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ENVIRONMENT

Mr. George Jacob
United States Environmental Protection Agency – Region 2
290 Broadway, 20th Floor
New York, New York 10007-1866

Subject:
Operational Year 6 Annual Monitoring Report,
Colesville Landfill, Broome County, New York. (Site No. 704010).

Date:
April 30, 2009

Contact:
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Our ref:
NY000949.0022.00004

Dear Mr. Jacob:

On behalf of Broome County, ARCADIS is providing the Operational Year 6 Annual Monitoring Report for the Colesville Landfill, Broome County, New York.

Please feel free to contact me if you have any questions or comments.

Sincerely,

ARCADIS

Steven M. Feldman
Project Manager

Copies:
Laurie Haskell, Broome County
Payson Long, NYSDEC
Julia Kenney, NYSDOH
File

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Broome County Division of Solid Waste Management

Operational Year 6 Annual Monitoring Report

Colesville Landfill, Broome County, New York
NYSDEC Site No. 704010

April 30, 2009

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Operational Year 6
Annual Monitoring Report
Colesville Landfill,
Broome County, New York
NYSDEC Site 704010

Prepared for:
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April 30, 2009

Tables

Figures

Appendices

1. Introduction

This Operational Year 6, Quarter Number 4 Annual Monitoring Report (Report) was prepared on behalf of the Broome County Division of Solid Waste Management for the Colesville Landfill, located in Broome County, New York (Site) to evaluate and document long-term monitoring (LTM) activities at the site. Remediation and monitoring activities are being conducted pursuant to the Record of Decision and Explanation of Significant Difference that were issued in March 1991 and September 2000, respectively. LTM activities (which include environmental effectiveness and remediation system performance monitoring) were performed in accordance with the LTM Plan (ARCADIS G&M, Inc. 2002), LTM Plan Addendum for Spring Water Remediation Systems (ARCADIS 2003), Interim Remedial Action Report (ARCADIS 2004), and the Proposed Modifications to the Long Term Monitoring Program (ARCADIS 2005) which were approved by the United States Environmental Protection Agency and New York State Department of Environmental Conservation (NYSDEC). These documents provide a detailed description of the LTM program, methodology, and rationale. Where applicable these elements are either summarized or incorporated by reference herein.

This report provides the data collected from the September 2008 water-level measurement round and the groundwater quality monitoring event conducted during Operational Year 6, Quarter Number 4 (i.e., annual monitoring event). A description of the operation, maintenance, and monitoring (OM&M) associated with the Groundwater Remediation System during Operational Year 6, Quarter Number 4 has also been provided. Included in the analysis of the results is a summary and discussion of all data collected during Operational Year 6 (October 2008 through September 2008). Following the detailed data analysis and discussion is a summary of findings, conclusions, and recommendations.

2. Methodology

The following section provides a summary of the environmental effectiveness and remedial system performance monitoring methodology for Operational Year 6, Quarter Number 4. A site plan, which shows the location of environmental effectiveness monitoring, is provided on Figure 1.

2.1 Environmental Effectiveness Monitoring

The environmental effectiveness monitoring performed during Operational Year 6, Quarter Number 4, included the following:

- Water-level (hydraulic) measurements were collected from 25 monitoring wells on September 17, 2008.
- Groundwater samples were collected from 19 monitoring wells (Year 6, Q4 list of wells plus injection test Monitoring Well TW-1) during the week of September 15, 2008 and were selectively analyzed for volatile organic compounds (VOCs), dissolved gases, and total organic carbon (TOC). Field parameters were also recorded at these monitoring locations.
- Samples (VOCs only) were collected at the SP-4 surface water location on September 18, 2008.

In accordance with the Proposed Modifications to the LTM Program (ARCADIS 2005), groundwater samples were collected from monitoring wells utilizing passive diffusive bag (PDB) samplers.

The depth to groundwater in monitoring wells was measured using methods consistent with those described in the LTM Program.

2.2 Groundwater Remediation System Performance Monitoring

Groundwater Remediation System performance monitoring activities during Operational Year 6, Quarter Number 4 were as follows:

- Pump-and-treat (PT) system recovery well influent and effluent samples were collected on September 18, 2008. The samples were analyzed for VOCs and total iron.
- One vapor sample from the PT system air stripper effluent was collected on September 18, 2008. The sample was analyzed for VOCs.
- PT system operating parameters were recorded during the quarterly OM&M site visit.

- TOC samples were collected from select injection wells on September 18, 2008.
- Automated reagent injection (ARI) system operating parameters were recorded during each injection event.
- A TOC sample was collected from alternate electron donor monitoring well TW-1 on September 18, 2008.

PT system groundwater samples were collected as grab samples directly from the individual recovery pipelines connected to recovery wells GMPW-3, GMPW-4, GMPW-5, the combined influent water to the low profile air stripper, and the combined effluent after the cartridge filters. The effluent air sample was collected as a grab sample directly from the designated point located on the low profile air stripper stack.

2.3 Spring Water Remediation System Performance Monitoring

SP-5 spring water remediation system corrective measures were completed on September 15 and 16, 2008 to alleviate the formation of tailwater at the discharge outfall. SP-5 spring water remediation system OM&M monitoring was conducted on September 18, 2008 following the completion of the corrective measures. System OM&M was conducted in accordance with the LTM Plan Addendum for Spring Water Remediation Systems (ARCADIS 2003) and consisted of recording field parameters (discharge flowrate and depth to water in treatment unit) and the collection of an influent and effluent spring water sample for analysis of VOCs. The influent sample was collected after removing three well volumes from the influent monitoring well, which is located within the SP-5 treatment unit and screened below the liquid phase granular activated carbon (LPGAC) zone. The treatment system effluent sample was collected as a grab sample from the discharge pipe prior to entering the riprap-lined outlet. All spring water samples were analyzed for VOCs using USEPA Method 8260.

Additional information related to the corrective measures rationale and methodology is provided in Section 8.

3. Groundwater Flow

Water-level measurements were made from existing wells on September 17, 2008. Water-level elevation data for Operational Year 6, Quarter Number 4 is provided in Table 1. A summary of water-level elevation data for Operational Year 6 is included in this table. Water-level elevations and the groundwater flow direction for the September

2008 monitoring event are shown on Figure 1. As shown on Figure 1, the groundwater flow direction in the project area (i.e., adjacent to the landfill western perimeter) and site-wide in the Operational Year 6, Quarter Number 4 round was consistent with previous rounds. The groundwater flow direction in the project area is toward the southwest from the western perimeter of the landfill. The groundwater flow direction in areas further to the east of the project area is toward the south/southwest.

Water-level elevation data for Operational Year 6 was similar to prior rounds of data. Seasonal fluctuations are observed during each operating quarter; however, the data generally indicate groundwater flow directions consistent with that observed during the Operational Year 5, Quarter Number 4 monitoring event.

4. Groundwater Quality

The following sections describe the analytical results for groundwater samples collected during the September 2008 monitoring round (Operational Year 6, Quarter Number 4). A discussion of analytical results for all data collected during Operational Year 6 is also provided. Groundwater analytical data for Operational Year 6, Quarter Number 4 is provided in Tables 2 and 3. A summary of all analytical data collected during Operational Year 6 is also provided in the referenced tables. Finally, Figures D-1 through D-10 provided in Appendix D present the concentration of tetrachloroethylene (PCE)-related degradation compounds versus time or trichloroethane (TCA)-related degradation compounds versus time for monitoring wells GMMW-2, GMMW-5, GMMW-6, W-5, and TW-1. The concentration of the VOCs have been converted into micromoles per liter (umol/L) by dividing the mass based concentration of a compound by the molecular weight. This conversion allows for the VOCs to be compared on a molecular basis as opposed to a mass basis. Because anaerobic IRZs are constantly releasing adsorbed phase mass and degrade mass to daughter compounds with different molecular weights, the evaluation of anaerobic IRZs on a molecular basis is the proper method to analyze the data.

4.1 Volatile Organic Compounds

A comparison of Operational Year 6, Quarter Number 4 groundwater analytical results with previous analytical data indicate that the dissolved-phase plume continues to be stable and that the anaerobic in-situ reactive zone (IRZ) is completely degrading contaminant mass. Specifically, total VOC (TVOC) concentrations for plume boundary, landfill interior, and landfill perimeter monitoring wells continue to be stable to

decreasing. TVOC concentrations for mid-plume monitoring wells generally decreased. Specific observations are provided below.

Plume boundary, landfill interior, and landfill perimeter monitoring data indicate that the dissolved phase plume is stable to decreasing in size. TVOC concentrations for plume boundary monitoring wells W-17S and W-18 remained stable at 1.5 micrograms per liter (ug/L) and 74.5 ug/L, respectively. Offsite monitoring well W-20S remained stable at below the limits of detection (0.0 ug/L). Landfill perimeter monitoring wells W-6, W-7, and W-13 remained stable at 53.8 ug/L, 12.4 ug/L, and 0.0 ug/L, respectively. Landfill perimeter monitoring well PW-7 continued to decrease. Specifically, the TVOC concentration decreased from 190.8 ug/L (September 2007) to 106.8 ug/L (September 2008). Landfill interior monitoring well PW-13 generally remained stable at 29.6 ug/L. Landfill interior monitoring well GMMW-7 increased from 370.8 ug/L (September 2007) to 452.5 ug/L (September 2008).

In general, TVOC concentrations in mid-plume monitoring wells located furthest from the IRZ were stable during the current reporting period. Specifically, mid-plume monitoring wells W-16S, PW-4, PW-3 and PW-5 remained stable at 51.8 ug/L, 74.8 ug/L, 176.5 ug/L, 0.0 ug/L respectively. TVOC concentrations in mid-plume monitoring wells located closest to the IRZ (GMMW-5, GMMW-6, W-5, GMMW-2, and TW-1) were generally stable to decreasing during September 2008. Specifically, monitoring wells GMMW-2, GMMW-5, and W-5 remained stable at 312.1 ug/L, 136.1 ug/L, and 171.0 ug/L, respectively. Monitoring well GMMW-6 decreased from 403.1 ug/L (September 2007) to 243.0 ug/L (September 2008). The TVOC concentration in alternate electron donor pilot test monitoring well TW-1 decreased from 219.1 ug/L (December 2007) to 79.8 ug/L (September 2008).

Finally, background monitoring well W-14S remained stable at 0.0 ug/L.

A comparative analysis of groundwater analytical data for VOCs during Operational Year 6 continues to corroborate historical data and indicate that the dissolved phase plume is stable to decreasing. The overall stable plume provides continued evidence that ongoing natural attenuation processes are effectively controlling the further migration of the plume. Data also indicate that the IRZ is completely degrading mass as observed by an overall continuing decreasing trend of VOCs in monitoring wells GMMW-5, GMMW-6, W-5, GMMW-2, and TW-1. Additional discussion of the degradation of VOCs at these monitoring well locations is provided in Section 7.2.2 of this report.

PT system VOC analytical results are provided in Table 4. During the current reporting period, the TVOC concentration at recovery wells GMPW-3, GMPW-4, and GMPW-5 were stable when compared to prior data. Specifically, TVOC concentrations in recovery wells GMPW-3, GMPW-4, and GMPW-5 were 213.6 ug/L, 236.7 ug/L, and 0.0 ug/L, respectively. A complete evaluation of performance monitoring conducted on the PT system is provided in Section 7.1.2 of this report.

4.2 Indicators of Reducing Conditions

Groundwater analytical results for biogeochemical parameters and field parameters were collected in accordance with the LTM plan and are provided in Table 3. In addition, the concentration of methane versus time for monitoring wells GMMW-2, GMMW-5, GMMW-6, W-5, and TW-1 is provided on Figures D-1 through D-10 (Appendix D). In summary, field and laboratory groundwater data for Wells GMMW-5, GMMW-6, W-5, and TW-1 indicate that strongly reducing conditions are being maintained within the IRZ. This is evidenced by the presence of reduced forms of alternate electron acceptors (i.e., methane). Further details of the ARI system performance monitoring are provided in Section 7.2.2 of this report.

4.3 Evidence of Biodegradation

Table 3 provides the results of biodegradation end product concentrations in monitoring wells and indicates the continued occurrence of bioactivity and biodegradation of VOCs within the IRZ. In addition, the concentration of ethene (Figures D-1 through D-5) or ethane (Figures D-6 through D-10) versus time for monitoring wells GMMW-2, GMMW-5, GMMW-6, W-5, and TW-1 is provided on Figures D-1 through D-10 (Appendix D). The concentration of ethane at monitoring well GMMW-5 continues to be elevated when compared to baseline conditions. GMMW-5 is located closest to the ARI injection wells and would be expected to be the first well to exhibit increases in biodegradation end products. Ethene results for monitoring well GMMW-6 remained elevated during Operational Year 6, Quarter Number 4 and continue to indicate that the IRZ extends to the vicinity of this well. Finally, as shown on Figure D-3, monitoring well GMMW-2 exhibits a gradual decrease in PCE related daughter compounds and a gradual increase in ethene. This provides evidence that the monitoring well GMMW-2 location is being affected by groundwater that has been treated within the IRZ located upgradient of the GMMW-2 location. Additional details on the results of biogeochemical monitoring as evidence of Groundwater Remediation System performance and effectiveness are discussed in Section 7.2.2 of this report.

5. Spring Water Quality

Spring water locations SP-2 and SP-3 were observed during the OM&M site visit on September 18, 2008. Springs were not observed at the SP-2 and SP-3 locations except for a small amount of standing water (with no iron staining) at the SP-3 location. A few areas of spring water were observed along the heavy stone retention wall between SP-2 and SP-4.

6. Surface Water Quality

Table 5 presents the analytical results for surface water sampling location F-6 and SP-4 during Operational Year 6. As shown in Table 5, surface water quality remained stable during the reporting period. Similarly, surface water quality remained stable during Operational Year 6 with VOC concentrations either not detected or slightly above the limits of detection. The data continue to indicate that surface water quality is not being adversely impacted by the landfill.

7. Groundwater Remediation System Performance

The following section describes the results of the Groundwater Remediation System performance monitoring conducted during Operational Year 6, Quarter Number 4. A brief summary of system performance during Operational Year 6 is also provided.

7.1 PT System

The following section describes the results of the PT system performance monitoring conducted during Operational Year 6, Quarter Number 4.

7.1.1 Summary of Operation, Maintenance, and Monitoring

During Operational Year 6, Quarter Number 4, the PT system operated continuously with the exception of brief system shutdowns as a result of minor system alarms and routine OM&M activities. As part of the ongoing effort to maximize the flow rate at recovery wells GMPW-3 and GMPW-5, weekly interim monitoring visits were completed during the months of August and September 2008 to record the instantaneous flow rate at these two recovery wells. Pumping data generated during the weekly program indicate that the instantaneous flow rate of these two recovery wells decreases markedly (~50 percent) approximately 1.5 months following maintenance of these pumps. The decreased performance appears to be the direct

result of fouling of the pump intake filter socks. Accordingly, the pump intake filter socks were replaced at 45-day intervals and will continue to be replaced at this interval as part of the long-term maintenance program of the PT system.

PT system OM&M for Operational Year 6, Quarter Number 4 was conducted during the week of September 15, 2008 and included operation and maintenance of system equipment, the collection of system performance samples (water and vapor), and recording system operating parameters. Table 6 provides a summary of the recorded system operating parameters for the current operating period. As shown in Table 6, the total effluent groundwater recovery rate for Operational Year 6, Quarter Number 4 was approximately 0.61-gallon per minute (gpm), with individual recovery rates of 0.21-gpm, 0.18-gpm, and 0.23-gpm in GMPW-3, GMPW-4, and GMPW-5, respectively. The average recovery rates in recovery wells GMPW-3 and GMPW-5 were below system startup data but were 2 to 3 times higher than their respective average flow rates in Operational Year 6, Quarter Number 3. The average individual recovery well rate during Operational Year 6, Quarter Number 4 in recovery well GMPW-4 was consistent with system start up data. The increase in average recovery rates in recovery wells GMPW-3 and GMPW-5 is likely the direct result of the pump intake filter replacement referenced above.

A total of 73,251 gallons of groundwater was recovered during Operational Year 6, Quarter Number 4, and a total of 1,620,201 gallons of groundwater has been recovered since system startup. The low profile air stripper operated in accordance with the design specifications at a blower flow rate of 251 standard cubic feet per minute.

The overall system pumping rate during Operational Year 6 was consistent when compared to Operational Year 5 (ARCADIS 2008). Specifically, the total effluent groundwater recovery rate for Operational Year 6 was approximately 0.56-gpm, with individual recovery rates of 0.11-gpm, 0.22-gpm, and 0.11-gpm for recovery wells GMPW-3, GMPW-4, and GMPW-5, respectively. While these data remain below startup conditions, it is a marked improvement when compared to the average annual pump rate during Operational Years 3 and 4. This is likely the cumulative result of the installation of replacement pumps in recovery wells GMPW-3 and GMPW-5 (completed during 2006 and 2007) and the pump intake filter replacement activities referenced previously. It is anticipated that the recovery well flow rates will continue to remain stable or increase as a result of the planned increase in pump intake filter replacement frequency. Similar to the current reporting period, the PT system operated continuously during Operational Year 6 with minor system shutdown for

system maintenance. A total of 295,679 gallons of groundwater was recovered during Operational Year 6.

7.1.2 Results of Performance Sampling

PT system performance sampling for Operational Year 6, Quarter Number 4 was conducted on September 18, 2008. As discussed previously, five groundwater samples and one vapor sample were collected. Groundwater samples included collection of individual recovery well samples (GMPW-3, GMPW-4, and GMPW-5), total influent, and total effluent after the cartridge filters. The vapor sample was collected from the effluent stack of the low profile air stripper.

Table 4 provides a summary of the PT system performance groundwater sampling analytical results. As shown in Table 4, all groundwater VOCs were treated to below their respective Best Professional Judgment (BPJ) limits via the low profile air stripper. Total iron concentration after the cartridge filter (sample ID: EFFLUENT AC 11) was 0.065 mg/L for the fourth quarter sampling event, which is below the BPJ recommended daily average limit of 0.61 mg/L and recommended daily limit of 1.2 mg/L. Based on the total groundwater recovered during the reporting period and total influent groundwater concentration, an estimated 0.09 pounds (lbs) of VOC mass were removed from the subsurface during the quarterly reporting period, as shown in Table 7. A total of approximately 3.03 lbs of VOCs have been removed from the subsurface since system startup.

Table 8 provides a summary of the PT system performance sampling vapor analytical results for the Operational Year 6, Quarter Number 4 monitoring event as well as a summary of all data for Operational Year 6. As shown in Table 8, VOCs were not detected above their respective detection limits during the current reporting period. To be conservative, NYSDEC DAR-1 air model calculations were performed using the actual analytical data for detected constituents and the detection limit of all constituents that were not detected but have historically been detected in the influent groundwater. All VOCs were below their respective short-term guidance concentrations (SGCs) and annual guidance concentrations (AGCs). Appendix B contains the NYSDEC DAR-1 SGC and AGC screening simulation based on the hand calculations provided in the NYSDEC DAR-1 AGC/SGC tables dated September 10, 2007.

As shown in Table 4, the PT system operated effectively during Operational Year 6 and treated influent VOCs to below their respective BPJ limits during each operational period. As shown in Table 7, a total of approximately 0.44 lbs of VOC mass were

recovered during Operational Year 6. Finally, all VOCs were below their respective SGCs and AGCs during each operating period of Operational Year 6.

7.2 ARI System

The following section describes the results of the ARI system performance monitoring conducted during Operational Year 6, Quarter Number 4. A brief summary of ARI system performance for Operational Year 6 has also been provided.

7.2.1 Summary of Operation, Maintenance, and Monitoring

ARI system OM&M was conducted during the Operational Year 6, Quarter Number 4 OM&M site visit during the week of September 15, 2008 and included operation and maintenance of system equipment and the collection of samples for analysis of TOC from injection wells IW-3 and IW-13. In addition, TOC samples were collected from injection well IW-8 and monitoring well TW-1 to evaluate the long- term performance of the alternate electron donor EOS™ in providing TOC to the subsurface (ARCADIS 2006).

A reagent injection was initiated but not completed during Operational Year 6, Quarter Number 4. This reagent injection event will be reported as part of the Operational Year 7, Quarter Number 1 Monitoring Report.

A total of 41,116-gallons of molasses solution were delivered to the subsurface during Operational Year 6. A total of 172,047-gallons of molasses solution have been injected since system startup. Appendix C provides a summary of the solution injection quantities for Operational Year 6.

7.2.2 Results of Performance Sampling

ARI system performance sampling was conducted on September 18, 2008 and included the collection of TOC samples from injection wells IW-3 and IW-13. In addition to performance sampling conducted explicitly for ARI system monitoring, analytical results from select wells sampled under the environmental effectiveness monitoring program were also utilized to determine the effectiveness of the ARI system.

As discussed previously, Tables 2 and 3 summarize the results of VOCs, and biogeochemical and field parameters, respectively, for the ARI system performance

monitoring and environmental effectiveness Operational Year 6, Quarter Number 4 sampling event. In addition, the concentration of PCE daughter compounds, ethene, methane, and TOC versus time for select monitoring wells are provided in Figures D-1 through D-5 of Appendix D. Likewise, the concentration of TCA daughter compounds, ethane, methane, and TOC versus time for select monitoring wells are provided in Figures D-6 through D-10 of Appendix D. Analytical results and field parameters indicate that geochemical conditions in the current area of ARI system influence exhibit sufficient TOC within injection wells, elevated chlorinated VOC degradation products (i.e., ethene and ethane), and elevated reduced forms of alternate electron acceptors (i.e., methane). Operational Year 6, Quarter Number 4 analytical data provide strong evidence that VOCs are being completely degraded within the IRZ along the downgradient flow path.

Key observations for Operational Year 6, Quarter Number 4, are as follows:

- The TOC concentration at monitoring well GMMW-5 (26 mg/L) and injection wells IW-3 (100 mg/L) and IW-13 (580 mg/L) indicated that sufficient organic carbon is being delivered to the subsurface to maintain the IRZ using molasses solution as an electron donor.

- The TOC in monitoring well TW-1 and injection well IW-8 was 1,100 mg/L and 1,400 mg/L, respectively. The data indicate that the alternate electron donor EOS™ continues to provide sufficient organic carbon to the subsurface following the one time injection in injection well IW-8 during December 2006.

- As shown on Figures D-1 through D-10, the methane concentration in monitoring wells GMMW-2, GMMW-5, GMMW-6, W-5, and TW-1 remain elevated when compared to baseline conditions. These data provide evidence that strongly reducing conditions (methanogenic) are being maintained within the IRZ.

- As shown on Figures D-1, D-2, D-3, D-6, D-7, and D-8, the concentration of ethene and/or ethane within monitoring wells GMMW-2, GMMW-5 and GMMW-6 continue to be elevated when compared to baseline conditions. GMMW-5 is located closest to the ARI injection wells and would be expected to be the first well to exhibit increases in biodegradation end products. Ethene results for monitoring well GMMW-6 remained elevated during Operational Year 6, Quarter Number 4 and continue to indicate that the IRZ has extended to the vicinity of this well. Finally, as shown on Figure D-3, monitoring well

GMMW-2 exhibits a gradual decrease in PCE related daughter compounds and a gradual increase in ethene. These data provide evidence that the monitoring well GMMW-2 location is being affected by groundwater that has been treated within the IRZ.

- The concentration of PCE-related daughter compounds has decreased approximately 90 percent when comparing Operational Year 6, Quarter Number 4 data to baseline conditions (i.e., pre-injection conditions) within all monitoring wells located in the vicinity of the IRZ (i.e., monitoring wells GMMW-2, GMMW-5, GMMW-6, W-5, and TW-1). The concentration of PCE-related daughter compounds are currently at or below their respective New York State Water Quality Standards (NYS WQS) within monitoring wells GMMW-5, GMMW-6, W-5, and TW-1.

- The concentration of TCA related daughter compounds has decreased approximately 30 percent when comparing Operational Year 6, Quarter Number 4 data to baseline conditions within all monitoring wells located in the vicinity of the IRZ. Relative changes in the concentration of TCA-related daughter compounds when compared to baseline conditions for key monitoring wells are as follows:

    - GMMW-2 – Overall decrease of 25 percent.
    - GMMW-5 – Overall increase of 38 percent.
    - GMMW-6 – Overall decrease of 71 percent.
    - W-5 – Overall decrease of 23 percent.
    - TW-1 – Overall decrease of 80 percent.

Overall, the current and annual data indicate that the anaerobic IRZ is completely degrading PCE related daughter compounds and, to a lesser extent, TCA related daughter compounds. The greatest reduction in TCA related daughter compounds has occurred at alternate electron donor pilot test monitoring well TW-1. The data could indicate that EOS™ is a more effective electron donor for the complete reductive dechlorination of TCA-related daughter compounds when compared to the dilute molasses solution. However, additional monitoring data are needed to confirm this observation.

8. Spring Water Remediation System Performance

As referenced in previous monitoring reports, tailwater (e.g., backed up water) has been observed at the SP-5 discharge outfall. Following several activities to troubleshoot the cause of the tailwater, it was determined that its presence was the result of the following:

1. Untreated groundwater was bypassing the existing carbon vessel through preferential pathways and discharging at the outfall location; and,

2. The riprap infiltration zone located downgradient of the SP-5 outfall location had become clogged with iron bacteria and other precipitates. This prevented the drainage/positive flow of water from the outfall location.

SP-5 maintenance/modifications were implemented during September 2008 to correct the problems identified above. Specific modifications included the installation of a subsurface clay barrier immediately downgradient of the existing SP-5 carbon unit and the extension of the SP-5 discharge pipe to a location approximately 12 feet to the southwest of the existing outfall location. Tailwater was not observed following implementation of the corrective measures referenced above. An as-built of the modified SP-5 spring water remediation system area is provided on Figure 2.

SP-5 spring water remediation system OM&M monitoring was conducted on September 18, 2008 following the completion of the corrective measures referenced above. SP-5 remediation system analytical results are provided in Table 9. As shown in Table 9, all effluent VOCs were treated to below their respective BPJ limits via the LPGAC. Influent TVOC analytical data (72.9 ug/L) remained consistent with historical analytical data. Table 10 contains the SP-5 spring water remediation system operating parameters recorded during Operational Year 6, Quarter Number 4. As shown on Table 10, the total effluent flow rate (0.79 gpm) was consistent with historical data and indicate that the corrective measures implemented in September 2008 were successful in restoring normal operation of the SP-5 spring water remediation system.

9. Conclusions

Based on the data obtained from the Operational Year 6, Quarter Number 4 monitoring and overall system performance during Operational Year 6, ARCADIS concludes the following:

- The groundwater flow direction in the project area (i.e., adjacent to the landfill western perimeter) and site-wide in the September 2008 round was consistent with previous rounds. The groundwater flow direction in the project area is toward the southwest from the western perimeter of the landfill. The groundwater flow direction in areas further to the east of the project area is toward the south/southwest.

- The anaerobic IRZ established downgradient of the injection transect is successfully reducing the concentration of site-related VOCs through enhanced reductive dechlorination. The concentrations of PCE-related daughter compounds are currently below NYS WQS within monitoring wells GMMW-5, GMMW-6, W-5, and TW-1.

- The concentrations of TCA-related daughter compounds within monitoring wells GMMW-2, GMMW-5, GMMW-6, W-5, and TW-1 have decreased an average of 30 percent from baseline conditions. Alternate electron donor pilot test well TW-1 exhibited the overall greatest decrease (80-percent) when compared to December 2007 data. The data may indicate that EOS™ serves as a more effective electron donor for the reductive dechlorination of TCA daughter compounds when compared to molasses. However, additional data are needed to confirm this observation.

- Site-wide groundwater analytical data for VOCs are consistent with site historical data and indicate that the dissolved phase plume is stable. This observation provides continued evidence that ongoing natural attenuation processes are effectively controlling the further migration of the plume in areas beyond the present-day influence of the IRZ.

- The PT system is operating as designed and is treating recovered groundwater VOCs to below BPJ limits prior to discharge. The total recovery flow rate for Operational Year 6 was consistent with data from Operational Year 5.

- Sufficient organic carbon was delivered to the subsurface to maintain the IRZ through the injection of a dilute molasses solutions as evidenced through the analytical data.

- Organic carbon data from alternate electron donor injection well IW-8 and monitoring well TW-1 indicate that EOS™ is a suitable long-term source of organic

carbon. Combined, the organic carbon and VOC analytical data for monitoring well TW-1 indicate that EOS™ is an effective alternate electron donor for the Site.

- SP-5 spring water remediation system analytical data, field parameter data, and field observations from September 2008 indicate that the corrective measures implemented in September 2008 were successful at restoring normal operation to the system.

- Surface water quality continues to be consistent with historical data indicating that impacted groundwater and/or flood-related stream changes are not causing an adverse impact to surface water along the North Stream.

10. Recommendations

The following recommendations are made for Operational Year 7, Quarter Number 1 activities:

- Continue to inspect the former spring locations and the side slopes of the north stream.

- Continue to operate the ARI system without injection well IW-8. Continue to obtain and evaluate data related to the ongoing alternate electron donor pilot program. If data are favorable, consider transitioning to the alternate electron donor EOS™ on a full-scale basis.

- Continue to replace the pneumatic pump intake filter socks every 1.5 months.

- Evaluate whether injection amendments are available to accelerate the rate of reductive dechlorination for TCA and its daughter compounds. Similarly, continue to evaluate if EOS™ is a more effective electron donor for the reductive dechlorination of TCA and its daughter compounds when compared to molasses.

11. Project Schedule

Groundwater environmental effectiveness monitoring is scheduled to be conducted for Operational Year 7 on the quarterly schedule set forth in the Proposed Modifications to Long-Term Monitoring Program (ARCADIS 2005). System OM&M of the Groundwater

Remediation System will continue to be performed on a quarterly basis consistent with the LTM Plan.

12. References

ARCADIS G&M, Inc. 2002. Long-Term Monitoring Plan, Colesville Landfill, Broome County, New York, NYSDEC Site 704010. June 28, 2002.

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Table 1. Water-Level Measurements Collected During Opertational Year 6, Colesville Landfill, Broome County, New York.

Well Identification	MP Elevation (feet above msl)	3/25/2008 Depth to Water (feet below MP)	3/25/2008 Water-Table Elevation (feet above msl)	9/17/2008 Depth to Water (feet below MP)	9/17/2008 Water-Table Elevation (feet above msl)	MP Description
GMMW-2	1030.95	35.52	995.43	36.82	994.13	Inner casing
GMMW-3	1028.02	33.14	994.88	34.45	993.57	Inner casing
GMMW-4	1042.9	45.17	997.73	46.25	996.65	Inner casing
GMMW-5	1043.66	48.78	994.88	48.95	994.71	Inner casing
GMMW-6	1033.56	37.64	995.92	38.80	994.76	Inner casing
GMMW-7	1045.43	46.81	998.62	47.71	997.72	Inner casing
PW-1	976.23	14.18	962.05	15.21	961.02	Inner casing
PW-2	975.28	--	--	7.14	968.14	Inner casing
PW-3	988.92	9.81	979.11	13.83	975.09	Inner casing
PW-4	1001.75	14.95	986.80	18.55	983.20	Inner casing
PW-5	986.12	0.00	986.12	0.40	985.72	Inner casing
W-5	1051.41	51.23	1000.18	51.91	999.50	Inner casing
W-6	1050.38	48.25	1002.13	50.37	1000.01	Inner casing
PW-7	1042.47	39.13	1003.34	40.13	1002.34	Inner casing
PW-8	1049.73	--	--	40.00	1009.73	Inner casing
W-7	1049.12	40.62	1008.50	43.60	1005.52	Inner casing
PW-10	1049.29	36.90	1012.39	39.41	1009.88	Inner casing
PW-11	1052.37	51.07	1001.30	52.40	999.97	Inner casing
PW-13	1072.41	61.05	1011.36	62.75	1009.66	Inner casing
W-13	1053.43	45.35	1008.08	48.22	1005.21	Inner casing
W-14S	957.68	5.19	952.49	11.56	946.12	Inner casing
W-16S	990.33	8.27	982.06	9.76	980.57	Outer casing
W-17S	959.13	7.72	951.41	12.60	946.53	Inner casing
W-18	973.56	9.50	964.06	9.81	963.75	Inner casing
W-20S	952.88	7.71	945.17	12.76	940.12	Inner casing

msl Mean sea level.
MP Measuring point.
-- Water Level not Recorded

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Table 2. Concentrations of Volatile Organic Compounds Detected in Groundwater, Operational Year 6, Colesville Landfill, Broome County, New York.

Constituents (units in ug/L)	Sample ID:	GMMW-02	GMMW-02	GMMW-02	GMMW-02	GMMW-05	GMMW-05	GMMW-05	GMMW-05	GMMW-05*	GMMW-06	GMMW-06
	Date:	12/19/2007	3/25/2008	6/25/2008	9/18/2008	12/18/2007	3/25/2008	6/25/2008	9/18/2008	9/18/2008	12/18/2007	3/25/2008
1,1,1-Trichloroethane		**9.5**	**9.0**	**6.5**	**7.3**	<1.0	<1.0	<1.0	<1.0	<1.0	**3.1**	**1.8**
1,1,2-Trichloroethane		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,1-Dichloroethane		**92**	**110**	**110**	**110**	**16**	**21**	**22**	**17**	**16**	**120**	**130**
1,1-Dichloroethene		**1.3**	**1.2**	**1.3**	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,2-Dichloroethane		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	**1.5**	**1.4**	<1.0	<1.0
1,2-Dichloropropane		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	**1.1**	**1.0**
Benzene		**3**	**2.5**	**2.7**	**2.6**	<1.0	<1.0	**1.2**	**2**	<1.0	**9.5**	**8.1**
Carbon Tetrachloride		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Chlorobenzene		**34**	**30**	**30**	**30**	**16**	**11**	**15**	**19**	**19**	**37**	**35**
Chloroethane		**32**	**24**	**27**	**23**	**34**	**33**	**92**	**89**	**91**	**180**	**140**
Chloroform		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
cis-1,2-Dichloroethene		**100**	**110**	**100**	**98**	**2.3**	**1.8**	**2.6**	**1.9**	**2**	**14**	**7.8**
Dichlorodifluoromethane		**1.6**	**1.2**	**1.1**	**1.2**	<1.0	<1.0	<1.0	<1.0	<1.0	**5.8**	**4.6**
Ethylbenzene		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	**2.9**	**2.9**
Methylene chloride		<1.0	<1.0	**1.4**	<1.0	<1.0	<1.0	**1.8**	**1.6**	**2.2**	**5.5**	**5.8**
Methyl tert-butyl ether		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Naphthalene		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
o-Xylene		<1.0	<1.0	<1.0	<1.0	**2.0**	**1.1**	**1.3**	**1.7**	**1.7**	**2.7**	**2.2**
m,p-Xylene		<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<1.0 J	<1.0 J	**7.0**	**6.0**
Tetrachloroethene		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Toluene		<1.0	<1.0	<1.0	<1.0	**2.5**	<1.0	**1.7**	**2.4**	**2.4**	**3.0**	**2.8**
trans-1,2-Dichloroethene		**1.1**	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	**1.6**	**1.6**
Trichloroethene		**40**	**28**	**27**	**26**	**1.3**	**1.1**	<1.0	<1.0	<1.0	**3.4**	**3.2**
Vinyl chloride		**20**	**15**	**16**	**14**	<1.0	<1.0	**1.0**	<1.0	<1.0	**10**	**5.1**
Total VOCs		**334.5**	**330.9**	**323.0**	**312.1**	**74.1**	**69.0**	**138.6**	**136.1**	**135.7**	**406.6**	**357.9**

Bold	**Constituent detected above MDL.**
VOCs	Volatile Organic Compounds.
ug/L	Micrograms per liter.
*	Field replicate.
J	Estimated value.
MDL	Method detection limit.

Table 2. Concentrations of Volatile Organic Compounds Detected in Groundwater, Operational Year 6, Colesville Landfill, Broome County, New York.

Constituents (units in ug/L)	Sample ID:	GMMW-06	GMMW-06	GMMW-07	PW-03	PW-04	PW-04	PW-04	PW-04	PW-05	PW-07	PW-13
	Date:	6/24/2008	9/18/2008	9/18/2008	9/17/2008	12/18/2007	3/25/2008	6/25/2008	9/18/2008	9/17/2008	9/18/2008	9/17/2008
1,1,1-Trichloroethane		**5.5**	<5.0	**5.6**	**14**	**9**	**8.9**	**8.2**	**9.7**	<1.0	**7.4**	<1.0
1,1,2-Trichloroethane		**1.2**	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,1-Dichloroethane		**150**	**96**	**140**	**51**	**4.6**	**8.3**	**15**	**13**	<1.0	**51**	**6.2**
1,1-Dichloroethene		<1.0	<5.0	**1.4**	**1.1**	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,2-Dichloroethane		<1.0	<5.0	**1.3**	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	**3.2**
1,2-Dichloropropane		<1.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Benzene		**5.7**	**7.1**	**2.3**	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Carbon Tetrachloride		<1.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Chlorobenzene		**29**	**30**	**23**	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	**7.9**	**12**
Chloroethane		**120**	**89**	**42**	**7.6**	**1.8**	**3.6**	**4.4**	**2.9**	<1.0	**12**	**4.2**
Chloroform		<1.0	<5.0	<1.0	<1.0	**1.2**	**1.4**	**1.0**	<1.0	<1.0	<1.0	<1.0
cis-1,2-Dichloroethene		**37**	**10**	**130**	**57**	**5.6**	**5.8**	**12**	**23**	<1.0	**14**	**1.8**
Dichlorodifluoromethane		**2.7**	<5.0	<1.0	<1.0	**2.3**	**1.4**	**1.2**	**1.2**	<1.0	<1.0	<1.0
Ethylbenzene		**1.1**	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Methylene chloride		**6.0**	**5.5**	**1.9**	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Methyl tert-butyl ether		<1.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Naphthalene		<1.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
o-Xylene		<1.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
m,p-Xylene		**2.3**	<10	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Tetrachloroethene		<1.0	<5.0	<1.0	**3.7**	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Toluene		**1.2**	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
trans-1,2-Dichloroethene		**1.6**	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Trichloroethene		**16**	<5.0	**50**	**40**	**22**	**18**	**22**	**25**	<1.0	**8.9**	**2.2**
Vinyl chloride		**20**	**5.4**	**55**	**2.1**	<1.0	<1.0	<1.0	<1.0	<1.0	**5.6**	<1.0
Total VOCs		**399.3**	**243.0**	**452.5**	**176.5**	**46.5**	**47.4**	**63.8**	**74.8**	**0.0**	**106.8**	**29.6**

Bold	**Constituent detected above MDL.**
VOCs	Volatile Organic Compounds.
ug/L	Micrograms per liter.
*	Field replicate.
J	Estimated value.
MDL	Method detection limit.

Table 2. Concentrations of Volatile Organic Compounds Detected in Groundwater, Operational Year 6, Colesville Landfill, Broome County, New York.

Constituents (units in ug/L)	Sample ID:	TW-01	TW-01	TW-01	TW-01	W-05	W-05	W-05	W-05	W-06	W-07	W-13
	Date:	12/18/2007	3/25/2008	6/25/2008	9/18/2008	12/18/2007	3/25/2008	6/25/2008	9/18/2008	9/17/2008	9/17/2008	9/17/2008
1,1,1-Trichloroethane		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,1,2-Trichloroethane		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,1-Dichloroethane		**34**	**18**	**2.4**	<1.0	**57**	**67**	**66**	**54**	**19**	**4.2**	<1.0
1,1-Dichloroethene		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,2-Dichloroethane		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,2-Dichloropropane		<1.0	<1.0	<1.0	<1.0	**1.2**	**1.0**	**1.0**	**1.1**	<1.0	<1.0	<1.0
Benzene		**3.2**	**3.3**	**1.9**	**1.8**	**8.0**	**5.8**	**6.0**	<1.0	**3.6**	<1.0	<1.0
Carbon Tetrachloride		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Chlorobenzene		**16**	**15**	**15**	**8.0**	**11**	**9.9**	**9.5**	**8.7**	**13**	**2.5**	<1.0
Chloroethane		**110**	**67**	**29**	**29**	**150**	**100**	**91**	**98**	**4.7**	**2.6**	<1.0
Chloroform		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
cis-1,2-Dichloroethene		**14**	**12**	**3.8**	**2.9**	**3.0**	**3.5**	**3.2**	**2.6**	**3.9**	**2.0**	<1.0
Dichlorodifluoromethane		<1.0	<1.0	<1.0	<1.0	**2.4**	**1.2**	<1.0	<1.0	**2.7**	<1.0	<1.0
Ethylbenzene		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Methylene chloride		**1.6**	<1.0	<1.0	<1.0	**3.6**	**2.6**	**2.5**	**2.8**	<1.0	<1.0	<1.0
Methyl tert-butyl ether		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Naphthalene		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
o-Xylene		**1.6**	**1.5**	**1.4**	<1.0	**3.3**	**3.0**	**3.2**	**2.7**	<1.0	<1.0	<1.0
m,p-Xylene		<2.0	<2.0	<2.0	<2.0	**1.8**	<2.0	<2.0	<1.0 J	<2.0	<2.0	<2.0
Tetrachloroethene		<1.0	<1.0	<1.1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Toluene		**29**	**20**	**81**	**37**	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
trans-1,2-Dichloroethene		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Trichloroethene		**2.2**	**2.2**	<1.0	<1.0	<1.0	**1.4**	**1.2**	<1.0	**5.4**	**1.1**	<1.0
Vinyl chloride		**7.5**	<1.0	**2.3**	**1.1**	<1.0	<1.0	**1.2**	**1.1**	**1.5**	<1.0	<1.0
Total VOCs		**219.1**	**139.0**	**136.8**	**79.8**	**241.3**	**195.4**	**184.8**	**171.0**	**53.8**	**12.4**	**0.0**

Bold	**Constituent detected above MDL.**
VOCs	Volatile Organic Compounds.
ug/L	Micrograms per liter.
*	Field replicate.
J	Estimated value.
MDL	Method detection limit.

Table 2. Concentrations of Volatile Organic Compounds Detected in Groundwater, Operational Year 6, Colesville Landfill, Broome County, New York.

Constituents (units in ug/L)	Sample ID: / Date:	W-14S 9/17/2008	W-16S 9/17/2008	W-17S 9/17/2008	W-18 9/17/2008	W-20S 9/17/2008	FBV 180908 9/18/2008
1,1,1-Trichloroethane		<1.0	<1.0	<1.0	**16**	<1.0	<1.0
1,1,2-Trichloroethane		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,1-Dichloroethane		<1.0	**16**	**1.5**	**18**	<1.0	<1.0
1,1-Dichloroethene		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,2-Dichloroethane		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,2-Dichloropropane		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Benzene		<1.0	**1.9**	<1.0	<1.0	<1.0	<1.0
Carbon Tetrachloride		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Chlorobenzene		<1.0	**25**	<1.0	<1.0	<1.0	<1.0
Chloroethane		<1.0	**5.0**	<1.0	**1.5**	<1.0	<1.0
Chloroform		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
cis-1,2-Dichloroethene		<1.0	**1.5**	<1.0	**17**	<1.0	<1.0
Dichlorodifluoromethane		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Ethylbenzene		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Methylene chloride		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Methyl tert-butyl ether		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Naphthalene		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
o-Xylene		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
m,p-Xylene		<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Tetrachloroethene		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Toluene		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
trans-1,2-Dichloroethene		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Trichloroethene		<1.0	**2.4**	<1.0	**22**	<1.0	<1.0
Vinyl chloride		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Total VOCs		**0.0**	**51.8**	**1.5**	**74.5**	**0.0**	**0.0**

Bold	**Constituent detected above MDL.**
VOCs	Volatile Organic Compounds.
ug/L	Micrograms per liter.
*	Field replicate.
J	Estimated value.
MDL	Method detection limit.

Table 3. Concentrations of General Chemistry, Field Parameters, and Dissolved Gases Detected in Groundwater, Operational Year 6, Colesville Landfill, Broome County, New York.

Parameters	Sample ID: / Date:	GMMW-02 12/19/07	GMMW-02 3/25/08	GMMW-02 6/25/08	GMMW-02 9/18/08	GMMW-05 12/18/07	GMMW-05 3/25/08
	UNITS						
GENERAL CHEMISTRY							
Total Organic Carbon	mg/L	**2.1**	**1.9**	**2.4**	**1.9**	**20**	**16**
FIELD PARAMETERS							
pH	Standard units	**6.67**	**6.95**	**6.76**	**6.47**	**6.65**	**6.72**
Specific Conductance	mmhos/cm	**0.621**	**0.615**	**0.729**	**0.634**	**0.360**	**0.281**
Turbidity	NTU	--	--	--	**3.4**	--	--
Dissolved Oxygen	mg/L	**1.80**	**2.91**	--	**1.43**	**1.17**	**1.05**
Temperature	deg C	**8.08**	**9.04**	**11.31**	**11.01**	**8.40**	**12.07**
ORP	mV	**5**	**-22**	--	--	**-105**	**-111**
DISSOLVED GASES							
Carbon dioxide	mg/L	--	<5.00	<5.00	<5.00	--	<5.00
Carbon monoxide	mg/L	--	<1.00	<1.00	<1.00	--	<1.00
Ethane	ng/L	**790**	**630**	**1,100**	**540**	**18,000**	**26,000**
Ethene	ng/L	**12,000**	**13,000**	**12,000**	**14,000**	**470**	**780**
Methane	ug/L	**3,900**	**3,300**	**2,900**	**3,800**	**16,000**	**6,100**
Nitrogen	mg/L	--	**18.00**	**16.00**	**16.00**	--	**19.00**
Oxygen	mg/L	--	**2.10**	**2.40**	**2.50**	--	**2.50**

Bold	**Constituent detected above MDL.**
mg/L	Milligrams per liter.
mmhos/cm	Millimhos per centimeter.
NTU	Nephelometric Turbidity Units.
deg C	Degrees Celsius.
mV	Millivolts.
ng/L	Nanograms per liter.
--	Not analyzed or collected.
ug/L	Micrograms per liter.
IW	Injection well.
ORP	Oxidation-reduction potential.
J	Qualifier assigned to analytical data indicating result is estimated.

Table 3. Concentrations of General Chemistry, Field Parameters, and Dissolved Gases Detected in Groundwater, Operational Year 6, Colesville Landfill, Broome County, New York.

Parameters	Sample ID: / Date:	GMMW-05 6/25/08	GMMW-05 9/18/08	GMMW-06 12/18/07	GMMW-06 3/25/08	GMMW-06 6/24/08	GMMW-06 9/18/08
	UNITS						
GENERAL CHEMISTRY							
Total Organic Carbon	mg/L	**18**	**26**	**3.9**	**3.4**	**2.6**	**5.4**
FIELD PARAMETERS							
pH	Standard units	**6.62**	**6.25**	**6.71**	**6.89**	**6.39**	**6.28**
Specific Conductance	mmhos/cm	**0.629**	**0.710**	**0.869**	**0.863**	**0.946**	**1.087**
Turbidity	NTU	--	**20.8**	--	--	--	**25.0**
Dissolved Oxygen	mg/L	--	**0.41**	**2.05**	**2.79**	**0.82**	**1.45**
Temperature	deg C	**12.78**	**11.69**	**8.35**	**10.03**	**13.06**	**11.04**
ORP	mV	--	--	**-89**	**-55**	**-23**	--
DISSOLVED GASES							
Carbon dioxide	mg/L	<5.00	<5.00	--	<5.00	<5.00	<5.00
Carbon monoxide	mg/L	<1.00	<1.00	--	<1.00	<1.00	<1.00
Ethane	ng/L	**23,000**	**20,000**	**12,000**	**9,800**	**11,000**	**18,000**
Ethene	ng/L	**730**	**690**	**67,000**	**57,000**	**45,000**	**25,000**
Methane	ug/L	**15,000**	**16,000**	**1,600**	**1,300**	**1,700**	**26,000**
Nitrogen	mg/L	**10.00**	**8.00**	--	**19.00**	**22.00**	**15.00**
Oxygen	mg/L	**2.90**	**2.30**	--	**3.20**	**3.00**	**1.90**

Bold	**Constituent detected above MDL.**
mg/L	Milligrams per liter.
mmhos/cm	Millimhos per centimeter.
NTU	Nephelometric Turbidity Units.
deg C	Degrees Celsius.
mV	Millivolts.
ng/L	Nanograms per liter.
--	Not analyzed or collected.
ug/L	Micrograms per liter.
IW	Injection well.
ORP	Oxidation-reduction potential.
J	Qualifier assigned to analytical data indicating result is estimated.

Table 3. Concentrations of General Chemistry, Field Parameters, and Dissolved Gases Detected in Groundwater, Operational Year 6, Colesville Landfill, Broome County, New York.

Parameters	Sample ID: / Date:	GMMW-07 9/18/08	PW-03 9/17/08	PW-04 12/19/07	PW-04 3/25/08	PW-04 6/25/08	PW-04 9/18/08
	UNITS						
GENERAL CHEMISTRY							
Total Organic Carbon	mg/L	**1.1**	--	**8**	**0.8**	**0.9**	**0.9**
FIELD PARAMETERS							
pH	Standard units	**6.53**	**6.23**	**5.85**	**6.15**	**6.09**	**5.34**
Specific Conductance	mmhos/cm	**0.279**	**0.621**	**0.473**	**0.818**	**1.051**	**2.080**
Turbidity	NTU	**58.3**	**605**	--	--	--	**46.1**
Dissolved Oxygen	mg/L	**2.41**	**6.07**	**2.24**	**5.26**	--	**4.92**
Temperature	deg C	**11.04**	**14.26**	**9.35**	**8.34**	**10.40**	**11.63**
ORP	mV	--	--	**130**	**41**	--	--
DISSOLVED GASES							
Carbon dioxide	mg/L	<5.00	--	--	<5.00	<5.00	<5.00
Carbon monoxide	mg/L	<1.00	--	--	<1.00	<1.00	<1.00
Ethane	ng/L	**430**	--	<25	**40**	**26**	**3 J**
Ethene	ng/L	**5,000**	--	<25	**52**	**36**	<25
Methane	ug/L	**840**	--	**0.33**	**3.1**	**4.8**	**0.96**
Nitrogen	mg/L	**22.00**	--	--	**21.00**	**18.00**	**15.00**
Oxygen	mg/L	**2.50**	--	--	**6.00**	**4.80**	**6.00**

Bold	**Constituent detected above MDL.**
mg/L	Milligrams per liter.
mmhos/cm	Millimhos per centimeter.
NTU	Nephelometric Turbidity Units.
deg C	Degrees Celsius.
mV	Millivolts.
ng/L	Nanograms per liter.
--	Not analyzed or collected.
ug/L	Micrograms per liter.
IW	Injection well.
ORP	Oxidation-reduction potential.
J	Qualifier assigned to analytical data indicating result is estimated.

Table 3. Concentrations of General Chemistry, Field Parameters, and Dissolved Gases Detected in Groundwater, Operational Year 6, Colesville Landfill, Broome County, New York.

Parameters	Sample ID: / Date:	PW-05 9/18/08	PW-07 9/18/08	PW-13 9/17/08	W-05 12/18/07	W-05 3/25/08	W-05 6/25/08
	UNITS						
GENERAL CHEMISTRY							
Total Organic Carbon	mg/L	**0.7**	--	--	**7.7**	**6.9**	**5.8**
FIELD PARAMETERS							
pH	Standard units	**6.68**	**6.28**	**5.93**	**6.46**	**6.72**	**6.64**
Specific Conductance	mmhos/cm	**0.294**	**0.229**	**0.184**	**1.006**	**0.955**	**0.983**
Turbidity	NTU	**30.4**	**526**	**56.1**	--	--	--
Dissolved Oxygen	mg/L	**4.63**	**1.16**	**0.96**	**1.49**	**1.30**	--
Temperature	deg C	**18.00**	**11.04**	**11.63**	**8.12**	**9.26**	**11.90**
ORP	mV	--	--	--	**-111**	**-87**	--
DISSOLVED GASES							
Carbon dioxide	mg/L	--	--	--	--	<5.00	<5.00
Carbon monoxide	mg/L	--	--	--	--	<1.00	<1.00
Ethane	ng/L	--	--	--	**17,000**	**17,000**	**13,000**
Ethene	ng/L	--	--	--	**1,500**	**2,000**	**1,800**
Methane	ug/L	--	--	--	**3,100**	**4,900**	**4,100**
Nitrogen	mg/L	--	--	--	--	**20.00**	**21.00**
Oxygen	mg/L	--	--	--	--	**2.70**	**3.20**

Bold	**Constituent detected above MDL.**
mg/L	Milligrams per liter.
mmhos/cm	Millimhos per centimeter.
NTU	Nephelometric Turbidity Units.
deg C	Degrees Celsius.
mV	Millivolts.
ng/L	Nanograms per liter.
--	Not analyzed or collected.
ug/L	Micrograms per liter.
IW	Injection well.
ORP	Oxidation-reduction potential.
J	Qualifier assigned to analytical data indicating result is estimated.

Table 3. Concentrations of General Chemistry, Field Parameters, and Dissolved Gases Detected in Groundwater, Operational Year 6, Colesville Landfill, Broome County, New York.

Parameters	Sample ID: / Date:	W-05 9/18/08	W-06 9/17/08	W-07 9/17/08	W-13 9/17/08	W-14S 9/17/08	W-16S 9/17/08
	UNITS						
GENERAL CHEMISTRY							
Total Organic Carbon	mg/L	**6.3**	--	--	--	--	--
FIELD PARAMETERS							
pH	Standard units	**6.18**	**6.02**	**6.04**	**5.96**	**6.50**	**6.57**
Specific Conductance	mmhos/cm	**0.955**	**0.520**	**0.449**	**0.756**	**0.067**	**0.434**
Turbidity	NTU	**47.1**	**7.1**	**155**	**5.7**	**180**	**115**
Dissolved Oxygen	mg/L	**1.21**	**1.12**	**2.10**	**2.00**	**3.50**	**1.73**
Temperature	deg C	**12.32**	**11.65**	**11.43**	--	**13.69**	**14.75**
ORP	mV	--	--	--	--	--	--
DISSOLVED GASES							
Carbon dioxide	mg/L	<5.00	--	--	--	--	--
Carbon monoxide	mg/L	<1.00	--	--	--	--	--
Ethane	ng/L	**11,000**	--	--	--	--	--
Ethene	ng/L	**1,200**	--	--	--	--	--
Methane	ug/L	**6,500**	--	--	--	--	--
Nitrogen	mg/L	**14.00**	--	--	--	--	--
Oxygen	mg/L	**2.70**	--	--	--	--	--

Bold	**Constituent detected above MDL.**
mg/L	Milligrams per liter.
mmhos/cm	Millimhos per centimeter.
NTU	Nephelometric Turbidity Units.
deg C	Degrees Celsius.
mV	Millivolts.
ng/L	Nanograms per liter.
--	Not analyzed or collected.
ug/L	Micrograms per liter.
IW	Injection well.
ORP	Oxidation-reduction potential.
J	Qualifier assigned to analytical data indicating result is estimated.

Table 3. Concentrations of General Chemistry, Field Parameters, and Dissolved Gases Detected in Groundwater, Operational Year 6, Colesville Landfill, Broome County, New York.

Parameters	Sample ID: / Date:	W-17S 9/17/08	W-18 9/17/08	W-20S 9/17/08	IW-02 12/19/07	IW-03 3/25/08	IW-03 6/24/08
	UNITS						
GENERAL CHEMISTRY							
Total Organic Carbon	mg/L	--	--	--	**20**	**260**	**210**
FIELD PARAMETERS							
pH	Standard units	**6.29**	**6.14**	**6.79**	**5.14**	**6.00**	**6.10**
Specific Conductance	mmhos/cm	**0.263**	**0.514**	**0.085**	**0.106**	**0.653**	**0.809**
Turbidity	NTU	**237**	**176**	**69.9**	--	--	--
Dissolved Oxygen	mg/L	**3.60**	**4.25**	**5.56**	**1.12**	**1.21**	**0.59**
Temperature	deg C	**14.34**	**14.98**	**13.86**	**1.69**	**9.28**	**12.75**
ORP	mV	--	--	--	**169**	**-54**	**-9**
DISSOLVED GASES							
Carbon dioxide	mg/L	--	--	--	--	--	--
Carbon monoxide	mg/L	--	--	--	--	--	--
Ethane	ng/L	--	--	--	--	--	--
Ethene	ng/L	--	--	--	--	--	--
Methane	ug/L	--	--	--	--	--	--
Nitrogen	mg/L	--	--	--	--	--	--
Oxygen	mg/L	--	--	--	--	--	--

Bold	**Constituent detected above MDL.**
mg/L	Milligrams per liter.
mmhos/cm	Millimhos per centimeter.
NTU	Nephelometric Turbidity Units.
deg C	Degrees Celsius.
mV	Millivolts.
ng/L	Nanograms per liter.
--	Not analyzed or collected.
ug/L	Micrograms per liter.
IW	Injection well.
ORP	Oxidation-reduction potential.
J	Qualifier assigned to analytical data indicating result is estimated.

Table 3. Concentrations of General Chemistry, Field Parameters, and Dissolved Gases Detected in Groundwater, Operational Year 6, Colesville Landfill, Broome County, New York.

Parameters	Sample ID: / Date:	IW-03 9/18/08	IW-08 9/18/08	IW-13 12/19/07	IW-13 3/25/08	IW-13 6/24/08	IW-13 9/18/08
	UNITS						
GENERAL CHEMISTRY							
Total Organic Carbon	mg/L	**100**	**1,400**	**300**	**100**	**2,300**	**580**
FIELD PARAMETERS							
pH	Standard units	**6.03**	**6.07**	**5.69**	**6.32**	**4.56**	**4.79**
Specific Conductance	mmhos/cm	--	--	**0.689**	**0.589**	**2.860**	--
Turbidity	NTU	--	--	--	--	--	--
Dissolved Oxygen	mg/L	--	--	**1.65**	**1.33**	**1.26**	--
Temperature	deg C	--	--	**6.82**	**9.59**	**12.76**	--
ORP	mV	--	--	**-62**	**-65**	**83**	--
DISSOLVED GASES							
Carbon dioxide	mg/L	--	--	--	--	--	--
Carbon monoxide	mg/L	--	--	--	--	--	--
Ethane	ng/L	--	--	--	--	--	--
Ethene	ng/L	--	--	--	--	--	--
Methane	ug/L	--	--	--	--	--	--
Nitrogen	mg/L	--	--	--	--	--	--
Oxygen	mg/L	--	--	--	--	--	--

Bold	**Constituent detected above MDL.**
mg/L	Milligrams per liter.
mmhos/cm	Millimhos per centimeter.
NTU	Nephelometric Turbidity Units.
deg C	Degrees Celsius.
mV	Millivolts.
ng/L	Nanograms per liter.
--	Not analyzed or collected.
ug/L	Micrograms per liter.
IW	Injection well.
ORP	Oxidation-reduction potential.
J	Qualifier assigned to analytical data indicating result is estimated.

Table 3. Concentrations of General Chemistry, Field Parameters, and Dissolved Gases Detected in Groundwater, Operational Year 6, Colesville Landfill, Broome County, New York.

Parameters	Sample ID: / Date:	TW-1 12/18/07	TW-1 3/25/08	TW-1 6/25/08	TW-1 9/18/08
	UNITS				
GENERAL CHEMISTRY					
Total Organic Carbon	mg/L	**150**	**200**	**1,900**	**1,100**
FIELD PARAMETERS					
pH	Standard units	**6.33**	**6.71**	**6.57**	**6.40**
Specific Conductance	mmhos/cm	**1.210**	**1.490**	**4.570**	**3.810**
Turbidity	NTU	**440**	--	--	**60.4**
Dissolved Oxygen	mg/L	**2.74**	**1.02**	--	**0.23**
Temperature	deg C	**11.10**	**11.47**	**12.49**	**11.55**
ORP	mV	**-98**	**-121**	--	--
DISSOLVED GASES					
Carbon dioxide	mg/L	--	<5.00	**27**	**0.48**
Carbon monoxide	mg/L	--	<1.00	<1.00	<1.00
Ethane	ng/L	**840**	**1,000**	**98**	**46**
Ethene	ng/L	**3,900**	**3,200**	**510**	**130**
Methane	ug/L	**21,000**	**17,000**	**22,000**	**16,000**
Nitrogen	mg/L	--	**7.80**	**8.90**	**4.70**
Oxygen	mg/L	--	**1.70**	**3.60**	**2.20**

Bold	**Constituent detected above MDL.**
mg/L	Milligrams per liter.
mmhos/cm	Millimhos per centimeter.
NTU	Nephelometric Turbidity Units.
deg C	Degrees Celsius.
mV	Millivolts.
ng/L	Nanograms per liter.
--	Not analyzed or collected.
ug/L	Micrograms per liter.
IW	Injection well.
ORP	Oxidation-reduction potential.
J	Qualifier assigned to analytical data indicating result is estimated.

Table 4. Concentrations of Volatile Organic Compounds and Selected Metals Detected in Aqueous Samples Collected from the PT System, Operational Year 6, Colesville Landfill, Broome County, New York. 5,6

Constituents	Model Technology BPJ Limits[1,2] (ug/L)	Sample ID: Date:	GMPW-3 1/17/2008	GMPW-3 3/26/2008	GMPW-3 6/25/2008	GMPW-3 9/18/2008	GMPW-4 1/17/2008	GMPW-4 3/26/2008	GMPW-4 6/25/2008	GMPW-4 9/18/2008
1,1,1-Trichloroethane	10-20		**27**	**19**	**12**	**18**	**16**	**13**	**8.6**	**10**
1,1,2-Trichloroethane	10		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,1-Dichloroethane	10		**48**	**51**	**43**	**43**	**65**	**69**	**72**	**64**
1,1-Dichloroethene	10		**2.4**	**1.4**	<1.0	**2.2**	**1.5**	**1.2**	**1.5**	<1.0
1,2-Dichloroethane	10-30		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,2-Dichloropropane	NA		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Benzene	5		**4.6**	**2.8**	**2.8**	**3.2**	**4.2**	**3.3**	**3.3**	**3.2**
Carbon Tetrachloride	NA		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	**7.0**	<1.0
Chlorobenzene	NA		**1.7**	**2.8**	**2.1**	**2.4**	**7.8**	**7.3**	<1.0	**8.9**
Chloroethane	NA		**24**	**16**	**14**	**15**	**39**	**29**	<1.0	**32**
Chloroform	NA		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
cis-1,2-Dichloroethene	10		**81**	**74**	**62**	**60**	**66**	**53**	**49**	**47**
Dichlorodifluoromethane	NA		**2.7**	**1.0**	<1.0	**1.3**	**2.8**	**1.6**	**1.3**	**1.2**
Ethylbenzene	5		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Methylene Chloride	10-50		**2.7**	**1.8**	**2.3**	**1.5**	**2.0**	**2.0**	**2.3**	**2.0**
Methyl tert-butyl ether	50		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Naphthalene	10		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
o-Xylene	5		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Tetrachloroethene	10		**1.3**	**1.7**	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Toluene	5		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
trans-1,2-Dichloroethene	10-50		<1.0	<1.0	<1.0	<1.0	**1.1**	<1.0	<1.0	<1.0
Trichloroethene	10		**74**	**54**	**41**	**52**	**71**	**59**	**55**	**60**
Vinyl Chloride	10-50		**15**	<1.0	**7.3**	**15**	**21**	**14**	**13**	**8.4**
Total VOCs			**284.4**	**225.5**	**186.5**	**213.6**	**297.4**	**252.4**	**213.0**	**236.7**
Metals (units in mg/L)	Model Technology BPJ Limits[3,4] (mg/L)									
Total Iron	1.2 / 0.61		**0.784**	**2.67**	**15.2**	**0.263**	**1.61**	**0.164**	**0.173**	**0.558**

See Notes on Last Page.

Table 4. Concentrations of Volatile Organic Compounds and Selected Metals Detected in Aqueous Samples Collected from the PT System, Operational Year 6, Colesville Landfill, Broome County, New York. 5,6

Constituents	Model Technology BPJ Limits[1,2] (ug/L)	Sample ID: Date:	GMPW-5 1/17/2008	GMPW-5 3/26/2008	GMPW-5 6/25/2008	GMPW-5 9/18/2008	COMBINED INF 1/17/2008	COMBINED INF 3/26/2008	COMBINED INF 6/25/2008	COMBINED INF 9/18/2008
1,1,1-Trichloroethane	10-20		<1.0	<1.0	<1.0	<1.0	**20**	**16**	**10**	**9.6**
1,1,2-Trichloroethane	10		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,1-Dichloroethane	10		<1.0	<1.0	<1.0	<1.0	**38**	**53**	**46**	**27**
1,1-Dichloroethene	10		<1.0	<1.0	<1.0	<1.0	**1.7**	**1.2**	**1.3**	<1.0
1,2-Dichloroethane	10-30		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,2-Dichloropropane	NA		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Benzene	5		<1.0	<1.0	<1.0	<1.0	**3.6**	**2.6**	**2.7**	**1.8**
Carbon Tetrachloride	NA		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Chlorobenzene	NA		<1.0	<1.0	<1.0	<1.0	**1.4**	**3.9**	**2.9**	**1.7**
Chloroethane	NA		<1.0	<1.0	<1.0	<1.0	**19**	**19**	**16**	**11**
Chloroform	NA		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
cis-1,2-Dichloroethene	10		<1.0	<1.0	<1.0	<1.0	**62**	**57**	**53**	**34**
Dichlorodifluoromethane	NA		<1.0	<1.0	<1.0	<1.0	**2.2**	**1.5**	<1.0	<1.0
Ethylbenzene	5		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Methylene Chloride	10-50		<1.0	<1.0	<1.0	<1.0	**2.2**	**1.6**	**2.1**	**1.1**
Methyl tert-butyl ether	50		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Naphthalene	10		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
o-Xylene	5		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Tetrachloroethene	10		<1.0	<1.0	<1.0	<1.0	**1.0**	**1.0**	<1.0	<1.0
Toluene	5		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
trans-1,2-Dichloroethene	10-50		<1.0	<1.0	<1.0	<1.0	<1.0	**1.3**	<1.0	<1.0
Trichloroethene	10		<1.0	<1.0	<1.0	<1.0	**57**	**50**	**41**	**30**
Vinyl Chloride	10-50		<1.0	<1.0	<1.0	<1.0	**12**	**9.1**	**8.0**	**6.9**
Total VOCs			**0.0**	**0.0**	**0.0**	**0.0**	**220.1**	**217.2**	**183.0**	**123.1**
Metals (units in mg/L)	Model Technology BPJ Limits[3,4] (mg/L)									
Total Iron	1.2 / 0.61		<0.040	**0.421**	<0.04	**0.196**	**2.73**	**7.17**	**45.1**	**3.99**

See Notes on Last Page.

Table 4. Concentrations of Volatile Organic Compounds and Selected Metals Detected in Aqueous Samples Collected from the PT System, Operational Year 6, Colesville Landfill, Broome County, New York. 5,6

Constituents	Model Technology BPJ Limits[1,2] (ug/L)	Sample ID: EFFLUENT AC II	EFFLUENT AC II	EFFLUENT AC II	EFFLUENT AC II
		Date: 1/17/2008	3/26/2008	6/25/2008	9/18/2008
1,1,1-Trichloroethane	10-20	<1.0	<1.0	<1.0	<1.0
1,1,2-Trichloroethane	10	<1.0	<1.0	<1.0	<1.0
1,1-Dichloroethane	10	<1.0	<1.0	<1.0	<1.0
1,1-Dichloroethene	10	<1.0	<1.0	<1.0	<1.0
1,2-Dichloroethane	10-30	<1.0	<1.0	<1.0	<1.0
1,2-Dichloropropane	NA	<1.0	<1.0	<1.0	<1.0
Benzene	5	<1.0	<1.0	<1.0	<1.0
Carbon Tetrachloride	NA	<1.0	<1.0	<1.0	<1.0
Chlorobenzene	NA	<1.0	<1.0	<1.0	<1.0
Chloroethane	NA	<1.0	<1.0	<1.0	<1.0
Chloroform	NA	<1.0	<1.0	<1.0	<1.0
cis-1,2-Dichloroethene	10	<1.0	<1.0	<1.0	<1.0
Dichlorodifluoromethane	NA	<1.0	<1.0	<1.0	<1.0
Ethylbenzene	5	<1.0	<1.0	<1.0	<1.0
Methylene Chloride	10-50	<1.0	<1.0	<1.0	<1.0
Methyl tert-butyl ether	50	<1.0	<1.0	<1.0	<1.0
Naphthalene	10	<1.0	<1.0	<1.0	<1.0
o-Xylene	5	<1.0	<1.0	<1.0	<1.0
Tetrachloroethene	10	<1.0	<1.0	<1.0	<1.0
Toluene	5	<1.0	<1.0	<1.0	<1.0
trans-1,2-Dichloroethene	10-50	<1.0	<1.0	<1.0	<1.0
Trichloroethene	10	<1.0	<1.0	<1.0	<1.0
Vinyl Chloride	10-50	<1.0	<1.0	<1.0	<1.0
Total VOCs		**0.0**	**0.0**	**0.0**	**0.0**
Metals (units in mg/L)	Model Technology BPJ Limits[3,4] (mg/L)				
Total Iron	1.2 / 0.61	**0.095**	**0.172**	**1.35**	**0.0648**

See Notes on Last Page.

Table 4. Concentrations of Volatile Organic Compounds and Selected Metals Detected in Aqueous Samples Collected from the PT System, Operational Year 5, Colesville Landfill, Broome County, New York. 5,6

Notes:

1. Model Technology Best Professional Judgment (BPJ) Limits recommended for Air Stripping with appropriate pretreatment from Attachment C of TOGS 1.2.1.
2. When a range is listed for the BPJ limit, a variation in available references was found. Recommended daily maximum limits should be in this range.
3. Model Technology BPJ Limits recommended for Lime, Settle and Filter treatment.
4. The recommended daily maximum permit limit is 1.2 mg/L and the recommended daily average permit limit is 0.61 mg/L.
5. Production wells were sampled in accordance with the schedule set forth in Table 3 of the Long-Term Monitoring Plan (ARCADIS 2002).
6. Bold values indicate compound detected above method detection limit.

NA	No BPJ limit listed.
J	Estimated Value.
ug/L	Micrograms Per Liter.
mg/L	Milligrams Per Liter.
VOCs	Volatile Organic Compounds.
AC	After Cartridge Filter.
PT	Pump and Treat.
--	Not Analyzed or Collected.

Table 5. Concentrations of Volatile Organic Compounds Detected in Surface Water, Operational Year 6, Colesville Landfill, Broome County, New York.

Constituents (units in ug/L)	Sample ID: / Date:	F-6 12/19/2007	F-6 6/25/2008	SP-4 12/19/2007	SP-4 3/26/2008	SP-4 6/25/2008	SP-4 9/18/2008
1,1,1-Trichloroethane		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,1,2-Trichloroethane		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,1-Dichloroethane		<1.0	<1.0	**1.1**	<1.0	**2.2**	**2.7**
1,1-Dichloroethene		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,2-Dichloroethane		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,2-Dichloropropane		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Benzene		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Carbon Tetrachloride		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Chlorobenzene		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Chloroethane		<1.0	<1.0	<1.0	<1.0	<1.0	**1.2**
Chloroform		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
cis-1,2-Dichloroethene		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Dichlorodifluoromethane		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Ethylbenzene		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Methylene chloride		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Methyl tert-butyl ether		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Naphthalene		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
o-Xylene		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
m,p-Xylene		<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Tetrachloroethene		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Toluene		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
trans-1,2-Dichloroethene		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Trichloroethene		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Vinyl chloride		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Total VOCs		**0.0**	**0.0**	**1.1**	**0.0**	**2.2**	**3.9**

Bold **Constituent detected above MDL.**
VOCs Volatile Organic Compounds.
ug/L Micrograms per liter.

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Table 6. PT System Operating Parameters, Operational Year 6, Quarter Number 4 and Annual Summary, Groundwater Remediation System, Colesville Landfill, Broome County, New York.

Date	Time Recorded	Air Stripper Measurements: Blower Discharge Pressure PI-301 (i.w.c.)	Air Stripper Measurements: Blower Effluent Flowrate (scfm)	Flow Measurements: Total[1] Effluent Totalizer FQI-401 (gallons)	Flow Measurements: Water Bypass[2] Totalizer FQI-402 (gallons)	Flow Measurements: GMPW-3[3] Totalizer FQI-101 (gallons)	Flow Measurements: GMPW-4[3] Totalizer FQI-102 (gallons)	Flow Measurements: GMPW-5[3] Totalizer FQI-103 (gallons)
1/16/2008	4:00 PM	9.0	225	217,606.1	NM	522,529.9	211,185.1	423,152.9
3/26/2008	3:14 PM	8.5	209	287,023.3	NM	535,042.6	240,330.3	434,293.5
6/26/2008	3:11 PM	8.7	217	371,120.5	987.86	168.0	125.0	532.8
9/18/2008	4:40 PM	8.9	251	444,371.8	64465.45	25,788.6	21,641.8	28,059.2
	Average Daily Flowrate During Reporting Period (gpm) =			**0.61**	**0.53**	**0.21**	**0.18**	**0.23**
	Total Groundwater Recovered During Reporting Period (gallons) =			**73,251**	**63477.59**	**25,621**	**21,517**	**27,526**
	Average Daily Flowrate During Operational Year 6 (gpm) =			**0.56**	NA	**0.11**	**0.22**	**0.11**
	Total Groundwater Recovered During Operational Year 6 (gallons) =			**295,679**	NA	**55,377**	**114,153**	**59,161**

NA	Not available.
NM	Not measured.
gpm	Gallons per minute.
i.w.c.	Inches of water column.
scfm	Standard cubic feet per minute.

Notes:

1. Total effluent totalizer replaced on 12/23/2005.
2. Water bypass totalizer damaged as a result of freezing in February, 2007. Totalizer replaced on June 25, 2008.
3. Individual well totalizers replaced on June 26, 2008.

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Table 7. PT System Mass Removal Rate of Volatile Organic Compounds, Operational Year 6, Quarter Number 4 and Annual Summary, Groundwater Remediation System, Colesville Landfill, Broome County, New York.

Date Sampled	Total VOC Influent Concentration (ug/L)	Total Effluent Totalizer FQI-401 (gallons)	Total Groundwater Recovered[1] Between Sampling Intervals (gal)	Influent Concentration[2] Geometric Mean (ug/L)	Total Estimated Mass[3] Removed (lbs)
6/25/2008	183.0	371,120	NA	NA	NA
9/18/2008	123.1	444,372	73,251	150.1	0.09
			Total Estimated Mass Removed During Operational Year 6, Quarter Number 4 (lbs) =		**0.09**
			Total Estimated Mass Removed During Operational Year 6 (lbs) =		**0.44**
			Total Estimated Mass Removed Since System Startup (lbs) =		**3.03**

Notes:

NA	Not applicable.
ug/L	Micrograms per liter.
gal	Gallons.
lbs	Pounds.
VOC	Volatile organic compound.

1. Total Groundwater Recovered Between Sampling Intervals = Well Totalizer Reading for current sampling event - Well Totalizer Reading for prior sampling event.
2. Influent Concentration Geometric Mean = (Influent Concentration for prior sampling event x Influent Concentration for current sampling event) ^ (1/2).
3. Total Mass Removed = (Total Groundwater Recovered Between Sampling Intervals) x Influent Concentration Geometric Mean x 3.7854 L/gallon x (1 lb / 453,592,370 ug).

Table 8. Concentrations of Volatile Organic Compounds Detected in Air Stripper Effluent, Operational Year 6, Groundwater Remediation System, Colesville Landfill, Broome County, New York.

Compounds	CAS Numbers	Sample ID: Date Sampled:	Effluent 1/17/2008 ppbv	Effluent 3/26/2008 ppbv	Effluent 6/26/2008 ppbv	Effluent 9/18/2008 ppbv
Vinyl Chloride	75-01-4		<7.0	<7.4	<7.3	<7.8
Chloroethane(Ethyl Chloride)	75-00-3		<7.0	<7.4	<7.3	<7.8
1,1-Dichloroethene(Vinylidene Chloride)	75-35-4		<7.0	<7.4	<7.3	<7.8
Methylene Chloride(Dichloromethane)	75-09-2		<7.0	<7.4	<7.3	<7.8
1,1-Dichloroethane	75-34-3		<7.1	<7.4	<7.3	<7.8
cis-1,2-Dichloroethylene	156-59-2		<7.3	<7.4	<7.3	<7.8
Chloroform	67-66-3		<7.0	<7.4	<7.3	<7.8
1,1,1-Trichloroethane(Methyl Chloroform)	71-55-6		<7.0	<7.4	<7.3	<7.8
Benzene	71-43-2		<7.1	<7.4	<7.3	<7.8
Trichloroethene	79-01-6		<7.0	<7.4	<7.3	<7.8
Toluene	108-88-3		<7.0	<7.4	<7.3	<7.8
Ethyl benzene	100-41-4		<7.0	<7.4	<7.3	<7.8
m,p-Xylene	108-38-3/106-42-3		<7.1	<7.4	<7.3	<7.8
o-Xylene	95-47-6		<7.0	<7.4	<7.3	<7.8
1,2,4-Trimethylbenzene	95-63-6		<7.0	<7.4	<7.3	<7.8
2-Propanol (Isopropyl alcohol)	67-63-0		<7.0	<7.4	<7.3	<7.8
Dichlorodifluoromethane(Freon 12)	75-71-8		<7.0	<7.4	<7.3	<7.8

ppbv: parts per billion by volume

Notes/Assumptions:

1. Samples collected by ARCADIS personnel on the dates shown and submitted to Air Toxics Laboratories LTD. for volatile organic compound (VOC) analyses using a modified USEPA Method TO-14A.

Table 9. Concentrations of Volatile Organic Compounds Detected in Aqueous Samples Collected from the SP-5 Spring Water Remediation System, Operational Year 6, Colesville Landfill, Broome County, New York.

Constituents	Model Technology Sample ID:	SP-5 INF	SP-5 INF	SP-5 EFF	SP-5 EFF SURF	SP-5 EFF
	BPJ Limits[1,2] Date:	1/17/2008	9/18/2008	1/17/2008	1/18/2008	9/18/2008
	(ug/L)					
VOCs (units in ug/L)						
1,1,1-Trichloroethane	10	<1.0	<1.0	<1.0	<1.0	<1.0
1,1-Dichloroethane	10	**25**	**21**	**21**	<1.0	**1.4**
1,2-Dichloroethane	10-100	<1.0	<1.0	<1.0	<1.0	<1.0
Benzene	5	**3.2**	**2.4**	**2.2**	<1.0	<1.0
Chlorobenzene	10-25	**36**	**44**	**33**	<1.0	<1.0
Chloroethane	NA	<1.0	<1.0	**6.7**	<1.0	**3.2**
cis-1,2-Dichloroethene	10	**1.5**	**1.5**	**1.7**	<1.0	<1.0
Dichlorodifluoromethane	NA	**2.0**	**1.2**	**1.6**	<1.0	<1.0
Ethylbenzene	5	<1.0	<1.0	<1.0	<1.0	<1.0
Toluene	5	<1.0	<1.0	<1.0	<1.0	<1.0
trans-1,2-Dichloroethene	10-100	<1.0	<1.0	<1.0	<1.0	<1.0
Trichloroethene	10	**3.5**	**2.8**	**3.8**	<1.0	<1.0
Vinyl Chloride	10	<1.0	<1.0	<1.0	<1.0	<1.0
Total VOCs		**71.2**	**72.9**	**70.0**	**0.0**	**4.6**

Bold Constituent detected above MDL.

ug/L	Micrograms per liter.
VOCs	Volatile organic compounds.
<	Analyte below detection limit.
INF.	Influent.
EFF.	Effluent.
NA	No BPJ limit listed.

Notes:

1. Model Technology Best Professional Judgment (BPJ) Limits recommended for carbon adsorption with appropriate pretreatment from Attachment C of TOGS 1.2.1.
2. When a range is listed for the BPJ limit, a variation in available references was found. Recommended daily maximum limits should be in this range.

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Table 10. SP-5 Spring Water Remediation System Operating Parameters, Operational Year 6, Quarter Number 4, and Annual Summary, Colesville Landfill, Broome County, New York.

Date Sampled	Total VOC Influent Concentration (ug/L)	Effluent Flowrate (gpm)	Depth to Water (feet btc)	Total Groundwater Treated[1] Between Sampling Intervals (gal)	Influent Concentration[2] Geometric Mean (ug/L)	Total Estimated Mass[3] Removed (lbs)
9/18/2008	72.9	0.79	0.3	0	NA	0.00

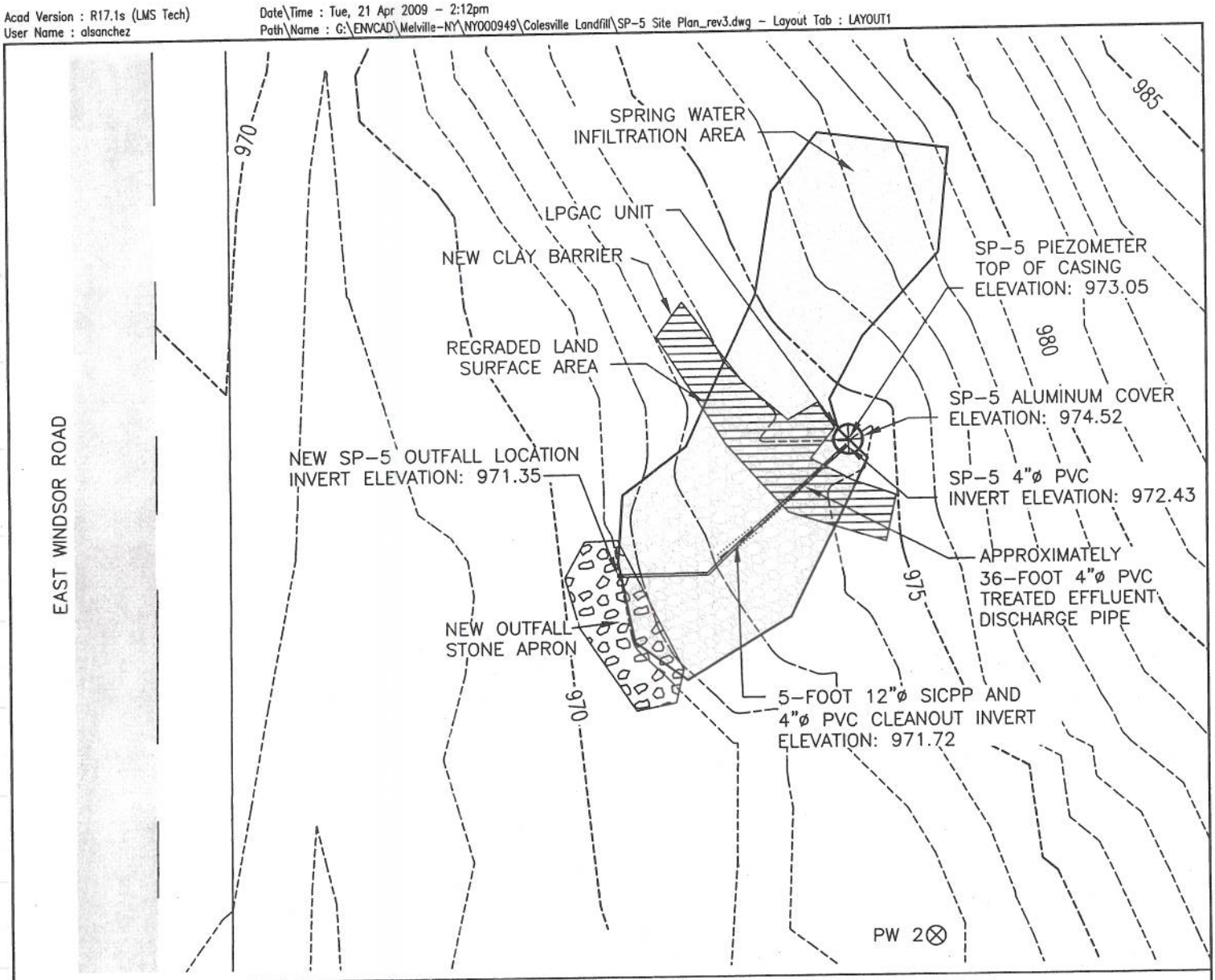
Total Estimated Mass Removed During Operational Year 6, Quarter Number 4 (lbs) =	**0.00**
Total Estimated Mass Removed During Operational Year 6 (lbs) =	**0.00**
Total Estimated Mass Removed Since System Startup (lbs) =	**0.81**
Total Effluent Treated During Operational Year 6 (gallons) =	**0**
Total Effluent Treated Since System Startup (gallons) =	**1,109,474**

Notes:

NA	Not applicable.
ug/L	Micrograms per liter.
gpm	Gallons per minute.
btc	Below top of casing.
gal	Gallons.
lbs	Pounds.
VOC	Volatile organic compound.

1. Total Spring Water Treated Between Sampling Intervals = Effluent Flowrate x 1440 min/day x days between sampling events.
2. Influent Concentration Geometric Mean = (Influent Concentration for prior sampling event x Influent Concentration for current sampling event)^(1/2).
3. Total Mass Removed = (Total Groundwater Treated Between Sampling Intervals) x Influent Concentration Geometric Mean x 3.7854 L/gallon x (1 lb / 453,592,370 ug).

Acad Version : R17.1s (LMS Tech)
User Name : alsanchez
Date\Time : Tue, 21 Apr 2009 - 2:12pm
Path\Name : G:\ENVCAD\Melville-NY\NY000949\Colesville Landfill\SP-5 Site Plan_rev3.dwg - Layout Tab : LAYOUT1



SP-5 SPRING AREA SITE PLAN

LEGEND

- TREATED WATER DISCHARGE LINE
- 980 — EXISTING GRADE LINE
- RIPRAP AREA
- ASPHALT
- PW 2 ⊗ EXISTING MONITORING WELL

NOTE:

1. BASE MAP TAKEN FROM "TOPOGRAPHIC SITE SURVEY, COLESVILLE LANDFILL." BY RONALD SCHIESS, PLS, NY LIC NO. 049554, SOURTHERN TIER SURVEYING, LLP, DATED DECEMBER 14, 1999, REVISED AUGUST 2004, DECEMBER 2007, APRIL 2008, AND OCTOBER 2008.

0 20
SCALE IN FEET

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PROJECT MANAGER	DEPARTMENT MANAGER	LEAD DESIGN PROF.	CHECKED BY
S. FELDMAN	N. VALKENBURG	C. TUOHY	K. ZEGEL
SHEET TITLE: SP-5 SPRING AREA AS-BUILT SITE PLAN COLESVILLE LANDFILL BROOME COUNTY, NEW YORK		TASK/PHASE NUMBER 00004	DRAWN BY J. GONZALEZ
		PROJECT NUMBER NY000949.0022	DRAWING NUMBER 2

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Appendix A

Groundwater Sampling Logs

Table 3. Field Measurements of Depth to Water in Select Wells, Colesville Landfill, Broome County, New York.

Date: 9/17/08

Well Identification		Depth to Water (feet below MP)	Comments
GMMW-2		36.82	Redeployed
GMMW-3		34.45	(don't sample)
GMMW-4		46.25	(don't sample)
GMMW-5		48.95	Redeploy
GMMW-6		38.80	Redeploy
GMMW-7		47.71	
PW-1		15.21	(don't sample)
PW-2		7.14	(don't sample)
PW-3		13.83	
PW-4		18.55	Redeploy
PW-5		0.40	
PW-7		40.13	
PW-8		40.00	(don't sample)
PW-10		39.41	(don't sample)
PW-11		52.40	(don't sample)
PW-13		Frozen *	Top Of Bag-62.75
W-5		51.91	Redeploy
W-6		50.37	
W-7		43.60	
W-13		48.22	
W-14S		11.56	
W-16S		9.76	
W-17S		Below PDB	12.60 after Bag was Pulled out
W-18		9.81	
W-20S		12.76	
TW-1		50.86	Redeploy

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Water Sampling Log

Project	Colesville Landfill	Project No.	NY000949.0021	Page	1 of 1
Site Location	Harpursville, NY			Date	9/17/08
Site/Well No.	PW-13	Replicate No.	—	Code No.	
Weather	Sun 70	Sampling Time:	Begin 1057	End	

Evacuation Data

Measuring Point	Top of PVC
MP Elevation (ft)	—
Land Surface Elevation (ft)	—
Sounded Well Depth (ft bmp)	
Depth to Water (ft bmp)	Top below Bag 61.91
Water-Level Elevation (ft)	after Bag was pulled out
Water Column in Well (ft)	
Casing Diameter/Type	2"
Gallons in Well	—
Gallons Pumped/Bailed Prior to Sampling	—
Sample Pump Intake Setting (ft bmp)	—
Purge Time	begin — end
Pumping Rate (gpm)	
Evacuation Method	2" Disposable poly bailer

Field Parameters

Color	Clear / orange/Red Tint
Odor	Slight to none
Appearance	Rust particles
pH (s.u.)	5.93
Conductivity (mS/cm)	0.184
(µmhos/cm)	
Turbidity (NTU)	56.1
Temperature (°C)	11.63
Dissolved Oxygen (mg/L)	0.96
ORP	
Sampling Method	Bailer / PDB
Remarks	Orange - Rust color Coating on PDB

Constituents Sampled	Container Description	Number	Preservative
8021 VOLATILES	40 ML VOA VIALS	2	HCL
Ethene, Ethane, Methane	40 ML Vials	—	
TOC	40 ML Plastic	—	Unpres.
Total Iron	250 ML Plastic	—	HNO3

Sampling Personnel: KA / Fran

Well Casing Volumes

Gal./Ft.				
	1-¼" = 0.06	2" = 0.16	3" = 0.37	4" = 0.65
	1-½" = 0.09	2-½" = 0.26	3-½" = 0.50	6" = 1.47

bmp	below measuring point	ml	milliliter	NTU	Nephelometric Turbidity Units
°C	Degrees Celsius	mS/cm	Milisiemens per centimeter	PVC	Polyvinyl chloride
ft	feet	msl	mean sea-level	s.u.	Standard units
gpm	Gallons per minute	N/A	Not Applicable	umhos/cm	Micromhos per centimeter
mg/L	Miligrams per liter	NR	Not Recorded	VOC	Volatile Organic Compounds

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Water Sampling Log

Project	Colesville Landfill	Project No.	NY000949.0021	Page	1 of 1
Site Location	Harpursville, NY			Date	9/17/08
Site/Well No.	MW-7	Replicate No.	—	Code No.	
Weather	Sun 70	Sampling Time: Begin	1147	End	

Evacuation Data

Measuring Point	Top of PVC
MP Elevation (ft)	—
Land Surface Elevation (ft)	—
Sounded Well Depth (ft bmp)	—
Depth to Water (ft bmp)	43.60
Water-Level Elevation (ft)	—
Water Column in Well (ft)	—
Casing Diameter/Type	2"
Gallons in Well	—
Gallons Pumped/Bailed Prior to Sampling	—
Sample Pump Intake Setting (ft bmp)	—
Purge Time	begin — end
Pumping Rate (gpm)	—
Evacuation Method	2" Disposable poly bailer

Field Parameters

Color	clear-to cloudy
Odor	none
Appearance	orangy Rust particles
pH (s.u.)	6.04
Conductivity (mS/cm)	0.449
(µmhos/cm)	
Turbidity (NTU)	155
Temperature (°C)	11.43
Dissolved Oxygen (mg/L)	2.10
ORP	—
Sampling Method	~~Bailer~~ / PDB
Remarks	PDB-Bag was orange

Constituents Sampled	Container Description	Number	Preservative
8021 VOLATILES	40 ML VOA VIALS	2	HCL
Ethene, Ethane, Methane	40 ML Vials	—	
TOC	40 ML Plastic	—	Unpres.
Total Iron	250 ML Plastic	—	HNO3

Sampling Personnel: KA / Fran

Well Casing Volumes

Gal./Ft.				
	1-¼" = 0.06	2" = 0.16	3" = 0.37	4" = 0.65
	1-½" = 0.09	2-½" = 0.26	3-½" = 0.50	6" = 1.47

bmp	below measuring point	ml	milliliter	NTU	Nephelometric Turbidity Units
°C	Degrees Celsius	mS/cm	Milisiemens per centimeter	PVC	Polyvinyl chloride
ft	feet	msl	mean sea-level	s.u.	Standard units
gpm	Gallons per minute	N/A	Not Applicable	umhos/cm	Micromhos per centimeter
mg/L	Miligrams per liter	NR	Not Recorded	VOC	Volatile Organic Compounds

ARCADIS

Water Sampling Log

Project	Colesville Landfill	Project No.	NY000949.0021	Page	1 of 1
Site Location	Harpursville, NY			Date	9/17/08
Site/Well No.	W-6	Replicate No.	—	Code No.	
Weather	Sun 70	Sampling Time:	Begin 1203	End	

Evacuation Data

Measuring Point	Top of PVC.
MP Elevation (ft)	—
Land Surface Elevation (ft)	—
Sounded Well Depth (ft bmp)	50.37
Depth to Water (ft bmp)	50.37
Water-Level Elevation (ft)	—
Water Column in Well (ft)	—
Casing Diameter/Type	2"
Gallons in Well	—
Gallons Pumped/Bailed Prior to Sampling	—
Sample Pump Intake Setting (ft bmp)	—
Purge Time	begin ____ end ____
Pumping Rate (gpm)	—
Evacuation Method	2" Disposable poly bailer

Field Parameters

Color	Clear
Odor	None
Appearance	Clear
pH (s.u.)	6.02
Conductivity (mS/cm)	0.520
(µmhos/cm)	
Turbidity (NTU)	7.1
Temperature (°C)	11.65
Dissolved Oxygen (mg/L)	1.12
ORP	—
Sampling Method	~~Bailer~~ PDB
Remarks	

Constituents Sampled	Container Description	Number	Preservative
8021 VOLATILES	40 ML VOA VIALS	2	HCL
Ethene, Ethane, Methane	40 ML Vials	—	
TOC	40 ML Plastic	—	Unpres.
Total Iron	250 ML Plastic	—	HNO3

Sampling Personnel: KA / FRAN

Well Casing Volumes

Gal./Ft.				
	1-¼" = 0.06	2" = 0.16	3" = 0.37	4" = 0.65
	1-½" = 0.09	2-½" = 0.26	3-½" = 0.50	6" = 1.47

bmp	below measuring point	ml	milliliter	NTU	Nephelometric Turbidity Units
°C	Degrees Celsius	mS/cm	Millisiemens per centimeter	PVC	Polyvinyl chloride
ft	feet	msl	mean sea-level	s.u.	Standard units
gpm	Gallons per minute	N/A	Not Applicable	umhos/cm	Micromhos per centimeter
mg/L	Miligrams per liter	NR	Not Recorded	VOC	Volatile Organic Compounds

ARCADIS

Water Sampling Log

Project	Colesville Landfill	Project No.	NY000949.0021	Page	1 of 1
Site Location	Harpursville, NY			Date	9/17/08
Site/Well No.	W-13	Replicate No.	—	Code No.	
Weather	SW 70°	Sampling Time: Begin	11:15	End	

Evacuation Data

Measuring Point	Top of PVC
MP Elevation (ft)	—
Land Surface Elevation (ft)	—
Sounded Well Depth (ft bmp)	—
Depth to Water (ft bmp)	48.22
Water-Level Elevation (ft)	—
Water Column in Well (ft)	—
Casing Diameter/Type	2"
Gallons in Well	—
Gallons Pumped/Bailed Prior to Sampling	—
Sample Pump Intake Setting (ft bmp)	—
Purge Time	begin ____ end ____
Pumping Rate (gpm)	—
Evacuation Method	2" Disposable poly bailer

Field Parameters

Color	
Odor	
Appearance	
pH (s.u.)	5.96
Conductivity (mS/cm)	0.756
(µmhos/cm)	
Turbidity (NTU)	5.7
Temperature (°C)	
Dissolved Oxygen (mg/L)	2.00
ORP	—
Sampling Method	Bailer / PDB
Remarks	* 2" Bailer will not go down Mac well used 1" Bailer on 9/18 to obtain parameter readings

Constituents Sampled	Container Description	Number	Preservative
8021 VOLATILES	40 ML VOA VIALS	2	HCL
Ethene, Ethane, Methane	40 ML Vials	—	
TOC	40 ML Plastic	—	Unpres.
Total Iron	250 ML Plastic	—	HNO3

Sampling Personnel: KA / Fcar

Well Casing Volumes

Gal./Ft.				
	1-¼" = 0.06	2" = 0.16	3" = 0.37	4" = 0.65
	1-½" = 0.09	2-½" = 0.26	3-½" = 0.50	6" = 1.47

bmp	below measuring point	ml	milliliter	NTU	Nephelometric Turbidity Units
°C	Degrees Celsius	mS/cm	Milisiemens per centimeter	PVC	Polyvinyl chloride
ft	feet	msl	mean sea-level	s.u.	Standard units
gpm	Gallons per minute	N/A	Not Applicable	umhos/cm	Micromhos per centimeter
mg/L	Miligrams per liter	NR	Not Recorded	VOC	Volatile Organic Compounds

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Water Sampling Log

Project	Colesville Landfill	Project No.	NY000949.0021	Page	1 of 1
Site Location	Harpursville, NY			Date	9/17/08
Site/Well No.	PW-3	Replicate No.	—	Code No.	—
Weather	Sun 70°	Sampling Time: Begin	12:15	End	

Evacuation Data

Measuring Point	Top of PVC
MP Elevation (ft)	—
Land Surface Elevation (ft)	—
Sounded Well Depth (ft bmp)	—
Depth to Water (ft bmp)	13.83
Water-Level Elevation (ft)	—
Water Column in Well (ft)	—
Casing Diameter/Type	2"
Gallons in Well	—
Gallons Pumped/Bailed Prior to Sampling	—
Sample Pump Intake Setting (ft bmp)	—
Purge Time	begin ____ end ____
Pumping Rate (gpm)	—
Evacuation Method	2" Disposable poly bailer

Field Parameters

Color	Cloudy H Brown
Odor	None
Appearance	Brown / Cloudy
pH (s.u.)	~~6.19~~ 6.23
Conductivity (mS/cm)	0.631
(µmhos/cm)	
Turbidity (NTU)	605
Temperature (°C)	14.26
Dissolved Oxygen (mg/L)	6.07
ORP	—
Sampling Method	Bailer / PDB
Remarks	

Constituents Sampled	Container Description	Number	Preservative
8021 VOLATILES	40 ML VOA VIALS	2	HCL
Ethene, Ethane, Methane	40 ML Vials	—	
TOC	40 ML Plastic	—	Unpres.
Total Iron	250 ML Plastic	—	HNO3

Sampling Personnel: KA / Fran

Well Casing Volumes

Gal./Ft.				
	1-¼" = 0.06	2" = 0.16	3" = 0.37	4" = 0.65
	1-½" = 0.09	2-½" = 0.26	3-½" = 0.50	6" = 1.47

bmp	below measuring point	ml	milliliter	NTU	Nephelometric Turbidity Units
°C	Degrees Celsius	mS/cm	Milisiemens per centimeter	PVC	Polyvinyl chloride
ft	feet	msl	mean sea-level	s.u.	Standard units
gpm	Gallons per minute	N/A	Not Applicable	umhos/cm	Micromhos per centimeter
mg/L	Miligrams per liter	NR	Not Recorded	VOC	Volatile Organic Compounds

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Water Sampling Log

Project: Colesville Landfill | Project No.: NY000949.0021 | Page 1 of 1

Site Location: Harpursville, NY | Date: 9/17/08

Site/Well No.: PW-5 | Replicate No.: — | Code No.: ____

Weather: Sun 70 | Sampling Time: Begin 1405 End ____

Evacuation Data

Measuring Point	Top of PVC
MP Elevation (ft)	—
Land Surface Elevation (ft)	—
Sounded Well Depth (ft bmp)	—
Depth to Water (ft bmp)	0.40
Water-Level Elevation (ft)	—
Water Column in Well (ft)	—
Casing Diameter/Type	2"
Gallons in Well	—
Gallons Pumped/Bailed Prior to Sampling	—
Sample Pump Intake Setting (ft bmp)	—
Purge Time	begin ____ end ____
Pumping Rate (gpm)	____
Evacuation Method	2" Disposable poly bailer

Field Parameters

Color	Clear
Odor	none
Appearance	Clear
pH (s.u.)	6.68
Conductivity (mS/cm)	0.294
(µmhos/cm)	____
Turbidity (NTU)	30.4
Temperature (°C)	1800
Dissolved Oxygen (mg/L)	4.63
ORP	—
Sampling Method	Bailer / PDB

Remarks: * Did not Sample For Ethene Methane Ethane

Constituents Sampled	Container Description	Number	Preservative
8021 VOLATILES	40 ML VOA VIALS	2	HCL
Ethene, Ethane, Methane	40 ML Vials	— *	
TOC	40 ML Plastic	2	Unpres.
Total Iron	250 ML Plastic	—	HNO3

Sampling Personnel: KA / Crew

Well Casing Volumes

Gal./Ft.				
	1-¼" = 0.06	2" = 0.16	3" = 0.37	4" = 0.65
	1-½" = 0.09	2-½" = 0.26	3-½" = 0.50	6" = 1.47

bmp	below measuring point	ml	milliliter	NTU	Nephelometric Turbidity Units
°C	Degrees Celsius	mS/cm	Milisiemens per centimeter	PVC	Polyvinyl chloride
ft	feet	msl	mean sea-level	s.u.	Standard units
gpm	Gallons per minute	N/A	Not Applicable	umhos/cm	Micromhos per centimeter
mg/L	Miligrams per liter	NR	Not Recorded	VOC	Volatile Organic Compounds

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Water Sampling Log

Project	Colesville Landfill	Project No.	NY000949.0021	Page	1 of 1
Site Location	Harpursville, NY			Date	9/17/08
Site/Well No.	MW-14S	Replicate No.	—	Code No.	
Weather	W-14S	Sampling Time:	Begin 1424	End	

Evacuation Data

Measuring Point	Top of PVC
MP Elevation (ft)	—
Land Surface Elevation (ft)	—
Sounded Well Depth (ft bmp)	—
Depth to Water (ft bmp)	11.56
Water-Level Elevation (ft)	—
Water Column in Well (ft)	—
Casing Diameter/Type	2"
Gallons in Well	—
Gallons Pumped/Bailed Prior to Sampling	—
Sample Pump Intake Setting (ft bmp)	—
Purge Time	begin ____ end ____
Pumping Rate (gpm)	—
Evacuation Method	2" Disposable poly bailer

Field Parameters

Color	Brownish
Odor	
Appearance	Cloudy
pH (s.u.)	6.50
Conductivity (mS/cm)	0.062
(µmhos/cm)	
Turbidity (NTU)	180
Temperature (°C)	13.69
Dissolved Oxygen (mg/L)	3.50
ORP	—
Sampling Method	Bailer / PDB
Remarks	

Constituents Sampled	Container Description	Number	Preservative
8021 VOLATILES	40 ML VOA VIALS	7	HCL
Ethene, Ethane, Methane	40 ML Vials	—	
TOC	40 ML Plastic	1	Unpres.
Total Iron	250 ML Plastic	—	HNO3

Sampling Personnel: KA / FSAM

Well Casing Volumes

Gal./Ft.				
	1-¼" = 0.06	2" = 0.16	3" = 0.37	4" = 0.65
	1-½" = 0.09	2-½" = 0.26	3-½" = 0.50	6" = 1.47

bmp	below measuring point	ml	milliliter	NTU	Nephelometric Turbidity Units
°C	Degrees Celsius	mS/cm	Milisiemens per centimeter	PVC	Polyvinyl chloride
ft	feet	msl	mean sea-level	s.u.	Standard units
gpm	Gallons per minute	N/A	Not Applicable	umhos/cm	Micromhos per centimeter
mg/L	Miligrams per liter	NR	Not Recorded	VOC	Volatile Organic Compounds

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Water Sampling Log

Project	Colesville Landfill	Project No.	NY000949.0021	Page	1 of 1
Site Location	Harpursville, NY			Date	9/17/08
Site/Well No.	GW-175	Replicate No.	—	Code No.	
Weather	Sun 70	Sampling Time:	Begin 1445	End	

Evacuation Data

Measuring Point	Top of PVC
MP Elevation (ft)	—
Land Surface Elevation (ft)	—
Sounded Well Depth (ft bmp)	—
Depth to Water (ft bmp)	Below PDB
Water-Level Elevation (ft)	—
Water Column in Well (ft)	—
Casing Diameter/Type	2"
Gallons in Well	—
Gallons Pumped/Bailed Prior to Sampling	—
Sample Pump Intake Setting (ft bmp)	—
Purge Time	begin ____ end ____
Pumping Rate (gpm)	
Evacuation Method	2" Disposable poly bailer

Field Parameters

Color	Lt Brown
Odor	none
Appearance	Cloudy
pH (s.u.)	6.29
Conductivity (mS/cm)	0.263
(µmhos/cm)	
Turbidity (NTU)	237
Temperature (°C)	14.34
Dissolved Oxygen (mg/L)	3.60
ORP	—
Sampling Method	Bailer / PDB

Remarks: DTW = 12.60 - After removing the bag

Constituents Sampled	Container Description	Number	Preservative
8021 VOLATILES	40 ML VOA VIALS	2	HCL
Ethene, Ethane, Methane	40 ML Vials	—	
TOC	40 ML Plastic	—	Unpres.
Total Iron	250 ML Plastic	—	HNO3

Sampling Personnel: KA

Well Casing Volumes

Gal./Ft.				
	1-¼" = 0.06	2" = 0.16	3" = 0.37	4" = 0.65
	1-½" = 0.09	2-½" = 0.26	3-½" = 0.50	6" = 1.47

bmp	below measuring point	ml	milliliter	NTU	Nephelometric Turbidity Units
°C	Degrees Celsius	mS/cm	Milisiemens per centimeter	PVC	Polyvinyl chloride
ft	feet	msl	mean sea-level	s.u.	Standard units
gpm	Gallons per minute	N/A	Not Applicable	umhos/cm	Micromhos per centimeter
mg/L	Miligrams per liter	NR	Not Recorded	VOC	Volatile Organic Compounds

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Water Sampling Log

Project	Colesville Landfill	Project No.	NY000949.0021	Page	1 of 1
Site Location	Harpursville, NY			Date	9/17/08
Site/Well No.	MW-116S	Replicate No.		Code No.	
Weather	Sun 70°	Sampling Time:	Begin 1507	End	

Evacuation Data

Measuring Point	Top of Casing
MP Elevation (ft)	—
Land Surface Elevation (ft)	—
Sounded Well Depth (ft bmp)	—
Depth to Water (ft bmp)	Before 9.76
Water-Level Elevation (ft)	—
Water Column in Well (ft)	—
Casing Diameter/Type	2"
Gallons in Well	—
Gallons Pumped/Bailed Prior to Sampling	—
Sample Pump Intake Setting (ft bmp)	—
Purge Time	begin ____ end ____
Pumping Rate (gpm)	—
Evacuation Method	2" Disposable poly bailer

Field Parameters

Color	Cloudy
Odor	none
Appearance	Cloudy
pH (s.u.)	6.57
Conductivity (mS/cm)	0.434
(µmhos/cm)	
Turbidity (NTU)	115
Temperature (°C)	14.75
Dissolved Oxygen (mg/L)	1.73
ORP	—
Sampling Method	Bailer / PDB
Remarks	

Constituents Sampled	Container Description	Number	Preservative
8021 VOLATILES	40 ML VOA VIALS	2	HCL
Ethene, Ethane, Methane	40 ML Vials	—	
TOC	40 ML Plastic	—	Unpres.
Total Iron	250 ML Plastic	—	HNO3

Sampling Personnel: KA / Fran

Well Casing Volumes

Gal./Ft.				
	1-¼" = 0.06	2" = 0.16	3" = 0.37	4" = 0.65
	1-½" = 0.09	2-½" = 0.26	3-½" = 0.50	6" = 1.47

bmp	below measuring point	ml	milliliter	NTU	Nephelometric Turbidity Units
°C	Degrees Celsius	mS/cm	Milisiemens per centimeter	PVC	Polyvinyl chloride
ft	feet	msl	mean sea-level	s.u.	Standard units
gpm	Gallons per minute	N/A	Not Applicable	umhos/cm	Micromhos per centimeter
mg/L	Miligrams per liter	NR	Not Recorded	VOC	Volatile Organic Compounds

ARCADIS

Water Sampling Log

Project: Colesville Landfill | Project No.: NY000949.0021 | Page 1 of 1

Site Location: Harpursville, NY | Date: 9/17/08

Site/Well No.: MW-20S | Replicate No.: — | Code No.: ____

Weather: Sun 70 | Sampling Time: Begin 1524 End ____

Evacuation Data

Measuring Point	Top of PVC
MP Elevation (ft)	
Land Surface Elevation (ft)	
Sounded Well Depth (ft bmp)	
Depth to Water (ft bmp)	
Water-Level Elevation (ft)	
Water Column in Well (ft)	
Casing Diameter/Type	2"
Gallons in Well	
Gallons Pumped/Bailed Prior to Sampling	
Sample Pump Intake Setting (ft bmp)	
Purge Time	begin ____ end ____
Pumping Rate (gpm)	
Evacuation Method	2" Disposable poly bailer

Field Parameters

Color	Clear / Black tint
Odor	None
Appearance	Black particles
pH (s.u.)	6.79
Conductivity (mS/cm)	0.085
(µmhos/cm)	
Turbidity (NTU)	69.9
Temperature (°C)	13.86
Dissolved Oxygen (mg/L)	5.56
ORP	—
Sampling Method	Bailer / PDB
Remarks	

Constituents Sampled	Container Description	Number	Preservative
8021 VOLATILES	40 ML VOA VIALS	2	HCL
Ethene, Ethane, Methane	40 ML Vials	—	
TOC	40 ML Plastic	—	Unpres.
Total Iron	250 ML Plastic	—	HNO3

Sampling Personnel: KA

Well Casing Volumes

Gal./Ft.				
	1-¼" = 0.06	2" = 0.16	3" = 0.37	4" = 0.65
	1-½" = 0.09	2-½" = 0.26	3-½" = 0.50	6" = 1.47

bmp	below measuring point	ml	milliliter	NTU	Nephelometric Turbidity Units
°C	Degrees Celsius	mS/cm	Milisiemens per centimeter	PVC	Polyvinyl chloride
ft	feet	msl	mean sea-level	s.u.	Standard units
gpm	Gallons per minute	N/A	Not Applicable	umhos/cm	Micromhos per centimeter
mg/L	Miligrams per liter	NR	Not Recorded	VOC	Volatile Organic Compounds

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Water Sampling Log

Project: Colesville Landfill | Project No.: NY000949.0021 | Page 1 of 1

Site Location: Harpursville, NY | Date: 9/17/08

Site/Well No.: MW-18 | Replicate No.: — | Code No.: ____

Weather: Sun 70° | Sampling Time: Begin 1535 End ____

Evacuation Data

Measuring Point	Top of PVC
MP Elevation (ft)	—
Land Surface Elevation (ft)	—
Sounded Well Depth (ft bmp)	—
Depth to Water (ft bmp)	9.81
Water-Level Elevation (ft)	—
Water Column in Well (ft)	—
Casing Diameter/Type	2"
Gallons in Well	—
Gallons Pumped/Bailed Prior to Sampling	—
Sample Pump Intake Setting (ft bmp)	—
Purge Time	begin ____ end ____
Pumping Rate (gpm)	____
Evacuation Method	2" Disposable poly bailer

Field Parameters

Color	Cloudy lt Brown
Odor	none
Appearance	Cloudy
pH (s.u.)	6.14
Conductivity (mS/cm)	0.514
(µmhos/cm)	____
Turbidity (NTU)	176
Temperature (°C)	14.98
Dissolved Oxygen (mg/L)	4.25
ORP	—
Sampling Method	Bailer 1 PDB
Remarks	____

Constituents Sampled	Container Description	Number	Preservative
8021 VOLATILES	40 ML VOA VIALS	2	HCL
Ethene, Ethane, Methane	40 ML Vials	—	
TOC	40 ML Plastic	—	Unpres.
Total Iron	250 ML Plastic	—	HNO3

Sampling Personnel: KA / Fran

Well Casing Volumes

Gal./Ft.				
	1-¼" = 0.06	2" = 0.16	3" = 0.37	4" = 0.65
	1-½" = 0.09	2-½" = 0.26	3-½" = 0.50	6" = 1.47

bmp	below measuring point	ml	milliliter	NTU	Nephelometric Turbidity Units
°C	Degrees Celsius	mS/cm	Milisiemens per centimeter	PVC	Polyvinyl chloride
ft	feet	msl	mean sea-level	s.u.	Standard units
gpm	Gallons per minute	N/A	Not Applicable	umhos/cm	Micromhos per centimeter
mg/L	Miligrams per liter	NR	Not Recorded	VOC	Volatile Organic Compounds

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Water Sampling Log

Project: Colesville Landfill | Project No.: NY000949.0021 | Page 1 of 1

Site Location: Harpursville, NY | Date: 9/18/08

Site/Well No.: MW-5 | Replicate No.: — | Code No.: —

Weather: Sun 68 | Sampling Time: Begin 0925 End 0932

Evacuation Data

Measuring Point	Top of PVC
MP Elevation (ft)	—
Land Surface Elevation (ft)	—
Sounded Well Depth (ft bmp)	—
Depth to Water (ft bmp)	51.91
Water-Level Elevation (ft)	~~51.91~~ —
Water Column in Well (ft)	—
Casing Diameter/Type	2"
Gallons in Well	—
Gallons Pumped/Bailed Prior to Sampling	—
Sample Pump Intake Setting (ft bmp)	—
Purge Time	begin ____ end ____
Pumping Rate (gpm)	—
Evacuation Method	2" Disposable poly bailer

Field Parameters

Color	Cloudy
Odor	None
Appearance	White tiny Bugs
pH (s.u.)	6.18
Conductivity (mS/cm)	0.955
(µmhos/cm)	
Turbidity (NTU)	47.1
Temperature (°C)	12.32
Dissolved Oxygen (mg/L)	1.21
ORP	—
Sampling Method	Bailer / PDB
Remarks	Redeployed a PDB ~~old PDB bag cracked~~ Black

Constituents Sampled	Container Description	Number	Preservative
8021 VOLATILES	40 ML VOA VIALS	2	HCL
Ethene, Ethane, Methane	40 ML Vials	2	
TOC	40 ML ~~Plastic~~ Vials	2	Unpres.
Total Iron	250 ML Plastic	—	HNO3

Sampling Personnel: KA / FCOJ

Well Casing Volumes

Gal./Ft.				
	1-¼" = 0.06	2" = 0.16	3" = 0.37	4" = 0.65
	1-½" = 0.09	2-½" = 0.26	3-½" = 0.50	6" = 1.47

bmp	below measuring point	ml	milliliter	NTU	Nephelometric Turbidity Units
°C	Degrees Celsius	mS/cm	Milisiemens per centimeter	PVC	Polyvinyl chloride
ft	feet	msl	mean sea-level	s.u.	Standard units
gpm	Gallons per minute	N/A	Not Applicable	umhos/cm	Micromhos per centimeter
mg/L	Miligrams per liter	NR	Not Recorded	VOC	Volatile Organic Compounds

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Water Sampling Log

Project: Colesville Landfill | Project No.: NY000949.0021 | Page 1 of 1

Site Location: Harpursville, NY | Date: 7/18/08

Site/Well No.: TW-1 | Replicate No.: — | Code No.: —

Weather: Sun 68 | Sampling Time: Begin 0940 End ____

Evacuation Data

Measuring Point	Top of Pvc
MP Elevation (ft)	—
Land Surface Elevation (ft)	—
Sounded Well Depth (ft bmp)	—
Depth to Water (ft bmp)	50.86
Water-Level Elevation (ft)	—
Water Column in Well (ft)	—
Casing Diameter/Type	2"
Gallons in Well	—
Gallons Pumped/Bailed Prior to Sampling	—
Sample Pump Intake Setting (ft bmp)	—
Purge Time	begin ____ end ____
Pumping Rate (gpm)	—
Evacuation Method	2" Disposable poly bailer

Field Parameters

Color	Dark Brown
Odor	Strong
Appearance	Cloudy
pH (s.u.)	6.40
Conductivity (mS/cm)	3.81
(µmhos/cm)	
Turbidity (NTU)	60.4
Temperature (°C)	11.55
Dissolved Oxygen (mg/L)	0.23
ORP	—
Sampling Method	Bailer / PDB
Remarks	Redployed a PDB old PDB coated Black

Constituents Sampled	Container Description	Number	Preservative
8021 VOLATILES	40 ML VOA VIALS	2	HCL
Ethene, Ethane, Methane	40 ML Vials	2	
TOC	40 ML ~~Plastic~~ Vials	2	Unpres.
Total Iron	250 ML Plastic	—	HNO3

Sampling Personnel: KA / Fran

Well Casing Volumes

Gal./Ft.			
1-¼" = 0.06	2" = 0.16	3" = 0.37	4" = 0.65
1-½" = 0.09	2-½" = 0.26	3-½" = 0.50	6" = 1.47

bmp	below measuring point	ml	milliliter	NTU	Nephelometric Turbidity Units
°C	Degrees Celsius	mS/cm	Milisiemens per centimeter	PVC	Polyvinyl chloride
ft	feet	msl	mean sea-level	s.u.	Standard units
gpm	Gallons per minute	N/A	Not Applicable	umhos/cm	Micromhos per centimeter
mg/L	Miligrams per liter	NR	Not Recorded	VOC	Volatile Organic Compounds

ARCADIS

Water Sampling Log

Project: Colesville Landfill | Project No.: NY000949.0021 | Page 1 of 1

Site Location: Harpursville, NY | Date: 9/18/08

Site/Well No.: GMW-5 | Replicate No.: REPLICATE08 | Code No.: —

Weather: SUN 60s | Sampling Time: Begin 0955 End 1004

Evacuation Data

Measuring Point	Top of PVC
MP Elevation (ft)	—
Land Surface Elevation (ft)	—
Sounded Well Depth (ft bmp)	—
Depth to Water (ft bmp)	48.95
Water-Level Elevation (ft)	—
Water Column in Well (ft)	—
Casing Diameter/Type	2"
Gallons in Well	—
Gallons Pumped/Bailed Prior to Sampling	—
Sample Pump Intake Setting (ft bmp)	—
Purge Time	begin ____ end ____
Pumping Rate (gpm)	—
Evacuation Method	2" Disposable poly bailer

Field Parameters

Color	yellow
Odor	Strong
Appearance	Clear
pH (s.u.)	6.25
Conductivity (mS/cm)	0.710
(µmhos/cm)	
Turbidity (NTU)	20.8
Temperature (°C)	11.69
Dissolved Oxygen (mg/L)	0.91
ORP	—
Sampling Method	Bailer / PDB
Remarks	Redeployed a PDB

Constituents Sampled	Container Description	Number	Preservative
8021 VOLATILES	40 ML VOA VIALS	2	HCL Dup
Ethene, Ethane, Methane	40 ML Vials	2	
TOC	40 ML ~~Plastic~~ Vials	2	Unpres. Dup
Total Iron	250 ML Plastic	—	HNO3

Sampling Personnel: KA / Fran

Well Casing Volumes

Gal./Ft.				
	1-¼" = 0.06	2" = 0.16	3" = 0.37	4" = 0.65
	1-½" = 0.09	2-½" = 0.26	3-½" = 0.50	6" = 1.47

bmp	below measuring point	ml	milliliter	NTU	Nephelometric Turbidity Units
°C	Degrees Celsius	mS/cm	Milisiemens per centimeter	PVC	Polyvinyl chloride
ft	feet	msl	mean sea-level	s.u.	Standard units
gpm	Gallons per minute	N/A	Not Applicable	umhos/cm	Micromhos per centimeter
mg/L	Miligrams per liter	NR	Not Recorded	VOC	Volatile Organic Compounds

ARCADIS

Water Sampling Log

Project	Colesville Landfill	Project No.	NY000949.0021	Page	1 of 1
Site Location	Harpursville, NY			Date	9/18/08
Site/Well No.	GMMW-6	Replicate No.	MS/MSD	Code No.	—
Weather	Sun 70°	Sampling Time: Begin	1024	End	1034

Evacuation Data

Measuring Point	Top of PVC
MP Elevation (ft)	—
Land Surface Elevation (ft)	—
Sounded Well Depth (ft bmp)	—
Depth to Water (ft bmp)	38.80
Water-Level Elevation (ft)	—
Water Column in Well (ft)	—
Casing Diameter/Type	2"
Gallons in Well	—
Gallons Pumped/Bailed Prior to Sampling	—
Sample Pump Intake Setting (ft bmp)	—
Purge Time	begin ____ end ____
Pumping Rate (gpm)	—
Evacuation Method	2" Disposable poly bailer

Field Parameters

Color	Clear to cloudy
Odor	Med.
Appearance	Tiny particles
pH (s.u.)	6.28
Conductivity (mS/cm)	1.087
(µmhos/cm)	
Turbidity (NTU)	250
Temperature (°C)	11.04
Dissolved Oxygen (mg/L)	1.45
ORP	—
Sampling Method	Bailer / PDB
Remarks	Rick played a PDB

Constituents Sampled	Container Description	Number	Preservative
8021 VOLATILES	40 ML VOA VIALS	2	HCL MS/MSD
Ethene, Ethane, Methane	40 ML Vials	2	
TOC	40 ML ~~Plastic~~ Vial	2	Unpres.
Total Iron	250 ML Plastic	—	HNO3

Sampling Personnel: KA / Ray

Well Casing Volumes

Gal./Ft.				
	1-¼" = 0.06	2" = 0.16	3" = 0.37	4" = 0.65
	1-½" = 0.09	2-½" = 0.26	3-½" = 0.50	6" = 1.47

bmp	below measuring point	ml	milliliter	NTU	Nephelometric Turbidity Units
°C	Degrees Celsius	mS/cm	Milisiemens per centimeter	PVC	Polyvinyl chloride
ft	feet	msl	mean sea-level	s.u.	Standard units
gpm	Gallons per minute	N/A	Not Applicable	umhos/cm	Micromhos per centimeter
mg/L	Miligrams per liter	NR	Not Recorded	VOC	Volatile Organic Compounds

ARCADIS

Water Sampling Log

Project: Colesville Landfill | Project No.: NY000949.0021 | Page 1 of 1

Site Location: Harpursville, NY | Date: 9/18/08

Site/Well No.: GMW-2 | Replicate No.: — | Code No.: —

Weather: Sun 70 | Sampling Time: Begin 1048 End 1054

Evacuation Data

Measuring Point	Top of PVC
MP Elevation (ft)	—
Land Surface Elevation (ft)	—
Sounded Well Depth (ft bmp)	—
Depth to Water (ft bmp)	36.82
Water-Level Elevation (ft)	—
Water Column in Well (ft)	—
Casing Diameter/Type	2"
Gallons in Well	—
Gallons Pumped/Bailed Prior to Sampling	—
Sample Pump Intake Setting (ft bmp)	—
Purge Time	begin ____ end ____
Pumping Rate (gpm)	—
Evacuation Method	2" Disposable poly bailer

Field Parameters

Color	Clear
Odor	None
Appearance	Clear
pH (s.u.)	6.47
Conductivity (mS/cm)	0.639
(µmhos/cm)	
Turbidity (NTU)	3.4
Temperature (°C)	11.01
Dissolved Oxygen (mg/L)	1.43
ORP	—
Sampling Method	Bailer / PDB
Remarks	Redeployed a PDB

Constituents Sampled	Container Description	Number	Preservative
8021 VOLATILES	40 ML VOA VIALS	2	HCL
Ethene, Ethane, Methane	40 ML Vials	2	
TOC	40 ML ~~Plastic~~ Vial	2	Unpres.
Total Iron	250 ML Plastic	—	HNO3

Sampling Personnel: KA / FSM

Well Casing Volumes

Gal./Ft.				
	1-¼" = 0.06	2" = 0.16	3" = 0.37	4" = 0.65
	1-½" = 0.09	2-½" = 0.26	3-½" = 0.50	6" = 1.47

bmp	below measuring point	ml	milliliter	NTU	Nephelometric Turbidity Units
°C	Degrees Celsius	mS/cm	Milisiemens per centimeter	PVC	Polyvinyl chloride
ft	feet	msl	mean sea-level	s.u.	Standard units
gpm	Gallons per minute	N/A	Not Applicable	umhos/cm	Micromhos per centimeter
mg/L	Miligrams per liter	NR	Not Recorded	VOC	Volatile Organic Compounds

ARCADIS

Water Sampling Log

Project	Colesville Landfill	Project No.	NY000949.0021	Page	1 of 1
Site Location	Harpursville, NY			Date	4/18/08
Site/Well No.	PW-4	Replicate No.	—	Code No.	
Weather	Sun 70°	Sampling Time: Begin	1104	End	1107

Evacuation Data

Measuring Point	Top of PVC
MP Elevation (ft)	—
Land Surface Elevation (ft)	—
Sounded Well Depth (ft bmp)	—
Depth to Water (ft bmp)	18.55
Water-Level Elevation (ft)	—
Water Column in Well (ft)	—
Casing Diameter/Type	2"
Gallons in Well	—
Gallons Pumped/Bailed Prior to Sampling	—
Sample Pump Intake Setting (ft bmp)	—
Purge Time	begin ____ end ____
Pumping Rate (gpm)	—
Evacuation Method	2" Disposable poly bailer

Field Parameters

Color	Clear - Sl cloudy
Odor	none
Appearance	Clear
pH (s.u.)	5.34
Conductivity (mS/cm)	2.08
(µmhos/cm)	
Turbidity (NTU)	46.1
Temperature (°C)	11.63
Dissolved Oxygen (mg/L)	4.92
ORP	—
Sampling Method	Bailer / PDB
Remarks	Rocksplayed a PDB

Constituents Sampled	Container Description	Number	Preservative
8021 VOLATILES	40 ML VOA VIALS	2	HCL
Ethene, Ethane, Methane	40 ML Vials	2	
TOC	40 ML ~~Plastic~~ Vial	2	Unpres.
Total Iron	250 ML Plastic	—	HNO3

Sampling Personnel: KA / FSan

Well Casing Volumes

Gal./Ft.				
	1-¼" = 0.06	2" = 0.16	3" = 0.37	4" = 0.65
	1-½" = 0.09	2-½" = 0.26	3-½" = 0.50	6" = 1.47

bmp	below measuring point	ml	milliliter	NTU	Nephelometric Turbidity Units
°C	Degrees Celsius	mS/cm	Milisiemens per centimeter	PVC	Polyvinyl chloride
ft	feet	msl	mean sea-level	s.u.	Standard units
gpm	Gallons per minute	N/A	Not Applicable	umhos/cm	Micromhos per centimeter
mg/L	Miligrams per liter	NR	Not Recorded	VOC	Volatile Organic Compounds

ARCADIS

Water Sampling Log

Project	Colesville Landfill	Project No.	NY000949.0021	Page	1 of 1
Site Location	Harpursville, NY			Date	9/18/08
Site/Well No.	PW-7	Replicate No.		Code No.	
Weather	Sun 70°	Sampling Time:	Begin 1158	End	

Evacuation Data

Measuring Point	Top of PVC
MP Elevation (ft)	—
Land Surface Elevation (ft)	—
Sounded Well Depth (ft bmp)	—
Depth to Water (ft bmp)	
Water-Level Elevation (ft)	—
Water Column in Well (ft)	—
Casing Diameter/Type	2"
Gallons in Well	—
Gallons Pumped/Bailed Prior to Sampling	—
Sample Pump Intake Setting (ft bmp)	—
Purge Time	begin ____ end ____
Pumping Rate (gpm)	—
Evacuation Method	2" Disposable poly bailer

Field Parameters

Color	orange
Odor	None
Appearance	cloudy orange particles
pH (s.u.)	6.28
Conductivity (mS/cm)	0.229
(µmhos/cm)	
Turbidity (NTU)	526
Temperature (°C)	11.04
Dissolved Oxygen (mg/L)	1.16
ORP	—
Sampling Method	Bailer / PDB
Remarks	Redeployed a PDB

Constituents Sampled	Container Description	Number	Preservative
8021 VOLATILES	40 ML VOA VIALS	2	HCL
Ethene, Ethane, Methane	40 ML Vials		
TOC	40 ML Plastic		Unpres.
Total Iron	250 ML Plastic		HNO3

Sampling Personnel: KA / Ecan

Well Casing Volumes

Gal./Ft.				
	1-¼" = 0.06	2" = 0.16	3" = 0.37	4" = 0.65
	1-½" = 0.09	2-½" = 0.26	3-½" = 0.50	6" = 1.47

bmp	below measuring point	ml	milliliter	NTU	Nephelometric Turbidity Units
°C	Degrees Celsius	mS/cm	Milisiemens per centimeter	PVC	Polyvinyl chloride
ft	feet	msl	mean sea-level	s.u.	Standard units
gpm	Gallons per minute	N/A	Not Applicable	umhos/cm	Micromhos per centimeter
mg/L	Miligrams per liter	NR	Not Recorded	VOC	Volatile Organic Compounds

ARCADIS

Water Sampling Log

Project	Colesville Landfill	Project No.	NY000949.0021	Page	1 of 1
Site Location	Harpursville, NY			Date	9/18/08
Site/Well No.	GMW-7	Replicate No.	—	Code No.	
Weather	Sun 70	Sampling Time: Begin	1203	End	1209

Evacuation Data

Measuring Point	Top of PVC
MP Elevation (ft)	—
Land Surface Elevation (ft)	—
Sounded Well Depth (ft bmp)	—
Depth to Water (ft bmp)	47.71
Water-Level Elevation (ft)	—
Water Column in Well (ft)	—
Casing Diameter/Type	2"
Gallons in Well	—
Gallons Pumped/Bailed Prior to Sampling	—
Sample Pump Intake Setting (ft bmp)	—
Purge Time	begin ____ end ____
Pumping Rate (gpm)	—
Evacuation Method	2" Disposable poly bailer

Field Parameters

Color	Orange tint
Odor	none
Appearance	orange Rust Particles
pH (s.u.)	6.53
Conductivity (mS/cm)	0.279
(µmhos/cm)	
Turbidity (NTU)	58.3
Temperature (°C)	11.04
Dissolved Oxygen (mg/L)	2.41
ORP	—
Sampling Method	Bailer / PDB
Remarks	[redacted]

Constituents Sampled	Container Description	Number	Preservative
8021 VOLATILES	40 ML VOA VIALS	2	HCL
Ethene, Ethane, Methane	40 ML Vials	2	
TOC	40 ML ~~Plastic~~ Vial	2	Unpres.
Total Iron	250 ML Plastic		HNO3

Sampling Personnel: KA / FCan

Well Casing Volumes

Gal./Ft.				
	1-¼" = 0.06	2" = 0.16	3" = 0.37	4" = 0.65
	1-½" = 0.09	2-½" = 0.26	3-½" = 0.50	6" = 1.47

bmp	below measuring point	ml	milliliter	NTU	Nephelometric Turbidity Units
°C	Degrees Celsius	mS/cm	Milisiemens per centimeter	PVC	Polyvinyl chloride
ft	feet	msl	mean sea-level	s.u.	Standard units
gpm	Gallons per minute	N/A	Not Applicable	umhos/cm	Micromhos per centimeter
mg/L	Miligrams per liter	NR	Not Recorded	VOC	Volatile Organic Compounds

ARCADIS

Surface Water Sampling Form

Project Colesville Landfill Project No. NY000949.0021 Page 1 of 1

Site Location Harpursville NY Date 9/18/08

Site/Well No. SP-4 Replicate No. —

Weather Sun 70° Sampling Time: Begin 1410 End _____

Site Conditions

Water Quality Meter: Quanta

Location Condition: Rocks + pebbles covered in Brown slag

Vegetation: _____

Depth of Water: 3.5"

Estimated Flow Rate: 3' x 10 Sec

Collection Method: direct

Field Parameters

Color	Clear
Odor	none
Appearance	Clear
pH (s.u.)	7.39
Conductivity (mS/cm)	0.185
Temperature (°C)	14.30
DO (mg/L)	8.71
Turbidity (NTU)	5.5
ORP	—
Time	_____

Remarks: ~~20~~ 2- 40 mL VOA Vials 8021

Photos - 229 - 223

no staining on Banks where wet

Constituents Sampled: See COC Sampling Personnel: KA

ARCADIS

Water Sampling Log

Project	Colesville Landfill	Project No.	NY000949.0021	Page	1 of 1
Site Location	Harpursville, NY			Date	9/18/08
Site/Well No.	SP-5 influent	Replicate No.	—	Code No.	—
Weather	Sun 70	Sampling Time: Begin	1525	End	

Evacuation Data

Measuring Point	
MP Elevation (ft)	
Land Surface Elevation (ft)	
Sounded Well Depth (ft bmp)	3.90
Depth to Water (ft bmp)	0.3
Water-Level Elevation (ft)	
Water Column in Well (ft)	3.60
Casing Diameter/Type	2"
Gallons in Well	0.5
Gallons Pumped/Bailed Prior to Sampling	1.72
Sample Pump Intake Setting (ft bmp)	
Purge Time	begin ____ end ____
Pumping Rate (gpm)	
Evacuation Method	2" Disposable poly bailer

Field Parameters

Color	Cloudy - SI / clear
Odor	Slight
Appearance	Cloudy
pH (s.u.)	6.19
Conductivity (mS/cm)	0.559
(µmhos/cm)	
Turbidity (NTU)	109
Temperature (°C)	14.92
Dissolved Oxygen (mg/L)	1.66
ORP	—
Sampling Method	Bailer
Remarks	

Constituents Sampled	Container Description	Number	Preservative
8021 VOLATILES	40 ML VOA VIALS		HCL
Ethene, Ethane, Methane	40 ML Vials		
TOC	40 ML Plastic		Unpres.
Total Iron	250 ML Plastic		HNO3

Sampling Personnel: KA

Well Casing Volumes

Gal./Ft.			
1-¼" = 0.06	2" = 0.16	3" = 0.37	4" = 0.65
1-½" = 0.09	2-½" = 0.26	3-½" = 0.50	6" = 1.47

bmp	below measuring point	ml	milliliter	NTU	Nephelometric Turbidity Units
°C	Degrees Celsius	mS/cm	Milisiemens per centimeter	PVC	Polyvinyl chloride
ft	feet	msl	mean sea-level	s.u.	Standard units
gpm	Gallons per minute	N/A	Not Applicable	umhos/cm	Micromhos per centimeter
mg/L	Miligrams per liter	NR	Not Recorded	VOC	Volatile Organic Compounds

ARCADIS

Water Sampling Log

Project: Colesville Landfill | Project No.: NY000949.0021 | Page 1 of 1

Site Location: Harpursville, NY | Date: 9/18/08

Site/Well No.: SP-5 effluent | Replicate No.: — | Code No.: ____

Weather: Sun 70° | Sampling Time: Begin 1529 End ____

Evacuation Data

Measuring Point	____
MP Elevation (ft)	____
Land Surface Elevation (ft)	____
Sounded Well Depth (ft bmp)	____
Depth to Water (ft bmp)	____
Water-Level Elevation (ft)	____
Water Column in Well (ft)	____
Casing Diameter/Type	2"
Gallons in Well	____
Gallons Pumped/Bailed Prior to Sampling	____
Sample Pump Intake Setting (ft bmp)	800mL / 15 Sec
Purge Time	begin ____ end ____
Pumping Rate (gpm)	____
Evacuation Method	2" Disposable poly bailer

Field Parameters

Color	Clear
Odor	____
Appearance	Existing debris particles
pH (s.u.)	6.34
Conductivity (mS/cm)	0.536
(µmhos/cm)	____
Turbidity (NTU)	13.7
Temperature (°C)	~~16~~ 14.71
Dissolved Oxygen (mg/L)	4.56
ORP	—
Sampling Method	~~Bailer~~ direct
Remarks	____

Constituents Sampled	Container Description	Number	Preservative
8021 VOLATILES	40 ML VOA VIALS	2	HCL
Ethene, Ethane, Methane	40 ML Vials		
TOC	40 ML Plastic		Unpres.
Total Iron	250 ML Plastic		HNO3

Sampling Personnel: KA

Well Casing Volumes

Gal./Ft.				
	1-¼" = 0.06	2" = 0.16	3" = 0.37	4" = 0.65
	1-½" = 0.09	2-½" = 0.26	3-½" = 0.50	6" = 1.47

bmp	below measuring point	ml	milliliter	NTU	Nephelometric Turbidity Units
°C	Degrees Celsius	mS/cm	Milisiemens per centimeter	PVC	Polyvinyl chloride
ft	feet	msl	mean sea-level	s.u.	Standard units
gpm	Gallons per minute	N/A	Not Applicable	umhos/cm	Micromhos per centimeter
mg/L	Miligrams per liter	NR	Not Recorded	VOC	Volatile Organic Compounds

ARCADIS

Water Sampling Log

Project: Colesville Landfill | Project No.: NY000949.0021 | Page 1 of 1

Site Location: Harpursville, NY | Date: 9/18/08

Site/Well No.: IW-8 | Replicate No.: — | Code No.: _____

Weather: _____ | Sampling Time: Begin 1650 End _____

Evacuation Data

Measuring Point: _____

MP Elevation (ft): _____

Land Surface Elevation (ft): _____

Sounded Well Depth (ft bmp): _____

Depth to Water (ft bmp): _____

Water-Level Elevation (ft): _____

Water Column in Well (ft): _____

Casing Diameter/Type: 2"

Gallons in Well: _____

Gallons Pumped/Bailed Prior to Sampling: _____

Sample Pump Intake Setting (ft bmp): _____

Purge Time: begin _____ end _____

Pumping Rate (gpm): _____

Evacuation Method: 2" Disposable poly bailer

Field Parameters

Color: Yellow

Odor: Strong

Appearance: _____

pH (s.u.): 6.07 * 9/19/08

Conductivity (mS/cm): _____

(µmhos/cm): _____

Turbidity (NTU): _____

Temperature (°C): _____

Dissolved Oxygen (mg/L): _____

ORP: _____

Sampling Method: Bailer

Remarks: PH reading taken on 9/19/08 PH meter was not working From water collected on 9/18/08

Constituents Sampled	Container Description	Number	Preservative
8021 VOLATILES	40 ML VOA VIALS		HCL
Ethene, Ethane, Methane	40 ML Vials		
TOC	40 ML Plastic	2	Unpres.
Total Iron	250 ML Plastic		HNO3

Sampling Personnel: KA

Well Casing Volumes

Gal./Ft.				
	1-¼" = 0.06	2" = 0.16	3" = 0.37	4" = 0.65
	1-½" = 0.09	2-½" = 0.26	3-½" = 0.50	6" = 1.47

bmp	below measuring point	ml	milliliter	NTU	Nephelometric Turbidity Units
°C	Degrees Celsius	mS/cm	Milisiemens per centimeter	PVC	Polyvinyl chloride
ft	feet	msl	mean sea-level	s.u.	Standard units
gpm	Gallons per minute	N/A	Not Applicable	umhos/cm	Micromhos per centimeter
mg/L	Miligrams per liter	NR	Not Recorded	VOC	Volatile Organic Compounds

ARCADIS

Water Sampling Log

Project	Colesville Landfill	Project No.	NY000949.0021	Page	1 of 1
Site Location	Harpursville, NY			Date	9/18/08
Site/Well No.	TW-13	Replicate No.	~~HO40~~	Code No.	
Weather	Sun 70	Sampling Time:	Begin 1640	End	

Evacuation Data

Measuring Point	
MP Elevation (ft)	
Land Surface Elevation (ft)	
Sounded Well Depth (ft bmp)	
Depth to Water (ft bmp)	
Water-Level Elevation (ft)	
Water Column in Well (ft)	
Casing Diameter/Type	2"
Gallons in Well	
Gallons Pumped/Bailed Prior to Sampling	
Sample Pump Intake Setting (ft bmp)	
Purge Time	begin ____ end ____
Pumping Rate (gpm)	
Evacuation Method	2" Disposable poly bailer

Field Parameters

Color	Yellow
Odor	Strong
Appearance	
pH (s.u.)	4.79* - 9/19/08
Conductivity (mS/cm)	
(µmhos/cm)	
Turbidity (NTU)	
Temperature (°C)	
Dissolved Oxygen (mg/L)	
ORP	
Sampling Method	Bailer
Remarks	PH Reading Taken From water Collected on 9/18/08

Constituents Sampled	Container Description	Number	Preservative
8021 VOLATILES	40 ML VOA VIALS	~~3~~ -	HCL
Ethene, Ethane, Methane	40 ML Vials	-	
TOC	40 ML ~~Plastic~~	2	Unpres.
Total Iron	250 ML Plastic	-	HNO3

Sampling Personnel: KA

Well Casing Volumes

Gal./Ft.				
	1-¼" = 0.06	2" = 0.16	3" = 0.37	4" = 0.65
	1-½" = 0.09	2-½" = 0.26	3-½" = 0.50	6" = 1.47

bmp	below measuring point	ml	milliliter	NTU	Nephelometric Turbidity Units
°C	Degrees Celsius	mS/cm	Milisiemens per centimeter	PVC	Polyvinyl chloride
ft	feet	msl	mean sea-level	s.u.	Standard units
gpm	Gallons per minute	N/A	Not Applicable	umhos/cm	Micromhos per centimeter
mg/L	Miligrams per liter	NR	Not Recorded	VOC	Volatile Organic Compounds

ARCADIS

Water Sampling Log

Project: Colesville Landfill | Project No.: NY000949.0021 | Page 1 of 1

Site Location: Harpursville, NY | Date: 9/18/08

Site/Well No.: IW-3 | Replicate No.: — | Code No.: _____

Weather: _____ | Sampling Time: Begin 1620 End _____

Evacuation Data

Measuring Point	
MP Elevation (ft)	
Land Surface Elevation (ft)	
Sounded Well Depth (ft bmp)	
Depth to Water (ft bmp)	
Water-Level Elevation (ft)	
Water Column in Well (ft)	
Casing Diameter/Type	2"
Gallons in Well	
Gallons Pumped/Bailed Prior to Sampling	
Sample Pump Intake Setting (ft bmp)	
Purge Time	begin ____ end ____
Pumping Rate (gpm)	
Evacuation Method	2" Disposable poly bailer

Field Parameters

Color	Yellow Brown
Odor	Strong
Appearance	
pH (s.u.)	6.03
Conductivity (mS/cm)	
(µmhos/cm)	
Turbidity (NTU)	
Temperature (°C)	
Dissolved Oxygen (mg/L)	
ORP	
Sampling Method	Bailer
Remarks	

Constituents Sampled	Container Description	Number	Preservative
8021 VOLATILES	40 ML VOA VIALS		HCL
Ethene, Ethane, Methane	40 ML Vials		
TOC	40 ML ~~Plastic~~	2	Unpres.
Total Iron	250 ML Plastic		HNO3

Sampling Personnel: KA

Well Casing Volumes

Gal./Ft.				
	1-¼" = 0.06	2" = 0.16	3" = 0.37	4" = 0.65
	1-½" = 0.09	2-½" = 0.26	3-½" = 0.50	6" = 1.47

bmp	below measuring point	ml	milliliter	NTU	Nephelometric Turbidity Units
°C	Degrees Celsius	mS/cm	Milisiemens per centimeter	PVC	Polyvinyl chloride
ft	feet	msl	mean sea-level	s.u.	Standard units
gpm	Gallons per minute	N/A	Not Applicable	umhos/cm	Micromhos per centimeter
mg/L	Miligrams per liter	NR	Not Recorded	VOC	Volatile Organic Compounds

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Water Sampling Log

Project	Colesville Landfill	Project No.	NY000949.0021	Page	1 of 1
Site Location	Harpursville, NY			Date	9/18/07
Site/Well No.	GMW-3	Replicate No.	—	Code No.	
Weather	~	Sampling Time:	Begin 1515	End	

Evacuation Data

Measuring Point	
MP Elevation (ft)	
Land Surface Elevation (ft)	
Sounded Well Depth (ft bmp)	
Depth to Water (ft bmp)	
Water-Level Elevation (ft)	
Water Column in Well (ft)	
Casing Diameter/Type	2"
Gallons in Well	
Gallons Pumped/Bailed Prior to Sampling	
Sample Pump Intake Setting (ft bmp)	
Purge Time	begin ____ end ____
Pumping Rate (gpm)	
Evacuation Method	2" Disposable poly bailer

Field Parameters

Color	
Odor	
Appearance	
pH (s.u.)	6.20
Conductivity (mS/cm)	
(µmhos/cm)	
Turbidity (NTU)	
Temperature (°C)	
Dissolved Oxygen (mg/L)	
ORP	
Sampling Method	Bailer
Remarks	direct collection System Sampling

Constituents Sampled	Container Description	Number	Preservative
8021 VOLATILES	40 ML VOA VIALS	2	HCL
Ethene, Ethane, Methane	40 ML Vials		
TOC	40 ML Plastic		Unpres.
Total Iron	250 ML Plastic	1	HNO3

Sampling Personnel: KA / DM

Well Casing Volumes

Gal./Ft.				
	1-¼" = 0.06	2" = 0.16	3" = 0.37	4" = 0.65
	1-½" = 0.09	2-½" = 0.26	3-½" = 0.50	6" = 1.47

bmp	below measuring point	ml	milliliter	NTU	Nephelometric Turbidity Units
°C	Degrees Celsius	mS/cm	Milisiemens per centimeter	PVC	Polyvinyl chloride
ft	feet	msl	mean sea-level	s.u.	Standard units
gpm	Gallons per minute	N/A	Not Applicable	umhos/cm	Micromhos per centimeter
mg/L	Miligrams per liter	NR	Not Recorded	VOC	Volatile Organic Compounds

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Water Sampling Log

Project	Colesville Landfill	Project No.	NY000949.0021	Page	1 of 1
Site Location	Harpursville, NY			Date	9/18/08
Site/Well No.	GMW-4	Replicate No.	—	Code No.	
Weather	—	Sampling Time:	Begin 1520	End	

Evacuation Data

Measuring Point	
MP Elevation (ft)	
Land Surface Elevation (ft)	
Sounded Well Depth (ft bmp)	
Depth to Water (ft bmp)	
Water-Level Elevation (ft)	
Water Column in Well (ft)	
Casing Diameter/Type	2"
Gallons in Well	
Gallons Pumped/Bailed Prior to Sampling	
Sample Pump Intake Setting (ft bmp)	
Purge Time	begin ____ end ____
Pumping Rate (gpm)	
Evacuation Method	2" ~~Disposable poly bailer~~

Field Parameters

Color	
Odor	
Appearance	
pH (s.u.)	6.32
Conductivity (mS/cm)	
(µmhos/cm)	
Turbidity (NTU)	
Temperature (°C)	
Dissolved Oxygen (mg/L)	
ORP	
Sampling Method	~~Bailer~~
Remarks	Direct grab System Sampling

Constituents Sampled	Container Description	Number	Preservative
8021 VOLATILES	40 ML VOA VIALS	2	HCL
Ethene, Ethane, Methane	40 ML Vials		
TOC	40 ML Plastic		Unpres.
Total Iron	250 ML Plastic	1	HNO3

Sampling Personnel KA / DM

Well Casing Volumes

Gal./Ft.				
	1-¼" = 0.06	2" = 0.16	3" = 0.37	4" = 0.65
	1-½" = 0.09	2-½" = 0.26	3-½" = 0.50	6" = 1.47

bmp	below measuring point	ml	milliliter	NTU	Nephelometric Turbidity Units
°C	Degrees Celsius	mS/cm	Milisiemens per centimeter	PVC	Polyvinyl chloride
ft	feet	msl	mean sea-level	s.u.	Standard units
gpm	Gallons per minute	N/A	Not Applicable	umhos/cm	Micromhos per centimeter
mg/L	Miligrams per liter	NR	Not Recorded	VOC	Volatile Organic Compounds

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Water Sampling Log

Project: Colesville Landfill | Project No.: NY000949.0020 | Page 1 of 1

Site Location: Harpursville, NY | Date: 9/18/08

Site/Well No.: GMPW-5 | Replicate No.: — | Code No.: ____

Weather: — | Sampling Time: Begin 1525 End ____

Evacuation Data

Measuring Point: ____

MP Elevation (ft): ____

Land Surface Elevation (ft): ____

Sounded Well Depth (ft bmp): ____

Depth to Water (ft bmp): ____

Water-Level Elevation (ft): ____

Water Column in Well (ft): ____

Casing Diameter/Type: 2"

Gallons in Well: ____

Gallons Pumped/Bailed Prior to Sampling: ____

Sample Pump Intake Setting (ft bmp): ____

Purge Time: begin ____ end ____

Pumping Rate (gpm): ____

Evacuation Method: ____

Field Parameters

Color: ____

Odor: ____

Appearance: ____

pH (s.u.): 6.99

Conductivity (mS/cm): ____

(µmhos/cm): ____

Turbidity (NTU): ____

Temperature (°C): ____

Dissolved Oxygen (mg/L): ____

ORP: ____

Sampling Method: ____

Remarks: System Sampling direct grab

Constituents Sampled	Container Description	Number	Preservative
8021 VOLATILES	40 ML VOA VIALS	2	HCL
Ethene, Ethane, Methane	40 ML Vials		
TOC	40 ML Amber VOA VIALS		H2SO4
Total Iron	250 ML Plastic	1	HNO3

Sampling Personnel: KA

Well Casing Volumes

Gal./Ft.				
	1-¼" = 0.06	2" = 0.16	3" = 0.37	4" = 0.65
	1-½" = 0.09	2-½" = 0.26	3-½" = 0.50	6" = 1.47

bmp	below measuring point	ml	milliliter	NTU	Nephelometric Turbidity Units
°C	Degrees Celsius	mS/cm	Milisiemens per centimeter	PVC	Polyvinyl chloride
ft	feet	msl	mean sea-level	s.u.	Standard units
gpm	Gallons per minute	N/A	Not Applicable	umhos/cm	Micromhos per centimeter
mg/L	Miligrams per liter	NR	Not Recorded	VOC	Volatile Organic Compounds

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Water Sampling Log

Project: Colesville Landfill | Project No.: NY000949.0020 | Page 1 of 1

Site Location: Harpursville, NY | Date:

Site/Well No.: Geomicrobial upstream | Replicate No.: — | Code No.:

Weather: | Sampling Time: Begin 1530 End:

Evacuation Data

Measuring Point:

MP Elevation (ft):

Land Surface Elevation (ft):

Sounded Well Depth (ft bmp):

Depth to Water (ft bmp):

Water-Level Elevation (ft):

Water Column in Well (ft):

Casing Diameter/Type: 2"

Gallons in Well:

Gallons Pumped/Bailed Prior to Sampling:

Sample Pump Intake Setting (ft bmp):

Purge Time: begin ____ end ____

Pumping Rate (gpm):

Evacuation Method: 2" Disposable poly bailer

Field Parameters

Color:

Odor:

Appearance:

pH (s.u.):

Conductivity (mS/cm):

(µmhos/cm):

Turbidity (NTU):

Temperature (°C):

Dissolved Oxygen (mg/L):

ORP:

Sampling Method: Bailer

Remarks:

Constituents Sampled	Container Description	Number	Preservative
8021 VOLATILES	40 ML VOA VIALS	2	HCL
Ethene, Ethane, Methane	40 ML VOA Vials		
TOC	250 ML Plastic		Unpres.
Total Iron	250 ML Plastic	1	HNO3

Sampling Personnel: KA

Well Casing Volumes

Gal./Ft.				
	1-¼" = 0.06	2" = 0.16	3" = 0.37	4" = 0.65
	1-½" = 0.09	2-½" = 0.26	3-½" = 0.50	6" = 1.47

bmp	below measuring point	ml	milliliter	NTU	Nephelometric Turbidity Units
°C	Degrees Celsius	mS/cm	Milisiemens per centimeter	PVC	Polyvinyl chloride
ft	feet	msl	mean sea-level	s.u.	Standard units
gpm	Gallons per minute	N/A	Not Applicable	umhos/cm	Micromhos per centimeter
mg/L	Miligrams per liter	NR	Not Recorded	VOC	Volatile Organic Compounds

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Water Sampling Log

Project	Colesville Landfill	Project No.	NY000949.0021	Page	1 of 1
Site Location	Harpursville, NY			Date	9/18/08
Site/Well No.	Effluent water	Replicate No.	—	Code No.	
Weather	—	Sampling Time:	Begin 1535	End	

Evacuation Data

Measuring Point	
MP Elevation (ft)	
Land Surface Elevation (ft)	
Sounded Well Depth (ft bmp)	
Depth to Water (ft bmp)	
Water-Level Elevation (ft)	
Water Column in Well (ft)	
Casing Diameter/Type	2"
Gallons in Well	
Gallons Pumped/Bailed Prior to Sampling	
Sample Pump Intake Setting (ft bmp)	
Purge Time	begin ____ end ____
Pumping Rate (gpm)	
Evacuation Method	2" Disposable poly bailer

Field Parameters

Color	
Odor	
Appearance	
pH (s.u.)	
Conductivity (mS/cm)	
(µmhos/cm)	
Turbidity (NTU)	
Temperature (°C)	
Dissolved Oxygen (mg/L)	
ORP	
Sampling Method	~~Bailer~~
Remarks	Direct grab System Sampling

Constituents Sampled	Container Description	Number	Preservative
8021 VOLATILES	40 ML VOA VIALS	2	HCL
Ethene, Ethane, Methane	40 ML VOA Vials	—	
TOC	250 ML Plastic	—	Unpres.
Total Iron	250 ML Plastic	1	HNO3

Sampling Personnel: KA

Well Casing Volumes

Gal./Ft.				
	1-¼" = 0.06	2" = 0.16	3" = 0.37	4" = 0.65
	1-½" = 0.09	2-½" = 0.26	3-½" = 0.50	6" = 1.47

bmp	below measuring point	ml	milliliter	NTU	Nephelometric Turbidity Units
°C	Degrees Celsius	mS/cm	Milisiemens per centimeter	PVC	Polyvinyl chloride
ft	feet	msl	mean sea-level	s.u.	Standard units
gpm	Gallons per minute	N/A	Not Applicable	umhos/cm	Micromhos per centimeter
mg/L	Miligrams per liter	NR	Not Recorded	VOC	Volatile Organic Compounds

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Appendix B

New York State Department of Environmental Conservation DAR-1 Air Modeling Data

Table B-1. NYSDEC DAR-1 Air Modeling Data, Operational Year 6, Quarter Number 4, Colesville Landfill, Broome County, New York.

Parameters for 9/18/08 Sampling Event				
Discharge Temperature		T	524	°R
Ambient Temperature		Ta	529	°R
Stack Diameter		D	6	in
Stack Radius		R	0.25	ft
Stack Area		A	0.20	ft^2
Exit Velocity		V	21.1	fps
Exit Flow		Q	249	acfm
Exit Flow		Q	251	scfm
Stack Height		h_s	17	ft
Building Height		h_b	13.25	ft
Ratio of Heights		h_s/h_b	1.28	
Plume rise credit? $h_s/h_b > 1.5$?		(If no, $h_e=h_s$)	(If Yes, $h_e = h_s + 1.1 (F_m)^{1/3}$)	
Momentum Flux	Fm = Ta/T * V2 * R2		n/a	ft^4/s^2
Effective Stack Height		h_e	17.0	ft
Reduction Factor? $2.5 > h_s/h_b > 1.5$?			No, do not reduce impact	
Actual Annual Impact		C_a	$RF*6*Q_a/h_e^{2.25}$	
Mass Flow		Q_a	S lbs emitted for last 12 months	

fps: feet per second
acfm: actual cubic feet per minute
ug/m^3: micrograms per cubic meter
lb/yr: pounds per year
lb/hr: pounds per hour
ppb: parts per billion

Notes/Assumptions:

1. The stack discharge temperature is 64 °F based on recorded parameters.
2. The ambient temperature is approximately 69°F based on recorded conditions.
3. Calculations assume that the system will run with the maximum allowable concentrations between quarterly readings.
4. AGC refers to the Annual Guideline Concentration as determined using the hand calculations in the DAR-1 AGC/SGC Tables dated September 10, 2007.
5. To be conservative the lower detection limit was used for compounds that were below the limit of detection, but are found in the influent groundwater of the Groundwater Remediation System.

Table B-2. NYSDEC DAR-1 Air Modeling Data, Operational Year 6, Quarter Number 4, Colesville Landfill, Broome County, New York.

Calculation of the Short-Term Guideline Concentration (SGC) for Sampling Event on 9/18/2008

Compounds	CAS Numbers	Maximum Limit (SGC) (ug/m^3)	Analytical Concentration (ppb)	Detection Limit Used	Actual Emissions C_a (ug/m^3)	Mass/hour (lb/hr)	Maximum Potential Impact (Step III.A.3 in DAR-1) (ug/m^3)	Short Term Impact (Step III.A.5 in DAR-1) (ug/m^3)	Percent of the SGC (%)
Vinyl Chloride	75-01-4	180,000	7.8	*	20.27	2.85E-05	0.0049	0.31623	1.8E-04
Chloroethane(Ethyl Chloride)	75-00-3	--	7.8	*	20.92	2.94E-05	0.0050	0.32645	NA
1,1-Dichloroethene(Vinylidene Chloride)	75-35-4	--	7.8	*	31.44	4.42E-05	0.0075	0.49054	NA
Methylene Chloride(Dichloromethane)	75-09-2	14,000	7.8	*	27.54	3.87E-05	0.0066	0.42977	3.1E-03
1,1-Dichloroethane	75-34-3	--	7.8	*	32.09	4.51E-05	0.0077	0.50076	NA
cis-1,2 - Dichloroethylene	156-59-2	--	7.8	*	31.44	4.42E-05	0.0075	0.49054	NA
1,1,1-Trichloroethane(Methyl Chloroform)	71-55-6	68,000	7.8	*	43.26	6.08E-05	0.0104	0.67507	9.9E-04
Trichloroethene	79-01-6	14,000	7.8	*	42.61	5.98E-05	0.0102	0.66484	4.7E-03
m,p-Xylene	108-38-3/106-42-3	4,300	7.8	*	33.77	4.74E-05	0.0081	0.52692	1.2E-02
Dichlorofluoromethane(Freon 12)	75-71-8	--	7.8	*	39.20	5.51E-05	0.0094	0.61172	NA

ug/m^3: Micrograms per cubic meter
ppb: parts per billion
*: Analyte concentration below detection limit, detection limit was used in calculations
lb/hr: pounds per hour
--: No SGC listed for compound
NA: Not applicable

Notes:
1. DAR-1 refers to DAR-1 AGC/SGC Tables dated September 10, 2007.
2. SGC refers to the Short-Term Guideline Concentration as determined using the hand calculations in the DAR-1 AGC/SGC Tables dated September 10, 2007.
3. To be conservative the lower detection limit was used for compounds that were below the limit of detection, but are found in the influent groundwater of the Groundwater Remediation System.

Table B-2. NYSDEC DAR-1 Air Modeling Data, Operational Year 6, Quarter Number 4, Colesville Landfill, Broome County, New York.

Calculation of AGC based on 9/18/2008 Sampling Event

Compounds	CAS Numbers	Maximum Limit on C_a (AGC[4]) ug/m^3	Maximum Mass Flow Q_a lb/yr	Lab Data ppb	Detection Limit Used[5]	Actual Emissions C_a ug/m^3	Actual Mass Flow per Hour lb/hr	Actual Mass Flow per Year lb/yr	**Percent of Annual** %
Vinyl Chloride	75-01-4	0.11	10.76	7.8	*	20.27	1.90E-05	0.16556	**1.54**
Chloroethane(Ethyl Chloride)	75-00-3	10,000	978,044.97	7.8	*	20.92	1.97E-05	0.17091	**0.00**
1,1-Dichloroethene(Vinylidene Chloride)	75-35-4	70	6,846.31	7.8	*	31.44	2.95E-05	0.25681	**0.00**
Methylene Chloride(Dichloromethane)	75-09-2	2.1	205.39	7.8	*	27.54	2.59E-05	0.22500	**0.11**
1,1-Dichloroethane	75-34-3	0.63	61.62	7.8	*	32.09	3.02E-05	0.26217	**0.43**
cis-1,2-Dichloroethylene	156-59-2	63	6,161.68	7.8	*	31.44	2.95E-05	0.25681	**0.00**
1,1,1-Trichloroethane(Methyl Chloroform)	71-55-6	1,000	97,804.50	7.8	*	43.26	4.07E-05	0.35342	**0.00**
Trichloroethene	79-01-6	0.5	48.90	7.8	*	42.61	4.00E-05	0.34807	**0.71**
m,p-Xylene	108-38-3/106-42-3	100	9,780.45	7.8	*	33.77	3.17E-05	0.27586	**0.00**
Dichlorodifluoromethane(Freon 12)	75-71-8	12,000	1,173,653.96	7.8	*	19.49	1.83E-05	0.15920	**0.00**

fps: feet per second
acfm: actual cubic feet per minute
ug/m^3: micrograms per cubic meter
lb/yr: pounds per year
lb/hr: pounds per hour
ppb: parts per billion

Notes/Assumptions:

1. The stack discharge temperature is 64 °F based on recorded parameters.
2. The ambient temperature is approximately 69°F based on recorded conditions.
3. Calculations assume that the system will run with the maximum allowable concentrations between quarterly readings.
4. AGC refers to the Annual Guideline Concentration as determined using the hand calculations in the DAR-1 AGC/SGC Tables dated September 10, 2007.
5. To be conservative the lower detection limit was used for compounds that were below the limit of detection, but are found in the influent groundwater of the Groundwater Remediation System.

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Appendix C

Automated Reagent Injection System
Operating Parameters

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Table C-1. Automated Reagent Injection System Summary of Operational Year 6, Quarter Number 4 Injection Quantities, Groundwater Remediation System, Colesville Landfill, Broome County, New York.

Summary of Automated Reagant Injections

Date	Total Quantity of Molasses Solution Injected (gal.)	Total Quantity of Molasses Injected (gal.)	Total Quantity of Rinse Water Injected (gal.)
No Injections Completed During July 2008 through September 2008			
Quarter Totals (gal.) =	**0**	**0**	**0**
Totals For Operational Year 6 (gal.) =	**41,116**	**427**	**605**
Totals Since Startup (gal.) =	**172,047**	**9,013**	**8,571**

Notes:

gal. Gallons

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Table C-2. Automated Reagent Injection System, Operational Year 6, Quarter Number 4 Operating Parameters, Groundwater Remediation System, Colesville Landfill, Broome County, New York.

NO INJECTIONS COMPLETED DURING THE REPORTING PERIOD

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Appendix D

Degradation Trend Figures

Figure D-1. Concentrations of PCE Daughter Products Versus Time in GMMW-05

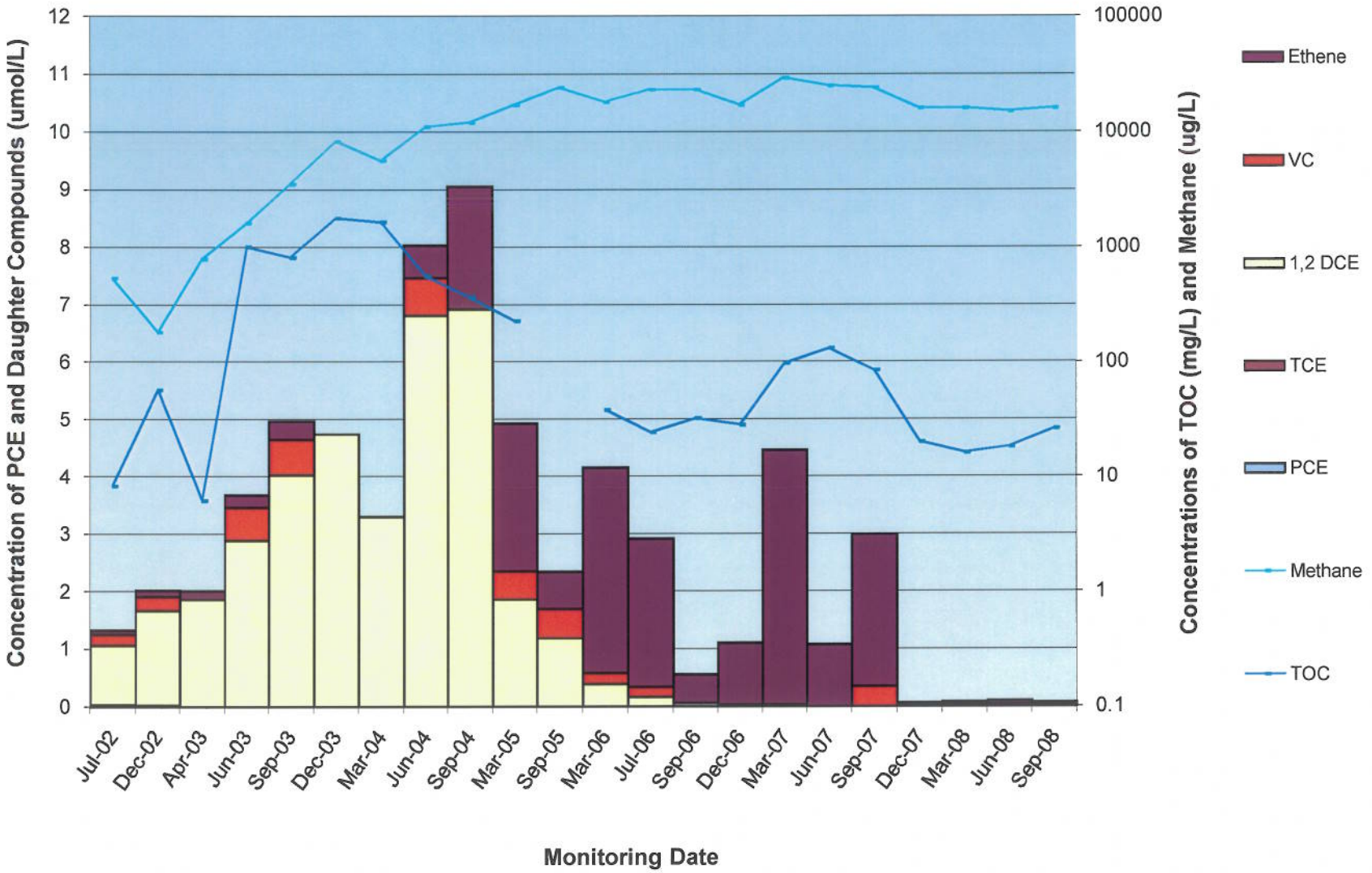

Figure D-2. Concentrations of PCE Daughter Products Versus Time in GMMW-06

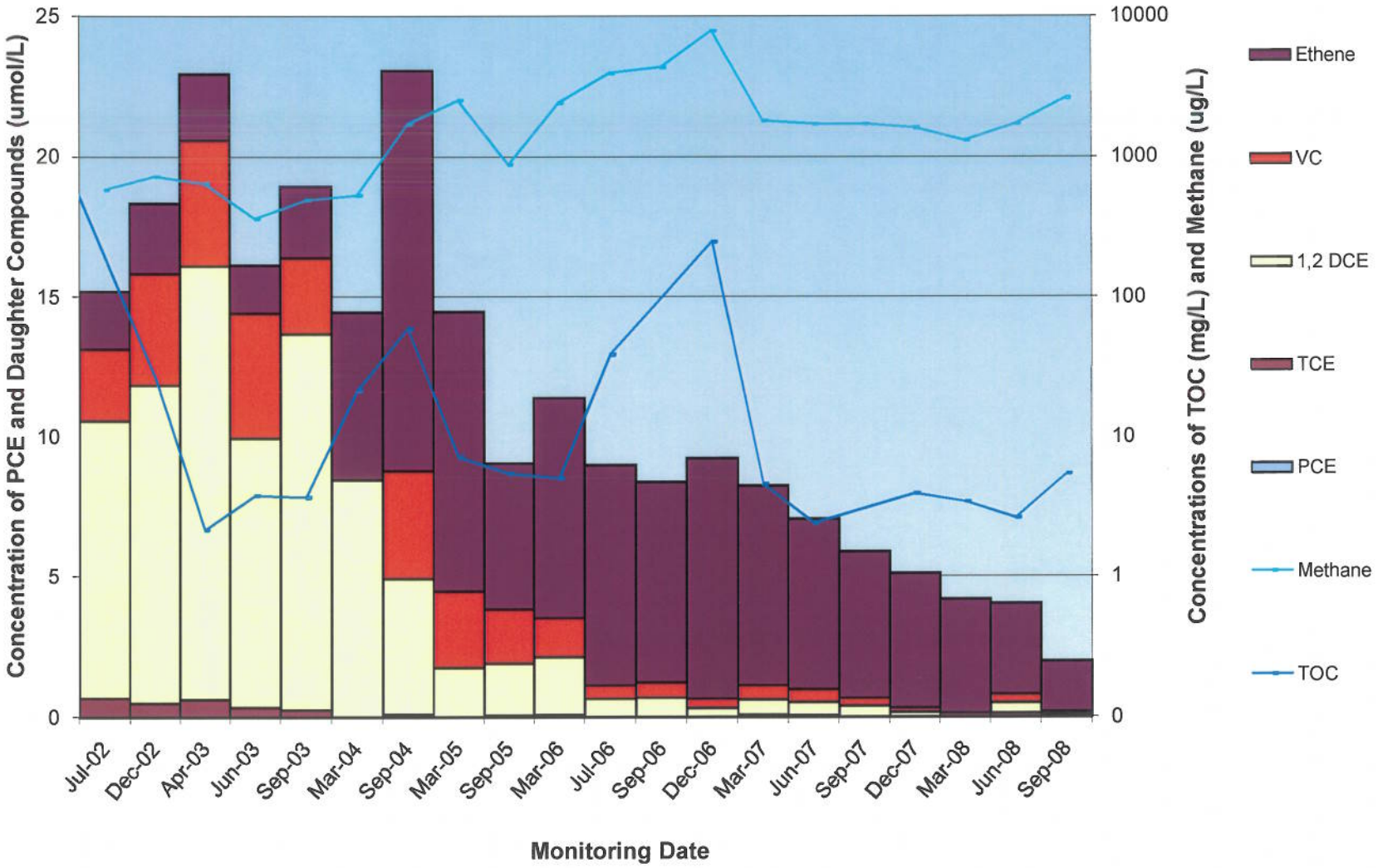

Figure D-3. Concentrations of PCE Daughter Products Versus Time in GMMW-02

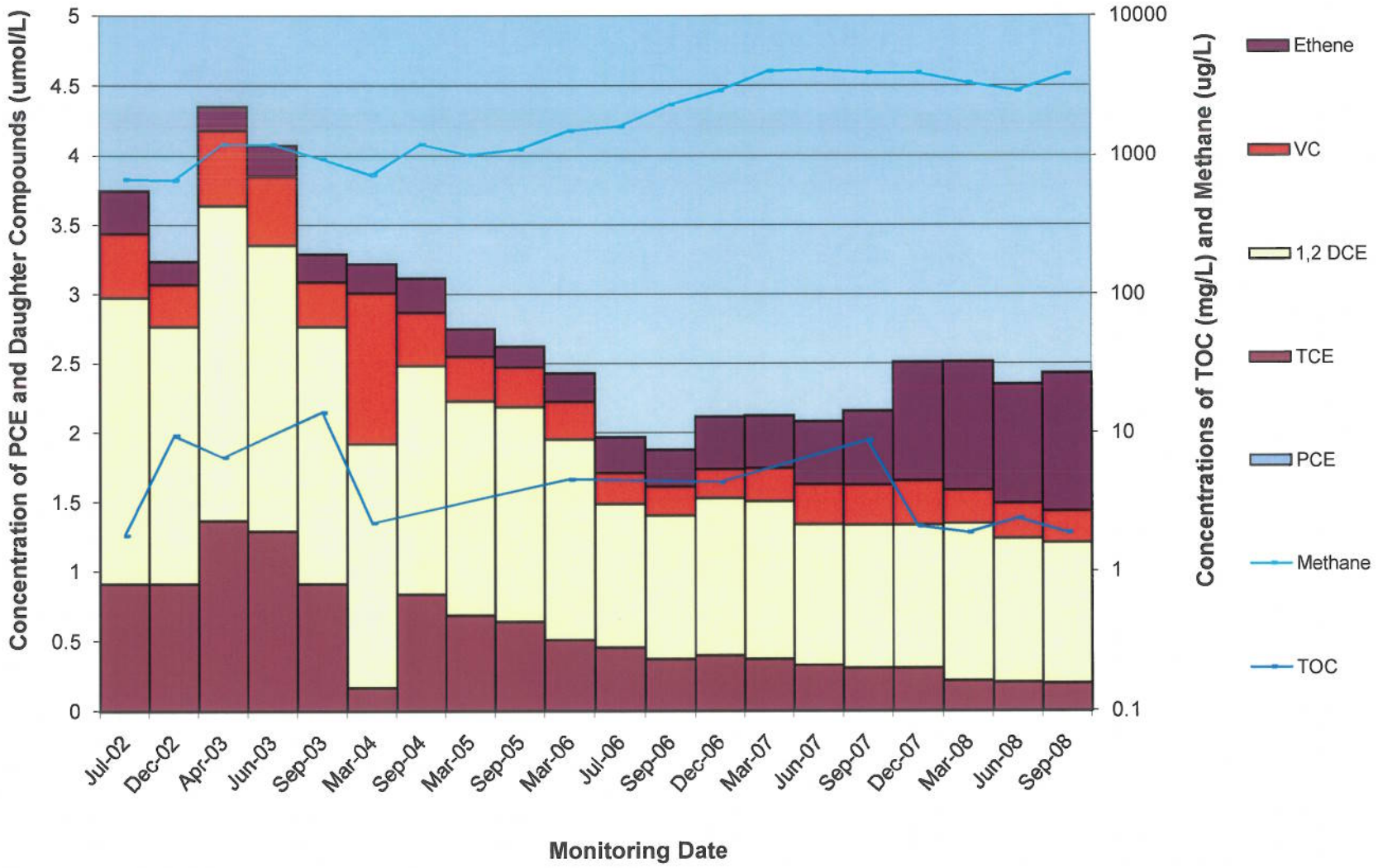

Figure D-4. Concentrations of PCE Daughter Products Versus Time in W-05

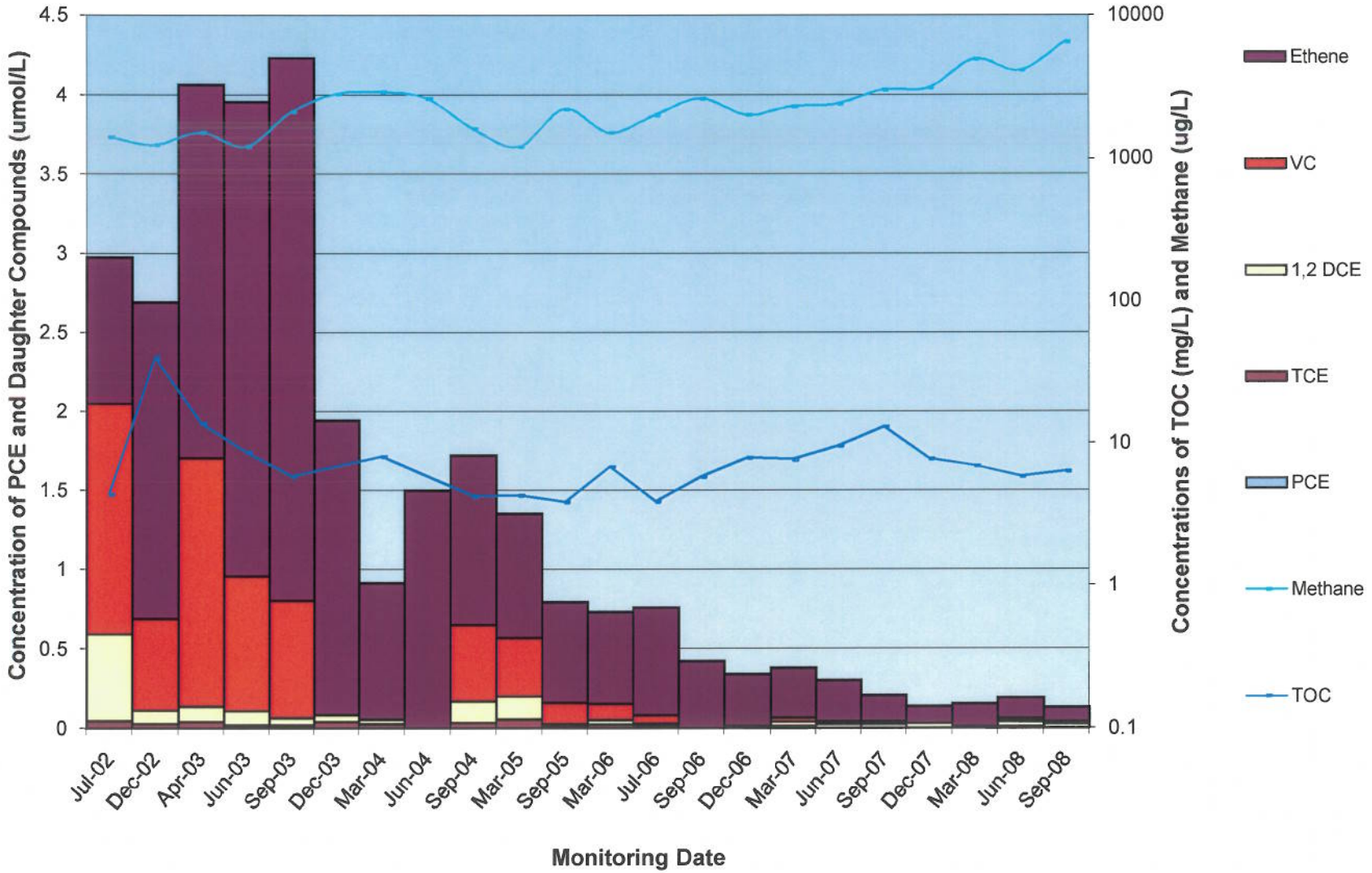

Figure D-5. Concentrations of PCE Daughter Products Versus Time in TW-1

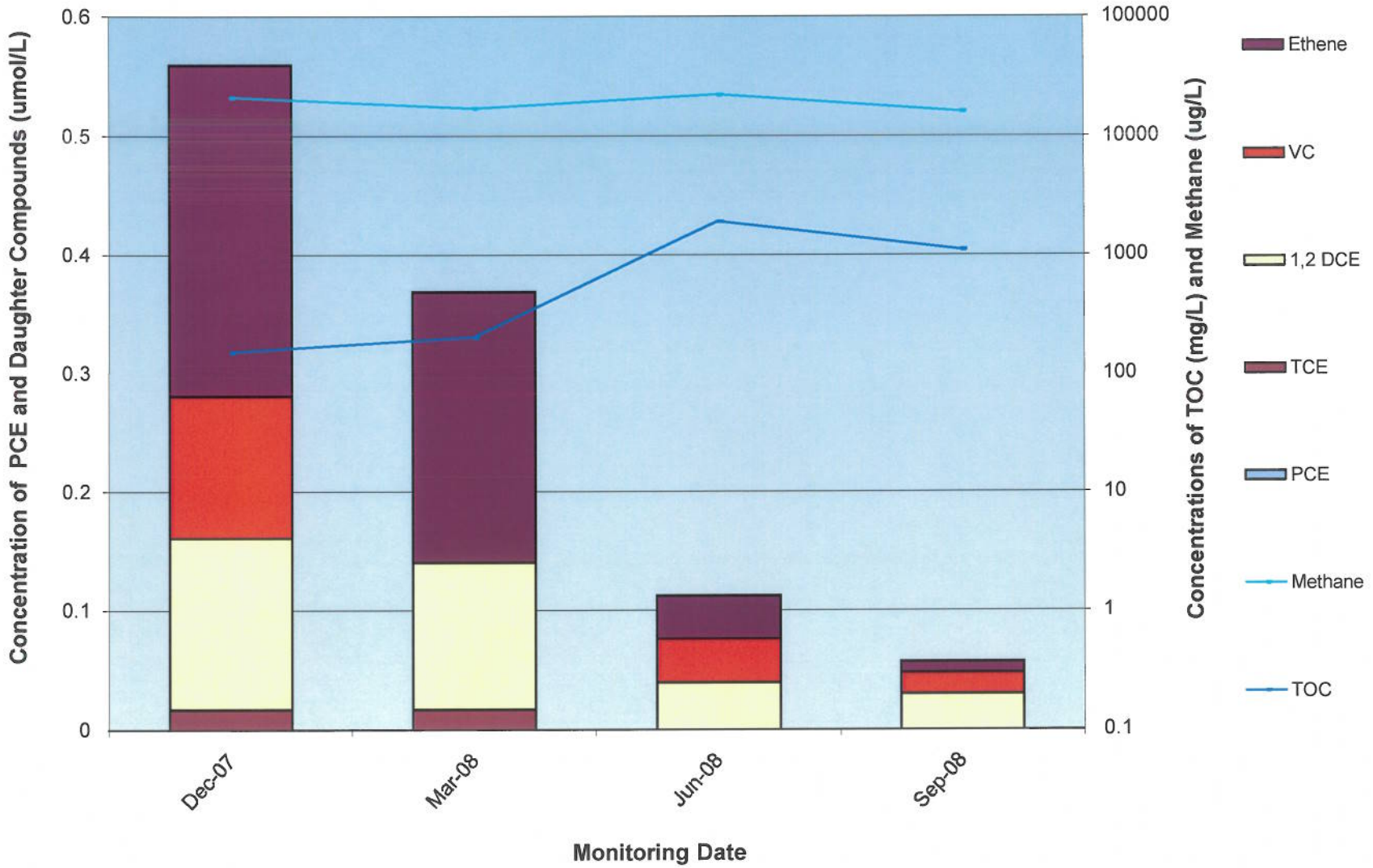

Figure D-6. Concentrations of 1,1,1-TCA Daughter Products Versus Time in GMMW-05

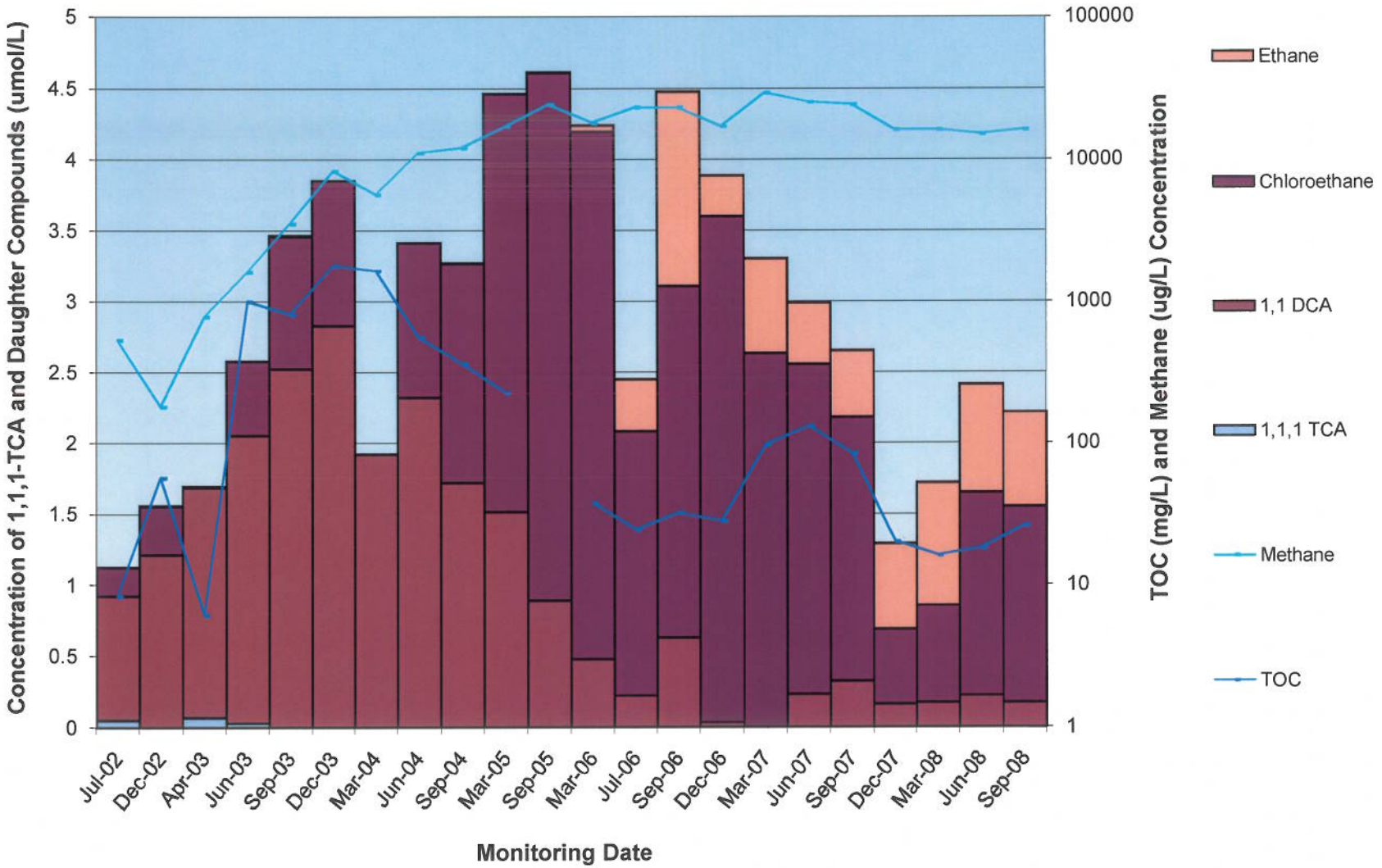

Figure D-7. Concentrations of 1,1,1-TCA Daughter Products Versus Time in GMMW-06

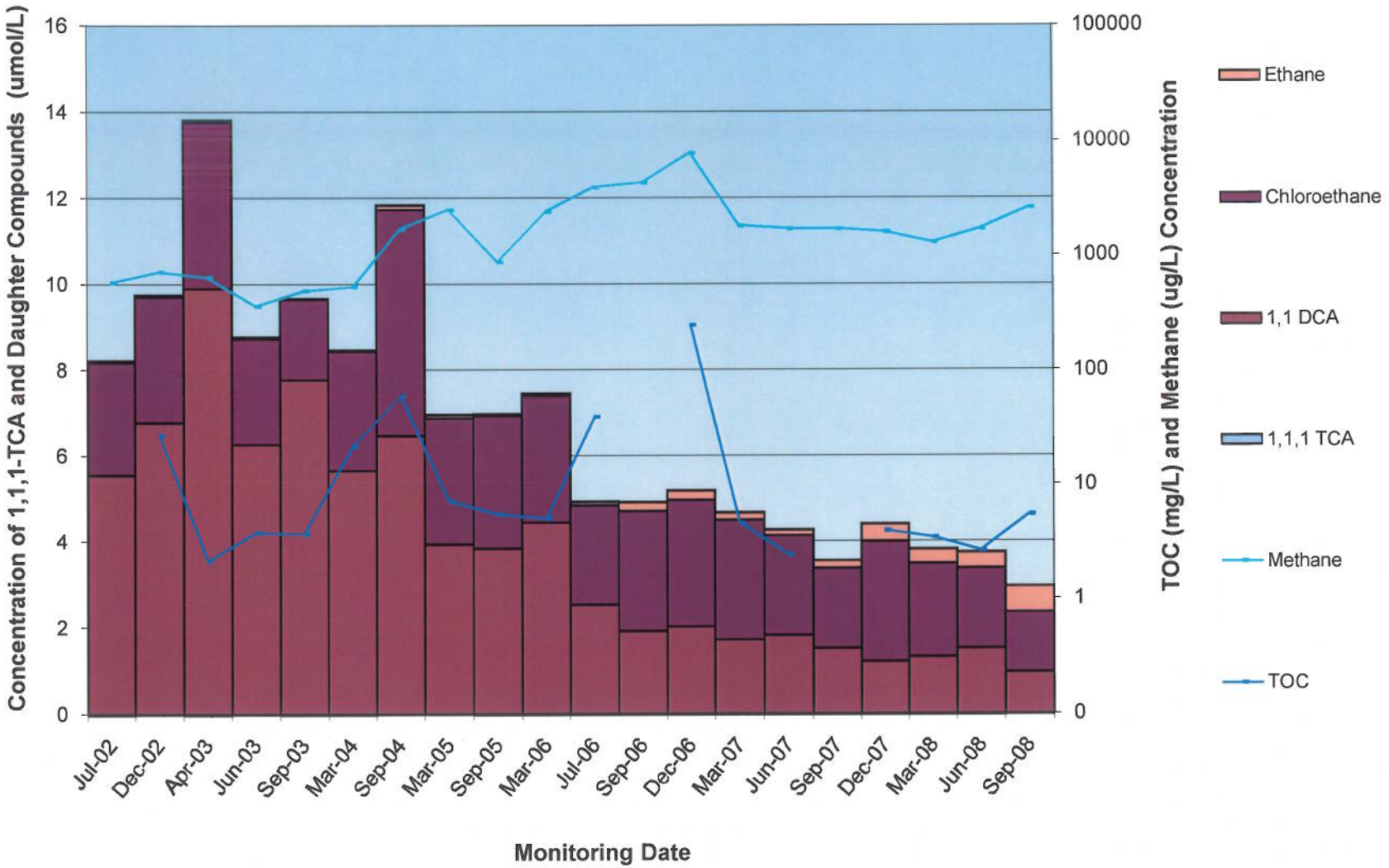

Figure D-8. Concentrations of 1,1,1-TCA Daughter Products Versus Time in GMMW-02

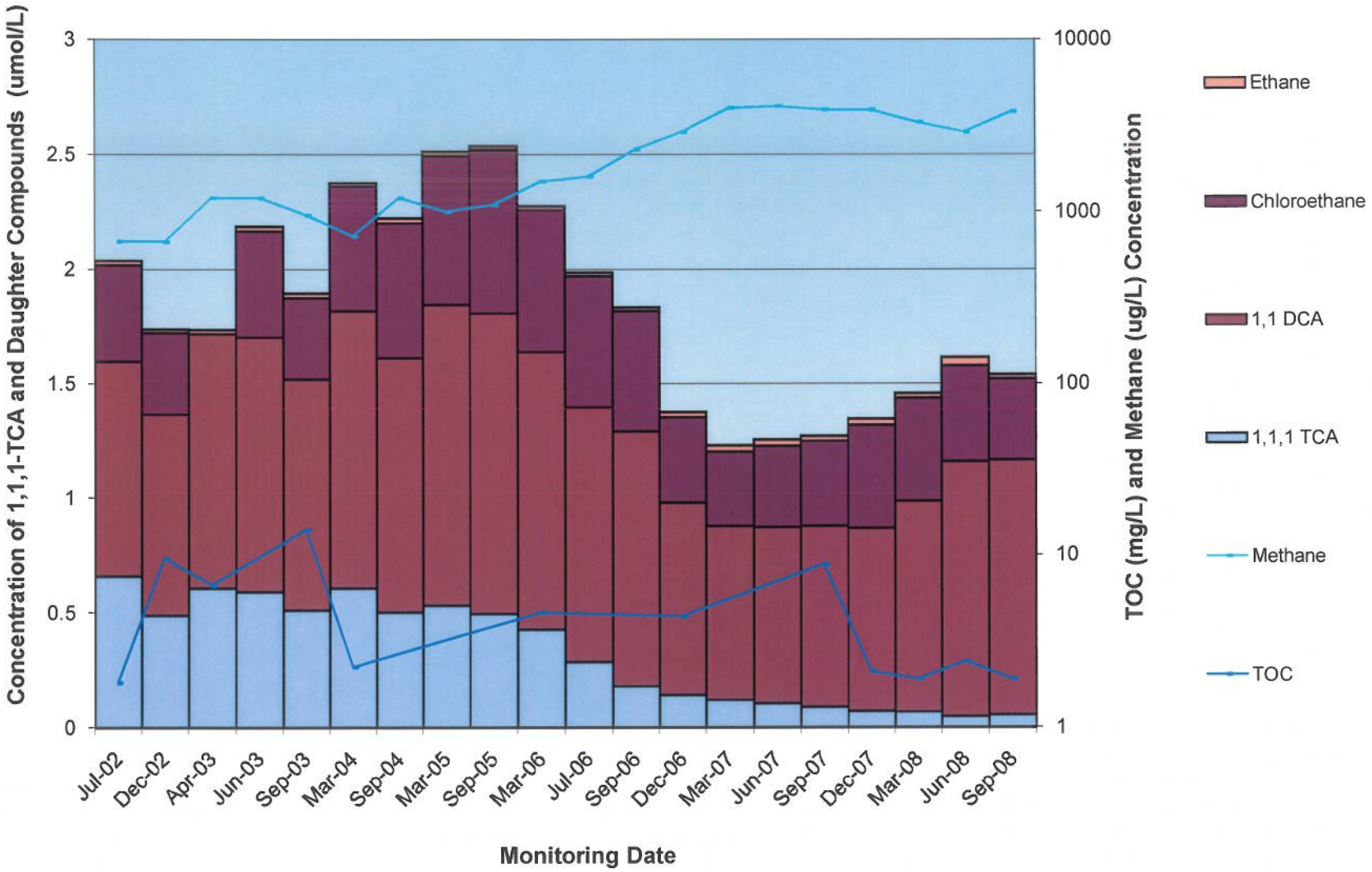

Figure D-9. Concentrations of 1,1,1-TCA Daughter Products Versus Time in W-05

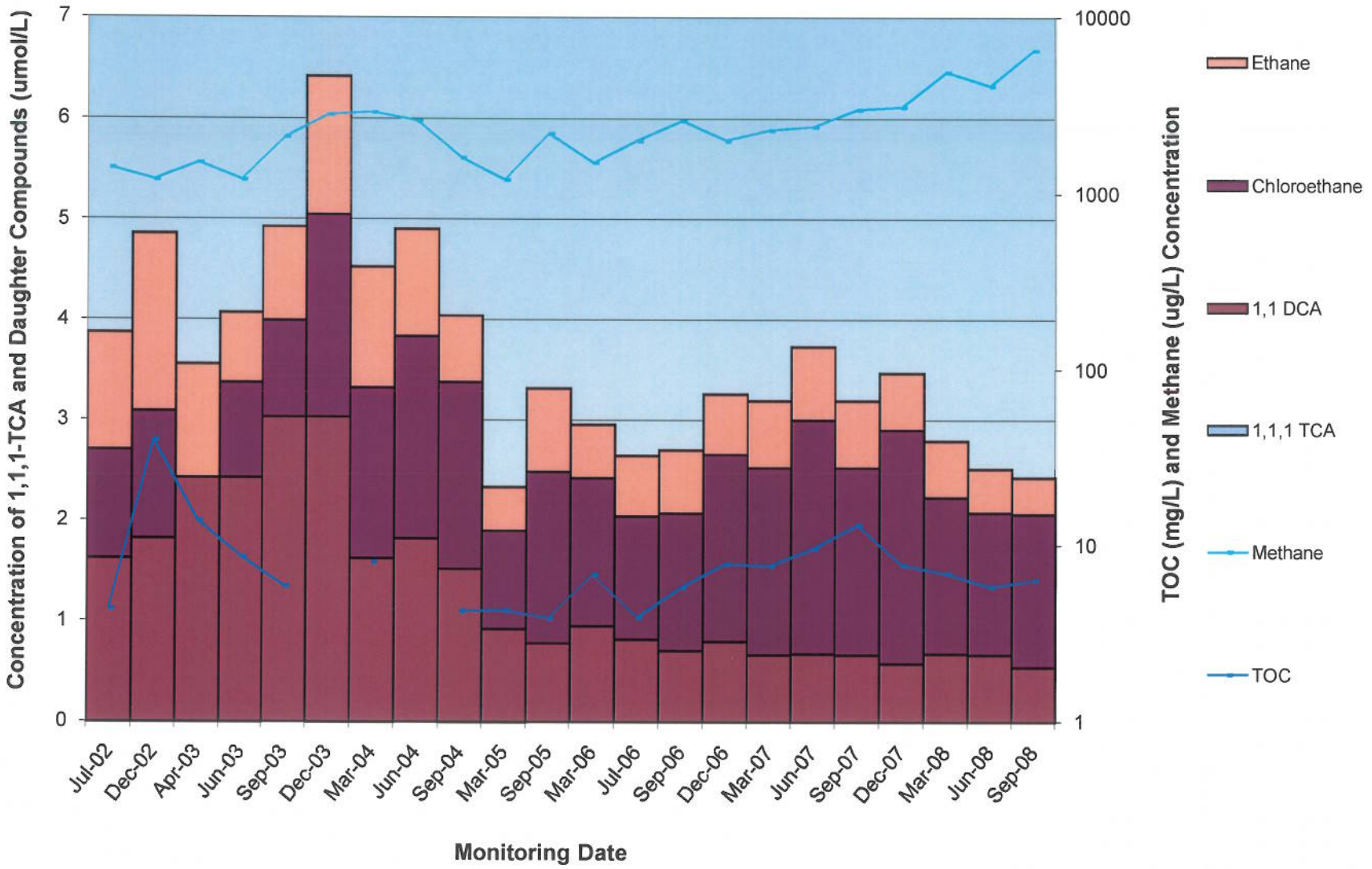

Figure D-10. Concentrations of 1,1,1-TCA Daughter Products Versus Time in TW-1