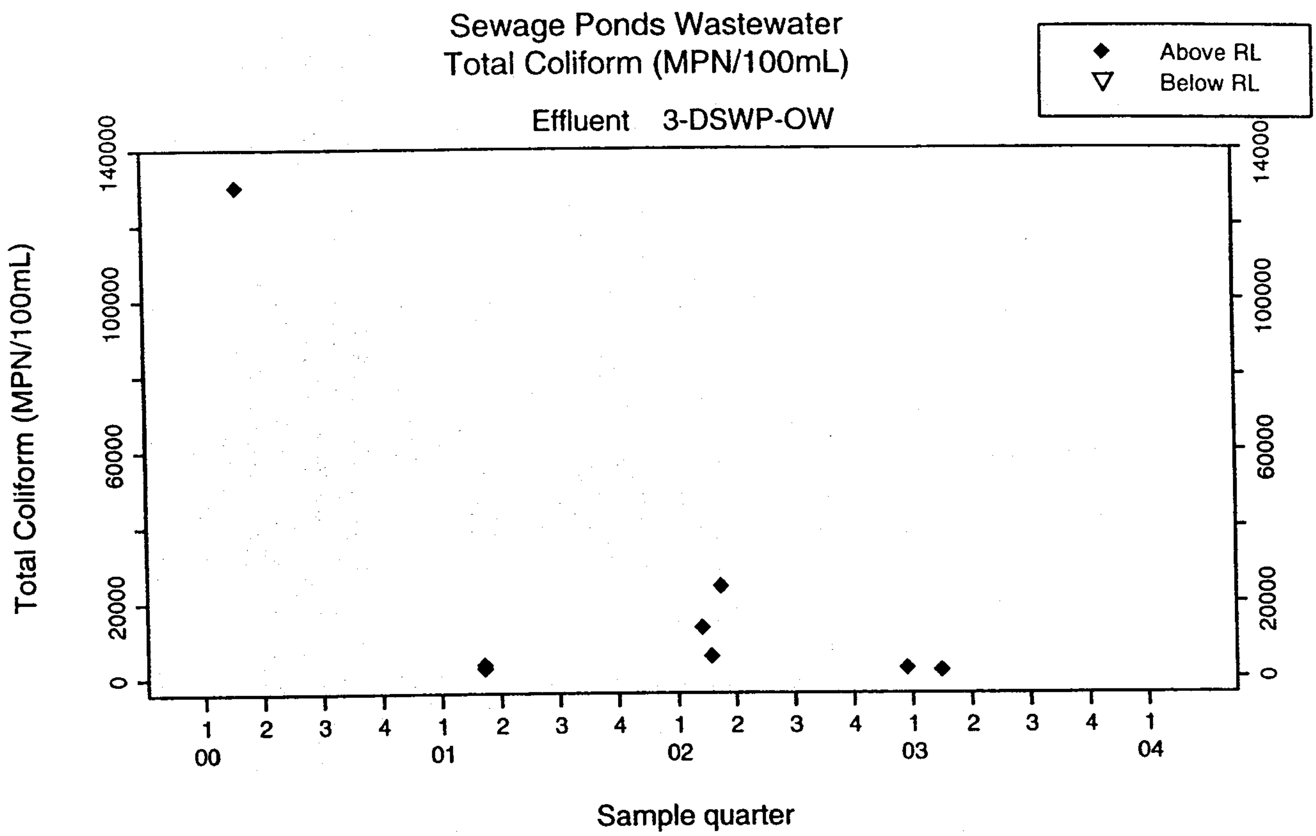
Sewage Ponds Wastewater
Biochemical Oxygen Demand (mg/L)
Above RL
Below RL
Influent 3-ISWP-OW
Biochemical Oxygen Demand (mg/L)
0
500
1000
1500
2000
2500
3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1
97
98
99
00
01
02
03
04
Sample quarter



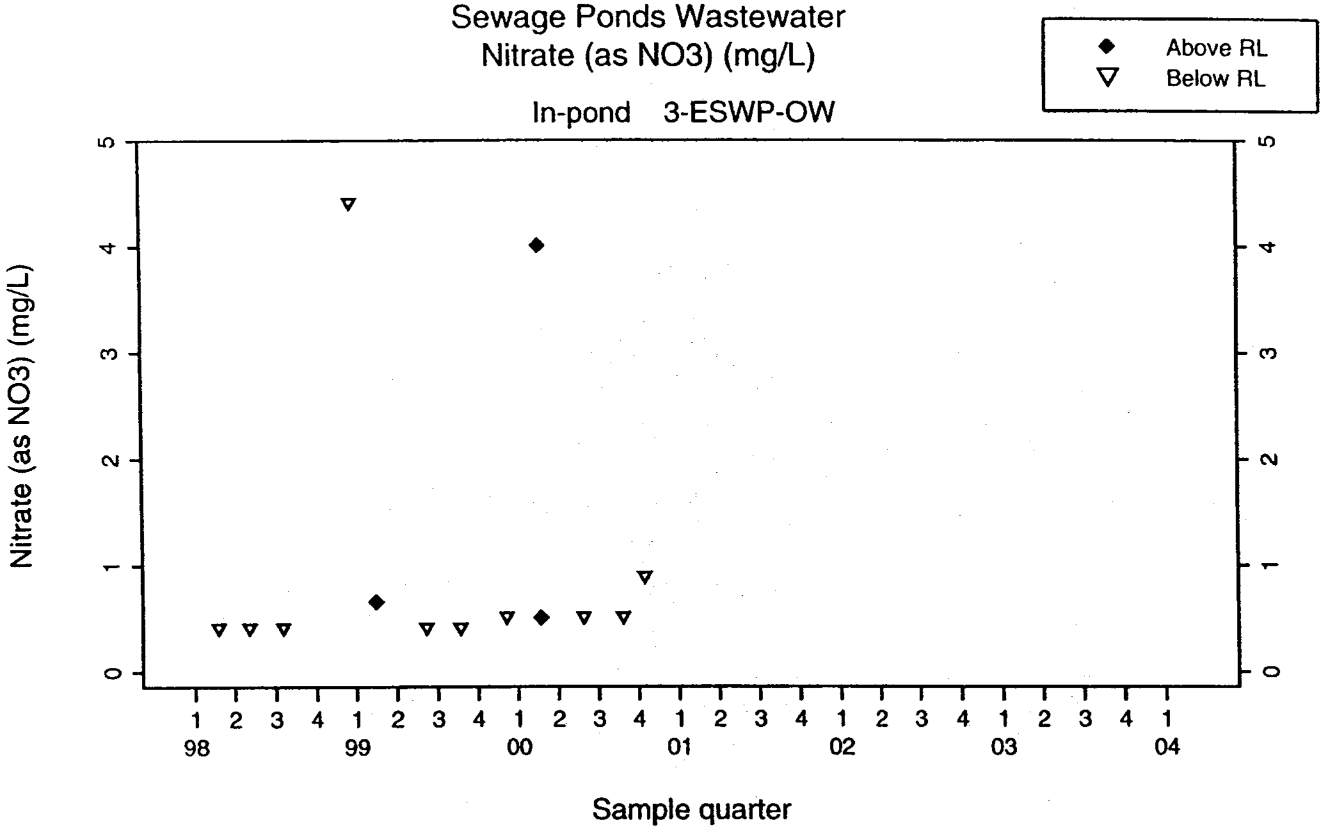
In-pond 3-ESWP-OW
Biochemical Oxygen Demand (mg/L)
0
100
200
300
400
500
3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1
97
98
99
00
01
02
03
04
Data omitted
See Table C-1
Sample quarter

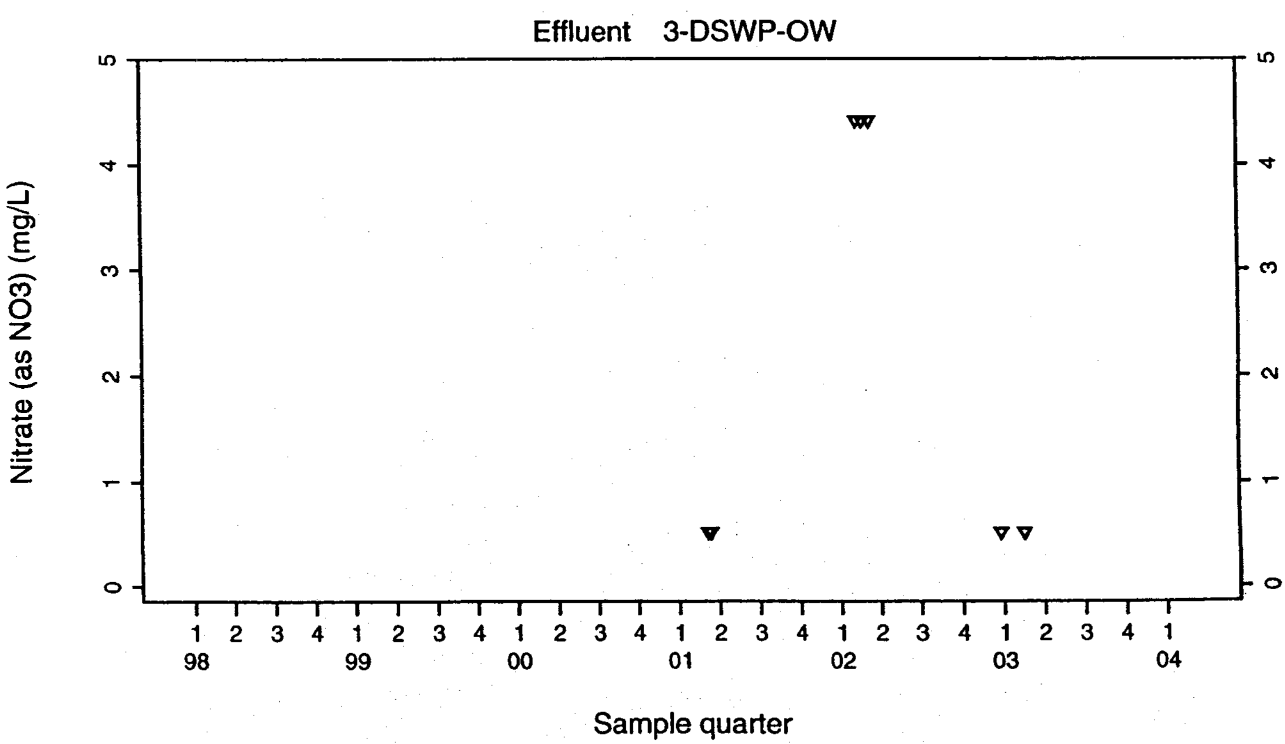

Sewage Ponds Wastewater
Biochemical Oxygen Demand (mg/L)
Effluent 3-DSWP-OW
Above RL
Below RL
Biochemical Oxygen Demand (mg/L)
0
500
1000
1500
2000
2500
3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1
97
98
99
00
01
02
03
04
Sample quarter

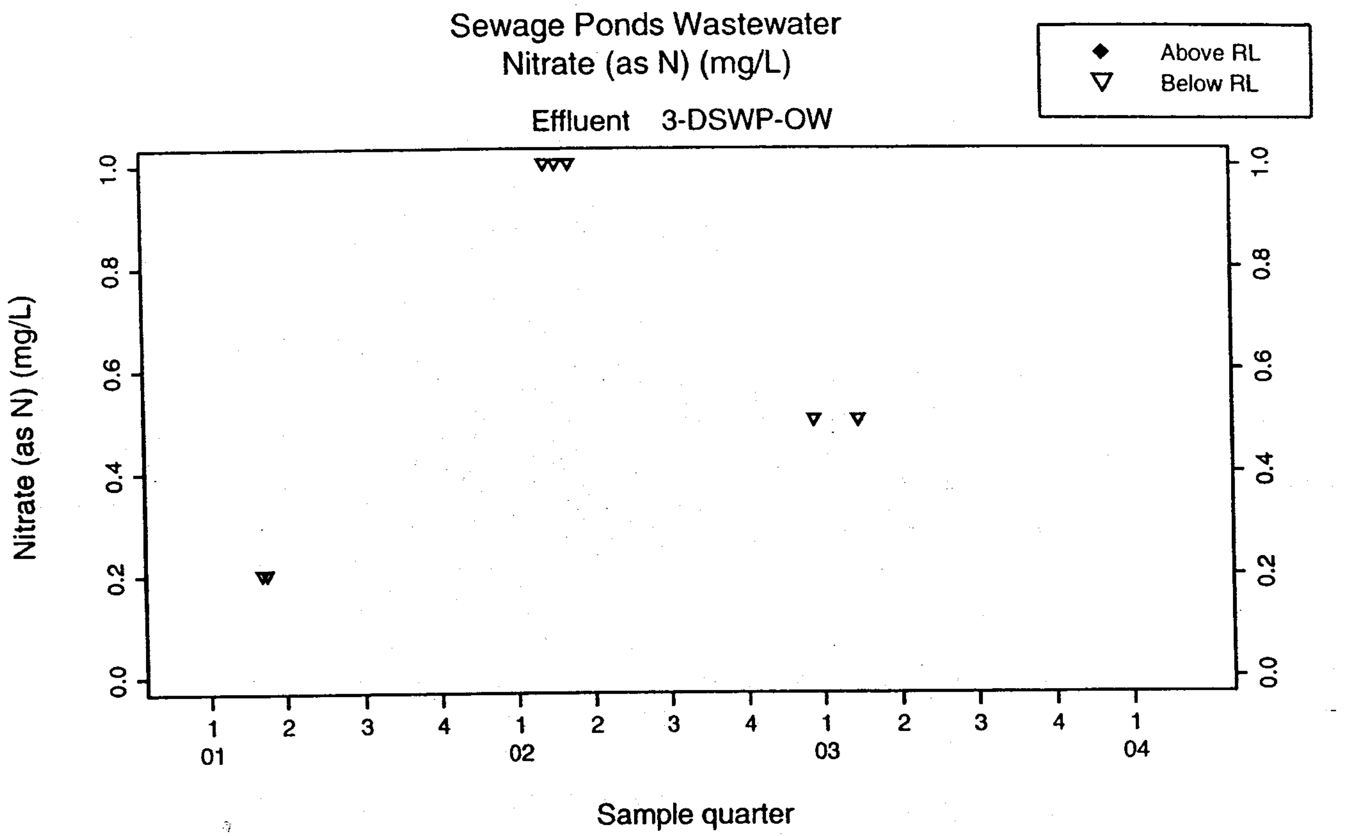

Sewage Ponds Wastewater
Fecal Coliform (MPN/100mL)
Effluent 3-DSWP-OW
Above RL
Below RL
Fecal Coliform (MPN/100mL)
0
20000
60000
100000
140000
1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1
00 01 02 03 04
Sample quarter

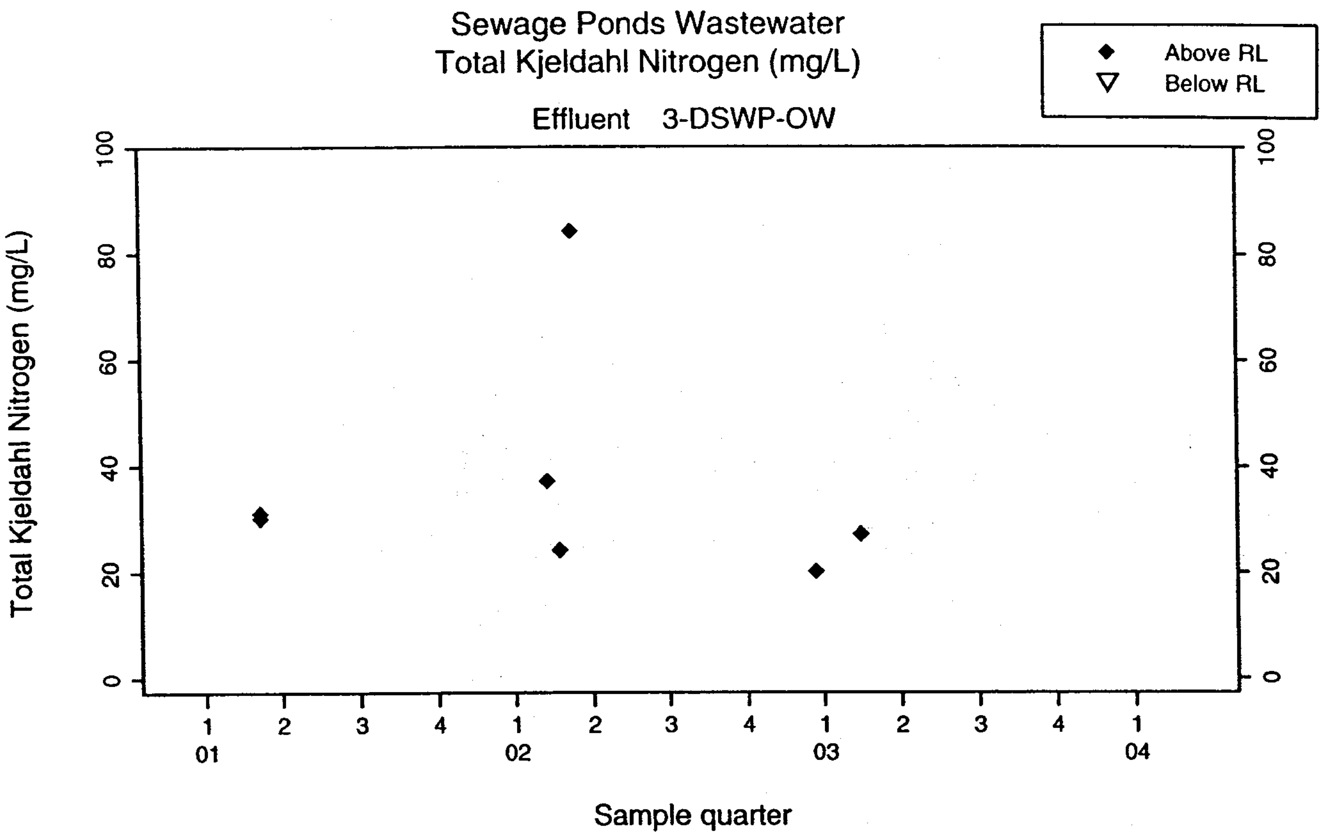

Sewage Ponds Wastewater
Total Coliform (MPN/100mL)
Effluent 3-DSWP-OW
Above RL
Below RL
Total Coliform (MPN/100mL)
0
20000
60000
100000
140000
1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1
00 01 02 03 04
Sample quarter

Sewage Ponds Wastewater
Nitrate (as NO3) (mg/L)

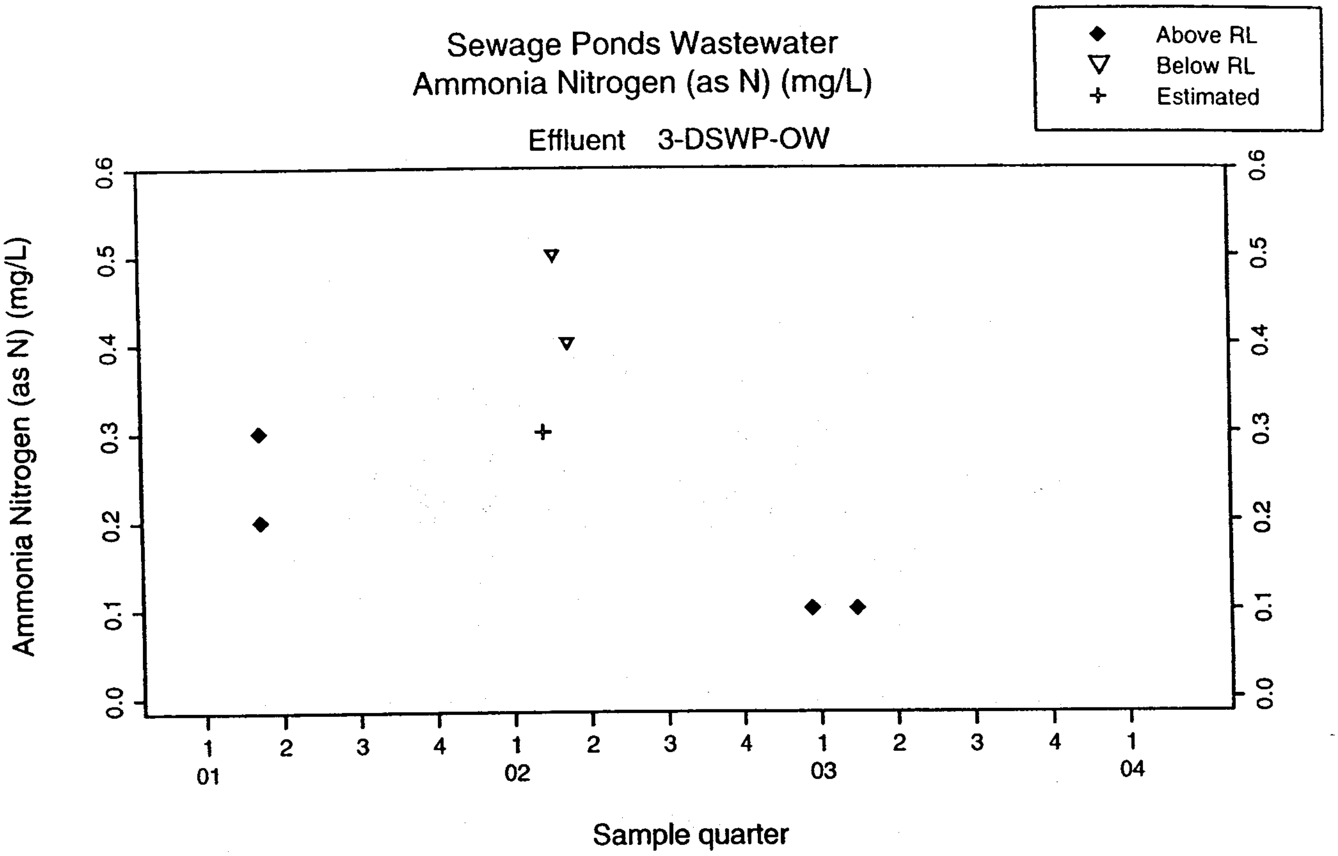


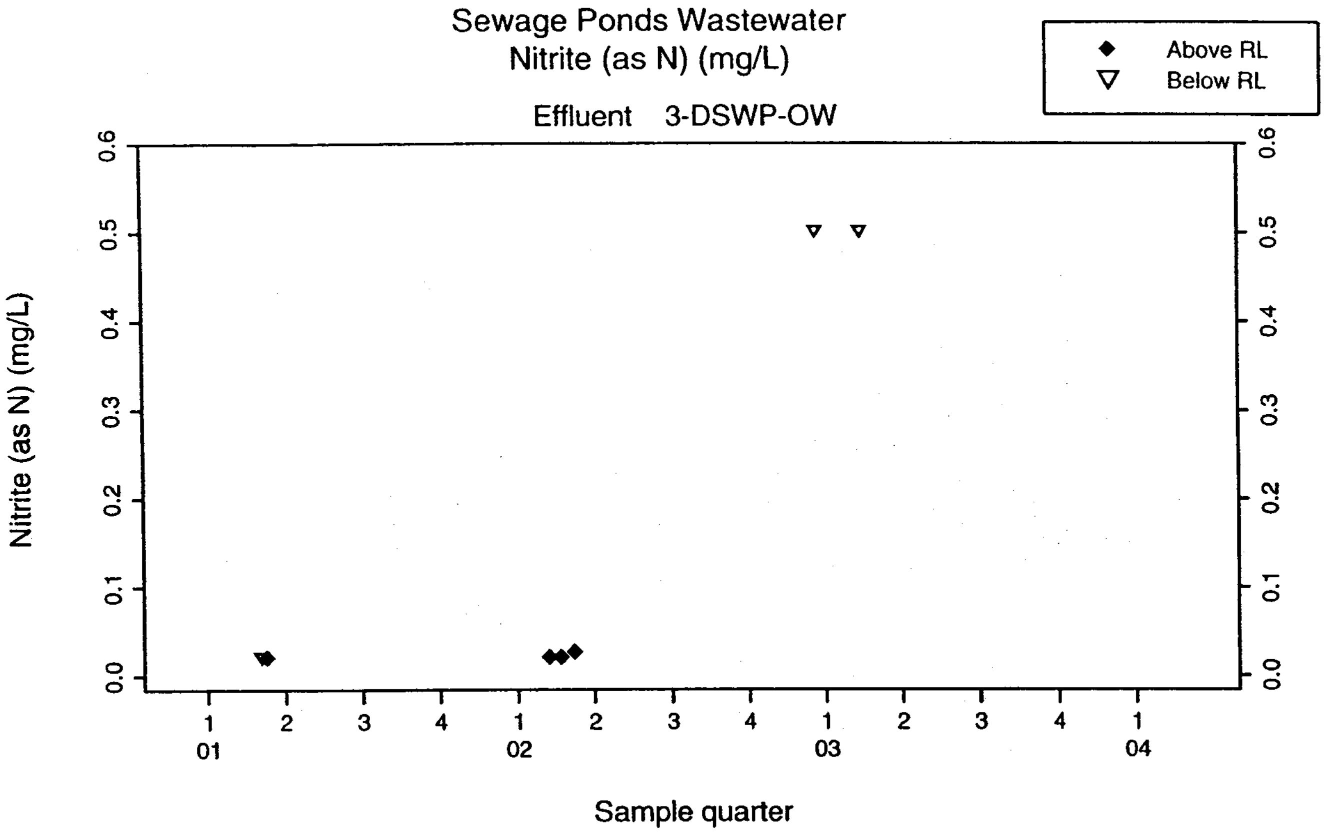


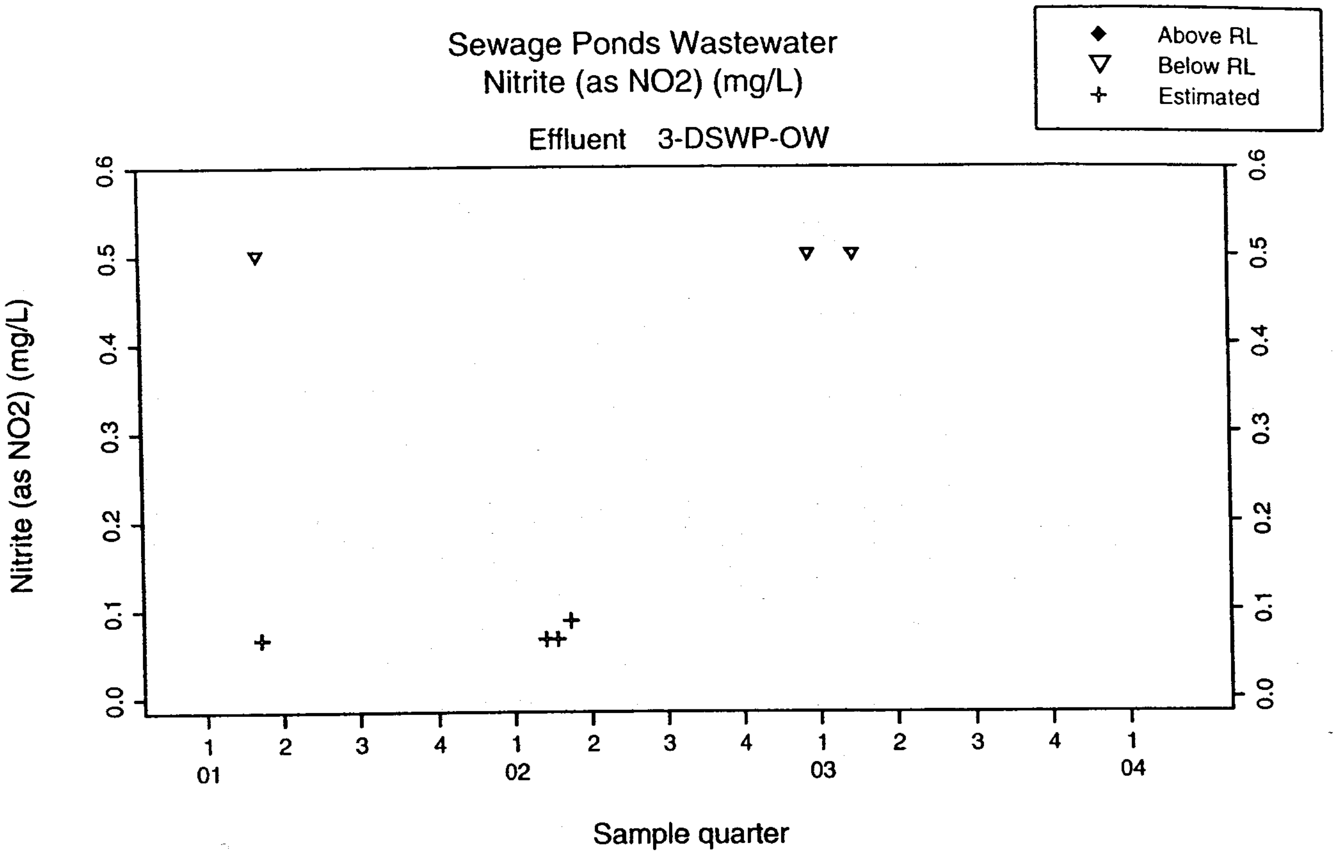

Sewage Ponds Wastewater
Nitrate (as N) (mg/L)
Effluent 3-DSWP-OW
Above RL
Below RL
Nitrate (as N) (mg/L)
0.0
0.2
0.4
0.6
0.8
1.0
1
2
3
4
01
02
03
04
Sample quarter



Sewage Ponds Wastewater
Total Kjeldahl Nitrogen (mg/L)
Effluent 3-DSWP-OW
Above RL
Below RL
Total Kjeldahl Nitrogen (mg/L)
0
20
40
60
80
100
1
2
3
4
1
2
3
4
1
2
3
4
1
01
02
03
04
Sample quarter


Sewage Ponds Wastewater
Ammonia Nitrogen (as N) (mg/L)
Effluent 3-DSWP-OW
Above RL
Below RL
Estimated
Ammonia Nitrogen (as N) (mg/L)
0.0
0.1
0.2
0.3
0.4
0.5
0.6
1 2 3 4 1 2 3 4 1 2 3 4 1
01
02
03
04
Sample quarter


Sewage Ponds Wastewater
Nitrite (as N) (mg/L)
Effluent 3-DSWP-OW
Above RL
Below RL
Nitrite (as N) (mg/L)
0.0
0.1
0.2
0.3
0.4
0.5
0.6
1
2
3
4
01
02
03
04
Sample quarter


Sewage Ponds Wastewater
Nitrite (as NO2) (mg/L)
Above RL
Below RL
Estimated
Effluent 3-DSWP-OW
Nitrite (as NO2) (mg/L)
0.0
0.1
0.2
0.3
0.4
0.5
0.6
1
2
3
4
01
02
03
04
Sample quarter

Annual Summary Tables of Sewage Evaporation and Percolation Ponds Ground Water Monitoring Data

Table C-1. 2003 summary of sewage pond observations.

Month	Freeboard[a]	Color	Odor	Levee condition
January	0.56 [b]–0.57 [b]	Green-brown	Slight	Animal burrows and erosion are okay, weed control is fair
February	0.57 [b]–0.60 [b]	Green-brown – brown-green	Slight	Animal burrows and erosion are okay, weed control is fair
March	0.58 [b]–0.60 [b]	Green-brown – brown-green	Slight to none	Animal burrows and erosion are okay, weed control is fair
April	0.60-0.64	Green-brown – green	Slight to none	Animal burrows and erosion are okay, weed control is fair
May	0.62-0.69	Green – green-brown	Slight	Animal burrows and erosion are okay, weed control is fair
June	0.65-0.71	Green	Slight to none	Animal burrows and erosion are okay, weed control is fair
July	0.66 –0.71	Green	Slight	Animal burrows and erosion are okay, weed control is okay
August	0.66–0.69	Green	Slight	Animal burrows and erosion are okay, weed control is fair
September	0.66–0.69	Green – green-brown	Slight	Animal burrows and erosion are okay, weed control is okay
October	0.66–0.70	Green – green-brown	Slight	Animal burrows and erosion are okay, weed control is good
November	0.64–0.69	Green – green-brown	Slight	Animal burrows and erosion are okay, weed control is good to fair
December	0.57 [b]-0.64	Green-brown	Slight	Animal burrows and erosion are okay, weed control is fair

a Minimum freeboard is 0.61 m = 2 ft.

b Freeboard in the evaporation pond was slightly less than 0.61 m (2 ft), as discharge to the percolation pond occurred.

Table C-2. 2003 sewage wastewater influent monitoring results (Location ISWP).

Parameter	Permit limits	First quarter	Second quarter	Third quarter	Fourth quarter
pH (units)	$6.5 < pH < 10$	8.67	8.6	8.4	8.8
EC (μmhos/cm)	None	1,600	1,400	1,780	2,250
BOD (mg/L)	None	800	134	152	820/600[a]

a Sample and duplicate sample results for BOD analysis for interlaboratory comparison.

Table C-3. 2003 sewage evaporation pond monitoring results (Location ESWP).

Parameter	Permit limits	First quarter	Second quarter	Third quarter	Fourth quarter
pH (units)	None	9.93	9.6	9.3	9.6
EC (µmhos/cm)	None	7,600	9,580	9,340	10,200
Laboratory DO (mg/L)	1.0 (min.)	18.5 [a]	1.07 [b]	9.94	16.44
Field DO [c] (mg/L)	1.0 (min.)	16.62	4.76	13.63	22.84

[a] Sample was saturated with dissolved oxygen (DO), according to analytical laboratory.

[b] Sample was analyzed within 24 hours, but beyond the EPA recommended holding time of 6 hours.

[c] Field dissolved oxygen with calibrated meter is reported here for comparison purposes.

Table C-4. 2003 sewage percolation pond discharge location (Location DSWP).

Parameter	Permit limits	February 11
pH (units)	6.5 < pH < 10	9.92
EC (µmhos/cm)	None	6,700
BOD (mg/L)	None	86
Fecal coliform (MPN [a]/100 mL)	None	130
Total coliform (MPN [a]/100 mL)	None	1,600
Nitrate as NO_3	None	< 0.5
Nitrate as N	None	< 0.5
Nitrate + nitrite as N	None	< 0.1
Total Kjeldahl nitrogen	None	27
Ammonia as N	None	0.1
Nitrite as N	None	< 0.5
Nitrite as NO_2	None	< 0.5

[a] MPN = Most probable number (of organisms).

Appendix D

Annual Summary Plots and Tables of Sewage Evaporation and Percolation Ponds Ground Water Monitoring Data

Appendix D

This appendix contains graphical and tabular summaries of ground water monitoring data from the sewage ponds ground water network. These plots contain all monitoring data available since LLNL began sampling from upgradient ground water monitoring wells W-7E, W-7ES, and W-7PS; from cross-gradient ground water monitoring well W-35A-04; and from downgradient ground water monitoring wells W-26R-01, W-26R-11, W-26R-05, W-25N-20, and W-7DS in 1987.

The plots display field parameters of ground water elevation, pH, electrical conductivity (EC), total coliform bacteria, fecal coliform bacteria, and finally nitrate (as NO_3). The upgradient (background) monitoring wells W-7E, W-7ES, and W-7PS are always plotted first for each analyte.

Each two-dimensional graph shows concentration plotted on the vertical axis versus time (years divided into four quarterly sampling periods) on the horizontal axis. Units of measure are given on the vertical axis label and in the header at the top of each page. Values above the analytical reporting limit for each analyte are plotted as solid diamonds, and values below the reporting limit are plotted as open inverted triangles.

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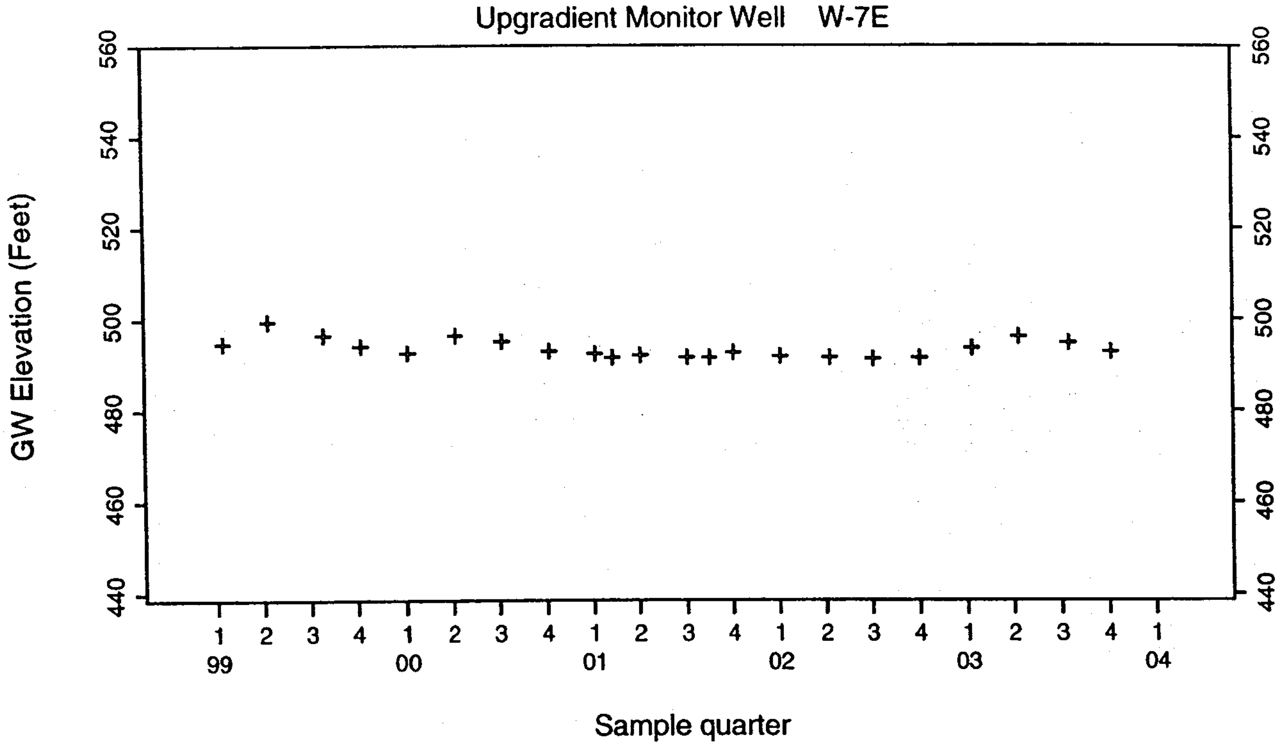
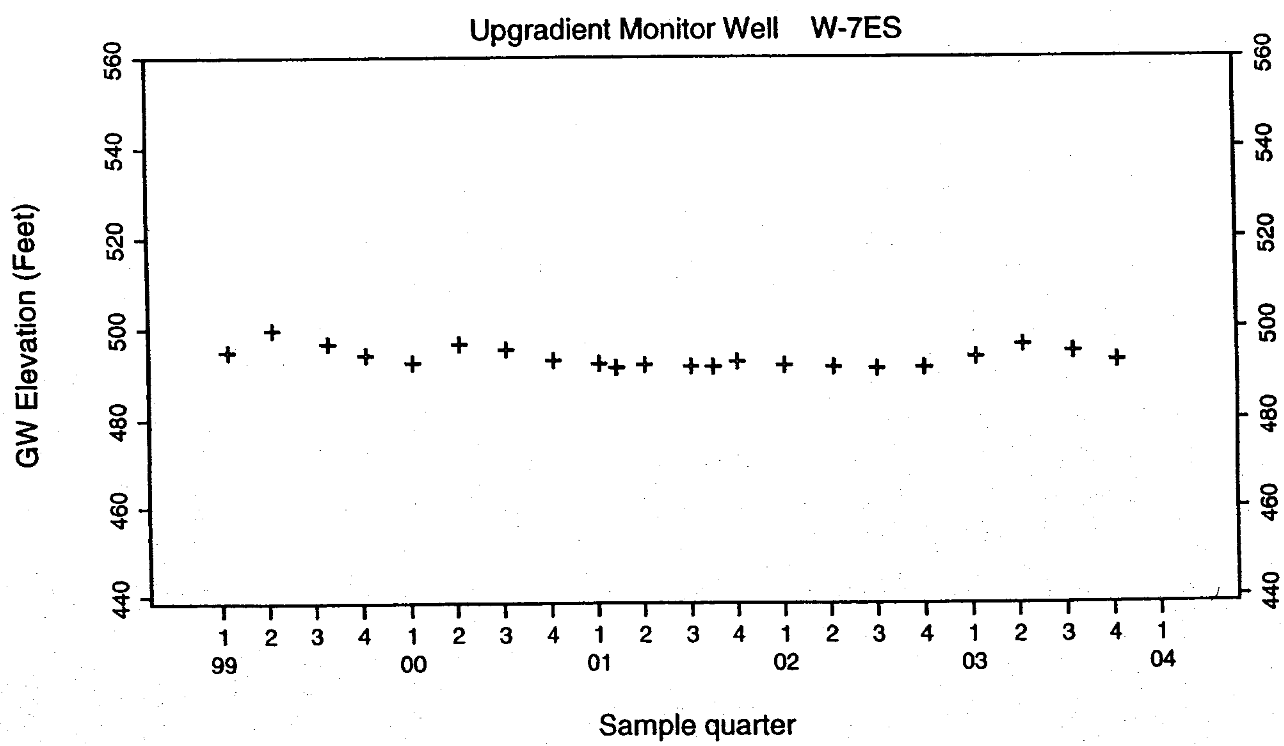
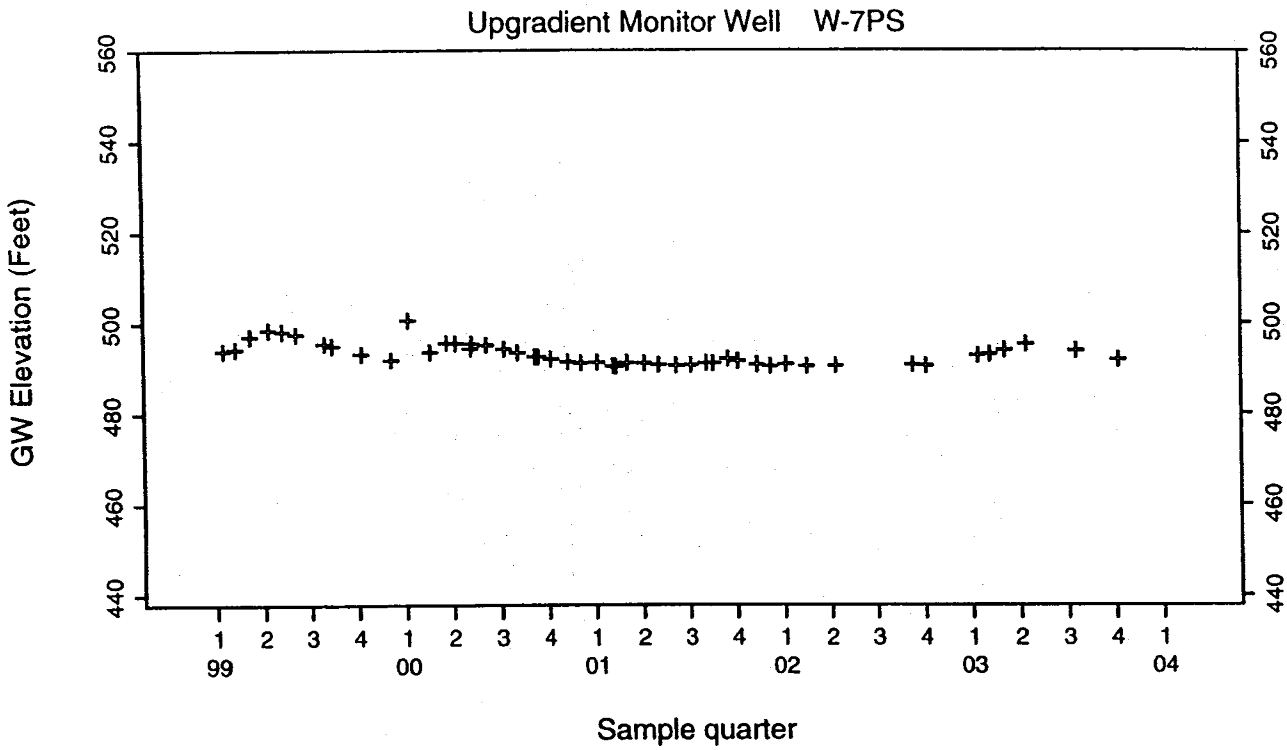
Annual Plots of Sewage Evaporation and Percolation Ponds Ground Water Monitoring Data

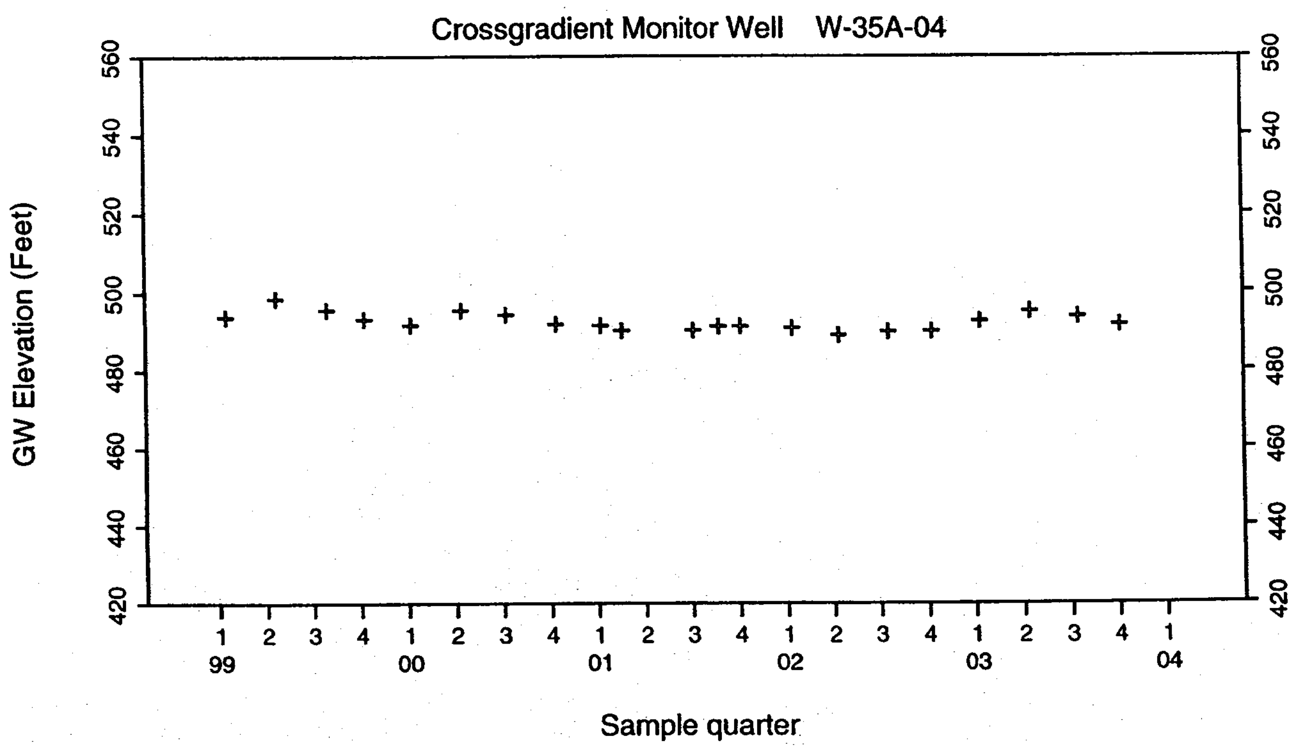
Sewage Ponds Ground Water
GW Elevation (Feet)



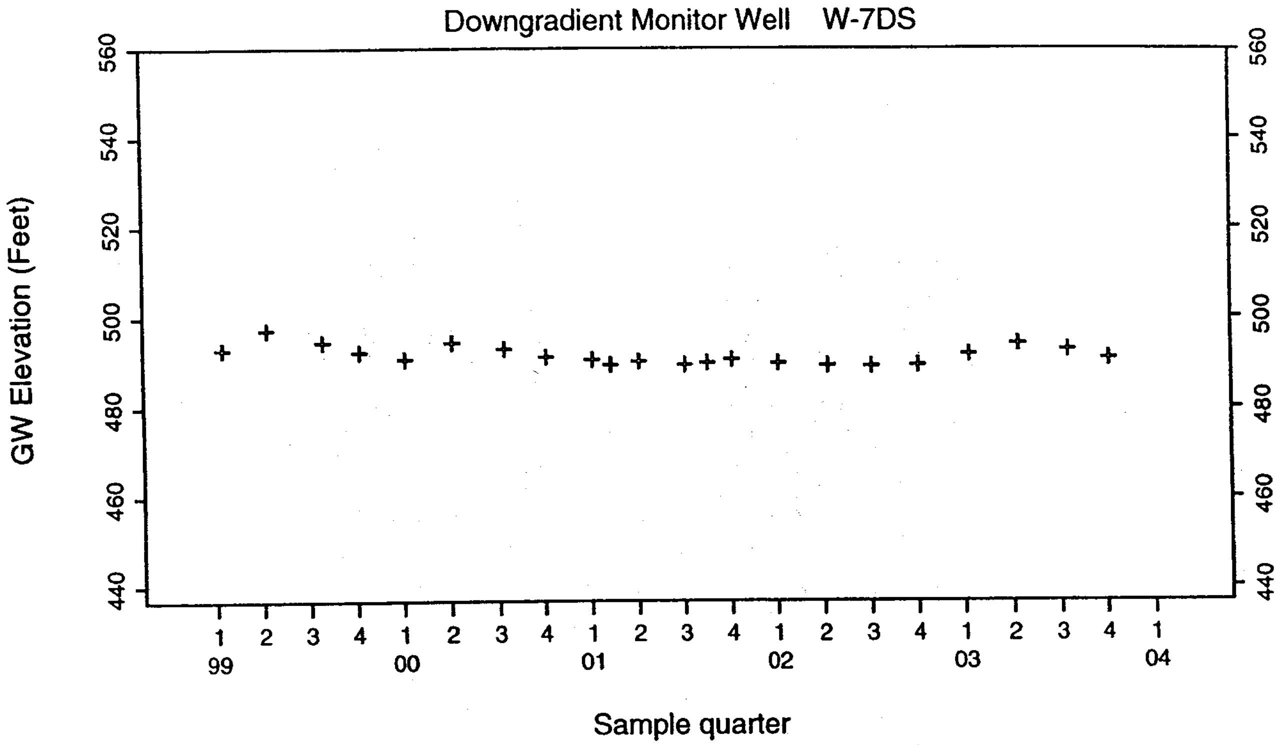


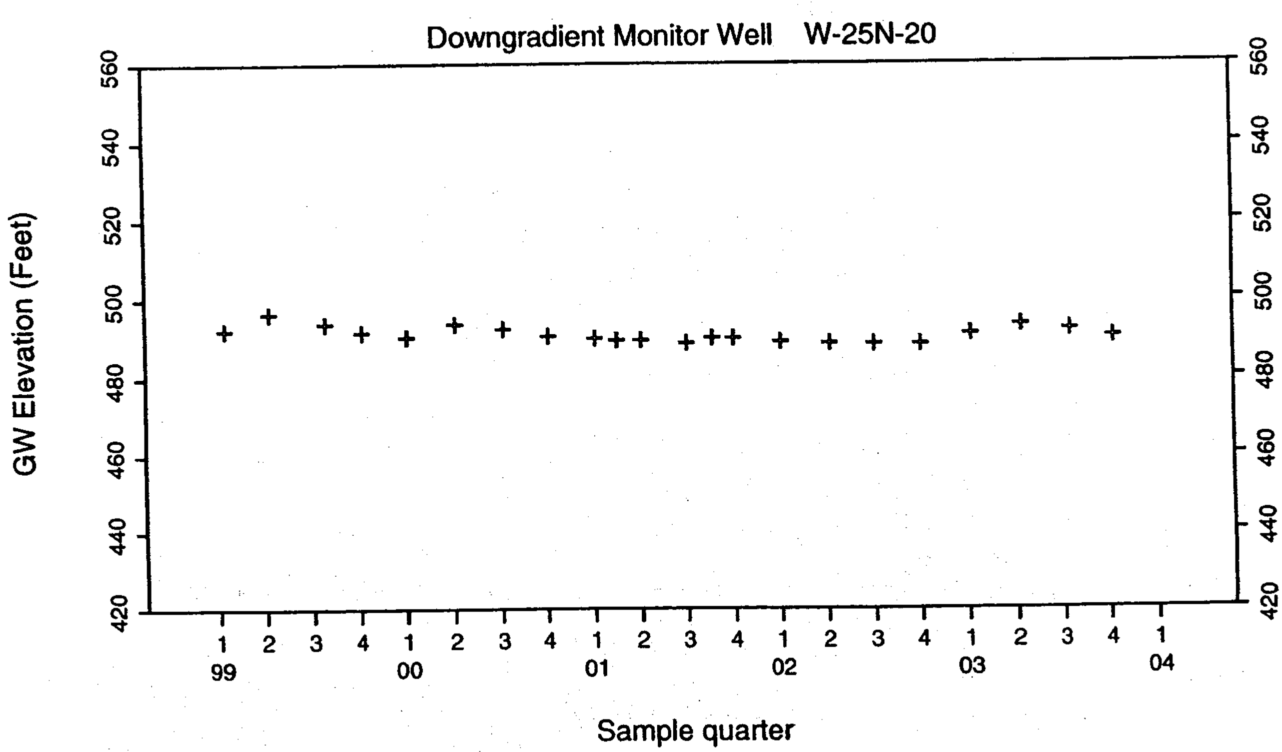
Sewage Ponds Ground Water
GW Elevation (Feet)



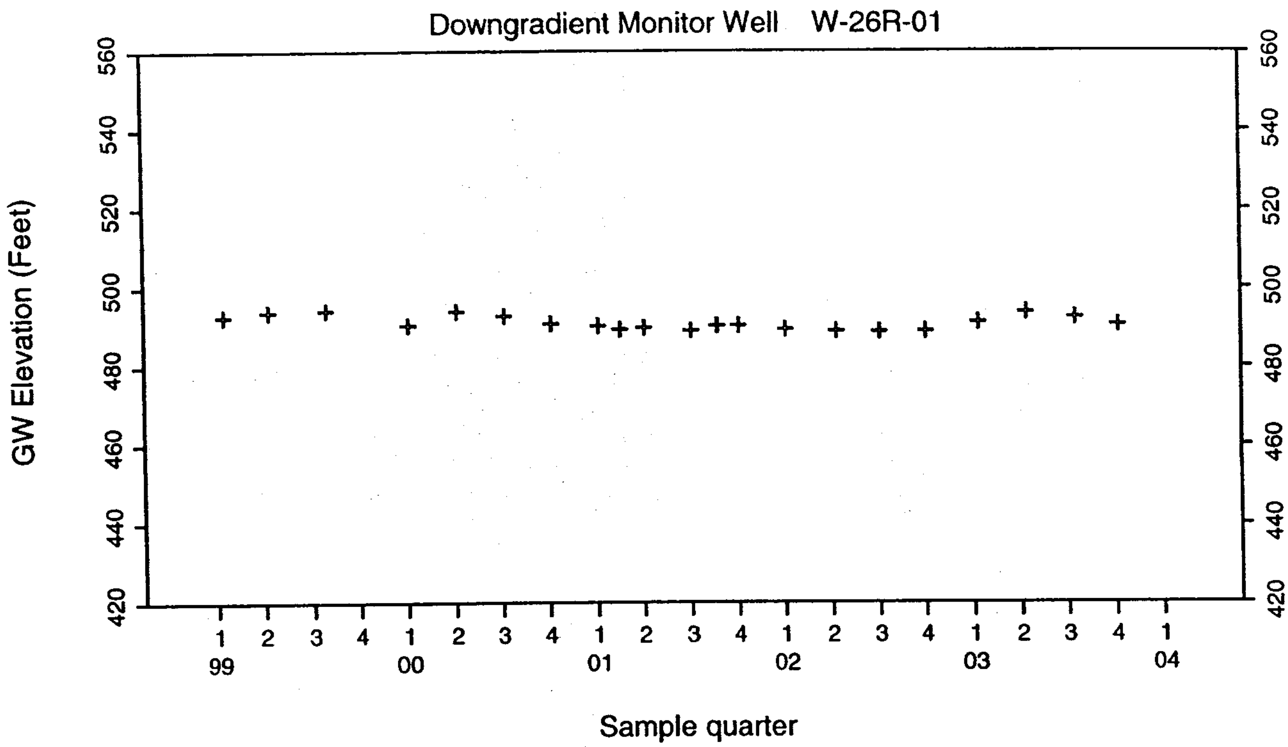


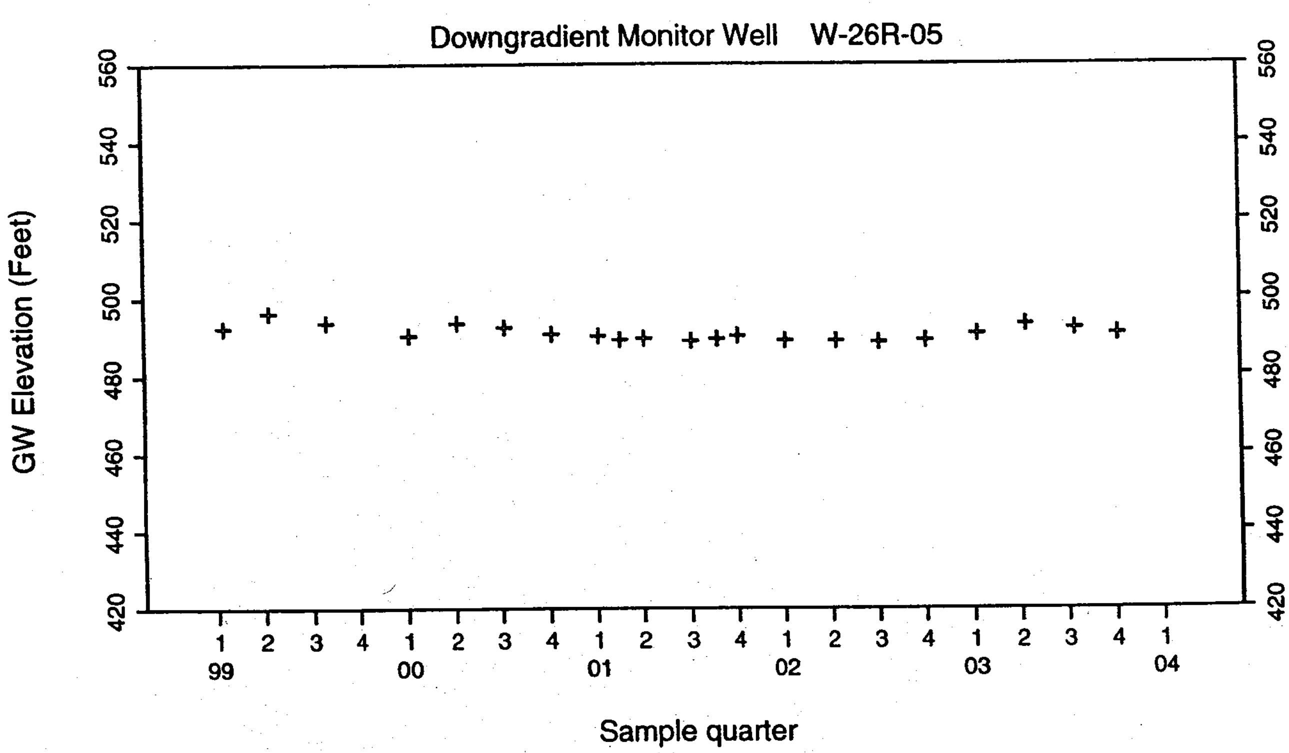
Sewage Ponds Ground Water
GW Elevation (Feet)



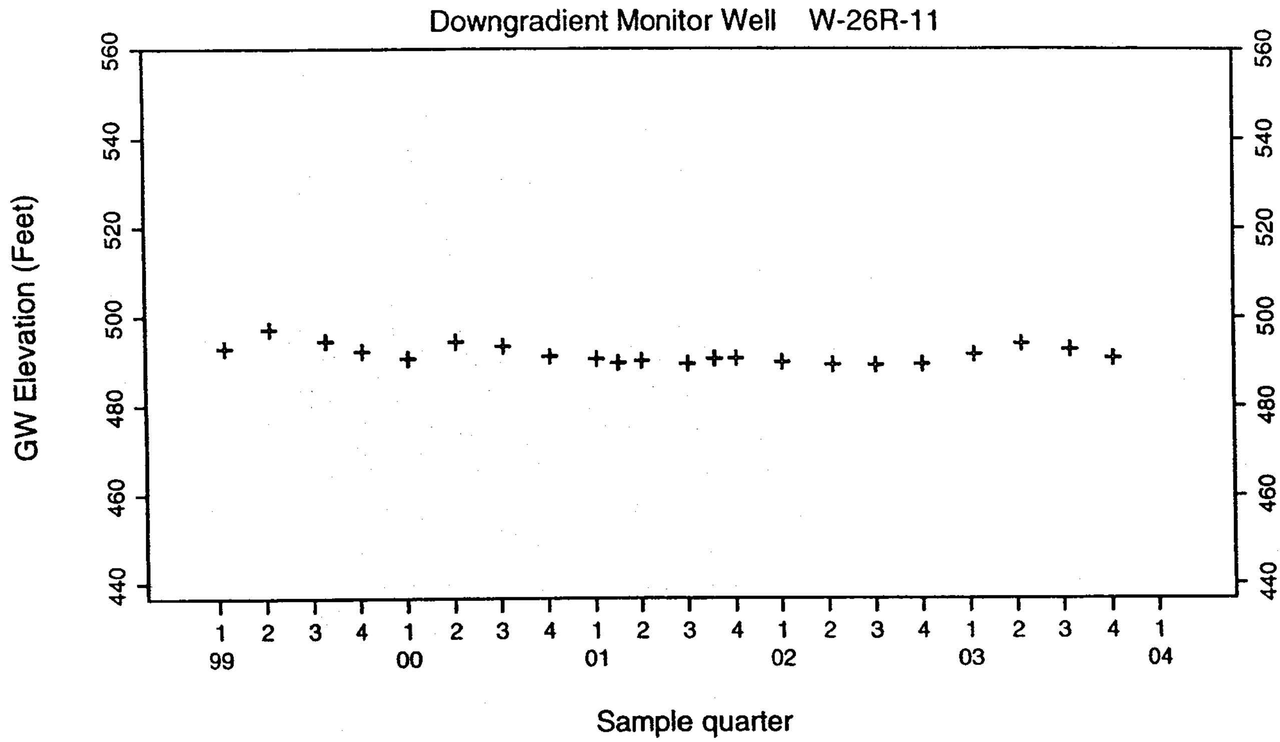


Sewage Ponds Ground Water
GW Elevation (Feet)

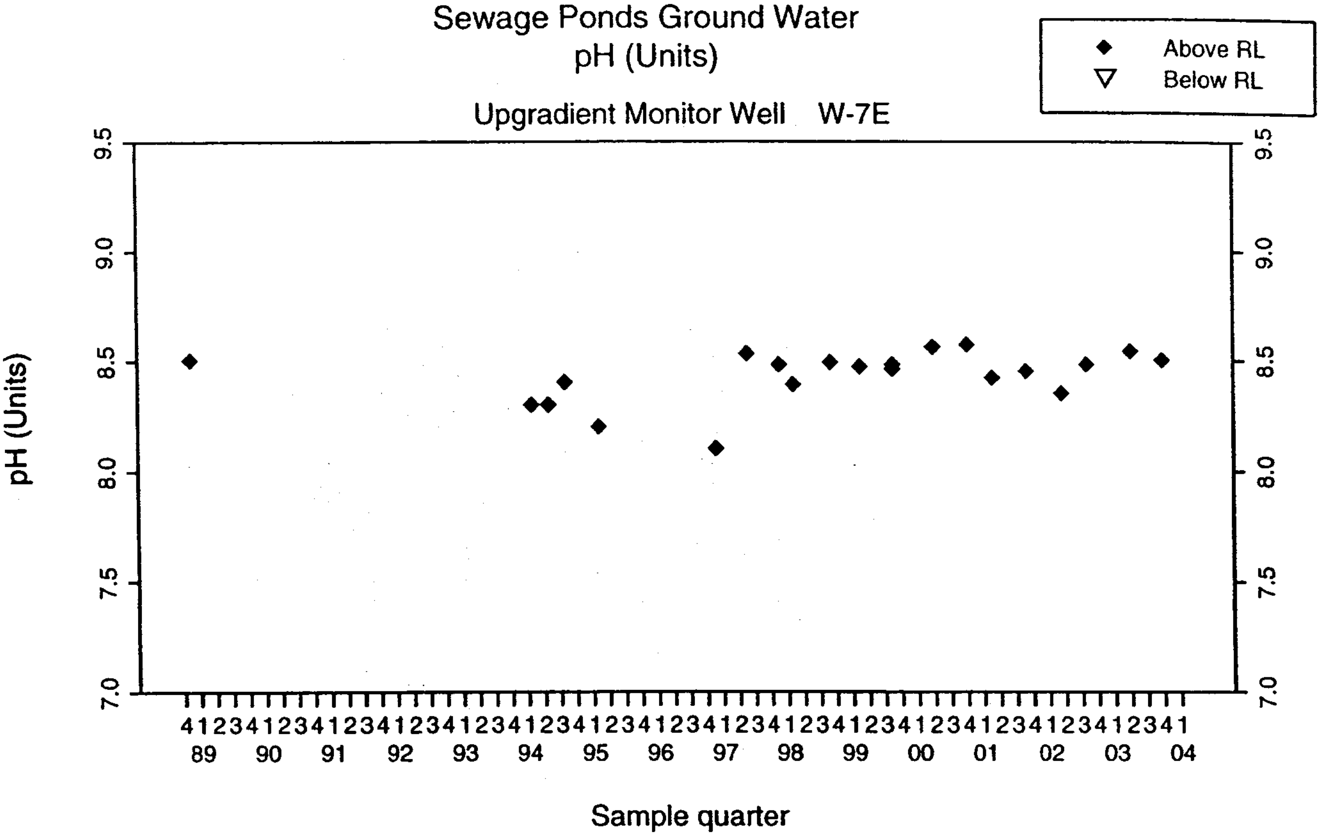


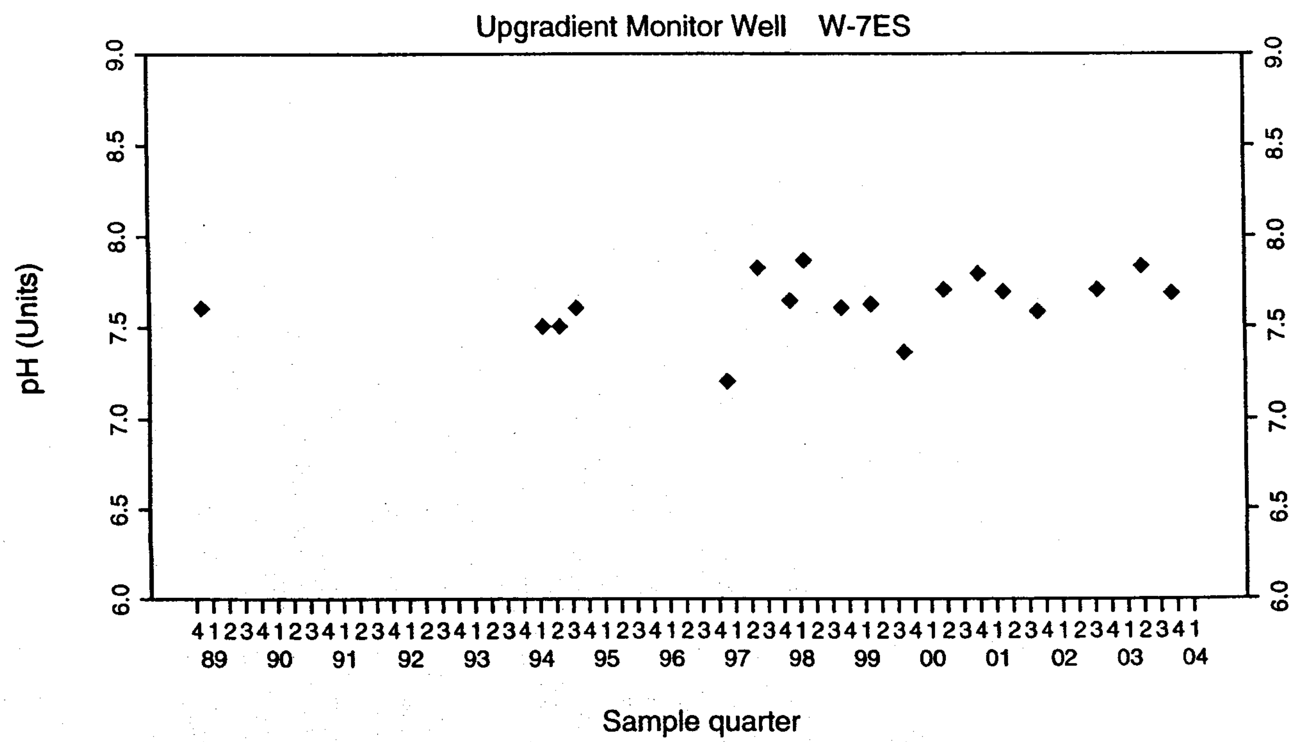


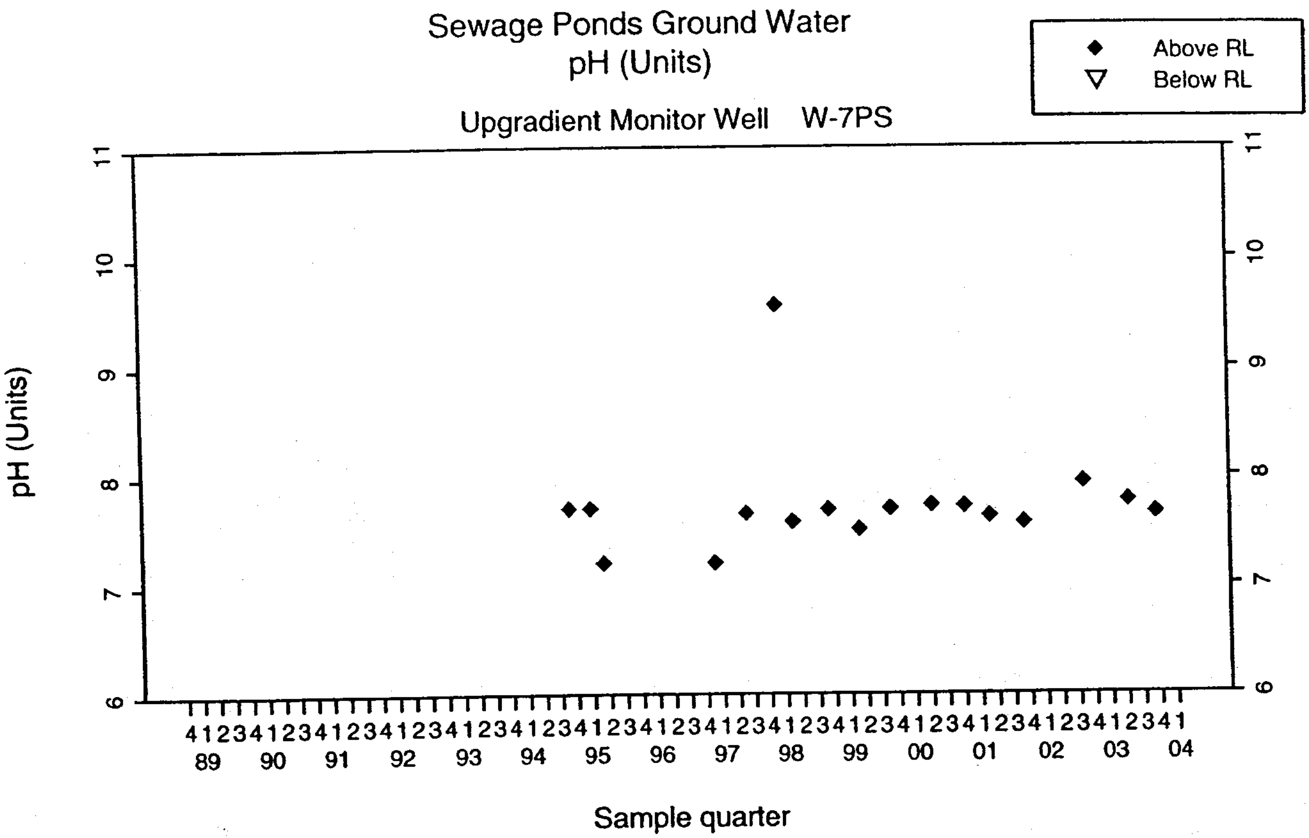
Sewage Ponds Ground Water
GW Elevation (Feet)



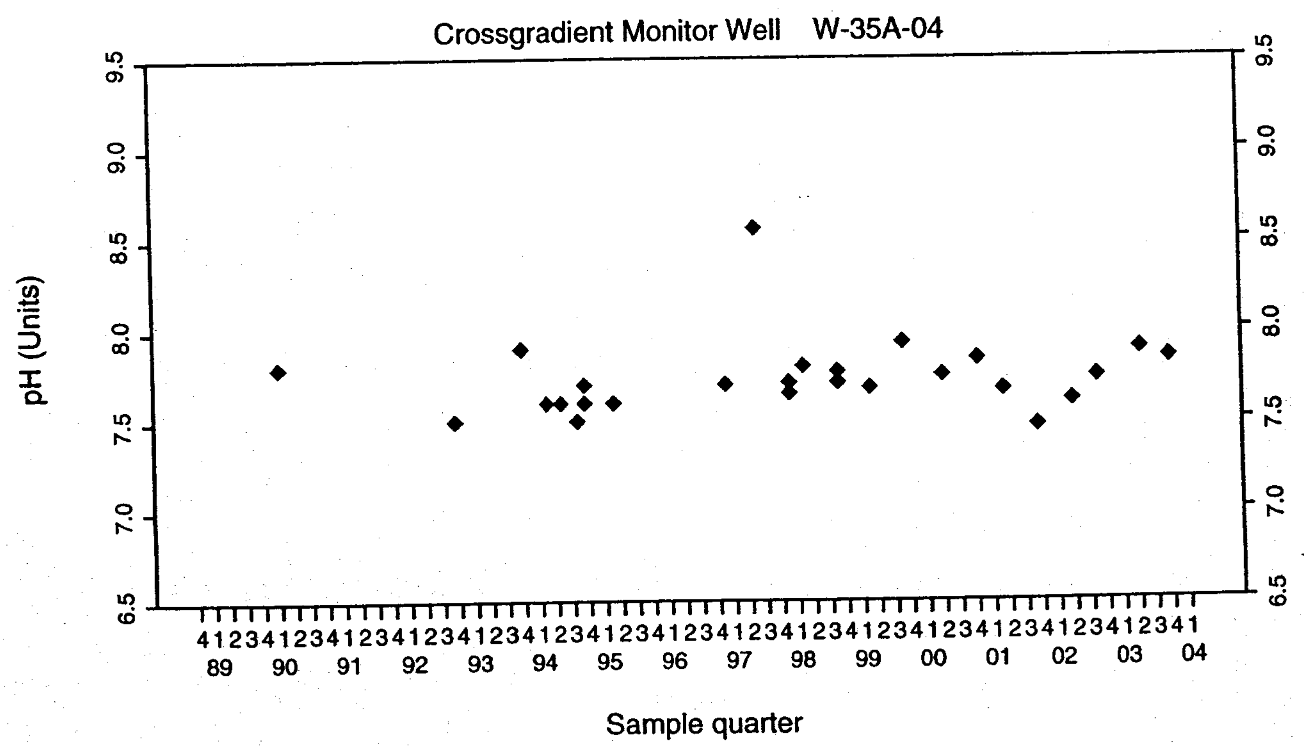
Sewage Ponds Ground Water
pH (Units)





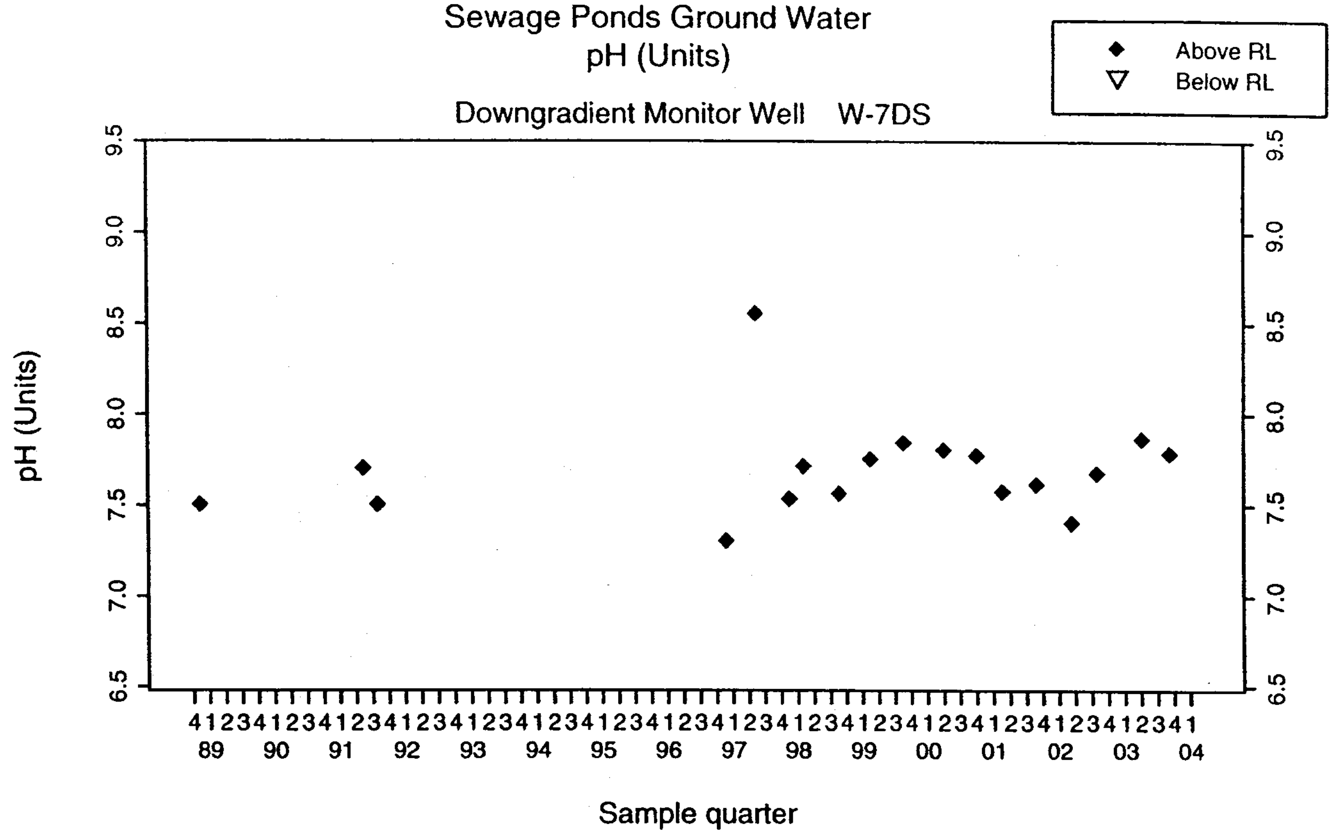


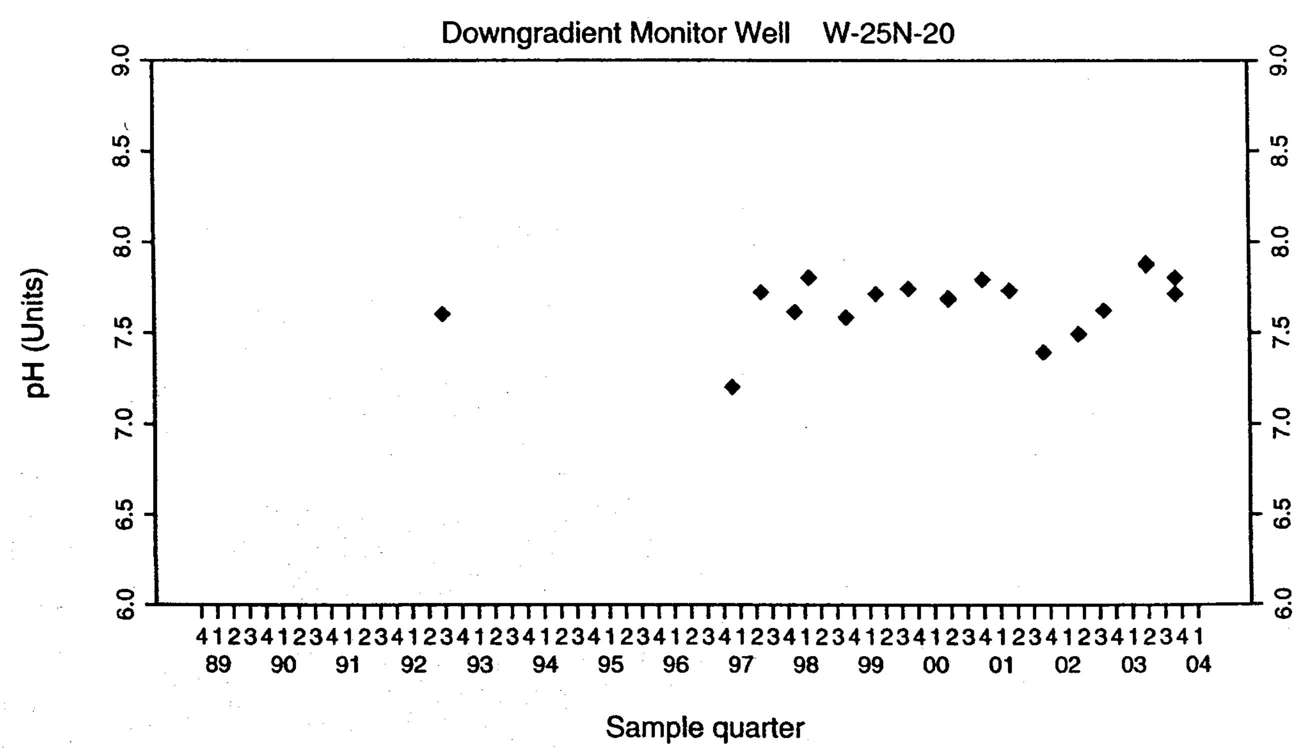
Sewage Ponds Ground Water
pH (Units)
Above RL
Below RL
Upgradient Monitor Well W-7PS
pH (Units)
6
7
8
9
10
11
41234123412341234123412341234123412341234123412341234123412341
89 90 91 92 93 94 95 96 97 98 99 00 01 02 03 04
Sample quarter



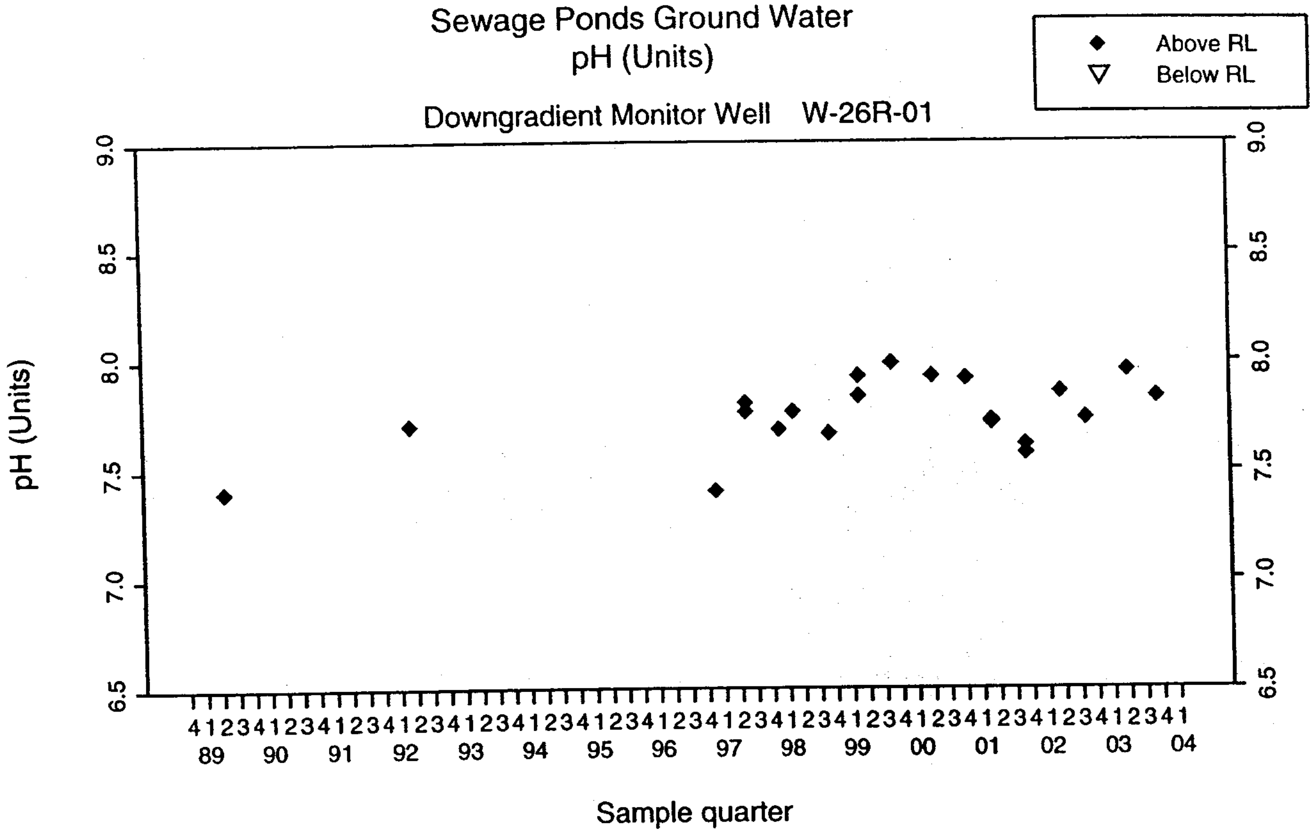
Crossgradient Monitor Well W-35A-04
pH (Units)
6.5
7.0
7.5
8.0
8.5
9.0
9.5
41234123412341234123412341234123412341234123412341234123412341
89 90 91 92 93 94 95 96 97 98 99 00 01 02 03 04
Sample quarter

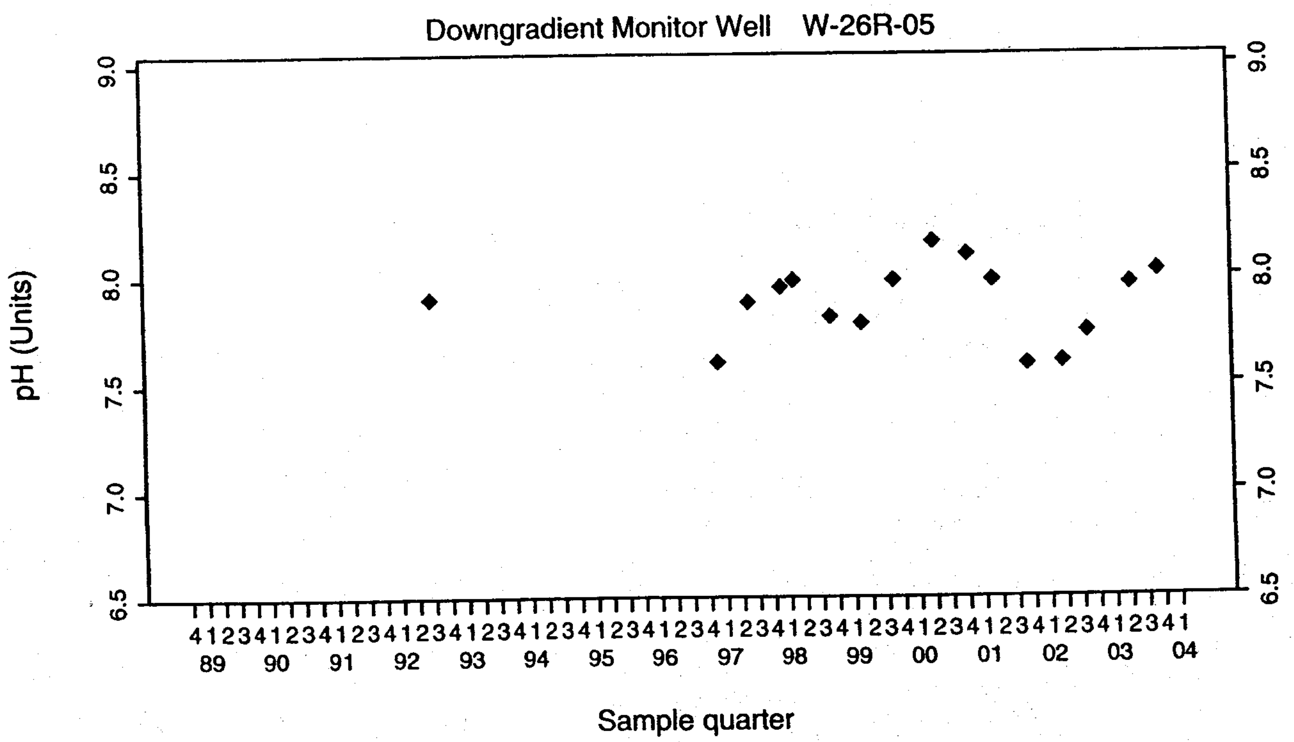
Sewage Ponds Ground Water
pH (Units)

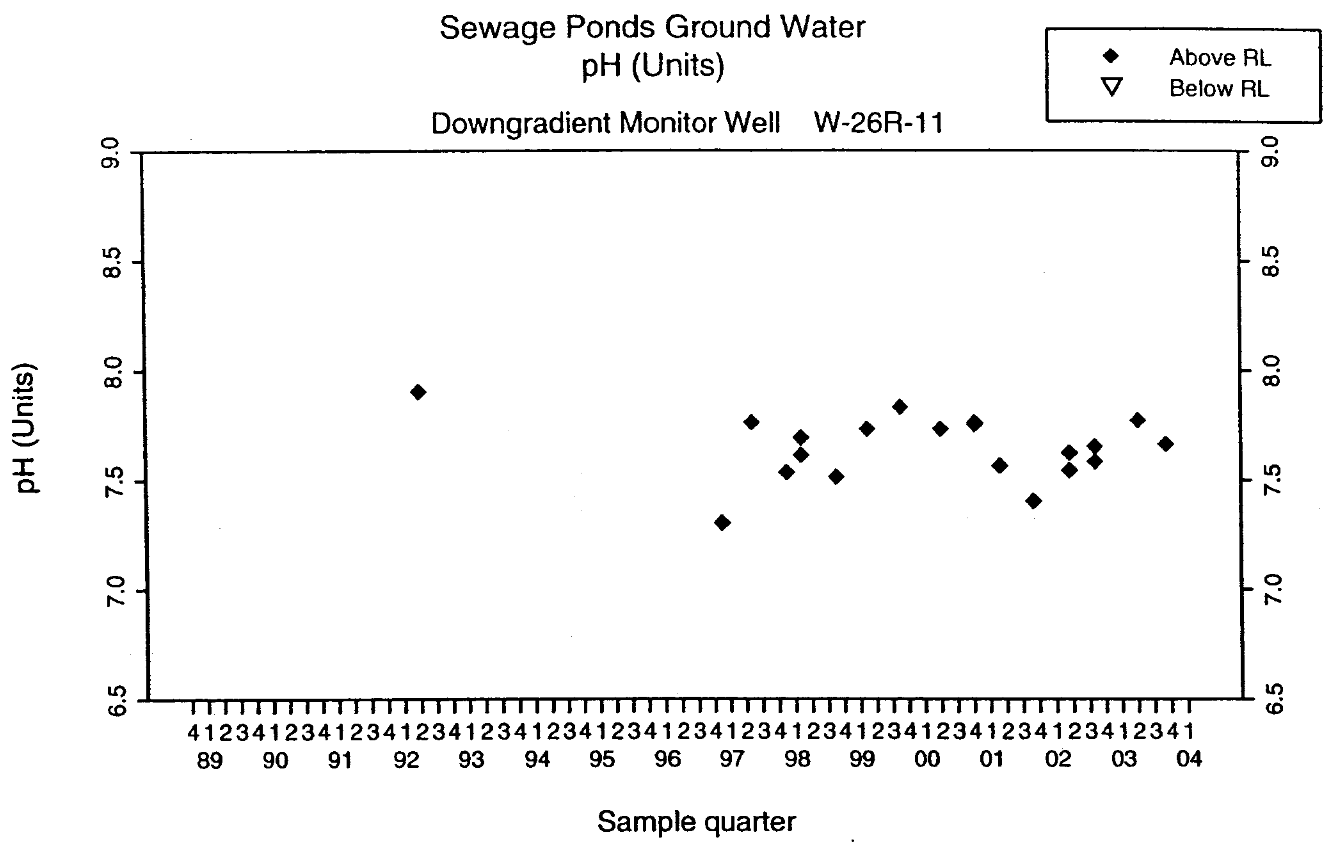


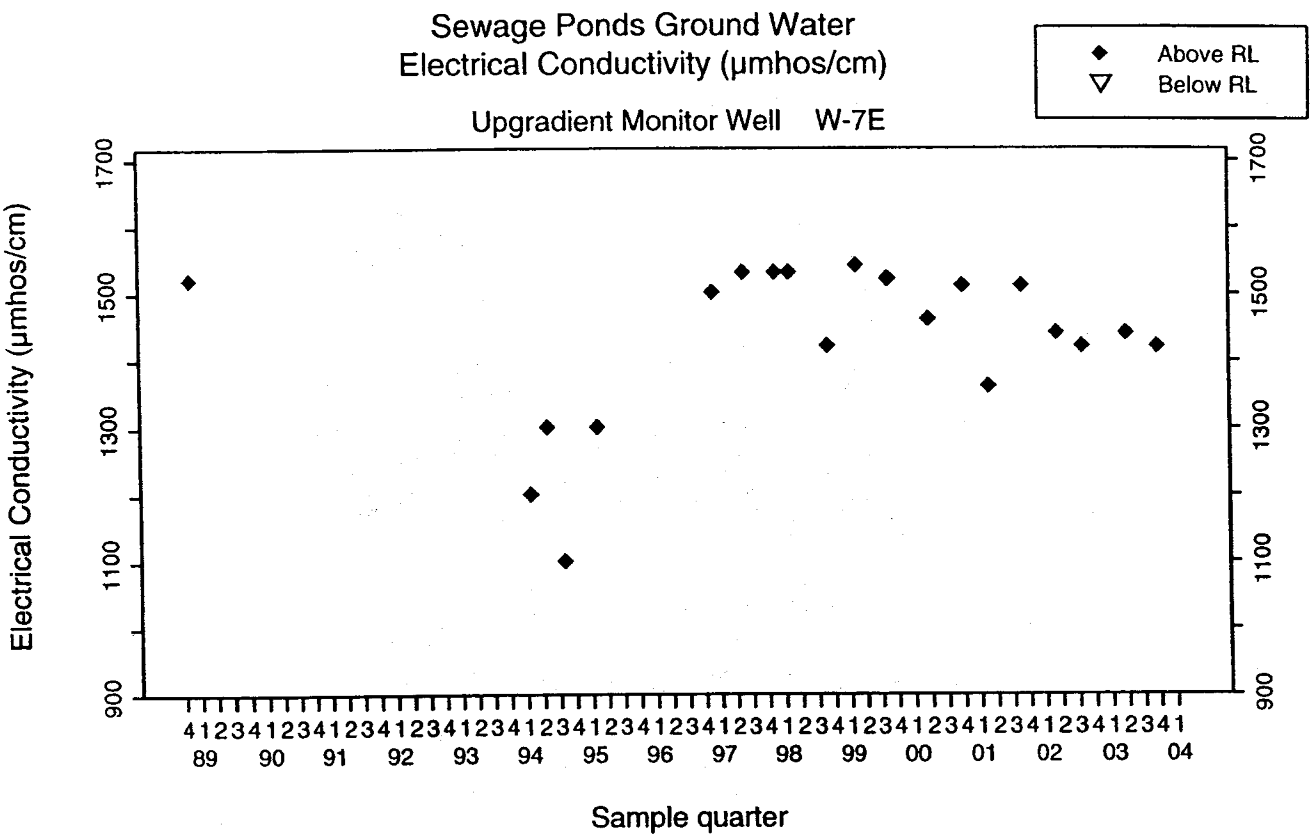


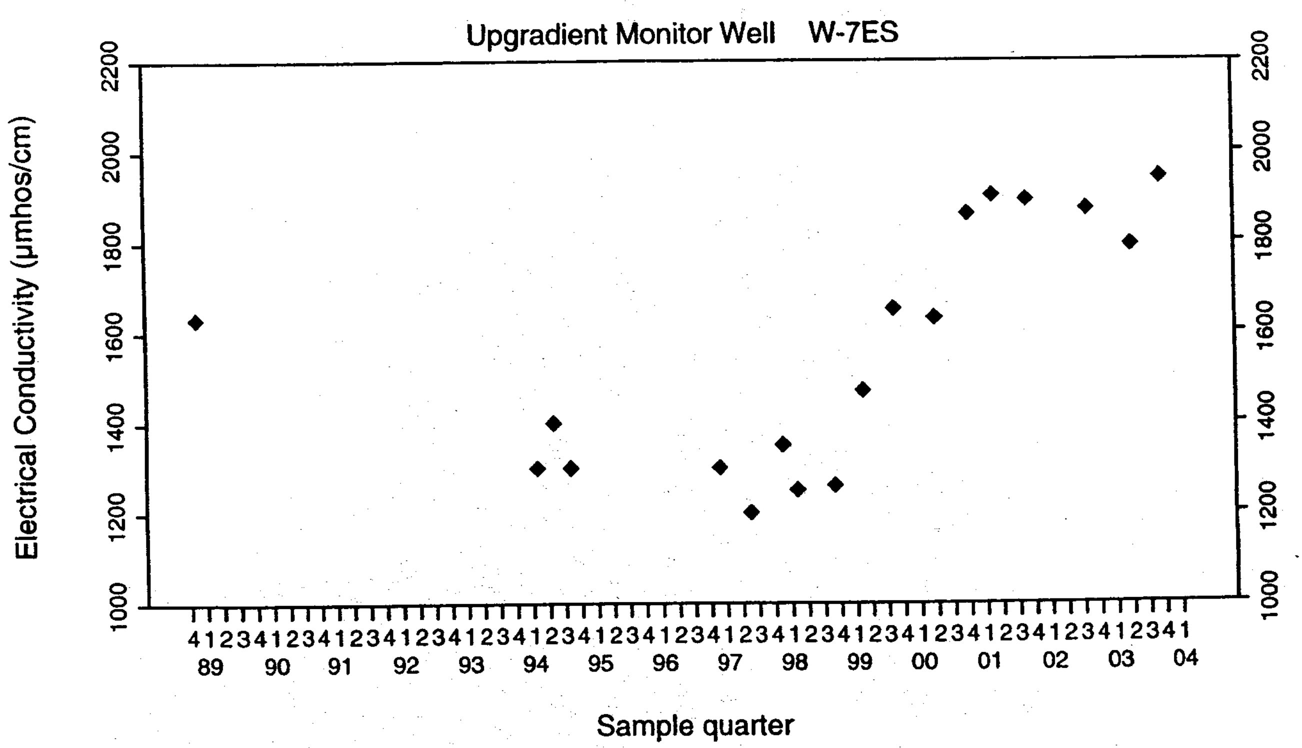
Sewage Ponds Ground Water
pH (Units)



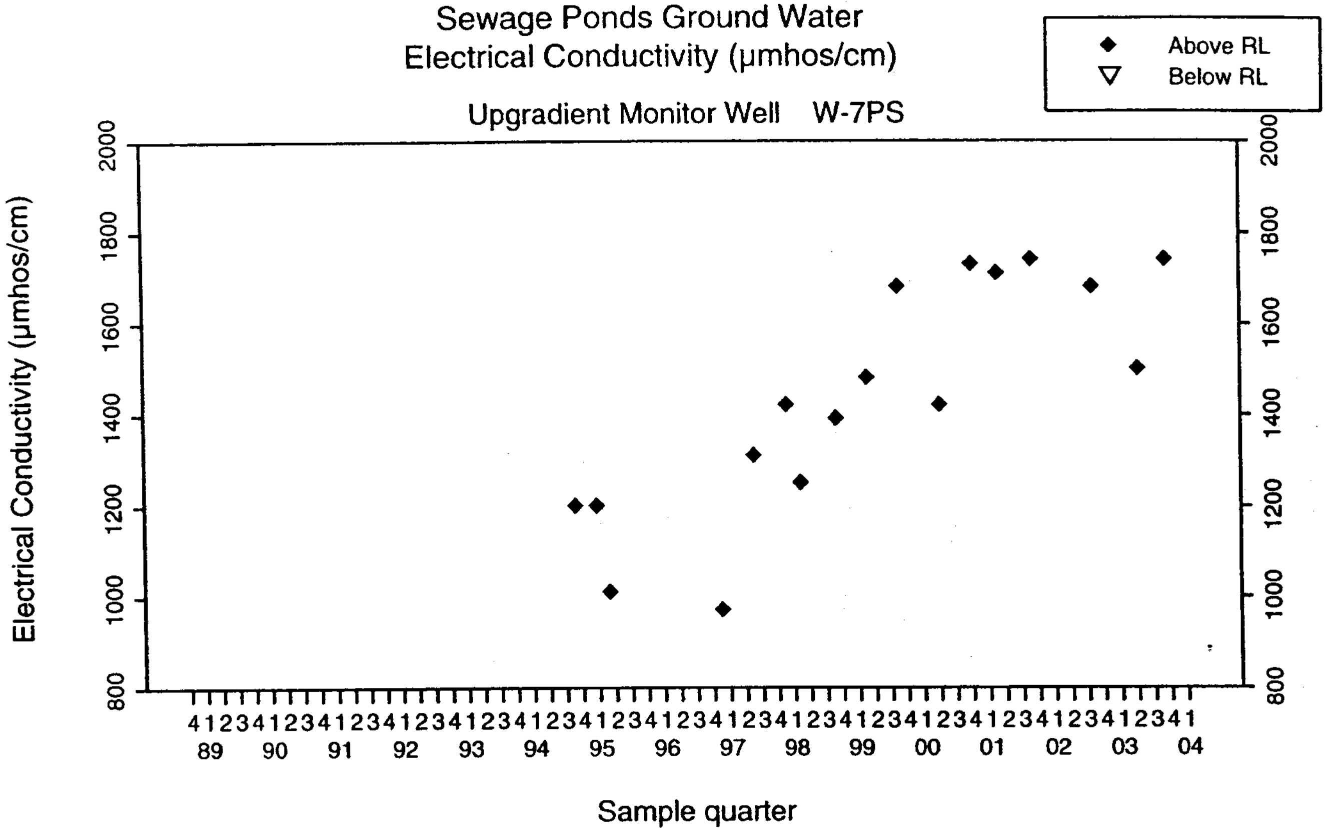


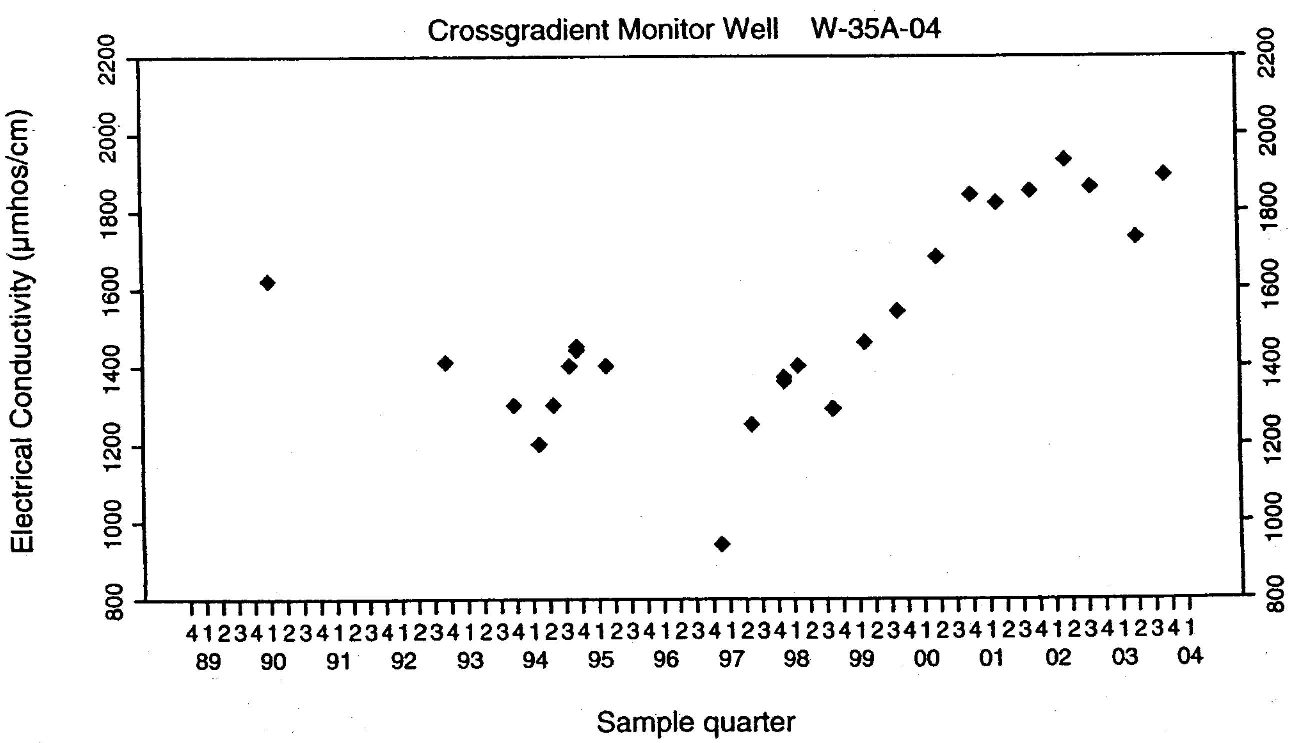

Sewage Ponds Ground Water
pH (Units)
Downgradient Monitor Well W-26R-11
Above RL
Below RL
pH (Units)
9.0
8.5
8.0
7.5
7.0
6.5
4123412341234123412341234123412341234123412341234123412341234123412341
89 90 91 92 93 94 95 96 97 98 99 00 01 02 03 04
Sample quarter


Sewage Ponds Ground Water
Electrical Conductivity (µmhos/cm)
Above RL
Below RL
Upgradient Monitor Well W-7E
Electrical Conductivity (µmhos/cm)
900
1100
1300
1500
1700
412341234123412341234123412341234123412341234123412341234123412341
89 90 91 92 93 94 95 96 97 98 99 00 01 02 03 04
Sample quarter

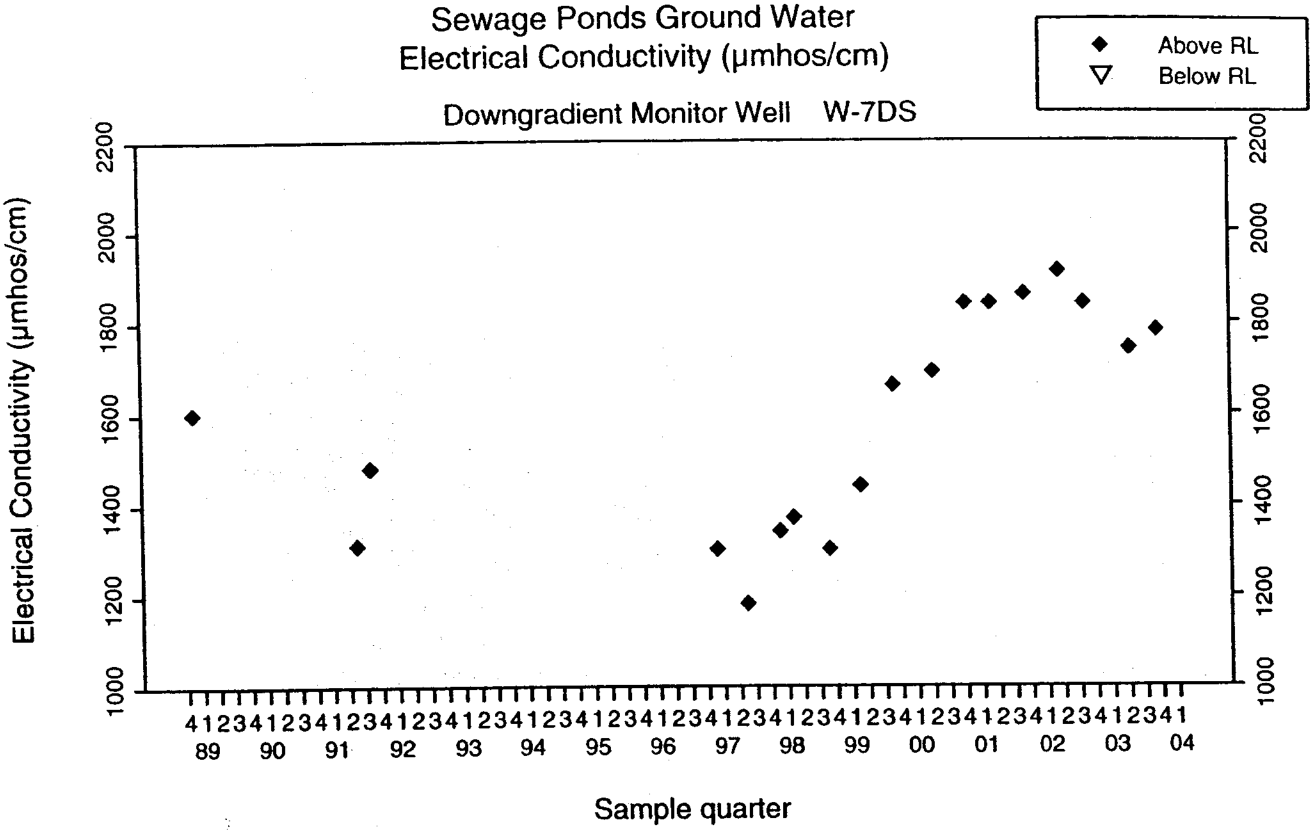

Upgradient Monitor Well W-7ES
Electrical Conductivity (µmhos/cm)
1000
1200
1400
1600
1800
2000
2200
412341234123412341234123412341234123412341234123412341234123412341
89 90 91 92 93 94 95 96 97 98 99 00 01 02 03 04
Sample quarter

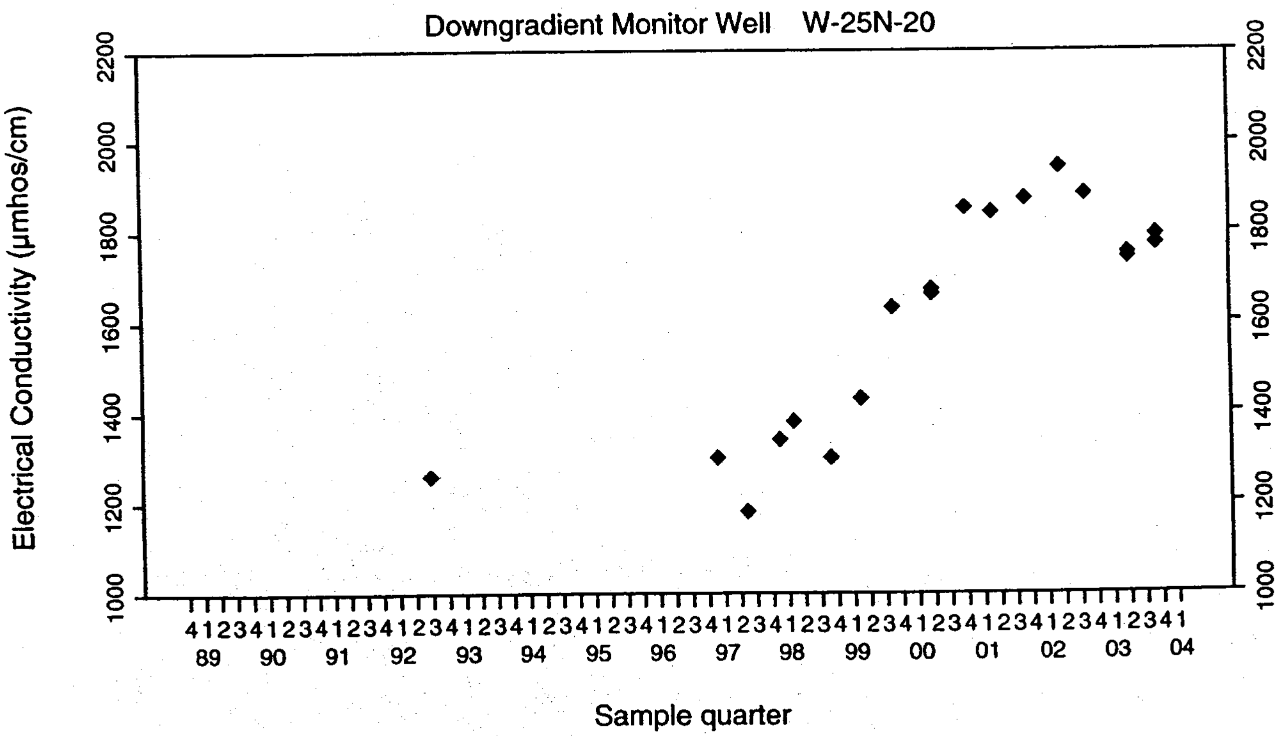
Sewage Ponds Ground Water Electrical Conductivity (µmhos/cm)



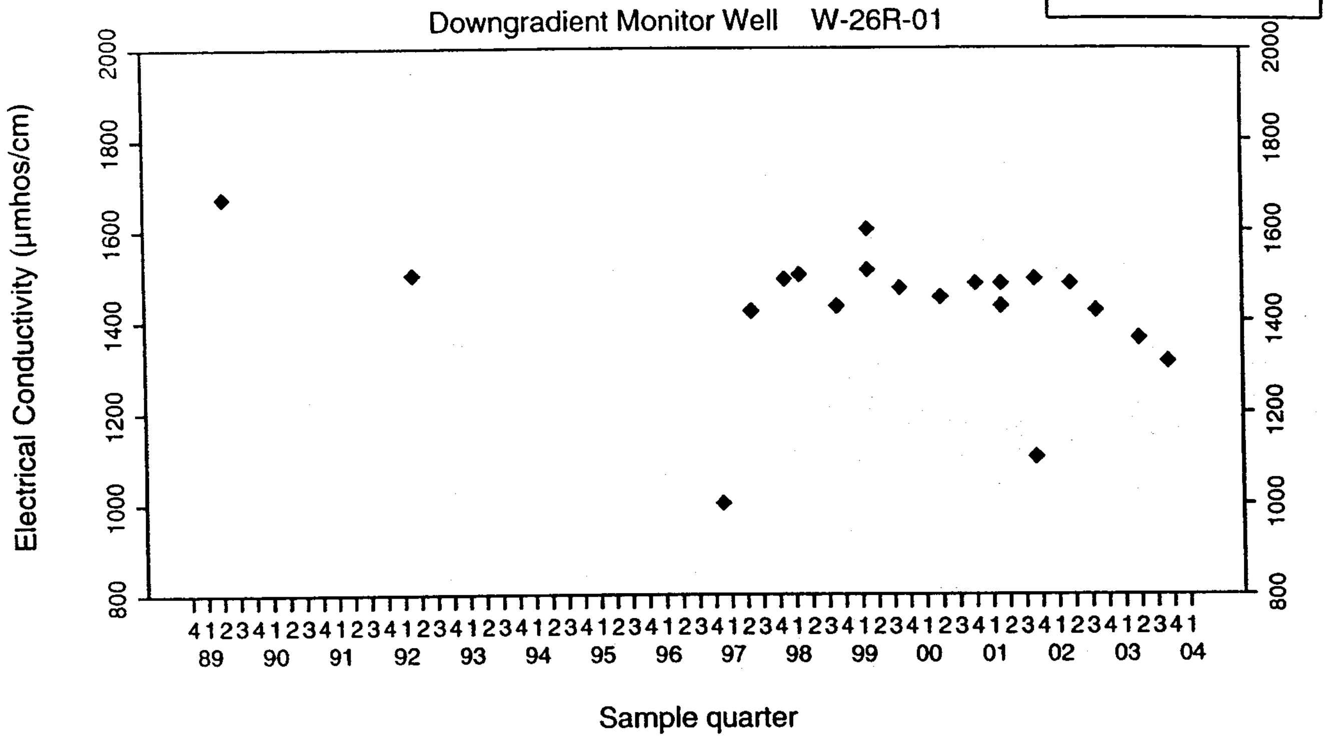


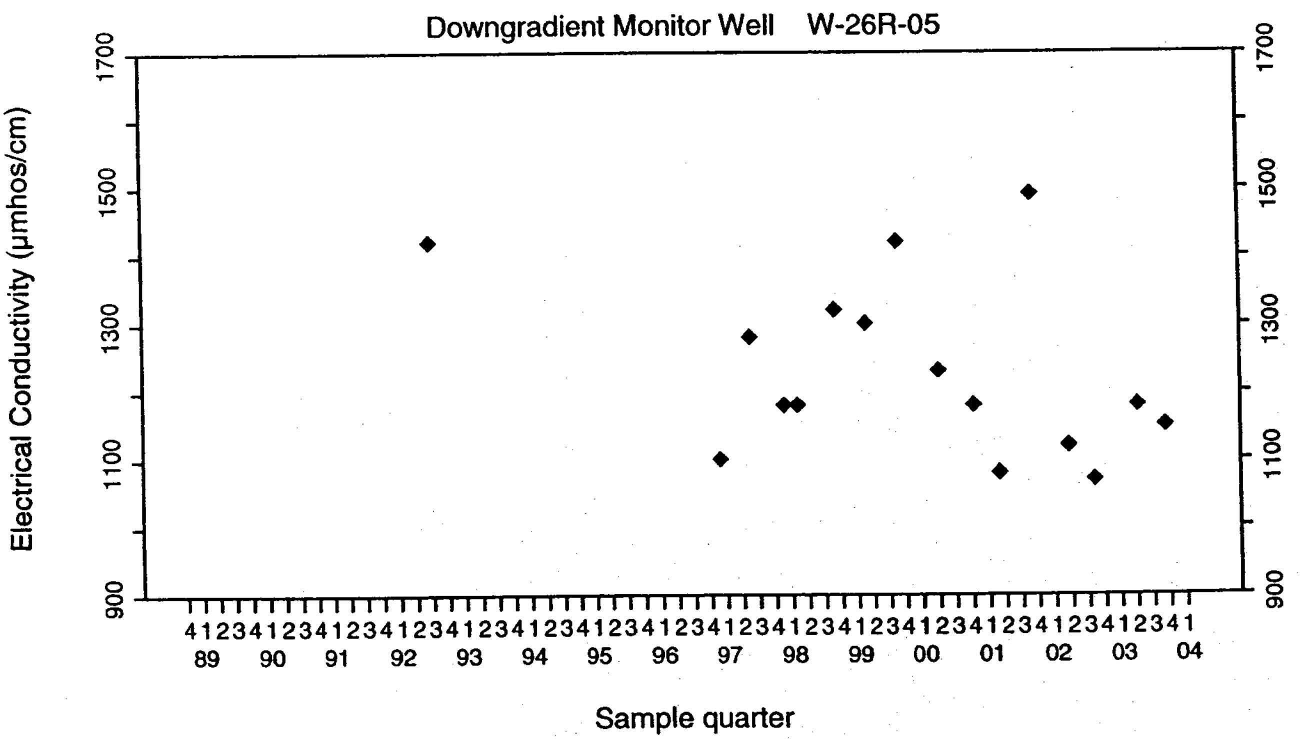
Sewage Ponds Ground Water
Electrical Conductivity (µmhos/cm)

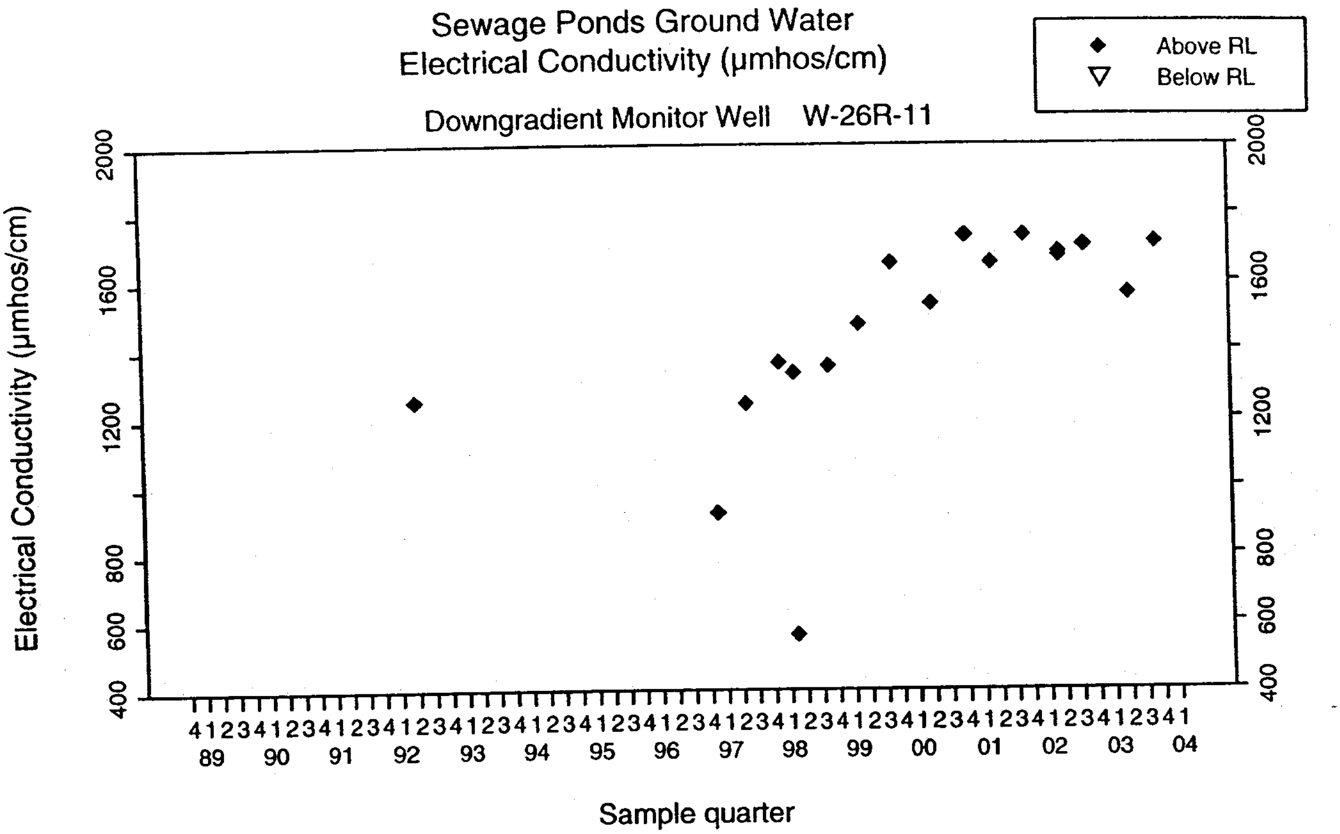


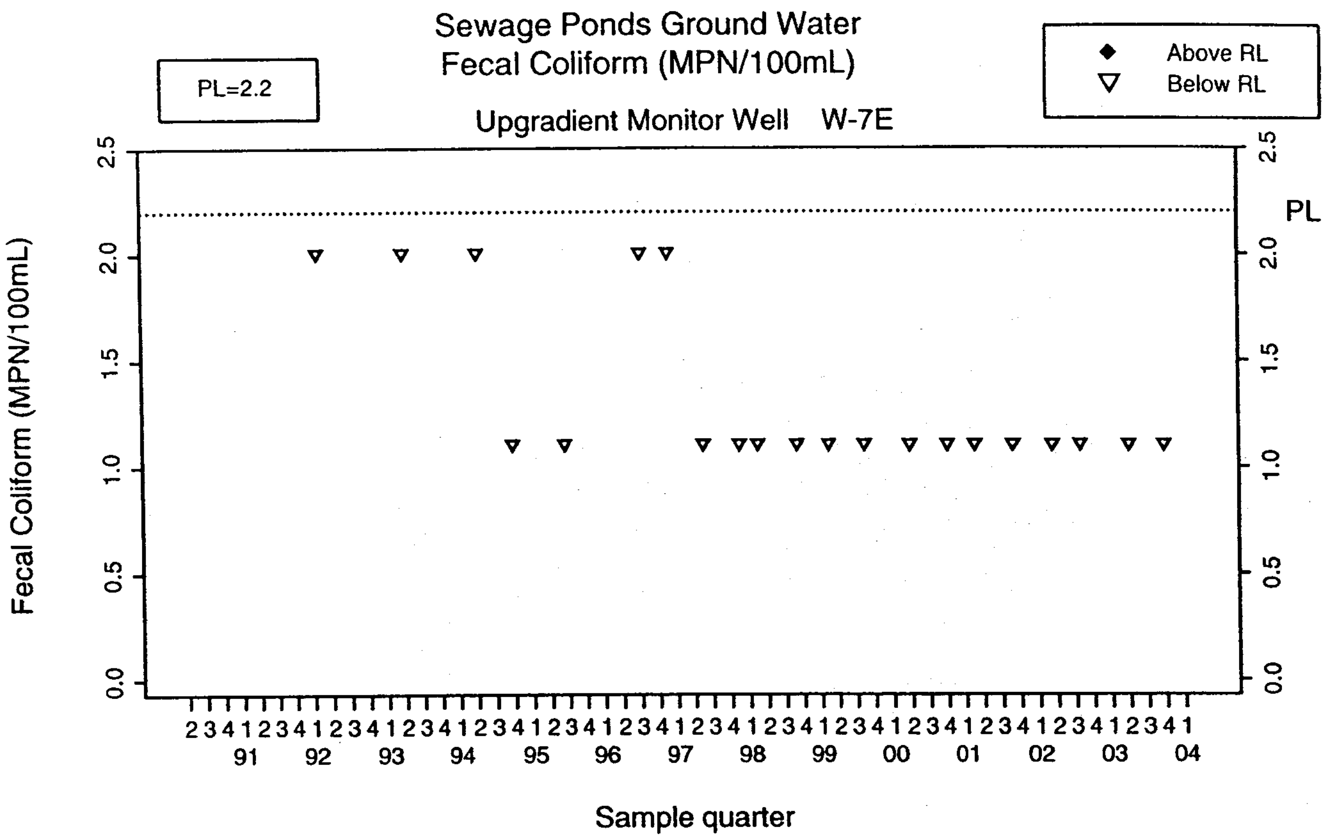


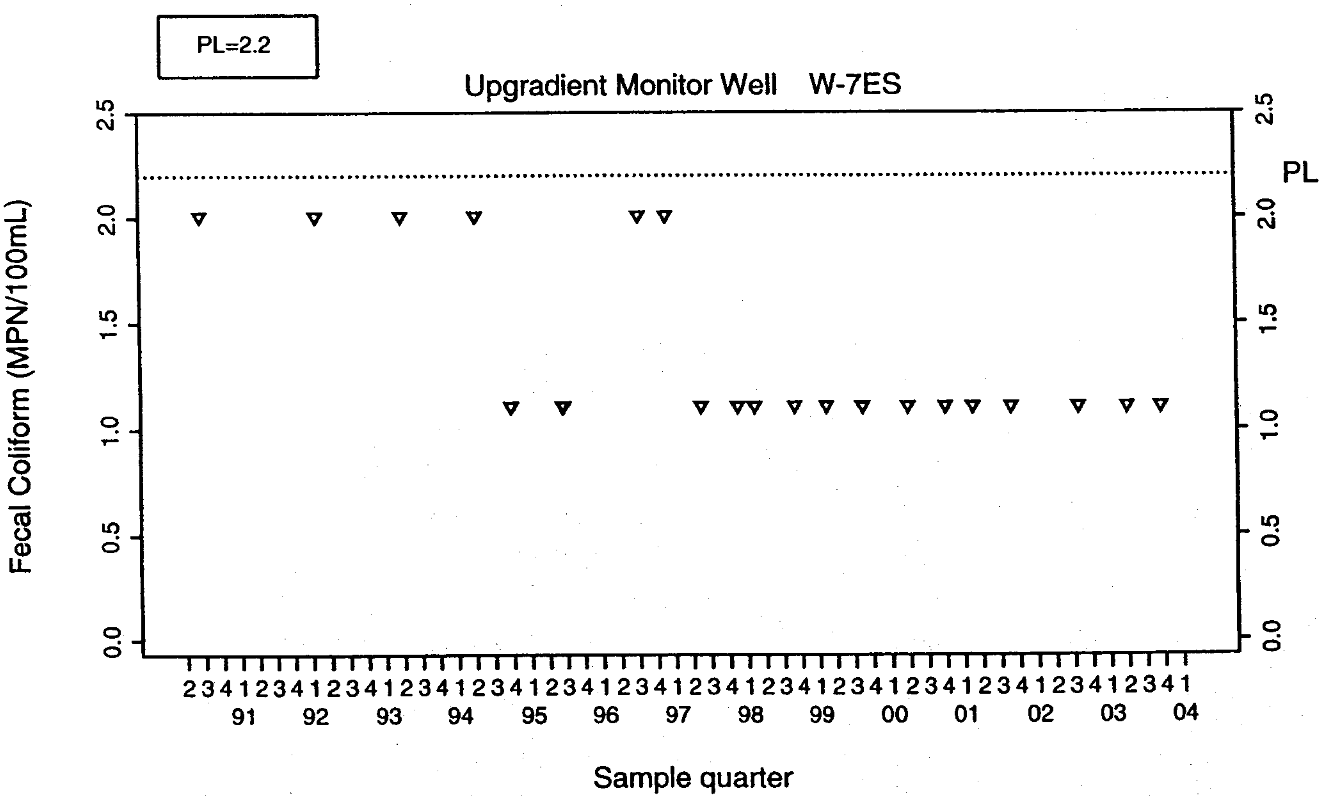
Sewage Ponds Ground Water
Electrical Conductivity (µmhos/cm)

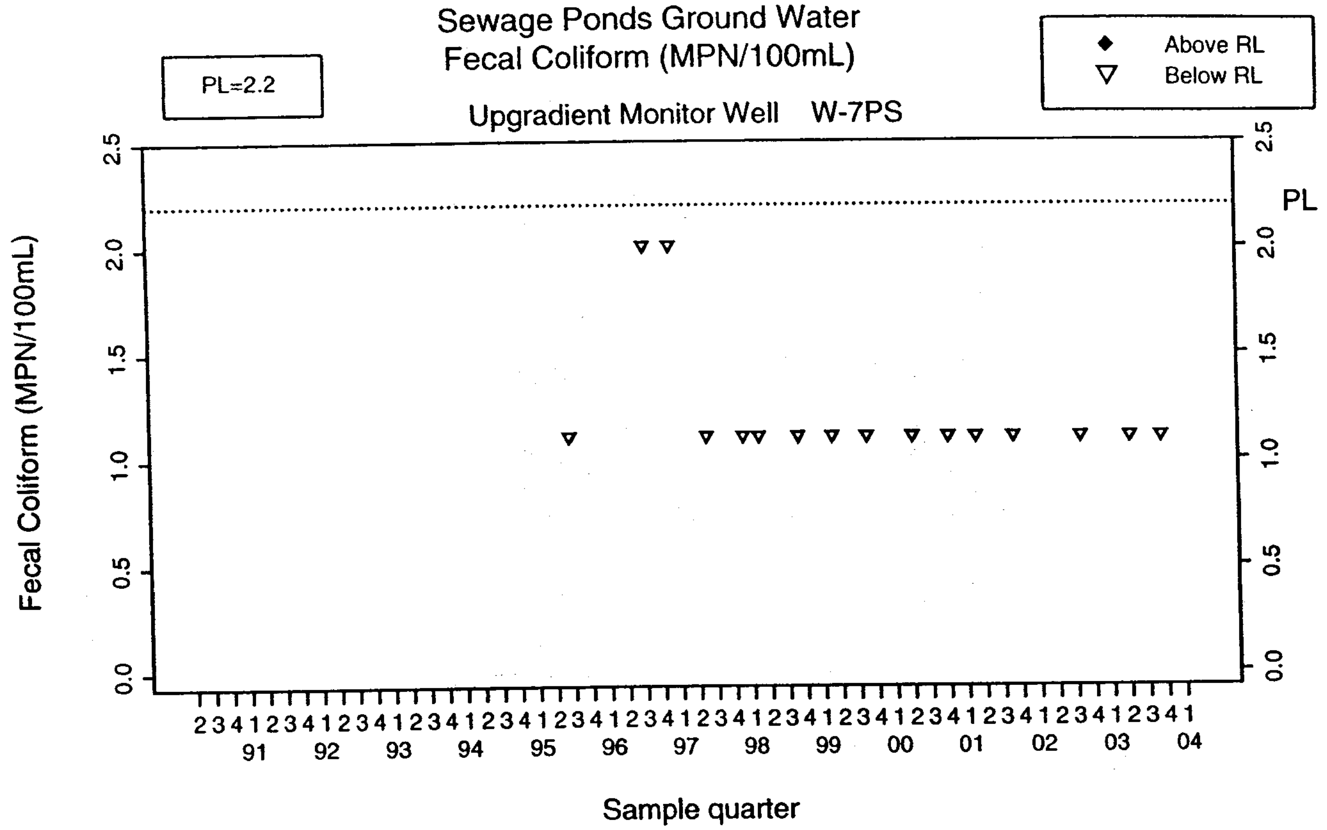


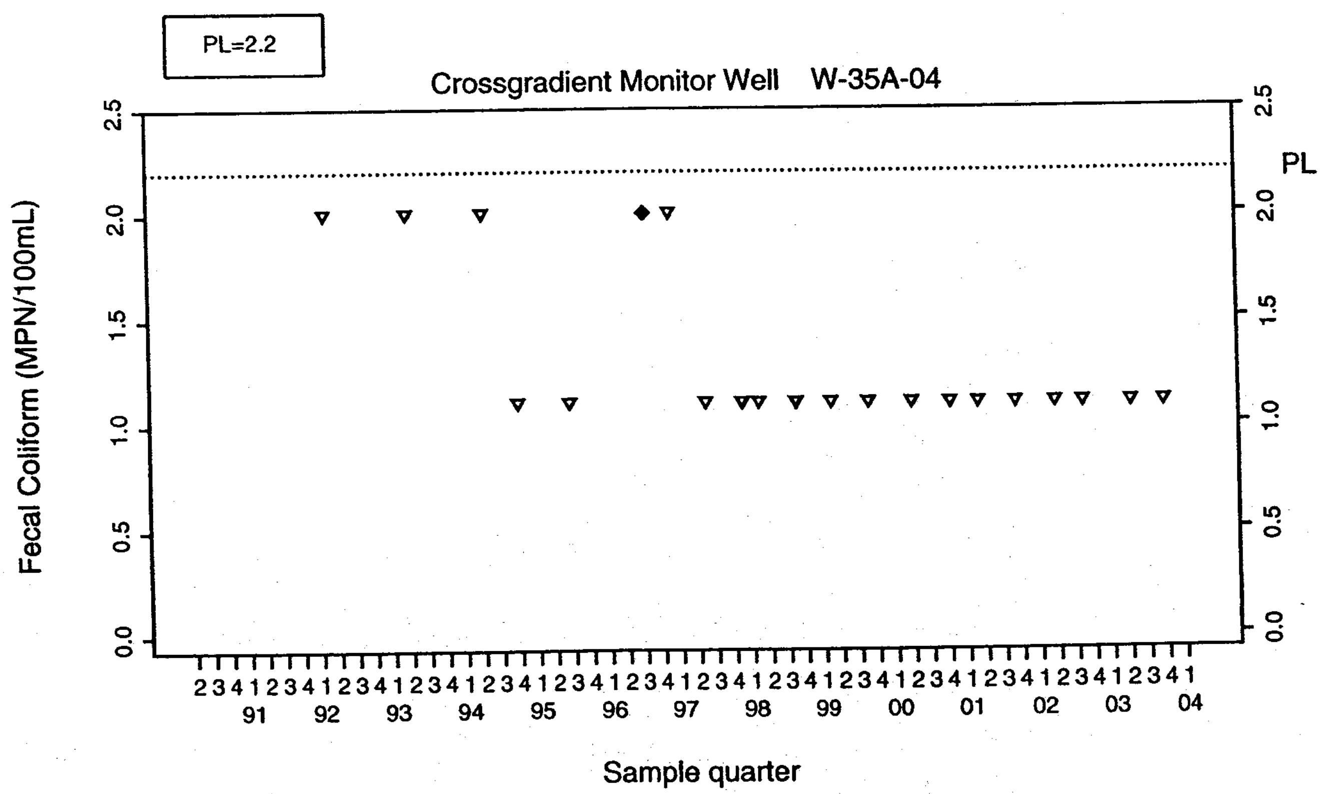


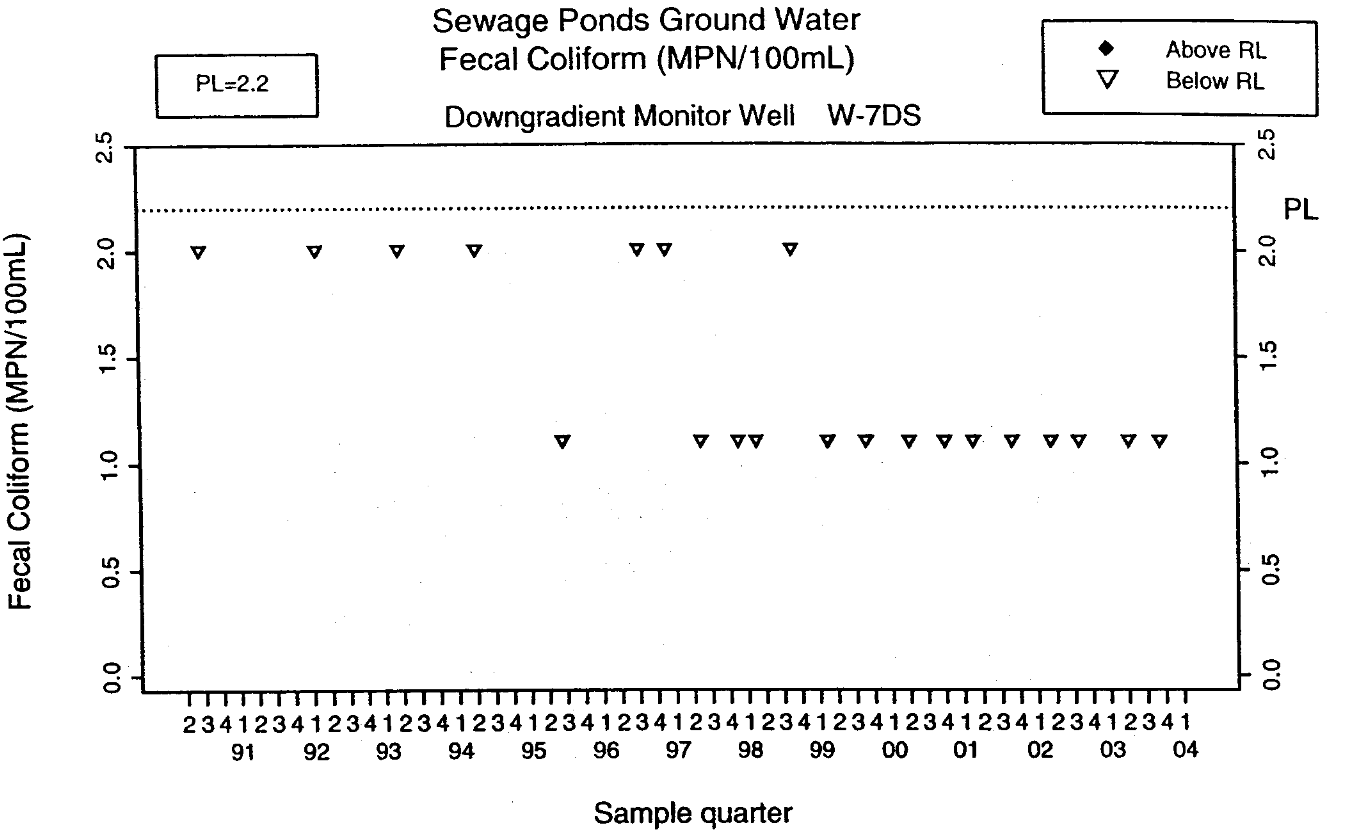

Sewage Ponds Ground Water
Electrical Conductivity (µmhos/cm)
Downgradient Monitor Well W-26R-11
Above RL
Below RL
Electrical Conductivity (µmhos/cm)
2000
1600
1200
800
600
400
41234123412341234123412341234123412341234123412341234123412341
89 90 91 92 93 94 95 96 97 98 99 00 01 02 03 04
Sample quarter

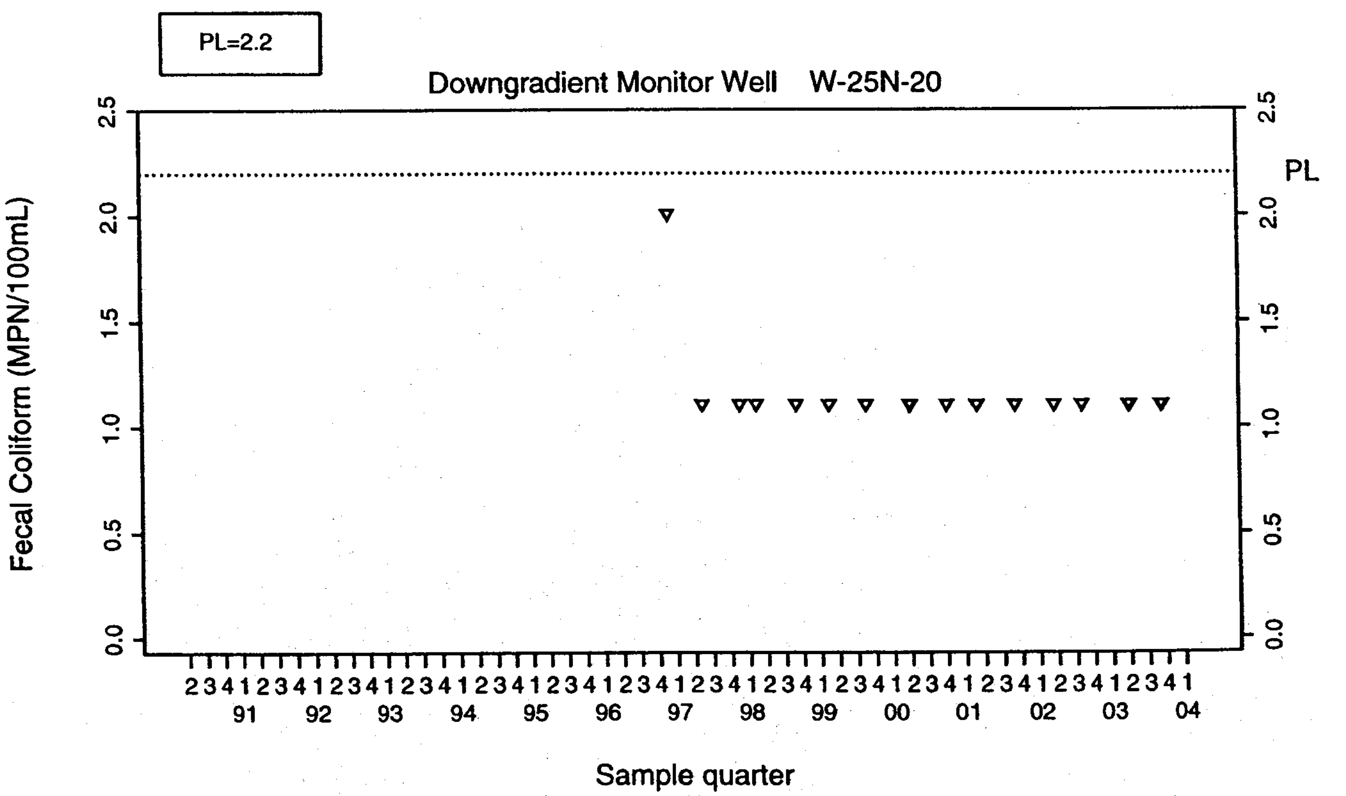

Sewage Ponds Ground Water
Fecal Coliform (MPN/100mL)
PL=2.2
Above RL
Below RL
Upgradient Monitor Well W-7E
PL
Fecal Coliform (MPN/100mL)
0.0
0.5
1.0
1.5
2.0
2.5
2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1
91 92 93 94 95 96 97 98 99 00 01 02 03 04
Sample quarter


PL=2.2
Upgradient Monitor Well W-7ES
PL
Fecal Coliform (MPN/100mL)
0.0
0.5
1.0
1.5
2.0
2.5
2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1
91 92 93 94 95 96 97 98 99 00 01 02 03 04
Sample quarter

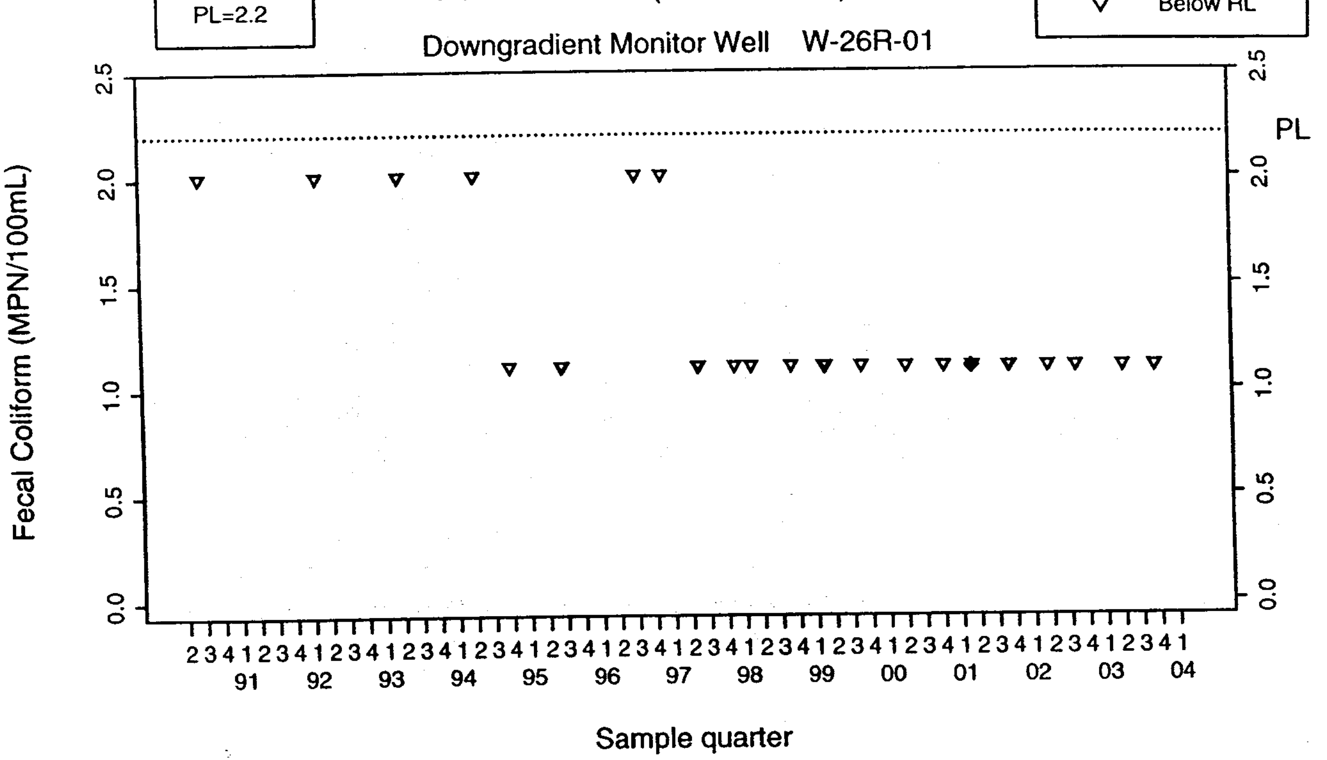

Sewage Ponds Ground Water
Fecal Coliform (MPN/100mL)
PL=2.2
Above RL
Below RL
Upgradient Monitor Well W-7PS
PL
Fecal Coliform (MPN/100mL)
0.0 0.5 1.0 1.5 2.0 2.5
2341234123412341234123412341234123412341234123412341234123412341
91 92 93 94 95 96 97 98 99 00 01 02 03 04
Sample quarter

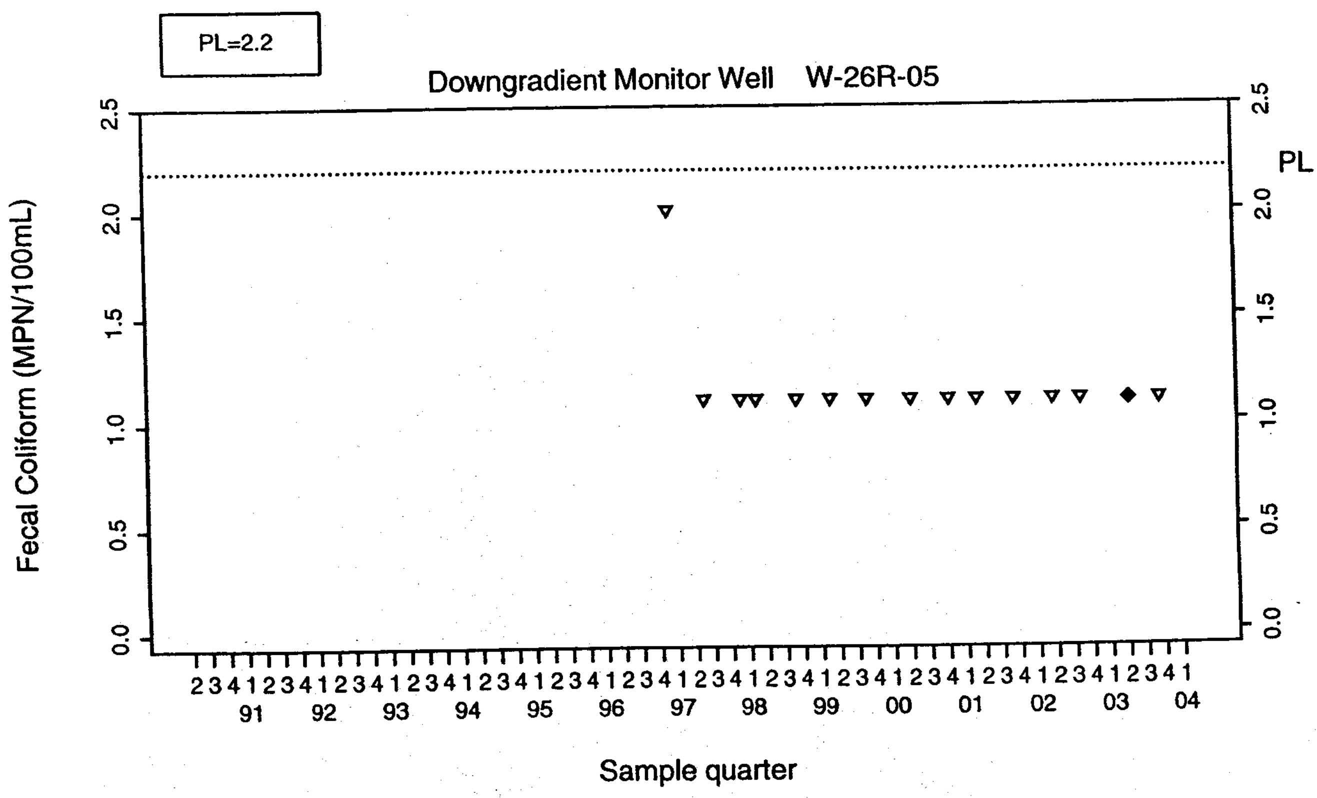

PL=2.2
Crossgradient Monitor Well W-35A-04
PL
Fecal Coliform (MPN/100mL)
0.0 0.5 1.0 1.5 2.0 2.5
2341234123412341234123412341234123412341234123412341234123412341
91 92 93 94 95 96 97 98 99 00 01 02 03 04
Sample quarter

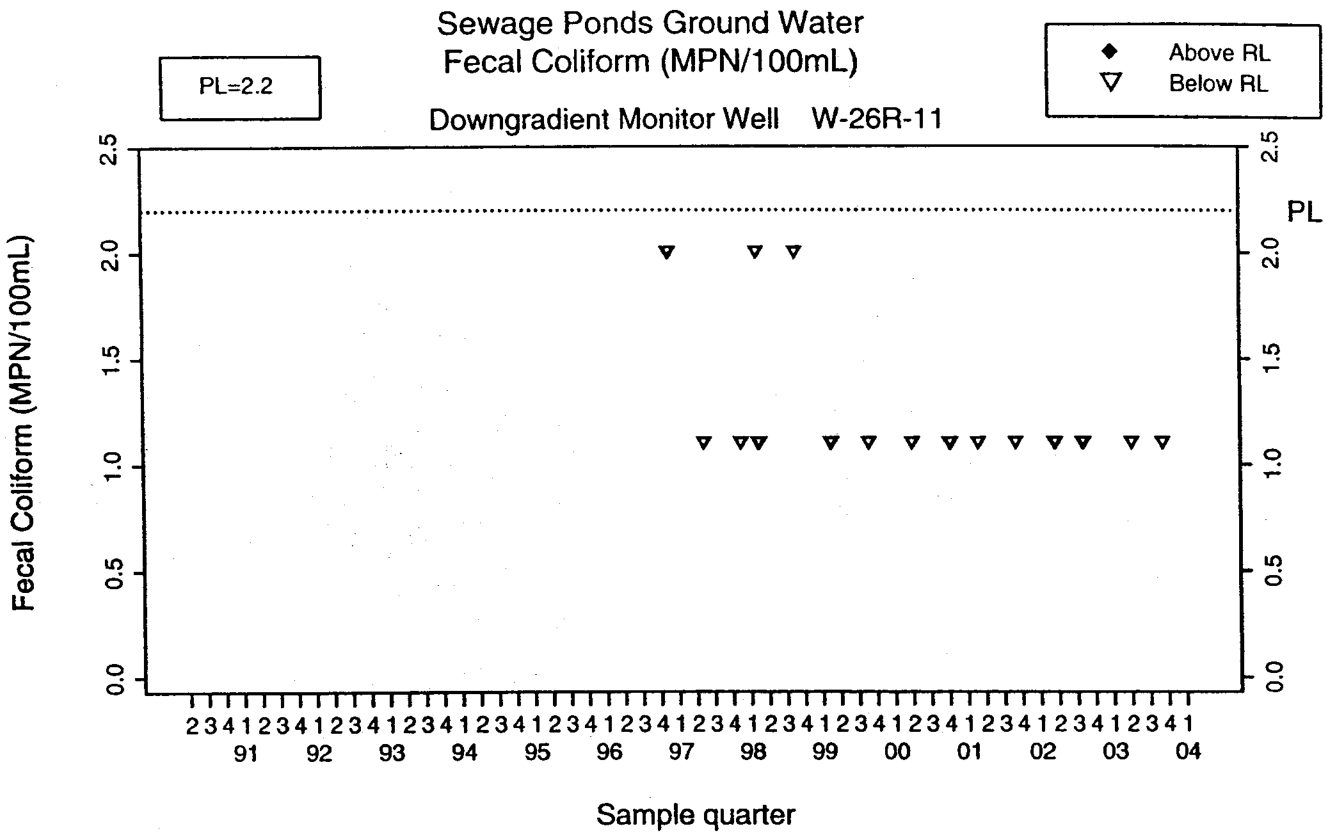

Sewage Ponds Ground Water
Fecal Coliform (MPN/100mL)
PL=2.2
Above RL
Below RL
Downgradient Monitor Well W-7DS
Fecal Coliform (MPN/100mL)
PL
2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1
91 92 93 94 95 96 97 98 99 00 01 02 03 04
Sample quarter

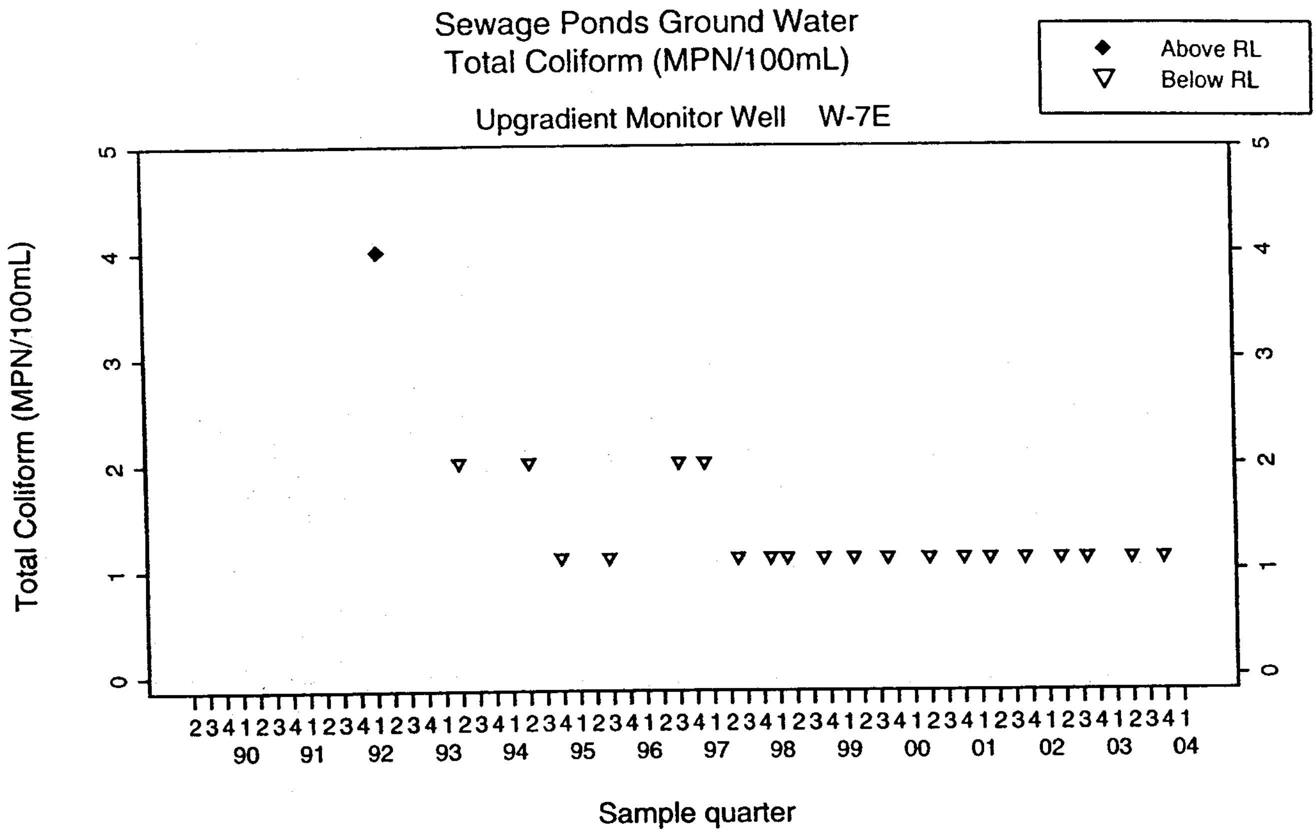

PL=2.2
Downgradient Monitor Well W-25N-20
Fecal Coliform (MPN/100mL)
PL
2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1
91 92 93 94 95 96 97 98 99 00 01 02 03 04
Sample quarter

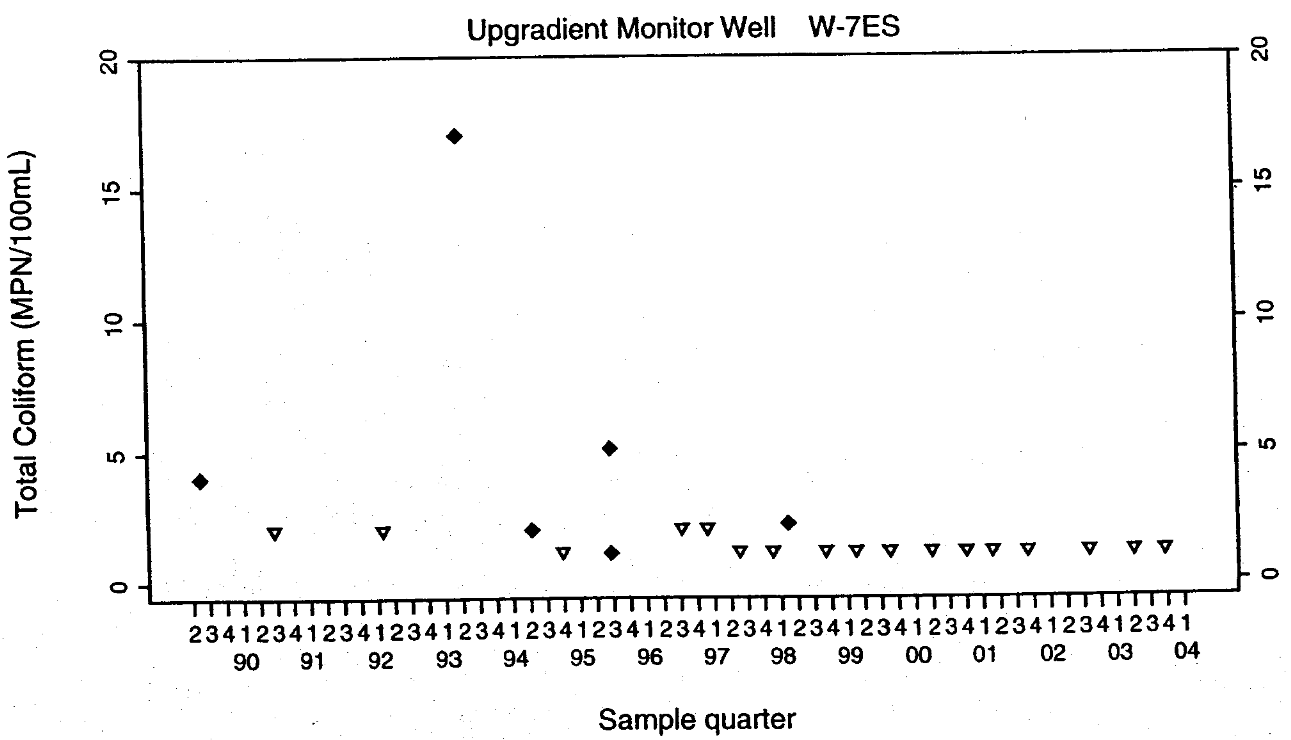
Sewage Ponds Ground Water
Fecal Coliform (MPN/100mL)



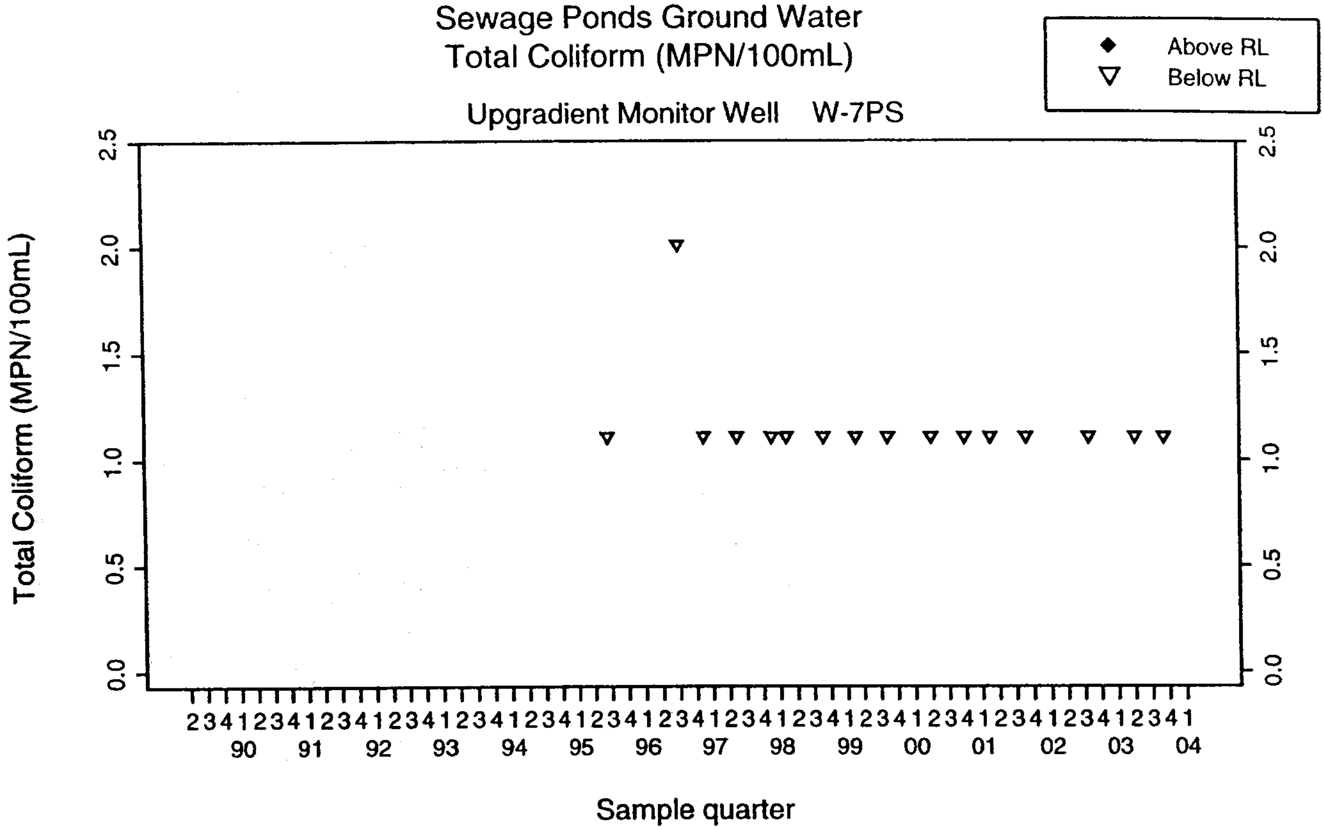


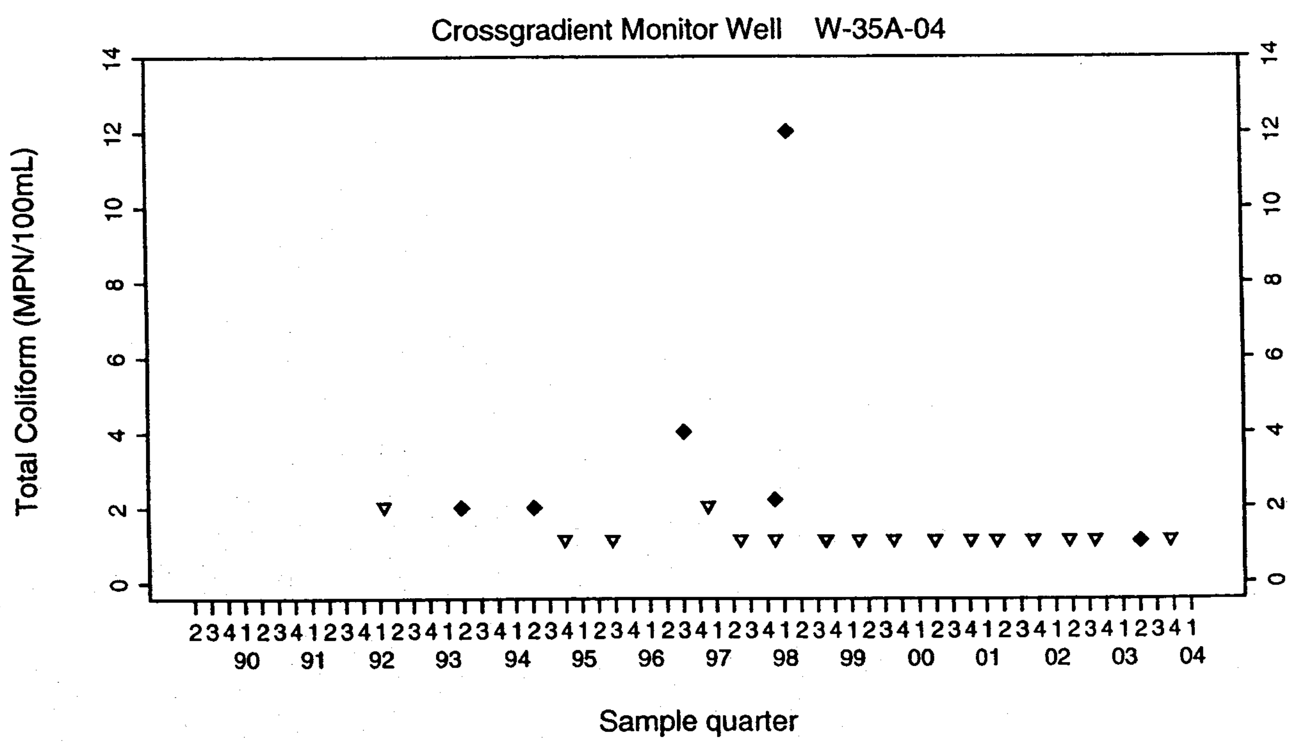

Sewage Ponds Ground Water
Fecal Coliform (MPN/100mL)
Downgradient Monitor Well W-26R-11
PL=2.2
Above RL
Below RL
PL
Fecal Coliform (MPN/100mL)
0.0
0.5
1.0
1.5
2.0
2.5
2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1
91 92 93 94 95 96 97 98 99 00 01 02 03 04
Sample quarter


Sewage Ponds Ground Water
Total Coliform (MPN/100mL)
Above RL
Below RL
Upgradient Monitor Well W-7E
Total Coliform (MPN/100mL)
0
1
2
3
4
5
2341234123412341234123412341234123412341234123412341234123412341
90 91 92 93 94 95 96 97 98 99 00 01 02 03 04
Sample quarter

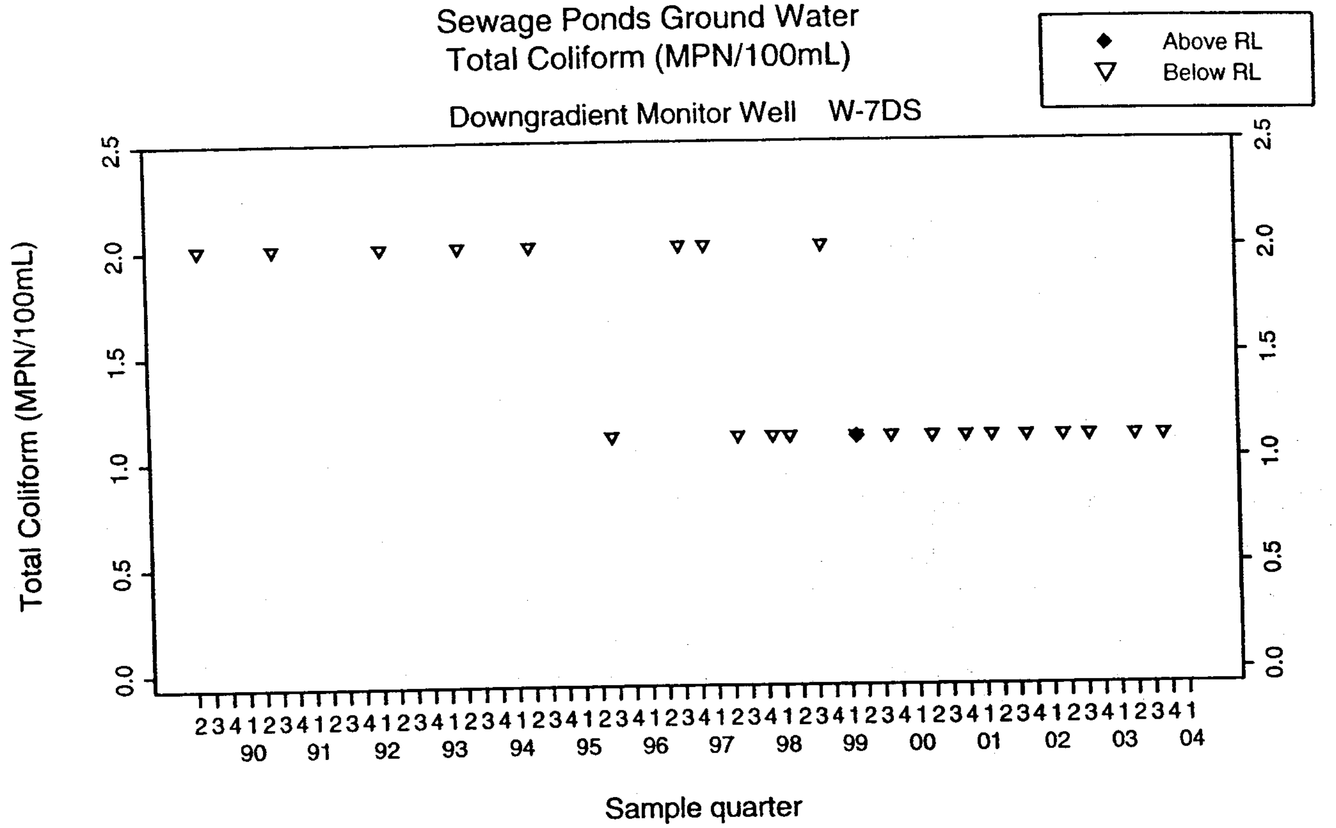

Upgradient Monitor Well W-7ES
Total Coliform (MPN/100mL)
0
5
10
15
20
2341234123412341234123412341234123412341234123412341234123412341
90 91 92 93 94 95 96 97 98 99 00 01 02 03 04
Sample quarter

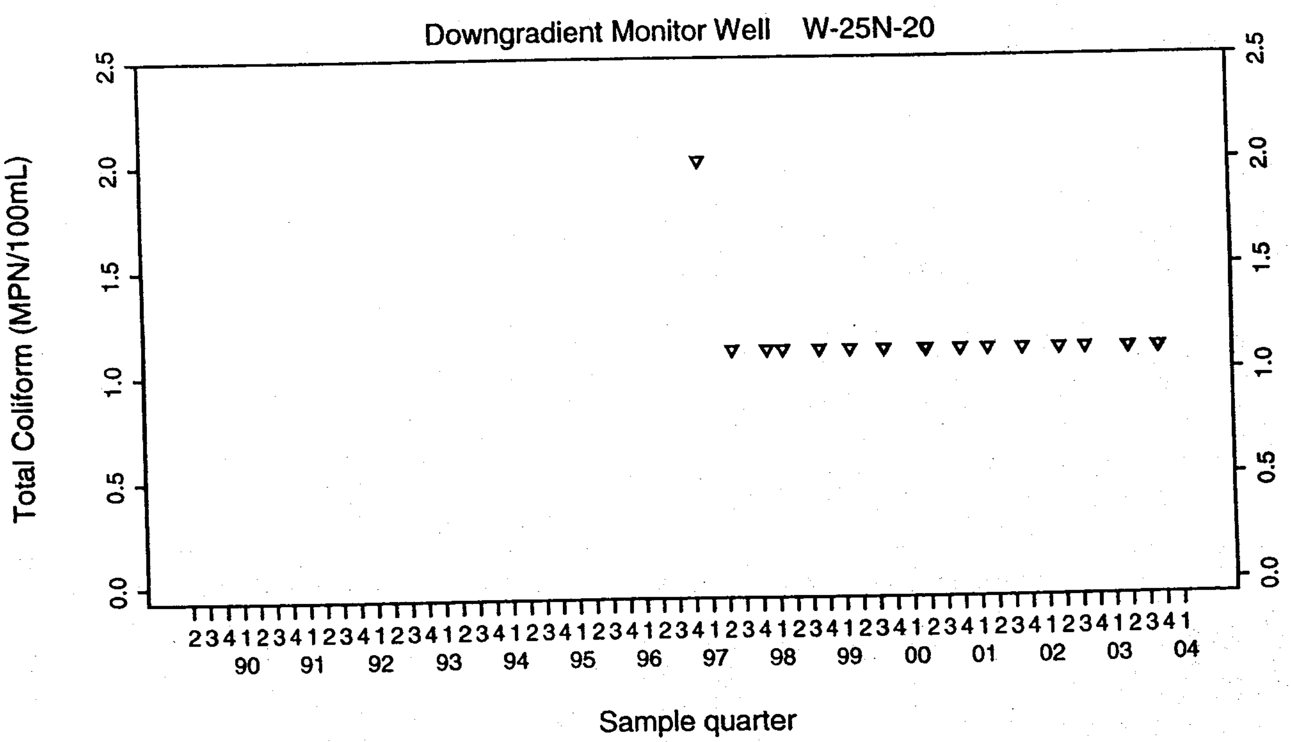
Sewage Ponds Ground Water
Total Coliform (MPN/100mL)

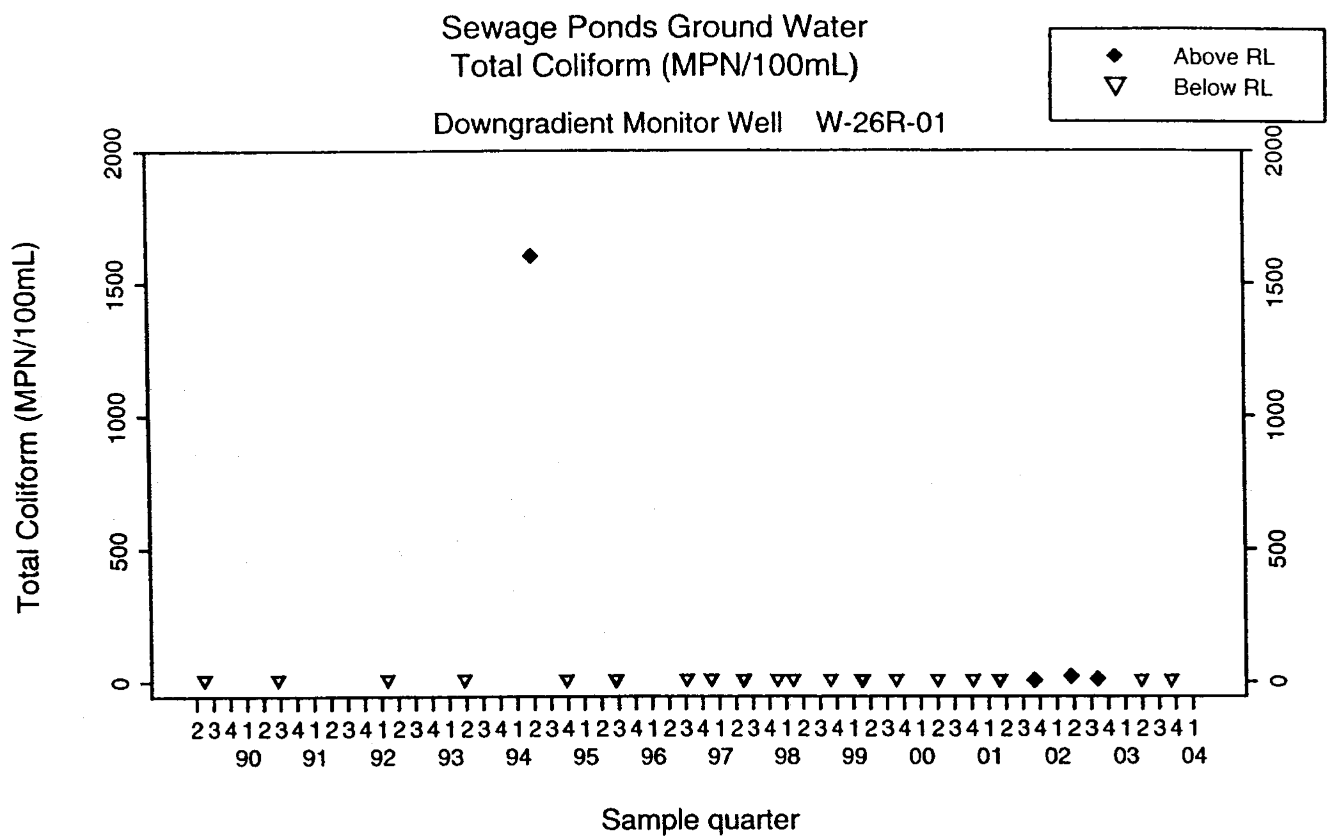


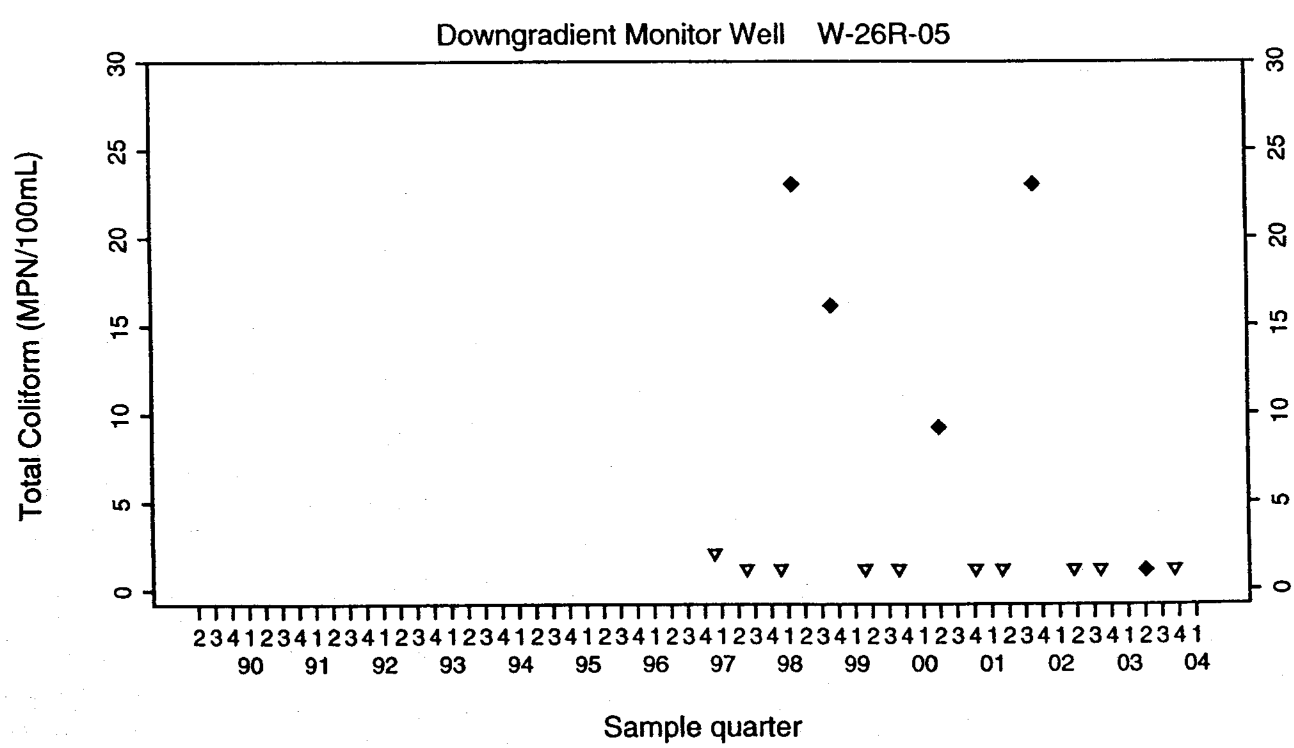


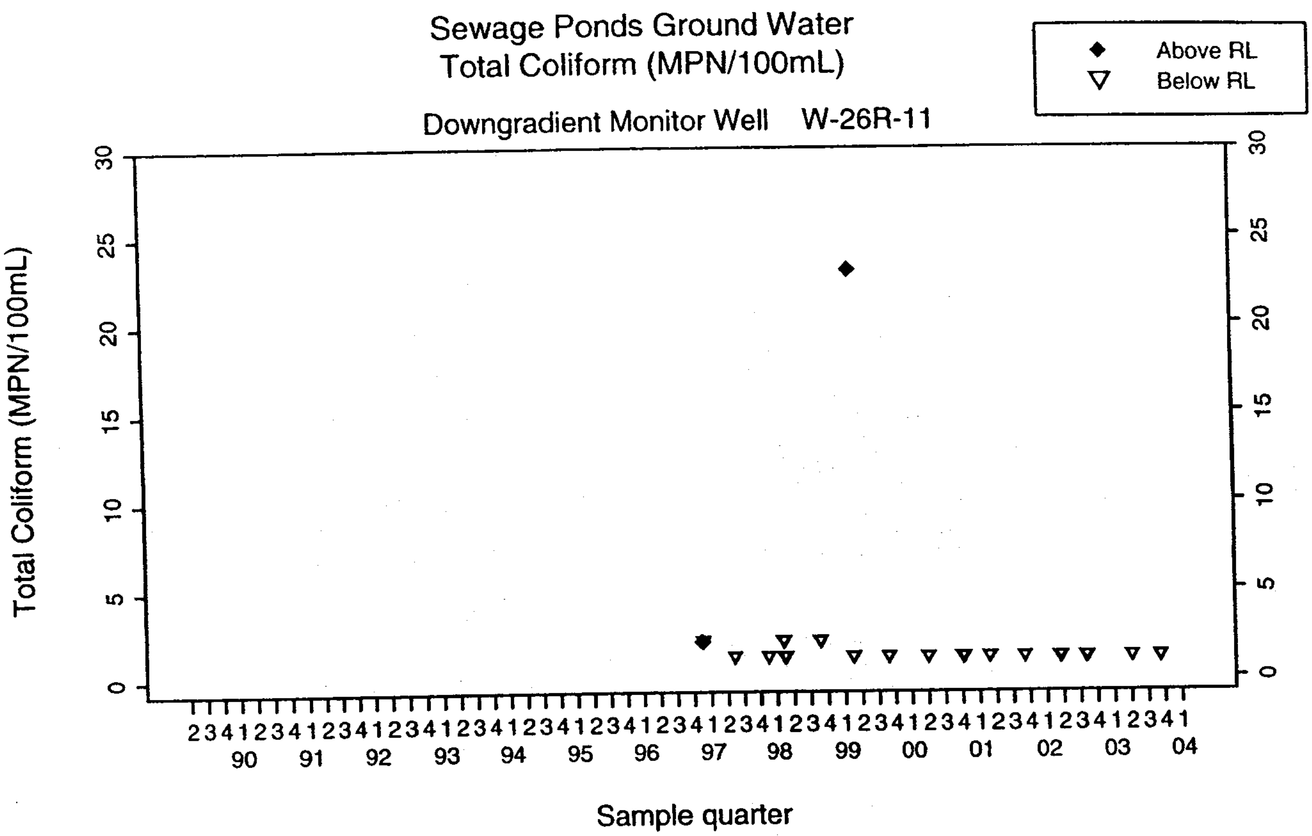
Sewage Ponds Ground Water
Total Coliform (MPN/100mL)





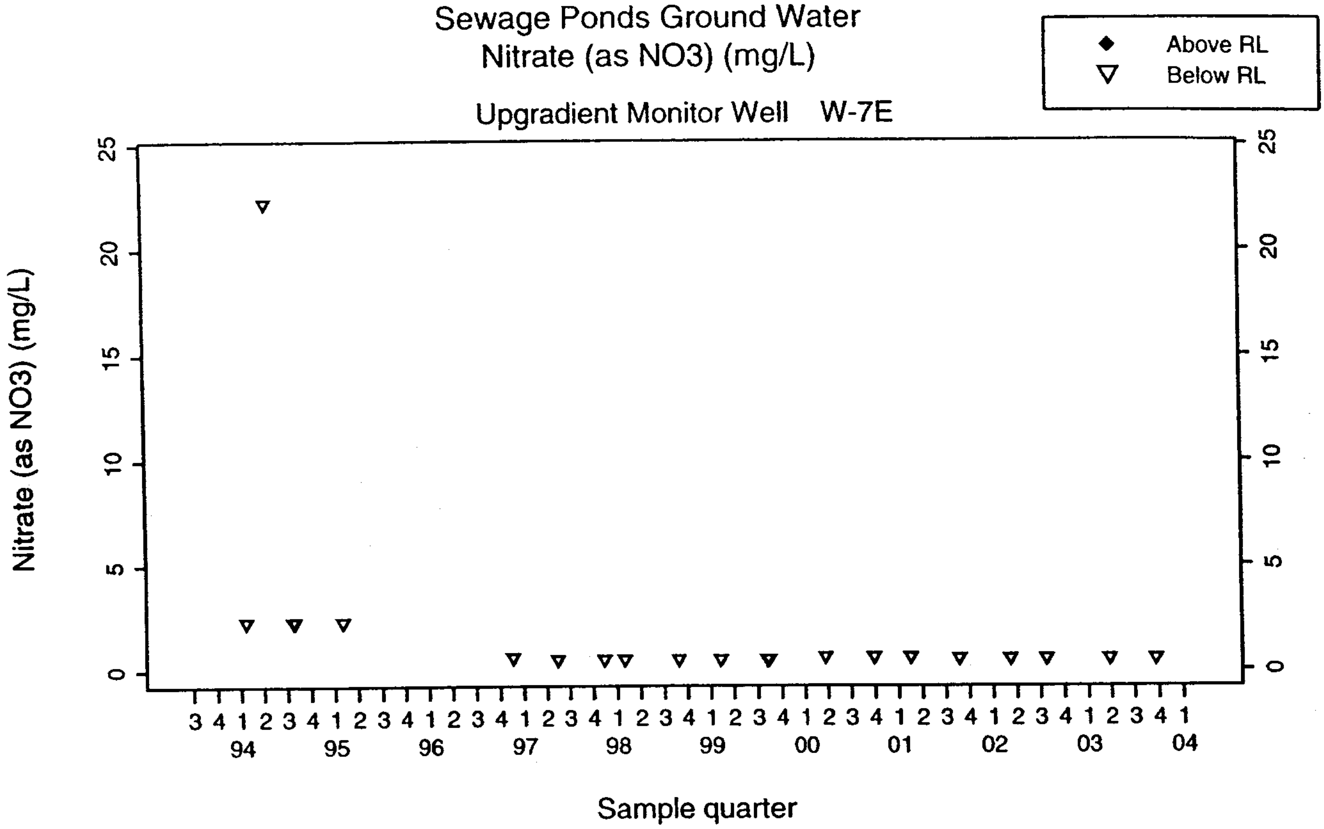

Sewage Ponds Ground Water
Total Coliform (MPN/100mL)
Above RL
Below RL
Downgradient Monitor Well W-26R-01
Total Coliform (MPN/100mL)
0
500
1000
1500
2000
2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1
90 91 92 93 94 95 96 97 98 99 00 01 02 03 04
Sample quarter


Downgradient Monitor Well W-26R-05
Total Coliform (MPN/100mL)
0
5
10
15
20
25
30
2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1
90 91 92 93 94 95 96 97 98 99 00 01 02 03 04
Sample quarter

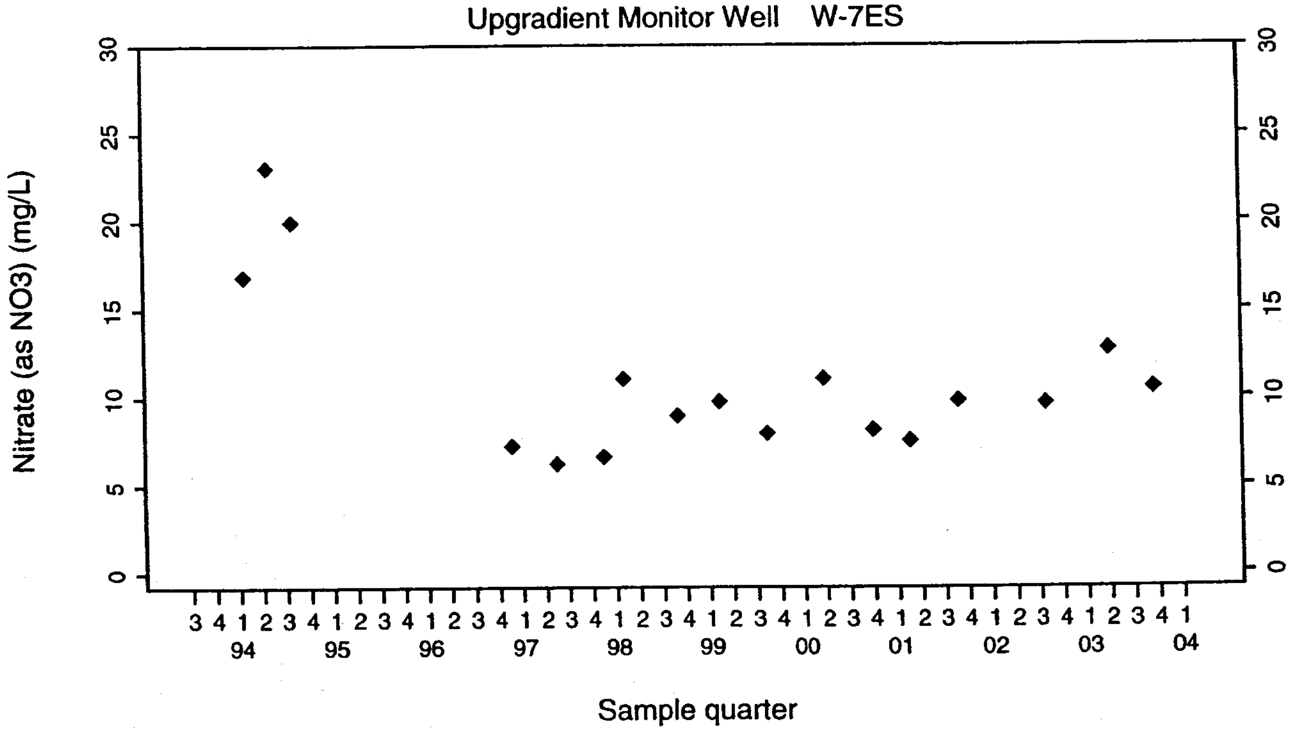

Sewage Ponds Ground Water
Total Coliform (MPN/100mL)
Above RL
Below RL
Downgradient Monitor Well W-26R-11
Total Coliform (MPN/100mL)
0
5
10
15
20
25
30
2341234123412341234123412341234123412341234123412341234123412341
90 91 92 93 94 95 96 97 98 99 00 01 02 03 04
Sample quarter

Sewage Ponds Ground Water
Nitrate (as NO3) (mg/L)

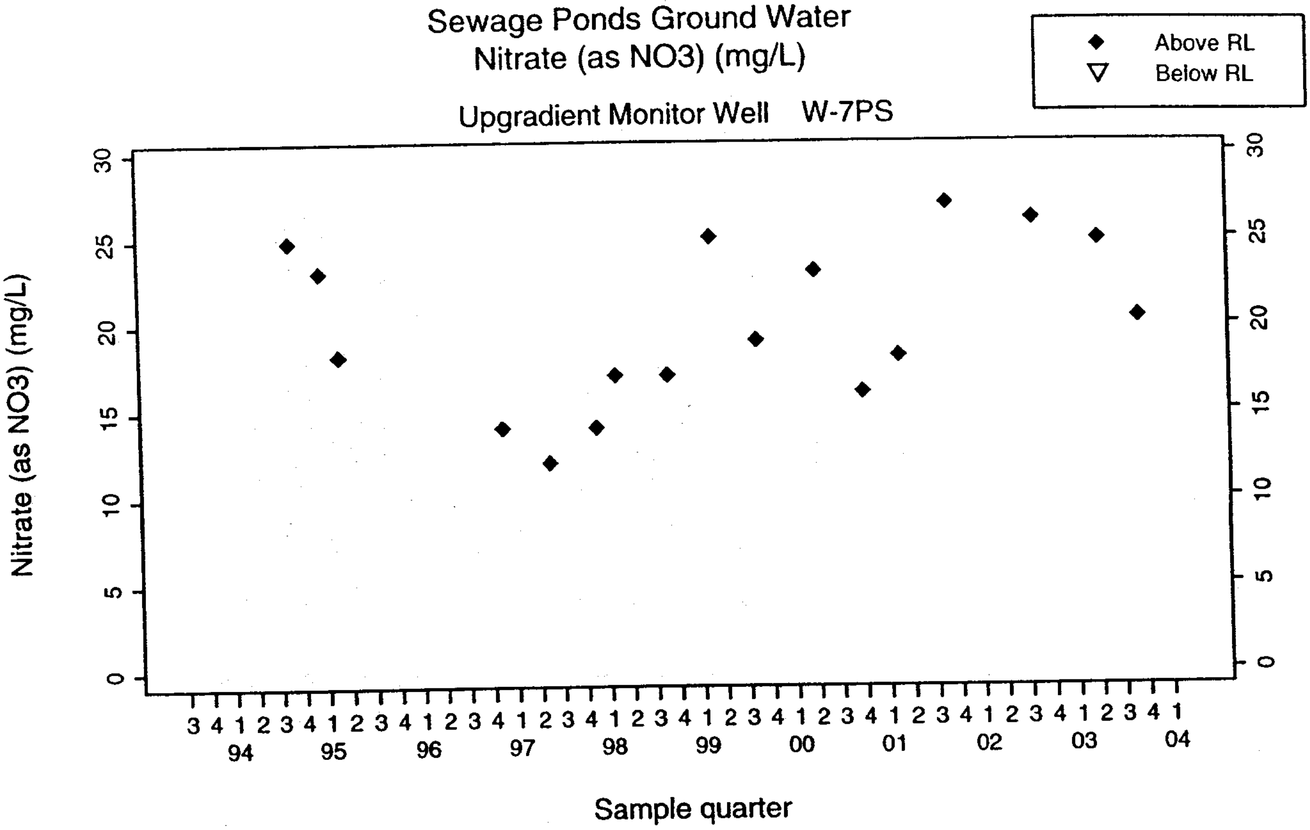
Upgradient Monitor Well W-7E

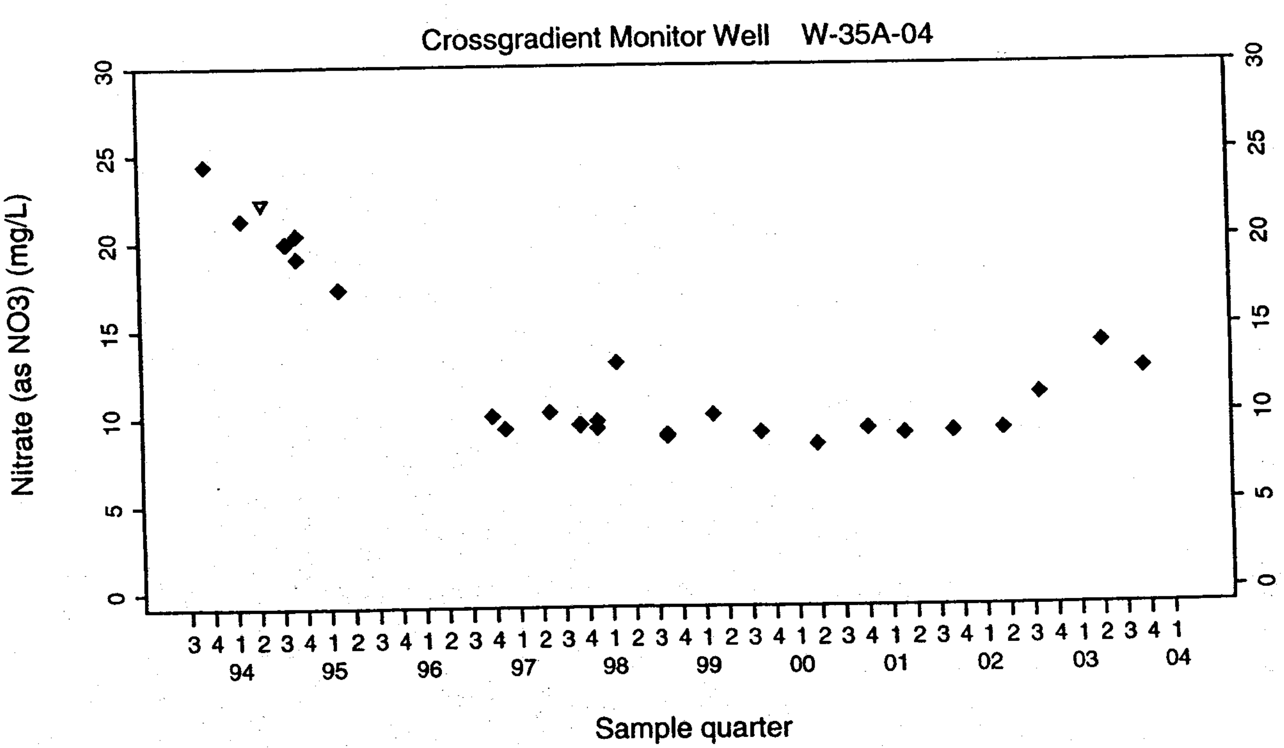


Upgradient Monitor Well W-7ES



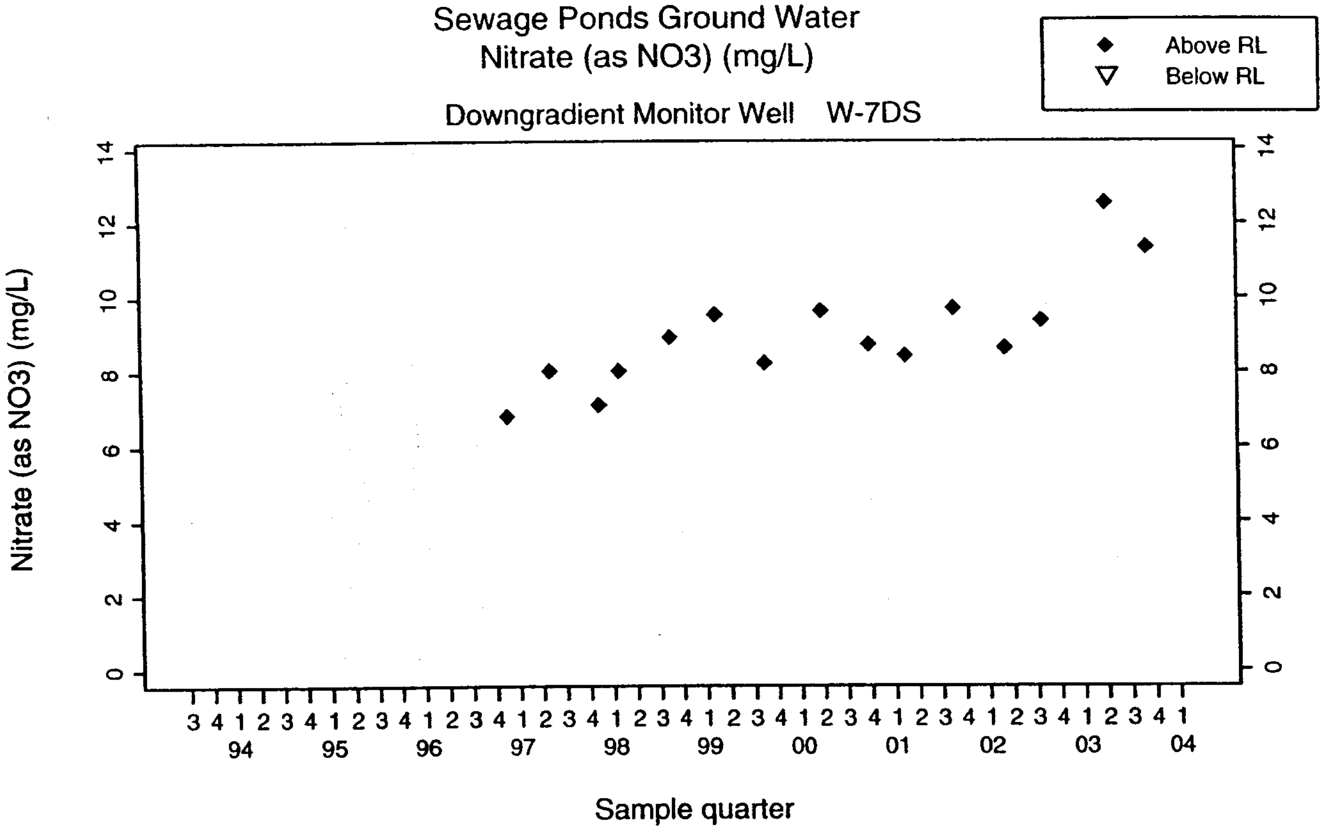
Sewage Ponds Ground Water
Nitrate (as NO3) (mg/L)



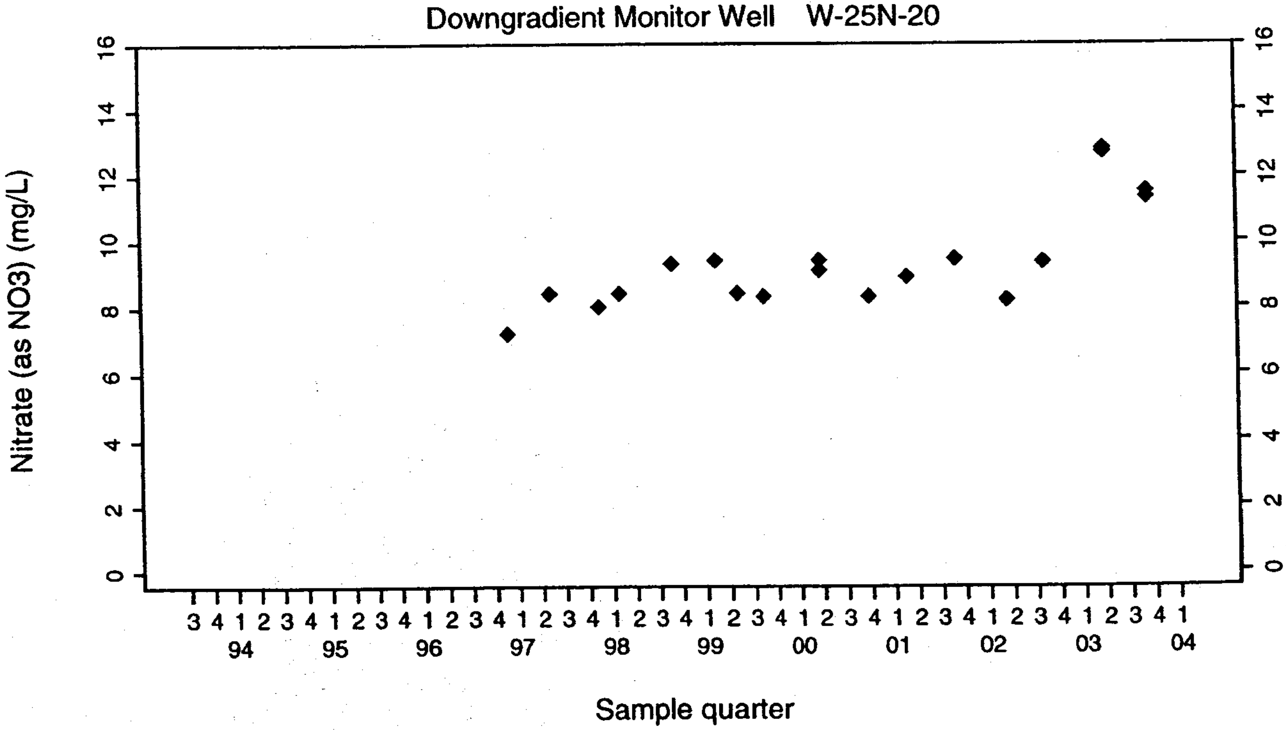


Sewage Ponds Ground Water
Nitrate (as NO3) (mg/L)

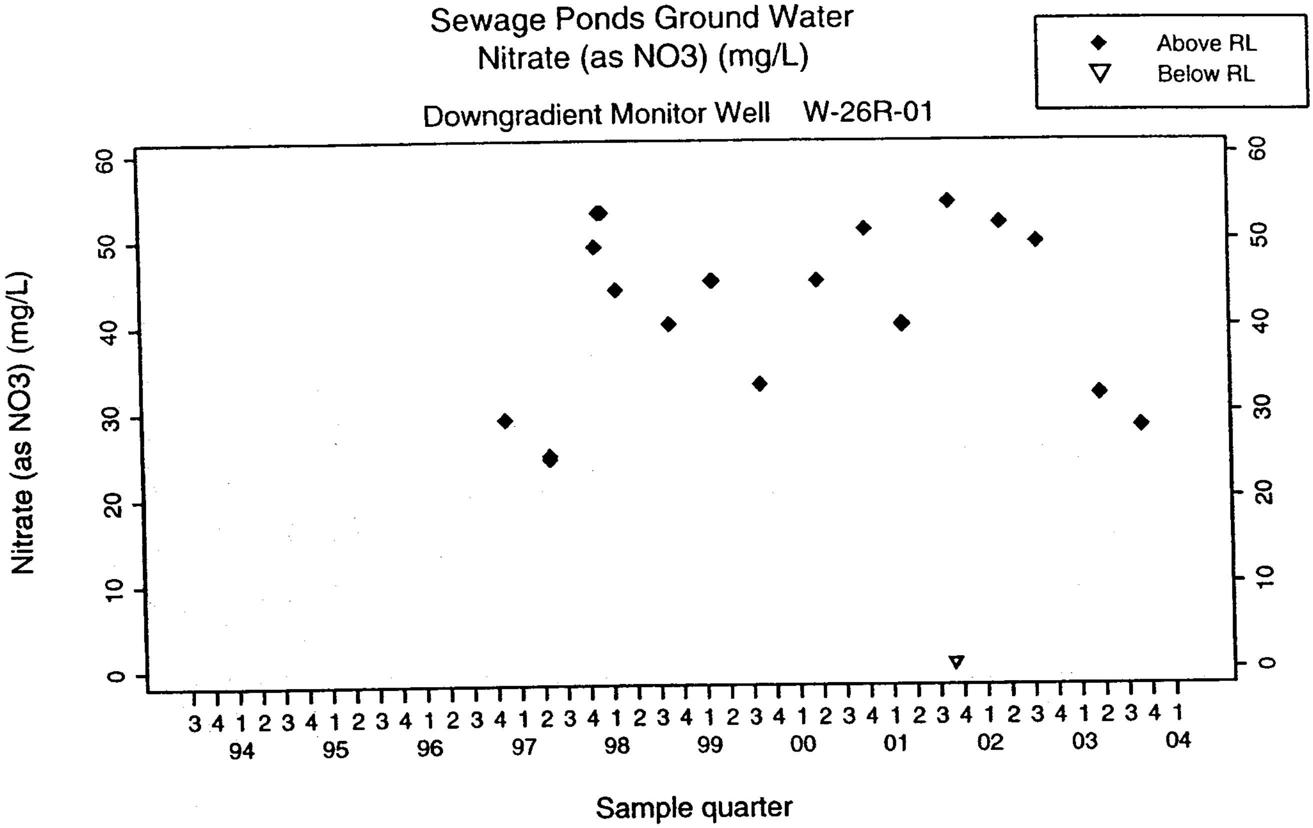
Downgradient Monitor Well W-7DS

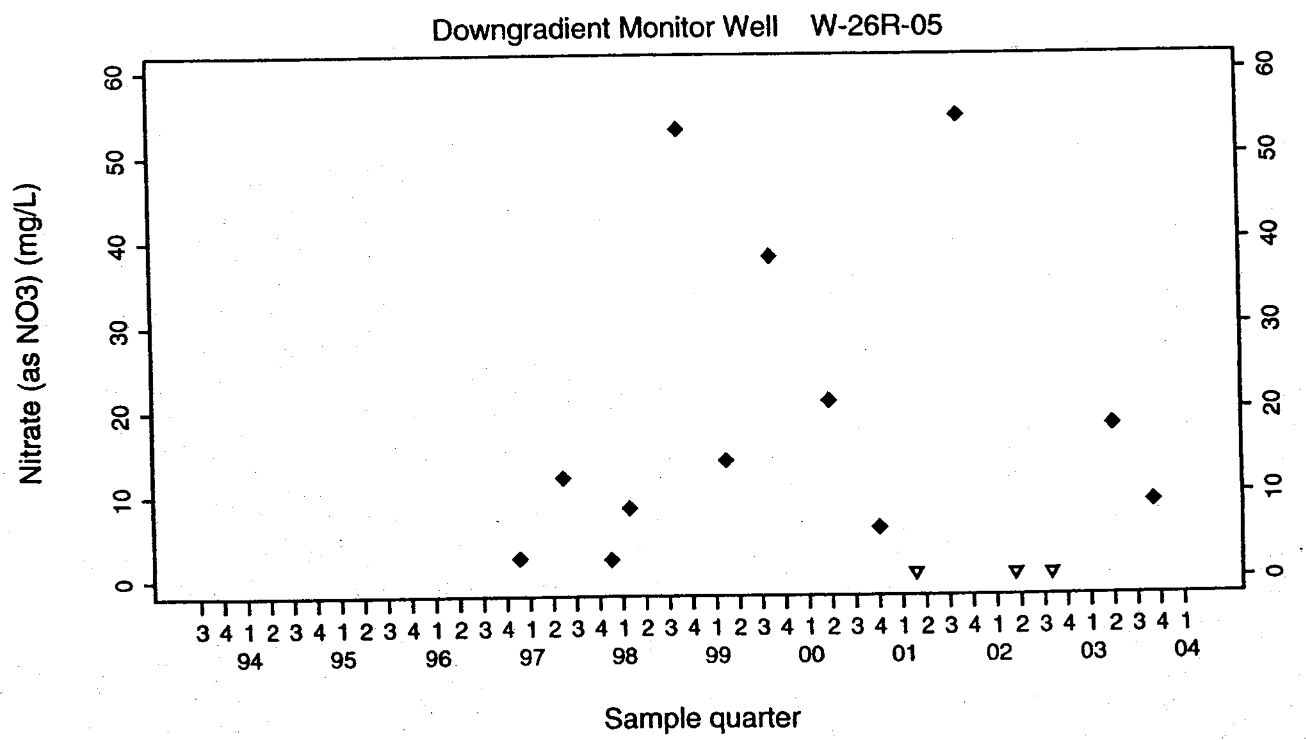


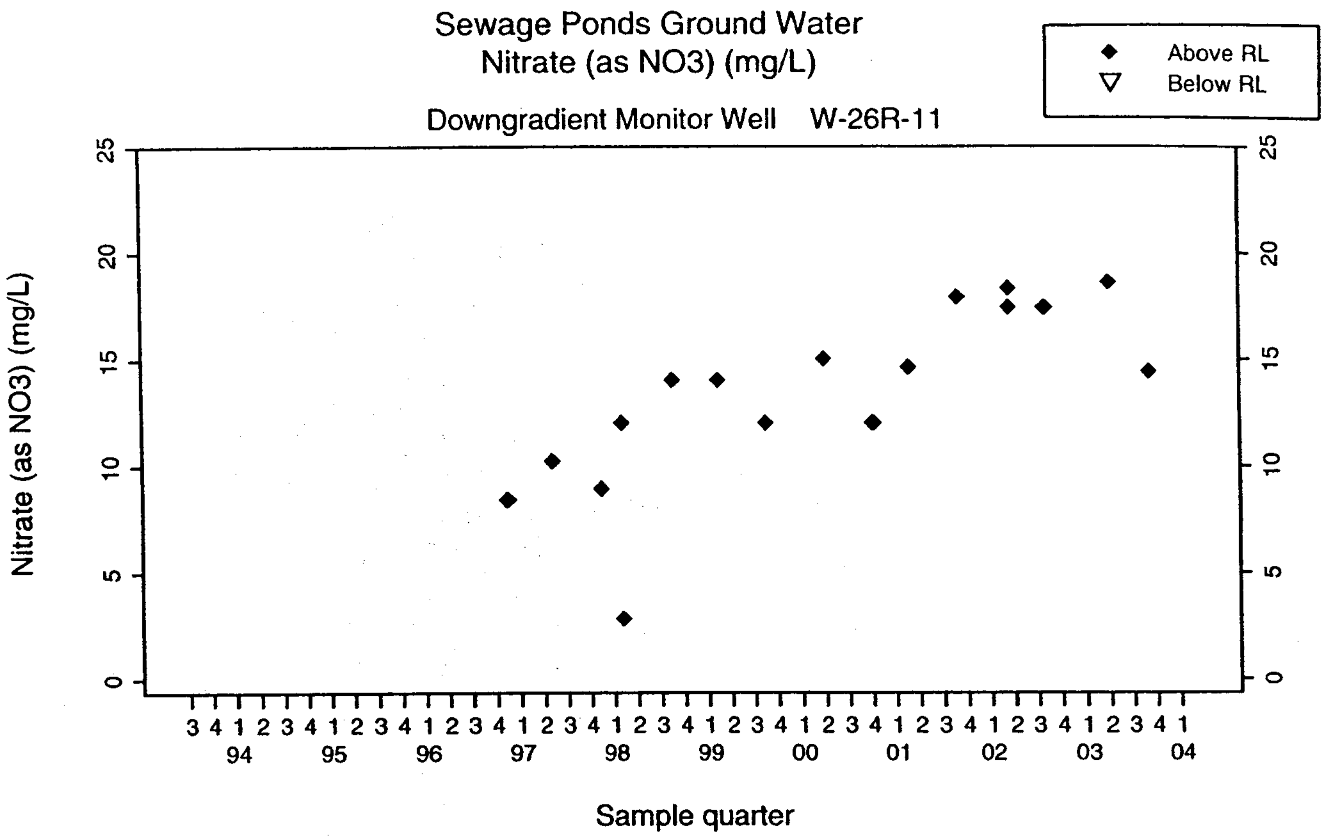
Downgradient Monitor Well W-25N-20



Sewage Ponds Ground Water
Nitrate (as NO3) (mg/L)






Sewage Ponds Ground Water
Nitrate (as NO3) (mg/L)
Downgradient Monitor Well W-26R-11
Above RL
Below RL
Nitrate (as NO3) (mg/L)
0
5
10
15
20
25
3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1 2 3 4 1
94
95
96
97
98
99
00
01
02
03
04
Sample quarter

Annual Summary Tables of Sewage Evaporation and Percolation Ponds Ground Water Monitoring Data

Table D-1. Ground water analytical results, sewage ponds, constituents of concern required by WDR 96-248, and additional constituents.

Parameter	Well	Reporting limit	WDR 96-248 limit	(Mar. 18 - Mar 25) First quarter result	(Aug. 26 - Sep. 10) Third quarter result
General					
pH (unitless)	W-7E	NA [a]	None	8. 54	8. 50
	W-7ES	NA	None	7. 83	7. 68
	W-7PS	NA	None	7. 76	7. 65
	W-35A-04	NA	None	7. 89	7. 84
	W-25N-20	NA	None	7. 88	7. 71
	W-26R-01	NA	None	7. 95	7. 83
	W-26R-05	NA	None	7. 96	8. 02
	W-26R-11	NA	None	7. 77	7. 66
	W-7DS	NA	None	7. 86	7. 78
Specific conductance (µmhos/cm)	W-7E	1	None	1440	1420
	W-7ES	1	None	1790	1940
	W-7PS	1	None	1500	1740
	W-35A-04	1	None	1730	1890
	W-25N-20	1	None	1740	1790
	W-26R-01	1	None	1360	1310
	W-26R-05	1	None	1180	1150
	W-26R-11	1	None	1560	1710
	W-7DS	1	None	1740	1780
Nutrients (mg/L)					
Nitrate (as NO_3)	W-7E	0. 44	None	<0. 44	<0. 44
	W-7ES	0. 88	None	12. 7	10. 5
	W-7PS	0. 44	None	24. 8	20. 3
	W-35A-04	0. 44	None	14. 0	12. 5
	W-25N-20	0. 44	None	12. 8	11. 3
	W-26R-01	2. 44	None	31. 9	28. 2
	W-26R-05	0. 44	None	18. 1	8. 99
	W-26R-11	0. 44	None	18. 6	14. 4
	W-7DS	0. 44	None	12. 5	11. 3

(continued)

Table D-1. Ground water analytical results, sewage ponds, constituents of concern required by WDR 96-248 and additional constituents.

Parameter	Well	Reporting limit	WDR 96-248 limit	(Mar. 19 - Mar 26) First quarter result	(Aug. 27 - Sep. 11) Third quarter result
Bacteria					
Fecal coliform (MPN [b]/100 mL	W-7E	1.1	2.2	<1.1	<1.1
	W-7ES	1.1	2.2	<1.1	<1.1
	W-7PS	1.1	2.2	<1.1	<1.1
	W-35A-04	1.1	2.2	<1.1	<1.1
	W-25N-20	1.1	2.2	<1.1	<1.1
	W-26R-01	1.1	2.2	<1.1	<1.1
	W-26R-05	1.1	2.2	<1.1	<1.1
	W-26R-11	1.1	2.2	<1.1	<1.1
	W-7DS	1.1	2.2	<1.1	<1.1
Total coliform (MPN/100 mL)	W-7E	1.1	None	<1.1	<1.1
	W-7ES	1.1	None	<1.1	<1.1
	W-7PS	1.1	None	<1.1	<1.1
	W-35A-04	1.1	None	1 1	<1.1
	W-25N-20	1.1	None	<1.1	<1.1
	W-26R-01	1.1	None	<1.1	<1.1
	W-26R-05	1.1	None	1 1	<1.1
	W-26R-11	1.1	None	<1.1	<1.1
	W-7DS	1.1	None	<1.1	<1.1

(concluded)

[a] NA = Not applicable.
[b] MPN = Most probable number (of organisms).

Appendix E

Statistical Analyses for Ground Water Data

Appendix E

Statistical Analyses

Statistical Methods

Statistical methods are used to detect increases in concentrations of COCs that may indicate releases of COCs to ground water. The CVRWQCB *Standard Provisions* (1993) accompanying WDR 96-248 require the use of statistical methods from the *California Code of Regulations* (CCR), Title 23, Chapter 3, Subchapter 15.

Two statistical methods, prediction intervals and control charts, are used to generate concentration limits and statistical test limits (SLs) for COCs in ground water samples from the surface impoundments monitoring network. Both methods are sensitive in indicating COC concentration increases, and both methods require only one sample per monitoring well for each COC per quarter. Prediction intervals are used when COC concentrations are statistically similar in each of the three downgradient wells to those in the upgradient well, W-817-01. The method of control charts is used when COC concentrations in the downgradient wells are statistically different from those in the upgradient well. A COC is considered to have exceeded its concentration limit when a single ground water analytical result exceeds its SL and either of two subsequent re-tests also exceeds the SL. The current SLs are listed in **Table B-1.**

Table E-1 provides a summary and status of the reported COCs that have shown statistically significant evidence of release, including bromide in well W-817-02 from this quarter. New revised SLs were proposed for many inorganic COCs in the *LLNL Experimental Test Site 300 Compliance Monitoring Report for Waste Discharge Requirements 96-248, Annual/Fourth Quarter Report for 2001* (Brown 2002).

Table E-1. Reported COCs showing statistically significant evidence of release.

Constituent	Date first reported	Monitor wells	Status of investigation
Zinc	1/9/97	W-817-02 W-817-03	In progress, under CERCLA
Chloride	2/7/97	W-817-03	Complete
Arsenic	4/14/97	W-817-02, W-817-03, W-817-04	In progress, under CERCLA
Chromium	7/14/99	W-817-04	Transferred to CERCLA
Bicarbonate alkalinity	7/2/2001	W-817-04	Complete
Manganese	7/2/2001	W-817-04	Complete
Ammonia, as nitrogen	1/24/2002	W-817-04	Complete
Bromide	10/23/02	W-817-03, W-817-02	Transferred to CERCLA
Nickel	1/24/2002	W-817-04	Complete
Ortho-phosphate	10/13/2003	W-817-02, W-817-03, W-817-04	Complete

Appendix F

Fourth Quarter Quality Assurance/Quality Control Monitoring Data Discussion, Surface Impoundments Monitoring Networks

Appendix F
Quality Assurance/Quality Control Program

1.0 Quality Assurance (QA) Program

To ensure data quality, LLNL utilizes an extensive written set of protocols and procedures that covers all aspects of ground water and surface water sampling, sample tracking, and environmental data management. The *LLNL Livermore Site and Site 300 Environmental Restoration Project Standard Operating Procedures* (Dibley and Depue, 2002) and the *Environmental Monitoring Plan* (Althouse *et al.* 2002) form the set of written instructions to be followed. Observing these protocols prevents inadvertent sample contamination and maintains sample integrity from the sampling location to the analytical laboratories. Data management procedures ensure that all laboratory measurements are received, accurately recorded, and properly stored in a computer database for easy and fast retrieval. Hard copies of the data are also archived. All sample analyses for the surface water impoundments meet the reporting criteria delineated in the Permit as modified by Wendy Cohen of CVRWQCB on September 25, 1998 (Cohen, 1998) (**Tables F-1.1** and **F-1.2**).

1.1 Field Procedures

As a part of the QA program, data quality for the sampling activities during each quarter is assessed by the following method: field blanks use analyte-free water for the analyses of organic compounds and high-performance liquid chromatography (HPLC)-grade water for all other required analyses. Field blanks, which are prepared at monitoring wells and wastewater sample locations chosen at random, are analyzed for parameters identical to those for the routine samples. Field blank data are reviewed by analysts to determine whether contamination has been introduced into the samples as a result of field conditions or sample handling procedures.

1.1.1 Process Wastewater Influent

Field QA procedures include adherence to the *Environmental Monitoring Plan* (Althouse *et al.* 2002) and sampling protocols of LLNL's Radioactive and Hazardous Waste Management (RHWM) Division (for wastewater in retention tanks of the Chemistry Area). These include approved procedures for: sample preparation, handling, preservation, custody, and equipment decontamination procedures. Field activities are recorded on field tracking forms and/or in logbooks, and sample tracking is maintained through the chain-of-custody process. Field QA protocols include the preparation of at least 10 percent duplicate or collocated samples. The purpose of field duplicates is to verify the precision and comparability of the sampling activity. Additionally, temperature blanks are included in each shipping container of samples to verify that the temperature is maintained at $4^{\circ} \pm 2^{\circ}$ Celsius until receipt at the analytical laboratories.

1.1.2 Ground Water Monitoring

Field QA procedures include adherence to the *Environmental Monitoring Plan* (Althouse et al. 2002), and the sampling and analysis protocols of the *LLNL Livermore Site and Site 300 Environmental Restoration Project Standard Operating Procedures* (Dibley and Depue, 2002). These include approved procedures for: sample collection, preparation, handling, preservation, custody, and equipment decontamination procedures. Field activities are recorded on field sampling sheets and/or in logbooks, and sample tracking is maintained through the chain-of-custody process. Field QA protocols include the preparation of at least 10 percent duplicate or collocated samples. The purpose of field collocated samples is to verify the precision of the sampling and analysis activities. Significant differences between duplicate samples (which should have identical results within the margin of sampling and analytical errors) are investigated by the responsible analysts, in collaboration with an LLNL quality control chemist. Field blanks are prepared at random locations to assess sample hygiene and handling practices.

1.2 Analytical Laboratories

LLNL contracts with several outside analytical laboratories. They provide routine analytical services that meet the requirements of LLNL's QA documents, as well as the requirements cited in the Permit. Analytical laboratories used by LLNL and each laboratory's responsible person are:

- BC Laboratories, Inc.
  4100 Atlas Court
  Bakersfield, CA 93308
  Laboratory Responsible Person: Kim Halbrook
- Caltest Analytical Laboratory
  1885 North Kelly Road
  Napa, CA 94558
  Laboratory Responsible Person: William Svoboda
- General Engineering Laboratories
  P.O. Box 30712
  2040 Savage Road
  Charleston, SC 29414
  Laboratory Responsible Person: Cheryl Jones
- Sequoia
  885 Jarvis Drive
  Morgan Hill, CA 95037
  Laboratory Responsible Person: Latonya Pelt

These laboratories perform extensive quality control analyses including: method blank analyses, analyses of laboratory control samples (LCS), matrix spike (MS), and matrix spike duplicates (MSD), and analyses of surrogate samples for organic compounds. Additionally, these laboratories provide data reports of tentatively identified compounds (TICs) for Volatile Organic Compounds (VOCs) and for Semi-Volatile Organic Compounds (SVOCs), analyzed by gas chromatography/mass spectroscopy (GC/MS), and provide estimated concentrations. Each of these laboratories is accredited by the California Department of Health Services for the analyses performed. Résumés of the analysts' education and qualifications are available through each laboratory.

2.0 Quality Assurance and Quality Control Results

2.1 Process Wastewater Influent

Field QA/QC data discussed in this section are contained in **Tables F-1.1** and **F-1.2.** Fourth quarter photographic process rinsewater samples were submitted to BC Laboratories, Inc., and to Sequoia for analysis, including duplicate samples prepared for interlaboratory comparison. Metals and pH laboratory QA/QC (i.e., MS/MSD and LCS) data associated with the samples, verified per EPA Functional Guidelines for data review (U.S. Environmental Protection Agency, 1994a and 1994b), showed that all data are usable.

Representative samples were collected from the retention tank at Building 823 on December 30, 2003. Metal concentrations and pH measurements show the variations experienced for certain metals between the routine and duplicate samples collected from the Building 823 retention tank. No metals were detected in the method blank above laboratory practical quantitation limits PQLs (**Table F-1.1**).

Representative samples were collected from the retention tank at Building 851 on October 20, 2003. No metals were detected in the method blank above laboratory PQLs (**Table F-1.2**).

2.2 Ground Water Monitoring

Fourth quarter ground water samples were submitted to BC Laboratories, Inc. and to General Engineering Laboratories for analyses. Analyte concentrations of routine and duplicate samples collected from upgradient monitoring well W-817-01 are in reasonable agreement for the COCs detected above their respective PQLs (**Table F-2.1**).

Methylene chloride was detected below its PQL at an estimated concentration of 0.34 μg/L in the method blank sample, and also in the trip blank (**Table F-2.1**). However, this is not an issue with the data because methylene chloride was not detected above its PQL in any fourth quarter ground water samples (**Tables B-1.1** and **B-1.2**). Although the elements chromium, copper, and zinc were detected in field blank samples, but not in the method blanks, at concentrations less than their respective PQLs (**Table F-2.1**), that creates no practical problem with ground water analytical results for those elements (**Tables B-1.1** and **B-1.2**). The detections of bicarbonate alkalinity and chloride at very low concentrations in field blank samples do not affect the quantitation of those analytes detected in ground water samples. However, the detection of ortho-phosphate at a concentration estimated at 0.044 mg/L might affect its quantitation in the ground water samples. Chloroform was detected at a concentration less than its PQL in the field blank but not the method blank sample (**Table F-2.2**). Chloroform is not quantifiable in any ground water samples (**Tables B–2.1** and **B-2.2**), so that its quantitation is not adversely affected by its detection in the field blank. No other inorganic or organic analytes were detected in either field or laboratory blank samples. Recoveries for all LCS samples and for all MS and MSD samples are within laboratory acceptance limits, so that these data meet all requirements for data accuracy as well as precision.

Laboratory QA/QC (i.e., MS/MSD and LCS) data associated with all ground water samples and evaluated per EPA Functional Guidelines for data review (U.S. Environmental Protection Agency 1994a and 1994b), showed all parameters within acceptable ranges for data usability.

Table F-1.1 Photographic process rinsewater QA/QC results, Building 823, constituents of concern required by WDR 96-248.

Parameter	Building 823 Sampled 12/30/03			
	MDL[a]	**Reporting limit**	**Routine sample**	**Method blank**
General parameters				
pH (unitless)	NA[b]	2.0	9.6	NA
Metals (mg/L)				
Antimony	0.000042	0.001	0.00015 est[c]	0.000057
Arsenic	0.00019	0.001	< 0.001	< 0.001
Barium	0.000015	0.001	0.022	< 0.001
Beryllium	0.000034	0.001	< 0.001	< 0.001
Cadmium	0.000014	0.001	0.0029	< 0.001
Chromium	0.00023	0.005	0.0024 est	0.000576
Cobalt	0.000009	0.001	0.000084 est	< 0.001
Copper	0.00011	0.005	0.081	< 0.005
Lead	0.000046	0.005	0.0016 est	< 0.005
Lithium	0.01	0.01	0.054	< 0.01
Manganese	0.00015	0.003	0.0084	< 0.003
Molybdenum	0.000083	0.001	0.019	< 0.001
Nickel	0.000098	0.001	0.0056	< 0.001
Potassium	0.3	1	21	< 1
Silver	0.00054	0.01	0.21	< 0.001
Thallium	0.000005	0.001	0.000039 est	< 0.001
Vanadium	0.0013	0.003	< 0.003	< 0.003
Zinc	0.00091	0.01	0.057	0.00112

a MDL = Method detection limit

b NA = Not applicable

c Results followed by "est" have estimated values between the MDL and the reporting limit for that compound

Table F-1.2 Photographic process rinsewater QA/QC results, Building 851, constituents of concern required by WDR 96-248.

Parameter	Building 851 Sampled 10/20/03				
	MDL[a]	Reporting limit	Routine sample	Duplicate sample	Method blank
General parameters					
pH (unitless)	2	2	7.84	NA[b]	NA
Metals (mg/L)					
Antimony	0.000042	0.001	< 0.001	NA	< 0.001
Arsenic	0.00019	0.001	0.0049	NA	< 0.001
Barium	0.000015	0.001	0.012	NA	< 0.001
Beryllium	0.000034	0.001	< 0.001	NA	< 0.001
Cadmium	0.000014	0.001	< 0.001	NA	< 0.001
Chromium	0.00023	0.005	0.007	NA	< 0.005
Cobalt	0.000009	0.001	< 0.001	NA	< 0.001
Copper	0.00011	0.005	0.052	NA	< 0.005
Lead	0.000046	0.005	< 0.005	NA	< 0.005
Lithium	0.0008 - 0.01	0.01 - 0.02	0.053	0.055	< 0.01
Manganese	0.00015	0.003	0.014	NA	< 0.003
Molybdenum	0.000083	0.001	0.019	NA	< 0.001
Nickel	0.000098	0.001	0.0021	NA	< 0.001
Potassium	0.3	1	18	NA	< 1
Silver	0.00054	0.01	0.34	NA	< 0.001
Thallium	0.000005	0.001	< 0.001	NA	< 0.001
Vanadium	0.0013	0.003	< 0.003	NA	< 0.003
Zinc	0.00091	0.01	0.031	NA	< 0.01

a MDL = Method detection limit

b NA = Not applicable. Only samples for lithium were duplicated this quarter.

Table F-2.1. Ground water field QA/QC results, constituents of concern required by WDR 96-248.

Monitoring well W-817-01	MDL[a]	Reporting limit	Routine sample	Duplicate sample	Field blank sample	Method blank sample
General						
pH (unitless)	NA[b]	NA	8. 12	8. 13	5. 88	NA
Halocarbons (µg/L)						
1,1,1-Trichloroethane	0. 11	0. 5	<0. 5	<0. 5	<0. 5	<0. 5
Bromoform	0. 08	0. 5	<0. 5	<0. 5	<0. 5	<0. 5
1,2-Dichloroethane	0. 063	0. 5	<0. 5	<0. 5	<0. 5	<0. 5
Freon 113	0. 05	0. 5	<0. 5	<0. 5	<0. 5	<0. 5
Methylene chloride	0. 17	1. 0	<1. 0	<1. 0	0. 85 est. [c]	<1
Tetrachloroethene	0. 11	0. 5	<0. 5	0. 15 est.	<0. 5	<0. 5
Chlorobenzene	0. 064	0. 5	<0. 5	<0. 5	<0. 5	<0. 5
Hydrocarbons (µg/L)						
Toluene	0. 069	0. 5	<0. 5	<0. 5	<0. 5	<0. 5
Naphthalene	0. 36	5	<5	<5	<5	<2
Photographic chemicals (µg/L)						
meta and *para*- Cresol	0. 56	2	<2	<2	<2	<2
Benzyl alcohol	1. 1	2	<2	<2	<2	<2
Volatile/semivolatile organic compounds (µg/L)						
Acetone	2. 8	10	<10	<10	<10	<10
2-Butanone	1. 3	20	<20	<20	<20	<20
Dimethyl sulfoxide (DMSO)	0. 038	10	<10	<10	<10	<10
Ethyl alcohol (ethanol)	40	1000	<1000	<1000	<1000	<1000
Methyl isobutyl ketone	1. 1	20	<20	<20	<20	<20
Additives to energetic compounds (µg/L)						
Bis(2-ethylhexyl)phthalate	0. 77	5	1. 1 est.	<5	<5	<5
Unreactive polymers (µg/L)						
Styrene	0. 091	0. 5	<0. 5	<0. 5	<0. 5	<0. 5
Vinyl chloride	0. 064	0. 5	<0. 5	<0. 5	0. 21 est.	<0. 5

(continued)

Table F-2.1. Ground water field QA/QC results, constituents of concern required by WDR 96-248.

Monitoring well W-817-01	MDL[a]	Reporting limit	Routine sample	Duplicate sample	Field blank sample	Method blank sample
Metals (mg/L)						
Aluminum	0. 017	0. 05	<0. 05	<0. 05	<0. 05	<0. 05
Arsenic	0. 0007	0. 008	0. 065	0. 069	<0. 0002 est.	<0. 002
Barium	0. 00062	0. 025	0. 0092 est.	0. 01 est.	<0. 025	<0. 025
Cadmium	0. 00005	0. 0005	0. 00002 est.	0. 00002 est.	<0. 0005	<0. 0005
Chromium	0. 00006	0. 001	0. 0007 est.	0. 001	0. 0002 est.	<0. 001
Cobalt	0. 013	0. 05	<0. 05	<0. 05	<0. 05	<0. 05
Copper	0. 0002	0. 001	0. 0005 est.	0. 0009 est.	0. 001	<0. 001
Lead	0. 003	0. 005	<0. 05	<0. 05	<0. 005	<0. 005
Manganese	0. 00045	0. 01	0 0005 est.	0 0025 est.	<0. 01	0. 0021
Molybdenum	0. 00072	0. 025	0. 051	0. 051	<0. 025	<0. 025
Nickel	0. 0005	0. 002	0. 0008 est.	0. 0009 est.	<0. 002	0. 00054
Potassium	0. 033	1	13	13	<1	0. 076
Silver	0. 00003	0. 001	<0. 001	<0. 001	<0. 001	0. 00013
Zinc	0. 0025	0. 01	0. 17	0. 22	0. 0011	<0. 01
Salts (mg/L)						
Ammonia nitrogen (as N)	0. 01	0. 02	<0. 02	<0. 02	0. 01 est.	<0. 02
Bicarbonate alkalinity (as CaCO3)	10	10	260	260	<2. 5	<2. 5
Bromide	0. 07	0. 2	1	1	<0. 1	<0. 1
Chloride	0. 074	1	277	277	0. 13 est.	<0. 5
Nitrate (as NO_3)	0. 012	1	94. 2	94. 6	<0. 5	<0. 44
Ortho -phosphate	0. 03	0. 05	0. 088	0. 082	<0. 05	<0. 05
Perchlorate	0. 0003	0. 004	0. 028	0. 03	<0. 003	<0. 004
Sulfate	0. 13	2	310	311	0. 31 est.	<1

(continued)

Table F-2.1. Ground water field QA/QC results, constituents of concern required by WDR 96-248

Monitoring well W-817-01	MDL[a]	Reporting limit	Routine sample	Duplicate sample	Field blank sample	Method blank sample
Energetic materials (µg/L)						
HMX	0. 779	1	<1	<1	<1	<1
RDX	0. 530	0. 85	0. 605 est.	0. 655	<0. 85	<0. 85
TNT	0. 0779	0. 260	<0. 260	<0. 260	<0. 260	<0. 260
TATB	5. 0	20	<20	<20	<20	<20
PETN	0. 104	1. 00	<1. 00	<1. 00	<1. 00	<1. 00
Tetryl	0. 032	1. 00	<1. 00	<1. 00	<1. 00	<1. 00
4-amino-2,6-dinitrotoluene	0. 0409	0. 260	<0. 260	<0. 260	<0. 260	<0. 260

(concluded

[a] MDL = Method detection limit.

[b] NA = Not applicable.

[c] Results followed by an "est." have estimated concentrations between the MDL and the reporting limit for that analyte.

Table F-2.2. Ground water field QA/QC results, other constituents.

Monitoring well W-817-01	MDL[a]	Reporting limit	Routine sample	Duplicate sample	Field blank sample	Method blank sample
General parameters (mg/L)						
Dissolved oxygen	0. 5	0. 5	9. 5	9. 0	0. 10	NA[b]
Metal (mg/L)						
Lithium	0. 0018	0. 02	0. 022	0. 023	<0. 02	<0. 01
Volatile/semivolatile organic compounds (µg/L)[c]						
1,1-Dichloroethene	0. 14	0. 5	<0. 5	<0. 5	<0. 5	<0. 5
Carbon disulfide	3. 4	50	<50	<50	<50	<10
Chloroform	0. 055	0. 5	<0. 5	<0. 5	2. 4	<0. 5
Trichloroethene (TCE)	0. 079	0. 5	0. 73	0. 68	<0. 5	<0. 5
Energetic materials (µg/L)[d]						
2-amino-4,6-dinitrotoluene	0. 0779	1	<1	<1	<1	<1

[a] MDL = Method detection limit.

[b] NA = Not applicable.

[c] Other than those listed in this subheading, no other VOCs/SVOCs were detected using EPA Methods 624 or 625.

[d] Other than those listed in this subheading, no other energetic materials were detected using EPA Method 8330.

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