

OPERATION/CONSTRUCTION MANAGERS

CIVIL/SANITARY ENGINEERS

**Municipal
Services**



**Engineering
Company, P.A.**

November 2, 2005

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

Re: Groundwater Sampling and Analysis
Iredell County Closed Sanitary Landfill
MESCO Project No. G05014.0

Dear Mr. Gamble:

Municipal Engineering Services Co., PA (MESCO) sampled the Iredell County Closed Sanitary Landfill on July 25, 2005 for the complete Appendix I list of constituents. All of the samples were analyzed by Environmental Conservation Laboratories, Inc. (ENCO) of Cary, NC. The complete results of the lab analysis are included herein.

All detected constituents were analyzed for regulatory exceedance with reference to North Carolina Groundwater Standards. The results are shown in the enclosed table titled "Exceedance Scan". No constituents were detected above the NCGW2L standard. This is the first event that there were no exceedances since the monitoring program was implemented.

Inorganic constituents (Metals) were detected within several monitoring wells and volatile organic constituents (VOCs) continue to be found within compliance well MW-6 and background well MW-1. The numbers of metal detections continue to decrease in general compared to the previous sampling events. Water samples obtained from compliance well MW-6, located northeast of the closed sanitary unit, continues to exhibit low levels of the intermediate chlorinated hydrocarbons 1,1-Dichloroethane and cis-1,2-Dichloroethene. The plume in this region appears to be contained in the horizontal direction as MW-6R again lacked any VOC detections. The results from the water samples obtained from the background well MW-1 also improved dramatically during this sampling event. MW-1 contained only a slight concentration of 1,1-Dichloroethane. The background well has historically contained elevated concentrations of dense chlorinated solvents PCE, TCE and their daughter products.

The water supply well that serves the animal shelter and adjacent mental health center contained no VOCs and only minor concentrations of metals which are likely not related to the closed landfill.

A water quality assessment report was submitted to the Section on April 14, 2005 in response to concerns raised by the Section in a letter dated December 8, 2004. The assessment report recommended improvements to the monitoring network which will further assess the nature and extent of groundwater contamination in both the MW-1 and MW-6 regions. All of the recommended actions were carried out during and prior to this sampling event with the exception of installation of the planned additional monitoring wells in the MW-1 and MW-6 areas and hooking up the buildings along Twin Oaks Road to the city water supply system. Since the laboratory results indicate that the groundwater quality upon the site has suddenly improved significantly it is now recommended to wait until after the next scheduled sampling event to determine if the expansion of the monitoring network is still necessary. The county owned buildings are still planned to be hooked up to the water line that runs parallel to Twin Oaks Road.

MESCO enclosed a superimposed single day potentiometric map from a previous sampling event depicting the monitoring locations and property boundaries. The field data sheet and C-O-C have also been attached. The Iredell County Closed Sanitary Landfill is scheduled for sampling again in January 2006. If you have any questions or comments regarding this report, please contact me at (919) 772-5393 or by email at jpfohl@mesco.com.

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



Jonathan Pfohl
Environmental Specialist

Enclosures
cc: Mr. David Lambert
Iredell County

Attachments:
Exceedance Scan for July 2005
Field Sampling Data Sheet & C-O-C for July 2005
Time Series plot of VOCs detected in MW-1, Figures 1,2, & 3
Time Series plot of VOCs detected in MW-6, Figures 4,5,6, & 7
Superimposed aerial photographic w/ potentiometric contours, Figure 8
Laboratory Results for July 2005

**Exceedance Scan
Iredell County Closed Landfill**

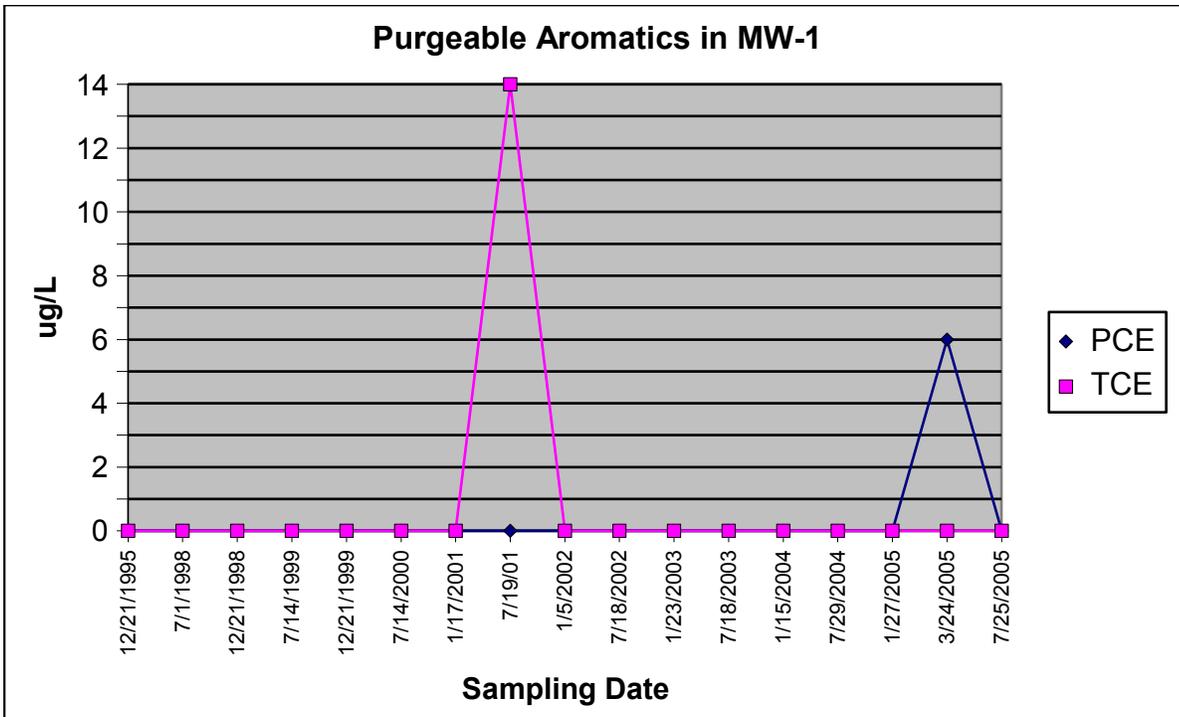
| Well ID | Parameter Name ¹ | Sample Date | Result | Unit | PQL ² | NCGW2L ³ | Exceedance |
|----------------------|-----------------------------|-------------|--------|------|------------------|---------------------|------------|
| MW-2 | Zinc | 07/25/2005 | 0.13 | mg/L | 0.05 | 2.1 | |
| MW-3R | Barium | 07/25/2005 | 0.57 | mg/L | 0.5 | 2 | |
| MW-3R | Cadmium | 07/25/2005 | 0.0021 | mg/L | 0.001 | 0.005 | |
| MW-3R | Cobalt | 07/25/2005 | 0.013 | mg/L | 0.01 | | |
| MW-3R | Lead | 07/25/2005 | 0.015 | mg/L | 0.01 | 0.015 | |
| MW-3R | Vanadium | 07/25/2005 | 0.041 | mg/L | 0.04 | | |
| MW-3R | Zinc | 07/25/2005 | 0.054 | mg/L | 0.05 | 2.1 | |
| MW-6R | Chromium | 07/25/2005 | 0.016 | mg/L | 0.01 | 0.05 | |
| MW-6R | Zinc | 07/25/2005 | 0.087 | mg/L | 0.05 | 2.1 | |
| SW-2 | Thallium | 07/25/2005 | 0.015 | mg/L | 0.01 | | |
| MENTAL HEALTH CENTER | Zinc | 07/25/2005 | 0.13 | mg/L | 0.05 | 2.1 | |
| ANIMAL SHELTER | Barium | 07/25/2005 | 0.6 | mg/L | 0.5 | 2 | |
| ANIMAL SHELTER | Thallium | 07/25/2005 | 0.014 | mg/L | 0.01 | | |
| MW-1 | 1,1-Dichloroethane | 07/25/2005 | 10 | ug/L | 5 | 700 | |
| MW-6 | 1,1-Dichloroethane | 07/25/2005 | 8 | ug/L | 5 | 700 | |
| MW-6 | cis-1,2-Dichloroethene | 07/25/2005 | 33 | ug/L | 5 | 70 | |
| MW-6 | Barium | 07/25/2005 | 0.96 | mg/L | 0.5 | 2 | |
| MW-6 | Cobalt | 07/25/2005 | 0.2 | mg/L | 0.01 | | |
| MW-6 | Thallium | 07/25/2005 | 0.095 | mg/L | 0.01 | | |
| MW-6 | Zinc | 07/25/2005 | 0.07 | mg/L | 0.05 | 2.1 | |

¹ Table only contains detected constituents.

² PQL = Practical Quantitation Limit

³ NCGW2L = North Carolina Ground Water 2L Standard

Figure 1. Historical Purgeable Aromatics in MW-1

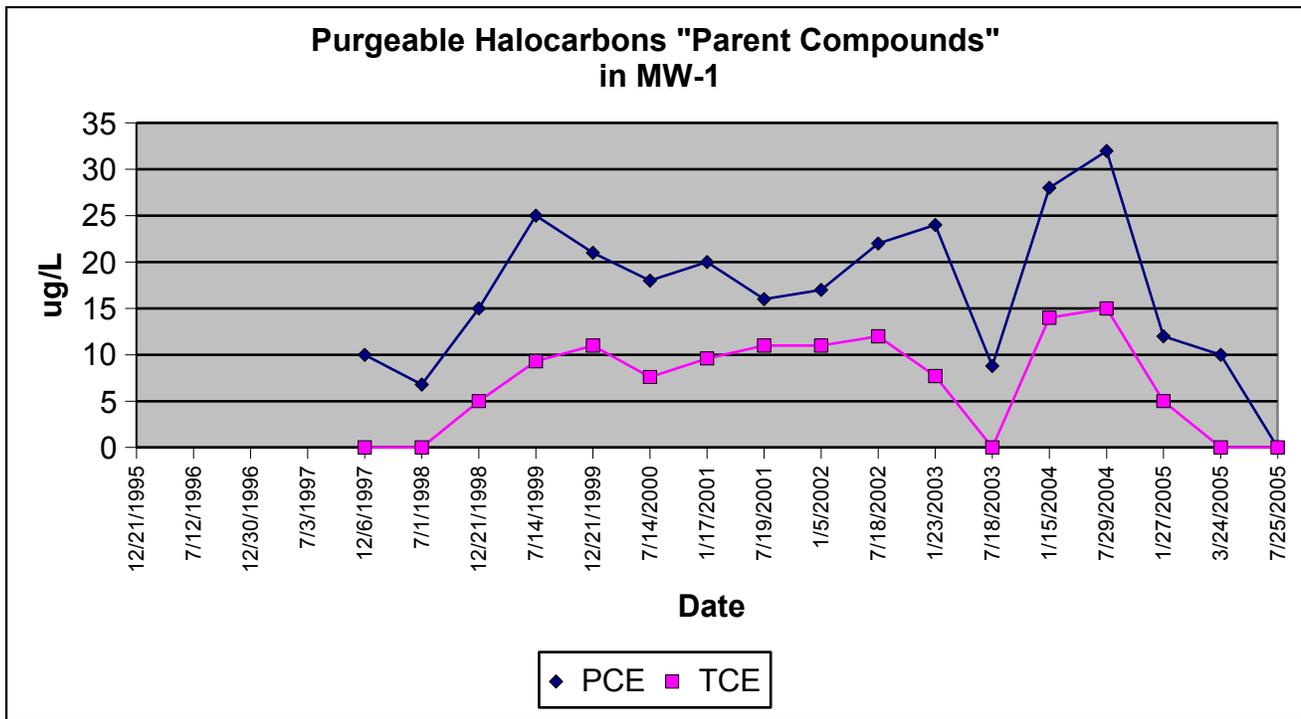


| Date | Benzene | Xylene |
|------------|----------|--------|
| 12/21/1995 | ND | ND |
| 7/1/1998 | ND | ND |
| 12/21/1998 | ND | ND |
| 7/14/1999 | ND | ND |
| 12/21/1999 | ND | ND |
| 7/14/2000 | ND | ND |
| 1/17/2001 | ND | ND |
| 7/19/2001 | ND | 14 |
| 1/5/2002 | ND | ND |
| 7/18/2002 | ND | ND |
| 1/23/2003 | ND | ND |
| 7/18/2003 | ND | ND |
| 1/15/2004 | ND | ND |
| 7/29/2004 | ND | ND |
| 1/27/2005 | ND | ND |
| 3/24/2005 | 6 | ND |
| 7/25/2005 | ND | ND |

ND = Not Detected

BOLD = Above MCL

Figure 2. Historical Purgeable Halocarbons "Parent" in MW-1

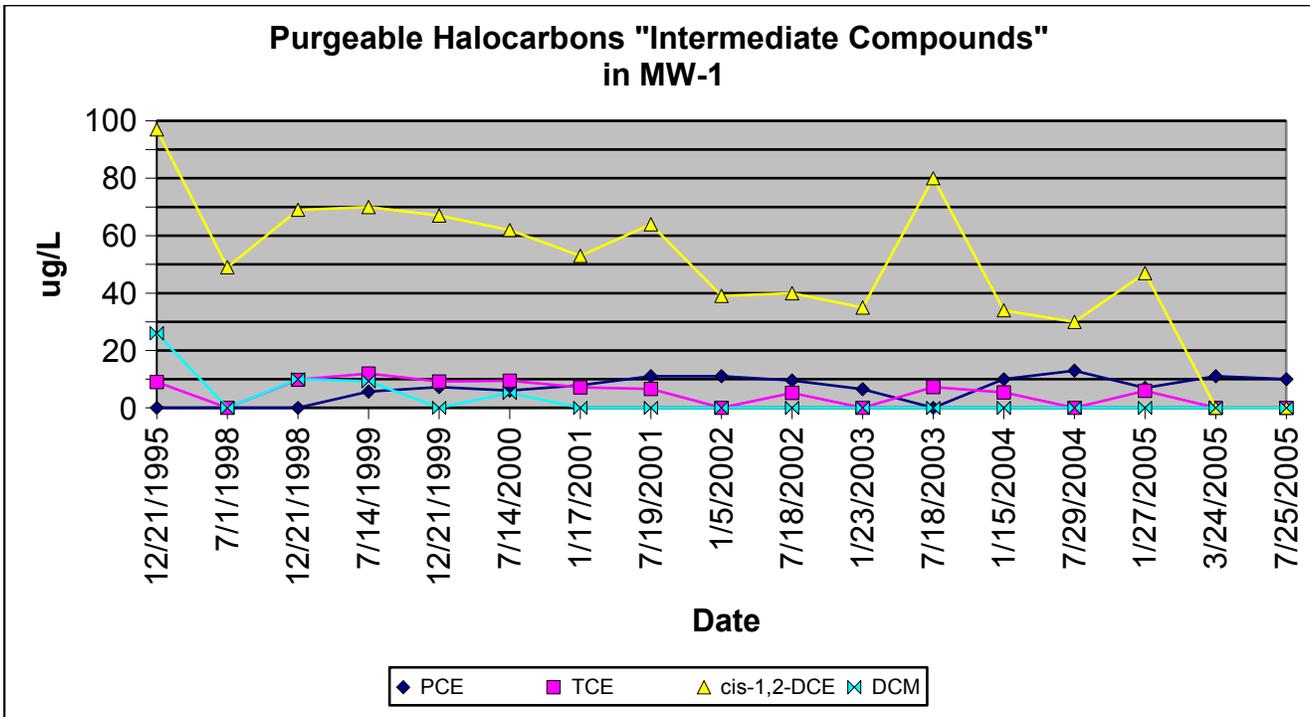


| Date | Tetrachloroethylene | Trichloroethylene |
|------------|---------------------|-------------------|
| 12/21/1995 | ND | ND |
| 7/12/1996 | ND | ND |
| 12/30/1996 | ND | ND |
| 7/3/1997 | ND | ND |
| 12/6/1997 | 10 | ND |
| 7/1/1998 | 6.8 | ND |
| 12/21/1998 | 15 | 5 |
| 7/14/1999 | 25 | 9.3 |
| 12/21/1999 | 21 | 11 |
| 7/14/2000 | 18 | 7.6 |
| 1/17/2001 | 20 | 9.6 |
| 7/19/2001 | 16 | 11 |
| 1/5/2002 | 17 | 11 |
| 7/18/2002 | 22 | 12 |
| 1/23/2003 | 24 | 7.7 |
| 7/18/2003 | 8.8 | ND |
| 1/15/2004 | 28 | 14 |
| 7/29/2004 | 32 | 15 |
| 1/27/2005 | 12 | 5 |
| 3/24/2005 | 10 | ND |
| 7/25/2005 | ND | ND |

ND = Not Detected

BOLD = Above MCL

Figure 3. Historical Purgeable Halocarbons "Intermediates" in MW-1

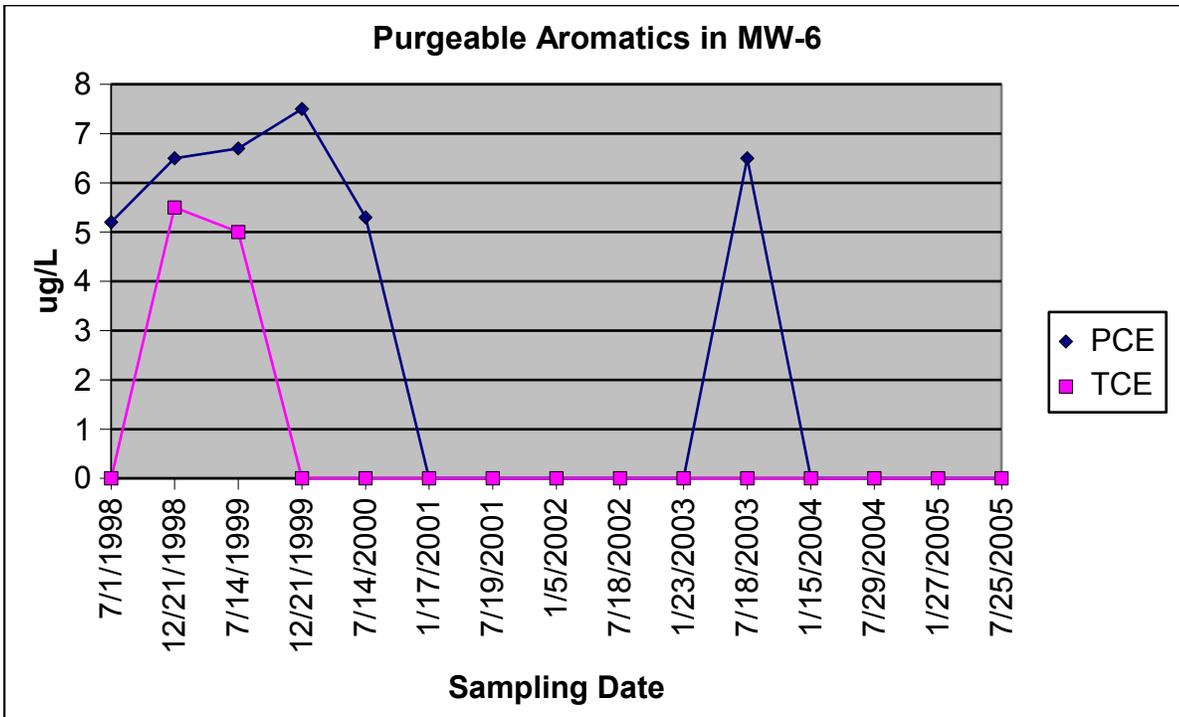


| Date | 1,1-DCA | 1,2-DCA | Cis 1,2-DCE | DCM |
|------------|---------|------------|-------------|------------|
| 12/21/1995 | ND | 9 | 97 | 26 |
| 7/1/1998 | ND | ND | 49 | ND |
| 12/21/1998 | ND | 9.8 | 69 | 10 |
| 7/14/1999 | 5.7 | 12 | 70 | 9.3 |
| 12/21/1999 | 7.3 | 9.2 | 67 | ND |
| 7/14/2000 | 6.1 | 9.5 | 62 | 5.2 |
| 1/17/2001 | 7.9 | 7.2 | 53 | ND |
| 7/19/2001 | 11 | 6.6 | 64 | ND |
| 1/5/2002 | 11 | ND | 39 | ND |
| 7/18/2002 | 9.6 | 5.2 | 40 | ND |
| 1/23/2003 | 6.5 | ND | 35 | ND |
| 7/18/2003 | ND | 7.3 | 80 | ND |
| 1/15/2004 | 10 | 5.4 | 34 | ND |
| 7/29/2004 | 13 | ND | 30 | ND |
| 1/27/2005 | 7 | 6 | 47 | ND |
| 3/24/2005 | 11 | ND | ND | ND |
| 7/25/2005 | 10 | ND | ND | ND |

ND = Not Detected

BOLD = Above MCL

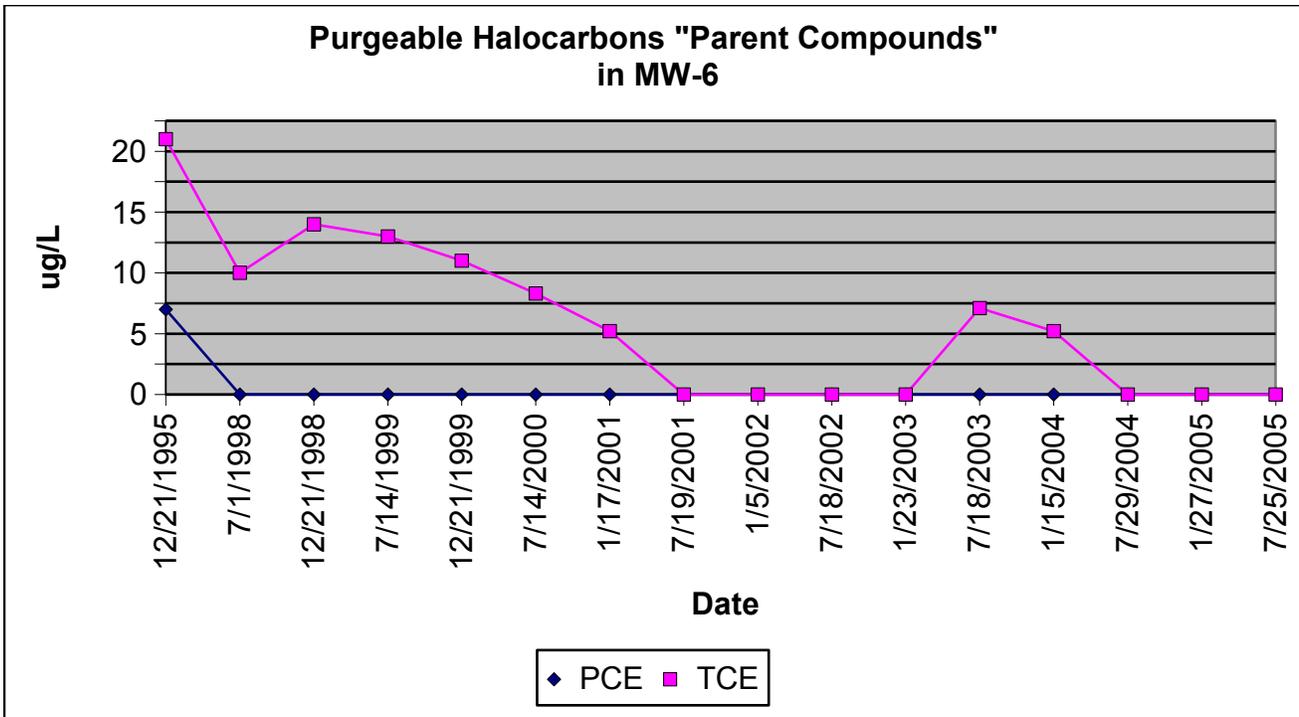
Figure 4. Historical Purgeable Aromatics in MW-6



| Date | Benzene | Xylene |
|------------|------------|--------|
| 12/21/1995 | 6 | 12 |
| 7/1/1998 | 5.2 | ND |
| 12/21/1998 | 6.5 | 5.5 |
| 7/14/1999 | 6.7 | 5 |
| 12/21/1999 | 7.5 | ND |
| 7/14/2000 | 5.3 | ND |
| 1/17/2001 | ND | ND |
| 7/19/2001 | ND | ND |
| 1/5/2002 | ND | ND |
| 7/18/2002 | ND | ND |
| 1/23/2003 | ND | ND |
| 7/18/2003 | 6.5 | ND |
| 1/15/2004 | ND | ND |
| 7/29/2004 | ND | ND |
| 1/27/2005 | ND | ND |
| 7/25/2005 | ND | ND |

ND = Not Detected
BOLD = Above MCL

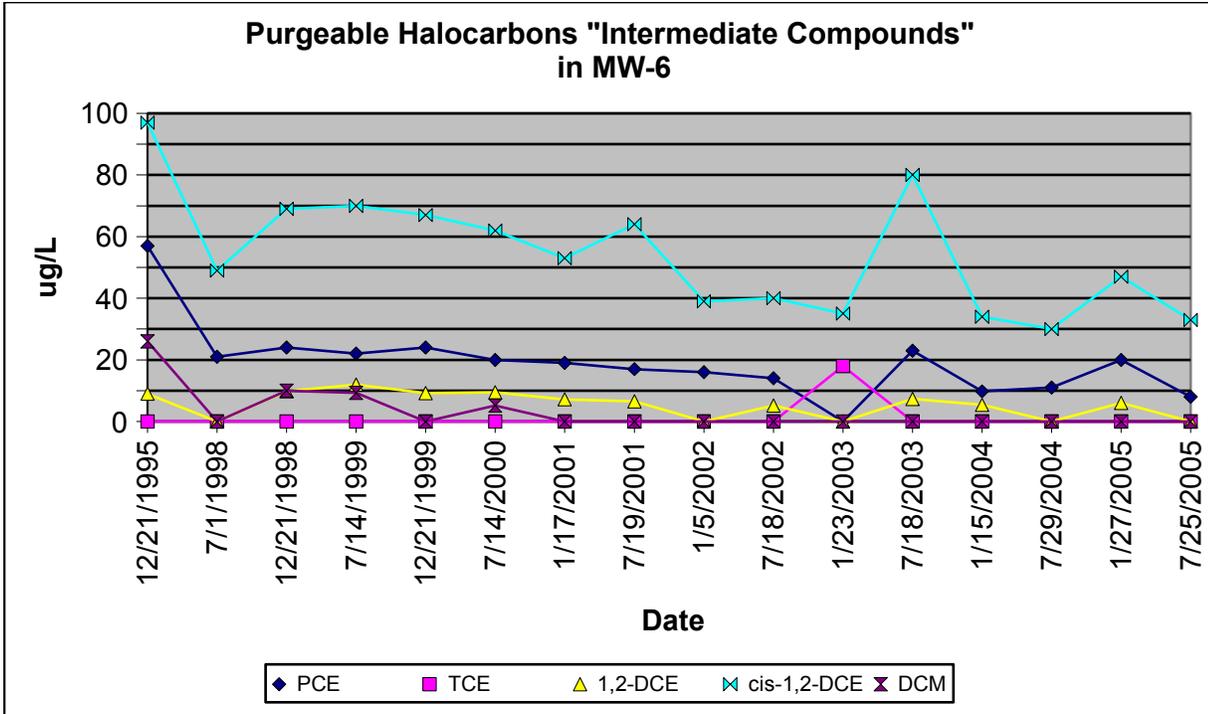
Figure 5. Historical Purgeable Halocarbons "Parent" in MW-6



| Date | Tetrachloroethylene | Trichloroethylene |
|------------|---------------------|-------------------|
| 12/21/1995 | 7 | 21 |
| 7/1/1998 | ND | 10 |
| 12/21/1998 | ND | 14 |
| 7/14/1999 | ND | 13 |
| 12/21/1999 | ND | 11 |
| 7/14/2000 | ND | 8.3 |
| 1/17/2001 | ND | 5.2 |
| 7/19/2001 | ND | ND |
| 1/5/2002 | ND | ND |
| 7/18/2002 | ND | ND |
| 1/23/2003 | ND | ND |
| 7/18/2003 | ND | 7.1 |
| 1/15/2004 | ND | 5.2 |
| 7/29/2004 | ND | ND |
| 1/27/2005 | ND | ND |
| 7/25/2005 | ND | ND |

ND = Not Detected
BOLD = Above MCL

Figure 6. Historical Purgeable Halocarbons "Intermediates" in MW-6

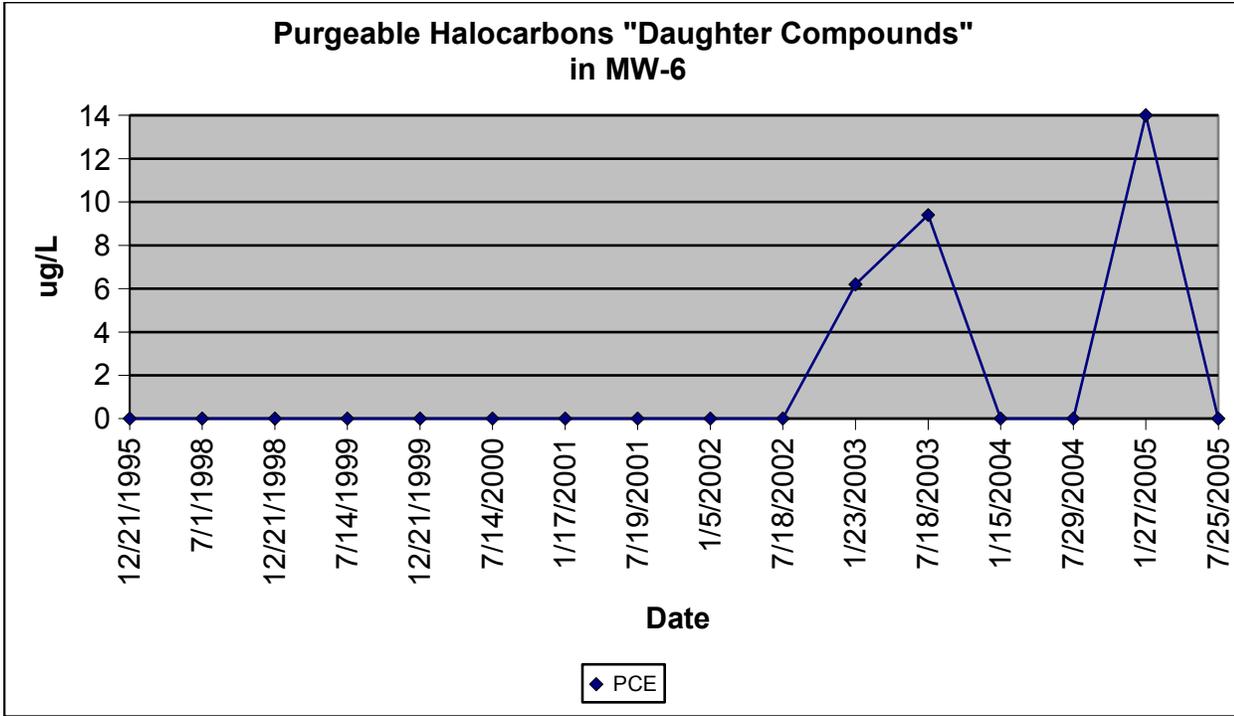


| Date | 1,1-DCA | 1,1-DCE | 1,2-DCA | cis-1,2-DCE | DCA |
|------------|---------|-----------|------------|-------------|------------|
| 12/21/1995 | 57 | ND | 9 | 97 | 26 |
| 7/1/1998 | 21 | ND | ND | 49 | ND |
| 12/21/1998 | 24 | ND | 9.8 | 69 | 10 |
| 7/14/1999 | 22 | ND | 12 | 70 | 9.3 |
| 12/21/1999 | 24 | ND | 9.2 | 67 | ND |
| 7/14/2000 | 20 | ND | 9.5 | 62 | 5.2 |
| 1/17/2001 | 19 | ND | 7.2 | 53 | ND |
| 7/19/2001 | 17 | ND | 6.6 | 64 | ND |
| 1/5/2002 | 16 | ND | ND | 39 | ND |
| 7/18/2002 | 14 | ND | 5.2 | 40 | ND |
| 1/23/2003 | ND | 18 | ND | 35 | ND |
| 7/18/2003 | 23 | ND | 7.3 | 80 | ND |
| 1/15/2004 | 9.8 | ND | 5.4 | 34 | ND |
| 7/29/2004 | 11 | ND | ND | 30 | ND |
| 1/27/2005 | 20 | ND | 6 | 47 | ND |
| 7/25/2005 | 8 | ND | ND | 33 | ND |

ND = Not Detected

BOLD = Above MCL

Figure 7. Historical Purgeable Halocarbons "Daughter" in MW-6

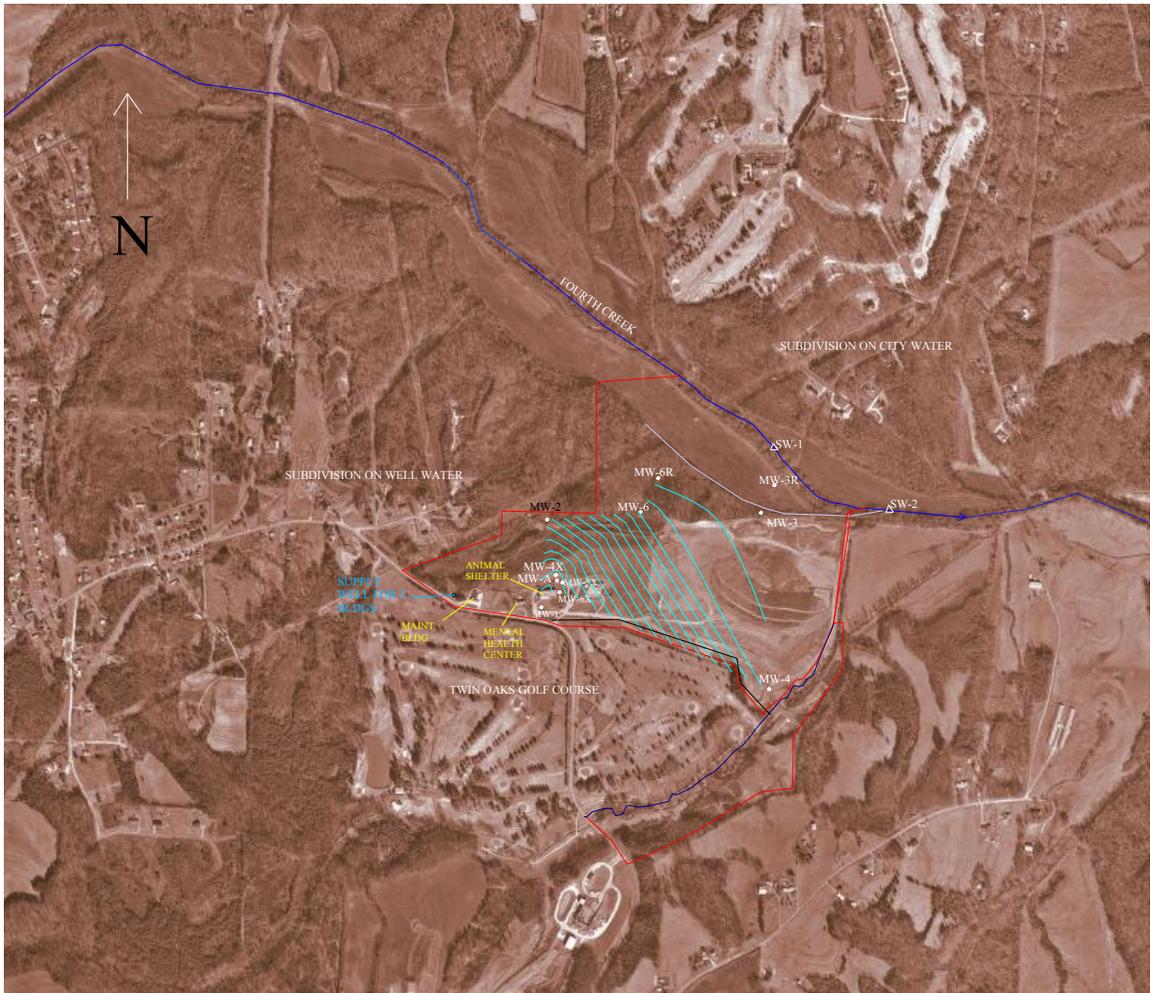


| Date | Vinyl chloride |
|------------|----------------|
| 12/21/1995 | ND |
| 7/1/1998 | ND |
| 12/21/1998 | ND |
| 7/14/1999 | ND |
| 12/21/1999 | ND |
| 7/14/2000 | ND |
| 1/17/2001 | ND |
| 7/19/2001 | ND |
| 1/5/2002 | ND |
| 7/18/2002 | ND |
| 1/23/2003 | 6.2 |
| 7/18/2003 | 9.4 |
| 1/15/2004 | ND |
| 7/29/2004 | ND |
| 1/27/2005 | 14 |
| 7/25/2005 | ND |

ND = Not Detected

BOLD = Above MCL

Figure 8



- Property Line
- Potentiometric Contours
- Ephemeral Ditch

Superimposed Aerial Photo-Iredell County Closed Landfill

