Carmen Johnson

| Fac/Perm/Co ID # | Date | Doc ID# |
|---|---|---|
| 96-01 | 7/19/12 | DIN |

96-01

Attachment to letter dated 12/15/99

Re: G/W Sampling -N- Statistical Analysis

MESCO Project No. G99008.0

I would agree if they 1st attempt to demonstrate compliance w/ .1634(9)(1). Should I send an "assessment letter?

M.,
see p. 3 in letter.
yeah, whatever. L

Fac/Perm/Co ID # 96-01 | Date 7/19/12 | Doc ID# DIN

App II

96-01
8-24-99

OPERATION/CONSTRUCTION MANAGERS

**Municipal Services**

PO Box 97, Garner, North Carolina 27529 (919) 772-5393

CIVIL/SANITARY ENGINEERS

**Engineering Company, P.A.**

PO Box 349, Boone, North Carolina 28607 (828) 262-1767

December 15, 1999

Mr. Larry Rose
Solid Waste Section
Division of Waste Management
North Carolina Department of Environment and Natural Resources
401 Oberlin Road, Suite 150
Raleigh, NC 27605

DEC 1999 Solid Waste Section

Re: Groundwater Sampling and Statistical Analysis
Wayne County Closed Sanitary Landfill, Dudley, North Carolina
MESCO Project No. G99008.0

Dear Mr. Rose:

The Wayne County Closed Dudley Landfill was sampled on August 24, 1999 by Environment 1, Inc. of Greenville for the Appendix II list of constituents. Municipal Engineering Services Company, P.A. (MESCO) completed the enclosed statistical analysis for inter-well intra-well comparisons, as well as the comparisons to North Carolina Groundwater Standard. The results are included in this report.

## Comparison with North Carolina Groundwater Standard

The analysis results were compared with North Carolina Groundwater Standard to check for regulatory exceedances. Chromium, lead, mercury, and vanadium were detected in the monitoring well MW-8, the well located directly to the south of the landfill property. Of these detected metals, chromium, lead and mercury were found to be above their standard levels. Zinc was detected in the monitoring well MW-4, but did not exceed the standard. The MW-4 is located on the northeast side of the site approximately 700 ft. downgradient of the background well MW-1. Several VOCs were detected in the wells MW-2, MW-6, and MW-8, but none of them showed exceedances. All other wells showed no VOC detections.

## Statistical Analysis

Inter-well statistical analysis was conducted to determine those constituents with levels significantly higher than their background levels. The monitoring well MW-1 was defined as the background well for the entire site, and all sampling data from that well was used as the background data. The analysis was run only on detected constituents in the well

MW-2, MW-4, MW-6, and MW-8. All other monitoring wells and surface water monitoring points showed no detections.

A total of nine constituents were detected over the entire site, for which the background data were summarized in order to determine the method to be used. In general, Poisson distribution is recommended when the rate of non-detects (%ND) exceeds 90%. Since the %NDs for chromium, lead, mercury, vanadium, zinc, 1,1-dichloroethane, 1,4-dichlorobenzene, chlorobenzene, and xylenes were 100% (*i.e.* no historical detections) in the background well, the upper Poisson prediction limits were calculated for those constituents. The %ND for zinc for the background well was 83%, and the non-parametric tolerance interval was used to calculate the upper tolerance limit.

The results depict statistical significance against the background levels for all tested constituents with the exception of zinc, which was found to be statistically insignificant. [redacted]ts were also determined for pooled VOCs in terms of the number of detections per scan. [redacted]

Intra-well analyses were conducted only on those constituents that were initially found to be statistically significant. Non-parametric Wilcoxon rank sum method was used for all comparisons. Stewart-CUSUM control charts are included in this report for those constituents with the number of samples greater than eight and the detection rate greater than 25%.[1] Contrary to the inter-well analysis results, the intra-well analysis results show no statistical significance against their own background levels. In general, intra-well analysis is conducted in order to differentiate true contamination from spatial variability. In this instance, however, the statistical insignificance may not necessarily suggest no occurrence of contamination resulted from the landfill. Since intra-well comparisons require the assumption that the site had no previous contamination prior to the inception of monitoring, these intra-well analysis results may only reflect the conditions after the first sampling event took place back in 1994.[2] To date, the landfill facility had long been in operation for more than 20 years prior to its closure. The eastern portion of the landfill was closed prior to 1991, and the western portion was closed in 1998.

## Conclusion and Recommendation

The monitoring wells MW-6 and MW-8 have relatively high VOC detection rates, especially the chlorinated species such as 1,4-dichlorobenzene and chlorobenzene. Ethylbenzene and xylene (dimethyl benzene) have been constantly detected in MW-6, but have never been detected in any other wells. Most VOCs detected in MW-6 and MW-8 typically show a declining tread over time, which may indicate the dissipation of

[1]Gibbons, R. D., 1994, Statistical methods for groundwater monitoring: John Wiley & Sons, Inc., New York, p. 163

[2]No sampling data were available prior to 1994.

contaminants as a result of the partial landfill closure prior to 1991. The monitoring well MW-2, which bounds the western portion of the landfill, shows the detections of two chlorinated species (1,1-dichloroethane and chlorobenzene) whose levels are significantly higher than their background levels. No VOCs were detected in the wells MW-1, MW-3, MW-4, MW-5 and MW-7 nor any surface water monitoring points. No Appendix II Semi-VOCs were detected over the entire site during this sampling event.

Overall, the observed levels of VOCs are still significantly higher than the background levels. This, coupled with the fact that the detections of chlorinated species in groundwater samples are frequently reported downgradient of a municipal solid waste landfill, suggests that the impact of groundwater contamination by the landfill is still present. However, a close examination of the time-series plots for historically detected VOCs suggests that the levels of VOCs are declining. This is also reflected by the fact that no intra-well analyses showed significant increase of VOC levels. Since the landfill facility has already ceased the operation, levels of VOCs are expected to decrease. [redacted] all future sampling events so far as no VOC detections occur in those wells.

If you have any questions or comments regarding this sampling and analysis report, please contact me at 919.772.5393.

Sincerely,
MUNICIPAL ENGINEERING SERVICES CO., P.A.

Kohei Yoshida

Kohei Yoshida
Hydrogeologist

Enclosures

cc: Mr. Lloyd Cook
Wayne County

Wayne Co 8-24-99

App II

| | | |
|---|---|---|
| MW-1 | ok | |
| MW-2 | 1,1-DCA | 7.20 |
| | Chlorobenzene | 25 |
| MW-3 | ok | |
| MW-4 | Zn | 69 |
| MW-5 | ok | |
| MW-6 | chlorobenzene | 9.70 |
| | Xylenes | 96 |
| | 1,4-DCB | 12 |
| MW-7 | ok | |
| MW-8 | Cr | 101 |
| | Pb | 19 |
| | Hg | 1.3 |
| | Vanadium | 130 |
| | 1,4-DCB | 32 |
| | chlorobenzene | 18 |

- No additional App II detects.
- wells 1-3-7 have never shown organics
- Well 4 had very low conc.s of 1,1-DCA in both '95 sampling
- need to proceed w/ .1634 before decision is made on dropping wells from assessment monitoring requirements.

## Table 1
# Wayne County Landfill
## Hydrologic Properties at Monitoring Well Locations

| Monitoring Well | Hydraulic Conductivity Conductivity (cm/sec) | Effective Porosity (%) | Change in Head/ Change in Distance | Groundwater Flow Rate (ft/yr) | Direction |
|---|---|---|---|---|---|
| MW-1 | 5.40E-04 | 20.0% | 0.0106 | 29.68 | N66W |
| MW-2 | 3.00E-04 | 20.0% | 0.0099 | 15.44 | N45W |
| MW-3 | 6.40E-03 | 20.0% | 0.0066 | 218.89 | N56W |
| MW-4 | 9.90E-04 | 20.0% | 0.0089 | 45.61 | N45W |
| MW-5 | 3.10E-05 | 20.0% | 0.0206 | 3.31 | N41W |
| MW-6 | 1.60E-04 | 20.0% | 0.0055 | 4.58 | N44W |
| MW-7 | 7.30E-05 | 20.0% | 0.0121 | 4.56 | N60W |
| MW-8 | 3.40E-04 | 20.0% | 0.0051 | 9.05 | N55W |

| Well ID | Parameter Name | Sample Date | Result | Unit | PQL | MCL | Exceedance |
|---|---|---|---|---|---|---|---|
| MW-2 | 1,1-Dichloroethane | 8/24/99 | 7.2 | ug/l | 5 | 700 | |
| MW-2 | Chlorobenzene | 8/24/99 | 25 | ug/l | 5 | 50 | |
| MW-4 | Zinc, total | 8/24/99 | 0.069 | mg/l | 0.05 | 2.1 | |
| MW-6 | 1,4-Dichlorobenzene | 8/24/99 | 12 | ug/l | 5 | 75 | |
| MW-6 | Chlorobenzene | 8/24/99 | 9.7 | ug/l | 5 | 50 | |
| MW-6 | Xylenes | 8/24/99 | 96 | ug/l | 5 | 530 | |
| **MW-8** | **Chromium, total** | **8/24/99** | **0.101** | **mg/l** | **0.01** | **0.05** | **0.051** |
| **MW-8** | **Lead, total** | **8/24/99** | **0.019** | **mg/l** | **0.01** | **0.015** | **0.004** |
| **MW-8** | **Mercury** | **8/24/99** | **0.0013** | **mg/l** | **0.0005** | **0.0011** | **0.0002** |
| MW-8 | Vanadium | 8/24/99 | 0.13 | mg/l | 0.04 | - | |
| MW-8 | 1,4-Dichlorobenzene | 8/24/99 | 32 | ug/l | 5 | 75 | |
| MW-8 | Chlorobenzene | 8/24/99 | 18 | ug/l | 5 | 50 | |

PQL = Practical Quantitation Limit
MCL = Maximam Contaminant Level (North Carolina Groundwater Standard)

# Statistical Analysis

# Basic Statistics

**Parameter: Chromium, total**

| | |
|---|---|
| Total Observations | 125 |
| Total Non-Detects | 82 |
| Pooled Mean | 20.544 |
| Pooled Std Dev | 26.2769 |
| Background Mean | 10 |
| Background Std Dev | 0 |

## Background Wells

There is 1 background well

| Well | Samples | Non-Detects | % ND | Total |
|---|---|---|---|---|
| MW-1 | 12 | 12 | 100 | 120 |

| Well | Mean | Std Dev | Std Err | Rank Sum | Rank Mean |
|---|---|---|---|---|---|
| MW-1 | 10 | 0 | 0 | 498 | 41.5 |

## Compliance Wells

There are 10 compliance wells

| Well | Samples | Non-Detects | % ND | Total |
|---|---|---|---|---|
| MW-2 | 13 | 10 | 76.9231 | 134 |
| MW-3 | 13 | 10 | 76.9231 | 143 |
| MW-4 | 13 | 12 | 92.3077 | 131 |
| MW-5 | 13 | 6 | 46.1538 | 222 |
| MW-6 | 13 | 5 | 38.4615 | 655 |
| MW-7 | 13 | 4 | 30.7692 | 456 |
| MW-8 | 13 | 5 | 38.4615 | 389 |
| SW-1 | 10 | 9 | 90 | 113 |
| SW-2 | 6 | 4 | 66.6667 | 130 |
| SW-3 | 6 | 5 | 83.3333 | 75 |

| Well | Mean | Std Dev | Dif From Bkg | Std Err | Rank Sum | Rank Mean |
|---|---|---|---|---|---|---|
| MW-2 | 10.3077 | 1.1094 | 0.307692 | 9.44377 | 674 | 51.8462 |
| MW-3 | 11 | 2.3094 | 1 | 9.44377 | 694 | 53.3846 |
| MW-4 | 10.0769 | 0.27735 | 0.0769231 | 9.44377 | 587 | 45.1538 |
| MW-5 | 17.0769 | 12.7113 | 7.07692 | 9.44377 | 933 | 71.7692 |
| MW-6 | 50.3846 | 53.1202 | 40.3846 | 9.44377 | 1123.5 | 86.4231 |
| MW-7 | 35.0769 | 36.5478 | 25.0769 | 9.44377 | 1117 | 85.9231 |
| MW-8 | 29.9231 | 27.9299 | 19.9231 | 9.44377 | 1070.5 | 82.3462 |
| SW-1 | 11.3 | 4.11096 | 1.3 | 10.1009 | 475.5 | 47.55 |
| SW-2 | 21.6667 | 19.1485 | 11.6667 | 11.7953 | 391 | 65.1667 |
| SW-3 | 12.5 | 6.12372 | 2.5 | 11.7953 | 311.5 | 51.9167 |

## Analysis of Variance Statistics

| | |
|---|---|
| SS Wells | 22176.5 |
| SS Total | 85619 |

## Kruskal-Wallis Statistics

| | |
|---|---|
| Non-Detect Rank | 41.5 |
| Background Rank Sum | 498 |
| Background Rank Mean | 41.5 |
| H Statistic | 27.038 |
| H Adjusted for Ties | 37.6719 |

# Basic Statistics

**Parameter: Lead, total**

| | |
|---|---|
| Total Observations | 125 |
| Total Non-Detects | 91 |
| Pooled Mean | 16.456 |
| Pooled Std Dev | 18.904 |
| Background Mean | 10 |
| Background Std Dev | 0 |

## Background Wells

There is 1 background well

| Well | Samples | Non-Detects | % ND | Total |
|---|---|---|---|---|
| MW-1 | 12 | 12 | 100 | 120 |

| Well | Mean | Std Dev | Std Err | Rank Sum | Rank Mean |
|---|---|---|---|---|---|
| MW-1 | 10 | 0 | 0 | 552 | 46 |

## Compliance Wells

There are 10 compliance wells

| Well | Samples | Non-Detects | % ND | Total |
|---|---|---|---|---|
| MW-2 | 13 | 10 | 76.9231 | 198 |
| MW-3 | 13 | 12 | 92.3077 | 138 |
| MW-4 | 13 | 13 | 100 | 130 |
| MW-5 | 13 | 8 | 61.5385 | 217 |
| MW-6 | 13 | 7 | 53.8462 | 293 |
| MW-7 | 13 | 6 | 46.1538 | 347 |
| MW-8 | 13 | 5 | 38.4615 | 319 |
| SW-1 | 10 | 10 | 100 | 100 |
| SW-2 | 6 | 3 | 50 | 125 |
| SW-3 | 6 | 5 | 83.3333 | 70 |

| Well | Mean | Std Dev | Dif From Bkg | Std Err | Rank Sum | Rank Mean |
|---|---|---|---|---|---|---|
| MW-2 | 15.2308 | 16.5436 | 5.23077 | 7.44654 | 780 | 60 |
| MW-3 | 10.6154 | 2.2188 | 0.615385 | 7.44654 | 658 | 50.6154 |
| MW-4 | 10 | 0 | 0 | 7.44654 | 598 | 46 |
| MW-5 | 16.6923 | 17.8016 | 6.69231 | 7.44654 | 889 | 68.3846 |
| MW-6 | 22.5385 | 23.95 | 12.5385 | 7.44654 | 989 | 76.0769 |
| MW-7 | 26.6923 | 21.8151 | 16.6923 | 7.44654 | 1074 | 82.6154 |
| MW-8 | 24.5385 | 37.3198 | 14.5385 | 7.44654 | 1077 | 82.8462 |
| SW-1 | 10 | 0 | 0 | 7.96466 | 460 | 46 |
| SW-2 | 20.8333 | 24.1198 | 10.8333 | 9.30072 | 460 | 76.6667 |
| SW-3 | 11.6667 | 4.08248 | 1.66667 | 9.30072 | 338 | 56.3333 |

## Analysis of Variance Statistics

| | |
|---|---|
| SS Wells | 4867.46 |
| SS Total | 44313 |

## Kruskal-Wallis Statistics

| | |
|---|---|
| Non-Detect Rank | 46 |
| Background Rank Sum | 552 |
| Background Rank Mean | 46 |
| H Statistic | 20.0651 |
| H Adjusted for Ties | 32.6691 |

# Basic Statistics

**Parameter: Mercury**

| | |
|---|---|
| Total Observations | 56 |
| Total Non-Detects | 51 |
| Pooled Mean | 0.725 |
| Pooled Std Dev | 1.14658 |
| Background Mean | 0.5 |
| Background Std Dev | 0 |

## Background Wells

There is 1 background well

| Well | Samples | Non-Detects | % ND | Total |
|---|---|---|---|---|
| MW-1 | 6 | 6 | 100 | 3 |

| Well | Mean | Std Dev | Std Err | Rank Sum | Rank Mean |
|---|---|---|---|---|---|
| MW-1 | 0.5 | 0 | 0 | 156 | 26 |

## Compliance Wells

There are 7 compliance wells

| Well | Samples | Non-Detects | % ND | Total |
|---|---|---|---|---|
| MW-2 | 7 | 7 | 100 | 3.5 |
| MW-3 | 7 | 7 | 100 | 3.5 |
| MW-4 | 7 | 6 | 85.7143 | 3.6 |
| MW-5 | 7 | 7 | 100 | 3.5 |
| MW-6 | 7 | 7 | 100 | 3.5 |
| MW-7 | 7 | 7 | 100 | 3.5 |
| MW-8 | 8 | 4 | 50 | 16.5 |

| Well | Mean | Std Dev | Dif From Bkg | Std Err | Rank Sum | Rank Mean |
|---|---|---|---|---|---|---|
| MW-2 | 0.5 | 0 | 0 | 0.598815 | 182 | 26 |
| MW-3 | 0.5 | 0 | 0 | 0.598815 | 182 | 26 |
| MW-4 | 0.514286 | 0.0377964 | 0.0142857 | 0.598815 | 208 | 29.7143 |
| MW-5 | 0.5 | 0 | 0 | 0.598815 | 182 | 26 |
| MW-6 | 0.5 | 0 | 0 | 0.598815 | 182 | 26 |
| MW-7 | 0.5 | 0 | 0 | 0.598815 | 182 | 26 |
| MW-8 | 2.0625 | 2.81828 | 1.5625 | 0.581285 | 322 | 40.25 |

## Analysis of Variance Statistics

| | |
|---|---|
| SS Wells | 16.6977 |
| SS Total | 72.305 |

## Kruskal-Wallis Statistics

| | |
|---|---|
| Non-Detect Rank | 26 |
| Background Rank Sum | 156 |
| Background Rank Mean | 26 |
| H Statistic | 5.1544 |
| H Adjusted for Ties | 21.0639 |

# Basic Statistics

**Parameter: Vanadium**

| | |
|---|---|
| Total Observations | 125 |
| Total Non-Detects | 100 |
| Pooled Mean | 55.056 |
| Pooled Std Dev | 51.0637 |
| Background Mean | 40 |
| Background Std Dev | 0 |

## Background Wells

There is 1 background well

| Well | Samples | Non-Detects | % ND | Total |
|---|---|---|---|---|
| MW-1 | 12 | 12 | 100 | 480 |

| Well | Mean | Std Dev | Std Err | Rank Sum | Rank Mean |
|---|---|---|---|---|---|
| MW-1 | 40 | 0 | 0 | 606 | 50.5 |

## Compliance Wells

There are 10 compliance wells

| Well | Samples | Non-Detects | % ND | Total |
|---|---|---|---|---|
| MW-2 | 13 | 12 | 92.3077 | 533 |
| MW-3 | 13 | 13 | 100 | 520 |
| MW-4 | 13 | 13 | 100 | 520 |
| MW-5 | 13 | 5 | 38.4615 | 929 |
| MW-6 | 13 | 7 | 53.8462 | 1226 |
| MW-7 | 13 | 6 | 46.1538 | 1098 |
| MW-8 | 13 | 11 | 84.6154 | 615 |
| SW-1 | 10 | 10 | 100 | 400 |
| SW-2 | 6 | 5 | 83.3333 | 321 |
| SW-3 | 6 | 6 | 100 | 240 |

| Well | Mean | Std Dev | Dif From Bkg | Std Err | Rank Sum | Rank Mean |
|---|---|---|---|---|---|---|
| MW-2 | 41 | 3.60555 | 1 | 19.5886 | 714 | 54.9231 |
| MW-3 | 40 | 0 | 0 | 19.5886 | 656.5 | 50.5 |
| MW-4 | 40 | 0 | 0 | 19.5886 | 656.5 | 50.5 |
| MW-5 | 71.4615 | 65.011 | 31.4615 | 19.5886 | 1137.5 | 87.5 |
| MW-6 | 94.3077 | 112.022 | 54.3077 | 19.5886 | 1052.5 | 80.9615 |
| MW-7 | 84.4615 | 69.8804 | 44.4615 | 19.5886 | 1098 | 84.4615 |
| MW-8 | 47.3077 | 24.8843 | 7.30769 | 19.5886 | 776.5 | 59.7308 |
| SW-1 | 40 | 0 | 0 | 20.9515 | 505 | 50.5 |
| SW-2 | 53.5 | 33.0681 | 13.5 | 24.4661 | 369.5 | 61.5833 |
| SW-3 | 40 | 0 | 0 | 24.4661 | 303 | 50.5 |

## Analysis of Variance Statistics

| | |
|---|---|
| SS Wells | 50373.1 |
| SS Total | 323331 |

## Kruskal-Wallis Statistics

| | |
|---|---|
| Non-Detect Rank | 50.5 |
| Background Rank Sum | 606 |
| Background Rank Mean | 50.5 |
| H Statistic | 20.8926 |
| H Adjusted for Ties | 42.8112 |

# Basic Statistics

**Parameter: Zinc, total**

| | |
|---|---|
| Total Observations | 125 |
| Total Non-Detects | 111 |
| Pooled Mean | 57.08 |
| Pooled Std Dev | 43.7409 |
| Background Mean | 65.4167 |
| Background Std Dev | 58.0133 |

## Background Wells

There is 1 background well

| Well | Samples | Non-Detects | % ND | Total |
|---|---|---|---|---|
| MW-1 | 12 | 10 | 83.3333 | 785 |

| Well | Mean | Std Dev | Std Err | Rank Sum | Rank Mean |
|---|---|---|---|---|---|
| MW-1 | 65.4167 | 58.0133 | 0 | 802 | 66.8333 |

## Compliance Wells

There are 10 compliance wells

| Well | Samples | Non-Detects | % ND | Total |
|---|---|---|---|---|
| MW-2 | 13 | 13 | 100 | 610 |
| MW-3 | 13 | 13 | 100 | 610 |
| MW-4 | 13 | 11 | 84.6154 | 997 |
| MW-5 | 13 | 11 | 84.6154 | 694 |
| MW-6 | 13 | 11 | 84.6154 | 645 |
| MW-7 | 13 | 11 | 84.6154 | 633 |
| MW-8 | 13 | 12 | 92.3077 | 747 |
| SW-1 | 10 | 9 | 90 | 609 |
| SW-2 | 6 | 5 | 83.3333 | 427 |
| SW-3 | 6 | 5 | 83.3333 | 378 |

| Well | Mean | Std Dev | Dif From Bkg | Std Err | Rank Sum | Rank Mean |
|---|---|---|---|---|---|---|
| MW-2 | 46.9231 | 11.094 | -18.4936 | 17.7991 | 728 | 56 |
| MW-3 | 46.9231 | 11.094 | -18.4936 | 17.7991 | 728 | 56 |
| MW-4 | 76.6923 | 103.329 | 11.2756 | 17.7991 | 856 | 65.8462 |
| MW-5 | 53.3846 | 21.9452 | -12.0321 | 17.7991 | 851 | 65.4615 |
| MW-6 | 49.6154 | 13.8295 | -15.8013 | 17.7991 | 847 | 65.1538 |
| MW-7 | 48.6923 | 5.34454 | -16.7244 | 17.7991 | 841 | 64.6923 |
| MW-8 | 57.4615 | 40.4611 | -7.95513 | 17.7991 | 795 | 61.1538 |
| SW-1 | 60.9 | 34.4688 | -4.51667 | 19.0375 | 625 | 62.5 |
| SW-2 | 71.1667 | 51.8475 | 5.75 | 22.231 | 402 | 67 |
| SW-3 | 63 | 31.8434 | -2.41667 | 22.231 | 400 | 66.6667 |

## Analysis of Variance Statistics

| | |
|---|---|
| SS Wells | 11881.8 |
| SS Total | 237245 |

## Kruskal-Wallis Statistics

| | |
|---|---|
| Non-Detect Rank | 56 |
| Background Rank Sum | 802 |
| Background Rank Mean | 66.8333 |
| H Statistic | 1.48985 |
| H Adjusted for Ties | 4.96972 |

# Basic Statistics

**Parameter: 1,1-Dichloroethane**

| | |
|---|---|
| Total Observations | 135 |
| Total Non-Detects | 122 |
| Pooled Mean | 5.44296 |
| Pooled Std Dev | 1.94248 |
| Background Mean | 5 |
| Background Std Dev | 0 |

## Background Wells

There is 1 background well

| Well | Samples | Non-Detects | % ND | Total |
|---|---|---|---|---|
| MW-1 | 13 | 13 | 100 | 65 |

| Well | Mean | Std Dev | Std Err | Rank Sum | Rank Mean |
|---|---|---|---|---|---|
| MW-1 | 5 | 0 | 0 | 799.5 | 61.5 |

## Compliance Wells

There are 10 compliance wells

| Well | Samples | Non-Detects | % ND | Total |
|---|---|---|---|---|
| MW-2 | 14 | 12 | 85.7143 | 72.7 |
| MW-3 | 14 | 14 | 100 | 70 |
| MW-4 | 14 | 12 | 85.7143 | 71 |
| MW-5 | 14 | 14 | 100 | 70 |
| MW-6 | 14 | 14 | 100 | 70 |
| MW-7 | 14 | 14 | 100 | 70 |
| MW-8 | 14 | 5 | 35.7143 | 126.1 |
| SW-1 | 11 | 11 | 100 | 55 |
| SW-2 | 6 | 6 | 100 | 30 |
| SW-3 | 7 | 7 | 100 | 35 |

| Well | Mean | Std Dev | Dif From Bkg | Std Err | Rank Sum | Rank Mean |
|---|---|---|---|---|---|---|
| MW-2 | 5.19286 | 0.59286 | 0.192857 | 0.605755 | 991 | 70.7857 |
| MW-3 | 5 | 0 | 0 | 0.605755 | 861 | 61.5 |
| MW-4 | 5.07143 | 0.267261 | 0.0714286 | 0.605755 | 987 | 70.5 |
| MW-5 | 5 | 0 | 0 | 0.605755 | 861 | 61.5 |
| MW-6 | 5 | 0 | 0 | 0.605755 | 861 | 61.5 |
| MW-7 | 5 | 0 | 0 | 0.605755 | 861 | 61.5 |
| MW-8 | 9.00714 | 4.81352 | 4.00714 | 0.605755 | 1482.5 | 105.893 |
| SW-1 | 5 | 0 | 0 | 0.644301 | 676.5 | 61.5 |
| SW-2 | 5 | 0 | 0 | 0.776212 | 369 | 61.5 |
| SW-3 | 5 | 0 | 0 | 0.737302 | 430.5 | 61.5 |

## Analysis of Variance Statistics

| | |
|---|---|
| SS Wells | 198.904 |
| SS Total | 505.611 |

## Kruskal-Wallis Statistics

| | |
|---|---|
| Non-Detect Rank | 61.5 |
| Background Rank Sum | 799.5 |
| Background Rank Mean | 61.5 |
| H Statistic | 15.835 |
| H Adjusted for Ties | 60.4454 |

# Basic Statistics

**Parameter: 1,4-Dichlorobenzene**

| | |
|---|---|
| Total Observations | 135 |
| Total Non-Detects | 113 |
| Pooled Mean | 7.4563 |
| Pooled Std Dev | 6.71188 |
| Background Mean | 5.38462 |
| Background Std Dev | 1.38675 |

## Background Wells

There is 1 background well

| Well | Samples | Non-Detects | % ND | Total |
|---|---|---|---|---|
| MW-1 | 13 | 13 | 100 | 70 |

| Well | Mean | Std Dev | Std Err | Rank Sum | Rank Mean |
|---|---|---|---|---|---|
| MW-1 | 5.38462 | 1.38675 | 0 | 741 | 57 |

## Compliance Wells

There are 10 compliance wells

| Well | Samples | Non-Detects | % ND | Total |
|---|---|---|---|---|
| MW-2 | 14 | 12 | 85.7143 | 80 |
| MW-3 | 14 | 14 | 100 | 75 |
| MW-4 | 14 | 14 | 100 | 75 |
| MW-5 | 14 | 14 | 100 | 75 |
| MW-6 | 14 | 3 | 21.4286 | 141.6 |
| MW-7 | 14 | 14 | 100 | 75 |
| MW-8 | 14 | 5 | 35.7143 | 295 |
| SW-1 | 11 | 11 | 100 | 55 |
| SW-2 | 6 | 6 | 100 | 30 |
| SW-3 | 7 | 7 | 100 | 35 |

| Well | Mean | Std Dev | Dif From Bkg | Std Err | Rank Sum | Rank Mean |
|---|---|---|---|---|---|---|
| MW-2 | 5.71429 | 1.54066 | 0.32967 | 1.8474 | 917 | 65.5 |
| MW-3 | 5.35714 | 1.33631 | -0.0274725 | 1.8474 | 798 | 57 |
| MW-4 | 5.35714 | 1.33631 | -0.0274725 | 1.8474 | 798 | 57 |
| MW-5 | 5.35714 | 1.33631 | -0.0274725 | 1.8474 | 798 | 57 |
| MW-6 | 10.1143 | 5.22521 | 4.72967 | 1.8474 | 1501 | 107.214 |
| MW-7 | 5.35714 | 1.33631 | -0.0274725 | 1.8474 | 798 | 57 |
| MW-8 | 21.0714 | 13.4477 | 15.6868 | 1.8474 | 1461 | 104.357 |
| SW-1 | 5 | 0 | -0.384615 | 1.96495 | 627 | 57 |
| SW-2 | 5 | 0 | -0.384615 | 2.36725 | 342 | 57 |
| SW-3 | 5 | 0 | -0.384615 | 2.24858 | 399 | 57 |

## Analysis of Variance Statistics

| | |
|---|---|
| SS Wells | 3183.96 |
| SS Total | 6036.61 |

## Kruskal-Wallis Statistics

| | |
|---|---|
| Non-Detect Rank | 57 |
| Background Rank Sum | 741 |
| Background Rank Mean | 57 |
| H Statistic | 33.5784 |
| H Adjusted for Ties | 81.1936 |

# Basic Statistics

**Parameter: Chlorobenzene**

| | |
|---|---|
| Total Observations | 135 |
| Total Non-Detects | 100 |
| Pooled Mean | 9.52593 |
| Pooled Std Dev | 9.6277 |
| Background Mean | 5 |
| Background Std Dev | 0 |

## Background Wells

There is 1 background well

| Well | Samples | Non-Detects | % ND | Total |
|---|---|---|---|---|
| MW-1 | 13 | 13 | 100 | 65 |

| Well | Mean | Std Dev | Std Err | Rank Sum | Rank Mean |
|---|---|---|---|---|---|
| MW-1 | 5 | 0 | 0 | 656.5 | 50.5 |

## Compliance Wells

There are 10 compliance wells

| Well | Samples | Non-Detects | % ND | Total |
|---|---|---|---|---|
| MW-2 | 14 | 2 | 14.2857 | 317 |
| MW-3 | 14 | 14 | 100 | 70 |
| MW-4 | 14 | 14 | 100 | 70 |
| MW-5 | 14 | 14 | 100 | 70 |
| MW-6 | 14 | 5 | 35.7143 | 98 |
| MW-7 | 14 | 14 | 100 | 70 |
| MW-8 | 14 | 0 | 0 | 406 |
| SW-1 | 11 | 11 | 100 | 55 |
| SW-2 | 6 | 6 | 100 | 30 |
| SW-3 | 7 | 7 | 100 | 35 |

| Well | Mean | Std Dev | Dif From Bkg | Std Err | Rank Sum | Rank Mean |
|---|---|---|---|---|---|---|
| MW-2 | 22.6429 | 8.88046 | 17.6429 | 1.80007 | 1554 | 111 |
| MW-3 | 5 | 0 | 0 | 1.80007 | 707 | 50.5 |
| MW-4 | 5 | 0 | 0 | 1.80007 | 707 | 50.5 |
| MW-5 | 5 | 0 | 0 | 1.80007 | 707 | 50.5 |
| MW-6 | 7 | 2.23882 | 2 | 1.80007 | 1197.5 | 85.5357 |
| MW-7 | 5 | 0 | 0 | 1.80007 | 707 | 50.5 |
| MW-8 | 29 | 11.1562 | 24 | 1.80007 | 1732 | 123.714 |
| SW-1 | 5 | 0 | 0 | 1.91461 | 555.5 | 50.5 |
| SW-2 | 5 | 0 | 0 | 2.3066 | 303 | 50.5 |
| SW-3 | 5 | 0 | 0 | 2.19098 | 353.5 | 50.5 |

## Analysis of Variance Statistics

| | |
|---|---|
| SS Wells | 9712.44 |
| SS Total | 12420.8 |

## Kruskal-Wallis Statistics

| | |
|---|---|
| Non-Detect Rank | 50.5 |
| Background Rank Sum | 656.5 |
| Background Rank Mean | 50.5 |
| H Statistic | 66.7512 |
| H Adjusted for Ties | 112.456 |

# Basic Statistics

**Parameter: Xylene**

| | |
|---|---|
| Total Observations | 135 |
| Total Non-Detects | 121 |
| Pooled Mean | 13.6222 |
| Pooled Std Dev | 28.682 |
| Background Mean | 5 |
| Background Std Dev | 0 |

## Background Wells

There is 1 background well

| Well | Samples | Non-Detects | % ND | Total |
|---|---|---|---|---|
| MW-1 | 13 | 13 | 100 | 65 |

| Well | Mean | Std Dev | Std Err | Rank Sum | Rank Mean |
|---|---|---|---|---|---|
| MW-1 | 5 | 0 | 0 | 793 | 61 |

## Compliance Wells

There are 10 compliance wells

| Well | Samples | Non-Detects | % ND | Total |
|---|---|---|---|---|
| MW-2 | 14 | 14 | 100 | 70 |
| MW-3 | 14 | 14 | 100 | 70 |
| MW-4 | 14 | 14 | 100 | 70 |
| MW-5 | 14 | 14 | 100 | 70 |
| MW-6 | 14 | 0 | 0 | 1234 |
| MW-7 | 14 | 14 | 100 | 70 |
| MW-8 | 14 | 14 | 100 | 70 |
| SW-1 | 11 | 11 | 100 | 55 |
| SW-2 | 6 | 6 | 100 | 30 |
| SW-3 | 7 | 7 | 100 | 35 |

| Well | Mean | Std Dev | Dif From Bkg | Std Err | Rank Sum | Rank Mean |
|---|---|---|---|---|---|---|
| MW-2 | 5 | 0 | 0 | 5.30165 | 854 | 61 |
| MW-3 | 5 | 0 | 0 | 5.30165 | 854 | 61 |
| MW-4 | 5 | 0 | 0 | 5.30165 | 854 | 61 |
| MW-5 | 5 | 0 | 0 | 5.30165 | 854 | 61 |
| MW-6 | 88.1429 | 42.5113 | 83.1429 | 5.30165 | 1799 | 128.5 |
| MW-7 | 5 | 0 | 0 | 5.30165 | 854 | 61 |
| MW-8 | 5 | 0 | 0 | 5.30165 | 854 | 61 |
| SW-1 | 5 | 0 | 0 | 5.63901 | 671 | 61 |
| SW-2 | 5 | 0 | 0 | 6.79351 | 366 | 61 |
| SW-3 | 5 | 0 | 0 | 6.45296 | 427 | 61 |

## Analysis of Variance Statistics

| | |
|---|---|
| SS Wells | 86742 |
| SS Total | 110236 |

## Kruskal-Wallis Statistics

| | |
|---|---|
| Non-Detect Rank | 61 |
| Background Rank Sum | 793 |
| Background Rank Mean | 61 |
| H Statistic | 37.3676 |
| H Adjusted for Ties | 133.469 |

**Summary of Upper Limits for Detected Constituents (Inter-Well Comparison)**
**Wayne County Closed Sanitary Landfill (Dudley)**

| Constituent | % ND | Normality | Method | ND Adjustment | Upper Limit (95%) | Unit | Well | Result |
|---|---|---|---|---|---|---|---|---|
| Chromium | 100.00 | – | Poisson Prediction Interval | zero | 0.268767 | detections per scan | MW-8 | 1 |
| Lead | 100.00 | – | Poisson Prediction Interval | zero | 0.268767 | detections per scan | MW-8 | 1 |
| Mercury | 100.00 | – | Poisson Prediction Interval | zero | 0.676737 | detections per scan | MW-8 | 1 |
| Vanadium | 100.00 | – | Poisson Prediction Interval | zero | 0.268767 | detections per scan | MW-8 | 1 |
| Zinc | 83.33 | – | Non-Parametric Tolerance Interval | – | 0.243 | mg/l | MW-4 | 0.069 |
| 1,1-Dichloroethane | 100.00 | – | Poisson Prediction Interval | zero | 0.24435 | detections per scan | MW-2 | 1 |
| 1,4-Dichlorobenzene | 100.00 | – | Poisson Prediction Interval | zero | 0.24435 | detections per scan | MW-6 | 1 |
| | | | | | | | MW-8 | 1 |
| Chlorobenzene | 100.00 | – | Poisson Prediction Interval | zero | 0.24435 | detections per scan | MW-2 | 1 |
| | | | | | | | MW-6 | 1 |
| | | | | | | | MW-8 | 1 |
| Xylene | 100.00 | – | Poisson Prediction Interval | zero | 0.24435 | detections per scan | MW-6 | 1 |

**Summary of Detections and Statistical Significance by Inter-Well Comparison**
**Wayne County Closed Sanitary Landfill (Dudley)**

**Detected Constituents**

| | Constituent | MW-2 | MW-4 | MW-6 | MW-8 |
|---|---|---|---|---|---|
| Inorganic (mg/l) | Chromium | | | | 0.101 |
| | Lead | | | | 0.019 |
| | Mercury | | | | 0.0013 |
| | Vanadium | | | | 0.13 |
| | Zinc | | 0.069 | | |
| VOC (ug/l) | 1,1-Dichloroethane | 7.2 | | | |
| | 1,4-Dichlorobenzene | | | 12 | 32 |
| | Chlorobenzene | 25 | | 9.7 | 18 |
| | Xylenes | | | 96 | |

**Statistical Significance against Background Level**

| | Constituent | MW-2 | MW-4 | MW-6 | MW-8 |
|---|---|---|---|---|---|
| Inorganic | Chromium | | | | yes |
| | Lead | | | | yes |
| | Mercury | | | | yes |
| | Vanadium | | | | yes |
| | Zinc | | no | | |
| VOC | 1,1-Dichloroethane | yes | | | |
| | 1,4-Dichlorobenzene | | | yes | yes |
| | Chlorobenzene | yes | | yes | yes |
| | Xylenes | | | yes | |

* Confidence levels for all comparions are fixed at 95%.

## Summary of Background VOC Detections (MW-1)

| Constituent | Samples | NDs | % NDs |
|---|---|---|---|
| 1,1,1,2-Tetrachloroethane | 13 | 13 | 100.00 |
| 1,1,1-Trichloroethane | 13 | 13 | 100.00 |
| 1,1,2,2-Tetrachloroethane | 13 | 13 | 100.00 |
| 1,1,2-Trichloroethane | 13 | 13 | 100.00 |
| 1,1-Dichloroethane | 13 | 13 | 100.00 |
| 1,1-Dichloroethene | 13 | 13 | 100.00 |
| 1,2,3-Trichloropropane | 13 | 13 | 100.00 |
| 1,2-Dibromo-3-chloropropane | 13 | 13 | 100.00 |
| 1,2-Dibromoethane | 13 | 13 | 100.00 |
| 1,2-Dichlorobenzene | 13 | 13 | 100.00 |
| 1,2-Dichloroethane | 13 | 13 | 100.00 |
| 1,2-Dichloropropane | 13 | 13 | 100.00 |
| 1,4-Dichlorobenzene | 13 | 13 | 100.00 |
| 2-Butanone | 13 | 13 | 100.00 |
| 2-Hexanone | 13 | 13 | 100.00 |
| Methylisobutylketone | 13 | 13 | 100.00 |
| Acetone | 13 | 13 | 100.00 |
| Acrylonitrile | 13 | 13 | 100.00 |
| Benzene | 13 | 13 | 100.00 |
| Bromochloromethane | 13 | 13 | 100.00 |
| Bromodichloromethane | 13 | 13 | 100.00 |
| Bromoform | 13 | 13 | 100.00 |
| Bromomethane | 13 | 13 | 100.00 |
| Carbon disulfide | 13 | 13 | 100.00 |
| Carbon tetrachloride | 13 | 13 | 100.00 |
| Chlorobenzene | 13 | 13 | 100.00 |
| Chloroethane | 13 | 13 | 100.00 |
| Chloroform | 13 | 13 | 100.00 |
| Chloromethane | 13 | 13 | 100.00 |
| cis-1,2-Dichloroethene | 13 | 13 | 100.00 |
| cis-1,3-Dichloropropene | 13 | 13 | 100.00 |
| Chlorodibromomethane | 13 | 13 | 100.00 |
| Dibromomethane | 12 | 12 | 100.00 |
| Ethylbenzene | 13 | 13 | 100.00 |
| Iodomethane | 13 | 13 | 100.00 |
| Dichloromethane | 13 | 13 | 100.00 |
| Styrene | 13 | 13 | 100.00 |
| Tetrachloroethylene | 13 | 13 | 100.00 |
| Toluene | 13 | 13 | 100.00 |
| trans-1,2-Dichloroethene | 13 | 13 | 100.00 |
| trans-1,3-Dichloropropene | 13 | 13 | 100.00 |
| trans-1,4-Dichloro-2-butene | 13 | 13 | 100.00 |
| Trichloroethylene | 13 | 13 | 100.00 |
| Trichlorofluoromethane | 13 | 13 | 100.00 |
| Vinyl acetate | 13 | 13 | 100.00 |
| Vinyl chloride | 13 | 13 | 100.00 |
| Xylene | 13 | 13 | 100.00 |
| **Total** | **610** | **610** | **100.00** |

**Poisson Prediction Interval for Pooled VOC Scan**

| Well | Date | 1,1-Dichloroethane | 1,4-Dichlorobenzene | Chlorobenzene | Xylenes | Detection |
|---|---|---|---|---|---|---|
| MW-2 | 8/24/99 | x | | x | | **2.00** |
| MW-3 | 8/24/99 | | | | | 0.00 |
| MW-4 | 8/24/99 | | | | | 0.00 |
| MW-5 | 8/24/99 | | | | | 0.00 |
| MW-6 | 8/24/99 | | x | x | x | **3.00** |
| MW-7 | 8/24/99 | | | | | 0.00 |
| MW-8 | 8/24/99 | | x | x | | **2.00** |
| SW-1 | 8/24/99 | | | | | 0.00 |
| SW-2 | 8/24/99 | | | | | 0.00 |
| SW-3 | 8/24/99 | | | | | 0.00 |

| | |
|---|---|
| Total number of sampling events [n] = | 13 |
| Total number of detections in background wells [y] = | 0 |
| Number of comparisons [k] = | 11 |
| One-sided value of Student's t-statistic (95% confidence) [t] = | 3.11 |
| Expected number of detections in a single future sample [y*] = | **0.74** |

**evidence of possible contamination in MW-2, MW-6, and MW-8 at 95% level of confidence**

# Wilcoxon Rank-Sum Non-Parametric Test (Intra-Well)

**Parameter: Chromium, total**
**Well: MW-8**

Total non detects is 5
Non detect rank is 3

## Wilcoxon Ranks

| Group | Date | Result | Rank |
|---|---|---|---|
| Baseline Values | 9/8/1994 | 15 | 6 |
| | 10/20/1994 | ND<10 | 3 |
| | 1/5/1995 | ND<10 | 3 |
| | 3/23/1995 | ND<10 | 3 |
| Comparison Values | 7/18/1995 | 17 | 7 |
| | 2/20/1996 | 25 | 8 |
| | 8/29/1996 | 72 | 12 |
| | 2/4/1997 | ND<10 | 3 |
| | 8/27/1997 | 38 | 10 |
| | 2/11/1998 | 33 | 9 |
| | 9/2/1998 | 38 | 11 |
| | 2/22/1999 | ND<10 | 3 |
| | 8/24/1999 | 101 | 13 |

The Wilcoxon Statistic is 31
The Expected value is is 18
The Standard Deviation is 6.48074
The Z Score is 1.92879
The Standard Deviation adjusted for ties is 6.48074
The Z Score adjusted for ties is 1.92879
1.92879 < 2.326 indicating no contamination at 1% significance level
1.98407 < 2.326 indicating no contamination at 1% significance level when adjusted for ties

# Wilcoxon Rank-Sum Non-Parametric Test (Intra-Well)

**Parameter: Lead, total**
**Well: MW-8**

Total non detects is 5
Non detect rank is 3

## Wilcoxon Ranks

| Group | Date | Result | Rank |
|---|---|---|---|
| Baseline Values | 9/8/1994 | 147 | 13 |
| | 10/20/1994 | ND<10 | 3 |
| | 1/5/1995 | ND<10 | 3 |
| | 3/23/1995 | ND<10 | 3 |
| Comparison Values | 7/18/1995 | 12 | 7 |
| | 2/20/1996 | 12 | 8 |
| | 8/29/1996 | 29 | 12 |
| | 2/4/1997 | ND<10 | 3 |
| | 8/27/1997 | 25 | 11 |
| | 2/11/1998 | 14 | 9 |
| | 9/2/1998 | 11 | 6 |
| | 2/22/1999 | ND<10 | 3 |
| | 8/24/1999 | 19 | 10 |

The Wilcoxon Statistic is 24
The Expected value is is 18
The Standard Deviation is 6.48074
The Z Score is 0.848668
The Standard Deviation adjusted for ties is 6.48074
The Z Score adjusted for ties is 0.848668
0.848668 < 2.326 indicating no contamination at 1% significance level
0.87299 < 2.326 indicating no contamination at 1% significance level when adjusted for ties

# Wilcoxon Rank-Sum Non-Parametric Test (Intra-Well)

**Parameter: Mercury**
**Well: MW-8**

Total non detects is 4
Non detect rank is 2.5

## Wilcoxon Ranks

| Group | Date | Result | Rank |
|---|---|---|---|
| Baseline Values | 7/18/1995 | 3.7 | 7 |
| | 2/20/1996 | 8.5 | 8 |
| | 3/12/1998 | ND<0.5 | 2.5 |
| | 9/2/1998 | ND<0.5 | 2.5 |
| Comparison Values | 10/29/1998 | ND<0.5 | 2.5 |
| | 12/2/1998 | 1 | 5 |
| | 2/22/1999 | ND<0.5 | 2.5 |
| | 8/24/1999 | 1.3 | 6 |

The Wilcoxon Statistic is 6
The Expected value is is 8
The Standard Deviation is 3.4641
The Z Score is -0.721688
The Standard Deviation adjusted for ties is 3.4641
The Z Score adjusted for ties is -0.721688
-0.721688 < 2.326 indicating no contamination at 1% significance level
-0.768906 < 2.326 indicating no contamination at 1% significance level when adjusted for ties

# Wilcoxon Rank-Sum Non-Parametric Test (Intra-Well)

**Parameter: Vanadium**
**Well: MW-8**

Total non detects is 11
Non detect rank is 6

## Wilcoxon Ranks

| Group | Date | Result | Rank |
|---|---|---|---|
| Baseline Values | 9/8/1994 | ND<40 | 6 |
| | 10/20/1994 | ND<40 | 6 |
| | 1/5/1995 | ND<40 | 6 |
| | 3/23/1995 | ND<40 | 6 |
| Comparison Values | 7/18/1995 | ND<40 | 6 |
| | 2/20/1996 | ND<40 | 6 |
| | 8/29/1996 | 45 | 12 |
| | 2/4/1997 | ND<40 | 6 |
| | 8/27/1997 | ND<40 | 6 |
| | 2/11/1998 | ND<40 | 6 |
| | 9/2/1998 | ND<40 | 6 |
| | 2/22/1999 | ND<40 | 6 |
| | 8/24/1999 | 130 | 13 |

The Wilcoxon Statistic is 22
The Expected value is is 18
The Standard Deviation is 6.48074
The Z Score is 0.540062
The Standard Deviation adjusted for ties is 6.48074
The Z Score adjusted for ties is 0.540062
0.540062 < 2.326 indicating no contamination at 1% significance level
0.858643 < 2.326 indicating no contamination at 1% significance level when adjusted for ties

# Wilcoxon Rank-Sum Non-Parametric Test (Intra-Well)

**Parameter: 1,1-Dichloroethane**
**Well: MW-2**

Total non detects is 12
Non detect rank is 6.5

## Wilcoxon Ranks

| Group | Date | Result | Rank |
|---|---|---|---|
| Baseline Values | 9/8/1994 | ND<5 | 6.5 |
| | 10/20/1994 | ND<5 | 6.5 |
| | 1/5/1995 | ND<5 | 6.5 |
| | 3/23/1995 | ND<5 | 6.5 |
| Comparison Values | 7/18/1995 | ND<5 | 6.5 |
| | 2/20/1996 | ND<5 | 6.5 |
| | 8/29/1996 | ND<5 | 6.5 |
| | 2/4/1997 | ND<5 | 6.5 |
| | 8/27/1997 | ND<5 | 6.5 |
| | 2/11/1998 | ND<5 | 6.5 |
| | 3/12/1998 | 5.5 | 13 |
| | 9/2/1998 | ND<5 | 6.5 |
| | 2/22/1999 | ND<5 | 6.5 |
| | 8/24/1999 | 7.2 | 14 |

The Wilcoxon Statistic is 24
The Expected value is is 20
The Standard Deviation is 7.07107
The Z Score is 0.494975
The Standard Deviation adjusted for ties is 7.07107
The Z Score adjusted for ties is 0.494975
0.494975 < 2.326 indicating no contamination at 1% significance level
0.812167 < 2.326 indicating no contamination at 1% significance level when adjusted for ties

# Wilcoxon Rank-Sum Non-Parametric Test (Intra-Well)

**Parameter: 1,4-Dichlorobenzene**
**Well: MW-6**

Total non detects is 3
Non detect rank is 2

## Wilcoxon Ranks

| Group | Date | Result | Rank |
|---|---|---|---|
| Baseline Values | 9/8/1994 | 16 | 13 |
| | 10/20/1994 | 11 | 10 |
| | 1/5/1995 | 8 | 7 |
| | 3/23/1995 | 10 | 9 |
| Comparison Values | 7/18/1995 | 25 | 14 |
| | 2/20/1996 | ND<5 | 2 |
| | 8/29/1996 | 8 | 8 |
| | 2/4/1997 | ND<5 | 2 |
| | 8/27/1997 | 11 | 11 |
| | 2/11/1998 | 6.2 | 4 |
| | 3/12/1998 | 7.2 | 5 |
| | 9/2/1998 | 7.2 | 6 |
| | 2/22/1999 | ND<10 | 2 |
| | 8/24/1999 | 12 | 12 |

The Wilcoxon Statistic is 11
The Expected value is is 20
The Standard Deviation is 7.07107
The Z Score is -1.3435
The Standard Deviation adjusted for ties is 7.07107
The Z Score adjusted for ties is -1.3435
-1.3435 < 2.326 indicating no contamination at 1% significance level
-1.34945 < 2.326 indicating no contamination at 1% significance level when adjusted for ties

# Wilcoxon Rank-Sum Non-Parametric Test (Intra-Well)

**Parameter: 1,4-Dichlorobenzene**
**Well: MW-8**

Total non detects is 5
Non detect rank is 3

## Wilcoxon Ranks

| Group | Date | Result | Rank |
|---|---|---|---|
| Baseline Values | 9/8/1994 | 24 | 8 |
| | 10/20/1994 | ND<5 | 3 |
| | 1/5/1995 | 16 | 6 |
| | 3/23/1995 | 29 | 9 |
| Comparison Values | 7/18/1995 | 45 | 14 |
| | 2/20/1996 | ND<5 | 3 |
| | 8/29/1996 | ND<5 | 3 |
| | 2/4/1997 | ND<5 | 3 |
| | 8/27/1997 | 32 | 10 |
| | 2/11/1998 | 34 | 13 |
| | 3/12/1998 | 32 | 11 |
| | 9/2/1998 | 21 | 7 |
| | 2/22/1999 | ND<10 | 3 |
| | 8/24/1999 | 32 | 12 |

The Wilcoxon Statistic is 24
The Expected value is is 20
The Standard Deviation is 7.07107
The Z Score is 0.494975
The Standard Deviation adjusted for ties is 7.07107
The Z Score adjusted for ties is 0.494975
0.494975 < 2.326 indicating no contamination at 1% significance level
0.506226 < 2.326 indicating no contamination at 1% significance level when adjusted for ties

# Wilcoxon Rank-Sum Non-Parametric Test (Intra-Well)

**Parameter: Chlorobenzene**
**Well: MW-6**

Total non detects is 5
Non detect rank is 3

## Wilcoxon Ranks

| Group | Date | Result | Rank |
|---|---|---|---|
| Baseline Values | 9/8/1994 | ND<5 | 3 |
| | 10/20/1994 | ND<5 | 3 |
| | 1/5/1995 | ND<5 | 3 |
| | 3/23/1995 | 6 | 7 |
| Comparison Values | 7/18/1995 | 10 | 13 |
| | 2/20/1996 | 6 | 8 |
| | 8/29/1996 | 8 | 10 |
| | 2/4/1997 | 11 | 14 |
| | 8/27/1997 | 9.9 | 12 |
| | 2/11/1998 | ND<5 | 3 |
| | 3/12/1998 | 5.9 | 6 |
| | 9/2/1998 | 6.5 | 9 |
| | 2/22/1999 | ND<5 | 3 |
| | 8/24/1999 | 9.7 | 11 |

The Wilcoxon Statistic is 34
The Expected value is is 20
The Standard Deviation is 7.07107
The Z Score is 1.90919
The Standard Deviation adjusted for ties is 7.07107
The Z Score adjusted for ties is 1.90919
1.90919 < 2.326 indicating no contamination at 1% significance level
1.95258 < 2.326 indicating no contamination at 1% significance level when adjusted for ties

# Wilcoxon Rank-Sum Non-Parametric Test (Intra-Well)

**Parameter: Chlorobenzene**
**Well: MW-8**

Total non detects is 0
Non detect rank is 3

## Wilcoxon Ranks

| Group | Date | Result | Rank |
|---|---|---|---|
| Baseline Values | 9/8/1994 | 40 | 12 |
| | 10/20/1994 | 15 | 1 |
| | 1/5/1995 | 32 | 10 |
| | 3/23/1995 | 40 | 13 |
| Comparison Values | 7/18/1995 | 56 | 14 |
| | 2/20/1996 | 33 | 11 |
| | 8/29/1996 | 24 | 5 |
| | 2/4/1997 | 30 | 9 |
| | 8/27/1997 | 29 | 8 |
| | 2/11/1998 | 28 | 7 |
| | 3/12/1998 | 26 | 6 |
| | 9/2/1998 | 16 | 2 |
| | 2/22/1999 | 19 | 4 |
| | 8/24/1999 | 18 | 3 |

The Wilcoxon Statistic is 14
The Expected value is is 20
The Standard Deviation is 7.07107
The Z Score is -0.919239
The Standard Deviation adjusted for ties is 7.07107
The Z Score adjusted for ties is -0.919239
-0.919239 < 2.326 indicating no contamination at 1% significance level
-0.919239 < 2.326 indicating no contamination at 1% significance level when adjusted for ties

# Wilcoxon Rank-Sum Non-Parametric Test (Intra-Well)

**Parameter: Xylene**
**Well: MW-6**

Total non detects is 0
Non detect rank is 7.5

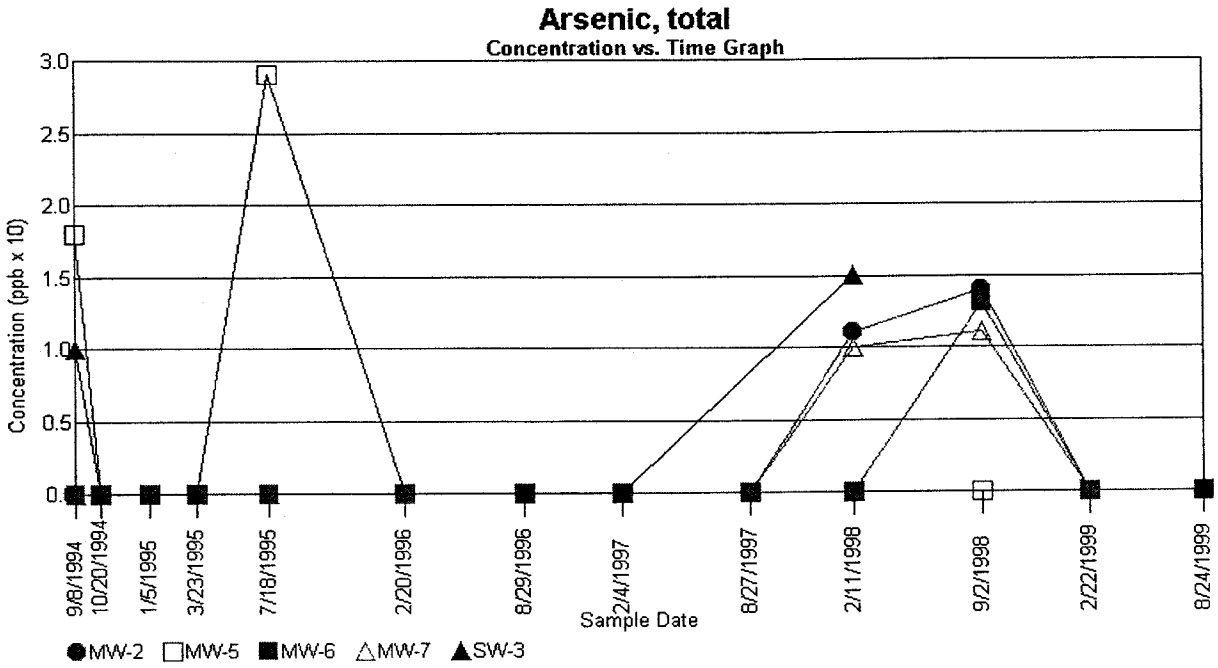
## Wilcoxon Ranks

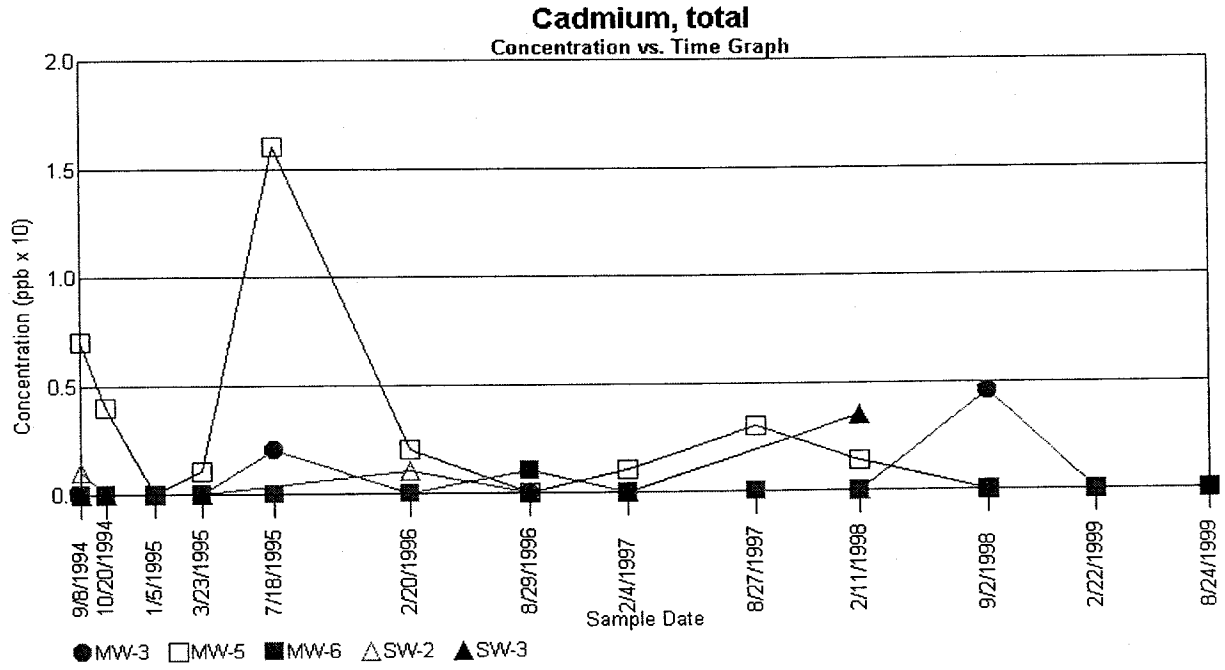
| Group | Date | Result | Rank |
|---|---|---|---|
| Baseline Values | 9/8/1994 | 180 | 14 |
| | 10/20/1994 | 104 | 10 |
| | 1/5/1995 | 47 | 4 |
| | 3/23/1995 | 141 | 13 |
| Comparison Values | 7/18/1995 | 114 | 11 |
| | 2/20/1996 | 52 | 5 |
| | 8/29/1996 | 46 | 3 |
| | 2/4/1997 | 133 | 12 |
| | 8/27/1997 | 78 | 7 |
| | 2/11/1998 | 66 | 6 |
| | 3/12/1998 | 89 | 8 |
| | 9/2/1998 | 43 | 1 |
| | 2/22/1999 | 45 | 2 |
| | 8/24/1999 | 96 | 9 |

The Wilcoxon Statistic is 9
The Expected value is is 20
The Standard Deviation is 7.07107
The Z Score is -1.62635
The Standard Deviation adjusted for ties is 7.07107
The Z Score adjusted for ties is -1.62635
-1.62635 < 2.326 indicating no contamination at 1% significance level
-1.62635 < 2.326 indicating no contamination at 1% significance level when adjusted for ties

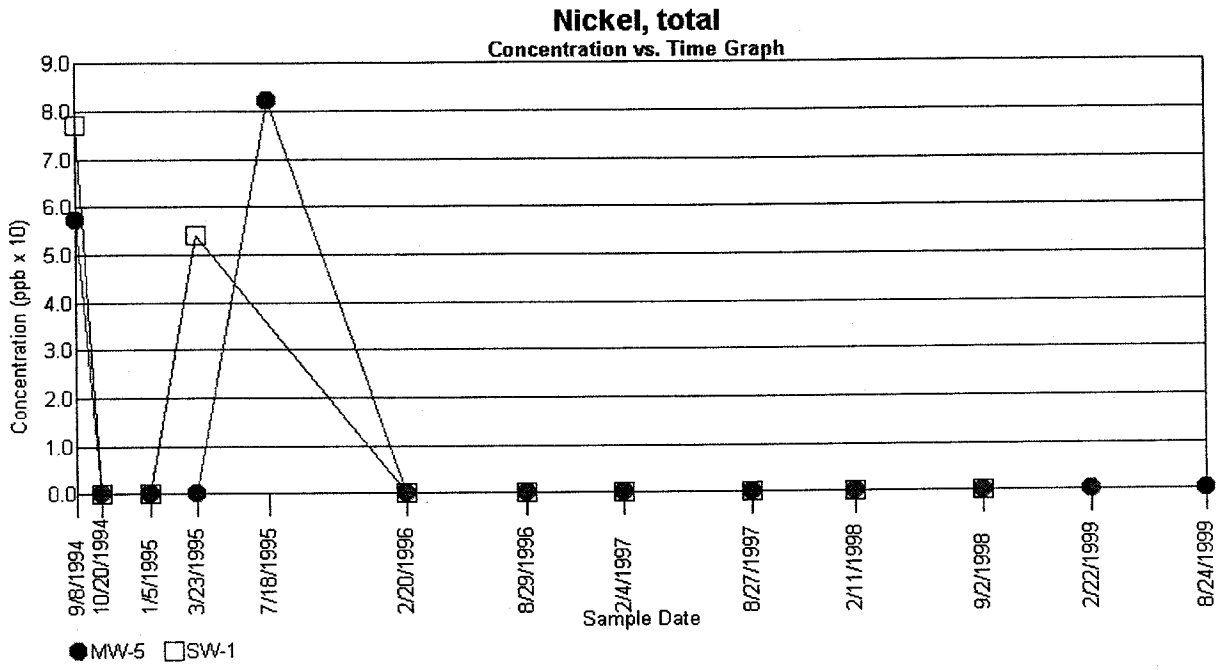
# Time–Series Plots
# and
# Stuwart–CUSUM Plots

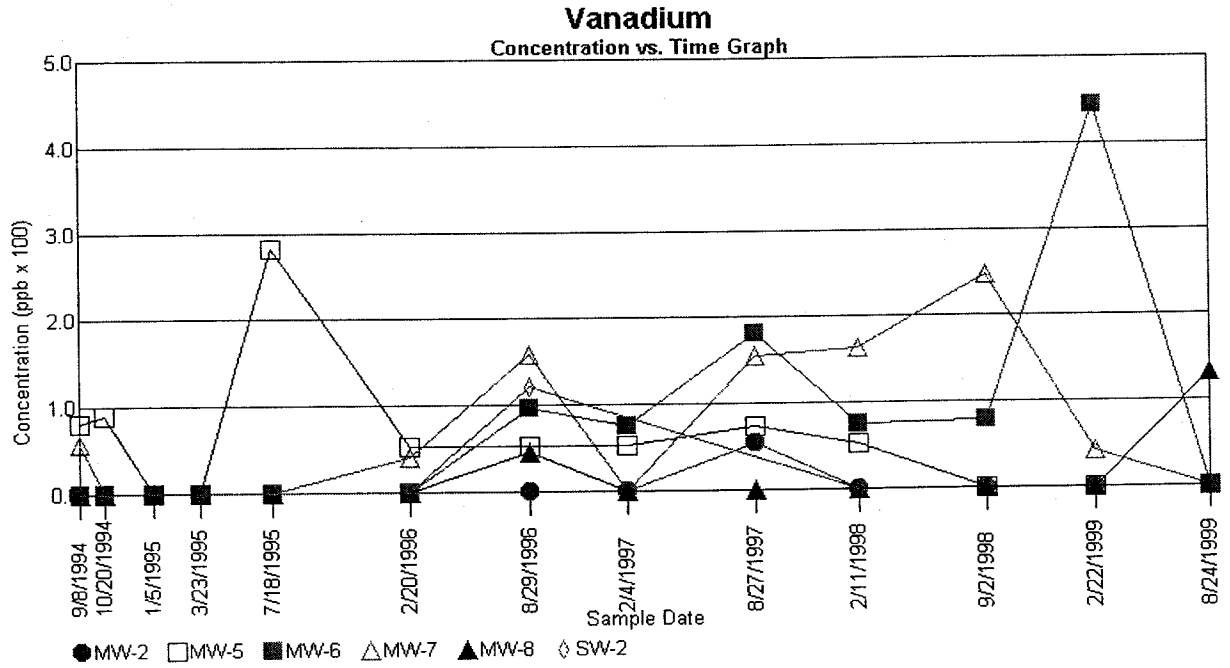
## Time–Series Plots for Major Constituents



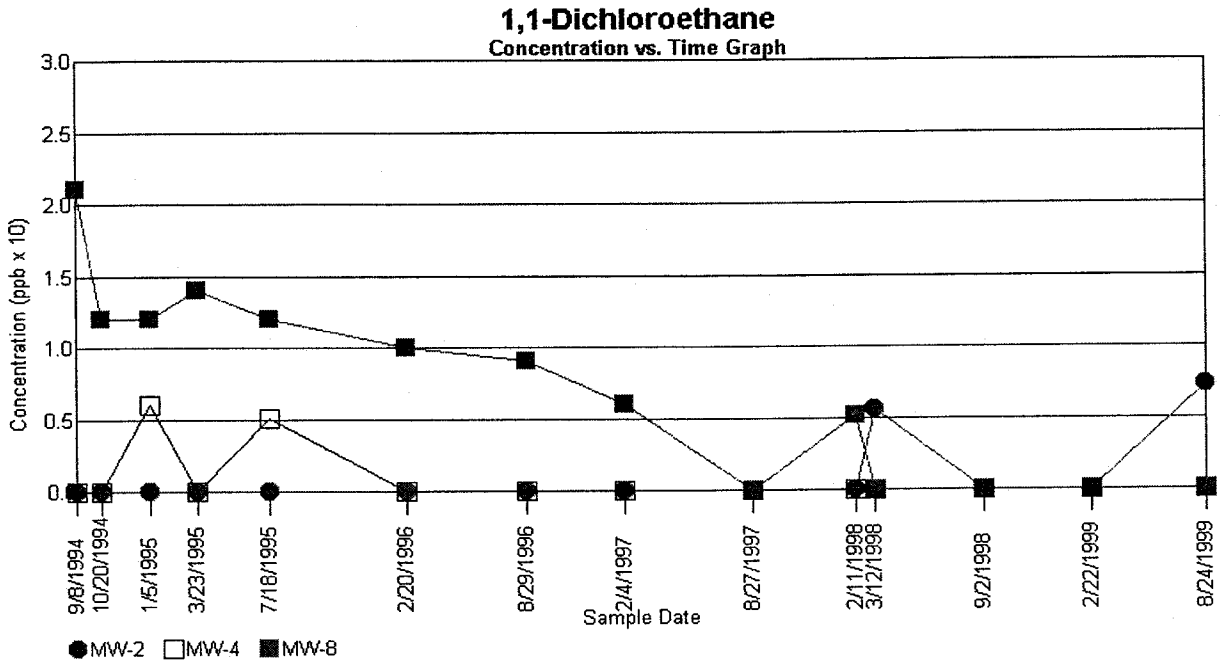



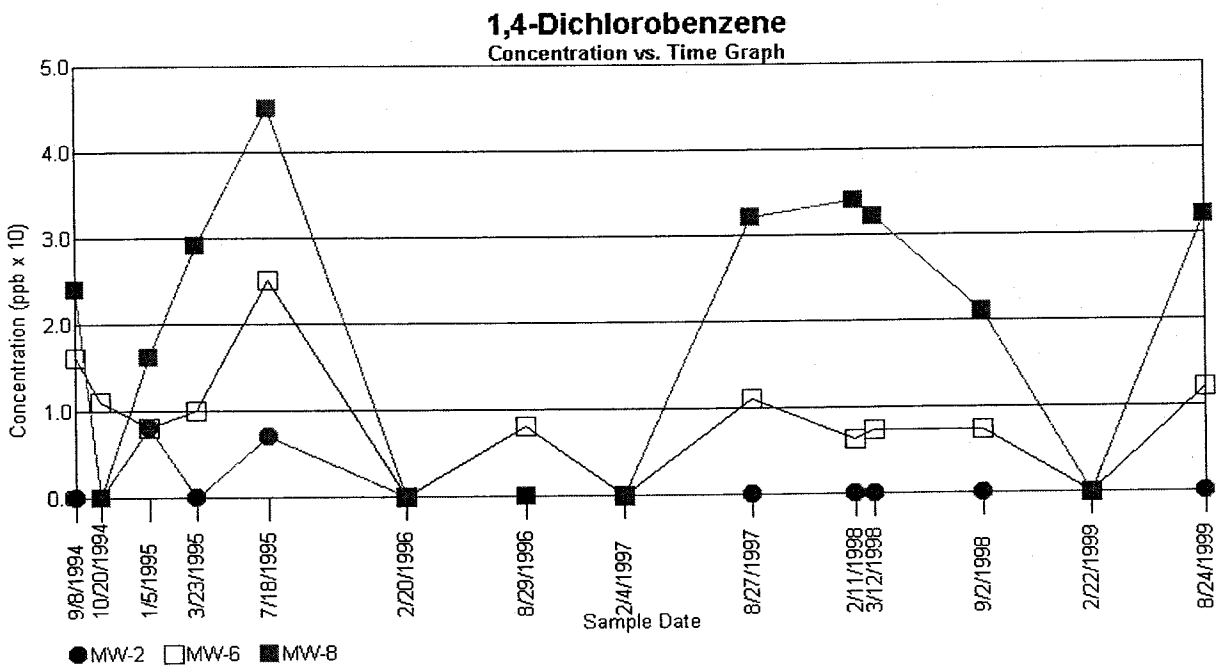
## Time–Series Plots for Major Constituents



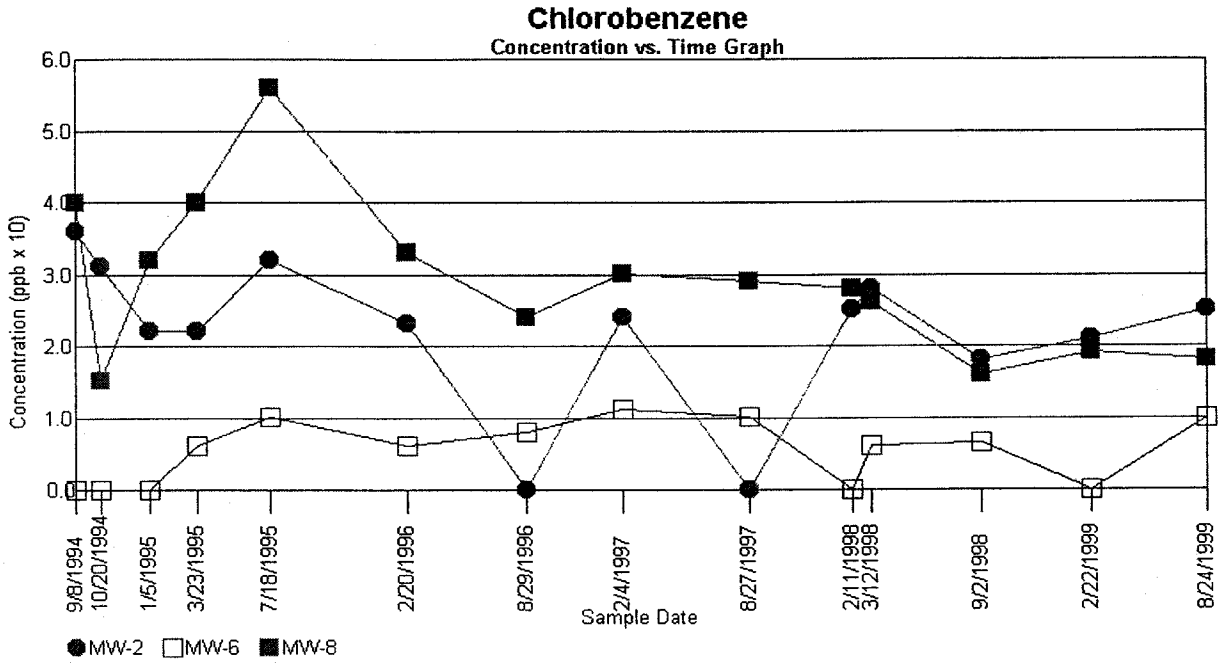



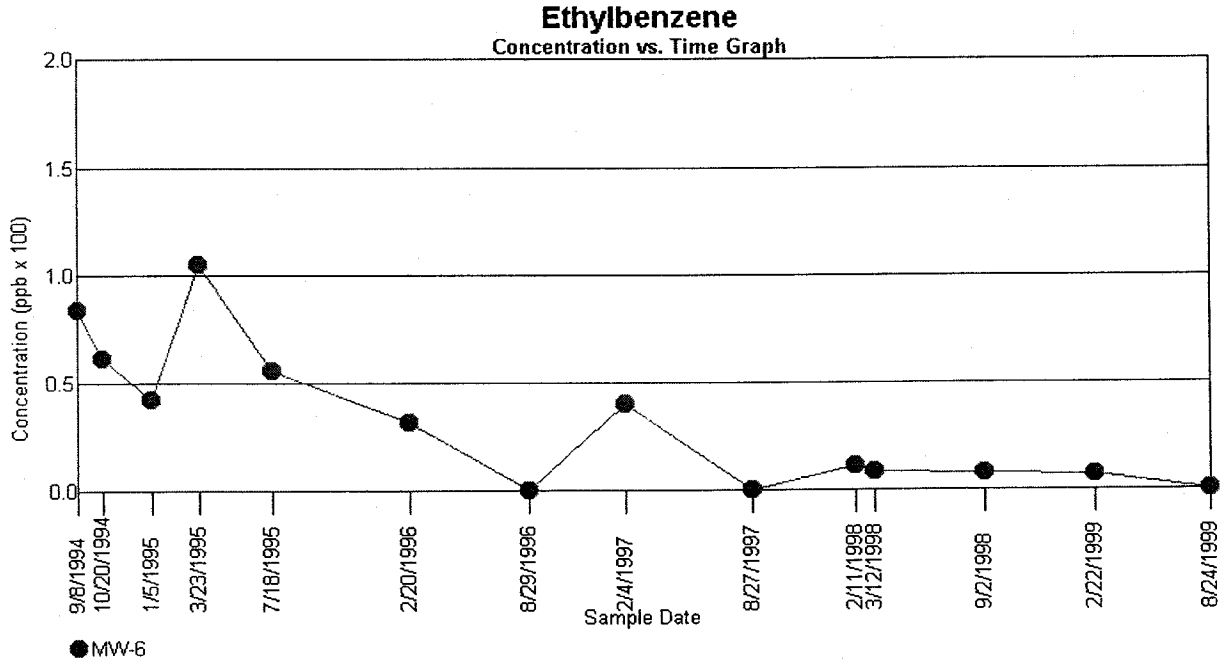
## Time–Series Plots for Major Constituents



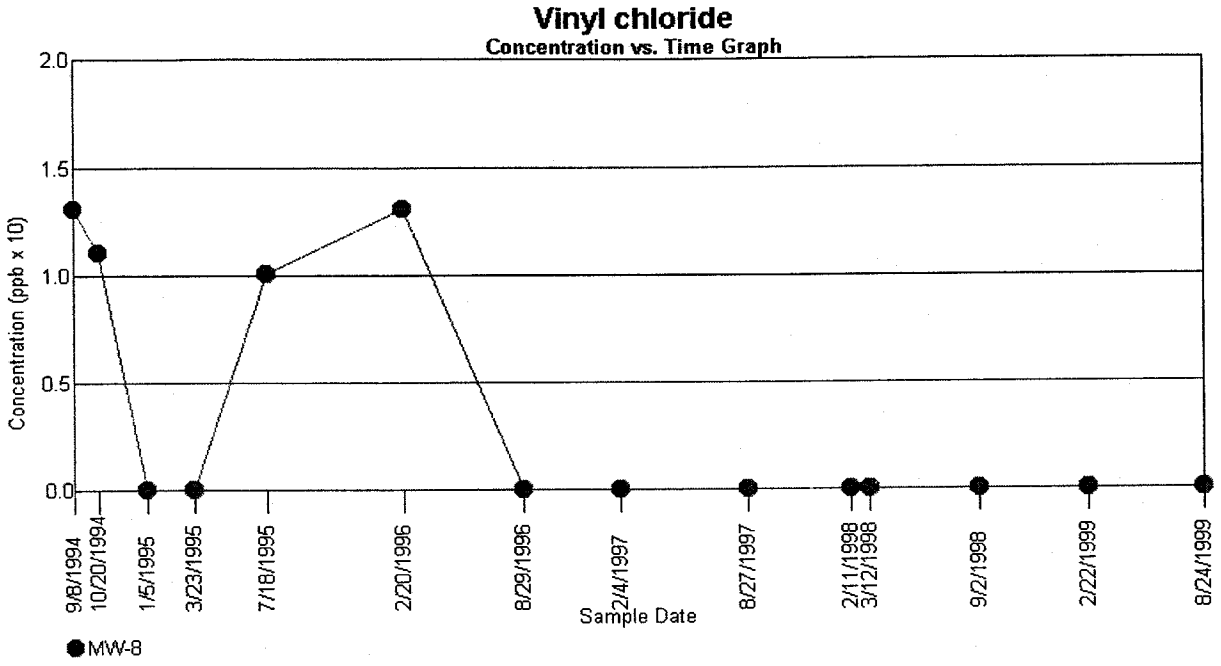



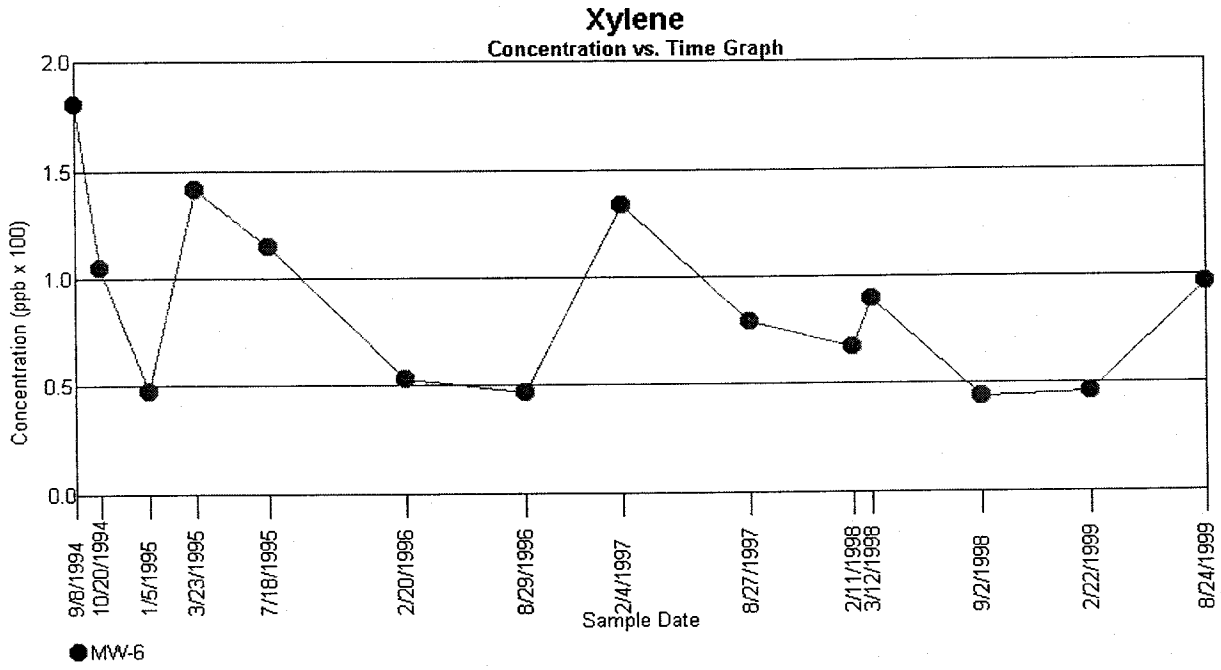
## Time–Series Plots for Major Constituents



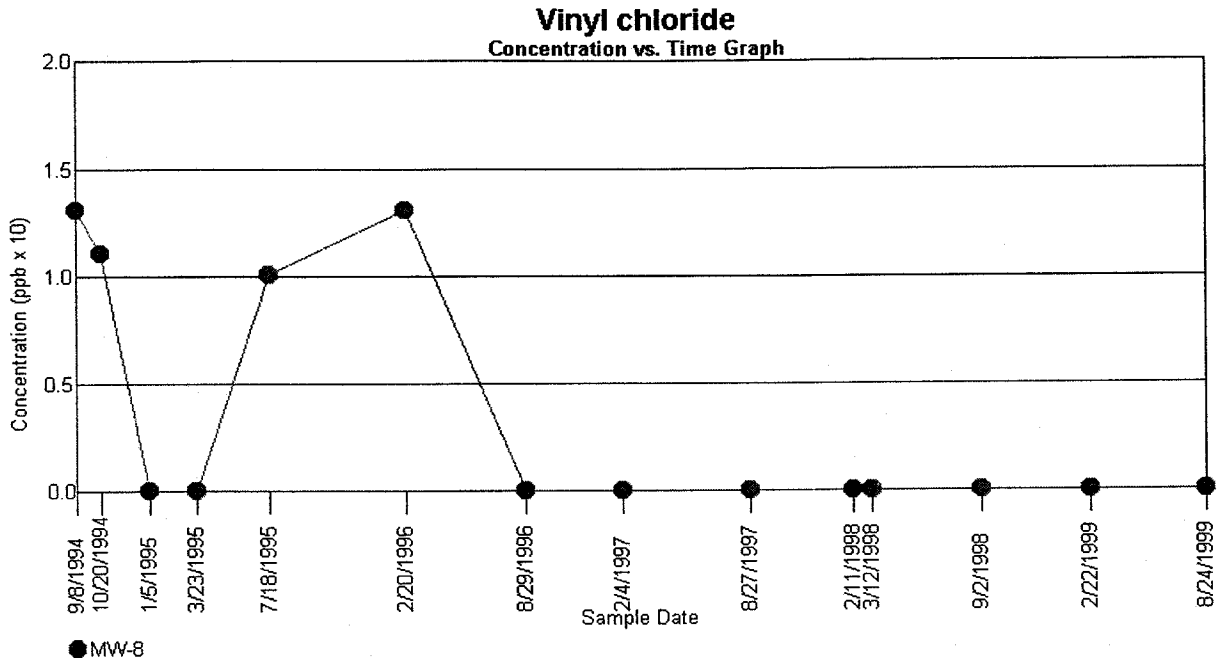



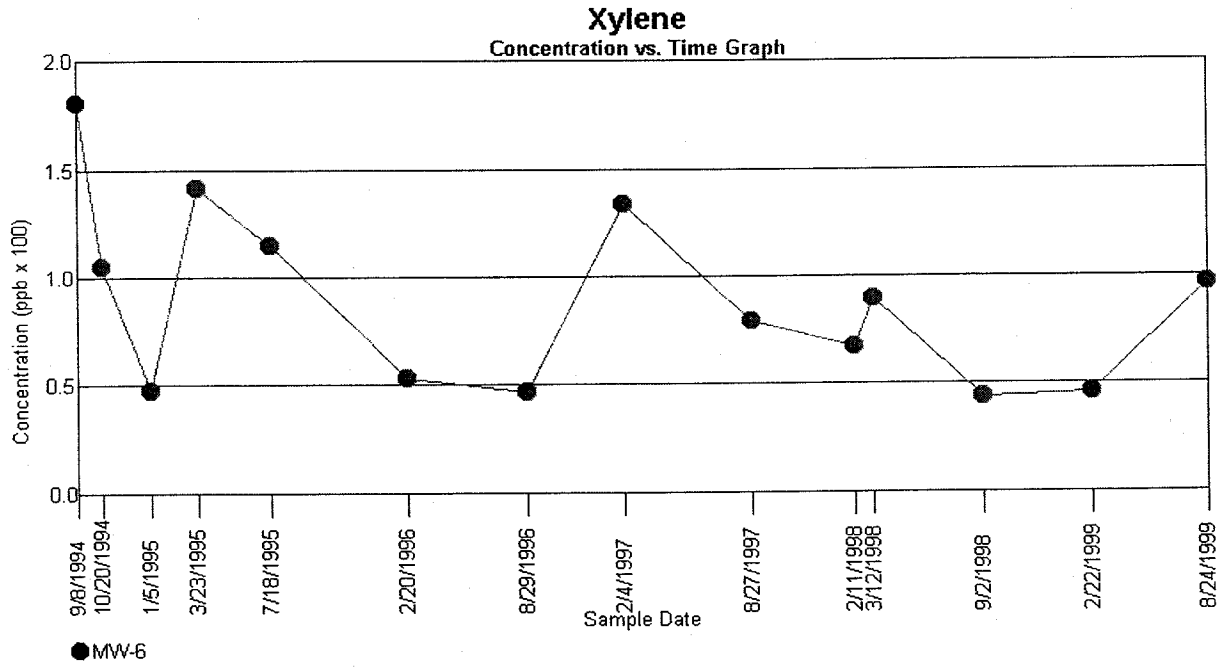
## Time-Series Plots for Major Constituents



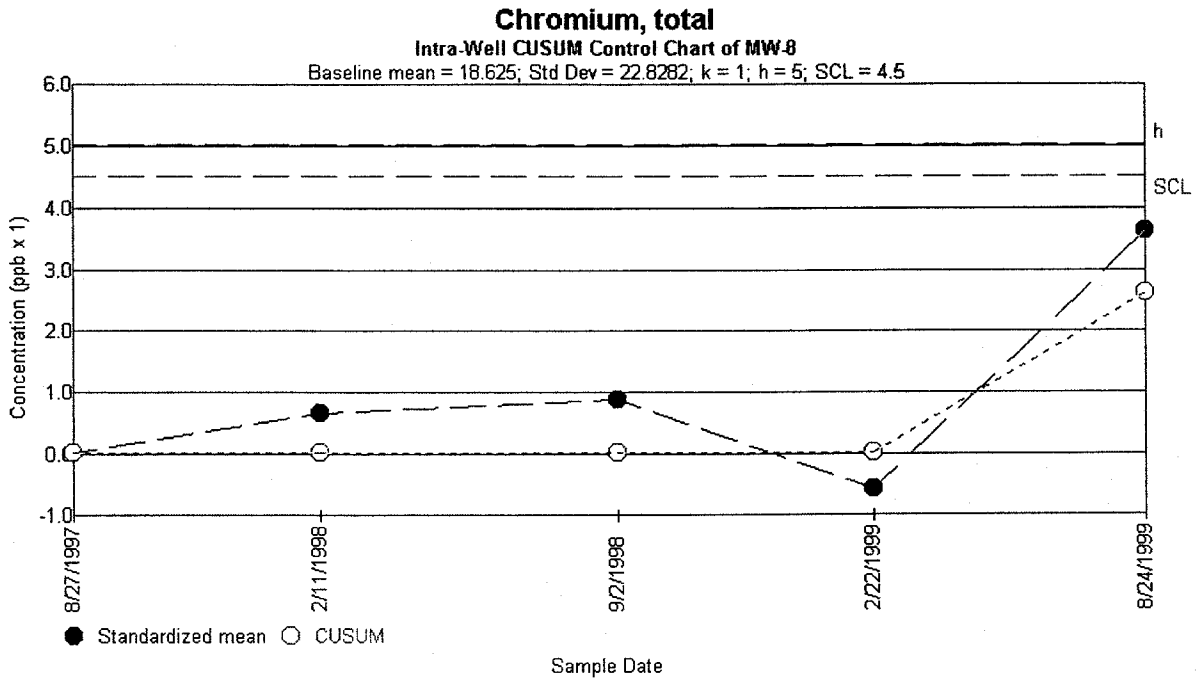



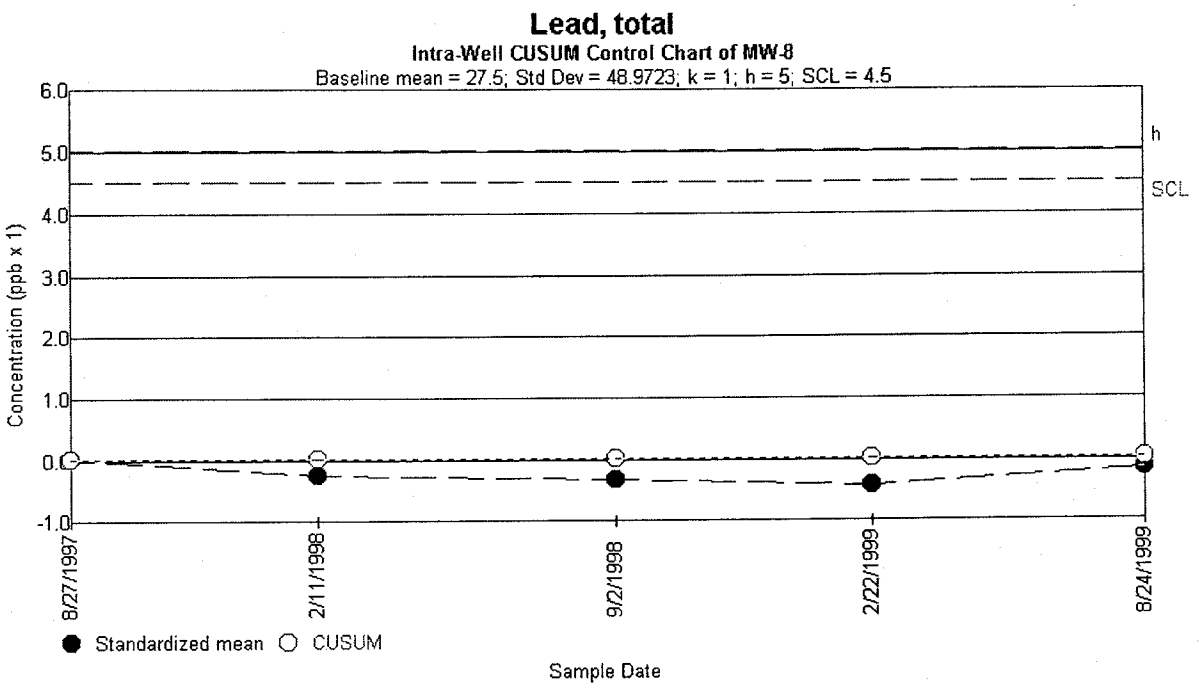
## Time–Series Plots for Major Constituents



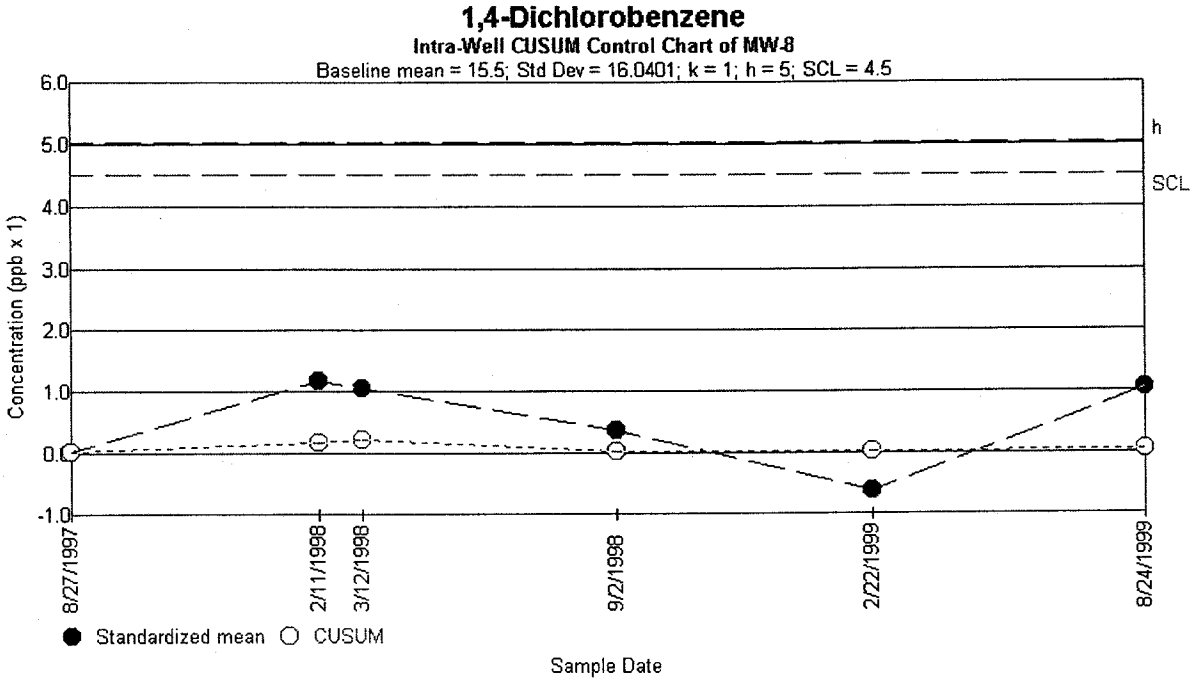



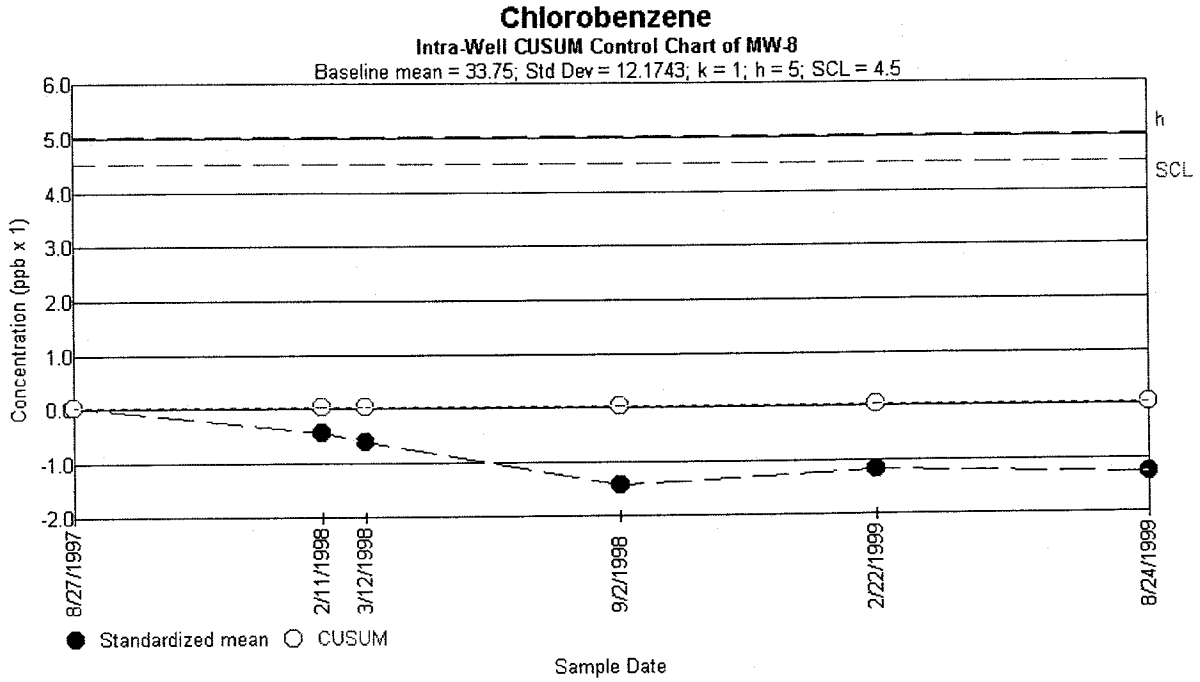
## Shewart–CUSUM Control Charts for Detected Constituents



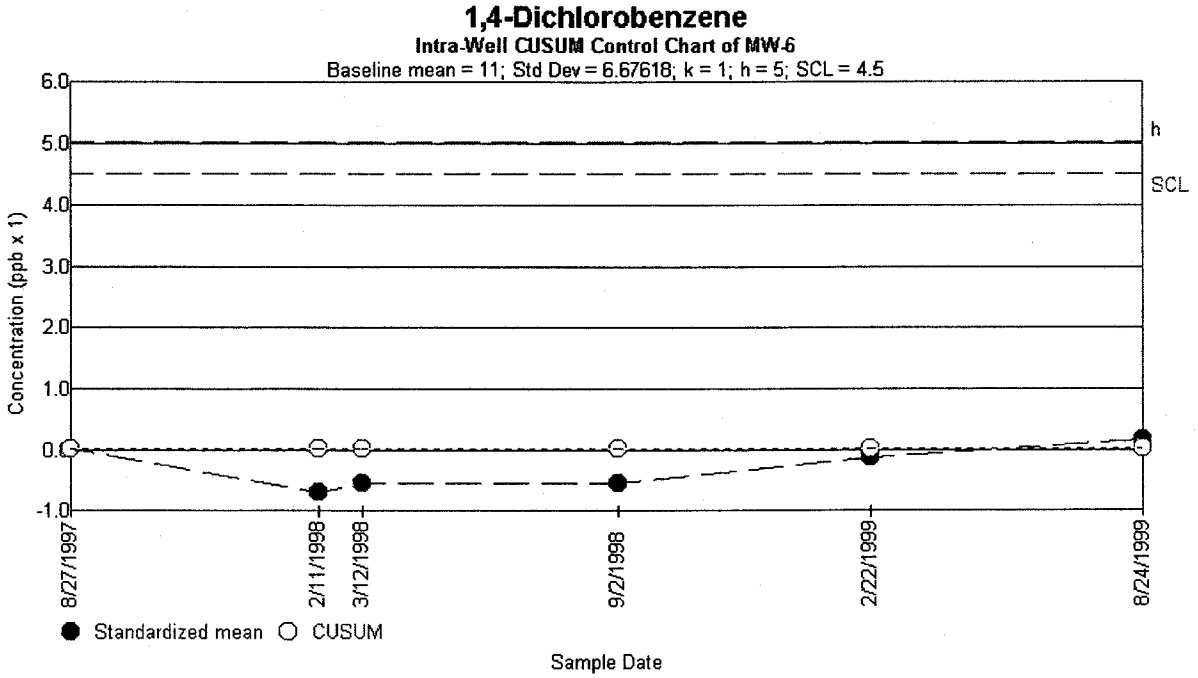



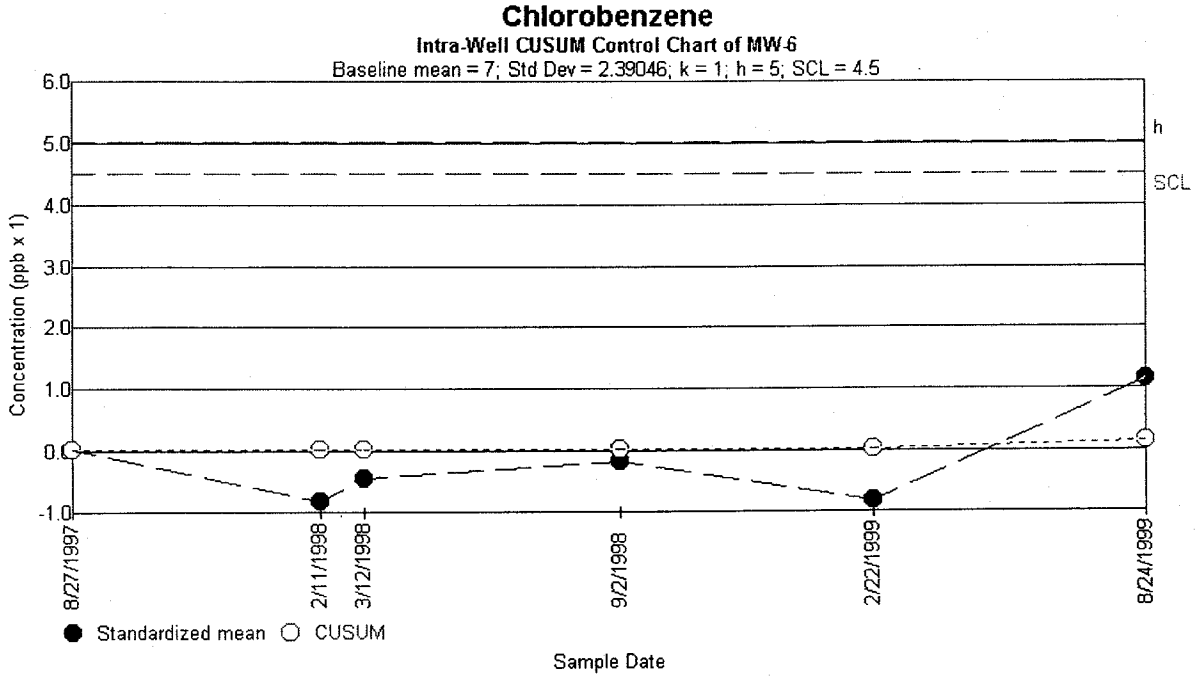
## Shewart–CUSUM Control Charts for Detected Constituents



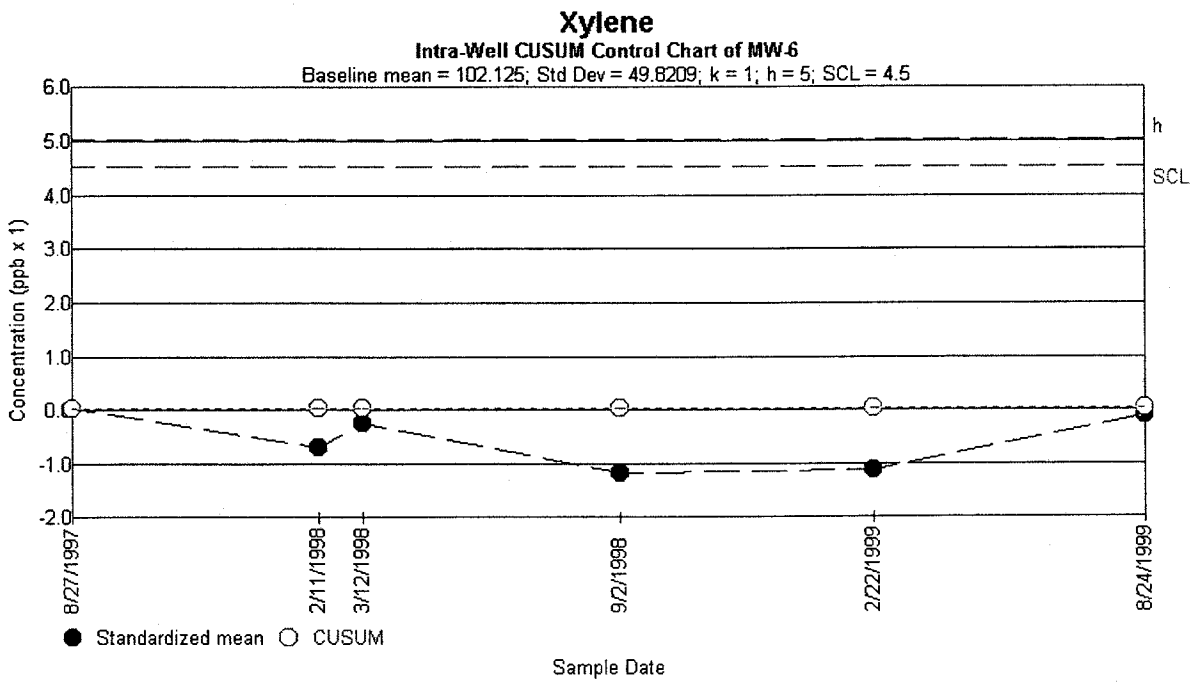



## Shewart–CUSUM Control Charts for Detected Constituents



## Shewart–CUSUM Control Charts for Detected Constituents



# Laboratory Data

Environment 1, Incorporated

P.O. BOX 7085, 114 OAKMONT DRIVE
GREENVILLE, N.C. 27835-7085

PHONE (252) 756-6208
FAX (252) 756-0633

MUNICIPAL ENG. SERVICES COMPANY
OCT 1999

October 12, 1999

Mr. Kohei Yoshida
Municipal Engineering Services
P.O. Box 97
Garner, NC 27529

Dear Mr. Yoshida:

Enclosed herewith are printed results for the Wayne County Landfill (Dudley Facility) collected on 08/24/99. The data will also be transmitted to your attention electronically. Please feel free to give me a call if you have any questions.

Best regards,

Steve Jones

# Environment 1, Incorporated

P.O. BOX 7085, 114 OAKMONT DRIVE
GREENVILLE, N.C. 27835-7085

PHONE (252) 756-6208
FAX (252) 756-0633

Drinking Water ID: 37715
Wastewater ID: 10

ID#: 6043

WAYNE CO. LANDFILL (DUDLEY)
MR. LLOYD COOK
460B LANDFILL ROAD
DUDLEY ,NC 28333

MUNICIPAL ENGINEERING SERVICES COMPANY
RECEIVED
OCT 18 1999

DATE COLLECTED: 08/24/99
DATE REPORTED : 10/11/99

REVIEWED BY:

| PARAMETERS | Well #1 | Well #2 | Well #3 | Well #4 | Well #5 | Analysis Date | Analyst | Method Code |
|---|---|---|---|---|---|---|---|---|
| PH (field measurement), Units | 5.6 | 6.4 | 5.6 | 4.7 | 6.1 | 08/24/99 | RJH | EPA150.1 |
| Antimony, mg/l | <0.030 | <0.030 | <0.030 | <0.030 | <0.030 | 08/28/99 | WTH | EPA7041 |
| Arsenic, mg/l | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | 09/03/99 | WTH | EPA7060 |
| Barium, mg/l | <0.500 | <0.500 | <0.500 | <0.500 | <0.500 | 08/28/99 | LFJ | EPA6010B |
| Beryllium, mg/l | <0.002 | <0.002 | <0.002 | <0.002 | <0.002 | 08/28/99 | LFJ | EPA6010B |
| Cadmium, mg/l | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | 09/08/99 | WTH | EPA7131 |
| Cobalt, mg/l | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | 08/28/99 | LFJ | EPA6010B |
| Copper, mg/l | <0.200 | <0.200 | <0.200 | <0.200 | <0.200 | 08/28/99 | LFJ | EPA6010B |
| Total Chromium, mg/l | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | 08/28/99 | LFJ | EPA6010B |
| Lead, mg/l | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | 08/28/99 | LFJ | EPA6010B |
| Mercury, mg/l | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | 08/26/99 | WTH | EPA7470 |
| Nickel, mg/l | <0.050 | <0.050 | <0.050 | <0.050 | <0.050 | 08/28/99 | LFJ | EPA6010B |
| Selenium, mg/l | <0.020 | <0.020 | <0.020 | <0.020 | <0.020 | 08/28/99 | LFJ | EPA6010B |
| Silver, mg/l | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | 08/28/99 | LFJ | EPA6010B |
| Thallium, mg/l | <0.010 | <0.010 | <0.010 | | | 09/10/99 | WTH | EPA7841 |
| | | | | <0.010 | | 09/02/99 | WTH | EPA7841 |
| | | | | | <0.010 | 09/10/99 | WTH | EPA7841 |
| Vanadium, mg/l | <0.040 | <0.040 | <0.040 | <0.040 | <0.040 | 08/28/99 | LFJ | EPA6010B |
| Zinc, mg/l | <0.050 | <0.050 | <0.050 | | | 08/28/99 | LFJ | EPA6010B |
| | | | | 0.069 | | 10/06/99 | LFJ | EPA6010B |
| | | | | | <0.050 | 08/28/99 | LFJ | EPA6010B |
| Conductivity (at 25c), uMhos | 18 | 1100 | 35 | 260 | 48 | 08/24/99 | RJH | SM2510B |
| Temperature, °C | 22 | 22 | 22 | 21 | 24 | 08/24/99 | RJH | SM2550B |
| Static Water Level, Feet | 15.42 | 5.11 | 0.60 | 6.69 | 3.86 | 08/24/99 | RJH | |
| Well Depth, feet | 26.61 | 16.65 | 19.46 | 19.45 | 18.84 | 08/24/99 | RJH | |

# Environment 1, Incorporated

P.O. BOX 7085, 114 OAKMONT DRIVE
GREENVILLE, N.C. 27835-7085

PHONE (252) 756-6208
FAX (252) 756-0633

Drinking Water ID: 37715
Wastewater ID: 10

ID#: 6043

WAYNE CO. LANDFILL (DUDLEY)
MR. LLOYD COOK
460B LANDFILL ROAD
DUDLEY ,NC 28333

DATE COLLECTED: 08/24/99
DATE REPORTED : 10/11/99

REVIEWED BY:

| PARAMETERS | Well #6 | Well #7 | Well #8 | Surface Water #1 | Surface Water #2 | Analysis Date | Analyst | Method Code |
|---|---|---|---|---|---|---|---|---|
| PH (field measurement), Units | 5.7 | 5.0 | 5.0 | 6.7 | Missing | 08/24/99 | RJH | EPA150.1 |
| Antimony, mg/l | <0.030 | <0.030 | <0.030 | <0.030 | Missing | 08/28/99 | WTH | EPA7041 |
| Arsenic, mg/l | <0.010 | <0.010 | <0.010 | <0.010 | Missing | 09/03/99 | WTH | EPA7060 |
| Barium, mg/l | <0.500 | <0.500 | <0.500 | <0.500 | Missing | 08/28/99 | LFJ | EPA6010B |
| Beryllium, mg/l | <0.002 | <0.002 | <0.002 | <0.002 | Missing | 08/28/99 | LFJ | EPA6010B |
| Cadmium, mg/l | <0.001 | <0.001 | <0.001 | <0.001 | Missing | 09/08/99 | WTH | EPA7131 |
| Cobalt, mg/l | <0.010 | <0.010 | <0.010 | <0.010 | Missing | 08/28/99 | LFJ | EPA6010B |
| Copper, mg/l | <0.200 | <0.200 | <0.200 | <0.200 | Missing | 08/28/99 | LFJ | EPA6010B |
| Total [redacted], mg/l | <0.010 | <0.010 | [redacted] | <0.010 | Missing | 08/28/99 | LFJ | EPA6010B |
| [redacted], mg/l | <0.010 | <0.010 | | | | 08/28/99 | LFJ | EPA6010B |
| | | | [redacted] | | | 08/30/99 | WTH | EPA7421 |
| | | | | <0.010 | Missing | 08/28/99 | LFJ | EPA6010B |
| [redacted], mg/l | <0.0005 | <0.0005 | [redacted] | | | 08/26/99 | WTH | EPA7470 |
| Nickel, mg/l | <0.050 | <0.050 | <0.050 | <0.050 | Missing | 08/28/99 | LFJ | EPA6010B |
| Selenium, mg/l | <0.020 | <0.020 | <0.020 | <0.020 | Missing | 08/28/99 | LFJ | EPA6010B |
| Silver, mg/l | <0.010 | <0.010 | <0.010 | <0.010 | Missing | 08/28/99 | LFJ | EPA6010B |
| Thallium, mg/l | <0.010 | <0.010 | <0.010 | <0.010 | Missing | 09/10/99 | WTH | EPA7841 |
| Vanadium, mg/l | <0.040 | <0.040 | 0.130 | <0.040 | Missing | 08/28/99 | LFJ | EPA6010B |
| Zinc, mg/l | <0.050 | <0.050 | <0.050 | <0.050 | Missing | 08/28/99 | LFJ | EPA6010B |
| Conductivity (at 25c), uMhos | 190 | 880 | 74 | 820 | Missing | 08/24/99 | RJH | SM2510B |
| Temperature, °C | 24 | 23 | 21 | 24 | Missing | 08/24/99 | RJH | SM2550B |
| Static Water Level, Feet | 5.47 | 7.92 | 18.91 | | | 08/24/99 | RJH | |
| Well Depth, feet | 19.00 | 19.89 | 30.01 | | | 08/24/99 | RJH | |
| EPA Method 8260B Volatiles | | | | | Missing | 08/24/99 | | |

# Environment 1, Incorporated

P.O. BOX 7085, 114 OAKMONT DRIVE
GREENVILLE, N.C. 27835-7085

PHONE (252) 756-6208
FAX (252) 756-0633

Drinking Water ID: 37715
Wastewater ID: 10

ID#: 6043

WAYNE CO. LANDFILL (DUDLEY)
MR. LLOYD COOK
460B LANDFILL ROAD
DUDLEY ,NC 28333

DATE COLLECTED: 08/24/99
DATE REPORTED : 10/11/99

REVIEWED BY:

| PARAMETERS | Surface Water #3 | Equipment Blank | Analysis Date | Analyst | Method Code |
|---|---|---|---|---|---|
| PH (field measurement), Units | Missing | | / / | | |
| Antimony, mg/l | Missing | <0.030 | 08/28/99 | WTH | EPA7041 |
| Arsenic, mg/l | Missing | <0.010 | 09/03/99 | WTH | EPA7060 |
| Barium, mg/l | Missing | <0.500 | 08/28/99 | LFJ | EPA6010B |
| Beryllium, mg/l | Missing | <0.002 | 08/28/99 | LFJ | EPA6010B |
| Cadmium, mg/l | Missing | <0.001 | 09/08/99 | WTH | EPA7131 |
| Cobalt, mg/l | Missing | <0.010 | 08/28/99 | LFJ | EPA6010B |
| Copper, mg/l | Missing | <0.200 | 08/28/99 | LFJ | EPA6010B |
| Total Chromium, mg/l | Missing | <0.010 | 08/28/99 | LFJ | EPA6010B |
| Lead, mg/l | Missing | <0.010 | 08/28/99 | LFJ | EPA6010B |
| Mercury, mg/l | | <0.0005 | 08/26/99 | WTH | EPA7470 |
| Nickel, mg/l | Missing | <0.050 | 08/28/99 | LFJ | EPA6010B |
| Selenium, mg/l | Missing | <0.020 | 08/28/99 | LFJ | EPA6010B |
| Silver, mg/l | Missing | <0.010 | 08/28/99 | LFJ | EPA6010B |
| Thallium, mg/l | Missing | <0.010 | 08/30/99 | WTH | EPA7841 |
| Vanadium, mg/l | Missing | <0.040 | 08/28/99 | LFJ | EPA6010B |
| Zinc, mg/l | Missing | <0.050 | 08/28/99 | LFJ | EPA6010B |
| Conductivity (at 25c), uMhos | Missing | | / / | | |
| Temperature, °C | Missing | | / / | | |
| EPA Method 8260B Volatiles | Missing | | 08/28/99 | | |

Environment 1, Incorporated

P.O. BOX 7085, 114 OAKMONT DRIVE
GREENVILLE, N.C. 27835-7085

PHONE (252) 756-6208
FAX (252) 756-0633

CLIENT: WAYNE CO. LANDFILL (DUDLEY)
MR. LLOYD COOK
460B LANDFILL ROAD
DUDLEY, NC 28333

CLIENT ID: 6043

ANALYST: JSM
DATE COLLECTED: 08/24/99
DATE ANALYZED: 08/29/99
DATE REPORTED: 10/11/99



REVIEWED BY:

LANDFILL APPENDIX II
EPA METHOD 8260B

| PARAMETERS, ug/l | Well #1 | Well #2 | Well #3 | Well #4 | Well #5 |
|---|---|---|---|---|---|
| 1. Chloromethane | <10.00 | <10.00 | <10.00 | <10.00 | <10.00 |
| 2. Vinyl Chloride | <10.00 | <10.00 | <10.00 | <10.00 | <10.00 |
| 3. Bromomethane | <10.00 | <10.00 | <10.00 | <10.00 | <10.00 |
| 4. Chloroethane | <10.00 | <10.00 | <10.00 | <10.00 | <10.00 |
| 5. Trichlorofluoromethane | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 |
| 6. 1,1-Dichloroethene | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 |
| 7. Acetone | <100.00 | <100.00 | <100.00 | <100.00 | <100.00 |
| 8. Iodomethane | <10.00 | <10.00 | <10.00 | <10.00 | <10.00 |
| 9. Carbon Disulfide | <100.00 | <100.00 | <100.00 | <100.00 | <100.00 |
| 10. Methylene Chloride | <10.00 | <10.00 | <10.00 | <10.00 | <10.00 |
| 11. trans-1,2-Dichloroethene | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 |
| 12. 1,1-Dichloroethane | <5.00 | 7.20 | <5.00 | <5.00 | <5.00 |
| 13. Vinyl Acetate | <50.00 | <50.00 | <50.00 | <50.00 | <50.00 |
| 14. Cis-1,2-Dichloroethene | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 |
| 15. 2-Butanone | <100.00 | <100.00 | <100.00 | <100.00 | <100.00 |
| 16. Bromochloromethane | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 |
| 17. Chloroform | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 |
| 18. 1,1,1-Trichloroethane | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 |
| 19. Carbon Tetrachloride | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 |
| 20. Benzene | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 |
| 21. 1,2-Dichloroethane | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 |
| 22. Trichloroethene | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 |
| 23. 1,2-Dichloropropane | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 |
| 24. Bromodichloromethane | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 |
| 25. Cis-1,3-Dichloropropene | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 |
| 26. 4-Methyl-2-Pentanone | <50.00 | <50.00 | <50.00 | <50.00 | <50.00 |
| 27. Toluene | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 |
| 28. trans-1,3-Dichloropropene | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 |
| 29. 1,1,2-Trichloroethane | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 |
| 30. Tetrachloroethene | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 |
| 31. 2-Hexanone | <50.00 | <50.00 | <50.00 | <50.00 | <50.00 |
| 32. Dibromochloromethane | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 |
| 33. 1,2-Dibromomethane | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 |
| 34. Chlorobenzene | <5.00 | 25.00 | <5.00 | <5.00 | <5.00 |
| 35. 1,1,1,2-Tetrachloroethane | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 |
| 36. Ethylbenzene | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 |
| 37. Xylenes | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 |
| 38. Dibromomethane | <10.00 | <10.00 | <10.00 | <10.00 | <10.00 |
| 39. Styrene | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 |
| 40. Bromoform | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 |
| 41. 1,1,2,2-Tetrachloroethane | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 |
| 42. 1,2,3-Trichloropropane | <15.00 | <15.00 | <15.00 | <15.00 | <15.00 |
| 43. 1,4-Dichlorobenzene | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 |
| 44. 1,2-Dichlorobenzene | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 |
| 45. 1,2-Dibromo-3-Chloropropane | <25.00 | <25.00 | <25.00 | <25.00 | <25.00 |
| 46. Acrylonitrile | <200.00 | <200.00 | <200.00 | <200.00 | <200.00 |
| 47. trans-1,4-Dichloro-2-Butene | <100.00 | <100.00 | <100.00 | <100.00 | <100.00 |
| 48. Acrolein | <100.00 | <100.00 | <100.00 | <100.00 | <100.00 |

Environment 1, Incorporated

P.O. BOX 7085, 114 OAKMONT DRIVE
GREENVILLE, N.C. 27835-7085

PHONE (252) 756-6208
FAX (252) 756-0633

CLIENT: WAYNE CO. LANDFILL (DUDLEY)
MR. LLOYD COOK
460B LANDFILL ROAD
DUDLEY, NC 28333

CLIENT ID: 6043

ANALYST: JSM
DATE COLLECTED: 08/24/99
DATE ANALYZED: 08/29/99
DATE REPORTED: 10/11/99



REVIEWED BY:

LANDFILL APPENDIX II
EPA METHOD 8260B

| PARAMETERS, ug/l | Well #1 | Well #2 | Well #3 | Well #4 | Well #5 |
|---|---|---|---|---|---|
| 49. Allyl Chloride | <10.00 | <10.00 | <10.00 | <10.00 | <10.00 |
| 50. Chloroprene | <20.00 | <20.00 | <20.00 | <20.00 | <20.00 |
| 51. 1,3-Dichlorobenzene | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 |
| 52. Dichlorodifluoromethane | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 |
| 53. 1,3-Dichloropropane | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 |
| 54. 2,2-Dichloropropane | <15.00 | <15.00 | <15.00 | <15.00 | <15.00 |
| 55. 1,1-Dichloropropene | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 |
| 56. Ethyl Methacrylate | <10.00 | <10.00 | <10.00 | <10.00 | <10.00 |
| 57. Hexachlorobutadine | <10.00 | <10.00 | <10.00 | <10.00 | <10.00 |
| 58. Isobutyl Alcohol | <100.00 | <100.00 | <100.00 | <100.00 | <100.00 |
| 59. Methacrylonitrile | <100.00 | <100.00 | <100.00 | <100.00 | <100.00 |
| 60. Methyl Metecrylate | <30.00 | <30.00 | <30.00 | <30.00 | <30.00 |
| 61. Naphthalene | <5.00 | <5.00 | <5.00 | <5.00 | <5.00 |
| 62. Propionitrile | <150.00 | <150.00 | <150.00 | <150.00 | <150.00 |
| 63. 1,2,4-Trichlorobenzene | <10.00 | <10.00 | <10.00 | <10.00 | <10.00 |
| 64. Acetonitrile | <100.00 | <100.00 | <100.00 | <100.00 | <100.00 |

Environment 1, Incorporated

P.O. BOX 7085, 114 OAKMONT DRIVE
GREENVILLE, N.C. 27835-7085

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CLIENT: WAYNE CO. LANDFILL (DUDLEY)
MR. LLOYD COOK
460B LANDFILL ROAD
DUDLEY, NC 28333

CLIENT ID: 6043

ANALYST: JSM
DATE COLLECTED: 08/24/99
DATE ANALYZED: 08/29/99
DATE REPORTED: 10/11/99



REVIEWED BY:

LANDFILL APPENDIX II
EPA METHOD 8260B

| PARAMETERS, ug/l | Well #6 | Well #7 | Well #8 | Equipment Blank |
|---|---|---|---|---|
| 1. Chloromethane | <10.00 | <10.00 | <10.00 | <10.00 |
| 2. Vinyl Chloride | <10.00 | <10.00 | <10.00 | <10.00 |
| 3. Bromomethane | <10.00 | <10.00 | <10.00 | <10.00 |
| 4. Chloroethane | <10.00 | <10.00 | <10.00 | <10.00 |
| 5. Trichlorofluoromethane | <5.00 | <5.00 | <5.00 | <5.00 |
| 6. 1,1-Dichloroethene | <5.00 | <5.00 | <5.00 | <5.00 |
| 7. Acetone | <100.00 | <100.00 | <100.00 | <100.00 |
| 8. Iodomethane | <10.00 | <10.00 | <10.00 | <10.00 |
| 9. Carbon Disulfide | <100.00 | <100.00 | <100.00 | <100.00 |
| 10. Methylene Chloride | <10.00 | <10.00 | <10.00 | <10.00 |
| 11. trans-1,2-Dichloroethene | <5.00 | <5.00 | <5.00 | <5.00 |
| 12. 1,1-Dichloroethane | <5.00 | <5.00 | <5.00 | <5.00 |
| 13. Vinyl Acetate | <50.00 | <50.00 | <50.00 | <50.00 |
| 14. Cis-1,2-Dichloroethene | <5.00 | <5.00 | <5.00 | <5.00 |
| 15. 2-Butanone | <100.00 | <100.00 | <100.00 | <100.00 |
| 16. Bromochloromethane | <5.00 | <5.00 | <5.00 | <5.00 |
| 17. Chloroform | <5.00 | <5.00 | <5.00 | <5.00 |
| 18. 1,1,1-Trichloroethane | <5.00 | <5.00 | <5.00 | <5.00 |
| 19. Carbon Tetrachloride | <5.00 | <5.00 | <5.00 | <5.00 |
| 20. Benzene | <5.00 | <5.00 | <5.00 | <5.00 |
| 21. 1,2-Dichloroethane | <5.00 | <5.00 | <5.00 | <5.00 |
| 22. Trichloroethene | <5.00 | <5.00 | <5.00 | <5.00 |
| 23. 1,2-Dichloropropane | <5.00 | <5.00 | <5.00 | <5.00 |
| 24. Bromodichloromethane | <5.00 | <5.00 | <5.00 | <5.00 |
| 25. Cis-1,3-Dichloropropene | <5.00 | <5.00 | <5.00 | <5.00 |
| 26. 4-Methyl-2-Pentanone | <50.00 | <50.00 | <50.00 | <50.00 |
| 27. Toluene | <5.00 | <5.00 | <5.00 | <5.00 |
| 28. trans-1,3-Dichloropropene | <5.00 | <5.00 | <5.00 | <5.00 |
| 29. 1,1,2-Trichloroethane | <5.00 | <5.00 | <5.00 | <5.00 |
| 30. Tetrachloroethene | <5.00 | <5.00 | <5.00 | <5.00 |
| 31. 2-Hexanone | <50.00 | <50.00 | <50.00 | <50.00 |
| 32. Dibromochloromethane | <5.00 | <5.00 | <5.00 | <5.00 |
| 33. 1,2-Dibromomethane | <5.00 | <5.00 | <5.00 | <5.00 |
| 34. Chlorobenzene | 9.70 | <5.00 | 18.00 | <5.00 |
| 35. 1,1,1,2-Tetrachloroethane | <5.00 | <5.00 | <5.00 | <5.00 |
| 36. Ethylbenzene | <5.00 | <5.00 | <5.00 | <5.00 |
| 37. Xylenes | 96.00 | <5.00 | <5.00 | <5.00 |
| 38. Dibromomethane | <10.00 | <10.00 | <10.00 | <10.00 |
| 39. Styrene | <5.00 | <5.00 | <5.00 | <5.00 |
| 40. Bromoform | <5.00 | <5.00 | <5.00 | <5.00 |
| 41. 1,1,2,2-Tetrachloroethane | <5.00 | <5.00 | <5.00 | <5.00 |
| 42. 1,2,3-Trichloropropane | <15.00 | <15.00 | <15.00 | <15.00 |
| 43. 1,4-Dichlorobenzene | 12.00 | <5.00 | 32.00 | <5.00 |
| 44. 1,2-Dichlorobenzene | <5.00 | <5.00 | <5.00 | <5.00 |
| 45. 1,2-Dibromo-3-Chloropropane | <25.00 | <25.00 | <25.00 | <25.00 |
| 46. Acrylonitrile | <200.00 | <200.00 | <200.00 | <200.00 |
| 47. trans-1,4-Dichloro-2-Butene | <100.00 | <100.00 | <100.00 | <100.00 |
| 48. Acrolein | <100.00 | <100.00 | <100.00 | <100.00 |

Environment 1, Incorporated

P.O. BOX 7085, 114 OAKMONT DRIVE
GREENVILLE, N.C. 27835-7085

PHONE (252) 756-6208
FAX (252) 756-0633

CLIENT: WAYNE CO. LANDFILL (DUDLEY)
MR. LLOYD COOK
460B LANDFILL ROAD
DUDLEY, NC 28333

CLIENT ID: 6043

ANALYST: JSM
DATE COLLECTED: 08/24/99
DATE ANALYZED: 08/29/99
DATE REPORTED: 10/11/99



REVIEWED BY:

LANDFILL APPENDIX II
EPA METHOD 8260B

| PARAMETERS, ug/l | Well #6 | Well #7 | Well #8 | Equipment Blank |
|---|---|---|---|---|
| 49. Allyl Chloride | <10.00 | <10.00 | <10.00 | <10.00 |
| 50. Chloroprene | <20.00 | <20.00 | <20.00 | <20.00 |
| 51. 1,3-Dichlorobenzene | <5.00 | <5.00 | <5.00 | <5.00 |
| 52. Dichlorodifluoromethane | <5.00 | <5.00 | <5.00 | <5.00 |
| 53. 1,3-Dichloropropane | <5.00 | <5.00 | <5.00 | <5.00 |
| 54. 2,2-Dichloropropane | <15.00 | <15.00 | <15.00 | <15.00 |
| 55. 1,1-Dichloropropene | <5.00 | <5.00 | <5.00 | <5.00 |
| 56. Ethyl Methacrylate | <10.00 | <10.00 | <10.00 | <10.00 |
| 57. Hexachlorobutadine | <10.00 | <10.00 | <10.00 | <10.00 |
| 58. Isobutyl Alcohol | <100.00 | <100.00 | <100.00 | <100.00 |
| 59. Methacrylonitrile | <100.00 | <100.00 | <100.00 | <100.00 |
| 60. Methyl Metecrylate | <30.00 | <30.00 | <30.00 | <30.00 |
| 61. Naphthalene | <5.00 | <5.00 | <5.00 | <5.00 |
| 62. Propionitrile | <150.00 | <150.00 | <150.00 | <150.00 |
| 63. 1,2,4-Trichlorobenzene | <10.00 | <10.00 | <10.00 | <10.00 |
| 64. Acetonitrile | <100.00 | <100.00 | <100.00 | <100.00 |

Environment 1, Incorporated

P.O. BOX 7085, 114 OAKMONT DRIVE
GREENVILLE, N.C. 27835-7085

PHONE (252) 756-6208
FAX (252) 756-0633

CLIENT: WAYNE CO. LANDFILL (DUDLEY)
MR. LLOYD COOK
460B LANDFILL ROAD
DUDLEY, NC 28333

CLIENT ID: 6043

ANALYST: JSM
DATE COLLECTED: 08/24/99
DATE ANALYZED: 09/05/99
DATE REPORTED: 10/11/99



REVIEWED BY:

VOLATILE ORGANICS
EPA METHOD 8260B

| PARAMETERS, ug/l | Surface Water #1 |
|---|---|
| 1. Chloromethane | <10.00 |
| 2. Vinyl Chloride | <10.00 |
| 3. Bromomethane | <10.00 |
| 4. Chloroethane | <10.00 |
| 5. Trichlorofluoromethane | <5.00 |
| 6. 1,1-Dichloroethene | <5.00 |
| 7. Acetone | <100.00 |
| 8. Iodomethane | <10.00 |
| 9. Carbon Disulfide | <100.00 |
| 10. Methylene Chloride | <10.00 |
| 11. trans-1,2-Dichloroethene | <5.00 |
| 12. 1,1-Dichloroethane | <5.00 |
| 13. Vinyl Acetate | <50.00 |
| 14. Cis-1,2-Dichloroethene | <5.00 |
| 15. 2-Butanone | <100.00 |
| 16. Bromochloromethane | <5.00 |
| 17. Chloroform | <5.00 |
| 18. 1,1,1-Trichloroethane | <5.00 |
| 19. Carbon Tetrachloride | <5.00 |
| 20. Benzene | <5.00 |
| 21. 1,2-Dichloroethane | <5.00 |
| 22. Trichloroethene | <5.00 |
| 23. 1,2-Dichloropropane | <5.00 |
| 24. Bromodichloromethane | <5.00 |
| 25. Cis-1,3-Dichloropropene | <5.00 |
| 26. 4-Methyl-2-Pentanone | <50.00 |
| 27. Toluene | <5.00 |
| 28. trans-1,3-Dichloropropene | <5.00 |
| 29. 1,1,2-Trichloroethane | <5.00 |
| 30. Tetrachloroethene | <5.00 |
| 31. 2-Hexanone | <50.00 |
| 32. Dibromochloromethane | <5.00 |
| 33. 1,2-Dibromoethane | <5.00 |
| 34. Chlorobenzene | <5.00 |
| 35. 1,1,1,2-Tetrachloroethane | <5.00 |
| 36. Ethylbenzene | <5.00 |
| 37. Xylenes | <5.00 |
| 38. Dibromomethane | <10.00 |
| 39. Styrene | <5.00 |
| 40. Bromoform | <5.00 |
| 41. 1,1,2,2-Tetrachloroethane | <5.00 |
| 42. 1,2,3-Trichloropropane | <15.00 |
| 43. 1,4-Dichlorobenzene | <5.00 |
| 44. 1,2-Dichlorobenzene | <5.00 |
| 45. 1,2-Dibromo-3-Chloropropane | <25.00 |
| 46. Acrylonitrile | <200.00 |
| 47. trans-1,4-Dichloro-2-Butene | <100.00 |

# Environment 1, Incorporated

P.O. BOX 7085, 114 OAKMONT DRIVE
GREENVILLE, N.C. 27835-7085

PHONE (252) 756-6208
FAX (252) 756-0633

CLIENT: WAYNE CO. LANDFILL (DUDLEY)
MR. LLOYD COOK
460B LANDFILL ROAD
DUDLEY, NC 28333

CLIENT ID: 6043

ANALYST: CHS
DATE COLLECTED: 08/24/99
DATE EXTRACTED: 08/24/99
DATE ANALYZED: 08/27/99
DATE REPORTED: 10/11/99

Page: 1

REVIEWED BY:

BASE/NEUTRAL COMPOUNDS
EPA METHOD 8270C

| PARAMETERS, ug/l | Well #1 | Well #2 | Well #3 | Well #4 | Well #5 |
|---|---|---|---|---|---|
| 1. Acenaphthene | <10.00 | <10.00 | <10.00 | <10.00 | <10.00 |
| 2. Acenaphthylene | <10.00 | <10.00 | <10.00 | <10.00 | <10.00 |
| 3. Anthracene | <10.00 | <10.00 | <10.00 | <10.00 | <10.00 |
| 4. Benzo[a]antrhacene | <10.00 | <10.00 | <10.00 | <10.00 | <10.00 |
| 5. Benzo[b]fluoranthene | <10.00 | <10.00 | <10.00 | <10.00 | <10.00 |
| 6. Benzo[k]fluoranthene | <10.00 | <10.00 | <10.00 | <10.00 | <10.00 |
| 7. Benzo[g,h,i]perylene | <10.00 | <10.00 | <10.00 | <10.00 | <10.00 |
| 8. Benzo[a]pyrene | <10.00 | <10.00 | <10.00 | <10.00 | <10.00 |
| 9. 4-Bromophenyl Phenyl Ether | <10.00 | <10.00 | <10.00 | <10.00 | <10.00 |
| 10. Butyl Benzyl Phthalate | <10.00 | <10.00 | <10.00 | <10.00 | <10.00 |
| 11. Bis-(2-Chloroethoxy) Methane | <10.00 | <10.00 | <10.00 | <10.00 | <10.00 |
| 12. Bis-(2-Chloroethyl) Ether | <10.00 | <10.00 | <10.00 | <10.00 | <10.00 |
| 13. Bis-(2-Chloroisopropyl) Ether | <10.00 | <10.00 | <10.00 | <10.00 | <10.00 |
| 14. 2-Chloronaphthalene | <10.00 | <10.00 | <10.00 | <10.00 | <10.00 |
| 15. 4-Chlorophenyl Phenyl Ether | <10.00 | <10.00 | <10.00 | <10.00 | <10.00 |
| 16. Crysene | <10.00 | <10.00 | <10.00 | <10.00 | <10.00 |
| 17. Dibenz[a,h]anthracene | <10.00 | <10.00 | <10.00 | <10.00 | <10.00 |
| 18. Di-N-Butyl Phthalate | <10.00 | <10.00 | <10.00 | <10.00 | <10.00 |
| 19. Dimethyl Phthalate | <10.00 | <10.00 | <10.00 | <10.00 | <10.00 |
| 20. Diethyl Phthalate | <10.00 | <10.00 | <10.00 | <10.00 | <10.00 |
| 21. 2,4-Dinitrotoluene | <10.00 | <10.00 | <10.00 | <10.00 | <10.00 |
| 22. 2,6-Dinitrotoluene | <10.00 | <10.00 | <10.00 | <10.00 | <10.00 |
| 23. Di-N-Octyl Phthalate | <10.00 | <10.00 | <10.00 | <10.00 | <10.00 |
| 24. Bis-(2-Ethylhexyl) Phthalate | <20.00 | <20.00 | <20.00 | <20.00 | <20.00 |
| 25. Fluoranthene | <10.00 | <10.00 | <10.00 | <10.00 | <10.00 |
| 26. Fluorene | <10.00 | <10.00 | <10.00 | <10.00 | <10.00 |
| 27. Hexachlorobenzene | <10.00 | <10.00 | <10.00 | <10.00 | <10.00 |
| 28. Hexachlorocyclopentadiene | <10.00 | <10.00 | <10.00 | <10.00 | <10.00 |
| 29. Indeno[1,2,3-Cd]pyrene | <10.00 | <10.00 | <10.00 | <10.00 | <10.00 |
| 30. Isophorone | <10.00 | <10.00 | <10.00 | <10.00 | <10.00 |
| 31. Nitrobenzene | <10.00 | <10.00 | <10.00 | <10.00 | <10.00 |
| 32. N-Nitrosodimethylamine | <10.00 | <10.00 | <10.00 | <10.00 | <10.00 |
| 33. N-Nitrosodiphenylamine | <10.00 | <10.00 | <10.00 | <10.00 | <10.00 |
| 34. N-Nitrosodi-N-Propylamine | <10.00 | <10.00 | <10.00 | <10.00 | <10.00 |
| 35. Phenanthrene | <10.00 | <10.00 | <10.00 | <10.00 | <10.00 |
| 36. Pyrene | <10.00 | <10.00 | <10.00 | <10.00 | <10.00 |
| 37. Ethyl Methanesulfonate | <10.00 | <10.00 | <10.00 | <10.00 | <10.00 |
| 38. Methyl Methanesulfonate | <10.00 | <10.00 | <10.00 | <10.00 | <10.00 |
| 39. Acetophenone | <10.00 | <10.00 | <10.00 | <10.00 | <10.00 |
| 40. 2-Acetylaminofluorene | <20.00 | <20.00 | <20.00 | <20.00 | <20.00 |
| 41. 4-Aminobiphenyl | <20.00 | <20.00 | <20.00 | <20.00 | <20.00 |
| 42. Benzyl Alcohol | <20.00 | <20.00 | <20.00 | <20.00 | <20.00 |
| 43. 4-Chloroaniline | <20.00 | <20.00 | <20.00 | <20.00 | <20.00 |
| 44. Chlorobenzilate | <10.00 | <10.00 | <10.00 | <10.00 | <10.00 |
| 45. Diallate | <10.00 | <10.00 | <10.00 | <10.00 | <10.00 |
| 46. Dibenzofuran | <10.00 | <10.00 | <10.00 | <10.00 | <10.00 |
| 47. 3,3-Dichlorobenzidine | <20.00 | <20.00 | <20.00 | <20.00 | <20.00 |
| 48. Dimethoate | <20.00 | <20.00 | <20.00 | <20.00 | <20.00 |

Environment 1, Incorporated

P.O. BOX 7085, 114 OAKMONT DRIVE
GREENVILLE, N.C. 27835-7085

PHONE (252) 756-6208
FAX (252) 756-0633

CLIENT: WAYNE CO. LANDFILL (DUDLEY)
MR. LLOYD COOK
460B LANDFILL ROAD
DUDLEY, NC 28333

CLIENT ID: 6043

ANALYST: CHS
DATE COLLECTED: 08/24/99
DATE EXTRACTED: 08/24/99
DATE ANALYZED: 08/27/99
DATE REPORTED: 10/11/99



REVIEWED BY:

BASE/NEUTRAL COMPOUNDS
EPA METHOD 8270C

| PARAMETERS, ug/l | Well #1 | Well #2 | Well #3 | Well #4 | Well #5 |
|---|---|---|---|---|---|
| 49. P-Dimethylaminoazobenzene | <10.00 | <10.00 | <10.00 | <10.00 | <10.00 |
| 50. 7,12-Dimethylbenz[a]anthracene | <10.00 | <10.00 | <10.00 | <10.00 | <10.00 |
| 51. 3,3-Dimethylbenzadine | <10.00 | <10.00 | <10.00 | <10.00 | <10.00 |
| 52. 1,3-Dinitrobenzene | <20.00 | <20.00 | <20.00 | <20.00 | <20.00 |
| 53. Diphenylamine | <10.00 | <10.00 | <10.00 | <10.00 | <10.00 |
| 54. Disulfoton | <10.00 | <10.00 | <10.00 | <10.00 | <10.00 |
| 55. Famphur | <20.00 | <20.00 | <20.00 | <20.00 | <20.00 |
| 56. Hexachloropropene | <10.00 | <10.00 | <10.00 | <10.00 | <10.00 |
| 57. Isosafrole | <10.00 | <10.00 | <10.00 | <10.00 | <10.00 |
| 58. Kepone | <20.00 | <20.00 | <20.00 | <20.00 | <20.00 |
| 59. Methapryilene | <100.00 | <100.00 | <100.00 | <100.00 | <100.00 |
| 60. 3-Methylchloroanthrene | <10.00 | <10.00 | <10.00 | <10.00 | <10.00 |
| 61. 2-Methylnaphthalene | <10.00 | <10.00 | <10.00 | <10.00 | <10.00 |
| 62. Methyl Parathion | <10.00 | <10.00 | <10.00 | <10.00 | <10.00 |
| 63. 1,4-Naphthoquinone | <10.00 | <10.00 | <10.00 | <10.00 | <10.00 |
| 64. 1-Naphthylamine | <10.00 | <10.00 | <10.00 | <10.00 | <10.00 |
| 65. 2-Naphthylamine | <10.00 | <10.00 | <10.00 | <10.00 | <10.00 |
| 66. 2-Nitroaniline | <50.00 | <50.00 | <50.00 | <50.00 | <50.00 |
| 67. 3-Nitroaniline | <50.00 | <50.00 | <50.00 | <50.00 | <50.00 |
| 68. 4-Nitroaniline | <20.00 | <20.00 | <20.00 | <20.00 | <20.00 |
| 69. 5-Nitro-O-Toluidine | <10.00 | <10.00 | <10.00 | <10.00 | <10.00 |
| 70. N-Nitroso-n-butlyamine | <10.00 | <10.00 | <10.00 | <10.00 | <10.00 |
| 71. N-Nitrosodiethylamine | <20.00 | <20.00 | <20.00 | <20.00 | <20.00 |
| 72. N-Nitrosomethylethylamine | <10.00 | <10.00 | <10.00 | <10.00 | <10.00 |
| 73. N-Nitrosopiperidine | <20.00 | <20.00 | <20.00 | <20.00 | <20.00 |
| 74. N-Nitrosopyrrolidine | <40.00 | <40.00 | <40.00 | <40.00 | <40.00 |
| 75. Parathion | <10.00 | <10.00 | <10.00 | <10.00 | <10.00 |
| 76. Pentachlorobenzene | <10.00 | <10.00 | <10.00 | <10.00 | <10.00 |
| 77. Pentachloronitrobenzene | <50.00 | <50.00 | <50.00 | <50.00 | <50.00 |
| 78. Phenacetin | <20.00 | <20.00 | <20.00 | <20.00 | <20.00 |
| 79. 1,4-Phenylenediamine | <10.00 | <10.00 | <10.00 | <10.00 | <10.00 |
| 80. Phorate | <10.00 | <10.00 | <10.00 | <10.00 | <10.00 |
| 81. Pronamide | <10.00 | <10.00 | <10.00 | <10.00 | <10.00 |
| 82. Safrole | <10.00 | <10.00 | <10.00 | <10.00 | <10.00 |
| 83. 1,2,4,5-Tetrachlorobenzene | <10.00 | <10.00 | <10.00 | <10.00 | <10.00 |
| 84. Thionazin | <20.00 | <20.00 | <20.00 | <20.00 | <20.00 |
| 85. O-Toluidine | <10.00 | <10.00 | <10.00 | <10.00 | <10.00 |
| 86. 1,3,5-Trinitrobenzene | <10.00 | <10.00 | <10.00 | <10.00 | <10.00 |
| 87. 0,0,0-Triethyl Phosphorothioate | <10.00 | <10.00 | <10.00 | <10.00 | <10.00 |
| 88. Hexachloroethane | <10.00 | <10.00 | <10.00 | <10.00 | <10.00 |
| 89. Isodrin | <100.00 | <100.00 | <100.00 | <100.00 | <100.00 |

Environment 1, Incorporated

P.O. BOX 7085, 114 OAKMONT DRIVE
GREENVILLE, N.C. 27835-7085

PHONE (252) 756-6208
FAX (252) 756-0633

CLIENT: WAYNE CO. LANDFILL (DUDLEY)
MR. LLOYD COOK
460B LANDFILL ROAD
DUDLEY, NC 28333

CLIENT ID: 6043

ANALYST: CHS
DATE COLLECTED: 08/24/99
DATE EXTRACTED: 08/24/99
DATE ANALYZED: 08/27/99
DATE REPORTED: 10/11/99



REVIEWED BY:

BASE/NEUTRAL COMPOUNDS
EPA METHOD 8270C

| PARAMETERS, ug/l | Well #6 | Well #7 | Well #8 | Equipment Blank |
|---|---|---|---|---|
| 1. Acenaphthene | <10.00 | <10.00 | <10.00 | <10.00 |
| 2. Acenaphthylene | <10.00 | <10.00 | <10.00 | <10.00 |
| 3. Anthracene | <10.00 | <10.00 | <10.00 | <10.00 |
| 4. Benzo[a]antrhacene | <10.00 | <10.00 | <10.00 | <10.00 |
| 5. Benzo[b]fluoranthene | <10.00 | <10.00 | <10.00 | <10.00 |
| 6. Benzo[k]fluoranthene | <10.00 | <10.00 | <10.00 | <10.00 |
| 7. Benzo[g,h,i]perylene | <10.00 | <10.00 | <10.00 | <10.00 |
| 8. Benzo[a]pyrene | <10.00 | <10.00 | <10.00 | <10.00 |
| 9. 4-Bromophenyl Phenyl Ether | <10.00 | <10.00 | <10.00 | <10.00 |
| 10. Butyl Benzyl Phthalate | <10.00 | <10.00 | <10.00 | <10.00 |
| 11. Bis-(2-Chloroethoxy) Methane | <10.00 | <10.00 | <10.00 | <10.00 |
| 12. Bis-(2-Chloroethyl) Ether | <10.00 | <10.00 | <10.00 | <10.00 |
| 13. Bis-(2-Chloroisopropyl) Ether | <10.00 | <10.00 | <10.00 | <10.00 |
| 14. 2-Chloronaphthalene | <10.00 | <10.00 | <10.00 | <10.00 |
| 15. 4-Chlorophenyl Phenyl Ether | <10.00 | <10.00 | <10.00 | <10.00 |
| 16. Crysene | <10.00 | <10.00 | <10.00 | <10.00 |
| 17. Dibenz[a,h]anthracene | <10.00 | <10.00 | <10.00 | <10.00 |
| 18. Di-N-Butyl Phthalate | <10.00 | <10.00 | <10.00 | <10.00 |
| 19. Dimethyl Phthalate | <10.00 | <10.00 | <10.00 | <10.00 |
| 20. Diethyl Phthalate | <10.00 | <10.00 | <10.00 | <10.00 |
| 21. 2,4-Dinitrotoluene | <10.00 | <10.00 | <10.00 | <10.00 |
| 22. 2,6-Dinitrotoluene | <10.00 | <10.00 | <10.00 | <10.00 |
| 23. Di-N-Octyl Phthalate | <10.00 | <10.00 | <10.00 | <10.00 |
| 24. Bis-(2-Ethylhexyl) Phthalate | <20.00 | <20.00 | <20.00 | <20.00 |
| 25. Fluoranthene | <10.00 | <10.00 | <10.00 | <10.00 |
| 26. Fluorene | <10.00 | <10.00 | <10.00 | <10.00 |
| 27. Hexachlorobenzene | <10.00 | <10.00 | <10.00 | <10.00 |
| 28. Hexachlorocyclopentadiene | <10.00 | <10.00 | <10.00 | <10.00 |
| 29. Indeno[1,2,3-Cd]pyrene | <10.00 | <10.00 | <10.00 | <10.00 |
| 30. Isophorone | <10.00 | <10.00 | <10.00 | <10.00 |
| 31. Nitrobenzene | <10.00 | <10.00 | <10.00 | <10.00 |
| 32. N-Nitrosodimethylamine | <10.00 | <10.00 | <10.00 | <10.00 |
| 33. N-Nitrosodiphenylamine | <10.00 | <10.00 | <10.00 | <10.00 |
| 34. N-Nitrosodi-N-Propylamine | <10.00 | <10.00 | <10.00 | <10.00 |
| 35. Phenanthrene | <10.00 | <10.00 | <10.00 | <10.00 |
| 36. Pyrene | <10.00 | <10.00 | <10.00 | <10.00 |
| 37. Ethyl Methanesulfonate | <10.00 | <10.00 | <10.00 | <10.00 |
| 38. Methyl Methanesulfonate | <10.00 | <10.00 | <10.00 | <10.00 |
| 39. Acetophenone | <10.00 | <10.00 | <10.00 | <10.00 |
| 40. 2-Acetylaminofluorene | <20.00 | <20.00 | <20.00 | <20.00 |
| 41. 4-Aminobiphenyl | <20.00 | <20.00 | <20.00 | <20.00 |
| 42. Benzyl Alcohol | <20.00 | <20.00 | <20.00 | <20.00 |
| 43. 4-Chloroaniline | <20.00 | <20.00 | <20.00 | <20.00 |
| 44. Chlorobenzilate | <10.00 | <10.00 | <10.00 | <10.00 |
| 45. Diallate | <10.00 | <10.00 | <10.00 | <10.00 |
| 46. Dibenzofuran | <10.00 | <10.00 | <10.00 | <10.00 |
| 47. 3,3-Dichlorobenzidine | <20.00 | <20.00 | <20.00 | <20.00 |
| 48. Dimethoate | <20.00 | <20.00 | <20.00 | <20.00 |

Environment 1, Incorporated

P.O. BOX 7085, 114 OAKMONT DRIVE
GREENVILLE, N.C. 27835-7085

PHONE (252) 756-6208
FAX (252) 756-0633

CLIENT: WAYNE CO. LANDFILL (DUDLEY)
MR. LLOYD COOK
460B LANDFILL ROAD
DUDLEY, NC 28333

CLIENT ID: 6043

ANALYST: CHS
DATE COLLECTED: 08/24/99
DATE EXTRACTED: 08/24/99
DATE ANALYZED: 08/27/99
DATE REPORTED: 10/11/99



REVIEWED BY: _____

BASE/NEUTRAL COMPOUNDS
EPA METHOD 8270C

| PARAMETERS, ug/l | Well #6 | Well #7 | Well #8 | Equipment Blank |
|---|---|---|---|---|
| 49. P-Dimethylaminoazobenzene | <10.00 | <10.00 | <10.00 | <10.00 |
| 50. 7,12-Dimethylbenz[a]anthracene | <10.00 | <10.00 | <10.00 | <10.00 |
| 51. 3,3-Dimethylbenzadine | <10.00 | <10.00 | <10.00 | <10.00 |
| 52. 1,3-Dinitrobenzene | <20.00 | <20.00 | <20.00 | <20.00 |
| 53. Diphenylamine | <10.00 | <10.00 | <10.00 | <10.00 |
| 54. Disulfoton | <10.00 | <10.00 | <10.00 | <10.00 |
| 55. Famphur | <20.00 | <20.00 | <20.00 | <20.00 |
| 56. Hexachloropropene | <10.00 | <10.00 | <10.00 | <10.00 |
| 57. Isosafrole | <10.00 | <10.00 | <10.00 | <10.00 |
| 58. Kepone | <20.00 | <20.00 | <20.00 | <20.00 |
| 59. Methapryilene | <100.00 | <100.00 | <100.00 | <100.00 |
| 60. 3-Methylchloroanthrene | <10.00 | <10.00 | <10.00 | <10.00 |
| 61. 2-Methylnaphthalene | <10.00 | <10.00 | <10.00 | <10.00 |
| 62. Methyl Parathion | <10.00 | <10.00 | <10.00 | <10.00 |
| 63. 1,4-Naphthoquinone | <10.00 | <10.00 | <10.00 | <10.00 |
| 64. 1-Naphthylamine | <10.00 | <10.00 | <10.00 | <10.00 |
| 65. 2-Naphthylamine | <10.00 | <10.00 | <10.00 | <10.00 |
| 66. 2-Nitroaniline | <50.00 | <50.00 | <50.00 | <50.00 |
| 67. 3-Nitroaniline | <50.00 | <50.00 | <50.00 | <50.00 |
| 68. 4-Nitroaniline | <20.00 | <20.00 | <20.00 | <20.00 |
| 69. 5-Nitro-O-Toluidine | <10.00 | <10.00 | <10.00 | <10.00 |
| 70. N-Nitroso-n-butlyamine | <10.00 | <10.00 | <10.00 | <10.00 |
| 71. N-Nitrosodiethylamine | <20.00 | <20.00 | <20.00 | <20.00 |
| 72. N-Nitrosomethylethylamine | <10.00 | <10.00 | <10.00 | <10.00 |
| 73. N-Nitrosopiperidine | <20.00 | <20.00 | <20.00 | <20.00 |
| 74. N-Nitrosopyrrolidine | <40.00 | <40.00 | <40.00 | <40.00 |
| 75. Parathion | <10.00 | <10.00 | <10.00 | <10.00 |
| 76. Pentachlorobenzene | <10.00 | <10.00 | <10.00 | <10.00 |
| 77. Pentachloronitrobenzene | <50.00 | <50.00 | <50.00 | <50.00 |
| 78. Phenacetin | <20.00 | <20.00 | <20.00 | <20.00 |
| 79. 1,4-Phenylenediamine | <10.00 | <10.00 | <10.00 | <10.00 |
| 80. Phorate | <10.00 | <10.00 | <10.00 | <10.00 |
| 81. Pronamide | <10.00 | <10.00 | <10.00 | <10.00 |
| 82. Safrole | <10.00 | <10.00 | <10.00 | <10.00 |
| 83. 1,2,4,5-Tetrachlorobenzene | <10.00 | <10.00 | <10.00 | <10.00 |
| 84. Thionazin | <20.00 | <20.00 | <20.00 | <20.00 |
| 85. O-Toluidine | <10.00 | <10.00 | <10.00 | <10.00 |
| 86. 1,3,5-Trinitrobenzene | <10.00 | <10.00 | <10.00 | <10.00 |
| 87. 0,0,0-Triethyl Phosphorothioate | <10.00 | <10.00 | <10.00 | <10.00 |
| 88. Hexachloroethane | <10.00 | <10.00 | <10.00 | <10.00 |
| 89. Isodrin | <100.00 | <100.00 | <100.00 | <100.00 |

Environment 1, Inc.
P.O. Box 7085, 114 Oakmont Dr.
Greenville, NC 27858

Phone (252) 756-6208 • Fax (252) 756-0633

# CHAIN OF CUSTODY RECORD



CLIENT: 6043 Week: 33

WAYNE CO. LANDFILL (DUDLEY)
MR. LLOYD COOK
460B LANDFILL ROAD
DUDLEY NC 28333

(919) 689-2994

| | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | | | | | | | | | CHLORINE NEUTRALIZED AT COLLECTION |
| | | | | | | | | | | | | <2 | | | <2 | <2 | <2 | <2 | <2 | <2 | <2 | pH CHECK (LAB) |
| | | | | | | | | | | | | P | P | P | P | | G | G | G | G | G | CONTAINER TYPE, P/G |
| | | | | | | | | | | | | A | B | A | A | | E | E | A | A | E | CHEMICAL PRESERVATION |
| SAMPLE LOCATION | COLLECTION DATE | COLLECTION TIME | TOTAL CHLORINE AT COLLECTION | TEMPERATURE, °C AT COLLECTION | # OF CONTAINERS | Field pH | Metals | Conductivity | Temperature | Field Parameter | EPA 8260B | 8260 Dup. 1 | 8270C BN | 8270C Dup. 1 | 8260 App. II 1 | 8260 App. II 2 | 8260 App. II 3 | 8260B App. II | | | | PARAMETERS |
| Well #1 | 08/24/99 | 1325 | | 22 | 8 | G | G | G | G | G | | | G | G | G | G | G | G | | | | |
| Well #2 | 08/24/99 | 1255 | | 22 | 6 | G | G | G | G | G | | | G | G | G | | | G | | | | |
| Well #3 | 08/24/99 | 1200 | | 22 | 6 | G | G | G | G | G | | | G | G | G | | | G | | | | |
| Well #4 | 08/24/99 | 1235 | | 21 | 6 | G | G | G | G | G | | | G | G | G | | | G | | | | |
| Well #5 | 08/24/99 | 1305 | | 24 | 6 | G | G | G | G | G | | | G | G | G | | | G | | | | |
| Well #6 | 08/24/99 | 1225 | | 24 | 6 | G | G | G | G | G | | | G | G | G | | | G | | | | |
| Well #7 | 08/24/99 | 1315 | | 23 | 6 | G | G | G | G | G | | | G | G | G | | | G | | | | |
| Well #8 | 08/24/99 | 1215 | | 21 | 7 | G | G | G | G | G | | | G | G | G | G | G | G | | | | |
| Surface Water #1 | 08/24/99 | 1435 | | 24 | 4 | G | G | G | G | | G | G | | | | | | | | | | |
| Surface Water #2 | | | | | 4 | | | | | | | | | | | | | | | | | |
| Surface Water #3 | | | | | 4 | | | | | | | | | | | | | | | | | |

A - NONE
B - $HNO_3$
C - $H_2SO_4$
D - NAOH
E - HCL
F - ZINC ACETATE
G -

CLASSIFICATION:

- [ ] WASTEWATER (NPDES)
- [ ] DRINKING WATER
- [ ] DWQ/GW
- [X] SOLID WASTE
- [ ] OTHER

SAMPLES COLLECTED BY:
(Please Print)
Hugar Fan

SAMPLES RECEIVED IN LAB AT <4.0 °C

| RELINQUISHED BY (SIG.) (SAMPLER) | DATE/TIME | RECEIVED BY (SIG.) | DATE/TIME |
|---|---|---|---|
| Bob Hugar | 08/24/99 1500 | Vassie Barrett | 8/24/99 1500 |
| RELINQUISHED BY (SIG.) | DATE/TIME | RECEIVED BY (SIG.) | DATE/TIME |
| | | | |
| RELINQUISHED BY (SIG.) | DATE/TIME | RECEIVED BY (SIG.) | DATE/TIME |
| | | | |

COMMENTS:
SW2 DRY
SW3 DRY

Instructions for completing this form are on the reverse side.

Sampler must place a "C" for composite sample or a "G" for Grab sample in the blocks above for each parameter requested.

NO 22040

FORM #5

Environment 1, Inc.
P.O. Box 7085, 114 Oakmont Dr.
Greenville, NC 27858

Phone (252) 756-6208 • Fax (252) 756-0633

# CHAIN OF CUSTODY RECORD



CLIENT: 6043 Week: 33

WAYNE CO. LANDFILL (DUDLEY)
MR. LLOYD COOK
460B LANDFILL ROAD
DUDLEY NC 28333

(919) 689-2994

| SAMPLE LOCATION | COLLECTION DATE | COLLECTION TIME | TOTAL CHLORINE AT COLLECTION | TEMPERATURE, °C AT COLLECTION | # OF CONTAINERS | Field pH | Metals | Conductivity | Temperature | Field Parameter | EPA 8260B | 8260 Dup. 1 | 8270C B\N | 8270C Dup. 1 | 8260 App. II 1 | 8260 App. II 2 | 8260 App. II 3 | 8260B App. II | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CHLORINE NEUTRALIZED AT COLLECTION | | | | | | | | | | | | | | | | | | | | | |
| pH CHECK (LAB) | | | | | | | <2 | | | | | | <2 | <2 | <2 | | | <2 | | | |
| CONTAINER TYPE, P/G | | | | | | P | P | P | P | | G | G | G | G | G | G | G | G | | | |
| CHEMICAL PRESERVATION | | | | | | A | B | A | A | | E | E | A | A | E | E | E | E | | | |
| Equipment Blank | 08/24/99 | 1000 | | | 5 | | G | | | | | | G | G | G | | | G | | | |
| Trip Blank | | | | | 2 | | | | | | | | | | | | | | | | |

PARAMETERS

A - NONE
B - $HNO_3$
C - $H_2SO_4$
D - NAOH
E - HCL
F - ZINC ACETATE
G - _____

CLASSIFICATION:

- [ ] WASTEWATER (NPDES)
- [ ] DRINKING WATER
- [ ] DWQ/GW
- [X] SOLID WASTE
- [ ] OTHER_____

SAMPLES COLLECTED BY: (Please Print) N Vogel Fox

SAMPLES RECEIVED IN LAB AT 4.0 °C

| RELINQUISHED BY (SIG.) (SAMPLER) | DATE/TIME | RECEIVED BY (SIG.) | DATE/TIME |
|---|---|---|---|
| Brad Moore | 08/24/99 5:00 | Vassie Barrett | 8/24/99 5:00 |
| RELINQUISHED BY (SIG.) | DATE/TIME | RECEIVED BY (SIG.) | DATE/TIME |
| RELINQUISHED BY (SIG.) | DATE/TIME | RECEIVED BY (SIG.) | DATE/TIME |

COMMENTS:

Instructions for completing this form are on the reverse side.

Sampler must place a "C" for composite sample or a "G" for Grab sample in the blocks above for each parameter requested.

Nº 22042

FORM #5