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Broome County
Division of Solid Waste Management

Operational Year 10 Annual Monitoring Report

June 2013

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Operational Year 10 Annual Monitoring Report

Broome County, New York
NYSDEC Site 704010

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Our Ref.:
NY000949.0025.00004

Date:
June 17, 2013

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Colesville Landfill
Broome County, New York
NYSDEC Site 704010

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1. Introduction

This 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 (ROD) issued in March 1991 and Explanation of Significant Differences (ESD) that were issued in September 2000 and July 2004, 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 G&M, Inc. 2003), Interim Remedial Action Report (ARCADIS G&M, Inc. 2004), and the Proposed Modifications to the Long Term Monitoring Program (ARCADIS G&M, Inc. 2005) which were approved by the United States Environmental Protection Agency (USEPA) 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 describes the results of the June 2012 and September 2012 groundwater quality monitoring events conducted during Operational Year 10, Quarter Numbers 3 and 4. A description of the operation, maintenance, and monitoring (OM&M) associated with the Groundwater Remediation System from April 2012 through September 2012 (hereinafter referred to as the reporting period) has also been provided. Included in the analysis of the results is a summary and discussion of all data collected during Operational Year 10 (October 2011 through September 2012). 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 the reporting period. A site plan showing the environmental effectiveness monitoring locations is provided on Figure 1.

2.1 Environmental Effectiveness Monitoring

The environmental effectiveness monitoring performed during the reporting period included the following:

- Water-level (hydraulic) measurements were collected from 25 monitoring wells on September 18, 2012.

- Quarterly groundwater samples were collected from six monitoring wells (Year 10, quarterly list of wells plus monitoring well TW-1) during the week of June 18, 2012 and annual groundwater samples were collected from nineteen monitoring wells (Year 10 annual list of wells plus monitoring well TW-1) during the week of September 17, 2012. The samples 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 June 21, 2012 and September 20, 2012, and at the F-6 surface water location on June 21, 2012.

Water level measurements and groundwater samples were collected from monitoring wells utilizing passive diffusive bag (PDB) samplers, in accordance with the Long-Term Monitoring Program (ARCADIS G&M, Inc. 2002) and Proposed Modifications to the Long-Term Monitoring Program (ARCADIS G&M, Inc. 2005).

2.2 Groundwater Remediation System Performance Monitoring

Groundwater Remediation System performance monitoring activities during the reporting period were as follows:

- Pump-and-treat (PT) system groundwater samples were collected on June 20, 2012. Grab samples were taken directly from the individual recovery pipelines connected to recovery wells GMPW-4, GMPW-5, the combined influent water to the low profile air stripper, and the combined effluent after the cartridge filters. All samples were selectively analyzed for VOCs and total iron.

- PT system operating parameters were recorded during the quarterly OM&M site visits.

- TOC samples were collected from injection wells IW-3, IW-8 and IW-13on May 3, 2012, July 10, 2012 and September 20, 2012 to monitor TOC longevity in the vicinity of the injection network. These data were used to estimate the TOC persistence and injection frequency using molasses-whey blend (mol-whey) as the reagent.

- Automated reagent injection (ARI) system operating parameters were recorded during the injection event.

PT system groundwater samples and the air stripper effluent vapor sample were not collected in September 2012 as a result of the system being offline due to an air compressor motor failure.

2.3 Spring Water Remediation System Performance Monitoring

SP-5 Spring Water Remediation System OM&M was conducted on June 20, 2012 and September 20, 2012. System OM&M was conducted in accordance with the LTM Plan Addendum for Spring Water Remediation Systems (ARCADIS G&M, Inc. 2003) and consisted of the collection of influent and effluent spring water samples 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 outfall stone apron. All spring water samples were analyzed for VOCs using USEPA Method 8260.

3. Groundwater Flow

Water-level measurements were made from existing wells on September 18, 2012. Water-level elevation data for Operational Year 10, Quarter 4 is provided in Table 1. A summary of water-level elevation data for Operational Year 10 is included in this table. Water-level elevations and the groundwater flow direction for the September 2012 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 10, 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 10 was similar to

prior rounds of data. Seasonal fluctuations are observed during each operating quarter; however, the data indicate groundwater flow directions consistent with the conceptual site model (CSM) of groundwater flow toward the discharge boundaries of the North Stream and Susquehanna River.

4. Groundwater Quality

The following sections describe the analytical results for groundwater samples collected during the June 2012 and September 2012 monitoring rounds. Groundwater analytical results for groundwater samples collected during the reporting period are provided in Tables 2 and 3. A summary of all analytical data collected during Operational Year 10 is also provided in the referenced tables. Where applicable, the previous round of analytical results for the respective sampling location has been provided in the same table for comparative purposes. Finally, Figures A-1 through A-10 provided in Appendix A 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 VOCs has 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 in-situ reactive zones (IRZs) are constantly releasing adsorbed phase mass and degrading mass to daughter compounds with different molecular weights, the evaluation of anaerobic IRZs on a molecular basis is the appropriate methodology for analyzing the data.

4.1 Volatile Organic Compounds

A comparison of the current reporting period groundwater analytical results with previous analytical data indicates that the dissolved-phase plume continues to be stable. Plume boundary, landfill interior, and landfill perimeter monitoring data are generally consistent with historic data except as noted below. TVOC concentrations for plume boundary monitoring well W-17S and offsite monitoring well W-20S remained stable at below the limits of detection. The TVOC concentration for plume boundary monitoring well W-18 slightly increased from 22 µg/L (September 2011) to 64 µg/L (September 2012); however, current concentrations are consistent with historic concentrations. Landfill perimeter monitoring wells W-6, W-7, and W-13 remained stable at 50 µg/L, 10 µg/L, and 0.24 µg/L, respectively. Landfill perimeter monitoring well PW-7 decreased from 641 µg/L (September 2011) to 414 µg/L (September 2012). Landfill interior monitoring well PW-13 remained stable at 25 µg/L. Landfill interior

monitoring well GMMW-7 increased from 347 µg/L (September 2011) to 777 µg/L (September 2012). The cause of the apparent TVOC concentration increase in monitoring well GMMW-7 is likely due to normal variation in compound concentrations emanating from beneath the landfill. ARCADIS will continue to monitor the TVOC trend at monitoring well GMMW-7.

In general, TVOC concentrations in mid-plume monitoring wells located furthest from the IRZ were stable. Specifically, mid-plume monitoring wells W-16S and PW-5 remained stable at 46 µg/L and 0.0 µg/L, respectively. The TVOC concentration in mid-plume monitoring wells PW-3 and PW-4 remained stable to slightly increasing at 84 µg/L and 21 µg/L, respectively. TVOC concentrations in mid-plume monitoring wells located closest to the IRZ (GMMW-6, W-5, and GMMW-2) were stable to slightly increasing during September 2012 at 417 µg/L, 143 µg/L and 164 µg/L, respectively.

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

A comparative analysis of groundwater analytical data for VOCs during Operational Year 10 continues to corroborate historical data and indicate that the dissolved phase plume is stable. The overall stable plume provides continued evidence that ongoing natural attenuation processes are effectively controlling the further migration of the plume beyond its current limits. 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. As mentioned previously, PT system samples were not collected during the fourth quarter as a result of the system being offline. During the reporting period, the TVOC concentration at recovery wells GMPW-4 and GMPW-5 were consistent when compared to prior data. Specifically, June 2012 TVOC concentrations in recovery wells GMPW-4 and GMPW-5 were 28 µg/L and 0.0 µg/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 A-1 through A-10 (Appendix A). In summary, field and laboratory groundwater data for Wells TW-1, GMMW-2, GMMW-5, GMMW-6, and W-5 indicate that reducing conditions are being

maintained within the IRZ. This is evidenced by the presence of reduced forms of alternate electron acceptors (i.e., methane) at a concentration significantly higher than baseline conditions. Further details of the automated reagent injection (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 biodegradation of VOCs within the IRZ. In addition, the concentration of ethene (Figures B-1 through B-5) or ethane (Figures B-6 through B-10) versus time for monitoring wells GMMW-2, GMMW-5, GMMW-6, W-5, and TW-1 is provided on Figures A-1 through A-10 (Appendix A). The concentration of ethane remained elevated at monitoring wells GMMW-5 and GMMW-6 when compared to baseline conditions. 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

SP-4 area maintenance work was conducted in November 2011 to enhance hydraulic control of the SP-4 spring and to eliminate the potential direct exposure risk to ecological receptors. Specifically, the existing high permeability media was extended to the North Stream so that spring water is redistributed within the high permeability media and groundwater table, and exfiltration of the spring above land surface is prevented.

The proposed improvements consisted of the excavation of native material between the existing infiltration bed and the North Stream down to one-foot below the water table elevation, and replacement with a highly permeable media (four-inch diameter riprap). The high permeability zone serves as an infiltration area such that the spring water is suppressed and distributed back into the natural water table, precluding the potential for contact with environmental receptors. The installation of a riprap barrier (twelve-inch diameter riprap) along the North Stream serves as an engineering control to prevent erosion of the improvements. In addition, Broome County's contractor conducted repairs to the two retaining walls further upstream of SP-4 that were damaged during Hurricane Irene and Tropical Storm Lee in August and September 2011, respectively.

The embankment of the North Stream was inspected for springs during the OM&M site visits on June 21, 2012 and September 20, 2012. During the June 21 and September 20 inspections, spring water and iron hydroxide staining was observed in the SP-2 and SP-3 areas, with the SP-3 area being the most highly impacted with iron hydroxide staining. Minor iron staining was also observed in the SP-4 area.

6. Surface Water Quality

Surface water quality analytical results for the reporting period monitoring rounds are summarized in Table 5. As shown in Table 5, surface water quality at the SP-4 and F-6 sampling locations remained consistent when compared to analytical results from the previous round. Specifically, the TVOC concentration at the SP-4 sampling location was 2.7 µg/L on June 21, 2012 and 1.8 µg/L on September 21, 2012. The TVOC concentration at the F-6 sampling location during the June 2012 semi-annual sampling was below the limits of detection. The data indicate that surface water quality is not being adversely impacted by the landfill.

7. Groundwater Remediation System Performance

The following sections describe the results of the Groundwater Remediation System performance monitoring conducted during the reporting period and a summary of the performance for Year 10.

7.1 PT System

The following section describes the results of the PT system performance monitoring conducted during the reporting period.

7.1.1 Summary of Operation, Maintenance, and Monitoring

Routine PT system OM&M for this reporting period was conducted during the site visits on June 21, 2012 and September 24, 2012. Routine OM&M included operation and maintenance of system equipment, the collection of system performance samples (water), and recording system operating parameters. The PT system operated continuously and was monitored by the SCADA system from the start of the reporting period through July 23, 2012, at which point the PT system was shut down for the rest of the reporting period due to power failures and an air compressor motor fault.

A discontinuation pilot test of the IRZ and PT system was proposed as part of the October 2012 IRZ Discontinuation Pilot Test Work Plan (ARCADIS of New York Inc. 2012). Implementation of the pilot test was verbally authorized by George Jacob of the USEPA during project status communications in the fourth quarter of 2012. Accordingly, the PT system will remain offline until completion of the pilot test, or if groundwater quality data indicates restart of the PT system is necessary for the protection of public health or the environment.

Table 6 provides a summary of the recorded system operating parameters for the current reporting period. As shown in Table 6, the total effluent groundwater recovery rate for the reporting period was approximately 0.14 gallons per minute (gpm), with individual recovery rates of 0.08 gpm and 0.10 gpm in GMPW-4 and GMPW-5, respectively. The average individual recovery well pumping rates during the reporting period were less than the previous reporting report.

A total of 38,669 gallons of groundwater was recovered during this reporting period and a total of 2,387,308 gallons of groundwater has been recovered since system startup.

The overall system pumping rate during Operational Year 10 was less when compared to Operational Year 9 (ARCADIS of New York Inc., 2012a). This was due in large part to the system being shut down from July 23, 2012 through the end of the reporting period. Specifically, the total effluent groundwater recovery rate for Operational Year 10 was approximately 0.23 gpm, with individual recovery rates of 0.11 gpm and 0.15 gpm for recovery wells GMPW-4 and GMPW-5, respectively. A total of 84,422 gallons of groundwater was recovered during Operational Year 10.

7.1.2 Results of Performance Sampling

PT system performance sampling for this reporting period was conducted on June 21, 2012. Four groundwater samples were collected. Groundwater samples included collection of individual recovery well samples (GMPW-4 and GMPW-5), total influent, and total effluent after the cartridge filters. A PT system air stripper effluent sample was not collected this reporting period due to the PT system being offline during the September 2012 site visit.

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 was also below its respective BPJ limit. Based on the total groundwater recovered during the reporting period and total influent groundwater concentration, an estimated 0.03 pounds (lbs) of VOC mass were removed from the subsurface during this reporting period, as shown in Table 7. A total of approximately 3.76 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 10. As shown in Table 8, an air stripper effluent vapor sample was not collected in September 2012 as a result of the system being offline due to an air compressor motor failure. Since the concentration of VOCs in groundwater samples collected from the PT system influent during Operational Year 10 were similar in concentration to the PT system influent during Operational Year 9, the NYSDEC DAR-1 air model calculations were performed using the values reported for Operational Year 9 for all constituents. Note that since all VOCs were reported at non-detect concentrations, NYSDEC DAR-1 air model calculations were performed using the detection limits reported for all constituents. Based on the results of the model, 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 October 18, 2010.

As shown in Table 4, the PT system operated effectively during Operational Year 10 and treated influent VOCs to below their respective BPJ limits during each operational period. As shown in Table 7, a total of approximately 0.08 lbs of VOC mass were recovered during Operational Year 10.

7.2 ARI System

The following section describes the results of the ARI system performance monitoring conducted during the reporting period.

7.2.1 Summary of Operation, Maintenance, and Monitoring

ARI system OM&M was conducted during the reporting period on, April 11, 2012, May 3, 2012, July 10, 2012 and September 20, 2012. The visits included operation and maintenance of system equipment and performance of reagent injections, as necessary. One reagent injection was conducted during the reporting period. The injection was initiated on April 11, 2012 and was completed on May 1, 2012. As

described in the Operational Year 8 Annual Monitoring Report (ARCADIS of New York, Inc. 2011a), reagent injections are completed using mol-whey beginning with the Operational Year 9, Quarter Number 1 injection event. Based on the monitoring results from the Operational Year 9, Quarter Number 1 injection event (ARCADIS of New York, Inc. 2011b), the frequency of reagent injections has been decreased. The revised injection frequency has been confirmed based on the results of ongoing TOC monitoring from injection and nearby monitoring wells and is estimated to be once every six to eight months. Approximately 100,004 gallons of mol-whey solution were delivered to the subsurface during Operational Year 10, Quarter Number 4 via the ARI system. A total of 549,138 gallons of electron donor solution (molasses and mol-whey) have been injected since system startup. Appendix C provides a summary of the recorded system operating parameters for the reporting period.

7.2.2 Results of Performance Sampling

ARI system performance sampling was conducted during the weeks of May 3, 2012, July 9, 2012 and September17, 2012 and included the collection of TOC samples at three injection wells. In addition, analytical results from select monitoring wells under the environmental effectiveness monitoring program were also used 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 10 sampling events. In addition, the concentrations of PCE daughter compounds, ethene, methane, and TOC versus time for select monitoring wells are provided in Figures A-1 through A-5 of Appendix A. Likewise, the concentrations of TCA daughter compounds, ethane, methane, and TOC versus time for select monitoring wells are provided in Figures A-6 through A-10 of Appendix A. Analytical results and field parameters indicate that geochemical conditions in the current area of ARI system influence exhibit elevated TOC, elevated chlorinated VOC degradation end-products (i.e., ethene and ethane), and elevated reduced forms of alternate electron acceptors (i.e., methane). Operational Year 10 analytical data provide strong evidence that VOCs are being degraded within the IRZ along the downgradient flow path.

Key observations for Operational Year 10, Quarters Number 3 & 4, are as follows:

- The TOC concentrations at injection wells IW-3, IW-8 and IW-13 and monitoring wells TW-1 and GMMW-5 decreased during the reporting period from 1,410 mg/L,

2,660 mg/L, 819 mg/L, 347 mg/L and 20.7 mg/L during the May 3, 2012 monitoring event to 7.8 mg/L, 328 mg/L, 97.1 mg/L, 14.8 mg/L and 19.4 mg/L during the September 20, 2012 monitoring event, respectively. These data indicate that sufficient organic carbon was delivered and persisted to maintain the IRZ during the reporting period.

- Monitoring wells in close proximity to the anaerobic IRZ (i.e., GMMW-5, W-5, TW-1, GMMW-6 and GMMW-2) exhibited stable to slightly increasing VOC concentrations when compared to historic analytical results and remain significantly lower than baseline conditions.

- The methane concentration in monitoring wells GMMW-5, W-5, TW-1, GMMW-6, and GMMW-2 remained elevated throughout the reporting period, with September 2012 results of 18,000 µg/L, 8,400 µg/L, 10,000 µg/L, 13,000 µg/L, and 14,000 µg/L, respectively. These data provide evidence that strongly reducing conditions (methanogenic) are being maintained within the IRZ.

- As shown on Figures B-1, B-2, B-3, B-6, B-7, and B-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.

- The concentrations of PCE-related daughter compounds have decreased approximately 93 percent when comparing Operational Year 10 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 concentrations of PCE-related daughter compounds are currently at or below their respective New York State Ambient Water Quality Standards and Guidance Values (NYS WQS) within monitoring wells GMMW-5, W-5, and TW-1. The concentrations of PCE-related daughter compounds are currently slightly above NYS WQS within monitoring wells GMMW-2 and GMMW-6.

- The concentrations of TCA-related daughter compounds have decreased approximately 38 percent when comparing Operational Year 10 data to baseline conditions within all monitoring wells located in the vicinity of the IRZ, except for monitoring well GMMW-5. 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 49 percent.

- GMMW-6 – Overall decrease of 41 percent.
- W-5 – Overall decrease of 38 percent.
- TW-1 – Overall decrease of 24 percent.

- The concentrations of TCA-related daughter compounds are currently below USEPA MCLs for all monitoring wells sampled at the site but are above NYS WQS for 1,1-dichloroethane and chloroethane in select monitoring wells.

In summary, the IRZ continues to be maintained and continues to enhance the rate of reductive dechlorination.

8. Spring Water Remediation System Performance

SP-5 Spring Water Remediation System OM&M was conducted on June 20, 2012 and September 20, 2012 in accordance with the LTM Plan Addendum for Spring Water Remediation Systems (ARCADIS G&M, Inc. 2003). SP-5 Spring Water Remediation System analytical results for this reporting period 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 (35 µg/L in June 2012 and 48 µg/L in September 2012) remained stable when compared with recent historical analytical data.

Table 10 contains the SP-5 spring water remediation system operating parameters recorded during the reporting period. As shown in Table 10, approximately 89,670 gallons of spring water was treated and approximately 0.03 lbs of mass was recovered during the reporting period. An estimated 3,685,694 gallons of spring water has been treated and an estimated 1.92 lbs of VOC mass has been recovered since system startup.

9. Conclusions

Based on the data obtained from the reporting period monitoring, ARCADIS concludes the following:

- Water level measurements in the project area (i.e., adjacent to the landfill western perimeter) and site-wide in the September 2012 round were 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 has successfully reduced 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, W-5, and TW-1. The concentrations of PCE-related daughter compounds are currently slightly above NYS WQS within monitoring wells GMMW-2 and GMMW-6.

- The concentrations of TCA-related daughter compounds are currently below USEPA MCLs for all monitoring wells sampled at the site but are above NYS WQS for 1,1-dichloroethane and chloroethane in select monitoring wells.

- The PT system treated recovered groundwater VOCs to below BPJ limits prior to discharge and is currently offline as part of the IRZ Discontinuation Pilot Test Work Plan (ARCADIS of New York Inc. 2012b).

- The ARI system delivered sufficient organic carbon to the subsurface to maintain the IRZ, through the injection of a mol-whey solution, as evidenced by TOC analytical data.

- The SP-5 Spring Water Remediation System treated VOCs to below their respective BPJ limits via the LPGAC.

- VOC concentrations in surface water continue to be consistent with historical data, and surface water is not being adversely impacted by the landfill

10. Recommendations

The following recommendations are made for this reporting period:

- Continue to inspect the former spring locations and the embankment of the North Stream.

- Temporarily discontinue the operation of the ARI and PT systems and injections of mol-whey solution to evaluate the resultant response on geochemical conditions in groundwater, VOC concentration trends, and

groundwater / surface water interactions, in accordance with the IRZ Discontinuation Pilot Test Work Plan (ARCADIS of New York Inc. 2012b. (Note: Implementation of the Work Plan was verbally authorized by George Jacob of the USEPA during project status communications in the fourth quarter of 2012).

11. Project Schedule

Groundwater environmental effectiveness monitoring is scheduled to be conducted for Operational Year 11 on the quarterly schedule set forth in Table 4 of the IRZ Discontinuation Pilot Test Work Plan (ARCADIS of New York Inc. 2012). OM&M of the ARI and PT systems will be temporarily discontinued as part of the IRZ Discontinuation Pilot Test Work Plan (ARCADIS of New York Inc. 2012b) and will be restarted at the completion of the pilot test, or sooner if groundwater quality data indicates restart of the systems is necessary for the protection of public health or the environment.

12. References

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Tables

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Table 1. Water-Level Measurements Collected During Operational Year 10, Colesville Landfill, Broome County, New York.

Well Identification	MP Elevation (feet above msl)	3/21/2012 Depth to Water (feet below MP)	3/21/2012 Water-Table Elevation (feet above msl)	9/18/2012 Depth to Water (feet below MP)	9/18/2012 Water-Table Elevation (feet above msl)	MP Description
GMMW-2	1,030.95	35.41	995.54	36.63	994.32	Inner casing
GMMW-3	1,028.02	32.80	995.22	34.38	993.64	Inner casing
GMMW-4	1,042.90	44.53	998.37	45.92	996.98	Inner casing
GMMW-5	1,043.66	47.25	996.41	50.63	993.03	Inner casing
GMMW-6	1,033.56	37.60	995.96	39.19	994.37	Inner casing
GMMW-7	1,045.43	46.58	998.85	48.09	997.34	Inner casing
PW-1	976.23	14.43	961.80	15.08	961.15	Inner casing
PW-2	975.28	5.44	969.84	9.52	965.76	Inner casing
PW-3	988.92	10.29	978.63	13.51	975.41	Inner casing
PW-4	1,001.75	16.03	985.72	18.31	983.44	Inner casing
PW-5	986.12	0.0	986.12	0.65	985.47	Inner casing
PW-7	1,042.47	39.75	1,002.72	40.92	1,001.55	Inner casing
PW-8	1,049.73	--	--	40.55	1,009.18	Inner casing
PW-10[(1)]	1,049.29	36.02	1,013.27	--	--	Inner casing
PW-11	1,052.37	51.76	1,000.61	53.02	999.35	Inner casing
PW-13	1,072.41	59.40	1,013.01	62.03	1,010.38	Inner casing
W-5	1,051.41	50.80	1,000.61	52.22	999.19	Inner casing
W-6	1,050.38	48.08	1,002.30	50.67	999.71	Inner casing
W-7	1,049.12	40.88	1,008.24	43.69	1,005.43	Inner casing
W-13	1,053.43	44.56	1,008.87	46.62	1,006.81	Inner casing
W-14S	957.68	4.85	952.83	9.79	947.89	Inner casing
W-16S	990.33	8.80	981.53	8.82	981.51	Outer casing
W-17S	959.13	8.31	950.82	11.72	947.41	Inner casing
W-18	973.56	10.14	963.42	11.54	962.02	Inner casing
W-20S	952.88	8.16	944.72	11.91	940.97	Inner casing

1. Measurement not collected due to obstruction in well at 10.98 feet below M

msl Mean sea level
MP Measuring point
-- Not measured

Table 2. Concentrations of Volatile Organic Compounds Detected in Groundwater, Operational Year 10, Colesville Landfill, Broome County, New York.

Constituents (units in ug/L)	Sample ID: / Date:	GMMW-2 12/7/2011	GMMW-2 [(1)] 3/22/2012	GMMW-2 6/21/2012	GMMW-2 9/19/2012
1,1,1-Trichloroethane		**2.9**	**4.9**	**2.1**	**1.6**
1,1,2,2-Tetrachloroethane		<1.0	<1.0	<1.0	<1.0
1,1,2-trichloro-1,2,2-trifluoroethane		<1.0	<1.0	<1.0	<1.0
1,1,2-Trichloroethane		<1.0	<1.0	<1.0	<1.0
1,1-Dichloroethane		**54**	**5.4**	**51**	**55**
1,1-Dichloroethene		<1.0	<1.0	<1.0	<1.0
1,2,4-Trichlorobenzene		<1.0	<1.0	<1.0	<1.0
1,2-Dibromo-3-chloropropane		<1.0	<1.0	<1.0	<1.0
1,2-Dibromoethane		<1.0	<1.0	<1.0	<1.0
1,2-Dichlorobenzene		<1.0	<1.0	<1.0	<1.0
1,2-Dichloroethane		<1.0	<1.0	**0.41 J**	<1.0
1,2-Dichloropropane		<1.0	<1.0	<1.0	<1.0
1,3-Dichlorobenzene		<1.0	<1.0	<1.0	<1.0
1,4-Dichlorobenzene		<1.0	<1.0	<1.0	<1.0
2-Butanone		<10	<10	<10	<10
2-Hexanone		<5.0	<5.0	<5.0	<5.0
4-Methyl-2-pentanone		<5.0	<5.0	<5.0	<5.0
Acetone		<10	**8.0 J**	<10	<10
Benzene		**2.2**	<1.0	**2.0**	**2.2**
Bromodichloromethane		<1.0	<1.0	<1.0	<1.0
Bromoform		<1.0	<1.0	<1.0	<1.0
Bromomethane		<1.0	<1.0	<1.0	<1.0
Carbon Disulfide		<1.0	<1.0	<1.0	<1.0
Carbon Tetrachloride		<1.0	<1.0	<1.0	<1.0
Chlorobenzene		**25**	<1.0	**28**	**28**
Chloroethane		**13**	**0.78 J**	**14**	**30**
Chloroform		<1.0	**0.78 J**	<1.0	<1.0
Chloromethane		<1.0	<1.0	<1.0	<1.0
cis-1,2-Dichloroethene		**28**	**3.0**	**26**	**24**
cis-1,3-Dichloropropene		<1.0	<1.0	<1.0	<1.0
Cyclohexane		<1.0	<1.0	<1.0	**0.32 J**
Dibromochloromethane		<1.0	<1.0	<1.0	<1.0
Dichlorodifluoromethane		<1.0	**1.9**	**0.79 J**	<1.0
Ethylbenzene		<1.0	<1.0	<1.0	<1.0
Isopropylbenzene		<1.0	<1.0	<1.0	<1.0
Methyl acetate		<1.0	<1.0	<1.0	<1.0
Methyl tert-butyl ether		<1.0	<1.0	<1.0	<1.0
Methylcyclohexane		<1.0	<1.0	<1.0	<1.0
Methylene Chloride		<1.0	<1.0	**0.59 J**	**0.52 J**
Styrene		<1.0	<1.0	<1.0	<1.0
Tetrachloroethene		<1.0	<1.0	<1.0	<1.0
Toluene		<1.0	<1.0	<1.0	<1.0
trans-1,2-Dichloroethene		<1.0	<1.0	<1.0	<1.0
trans-1,3-Dichloropropene		<1.0	<1.0	<1.0	<1.0
Trichloroethene		**17**	**12**	**17**	**16**
Trichlorofluoromethane		<1.0	<1.0	<1.0	<1.0
Vinyl Chloride		**5.6**	<1.0	**5.1**	**6.5**
Xylenes (total)		<2.0	<2.0	<2.0	<2.0
Total VOCs		**148**	**37 J**	**147 J**	**164 J**

Notes and abbreviations on last page.

Table 2. Concentrations of Volatile Organic Compounds Detected in Groundwater, Operational Year 10, Colesville Landfill, Broome County, New York.

Constituents (units in ug/L)	Sample ID: / Date:	GMMW-5 12/7/2011	GMMW-5 3/22/2012	GMMW-5 7/10/2012	GMMW-5 9/20/2012
1,1,1-Trichloroethane		<1.0	<1.0	<1.0	<2.0
1,1,2,2-Tetrachloroethane		<1.0	<1.0	<1.0	<2.0
1,1,2-trichloro-1,2,2-trifluoroethane		<1.0	<1.0	<1.0	<2.0
1,1,2-Trichloroethane		<1.0	<1.0	<1.0	<2.0
1,1-Dichloroethane		<1.0	<1.0	<1.0	<2.0
1,1-Dichloroethene		<1.0	<1.0	<1.0	<2.0
1,2,4-Trichlorobenzene		<1.0	<1.0	<1.0	<2.0
1,2-Dibromo-3-chloropropane		<1.0	<1.0	<1.0	<2.0
1,2-Dibromoethane		<1.0	<1.0	<1.0	<2.0
1,2-Dichlorobenzene		<1.0	<1.0	<1.0	<2.0
1,2-Dichloroethane		**1.2**	**0.89 J**	**0.95 J**	**0.66 J**
1,2-Dichloropropane		<1.0	<1.0	<1.0	<2.0
1,3-Dichlorobenzene		<1.0	<1.0	<1.0	<2.0
1,4-Dichlorobenzene		<1.0	<1.0	<1.0	<2.0
2-Butanone		**12**	**6.9 J**	**2.3 J**	<20
2-Hexanone		<5.0	<5.0	<5.0	<10
4-Methyl-2-pentanone		<5.0	<5.0	<5.0	<10
Acetone		<10	<10	**7.3 J**	<20
Benzene		**2.3**	**2.6**	**2.1**	**1.4 J**
Bromodichloromethane		<1.0	<1.0	<1.0	<2.0
Bromoform		<1.0	<1.0	<1.0	<2.0
Bromomethane		<1.0	<1.0	<1.0	<2.0
Carbon Disulfide		<1.0	<1.0	<1.0	<2.0
Carbon Tetrachloride		<1.0	<1.0	<1.0	<2.0
Chlorobenzene		**16**	**19**	**12**	**14**
Chloroethane		**140 D**	**150 D**	**140 D**	**86**
Chloroform		<1.0	<1.0	<1.0	<2.0
Chloromethane		<1.0	<1.0	<1.0	<2.0
cis-1,2-Dichloroethene		<1.0	**1.0**	**0.87 J**	<2.0
cis-1,3-Dichloropropene		<1.0	<1.0	<1.0	<2.0
Cyclohexane		<1.0	<1.0	<1.0	**1.9 J**
Dibromochloromethane		<1.0	<1.0	<1.0	<2.0
Dichlorodifluoromethane		<1.0	<1.0	<1.0	<2.0
Ethylbenzene		<1.0	<1.0	<1.0	<2.0
Isopropylbenzene		<1.0	<1.0	<1.0	<2.0
Methyl acetate		<1.0	<1.0	<1.0	<2.0
Methyl tert-butyl ether		<1.0	<1.0	<1.0	<2.0
Methylcyclohexane		<1.0	<1.0	<1.0	<2.0
Methylene Chloride		<1.0	<1.0	<1.0	<2.0
Styrene		<1.0	<1.0	<1.0	<2.0
Tetrachloroethene		<1.0	<1.0	<1.0	<2.0
Toluene		**21**	**19**	**9.0**	**18**
trans-1,2-Dichloroethene		<1.0	<1.0	<1.0	<2.0
trans-1,3-Dichloropropene		<1.0	<1.0	<1.0	<2.0
Trichloroethene		<1.0	**0.54 J**	**0.70 J**	<2.0
Trichlorofluoromethane		<1.0	<1.0	<1.0	<2.0
Vinyl Chloride		<1.0	<1.0	<1.0	<2.0
Xylenes (total)		**2.1**	**3.0**	**0.77 J**	<4.0
Total VOCs		**195 D**	**203 DJ**	**176 DJ**	**122 J**

Notes and abbreviations on last page.

Table 2. Concentrations of Volatile Organic Compounds Detected in Groundwater, Operational Year 10, Colesville Landfill, Broome County, New York.

Constituents (units in ug/L)	Sample ID: / Date:	GMMW-6 12/7/2011	GMMW-6 3/22/2012	GMMW-6 6/21/2012	GMMW-6 9/19/2012
1,1,1-Trichloroethane		<1.0	<1.0	**2.6**	<1.0
1,1,2,2-Tetrachloroethane		<1.0	<1.0	<2.0	<1.0
1,1,2-trichloro-1,2,2-trifluoroethane		<1.0	<1.0	<2.0	<1.0
1,1,2-Trichloroethane		<1.0	<1.0	<2.0	<1.0
1,1-Dichloroethane		**96**	**110 D**	**100**	**110 D**
1,1-Dichloroethene		<1.0	<1.0	<2.0	<1.0
1,2,4-Trichlorobenzene		<1.0	<1.0	<2.0	<1.0
1,2-Dibromo-3-chloropropane		<1.0	<1.0	<2.0	<1.0
1,2-Dibromoethane		<1.0	<1.0	<2.0	<1.0
1,2-Dichlorobenzene		<1.0	<1.0	<2.0	<1.0
1,2-Dichloroethane		**0.76 J**	**0.81 J**	<2.0	**0.85 J**
1,2-Dichloropropane		<1.0	**0.76 J**	<2.0	<1.0
1,3-Dichlorobenzene		<1.0	<1.0	<2.0	<1.0
1,4-Dichlorobenzene		<1.0	<1.0	<2.0	<1.0
2-Butanone		<10	<10	<20	<10
2-Hexanone		<5.0	<5.0	<10	<5.0
4-Methyl-2-pentanone		<5.0	<5.0	<10	<5.0
Acetone		<10	**7.3 J**	<20 B	<10 B
Benzene		**5.5**	**6.6**	**4.9**	**5.9**
Bromodichloromethane		<1.0	<1.0	<2.0	<1.0
Bromoform		<1.0	<1.0	<2.0	<1.0
Bromomethane		<1.0	<1.0	<2.0	<1.0
Carbon Disulfide		<1.0	<1.0	<2.0	<1.0
Carbon Tetrachloride		<1.0	<1.0	<2.0	<1.0
Chlorobenzene		**22**	**30 J**	**24**	**26**
Chloroethane		**110 D**	**120 D**	**100**	**240 D**
Chloroform		<1.0	<1.0	<2.0	<1.0
Chloromethane		<1.0	<1.0	<2.0	<1.0
cis-1,2-Dichloroethene		**3.7**	**5.9**	**10**	**9.6**
cis-1,3-Dichloropropene		<1.0	<1.0	<2.0	<1.0
Cyclohexane		<1.0	**0.80 J**	<2.0	<1.0
Dibromochloromethane		<1.0	<1.0	<2.0	<1.0
Dichlorodifluoromethane		<1.0	**1.8**	<2.0	<1.0
Ethylbenzene		**1.2**	**1.7 J**	<2.0	**0.89 J**
Isopropylbenzene		<1.0	<1.0	<2.0	<1.0
Methyl acetate		<1.0	<1.0	<2.0	<1.0
Methyl tert-butyl ether		<1.0	<1.0	<2.0	<1.0
Methylcyclohexane		<1.0	<1.0	<2.0	<1.0
Methylene Chloride		**4.2**	**5.2**	**4.3**	**3.9**
Styrene		<1.0	<1.0	<2.0	<1.0
Tetrachloroethene		<1.0	<1.0	<2.0	<1.0
Toluene		**3.0**	**4.1**	**1.4 J**	**2.8**
trans-1,2-Dichloroethene		**0.94 J**	**1.1 J**	<2.0	**0.93 J**
trans-1,3-Dichloropropene		<1.0	<1.0	<2.0	<1.0
Trichloroethene		**1.6**	**2.9**	**6.1**	**3.3**
Trichlorofluoromethane		<1.0	<1.0	<2.0	<1.0
Vinyl Chloride		**3.8**	**4.9**	**9.9**	**11**
Xylenes (total)		**2.3**	**3.8**	**1.4 J**	**1.7 J**
Total VOCs		**255 DJ**	**308 DJ**	**265 J**	**417 DJ**

Notes and abbreviations on last page.

Table 2. Concentrations of Volatile Organic Compounds Detected in Groundwater, Operational Year 10, Colesville Landfill, Broome County, New York.

Constituents (units in ug/L)	Sample ID: / Date:	GMMW-07 9/27/2011	GMMW-7 9/19/2012	PW-3 9/27/2011	PW-3 9/19/2012
1,1,1-Trichloroethane		<5.0	**2.2**	**1.9 J**	**3.0**
1,1,2,2-Tetrachloroethane		<5.0	<1.0	<5.0	<1.0
1,1,2-trichloro-1,2,2-trifluoroethane		--	**0.45 J**	--	<1.0
1,1,2-Trichloroethane		<5.0	**1.0**	<5.0	<1.0
1,1-Dichloroethane		**110**	**230 DJ**	**16**	**34**
1,1-Dichloroethene		**0.93 J**	**1.3**	<5.0	<1.0
1,2,4-Trichlorobenzene		<5.0	<1.0	<5.0	<1.0
1,2-Dibromo-3-chloropropane		<5.0	<1.0	<5.0	<1.0
1,2-Dibromoethane		<5.0	<1.0	<5.0	<1.0
1,2-Dichlorobenzene		<5.0	<1.0	<5.0	<1.0
1,2-Dichloroethane		<5.0	**2.1**	<5.0	**0.26 J**
1,2-Dichloropropane		<5.0	<1.0	<5.0	<1.0
1,3-Dichlorobenzene		<5.0	<1.0	<5.0	<1.0
1,4-Dichlorobenzene		<5.0	<1.0	<5.0	<1.0
2-Butanone		--	<10	--	<10
2-Hexanone		--	<5.0	--	<5.0
4-Methyl-2-pentanone		--	<5.0	--	<5.0
Acetone		--	<10	--	<10
Benzene		**1.9 J**	**2.6**	<5.0	<1.0
Bromodichloromethane		<5.0	<1.0	<5.0	<1.0
Bromoform		<5.0	<1.0	<5.0	<1.0
Bromomethane		<5.0	<1.0	<5.0	<1.0
Carbon Disulfide		--	<1.0	--	<1.0
Carbon Tetrachloride		<5.0	<1.0	<5.0	<1.0
Chlorobenzene		**18**	**23**	<5.0	**1.2**
Chloroethane		**47**	**160 D**	<5.0	**6.4**
Chloroform		<5.0	**1.1**	<5.0	**0.57 J**
Chloromethane		<5.0	<1.0	<5.0	<1.0
cis-1,2-Dichloroethene		**89**	**200 DJ**	**6.4**	**17**
cis-1,3-Dichloropropene		<5.0	<1.0	<5.0	<1.0
Cyclohexane		--	**0.37 J**	--	<1.0
Dibromochloromethane		<5.0	<1.0	<5.0	<1.0
Dichlorodifluoromethane		<5.0	**2.0**	<5.0	<1.0
Ethylbenzene		<5.0	<1.0	<5.0	<1.0
Isopropylbenzene		<5.0	<1.0	<5.0	<1.0
Methyl acetate		--	<1.0	--	<1.0
Methyl tert-butyl ether		<5.0	<1.0	<5.0	<1.0
Methylcyclohexane		--	<1.0	--	<1.0
Methylene Chloride		<5.0 B	**2.3**	<5.0	<1.0
Styrene		<5.0	<1.0	<5.0	<1.0
Tetrachloroethene		<5.0	**0.44 J**	**1.9 J**	**2.5**
Toluene		<5.0	<1.0	<5.0	<1.0
trans-1,2-Dichloroethene		<5.0	**0.92 J**	<5.0	<1.0
trans-1,3-Dichloropropene		<5.0	<1.0	<5.0	<1.0
Trichloroethene		**38**	**47**	**9.8**	**19**
Trichlorofluoromethane		<5.0	<1.0	<5.0	<1.0
Vinyl Chloride		**42**	**100 D**	<5.0	<1.0
Xylenes (total)		--	<2.0	--	<2.0
Total VOCs		**347 J**	**777 DJ**	**36 J**	**84 J**

Notes and abbreviations on last page.

Table 2. Concentrations of Volatile Organic Compounds Detected in Groundwater, Operational Year 10, Colesville Landfill, Broome County, New York.

Constituents (units in ug/L)	Sample ID: / Date:	PW-4 9/28/2011	PW-4 [(1)] 3/22/2012	PW-4 6/21/2012	PW-4 9/19/2012
1,1,1-Trichloroethane		**4.4**	**2.2**	**5.3**	**6.0**
1,1,2,2-Tetrachloroethane		<1.0	<1.0	<1.0	<1.0
1,1,2-trichloro-1,2,2-trifluoroethane		--	<1.0	<1.0	<1.0
1,1,2-Trichloroethane		<1.0	<1.0	<1.0	<1.0
1,1-Dichloroethane		**2.2**	**60**	**4.3**	**9.7**
1,1-Dichloroethene		<1.0	<1.0	<1.0	<1.0
1,2,4-Trichlorobenzene		<1.0	<1.0	<1.0	<1.0
1,2-Dibromo-3-chloropropane		<1.0	<1.0	<1.0	<1.0
1,2-Dibromoethane		<1.0	<1.0	<1.0	<1.0
1,2-Dichlorobenzene		<1.0	<1.0	<1.0	<1.0
1,2-Dichloroethane		<1.0	**0.49 J**	<1.0	<1.0
1,2-Dichloropropane		<1.0	<1.0	<1.0	<1.0
1,3-Dichlorobenzene		<1.0	<1.0	<1.0	<1.0
1,4-Dichlorobenzene		<1.0	<1.0	<1.0	<1.0
2-Butanone		<10	<10	<10	<10
2-Hexanone		<5.0	<5.0	<5.0	<5.0
4-Methyl-2-pentanone		<5.0	<5.0	<5.0	<5.0
Acetone		<10	<10	<10	<10
Benzene		<1.0	**2.1**	<1.0	<1.0
Bromodichloromethane		<1.0	<1.0	<1.0	<1.0
Bromoform		<1.0	<1.0	<1.0	<1.0
Bromomethane		<1.0	<1.0	<1.0	<1.0
Carbon Disulfide		<1.0	<1.0	<1.0	<1.0
Carbon Tetrachloride		<1.0	<1.0	<1.0	<1.0
Chlorobenzene		<1.0	**29**	<1.0	<1.0
Chloroethane		<1.0	**11**	**1.0**	**3.5**
Chloroform		**0.88 J**	<1.0	<1.0 B	**0.56 J**
Chloromethane		<1.0	<1.0	<1.0	<1.0
cis-1,2-Dichloroethene		**2.7**	**29**	**1.8**	**5.2**
cis-1,3-Dichloropropene		<1.0	<1.0	<1.0	<1.0
Cyclohexane		<1.0	<1.0	<1.0	<1.0
Dibromochloromethane		<1.0	<1.0	<1.0	<1.0
Dichlorodifluoromethane		**0.89 J**	<1.0	**1.8**	**1.8**
Ethylbenzene		<1.0	<1.0	<1.0	<1.0
Isopropylbenzene		<1.0	<1.0	<1.0	<1.0
Methyl acetate		<1.0	<1.0	<1.0	<1.0
Methyl tert-butyl ether		<1.0	<1.0	<1.0	<1.0
Methylcyclohexane		<1.0	<1.0	<1.0	<1.0
Methylene Chloride		<1.0	**0.47 J**	<1.0	<1.0
Styrene		<1.0	<1.0	<1.0	<1.0
Tetrachloroethene		<1.0	<1.0	<1.0	<1.0
Toluene		<1.0	<1.0	<1.0	<1.0
trans-1,2-Dichloroethene		<1.0	<1.0	<1.0	<1.0
trans-1,3-Dichloropropene		<1.0	<1.0	<1.0	<1.0
Trichloroethene		**10**	**19**	**9.6**	**15**
Trichlorofluoromethane		<1.0	<1.0	<1.0	<1.0
Vinyl Chloride		<1.0	**6.4**	<1.0	<1.0
Xylenes (total)		<2.0	<2.0	<2.0	<2.0
Total VOCs		**21 J**	**160 J**	**24**	**42 J**

Notes and abbreviations on last page.

Table 2. Concentrations of Volatile Organic Compounds Detected in Groundwater, Operational Year 10, Colesville Landfill, Broome County, New York.

Constituents (units in ug/L)	Sample ID: / Date:	PW-5 9/27/2011	PW-5 9/19/2012	PW-7 9/27/2011	PW-7 9/19/2012
1,1,1-Trichloroethane		<5.0	<1.0	**2.3 J**	<1.0
1,1,2,2-Tetrachloroethane		<5.0	<1.0	<10	<1.0
1,1,2-trichloro-1,2,2-trifluoroethane		--	<1.0	--	<1.0
1,1,2-Trichloroethane		<5.0	<1.0	<10	**0.51 J**
1,1-Dichloroethane		<5.0	<1.0	**310**	**160 D**
1,1-Dichloroethene		<5.0	<1.0	**1.7 J**	**0.38 J**
1,2,4-Trichlorobenzene		<5.0	<1.0	<10	<1.0
1,2-Dibromo-3-chloropropane		<5.0	<1.0	<10	<1.0
1,2-Dibromoethane		<5.0	<1.0	<10	<1.0
1,2-Dichlorobenzene		<5.0	<1.0	<10	<1.0
1,2-Dichloroethane		<5.0	<1.0	<10	**1.1**
1,2-Dichloropropane		<5.0	<1.0	<10	<1.0
1,3-Dichlorobenzene		<5.0	<1.0	<10	<1.0
1,4-Dichlorobenzene		<5.0	<1.0	<10	<1.0
2-Butanone		--	<10	--	<10
2-Hexanone		--	<5.0	--	<5.0
4-Methyl-2-pentanone		--	<5.0	--	<5.0
Acetone		--	<10 B	--	<10
Benzene		<5.0	<1.0	**2.0 J**	**1.1**
Bromodichloromethane		<5.0	<1.0	<10	<1.0
Bromoform		<5.0	<1.0	<10	<1.0
Bromomethane		<5.0	<1.0	<10	<1.0
Carbon Disulfide		--	<1.0	--	<1.0
Carbon Tetrachloride		<5.0	<1.0	<10	<1.0
Chlorobenzene		<5.0	<1.0	**46**	**34**
Chloroethane		<5.0	<1.0	**110**	**71**
Chloroform		<5.0	<1.0	<10	<1.0
Chloromethane		<5.0	<1.0	<10	<1.0
cis-1,2-Dichloroethene		<5.0	<1.0	**120**	**75**
cis-1,3-Dichloropropene		<5.0	<1.0	<10	<1.0
Cyclohexane		--	<1.0	--	<1.0
Dibromochloromethane		<5.0	<1.0	<10	<1.0
Dichlorodifluoromethane		<5.0	<1.0	<10	<1.0
Ethylbenzene		<5.0	<1.0	<10	**13**
Isopropylbenzene		<5.0	<1.0	<10	**1.3**
Methyl acetate		--	<1.0	--	<1.0
Methyl tert-butyl ether		<5.0	<1.0	<10	<1.0
Methylcyclohexane		--	<1.0	--	<1.0
Methylene Chloride		<5.0	<1.0	<10 B	**0.68 J**
Styrene		<5.0	<1.0	<10	<1.0
Tetrachloroethene		<5.0	<1.0	**0.52 J**	**0.52 J**
Toluene		<5.0	<1.0	<10	<1.0
trans-1,2-Dichloroethene		<5.0	<1.0	<10	<1.0
trans-1,3-Dichloropropene		<5.0	<1.0	<10	<1.0
Trichloroethene		<5.0	<1.0	**18**	**11**
Trichlorofluoromethane		<5.0	<1.0	<10	<1.0
Vinyl Chloride		<5.0	<1.0	**31**	**44**
Xylenes (total)		--	<2.0	--	**0.87 J**
Total VOCs		ND	ND	**641 J**	**414 DJ**

Notes and abbreviations on last page.

Table 2. Concentrations of Volatile Organic Compounds Detected in Groundwater, Operational Year 10, Colesville Landfill, Broome County, New York.

Constituents (units in ug/L)	Sample ID: / Date:	PW-13 9/27/2011	PW-13 9/19/2012	W-5 12/7/2011	W-5 3/22/2012
1,1,1-Trichloroethane		<5.0	<1.0	<1.0	<1.0
1,1,2,2-Tetrachloroethane		<5.0	<1.0	<1.0	<1.0
1,1,2-trichloro-1,2,2-trifluoroethane		--	<1.0	<1.0	<1.0
1,1,2-Trichloroethane		<5.0	<1.0	<1.0	<1.0
1,1-Dichloroethane		**3.0 J**	**3.5**	**40**	**35**
1,1-Dichloroethene		<5.0	<1.0	<1.0	<1.0
1,2,4-Trichlorobenzene		<5.0	<1.0	<1.0	<1.0
1,2-Dibromo-3-chloropropane		<5.0	<1.0	<1.0	<1.0
1,2-Dibromoethane		<5.0	<1.0	<1.0	<1.0
1,2-Dichlorobenzene		<5.0	<1.0	<1.0	<1.0
1,2-Dichloroethane		<5.0	**1.1**	<1.0	<1.0
1,2-Dichloropropane		<5.0	<1.0	<1.0	**0.73 J**
1,3-Dichlorobenzene		<5.0	<1.0	<1.0	<1.0
1,4-Dichlorobenzene		<5.0	<1.0	<1.0	<1.0
2-Butanone		--	<10	<10	**1.3 J**
2-Hexanone		--	<5.0	<5.0	<5.0
4-Methyl-2-pentanone		--	<5.0	<5.0	<5.0
Acetone		--	<10	<10	**7.5 J**
Benzene		<5.0	<1.0	**3.8**	**4.7**
Bromodichloromethane		<5.0	<1.0	<1.0	<1.0
Bromoform		<5.0	<1.0	<1.0	<1.0
Bromomethane		<5.0	<1.0	<1.0	<1.0
Carbon Disulfide		--	<1.0	<1.0	<1.0
Carbon Tetrachloride		<5.0	<1.0	<1.0	<1.0
Chlorobenzene		**3.3 J**	**8.2**	**5.7**	**9.8**
Chloroethane		**3.9 J**	**9.6**	**44**	**62**
Chloroform		<5.0	<1.0	<1.0	<1.0
Chloromethane		<5.0	<1.0	<1.0	<1.0
cis-1,2-Dichloroethene		<5.0	**1.1**	**5.5**	**3.3**
cis-1,3-Dichloropropene		<5.0	<1.0	<1.0	<1.0
Cyclohexane		--	<1.0	<1.0	<1.0
Dibromochloromethane		<5.0	<1.0	<1.0	<1.0
Dichlorodifluoromethane		<5.0	<1.0	<1.0	<1.0
Ethylbenzene		<5.0	<1.0	**0.85 J**	**1.2**
Isopropylbenzene		<5.0	<1.0	<1.0	<1.0
Methyl acetate		--	<1.0	<1.0	<1.0
Methyl tert-butyl ether		<5.0	<1.0	<1.0	<1.0
Methylcyclohexane		--	<1.0	<1.0	<1.0
Methylene Chloride		<5.0	<1.0	**1.6**	**1.6**
Styrene		<5.0	<1.0	<1.0	<1.0
Tetrachloroethene		<5.0	<1.0	<1.0	<1.0
Toluene		<5.0	<1.0	**0.82 J**	**0.68 J**
trans-1,2-Dichloroethene		<5.0	<1.0	<1.0	<1.0
trans-1,3-Dichloropropene		<5.0	<1.0	<1.0	<1.0
Trichloroethene		**1.4 J**	**1.4**	**4.9**	**1.7**
Trichlorofluoromethane		<5.0	<1.0	<1.0	<1.0
Vinyl Chloride		<5.0	<1.0	<1.0	**1.3**
Xylenes (total)		--	<2.0	**3.1**	**3.7**
Total VOCs		**12 J**	**25**	**110 J**	**135 J**

Notes and abbreviations on last page.

Table 2. Concentrations of Volatile Organic Compounds Detected in Groundwater, Operational Year 10, Colesville Landfill, Broome County, New York.

Constituents (units in ug/L)	Sample ID: / Date:	W-5 6/21/2012	W-5 9/19/2012	W-6 9/27/2011	W-6 9/19/2012
1,1,1-Trichloroethane		<1.0	<1.0	<5.0	<1.0
1,1,2,2-Tetrachloroethane		<1.0	<1.0	<5.0	<1.0
1,1,2-trichloro-1,2,2-trifluoroethane		<1.0	<1.0	--	<1.0
1,1,2-Trichloroethane		<1.0	<1.0	<5.0	<1.0
1,1-Dichloroethane		**31**	**30**	**14**	**17**
1,1-Dichloroethene		<1.0	<1.0	<5.0	<1.0
1,2,4-Trichlorobenzene		<1.0	<1.0	<5.0	<1.0
1,2-Dibromo-3-chloropropane		<1.0	<1.0	<5.0	<1.0
1,2-Dibromoethane		<1.0	<1.0	<5.0	<1.0
1,2-Dichlorobenzene		<1.0	<1.0	<5.0	<1.0
1,2-Dichloroethane		<1.0	<1.0	<5.0	**0.56 J**
1,2-Dichloropropane		<1.0	<1.0	<5.0	**1.1**
1,3-Dichlorobenzene		<1.0	<1.0	<5.0	<1.0
1,4-Dichlorobenzene		<1.0	<1.0	<5.0	<1.0
2-Butanone		<10	<10	--	<10
2-Hexanone		<5.0	<5.0	--	<5.0
4-Methyl-2-pentanone		<5.0	<5.0	--	<5.0
Acetone		<10	<10	--	<10
Benzene		**4.0**	**5.1**	**1.0 J**	**1.6**
Bromodichloromethane		<1.0	<1.0	<5.0	<1.0
Bromoform		<1.0	<1.0	<5.0	<1.0
Bromomethane		<1.0	<1.0	<5.0	<1.0
Carbon Disulfide		<1.0	<1.0	--	<1.0
Carbon Tetrachloride		<1.0	<1.0	<5.0	<1.0
Chlorobenzene		**6.8**	**6.2**	**4.6 J**	**7.0**
Chloroethane		**58**	**89 D**	**2.0 J**	**5.6**
Chloroform		<1.0	<1.0	<5.0	<1.0
Chloromethane		<1.0	<1.0	<5.0	<1.0
cis-1,2-Dichloroethene		**2.1**	**1.8**	**6.1**	**5.9**
cis-1,3-Dichloropropene		<1.0	<1.0	<5.0	<1.0
Cyclohexane		<1.0	**5.0**	--	<1.0
Dibromochloromethane		<1.0	<1.0	<5.0	<1.0
Dichlorodifluoromethane		<1.0	<1.0	<5.0	**2.5**
Ethylbenzene		**0.95 J**	**0.82 J**	<5.0	<1.0
Isopropylbenzene		<1.0	<1.0	<5.0	<1.0
Methyl acetate		<1.0	<1.0	--	<1.0
Methyl tert-butyl ether		<1.0	<1.0	<5.0	<1.0
Methylcyclohexane		<1.0	<1.0	--	<1.0
Methylene Chloride		**1.2**	**1.2**	<5.0	<1.0
Styrene		<1.0	<1.0	<5.0	<1.0
Tetrachloroethene		<1.0	<1.0	<5.0	<1.0
Toluene		**0.54 J**	**0.64 J**	<5.0	<1.0
trans-1,2-Dichloroethene		<1.0	<1.0	<5.0	<1.0
trans-1,3-Dichloropropene		<1.0	<1.0	<5.0	<1.0
Trichloroethene		**0.88 J**	**0.77 J**	**5.4**	**6.2**
Trichlorofluoromethane		<1.0	<1.0	<5.0	<1.0
Vinyl Chloride		<1.0	<1.0	<5.0	**2.1**
Xylenes (total)		**2.9**	**2.2**	--	<2.0
Total VOCs		**108 J**	**143 DJ**	**33 J**	**50 J**

Notes and abbreviations on last page.

Table 2. Concentrations of Volatile Organic Compounds Detected in Groundwater, Operational Year 10, Colesville Landfill, Broome County, New York.

Constituents (units in ug/L)	Sample ID: / Date:	W-7 9/27/2011	W-7 9/19/2012	W-13 9/27/2011	W-13 9/19/2012
1,1,1-Trichloroethane		<5.0	<1.0	<5.0	<1.0
1,1,2,2-Tetrachloroethane		<5.0	<1.0	<5.0	<1.0
1,1,2-trichloro-1,2,2-trifluoroethane		--	<1.0	--	<1.0
1,1,2-Trichloroethane		<5.0	<1.0	<5.0	<1.0
1,1-Dichloroethane		**3.5 J**	**1.9**	<5.0	<1.0
1,1-Dichloroethene		<5.0	<1.0	<5.0	<1.0
1,2,4-Trichlorobenzene		<5.0	<1.0	<5.0	<1.0
1,2-Dibromo-3-chloropropane		<5.0	<1.0	<5.0	<1.0
1,2-Dibromoethane		<5.0	<1.0	<5.0	<1.0
1,2-Dichlorobenzene		<5.0	<1.0	<5.0	<1.0
1,2-Dichloroethane		<5.0	<1.0	<5.0	<1.0
1,2-Dichloropropane		<5.0	<1.0	<5.0	<1.0
1,3-Dichlorobenzene		<5.0	<1.0	<5.0	<1.0
1,4-Dichlorobenzene		<5.0	<1.0	<5.0	<1.0
2-Butanone		--	<10	--	<10
2-Hexanone		--	<5.0	--	<5.0
4-Methyl-2-pentanone		--	<5.0	--	<5.0
Acetone		--	<10	--	<10
Benzene		<5.0	**0.48 J**	<5.0	<1.0
Bromodichloromethane		<5.0	<1.0	<5.0	<1.0
Bromoform		<5.0	<1.0	<5.0	<1.0
Bromomethane		<5.0	<1.0	<5.0	<1.0
Carbon Disulfide		--	<1.0	--	<1.0
Carbon Tetrachloride		<5.0	<1.0	<5.0	<1.0
Chlorobenzene		**2.6 J**	**1.9**	<5.0	<1.0
Chloroethane		<5.0	**4.9**	<5.0	<1.0
Chloroform		<5.0	<1.0	<5.0	<1.0
Chloromethane		<5.0	<1.0	<5.0	<1.0
cis-1,2-Dichloroethene		<5.0	<1.0	<5.0	<1.0
cis-1,3-Dichloropropene		<5.0	<1.0	<5.0	<1.0
Cyclohexane		--	<1.0	--	**0.24 J**
Dibromochloromethane		<5.0	<1.0	<5.0	<1.0
Dichlorodifluoromethane		<5.0	<1.0	<5.0	<1.0
Ethylbenzene		<5.0	<1.0	<5.0	<1.0
Isopropylbenzene		<5.0	<1.0	<5.0	<1.0
Methyl acetate		--	<1.0	--	<1.0
Methyl tert-butyl ether		<5.0	<1.0	<5.0	<1.0
Methylcyclohexane		--	<1.0	--	<1.0
Methylene Chloride		<5.0	<1.0	<5.0	<1.0
Styrene		<5.0	<1.0	<5.0	<1.0
Tetrachloroethene		<5.0	<1.0	<5.0	<1.0
Toluene		<5.0	<1.0	<5.0	<1.0
trans-1,2-Dichloroethene		<5.0	<1.0	<5.0	<1.0
trans-1,3-Dichloropropene		<5.0	<1.0	<5.0	<1.0
Trichloroethene		**0.90 J**	**0.85 J**	<5.0	<1.0
Trichlorofluoromethane		<5.0	<1.0	<5.0	<1.0
Vinyl Chloride		<5.0	<1.0	<5.0	<1.0
Xylenes (total)		--	<2.0	--	<2.0
Total VOCs		**7 J**	**10 J**	ND	**0.24 J**

Notes and abbreviations on last page.

Table 2. Concentrations of Volatile Organic Compounds Detected in Groundwater, Operational Year 10, Colesville Landfill, Broome County, New York.

Constituents (units in ug/L)	Sample ID: / Date:	W-14S 9/27/2011	W-14S 9/18/2012	W-16S 9/27/2011	W-16S 9/18/2012
1,1,1-Trichloroethane		<5.0	<1.0	<5.0	<1.0
1,1,2,2-Tetrachloroethane		<5.0	<1.0	<5.0	<1.0
1,1,2-trichloro-1,2,2-trifluoroethane		--	<1.0	--	<1.0
1,1,2-Trichloroethane		<5.0	<1.0	<5.0	<1.0
1,1-Dichloroethane		<5.0	<1.0	**16**	**13**
1,1-Dichloroethene		<5.0	<1.0	<5.0	<1.0
1,2,4-Trichlorobenzene		<5.0	<1.0	<5.0	<1.0
1,2-Dibromo-3-chloropropane		<5.0	<1.0	<5.0	<1.0
1,2-Dibromoethane		<5.0	<1.0	<5.0	<1.0
1,2-Dichlorobenzene		<5.0	<1.0	<5.0	<1.0
1,2-Dichloroethane		<5.0	<1.0	<5.0	<1.0
1,2-Dichloropropane		<5.0	<1.0	<5.0	<1.0
1,3-Dichlorobenzene		<5.0	<1.0	<5.0	<1.0
1,4-Dichlorobenzene		<5.0	<1.0	<5.0	<1.0
2-Butanone		--	<10	--	<10
2-Hexanone		--	<5.0	--	<5.0
4-Methyl-2-pentanone		--	<5.0	--	<5.0
Acetone		--	<10	--	<10
Benzene		<5.0	<1.0	**2.0 J**	**1.7**
Bromodichloromethane		<5.0	<1.0	<5.0	<1.0
Bromoform		<5.0	<1.0	<5.0	<1.0
Bromomethane		<5.0	<1.0	<5.0	<1.0
Carbon Disulfide		--	<1.0	--	<1.0
Carbon Tetrachloride		<5.0	<1.0	<5.0	<1.0
Chlorobenzene		<5.0	<1.0	**18**	**18**
Chloroethane		<5.0	<1.0	**5.1**	**9.5**
Chloroform		<5.0	<1.0	<5.0	<1.0
Chloromethane		<5.0	<1.0	<5.0	<1.0
cis-1,2-Dichloroethene		<5.0	<1.0	**1.2 J**	**1.3**
cis-1,3-Dichloropropene		<5.0	<1.0	<5.0	<1.0
Cyclohexane		--	<1.0	--	<1.0
Dibromochloromethane		<5.0	<1.0	<5.0	<1.0
Dichlorodifluoromethane		<5.0	<1.0	<5.0	<1.0
Ethylbenzene		<5.0	<1.0	<5.0	<1.0
Isopropylbenzene		<5.0	<1.0	<5.0	<1.0
Methyl acetate		--	<1.0	--	<1.0
Methyl tert-butyl ether		<5.0	<1.0	<5.0	<1.0
Methylcyclohexane		--	<1.0	--	<1.0
Methylene Chloride		<5.0	<1.0	<5.0	<1.0
Styrene		<5.0	<1.0	<5.0	<1.0
Tetrachloroethene		<5.0	<1.0	<5.0	<1.0
Toluene		<5.0	<1.0	<5.0	<1.0
trans-1,2-Dichloroethene		<5.0	<1.0	<5.0	<1.0
trans-1,3-Dichloropropene		<5.0	<1.0	<5.0	<1.0
Trichloroethene		<5.0	<1.0	**2.4 J**	**2.7**
Trichlorofluoromethane		<5.0	<1.0	<5.0	<1.0
Vinyl Chloride		<5.0	<1.0	<5.0	<1.0
Xylenes (total)		--	<2.0	--	<2.0
Total VOCs		ND	ND	**45 J**	**46**

Notes and abbreviations on last page.

Table 2. Concentrations of Volatile Organic Compounds Detected in Groundwater, Operational Year 10, Colesville Landfill, Broome County, New York.

Constituents (units in ug/L)	Sample ID: / Date:	W-17S 9/27/2011	W-17S 9/18/2012	W-18 9/27/2011	W-18 9/18/2012
1,1,1-Trichloroethane		<5.0	<1.0	**3.5 J**	**8.2**
1,1,2,2-Tetrachloroethane		<5.0	<1.0	<5.0	<1.0
1,1,2-trichloro-1,2,2-trifluoroethane		--	<1.0	--	**0.34 J**
1,1,2-Trichloroethane		<5.0	<1.0	<5.0	<1.0
1,1-Dichloroethane		<5.0	<1.0	**4.4 J**	**18**
1,1-Dichloroethene		<5.0	<1.0	<5.0	<1.0
1,2,4-Trichlorobenzene		<5.0	<1.0	<5.0	<1.0
1,2-Dibromo-3-chloropropane		<5.0	<1.0	<5.0	<1.0
1,2-Dibromoethane		<5.0	<1.0	<5.0	<1.0
1,2-Dichlorobenzene		<5.0	<1.0	<5.0	<1.0
1,2-Dichloroethane		<5.0	<1.0	<5.0	<1.0
1,2-Dichloropropane		<5.0	<1.0	<5.0	<1.0
1,3-Dichlorobenzene		<5.0	<1.0	<5.0	<1.0
1,4-Dichlorobenzene		<5.0	<1.0	<5.0	<1.0
2-Butanone		--	<10	--	<10
2-Hexanone		--	<5.0	--	<5.0
4-Methyl-2-pentanone		--	<5.0	--	<5.0
Acetone		--	<10	--	<10
Benzene		<5.0	<1.0	<5.0	<1.0
Bromodichloromethane		<5.0	<1.0	<5.0	<1.0
Bromoform		<5.0	<1.0	<5.0	<1.0
Bromomethane		<5.0	<1.0	<5.0	<1.0
Carbon Disulfide		--	<1.0	--	<1.0
Carbon Tetrachloride		<5.0	<1.0	<5.0	<1.0
Chlorobenzene		<5.0	<1.0	<5.0	<1.0
Chloroethane		<5.0	<1.0	<5.0	**1.8**
Chloroform		<5.0	<1.0	<5.0	**0.49 J**
Chloromethane		<5.0	<1.0	<5.0	<1.0
cis-1,2-Dichloroethene		<5.0	<1.0	**5.0**	**16**
cis-1,3-Dichloropropene		<5.0	<1.0	<5.0	<1.0
Cyclohexane		--	<1.0	--	<1.0
Dibromochloromethane		<5.0	<1.0	<5.0	<1.0
Dichlorodifluoromethane		<5.0	<1.0	<5.0	<1.0
Ethylbenzene		<5.0	<1.0	<5.0	<1.0
Isopropylbenzene		<5.0	<1.0	<5.0	<1.0
Methyl acetate		--	<1.0	--	<1.0
Methyl tert-butyl ether		<5.0	<1.0	<5.0	<1.0
Methylcyclohexane		--	<1.0	--	<1.0
Methylene Chloride		<5.0	<1.0	<5.0	<1.0
Styrene		<5.0	<1.0	<5.0	<1.0
Tetrachloroethene		<5.0	<1.0	<5.0	<1.0
Toluene		<5.0	<1.0	<5.0	<1.0
trans-1,2-Dichloroethene		<5.0	<1.0	<5.0	<1.0
trans-1,3-Dichloropropene		<5.0	<1.0	<5.0	<1.0
Trichloroethene		<5.0	<1.0	**9.1**	**19**
Trichlorofluoromethane		<5.0	<1.0	<5.0	<1.0
Vinyl Chloride		<5.0	<1.0	<5.0	<1.0
Xylenes (total)		--	<2.0	--	<2.0
Total VOCs		ND	ND	**22 J**	**64 J**

Notes and abbreviations on last page.

Table 2. Concentrations of Volatile Organic Compounds Detected in Groundwater, Operational Year 10, Colesville Landfill, Broome County, New York.

Constituents (units in ug/L)	Sample ID: / Date:	W-20S 9/27/2011	W-20S 9/18/2012	TW-1 12/7/2011	TW-1 3/22/2012
1,1,1-Trichloroethane		<5.0	<1.0	<1.0	<1.0
1,1,2,2-Tetrachloroethane		<5.0	<1.0	<1.0	<1.0
1,1,2-trichloro-1,2,2-trifluoroethane		--	<1.0	<1.0	<1.0
1,1,2-Trichloroethane		<5.0	<1.0	<1.0	<1.0
1,1-Dichloroethane		<5.0	<1.0	**5.8**	**2.4**
1,1-Dichloroethene		<5.0	<1.0	<1.0	<1.0
1,2,4-Trichlorobenzene		<5.0	<1.0	<1.0	<1.0
1,2-Dibromo-3-chloropropane		<5.0	<1.0	<1.0	<1.0
1,2-Dibromoethane		<5.0	<1.0	<1.0	<1.0
1,2-Dichlorobenzene		<5.0	<1.0	<1.0	<1.0
1,2-Dichloroethane		<5.0	<1.0	<1.0	<1.0
1,2-Dichloropropane		<5.0	<1.0	<1.0	<1.0
1,3-Dichlorobenzene		<5.0	<1.0	<1.0	<1.0
1,4-Dichlorobenzene		<5.0	<1.0	<1.0	<1.0
2-Butanone		--	<10	**7.2 J**	<10
2-Hexanone		--	<5.0	<5.0	<5.0
4-Methyl-2-pentanone		--	<5.0	<5.0	<5.0
Acetone		--	<10	<10	<10
Benzene		<5.0	<1.0	**3.4**	**3.5**
Bromodichloromethane		<5.0	<1.0	<1.0	<1.0
Bromoform		<5.0	<1.0	<1.0	<1.0
Bromomethane		<5.0	<1.0	<1.0	<1.0
Carbon Disulfide		--	<1.0	<1.0	<1.0
Carbon Tetrachloride		<5.0	<1.0	<1.0	<1.0
Chlorobenzene		<5.0	<1.0	**4.4**	**7.3**
Chloroethane		<5.0	<1.0	**51**	**88**
Chloroform		<5.0	<1.0	<1.0	<1.0
Chloromethane		<5.0	<1.0	<1.0	**0.41 J**
cis-1,2-Dichloroethene		<5.0	<1.0	**1.4**	**2.5**
cis-1,3-Dichloropropene		<5.0	<1.0	<1.0	<1.0
Cyclohexane		--	<1.0	<1.0	<1.0
Dibromochloromethane		<5.0	<1.0	<1.0	<1.0
Dichlorodifluoromethane		<5.0	<1.0	<1.0	<1.0
Ethylbenzene		<5.0	<1.0	<1.0	<1.0
Isopropylbenzene		<5.0	<1.0	<1.0	<1.0
Methyl acetate		--	<1.0	<1.0	<1.0
Methyl tert-butyl ether		<5.0	<1.0	<1.0	<1.0
Methylcyclohexane		--	<1.0	<1.0	<1.0
Methylene Chloride		<5.0	<1.0	<1.0	**1.0**
Styrene		<5.0	<1.0	<1.0	<1.0
Tetrachloroethene		<5.0	<1.0	<1.0	<1.0
Toluene		<5.0	<1.0	**73**	**1.0**
trans-1,2-Dichloroethene		<5.0	<1.0	<1.0	<1.0
trans-1,3-Dichloropropene		<5.0	<1.0	<1.0	<1.0
Trichloroethene		<5.0	<1.0	<1.0	**1.2**
Trichlorofluoromethane		<5.0	<1.0	<1.0	<1.0
Vinyl Chloride		<5.0	<1.0	<1.0	**1.7**
Xylenes (total)		--	<2.0	**0.86 J**	**0.76 J**
Total VOCs		ND	ND	**147 J**	**110 J**

Notes and abbreviations on last page.

Table 2. Concentrations of Volatile Organic Compounds Detected in Groundwater, Operational Year 10, Colesville Landfill, Broome County, New York.

Constituents (units in ug/L)	Sample ID: / Date:	TW-1 7/10/2012	TW-1 9/20/2012
1,1,1-Trichloroethane		<1.0	<1.0
1,1,2,2-Tetrachloroethane		<1.0	<1.0
1,1,2-trichloro-1,2,2-trifluoroethane		<1.0	<1.0
1,1,2-Trichloroethane		<1.0	<1.0
1,1-Dichloroethane		**0.68 J**	<1.0
1,1-Dichloroethene		<1.0	<1.0
1,2,4-Trichlorobenzene		<1.0	<1.0
1,2-Dibromo-3-chloropropane		<1.0	<1.0
1,2-Dibromoethane		<1.0	<1.0
1,2-Dichlorobenzene		<1.0	<1.0
1,2-Dichloroethane		<1.0	<1.0
1,2-Dichloropropane		<1.0	<1.0
1,3-Dichlorobenzene		<1.0	<1.0
1,4-Dichlorobenzene		<1.0	<1.0
2-Butanone		**7.8 J**	**2.9 J**
2-Hexanone		<5.0	<5.0
4-Methyl-2-pentanone		<5.0	<5.0
Acetone		**8.7 J**	<10
Benzene		**2.6**	**2.2**
Bromodichloromethane		<1.0	<1.0
Bromoform		<1.0	<1.0
Bromomethane		<1.0	<1.0
Carbon Disulfide		<1.0	<1.0
Carbon Tetrachloride		<1.0	<1.0
Chlorobenzene		**6.8**	**7.7**
Chloroethane		**85**	**100 D**
Chloroform		<1.0	<1.0
Chloromethane		<1.0	<1.0
cis-1,2-Dichloroethene		**1.6**	**1.8**
cis-1,3-Dichloropropene		<1.0	<1.0
Cyclohexane		<1.0	**7.7**
Dibromochloromethane		<1.0	<1.0
Dichlorodifluoromethane		<1.0	<1.0
Ethylbenzene		<1.0	<1.0
Isopropylbenzene		<1.0	<1.0
Methyl acetate		<1.0	<1.0
Methyl tert-butyl ether		<1.0	<1.0
Methylcyclohexane		<1.0	<1.0
Methylene Chloride		<1.0	<1.0
Styrene		<1.0	<1.0
Tetrachloroethene		<1.0	<1.0
Toluene		**150 D**	**6.1**
trans-1,2-Dichloroethene		<1.0	<1.0
trans-1,3-Dichloropropene		<1.0	<1.0
Trichloroethene		**0.50 J**	**1.4**
Trichlorofluoromethane		<1.0	<1.0
Vinyl Chloride		**0.91 J**	**1.6**
Xylenes (total)		**0.83 J**	<2.0
Total VOCs		**265 DJ**	**131 DJ**

Notes and abbreviations on last page.

Table 2. Concentrations of Volatile Organic Compounds Detected in Groundwater, Operational Year 10, Colesville Landfill, Broome County, New York.

Notes and Abbreviations:

1. Results for GMMW-2 and PW-4 are not typical for each respective well and it is believed that they may have been inadvertently switched by the laboratory.

Bold constituent detected above method detection limit.

B	Compound considered non-detect at the listed value due to associated blank contamination.
D	Concentration is based on a diluted sample analysis.
J	Estimated value.
ND	Not detected.
ug/L	Micrograms per liter.
VOCs	Volatile organic compounds.
--	Not analyzed.
<	Analyte below detection limit.

Table 3. Concentrations of General Chemistry, Field Parameters, and Dissolved Gases Detected in Groundwater, Operational Year 10, Colesville Landfill, Broome County, New York.

Parameters	Sample ID: / Date:	Units	GMMW-2 12/7/2011	GMMW-2 3/22/2012	GMMW-2 6/21/2012	GMMW-2 9/19/2012	GMMW-5 12/7/2011	GMMW-5 12/22/2011	GMMW-5 3/22/2012	GMMW-5 5/3/2012	GMMW-5 7/10/2012
Total Organic Carbon		mg/L	**1.1**	**1.5**	**1.1**	<1.0	--	**39.4**	--	**20.7**	**19.4**
FIELD PARAMETERS											
pH		Standard units	**6.25**	**6.52**	--	**6.36**	**6.35**	**8.0**	**6.45**	--	--
Specific Conductance		mmhos/cm	**0.532**	**0.643**	--	**0.560**	**1.360**	--	**0.800**	--	--
Temperature		deg C	**9.4**	**12.67**	--	**11.8**	**9.7**	--	**13.0**	--	--
DISSOLVED GASES											
Ethane		ng/L	**1,100**	**740**	**850**	**910**	**2,600**	--	**14,000**	--	**14,000**
Ethene		ng/L	**4,600**	**4,600**	**4,200**	**3,600**	**100**	--	**56**	--	**33**
Methane		ug/L	**13,000**	**12,000**	**12,000**	**14,000**	**22,000**	--	**21,000**	--	**20,000**

Notes and Abbreviations:

Bold constituent detected above method detection limit.

deg C	Degrees Celsius.
J	Estimated value.
mg/L	Milligrams per liter.
mmhos/cm	Millimhos per centimeter.
mV	Millivolts.
ng/L	Nanograms per liter.
ug/L	Micrograms per liter.
--	Not analyzed or collected.

Table 3. Concentrations of General Chemistry, Field Parameters, and Dissolved Gases Detected in Groundwater, Operational Year 10, Colesville Landfill, Broome County, New York.

Parameters	Sample ID: / Date:	Units	GMMW-5 9/20/2012	GMMW-6 12/7/2011	GMMW-6 3/22/2012	GMMW-6 6/21/2012	GMMW-6 9/19/2012	GMMW-7 12/8/2011	GMMW-7 9/19/2012	PW-3 9/27/2011	PW-3 9/19/2012
Total Organic Carbon		mg/L	**19.2**	**7.9**	**4.1**	<1.0	**2.6**	<1.0	<1.0	--	--
FIELD PARAMETERS											
pH		Standard units	**6.54**	**6.47**	**6.66**	--	**6.63**	**6.75**	**6.64**	**6.11**	**6.26**
Specific Conductance		mmhos/cm	**0.710**	**1.063**	**0.976**	--	**0.930**	**0.239**	**0.280**	**0.454**	**0.570**
Temperature		deg C	**14.2**	**9.4**	**12.2**	--	**12.0**	**9.7**	**14.7**	**17.4**	**15.1**
DISSOLVED GASES											
Ethane		ng/L	**8,900**	**11,000**	**15,000**	**620**	**7,800**	--	**1,100**	--	--
Ethene		ng/L	**35**	**9,200**	**13,000**	**3,100**	**5,100**	--	**6,500**	--	--
Methane		ug/L	**18,000**	**15,000**	**5,700**	**19,000**	**13,000**	--	**770**	--	--

Notes and Abbreviations:

Bold constituent detected above method detection limit.

deg C	Degrees Celsius.
J	Estimated value.
mg/L	Milligrams per liter.
mmhos/cm	Millimhos per centimeter.
mV	Millivolts.
ng/L	Nanograms per liter.
ug/L	Micrograms per liter.
--	Not analyzed or collected.

Table 3. Concentrations of General Chemistry, Field Parameters, and Dissolved Gases Detected in Groundwater, Operational Year 10, Colesville Landfill, Broome County, New York.

Parameters	Sample ID: / Date:	PW-4 12/7/2011	PW-4 3/22/2012	PW-4 6/21/2012	PW-4 9/19/2012	PW-5 9/27/2011	PW-5 9/19/2012	PW-7 9/27/2011	PW-7 9/19/2012	PW-13 9/27/2011
	Units									
Total Organic Carbon	mg/L	**0.54 J**	**0.7 J**	<1.0	<1.0	<1.0	<1.0	--	--	--
FIELD PARAMETERS										
pH	Standard units	**5.54**	**5.90**	--	**7.01**	**7.05**	**7.83**	**6.13**	**6.12**	**5.89**
Specific Conductance	mmhos/cm	**1.103**	**1.098**	--	**0.330**	**0.276**	**0.290**	**0.345**	**0.360**	**0.323**
Temperature	deg C	**11.1**	**11.97**	--	**17.2**	**13.4**	**17.5**	**11.9**	**14.3**	**12.2**
DISSOLVED GASES										
Ethane	ng/L	**6.2 J**	**12 J**	**140**	**11 J**	**5.3 J**	**9 J**	--	--	--
Ethene	ng/L	**75**	**24 J**	**38**	**27**	**24 J**	**24 J**	--	--	--
Methane	ug/L	**0.083 J**	**2.6**	**3.4**	**0.13**	**1.6**	**1.7**	--	--	--

Notes and Abbreviations:

Bold constituent detected above method detection limit.

deg C	Degrees Celsius.
J	Estimated value.
mg/L	Milligrams per liter.
mmhos/cm	Millimhos per centimeter.
mV	Millivolts.
ng/L	Nanograms per liter.
ug/L	Micrograms per liter.
--	Not analyzed or collected.

Table 3. Concentrations of General Chemistry, Field Parameters, and Dissolved Gases Detected in Groundwater, Operational Year 10, Colesville Landfill, Broome County, New York.

Parameters	Sample ID: / Date:	PW-13 9/19/2012	W-5 12/7/2011	W-5 3/22/2012	W-5 6/21/2012	W-5 7/10/2012	W-5 9/19/2012	W-6 9/27/2011	W-6 9/19/2012	W-7 9/27/2011
	Units									
Total Organic Carbon	mg/L	--	**7.0**	**5.8**	<1.0	NA	**1.4**	--	--	--
FIELD PARAMETERS										
pH	Standard units	**6.01**	**6.32**	**6.43**	--	--	**6.49**	**5.77**	**6.05**	**5.55**
Specific Conductance	mmhos/cm	**0.430**	**0.958**	**0.934**	--	--	**0.990**	**0.344**	**0.500**	**0.179**
Temperature	deg C	**14.5**	**9.6**	**12.41**	--	--	**11.8**	**11.8**	**13.6**	**11.7**
DISSOLVED GASES										
Ethane	ng/L	--	**2,100**	**9,700**	--	**12,000**	**11,000**	--	--	--
Ethene	ng/L	--	**3,500**	**1,500**	--	**1,600**	**650**	--	--	--
Methane	ug/L	--	**17,000**	**15,000**	--	**8,400**	**8,400**	--	--	--

Notes and Abbreviations:

Bold constituent detected above method detection limit.

deg C	Degrees Celsius.
J	Estimated value.
mg/L	Milligrams per liter.
mmhos/cm	Millimhos per centimeter.
mV	Millivolts.
ng/L	Nanograms per liter.
ug/L	Micrograms per liter.
--	Not analyzed or collected.

Table 3. Concentrations of General Chemistry, Field Parameters, and Dissolved Gases Detected in Groundwater, Operational Year 10, Colesville Landfill, Broome County, New York.

Parameters	Sample ID: / Date:	Units	W-7 9/19/2012	W-13 9/27/2011	W-13 9/19/2012	W-14S 9/27/2011	W-14S 9/18/2012	W-16S 9/27/2011	W-16S 9/18/2012	W-17S 9/27/2011	W-17S 9/18/2012
Total Organic Carbon		mg/L	--	--	--	--	--	--	--	--	--
FIELD PARAMETERS											
pH		Standard units	**5.85**	**5.91**	**5.94**	**6.20**	**5.53**	**6.18**	**6.33**	**5.75**	**6.22**
Specific Conductance		mmhos/cm	**0.400**	**0.258**	**0.310**	**0.049**	**0.160**	**0.389**	**0.440**	**0.074**	**0.220**
Temperature		deg C	**12.5**	**12.0**	**14.1**	**16.8**	**16.3**	**14.5**	**15.2**	**16.9**	**16.1**
DISSOLVED GASES											
Ethane		ng/L	--	--	--	--	--	--	--	--	--
Ethene		ng/L	--	--	--	--	--	--	--	--	--
Methane		ug/L	--	--	--	--	--	--	--	--	--

Notes and Abbreviations:

Bold constituent detected above method detection limit.

deg C	Degrees Celsius.
J	Estimated value.
mg/L	Milligrams per liter.
mmhos/cm	Millimhos per centimeter.
mV	Millivolts.
ng/L	Nanograms per liter.
ug/L	Micrograms per liter.
--	Not analyzed or collected.

Table 3. Concentrations of General Chemistry, Field Parameters, and Dissolved Gases Detected in Groundwater, Operational Year 10, Colesville Landfill, Broome County, New York.

Parameters	Sample ID: / Date:	Units	W-18 9/27/2011	W-18 9/18/2012	W-20S 9/27/2011	W-20S 9/27/2011	W-20S 9/18/2012	TW-1 12/7/2011	TW-1 12/22/2011	TW-1 3/22/2012	TW-1 5/3/2012
Total Organic Carbon		mg/L	--	--	--	--	--	--	**95.2**	--	**347**
FIELD PARAMETERS											
pH		Standard units	**6.08**	**6.12**	**6.44**	**6.44**	**5.76**	**6.44**	**8.03**	--	--
Specific Conductance		mmhos/cm	**0.188**	**0.540**	**0.105**	**0.105**	**0.110**	**1.579**	--	--	--
Temperature		deg C	**17.0**	**17.1**	**15.4**	**15.4**	**15.1**	**9.1**	--	--	--
DISSOLVED GASES											
Ethane		ng/L	--	--	--	--	--	**2,000**	--	**5,800**	--
Ethene		ng/L	--	--	--	--	--	**280**	--	**550**	--
Methane		ug/L	--	--	--	--	--	**16,000**	--	**11,000**	--

Notes and Abbreviations:

Bold constituent detected above method detection limit.

deg C	Degrees Celsius.
J	Estimated value.
mg/L	Milligrams per liter.
mmhos/cm	Millimhos per centimeter.
mV	Millivolts.
ng/L	Nanograms per liter.
ug/L	Micrograms per liter.
--	Not analyzed or collected.

Table 3. Concentrations of General Chemistry, Field Parameters, and Dissolved Gases Detected in Groundwater, Operational Year 10, Colesville Landfill, Broome County, New York.

Parameters	Sample ID: / Date:	TW-1 6/21/2012	TW-1 7/10/2012	TW-1 9/20/2012	IW-03 3/16/2011	IW-03 6/15/2011	IW-03 4/27/2011	IW-03 9/27/2011	IW-08 9/27/2011	IW-3 12/22/2011
	Units									
Total Organic Carbon	mg/L	**209**	--	**14.8**	**31.7**	**23.6**	**54.2**	**969**	**693**	**60.4**
FIELD PARAMETERS										
pH	Standard units	--	--	**6.37**	**6.26**	**6.31**	**6.42**	**4.70**	**5.34**	**8.12**
Specific Conductance	mmhos/cm	--	--	**0.940**	**0.497**	--	--	--	--	--
Temperature	deg C	--	--	**14.4**	**9.67**	--	--	--	--	--
DISSOLVED GASES										
Ethane	ng/L	--	**730**	**4,900**	--	--	--	--	--	--
Ethene	ng/L	--	**180**	**700**	--	--	--	--	--	--
Methane	ug/L	--	**21,000**	**10,000**	--	--	--	--	--	--

Notes and Abbreviations:

Bold constituent detected above method detection limit.

deg C	Degrees Celsius.
J	Estimated value.
mg/L	Milligrams per liter.
mmhos/cm	Millimhos per centimeter.
mV	Millivolts.
ng/L	Nanograms per liter.
ug/L	Micrograms per liter.
--	Not analyzed or collected.

Table 3. Concentrations of General Chemistry, Field Parameters, and Dissolved Gases Detected in Groundwater, Operational Year 10, Colesville Landfill, Broome County, New York.

Parameters	Sample ID: / Date:	IW-3 5/3/2012	IW-3 7/10/2012	IW-3 9/20/2012	IW-8 12/22/2011	IW-8 5/3/2012	IW-8 7/10/2012	IW-8 9/20/2012	IW-13 12/22/2011	IW-13 5/3/2012
	Units									
Total Organic Carbon	mg/L	**1,410**	**11.6**	**7.8**	**168**	**2,660**	**1,370**	**328**	**52.9**	**819**
FIELD PARAMETERS										
pH	Standard units	--	--	**6.29**	**7.92**	--	--	**5.92**	**7.83**	--
Specific Conductance	mmhos/cm	--	--	**0.740**	--	--	--	**1.380**	--	--
Temperature	deg C	--	--	**14.4**	--	--	--	**16.6**	--	--
DISSOLVED GASES										
Ethane	ng/L	--	--	--	--	--	--	--	--	--
Ethene	ng/L	--	--	--	--	--	--	--	--	--
Methane	ug/L	--	--	--	--	--	--	--	--	--

Notes and Abbreviations:

Bold constituent detected above method detection limit.

deg C	Degrees Celsius.
J	Estimated value.
mg/L	Milligrams per liter.
mmhos/cm	Millimhos per centimeter.
mV	Millivolts.
ng/L	Nanograms per liter.
ug/L	Micrograms per liter.
--	Not analyzed or collected.

Table 3. Concentrations of General Chemistry, Field Parameters, and Dissolved Gases Detected in Groundwater, Operational Year 10, Colesville Landfill, Broome County, New York.

Parameters		Sample ID:	IW-13	IW-13
		Date:	7/10/2012	9/20/2012
	Units			
Total Organic Carbon	mg/L		**542**	**97.1**
FIELD PARAMETERS				
pH	Standard units		--	**6.16**
Specific Conductance	mmhos/cm		--	**1.030**
Temperature	deg C		--	**15.7**
DISSOLVED GASES				
Ethane	ng/L		--	--
Ethene	ng/L		--	--
Methane	ug/L		--	--

Notes and Abbreviations:

Bold constituent detected above method detection limit.

deg C	Degrees Celsius.
J	Estimated value.
mg/L	Milligrams per liter.
mmhos/cm	Millimhos per centimeter.
mV	Millivolts.
ng/L	Nanograms per liter.
ug/L	Micrograms per liter.
--	Not analyzed or collected.

Table 4. Concentrations of Volatile Organic Compounds and Selected Metals Detected in Aqueous Samples Collected from the Pump and Treat System, Operational Year 10, Colesville Landfill, Broome County, New York[1].

Constituents (units in ug/L)	Model Technology BPJ Limits[2,3]	Sample ID: Date:	GMPW-4 INF 09/28/11	GMPW-4 INF 01/19/12	GMPW-4 INF[6] 04/26/12	GMPW-4 INF 06/21/12	GMPW-5 INF 01/19/12	GMPW-5 INF[6] 04/26/12	GMPW-5 INF 06/21/12	COMBINED INF 09/28/11
1,1,1,2-Tetrachloroethane	NA		<5.0	--	--	--	--	--	--	<5.0
1,1,1-Trichloroethane	10-20		**2.7 J**	**6.5**	<1.0	**1.1**	<1.0	**2.5**	<1.0	<5.0
1,1,2,2-Tetrachloroethane	NA		<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0
1,1,2-trichloro-1,2,2-trifluoroethane	NA		--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	--
1,1,2-Trichloroethane	10		<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0
1,1-Dichloroethane	10		**40**	**46**	<1.0	**9.0**	<1.0	**30**	<1.0	**21**
1,1-Dichloroethene	10		<5.0	**0.54 J**	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0
1,1-Dichloropropene	NA		<5.0	--	--	--	--	--	--	--
1,2,3-Trichlorobenzene	NA		<5.0	--	--	--	--	--	--	--
1,2,3-Trichloropropane	NA		<5.0	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	NA		<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0
1,2,4-Trimethylbenzene	NA		<5.0	--	--	--	--	--	--	<5.0
1,2-Dibromo-3-chloropropane	NA		<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0
1,2-Dibromoethane	NA		<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0
1,2-Dichlorobenzene	NA		<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0
1,2-Dichloroethane	10-30		<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0
1,2-Dichloropropane	NA		<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0
1,3,5-Trimethylbenzene	NA		<5.0	--	--	--	--	--	--	--
1,3-Dichlorobenzene	NA		<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0
1,3-Dichloropropane	NA		<5.0	--	--	--	--	--	--	--
1,4-Dichlorobenzene	NA		<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0
2,2-Dichloropropane	NA		<5.0	--	--	--	--	--	--	--
2-Butanone	NA		--	<10	<10	<10	<10	<10	<10	--
2-Chlorotoluene	NA		<5.0	--	--	--	--	--	--	--
2-Hexanone	NA		--	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	--
4-Chlorotoluene	NA		<5.0	--	--	--	--	--	--	--
4-Methyl-2-pentanone	NA		--	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	--
Acetone	NA		--	<10	<10	<10	<10	<10	<10	--
Benzene	5		**2.0 J**	**2.8**	<1.0	**0.57 J**	<1.0	**1.6**	<1.0	**1.1 J**
Bromobenzene	NA		<5.0	--	--	--	--	--	--	--
Bromochloromethane	NA		<5.0	--	--	--	--	--	--	--
Bromodichloromethane	NA		<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0
Bromoform	NA		<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0
Bromomethane	NA		<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0
Carbon Disulfide	NA		--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	--
Carbon Tetrachloride	10		<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0
Chlorobenzene	NA		**6.2**	**14**	<1.0	**2.0**	<1.0	**6.3**	<1.0	**3.4 J**
Chloroethane	NA		**15**	**29**	<1.0	**4.2**	<1.0	**12**	<1.0	**7.4**
Chloroform	NA		<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0
Chloromethane	10		<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0
cis-1,2-Dichloroethene	10		**21**	**31**	<1.0	**4.9**	<1.0	**15**	<1.0	**12**
cis-1,3-Dichloropropene	NA		<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0

Notes and abbreviations on last page.

Table 4. Concentrations of Volatile Organic Compounds and Selected Metals Detected in Aqueous Samples Collected from the Pump and Treat System, Operational Year 10, Colesville Landfill, Broome County, New York[1].

Constituents (units in ug/L)	Model Technology BPJ Limits[2,3]	Sample ID: Date:	GMPW-4 INF 09/28/11	GMPW-4 INF 01/19/12	GMPW-4 INF [6] 04/26/12	GMPW-4 INF 06/21/12	GMPW-5 INF 01/19/12	GMPW-5 INF [6] 04/26/12	GMPW-5 INF 06/21/12	COMBINED INF 09/28/11
Cyclohexane	NA		--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	--
Dibromochloromethane	NA		<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0
Dibromomethane	NA		<5.0	--	--		--	--	--	--
Dichlorodifluoromethane	NA		<5.0	**1.1**	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0
Ethylbenzene	5		<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0
Hexachlorobutadiene	NA		<5.0	--	--		--	--		<5.0
Isopropylbenzene	NA		<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0
m,p-Xylene	5		<5.0	--	--		--	--	--	--
Methyl acetate	NA		--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	--
Methyl tert-butyl ether	50		<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0
Methylcyclohexane	NA		--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	--
Methylene Chloride	10-50		<5.0	**1.2**	<1.0	<1.0	<1.0	**0.86 J**	<1.0	<5.0
Naphthalene	NA		<5.0	--	--	--	--	--	--	--
n-Butylbenzene	NA		<5.0	--	--	--	--	--	--	--
n-Propylbenzene	NA		<5.0	--	--	--	--	--	--	--
o-Xylene	5		<5.0	--	--	--	--	--	--	--
p-Isopropyltoluene	NA		<5.0	--	--	--	--	--	--	--
sec-Butylbenzene	NA		<5.0	--	--	--	--	--	--	--
Styrene	NA		<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0
tert-Butylbenzene	NA		<5.0	--	--		--	--		<5.0
Tetrachloroethene	10		<5.0	**0.58 J**	<1.0	<1.0	<1.0	**0.45 J**	<1.0	<5.0
Toluene	5		<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0
trans-1,2-Dichloroethene	10-50		<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0
trans-1,3-Dichloropropene	NA		<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0
Trichloroethene	10		**24**	**36**	<1.0	**5.7**	<1.0	**20**	<1.0	**13**
Trichlorofluoromethane	10		<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0
Vinyl Chloride	10-50		**3.1 J**	**6.0**	<1.0	**0.96 J**	<1.0	**3.2**	<1.0	**1.6 J**
Xylenes (total)	NA		--	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	--
Total VOCs			**114 J**	**175 J**	ND	**28 J**	ND	**92 J**	ND	**59.5 J**
Metals (units in mg/L)	Model Technology BPJ Limits[4,5] (mg/L)									
Total Iron	1.2 / 0.61		**0.280**	**0.370**	**0.170**	**0.540**	**0.280**	<0.0500	**0.640**	**3.30**

Notes and abbreviations on last page.

Table 4. Concentrations of Volatile Organic Compounds and Selected Metals Detected in Aqueous Samples Collected from the Pump and Treat System, Operational Year 10, Colesville Landfill, Broome County, New York[1].

Constituents (units in ug/L)	Model Technology BPJ Limits[2,3]	Sample ID: Date:	COMBINED INF 01/19/12	COMBINED INF 04/26/12	COMBINED INF 06/21/12	COMBINED EFF 09/28/11	COMBINED EFF 01/19/12	COMBINED EFF 04/26/12	COMBINED EFF 06/21/12
1,1,1,2-Tetrachloroethane	NA		--	--		<5.0	--	--	--
1,1,1-Trichloroethane	10-20		**3.3**	**1.8**	**4.6**	<5.0	<1.0	<1.0	<1.0
1,1,2,2-Tetrachloroethane	NA		<1.0	<1.0	<1.0	<5.0	<1.0	<1.0	<1.0
1,1,2-trichloro-1,2,2-trifluoroethane	NA		<1.0	<1.0	<1.0	--	<1.0	<1.0	<1.0
1,1,2-Trichloroethane	10		<1.0	<1.0	<1.0	<5.0	<1.0	<1.0	<1.0
1,1-Dichloroethane	10		**24**	**20**	**38**	<5.0	<1.0	<1.0	<1.0
1,1-Dichloroethene	10		<1.0	<1.0	<1.0	<5.0	<1.0	<1.0	<1.0
1,1-Dichloropropene	NA		--	--	--	--	--	--	--
1,2,3-Trichlorobenzene	NA		--	--	--	--	--	--	--
1,2,3-Trichloropropane	NA		--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	NA		<1.0	<1.0	<1.0	<5.0	<1.0	<1.0	<1.0
1,2,4-Trimethylbenzene	NA		--	--	--	--	--	--	--
1,2-Dibromo-3-chloropropane	NA		<1.0	<1.0	<1.0	<5.0	<1.0	<1.0	<1.0
1,2-Dibromoethane	NA		<1.0	<1.0	<1.0	<5.0	<1.0	<1.0	<1.0
1,2-Dichlorobenzene	NA		<1.0	<1.0	<1.0	<5.0	<1.0	<1.0	<1.0
1,2-Dichloroethane	10-30		<1.0	<1.0	<1.0	<5.0	<1.0	<1.0	<1.0
1,2-Dichloropropane	NA		<1.0	<1.0	<1.0	<5.0	<1.0	<1.0	<1.0
1,3,5-Trimethylbenzene	NA		--	--	--	--	--	--	--
1,3-Dichlorobenzene	NA		<1.0	<1.0	<1.0	<5.0	<1.0	<1.0	<1.0
1,3-Dichloropropane	NA		--	--	--	--	--	--	--
1,4-Dichlorobenzene	NA		<1.0	<1.0	<1.0	<5.0	<1.0	<1.0	<1.0
2,2-Dichloropropane	NA		--	--	--	--	--	--	--
2-Butanone	NA		<10	<10	<10	--	**8.9 J**	**1.7 J**	<10
2-Chlorotoluene	NA		--	--	--	--	--	--	--
2-Hexanone	NA		<5.0	<5.0	<5.0	--	<5.0	<5.0	<5.0
4-Chlorotoluene	NA		--	--	--	--	--	--	--
4-Methyl-2-pentanone	NA		<5.0	<5.0	<5.0	--	<5.0	<5.0	<5.0
Acetone	NA		<10	<10	<10	--	**24**	<10	<10
Benzene	5		**1.5**	**1.0**	**2.1**	<5.0	<1.0	<1.0	<1.0
Bromobenzene	NA		--	--	--	--	--	--	--
Bromochloromethane	NA		--	--	--	--	--	--	--
Bromodichloromethane	NA		<1.0	<1.0	<1.0	<5.0	<1.0	<1.0	<1.0
Bromoform	NA		<1.0	<1.0	<1.0	<5.0	<1.0	<1.0	<1.0
Bromomethane	NA		<1.0	<1.0	<1.0	<5.0	<1.0	<1.0	<1.0
Carbon Disulfide	NA		<1.0	<1.0	<1.0	--	<1.0	<1.0	<1.0
Carbon Tetrachloride	10		<1.0	<1.0	<1.0	<5.0	<1.0	<1.0	<1.0
Chlorobenzene	NA		**7.6**	**4.2**	**8.8**	<5.0	<1.0	<1.0	<1.0
Chloroethane	NA		**15**	**8.5**	**17**	<5.0	<1.0	<1.0	<1.0
Chloroform	NA		<1.0	<1.0	<1.0	<5.0	<1.0	<1.0	<1.0
Chloromethane	10		<1.0	<1.0	<1.0	<5.0	<1.0	<1.0	<1.0
cis-1,2-Dichloroethene	10		**17**	**10**	**21**	<5.0	<1.0	<1.0	<1.0
cis-1,3-Dichloropropene	NA		<1.0	<1.0	<1.0	<5.0	<1.0	<1.0	<1.0

Notes and abbreviations on last page.

Table 4. Concentrations of Volatile Organic Compounds and Selected Metals Detected in Aqueous Samples Collected from the Pump and Treat System, Operational Year 10, Colesville Landfill, Broome County, New York[1].

Constituents (units in ug/L)	Model Technology BPJ Limits[2,3]	Sample ID: Date:	COMBINED INF 01/19/12	COMBINED INF 04/26/12	COMBINED INF 06/21/12	COMBINED EFF 09/28/11	COMBINED EFF 01/19/12	COMBINED EFF 04/26/12	COMBINED EFF 06/21/12
Cyclohexane	NA		<1.0	<1.0	<1.0	--	<1.0	<1.0	<1.0
Dibromochloromethane	NA		<1.0	<1.0	<1.0	<5.0	<1.0	<1.0	<1.0
Dibromomethane	NA		--	--	--	--	--	--	--
Dichlorodifluoromethane	NA		<1.0	<1.0	**0.73 J**	<5.0	<1.0	<1.0	<1.0
Ethylbenzene	5		<1.0	<1.0	<1.0	<5.0	<1.0	<1.0	<1.0
Hexachlorobutadiene	NA		--	--		<5.0	--	--	
Isopropylbenzene	NA		<1.0	<1.0	<1.0	<5.0	<1.0	<1.0	<1.0
m,p-Xylene	5		--	--	--	--	--	--	--
Methyl acetate	NA		<1.0	<1.0	<1.0	--	<1.0	<1.0	<1.0
Methyl tert-butyl ether	50		<1.0	<1.0	<1.0	<5.0	<1.0	<1.0	<1.0
Methylcyclohexane	NA		<1.0	<1.0	<1.0	--	<1.0	<1.0	<1.0
Methylene Chloride	10-50		**0.57 J**	**0.48 J**	**0.96 J**	<5.0	<1.0	<1.0	<1.0
Naphthalene	NA		--	--	--	--	--	--	--
n-Butylbenzene	NA		--	--	--	--	--	--	--
n-Propylbenzene	NA		--	--	--	--	--	--	--
o-Xylene	5		--	--	--	--	--	--	--
p-Isopropyltoluene	NA		--	--	--	--	--	--	--
sec-Butylbenzene	NA		--	--	--	--	--	--	--
Styrene	NA		<1.0	<1.0	<1.0	<5.0	<1.0	<1.0	<1.0
tert-Butylbenzene	NA		--	--		<5.0	--	--	
Tetrachloroethene	10		<1.0	<1.0	<1.0	<5.0	<1.0	<1.0	<1.0
Toluene	5		<1.0	<1.0	<1.0	<5.0	<1.0	<1.0	<1.0
trans-1,2-Dichloroethene	10-50		<1.0	<1.0	<1.0	<5.0	<1.0	<1.0	<1.0
trans-1,3-Dichloropropene	NA		<1.0	<1.0	<1.0	<5.0	<1.0	<1.0	<1.0
Trichloroethene	10		**19**	**13**	**25**	<5.0	<1.0	<1.0	<1.0
Trichlorofluoromethane	10		<1.0	<1.0	<1.0	<5.0	<1.0	<1.0	<1.0
Vinyl Chloride	10-50		**3.1**	**2.1**	**4.1**	<5.0	<1.0	<1.0	<1.0
Xylenes (total)	NA		<2.0	<2.0	<2.0	--	<2.0	<2.0	<2.0
Total VOCs			**91 J**	**61 J**	**122 J**	ND	**33 J**	**1.7 J**	ND
Metals (units in mg/L)	Model Technology BPJ Limits[4,5] (mg/L)								
Total Iron	1.2 / 0.61		**0.800**	**0.100**	**1.20**	**0.0710**	**0.0600**	<0.0500	**0.0680**

Notes and abbreviations on last page.

Table 4. Concentrations of Volatile Organic Compounds and Selected Metals Detected in Aqueous Samples Collected from the Pump and Treat System Operational Year 10, Colesville Landfill, Broome County, New York.[1]

Notes and Abbreviations:

1. Production wells were sampled in accordance with the schedule set forth in Table 3 of the Long-Term Monitoring Plan (ARCADIS 2002). Samples were not collected September 2012, since the PT system was shutdown from July 23, 2012 through the end of the reporting period, due to power failures and an air compressor motor failure.
2. Model Technology BPJ Limits recommended for Air Stripping with appropriate pretreatment from Attachment C of TOGS 1.2.1.
3. 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.
4. Model Technology BPJ Limits recommended for Lime, Settle and Filter treatment.
5. The recommended daily maximum permit limit is 1.2 mg/L and the recommended daily average permit limit is 0.61 mg/L.
6. Results for GMPW-4 INF and GMPW-5 INF are not typical for each respective well and it is believed that they may have been inadvertently switched by the laboratory.

Bold constituent detected above method detection limit.

BPJ	Best professional judgment.
NA	No BPJ limit listed.
J	Estimated value.
mg/L	Milligrams per liter.
VOCs	Volatile organic compounds.
ug/L	Micrograms per liter.
--	Not analyzed or collected.
ND	Not detected.

Table 5. Concentrations of Volatile Organic Compounds Detected in Surface Water, Operational Year 10, Colesville Landfill, Broome County, New York.

Constituents (units in ug/L)	Sample ID: / Date:	SP-4 12/8/2011	SP-4 3/21/2012	SP-4 6/21/2012	SP-4 9/20/2012
1,1,1-Trichloroethane		<1.0	<1.0	<1.0	<1.0
1,1,2,2-Tetrachloroethane		<1.0	<1.0	<1.0	<1.0
1,1,2-trichloro-1,2,2-trifluoroethane		<1.0	<1.0	<1.0	<1.0
1,1,2-Trichloroethane		<1.0	<1.0	<1.0	<1.0
1,1-Dichloroethane		<1.0	**1.2**	**1.8**	**1.8**
1,1-Dichloroethene		<1.0	<1.0	<1.0	<1.0
1,2,4-Trichlorobenzene		<1.0	<1.0	<1.0	<1.0
1,2-Dibromo-3-chloropropane		<1.0	<1.0	<1.0	<1.0
1,2-Dibromoethane		<1.0	<1.0	<1.0	<1.0
1,2-Dichlorobenzene		<1.0	<1.0	<1.0	<1.0
1,2-Dichloroethane		<1.0	<1.0	<1.0	<1.0
1,2-Dichloropropane		<1.0	<1.0	<1.0	<1.0
1,3-Dichlorobenzene		<1.0	<1.0	<1.0	<1.0
1,4-Dichlorobenzene		<1.0	<1.0	<1.0	<1.0
2-Butanone		<10	<10	<10	<10
2-Hexanone		<5.0	<5.0	<5.0	<5.0
4-Methyl-2-pentanone		<5.0	<5.0	<5.0	<5.0
Acetone		<10	<10	<10	<10
Benzene		<1.0	<1.0	<1.0	<1.0
Bromodichloromethane		<1.0	<1.0	<1.0	<1.0
Bromoform		<1.0	<1.0	<1.0	<1.0
Bromomethane		<1.0	<1.0	<1.0	<1.0
Carbon Disulfide		<1.0	<1.0	<1.0	<1.0
Carbon Tetrachloride		<1.0	<1.0	<1.0	<1.0
Chlorobenzene		<1.0	<1.0	<1.0	<1.0
Chloroethane		<1.0	<1.0	<1.0	<1.0
Chloroform		<1.0	<1.0	<1.0	<1.0
Chloromethane		<1.0	<1.0	<1.0	<1.0
cis-1,2-Dichloroethene		<1.0	<1.0	**0.86 J**	<1.0
cis-1,3-Dichloropropene		<1.0	<1.0	<1.0	<1.0
Cyclohexane		<1.0	<1.0	<1.0	<1.0
Dibromochloromethane		<1.0	<1.0	<1.0	<1.0
Dichlorodifluoromethane		<1.0	<1.0	<1.0	<1.0
Ethylbenzene		<1.0	<1.0	<1.0	<1.0
Isopropylbenzene		<1.0	<1.0	<1.0	<1.0
Methyl acetate		<1.0	<1.0	<1.0	<1.0
Methyl tert-butyl ether		<1.0	<1.0	<1.0	<1.0
Methylcyclohexane		<1.0	<1.0	<1.0	<1.0
Methylene Chloride		<1.0	<1.0	<1.0	<1.0
Styrene		<1.0	<1.0	<1.0	<1.0
Tetrachloroethene		<1.0	<1.0	<1.0	<1.0
Toluene		<1.0	<1.0	<1.0	<1.0
trans-1,2-Dichloroethene		<1.0	<1.0	<1.0	<1.0
trans-1,3-Dichloropropene		<1.0	<1.0	<1.0	<1.0
Trichloroethene		<1.0	<1.0	<1.0	<1.0
Trichlorofluoromethane		<1.0	<1.0	<1.0	<1.0
Vinyl Chloride		<1.0	<1.0	<1.0	<1.0
Xylenes (total)		<2.0	<2.0	<2.0	<2.0
Total VOCs		ND	**1.2**	**2.7 J**	**1.8**

Notes and Abbreviations:

Bold constituent detected above method detection limit.

ND	Not detected.
VOCs	Volatile organic compounds.
ug/L	Micrograms per liter.
<	Analyte below detection limit.

Table 5. Concentrations of Volatile Organic Compounds Detected in Surface Water, Operational Year 10, Colesville Landfill, Broome County, New York.

Constituents (units in ug/L)	Sample ID: Date:	F-6 12/8/2011	F-6 6/21/2012
1,1,1-Trichloroethane		<1.0	<1.0
1,1,2,2-Tetrachloroethane		<1.0	<1.0
1,1,2-trichloro-1,2,2-trifluoroethane		<1.0	<1.0
1,1,2-Trichloroethane		<1.0	<1.0
1,1-Dichloroethane		<1.0	<1.0
1,1-Dichloroethene		<1.0	<1.0
1,2,4-Trichlorobenzene		<1.0	<1.0
1,2-Dibromo-3-chloropropane		<1.0	<1.0
1,2-Dibromoethane		<1.0	<1.0
1,2-Dichlorobenzene		<1.0	<1.0
1,2-Dichloroethane		<1.0	<1.0
1,2-Dichloropropane		<1.0	<1.0
1,3-Dichlorobenzene		<1.0	<1.0
1,4-Dichlorobenzene		<1.0	<1.0
2-Butanone		<10	<10
2-Hexanone		<5.0	<5.0
4-Methyl-2-pentanone		<5.0	<5.0
Acetone		<10	<10
Benzene		<1.0	<1.0
Bromodichloromethane		<1.0	<1.0
Bromoform		<1.0	<1.0
Bromomethane		<1.0	<1.0
Carbon Disulfide		<1.0	<1.0
Carbon Tetrachloride		<1.0	<1.0
Chlorobenzene		<1.0	<1.0
Chloroethane		<1.0	<1.0
Chloroform		<1.0	<1.0
Chloromethane		<1.0	<1.0
cis-1,2-Dichloroethene		<1.0	<1.0
cis-1,3-Dichloropropene		<1.0	<1.0
Cyclohexane		<1.0	<1.0
Dibromochloromethane		<1.0	<1.0
Dichlorodifluoromethane		<1.0	<1.0
Ethylbenzene		<1.0	<1.0
Isopropylbenzene		<1.0	<1.0
Methyl acetate		<1.0	<1.0
Methyl tert-butyl ether		<1.0	<1.0
Methylcyclohexane		<1.0	<1.0
Methylene Chloride		<1.0	<1.0
Styrene		<1.0	<1.0
Tetrachloroethene		<1.0	<1.0
Toluene		<1.0	<1.0
trans-1,2-Dichloroethene		<1.0	<1.0
trans-1,3-Dichloropropene		<1.0	<1.0
Trichloroethene		<1.0	<1.0
Trichlorofluoromethane		<1.0	<1.0
Vinyl Chloride		<1.0	<1.0
Xylenes (total)		<2.0	<2.0
Total VOCs		ND	ND

Notes and Abbreviations:

Bold constituent detected above method detection limit.

ND	Not detected.
VOCs	Volatile organic compounds.
ug/L	Micrograms per liter.
<	Analyte below detection limit.

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Table 6. Pump and Treat System Operating Parameters, Groundwater Remediation System, Operational Year 10, Colesville Landfill, Broome County, New York.

Date	Time Recorded	Air Stripper Measurements: Blower Discharge Pressure PI-301 (iwc)	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[3,5] Totalizer FQI-101 (gallons)	Flow Measurements: GMPW-4[4] Totalizer FQI-102 (gallons)	Flow Measurements: GMPW-5[4] Totalizer FQI-103 (gallons)
3/20/2012	9:15 AM	9.2	191	1,285,577.0 [6]	584,841.6 [6]	51,739.1	305,804.8	426,252.8
6/21/2012	12:00 PM	NR[7]	NR[7]	1,304,604.8 [7]	603,355.9 [7]	51,739.1	316,829.9 [7]	439,645.8 [7]
9/25/2012	10:00 AM	NR[8]	NR[8]	1,324,246.4	622,467.5	51,739.1	328,210.6	453,470.8
	Average Daily Flowrate During Reporting Period (gpm) =			**0.14**	**0.14**	**0**	**0.08**	**0.10**
	Total Groundwater Recovered During Reporting Period (gallons) =			**38,669**	**37,626**	**0**	**22,406**	**27,218**
	Average Daily Flowrate During Year 10 (gpm) =			**0.23**	**0.23**	**0**	**0.11**	**0.15**
	Total Groundwater Recovered During Year 10 (gallons) =			**84,422**	**83,379**	**0**	**41,313**	**54,064**

Notes:

1. Total effluent totalizer replaced on December 23, 2005 and on April 5, 2011 due to fouling.
2. Water bypass totalizer damaged as a result of freezing in February 2007. Totalizer replaced on June 25, 2008. Water bypass totalizer replaced on April 5, 2011 due to fouling.
3. GMPW-3 well totalizer replaced on October 7, 2009 due to fouling.
4. GMPW-4 and GMPW-5 well totalizers replaced on June 26, 2008 due to fouling.
5. GMPW-3 well pump was removed from operation on January 7, 2010 as a result of a faulty intake poppet.
6. March 20, 2012 effluent totalizer readings were inadvertently not collected. Total groundwater recovered during reporting period was estimated based on total influent groundwater recovered from recovery wells GMPW-4 and GMPW-5 totalizers.
7. June 21, 2012 air stripper measurements and totalizer readings were inadvertently not collected. Values shown are estimated based on the average daily flowrate for the reporting period.
8. The air stripper measurements were not collected during the September 2012 quarterly monitoring event due to the groundwater remediation system being offline as a result of an air compressor motor failure.

gpm Gallons per minute.
iwc Inches of water column.
scfm Standard cubic feet per minute.
NR Not recorded

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Table 7. Pump and Treat System Mass Removal Rate of Volatile Organic Compounds, Groundwater Remediation System, Operational Year 10, Colesville Landfill, Broome County, New York.

Date Sampled	Total VOC Influent Concentration (ug/L)	Total Effluent Totalizer FQI-401 (gal)	Total Groundwater Recovered [1] Between Sampling Intervals (gal)	Influent Concentration [2] Geometric Mean (ug/L)	Total Estimated Mass [3] Removed (lbs)
1/19/2012	91.1	1,239,824.4	35,827	73.6	0.02
3/20/2012 [4]	61.1	1,285,577.0	45,753	74.6	0.03
6/21/2012	120	1,304,604.8 [5]	19,028	85.6	0.01
9/26/2012	NS [6]	1,324,246.4	19,642	85.6 [7]	0.01
				Total Estimated Mass Removed During Reporting Period (lbs) =	**0.03**
				Total Estimated Mass Removed During Operational Year 10 (lbs) =	**0.08**
				Total Estimated Mass Removed Since System Startup (lbs)[7] =	**3.76**

Notes and Abbreviations:

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/gal x (1 lbs / 453,592,370 ug).
4. Values shown for 3/20/2012 are estimated based on the sample collected on 4/26/12.
5. June 21, 2012 totalizer reading was inadvertently not collected. Value shown is estimated based on the average daily flowrate for the reporting period.
6. The treatment system influent sample was not collected during the September 2012 quarterly monitoring event due to the groundwater remediation system being offline as a result of an air compressor motor failure.
7. Value shown is estimated based on samples collected on 3/20/12 and 6/21/12.

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

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Table 8. Concentrations of Volatile Organic Compounds Detected in Groundwater Remediation System Air Stripper Effluent, Operational Year 10, Colesville Landfill, Broome County, New York.

Constituents (units in ppbv)	CAS Numbers	Sample ID: Date:	Effluent[1] 9/26/2012
1,1,2,2-Tetrachloroethane	79-34-5		--
1,1,1-Trichloroethane	71-55-6		--
1,1,2-Trichloroethane	79-00-5		--
1,2,4-Trimethylbenzene	95-63-6		--
1,3,5-Trimethylbenzene	108-67-8		--
1,1-Dichloroethane	75-34-3		--
1,1-Dichloroethene (Vinylidene Chloride)	75-35-4		--
1,2-Dibromoethane	106-93-4		--
1,2-Dichlorobenzene	95-50-1		--
1,2-Dichloroethane	107-06-2		--
1,2-Dichloropropane	78-87-5		--
1,3-Dichlorobenzene	541-73-1		--
1,4-Dichlorobenzene	106-46-7		--
2-Propanol (Isopropyl alcohol)	67-63-0		--
Benzene	71-43-2		--
Bromomethane	74-83-9		--
Carbon Tetrachloride	56-23-5		--
Chlorobenzene	108-90-7		--
Chloroethane	75-00-3		--
Chloroform	67-66-3		--
Chloromethane	74-87-3		--
cis-1,2-Dichloroethene	156-59-2		--
Dichlorofluoromethane (Freon 12)	75-71-8		--
Ethylbenzene	100-41-4		--
Freon 113	76-13-1		--
Freon 114	76-14-2		--
Methylene Chloride (Dichloromethane)	75-09-2		--
Methyl tert-butyl ether	1634-04-4		--
o-Xylene	95-47-6		--
m,p-Xylene	108-38-3/106-42-3		--
Tetrachloroethene	127-18-4		--
Toluene	108-88-3		--
trans-1,2-Dichloroethene	156-60-5		--
Trichloroethene	79-01-6		--
Trichlorofluoromethane	75-69-4		--
Vinyl chloride	75-01-4		--
Total VOCs			--

Notes:

1. An air stripper effluent vapor sample was not collected in September 2012 as a result of the system being offline due to an air compressor motor failure.

ND	Not detected.
ppbv	Parts per billion by volume.
VOCs	Volatile organic compounds.
<	Analyte below detection limit.
--	Not available

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Table 9. Concentrations of Volatile Organic Compounds Detected in Aqueous Samples Collected from the SP-5 Spring Water Remediation System, Operational Year 10, Colesville Landfill, Broome County, New York.

Constituents (units in ug/L)	Model Technology BPJ Limits[1,2]	Sample ID:	SP-5 INF.	SP-5 INF.	SP-5 INF.	SP-5 INF.	SP-5 EFF.	SP-5 EFF.	SP-5 EFF.	SP-5 EFF.
		Date:	12/8/2011	3/22/2012	6/20/2012	9/20/2012	12/8/2011	3/22/2012	6/20/2012	9/20/2012
VOCs										
1,1,1-Trichloroethane	10		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,1,2,2-Tetrachloroethane	50		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,1,2-trichloro-1,2,2-trifluoroethane	NA		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,1,2-Trichloroethane	100		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,1-Dichloroethane	10		**9.5**	**12**	**11**	**12**	**5.6**	**8.1**	**0.54 J**	**1.7**
1,1-Dichloroethene	10-100		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,2,4-Trichlorobenzene	NA		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,2-Dibromo-3-chloropropane	NA		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,2-Dibromoethane	NA		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,2-Dichlorobenzene	10-50		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,2-Dichloroethane	10-100		<1.0	<1.0	<1.0	**0.33 J**	<1.0	<1.0	<1.0	<1.0
1,2-Dichloropropane	10		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,3-Dichlorobenzene	10		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,4-Dichlorobenzene	10		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
2-Butanone	NA		<10	<10	<10	<10	<10	<10	<10	<10
2-Hexanone	NA		<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
4-Methyl-2-pentanone	NA		<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Acetone	NA		<10	<10	<10	<10	<10	<10	<10	<10
Benzene	5		<1.0	**0.72 J**	**0.91 J**	**1.3**	<1.0	**0.55 J**	<1.0	<1.0
Bromodichloromethane	NA		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Bromoform	50		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Bromomethane	10		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Carbon Disulfide	NA		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Carbon Tetrachloride	10-50		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Chlorobenzene	10-25		**15**	**16**	**16**	**20**	**9.1**	**14**	<1.0	<1.0
Chloroethane	10		**1.3**	**2.1**	**2.2**	**9.7**	**0.83 J**	**1.4**	**1.3**	**5.3**
Chloroform	100		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Chloromethane	10		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
cis-1,2-Dichloroethene	10		**1.0**	**1.7**	**1.6**	**1.6**	<1.0	**1.2**	<1.0	<1.0
cis-1,3-Dichloropropene	NA		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Cyclohexane	NA		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Dibromochloromethane	NA		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Dichlorodifluoromethane	10		<1.0	<1.0	**0.84 J**	<1.0	<1.0	<1.0	<1.0	<1.0
Ethylbenzene	5		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Isopropylbenzene	NA		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Methyl acetate	NA		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Methyl tert-butyl ether	NA		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Methylcyclohexane	NA		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Methylene Chloride	10-100		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Styrene	NA		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Tetrachloroethene	10-50		<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	10-100		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
trans-1,3-Dichloropropene	NA		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Trichloroethene	10		**1.6**	**2.0**	**2.2**	**2.6**	**1.2**	**1.7**	<1.0	<1.0
Trichlorofluoromethane	10		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Vinyl Chloride	10		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Xylenes (total)	NA		<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Total VOCs			**28.4**	**34.52 J**	**34.75 J**	**47.53 J**	**16.73 J**	**26.95 J**	**1.84 J**	**7.0**

Notes and Abbreviations:

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.

Bold constituent detected above method detection limit.

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

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Table 10. SP-5 Spring Water Remediation System Mass Removal Rate of Volatile Organic Compounds, Operational Year 10, Colesville Landfill, Broome County, New York.

Date Sampled	Total VOC Influent Concentration (ug/L)	Effluent Flowrate (gpm)	Depth to Water (feet btc)	Total Spring Water Treated [1] Between Sampling Intervals (gal)	Influent Concentration [2] Geometric Mean (ug/L)	Total Estimated Mass [3] Removed (lbs)
3/22/2012	35	0.40	NM	NA	NA	NA
6/20/2012	35	0.34 [4]	NM	47,573	35	0.014
9/20/2012	48	0.29	NM	41,644	41	0.014

Total Estimated Mass Removed During Operational Year 10, Quarters 3 & 4 (lbs) =	**0.028**
Total Estimated Mass Removed During Operational Year 10 (lbs) =	**0.12**
Total Estimated Mass Removed Since System Startup (lbs) =	**1.92**
Total Effluent Treated During Operation Year 10 (gallons) =	**435,023**
Total Effluent Treated Since System Startup (gallons) =	**3,685,241**

Notes and Abbreviations:

1. Total Spring Water Treated Between Sampling Intervals = Effluent Flowrate Geometric Mean 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/gal x (1 lbs / 453,592,370 ug).
4. Effluent flow rate not recorded during the reporting period due to operator error. Value shown is the average flow rate of 3/22/12 and 9/20/12.

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

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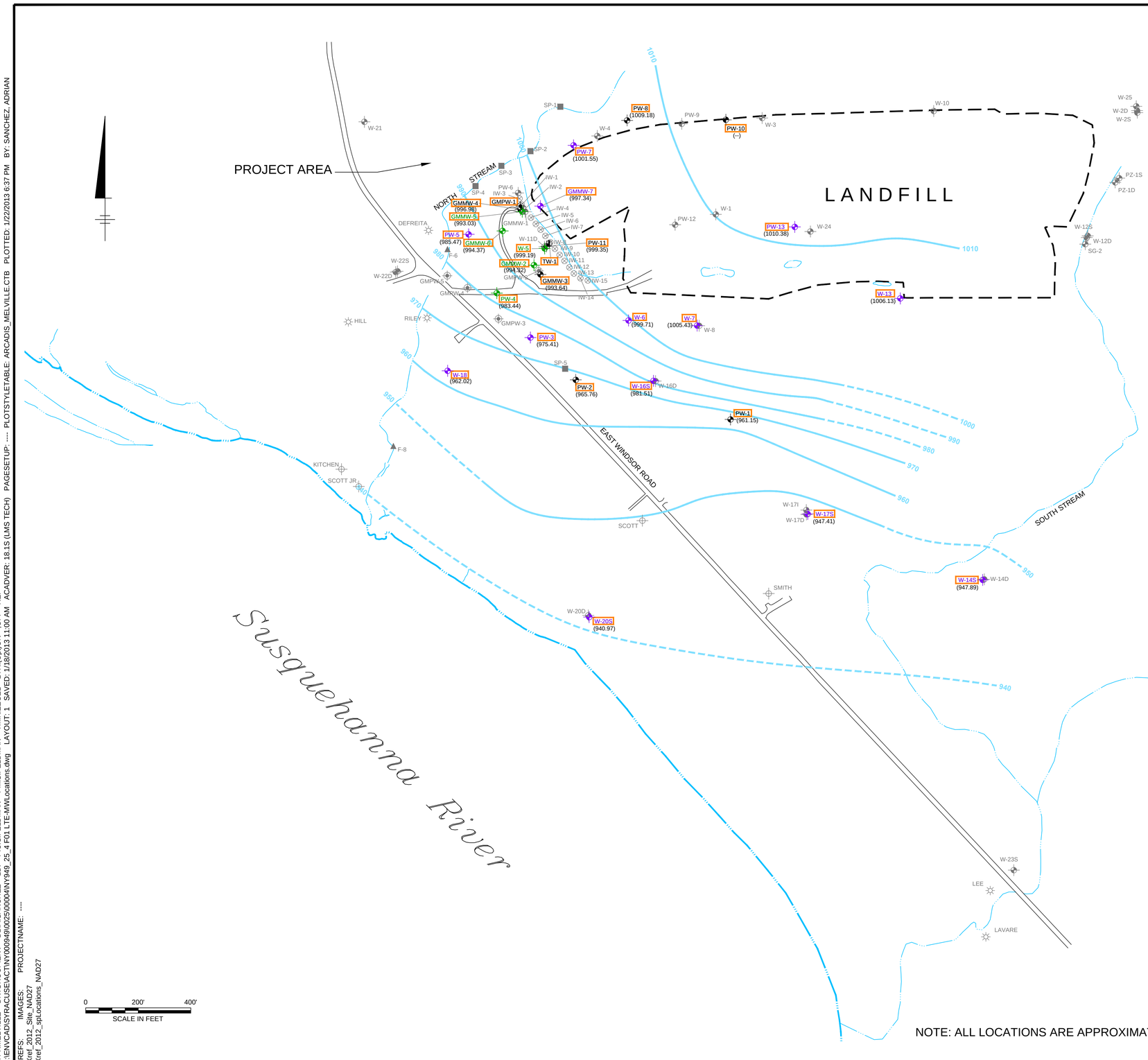
Figures



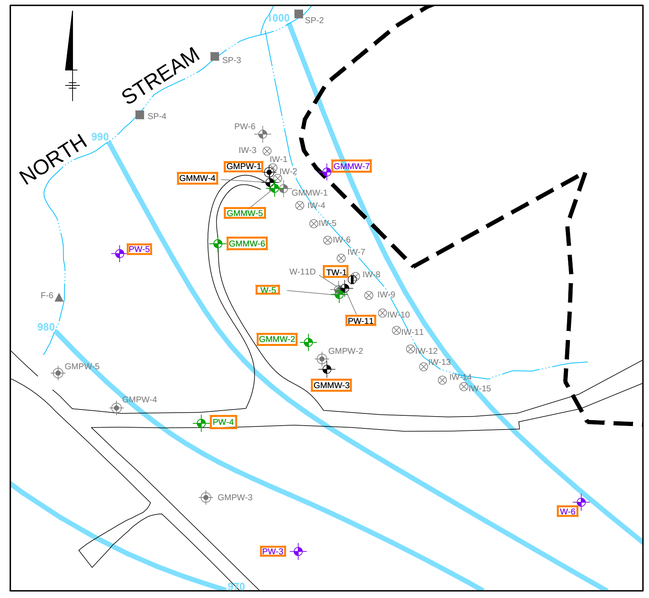
0 200' 400'
SCALE IN FEET

NOTE: ALL LOCATIONS ARE APPROXIMATE

EXPLANATION

LONG-TERM MONITORING PLAN DESIGNATIONS

- W–24 — LOCATION AND DESIGNATION OF MONITORING WELL
- SCOTT — LOCATION AND DESIGNATION OF EXISTING HOMEOWNER WELL
- HILL — LOCATION AND DESIGNATION OF FORMER HOMEOWNER WELL
- IW–2 — LOCATION AND DESIGNATION OF INJECTION WELL
- GMPW–3 — LOCATION AND DESIGNATION OF PRODUCTION WELL
- TW–1 — LOCATION AND DESIGNATION OF TEST MONITORING WELL
- F–6 — LOCATION AND DESIGNATION OF SURFACE WATER SAMPLE
- SP–2 — LOCATION AND DESIGNATION OF SPRING SAMPLE
- GMMW–5 — LOCATION AND DESIGNATION OF QUARTERLY MONITORING WELL
- PW–3 — LOCATION AND DESIGNATION OF ANNUAL MONITORING WELL
- LOCATION AND DESIGNATION OF WELLS INCLUDED IN ANNUAL HYDRAULIC MEASUREMENT PROGRAM
- 1000 — WATER LEVEL ELEVATION CONTOUR IN FT MSL; CONTOUR INTERVAL IS TEN (10) FEET (DASHED WHERE INFERRED)
- (947.89) — WATER LEVEL ELEVATION IN FT MSL



SITE PLAN SHOWING PROJECT AREA

0 100' 200'
SCALE IN FEET

COLESVILLE LANDFILL
COLESVILLE, NEW YORK
ANNUAL MONITORING REPORT

SITE PLAN SHOWING WATER-LEVEL ELEVATIONS ON SEPTEMBER 18, 2012

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FIGURE 1

CITY:MELVILLE DIV/GROUP:ENV DB:A.SANCHEZ LD: PIC:S.FELDMAN PM:S.FELDMAN TM:K.ZEGEL LYR:(Opt)ON=*;OFF=*REF*
G:\ENVCAD\SYRACUSE\ACTIVITY\00949\00250000\4NY949_25_4 F01 LTE-MWLocations.dwg LAYOUT: 1 SAVED: 1/18/2013 11:00 AM ACADVER: 18.1S (LMS TECH) PAGESETUP: ---- PLOTSTYLETABLE: ARCADIS_MELVILLE.CTB PLOTTED: 1/22/2013 6:37 PM BY: SANCHEZ, ADRIAN
XREFS: IMAGES: PROJECTNAME: ----
Xref 2012_Site_NAD27
Xref_2012_spLocations_NAD27

Appendix **A**

Degradation Trend Figures

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

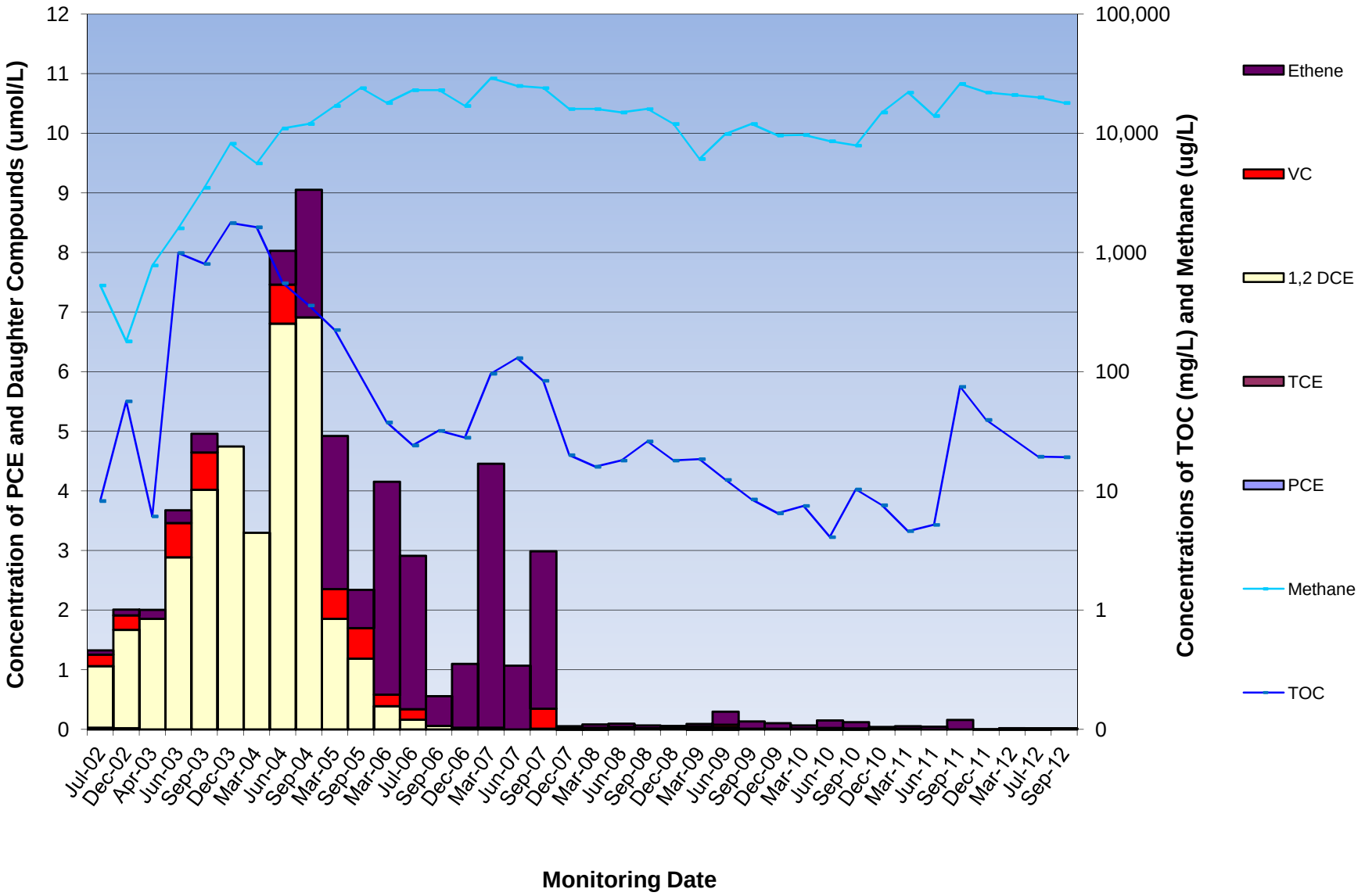


Figure A-2. Concentrations of PCE Daughter Products Versus Time in GMMW-06

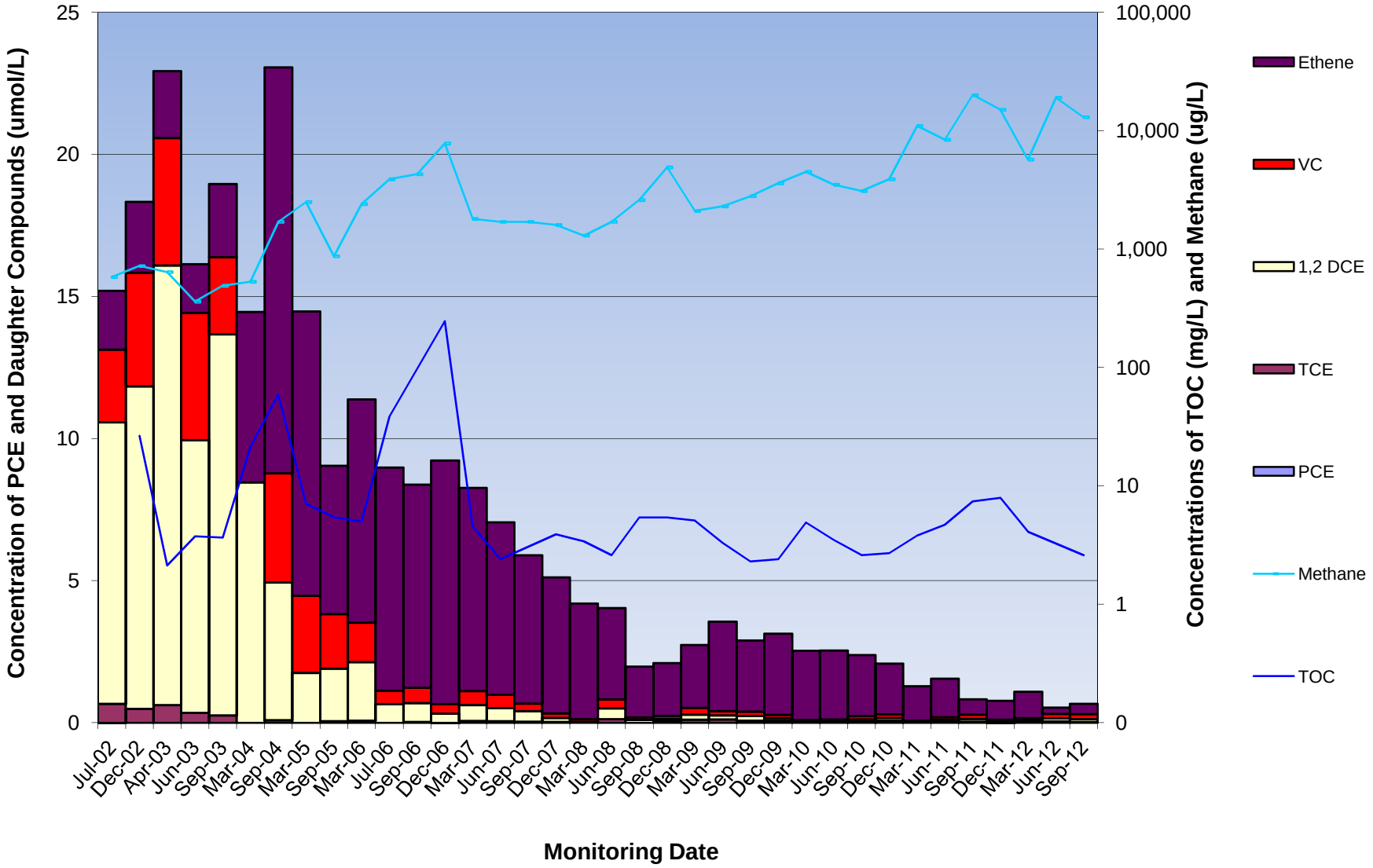


Figure A-3. Concentrations of PCE Daughter Products Versus Time in GMMW-02

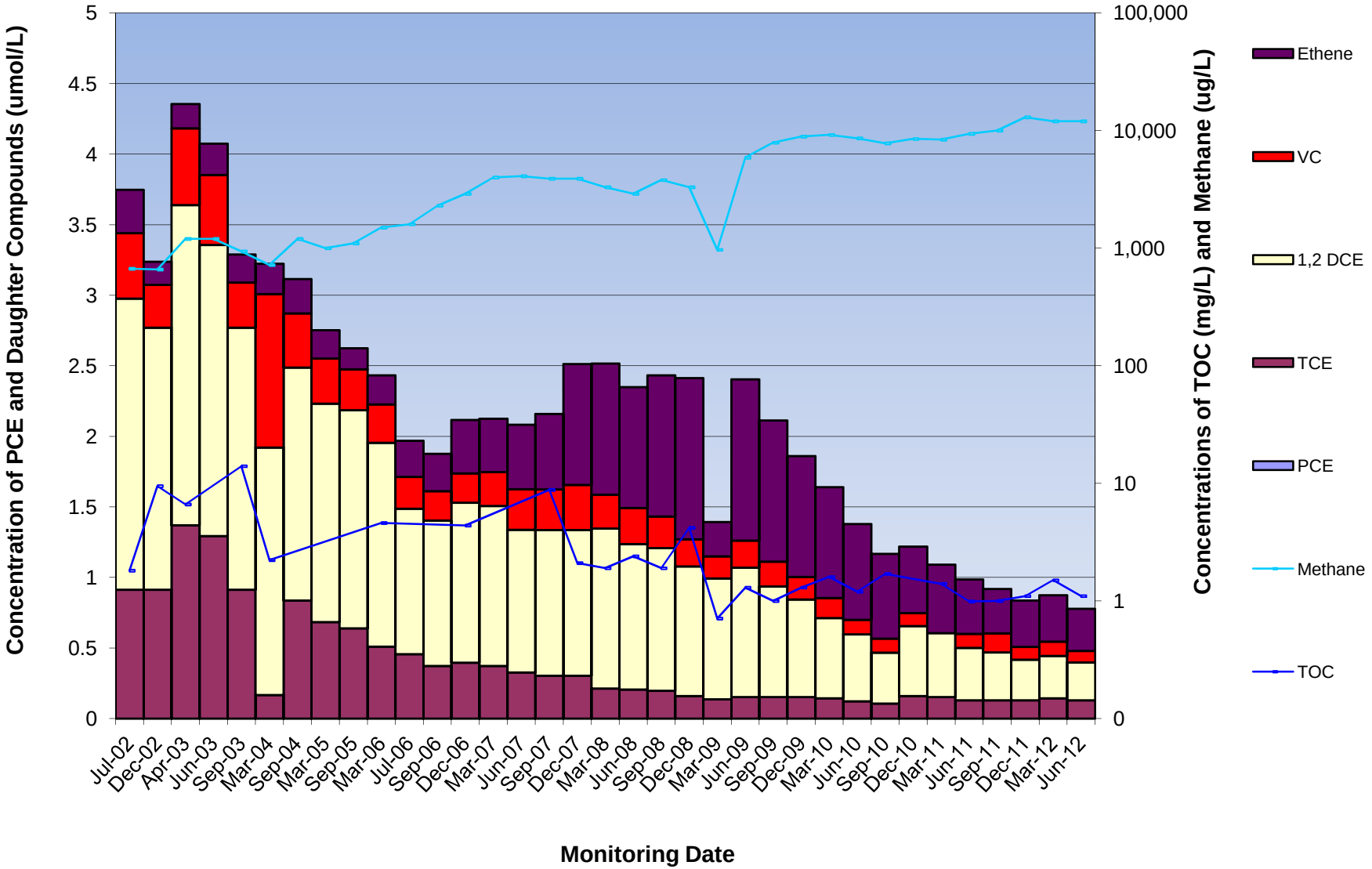


Figure A-4. Concentrations of PCE Daughter Products Versus Time in W-05

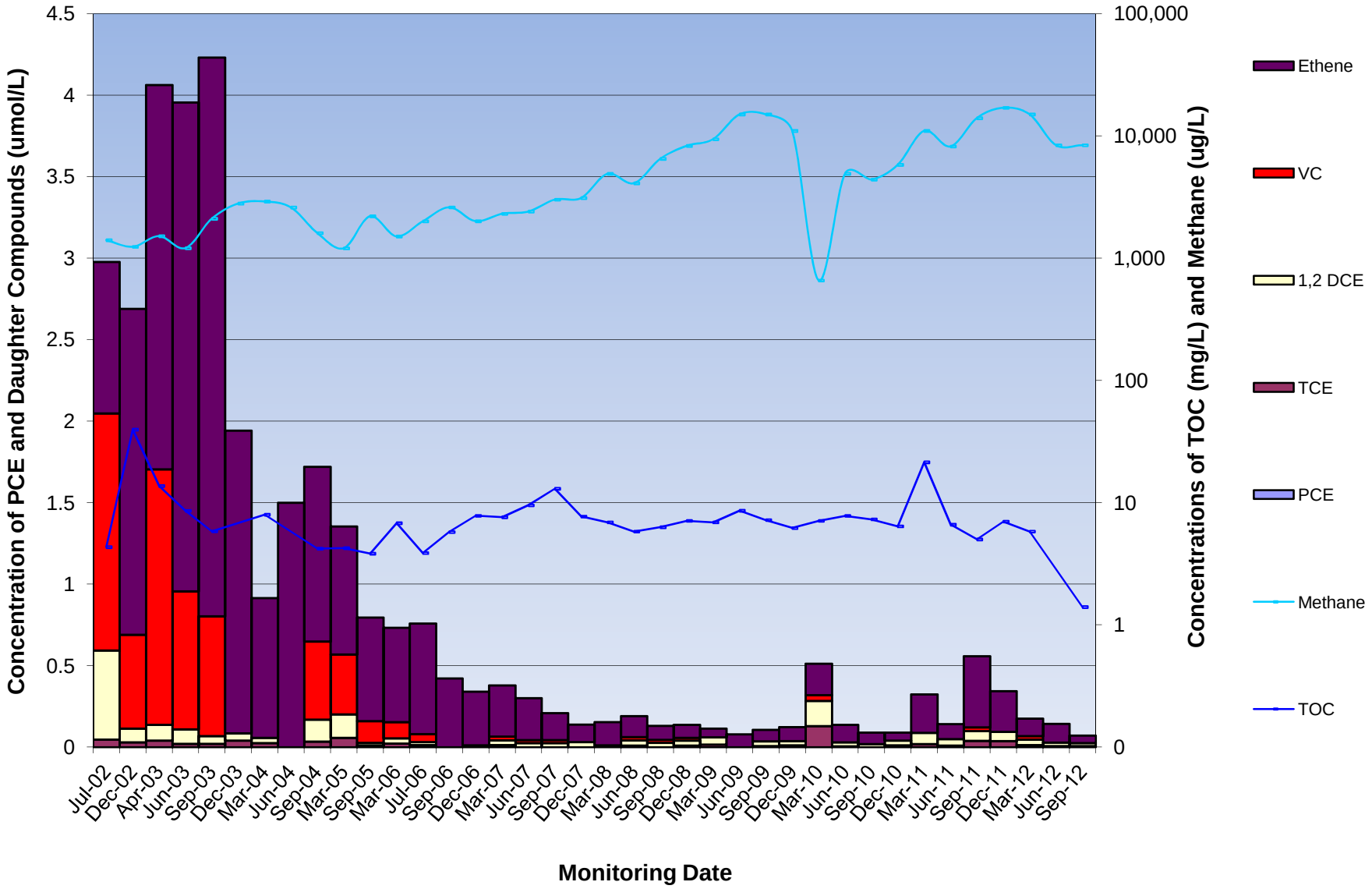


Figure A-5. Concentrations of PCE Daughter Products Versus Time in TW-1

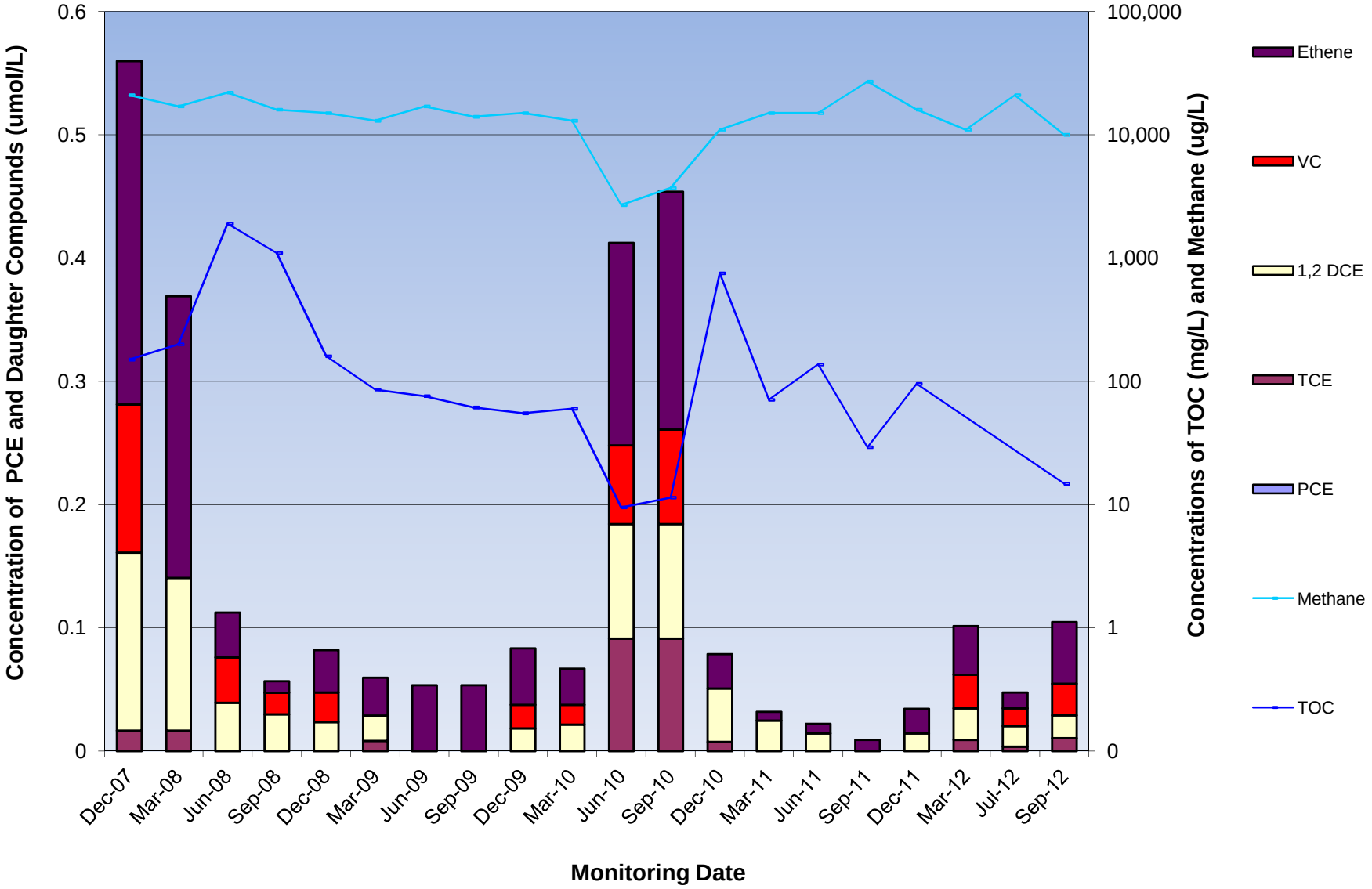


Figure A-6. Concentrations of 1,1,1-TCA Daughter Products Versus Time in GMMW-05

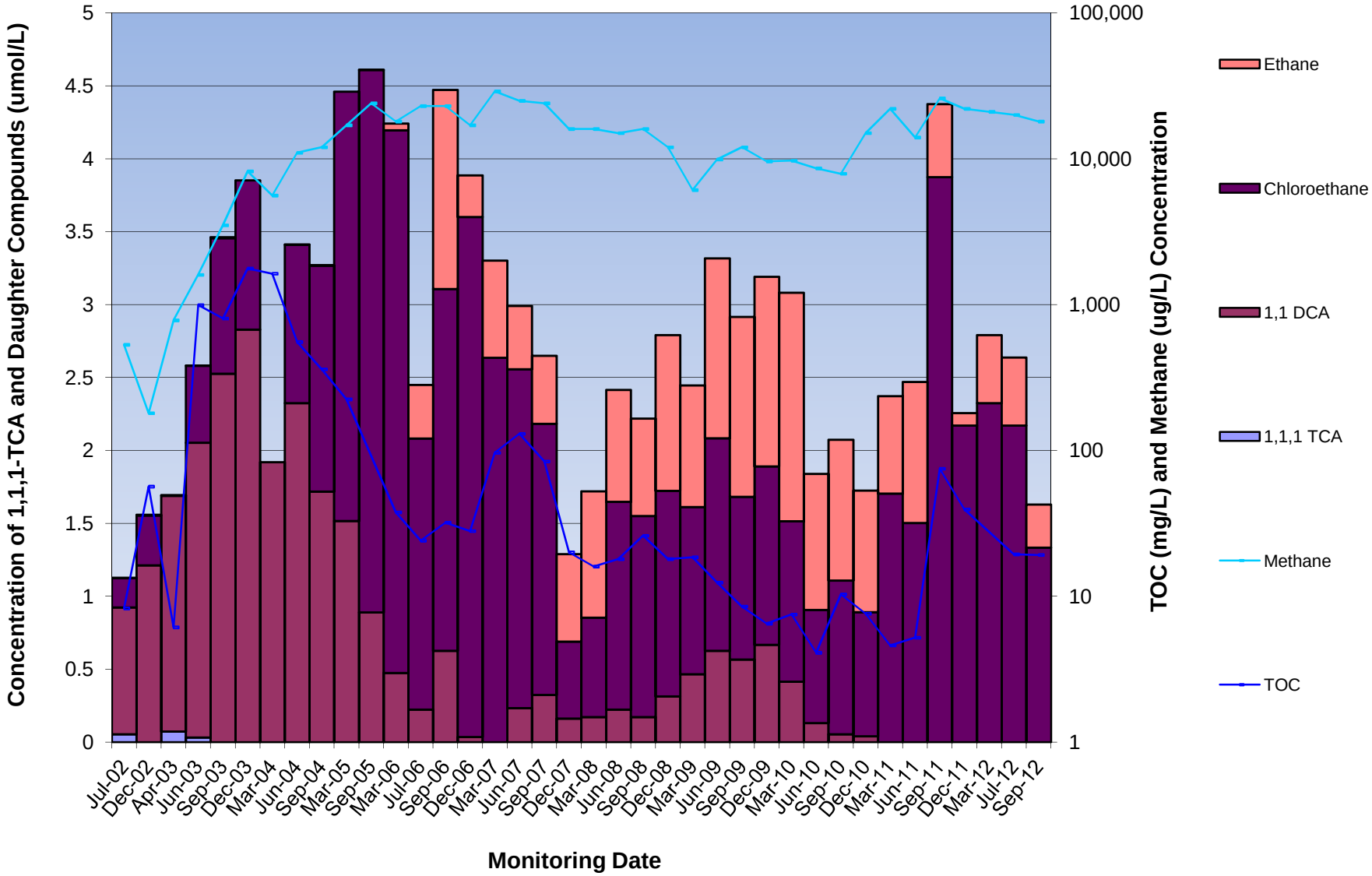


Figure A-7. Concentrations of 1,1,1-TCA Daughter Products Versus Time in GMMW-06

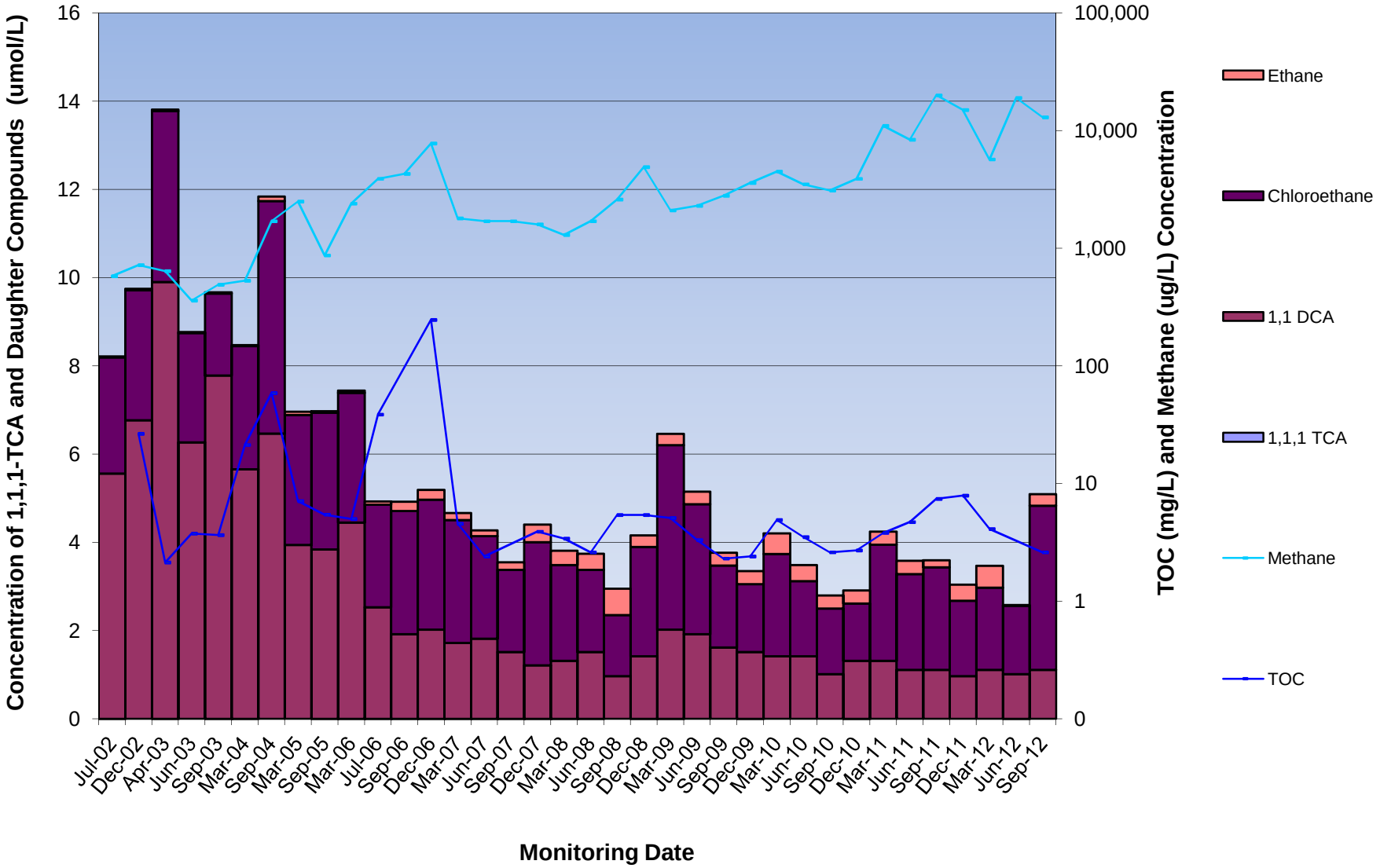


Figure A-8. Concentrations of 1,1,1-TCA Daughter Products Versus Time in GMMW-02

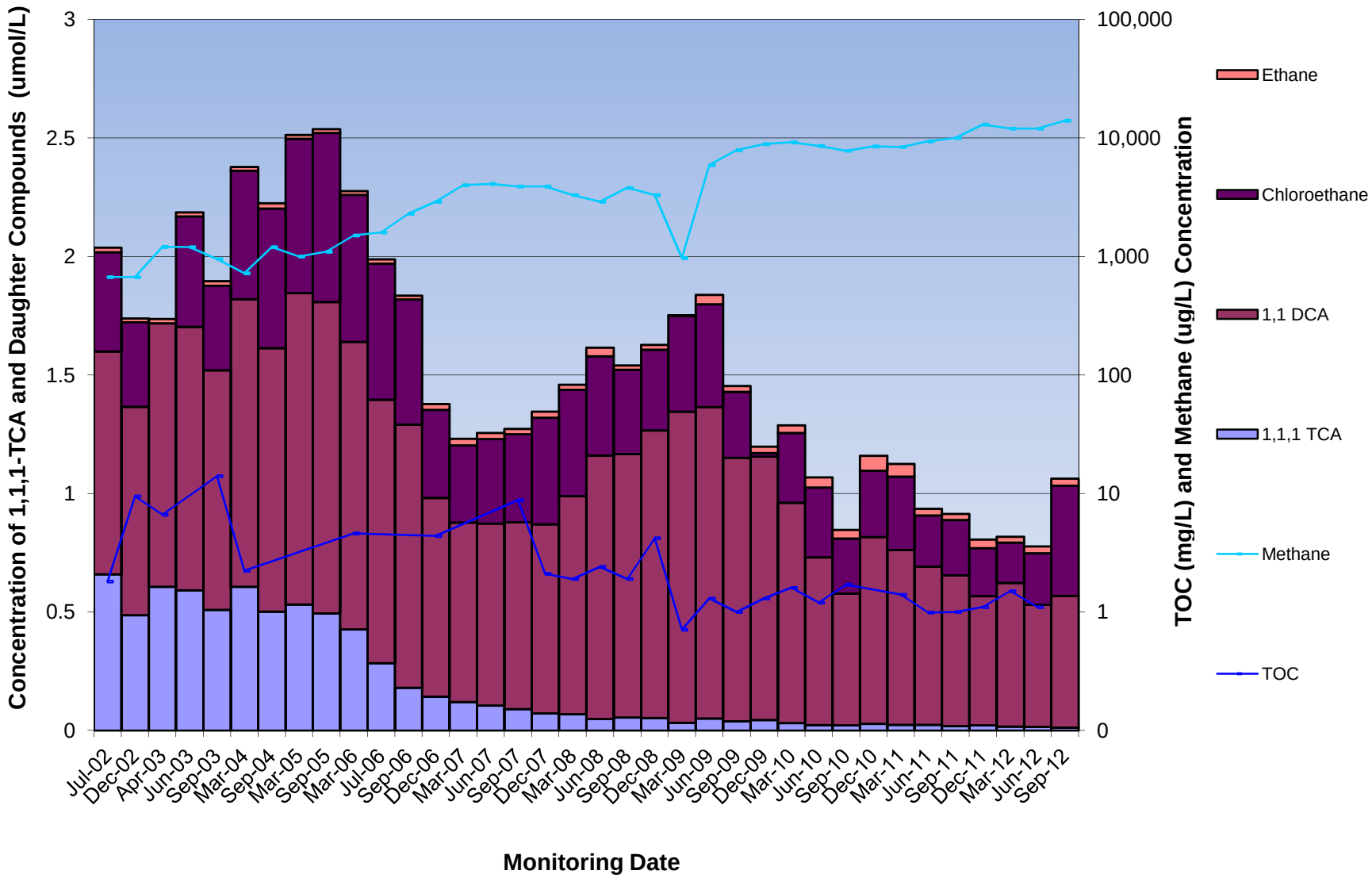


Figure A-9. Concentrations of 1,1,1-TCA Daughter Products Versus Time in W-05

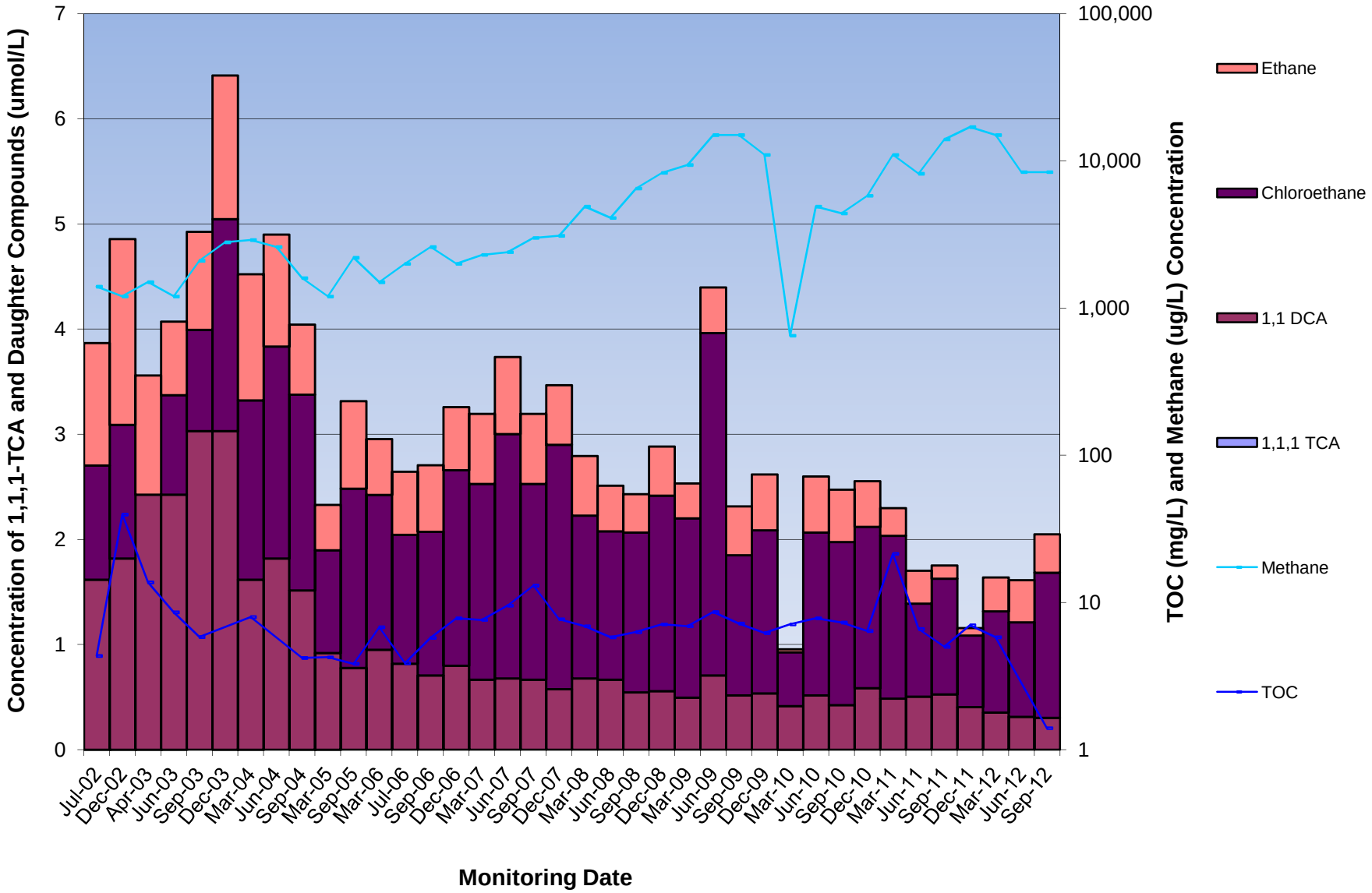
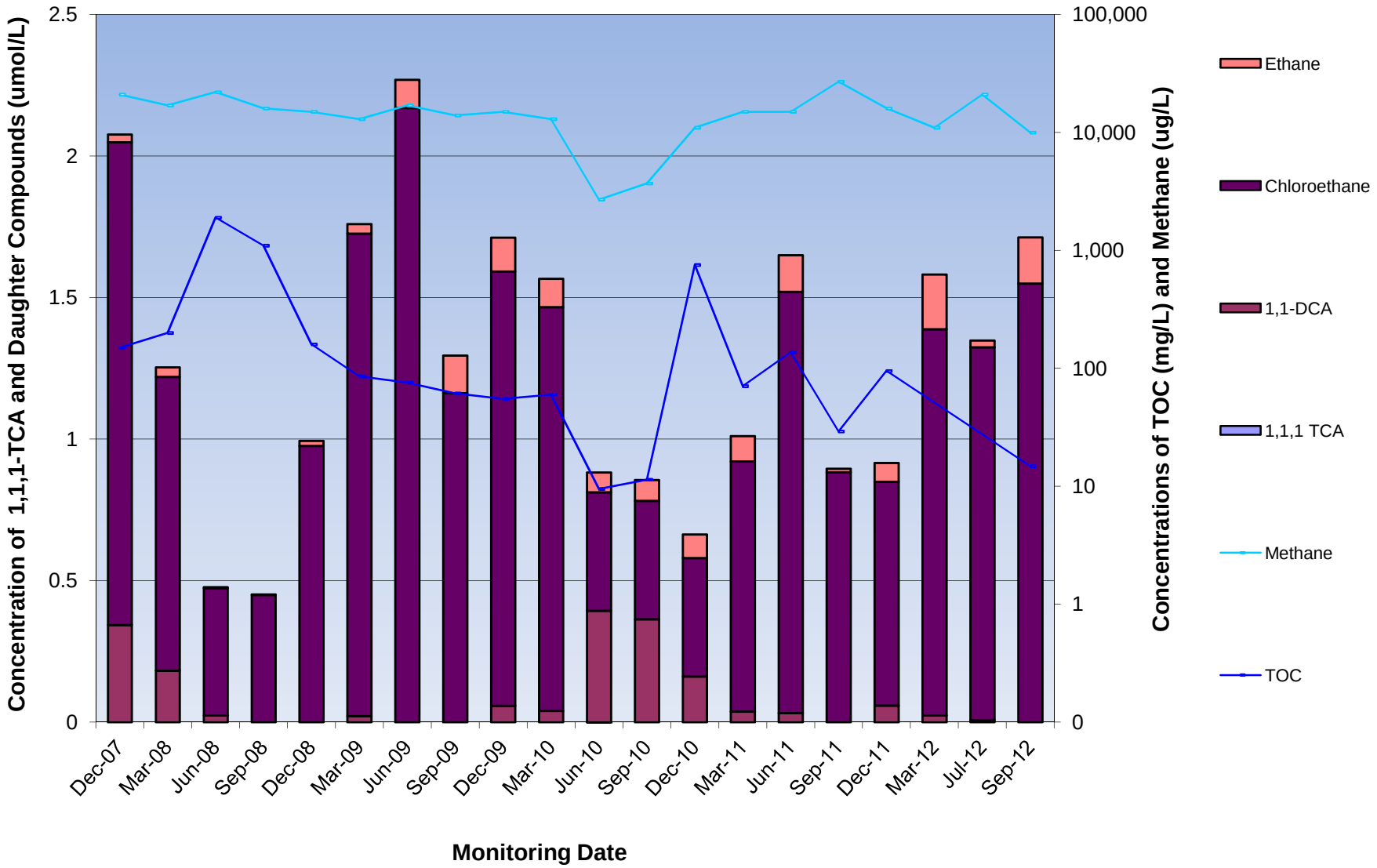


Figure A-10. Concentrations of 1,1,1-TCA Daughter Products Versus Time in TW-1



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Appendix **B**

NYSDEC DAR-1 Air Modeling Data

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Table B-1. NYSDEC DAR-1 Air Modeling Data, Operational Year 10, Colesville Landfill, Broome County, New York.

Air Model Input Data			
Discharge Temperature[1]	T	524	^{o}R
Ambient Temperature[2]	Ta	509	^{o}R
Stack Diameter	D	6	in
Stack Radius	R	0.25	ft
Stack Area	A	0.20	ft^2
Exit Velocity	V	17.8	fps
Exit Flow	Q	209	acfm
Exit Flow	Q	211	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	$F_m = T_a/T * V2 * R2$	N/A	ft^4/s^2
Effective Stack Height	h_e	17	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	

Notes/Assumptions:

1. The stack discharge temperature is 64 ^{o}F based on an average of readings since April 2011.
2. The ambient temperature is 49 ^{o}F based on the mean temperature reported by the National Weather Service for Binghamton, NY

^{o}R: degrees Rankine.
in: inches.
ft: feet.
ft^2: square feet.
fps: feet per second.
acfm: actual cubic feet per minute.
scfm: standard cubic feet per minute.
ft^4/s^2: feet to the fourth per square second.
N/A: not applicable.

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Table B-2. NYSDEC DAR-1 Air Modeling Data, Operational Year 10, Colesville Landfill, Broome County, New York.

Calculation of the Short-Term Guideline Concentration (SGC) for 9/28/2011 Monitoring Event

Compounds	CAS Numbers	Maximum Limit (SGC[1]) (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)[2] (ug/m^3)	Short Term Impact (Step III.A.5 in DAR-1)[2] (ug/m^3)	Percent of the SGC (%)
1,1,2,2-Tetrachloroethane	79-34-5	1,700[3]	7.8	*	34.42	2.72E-05	0.0046	0.30223	1.8E-02
1,1,1-Trichloroethane	71-55-6	9,000	7.8	*	43.26	3.42E-05	0.0058	0.37984	4.2E-03
1,1,2-Trichloroethane	79-00-5	10,700[3]	7.8	*	43.26	3.42E-05	0.0058	0.37984	3.5E-03
1,2,4-Trimethylbenzene	95-63-6	--	7.8	*	38.97	3.08E-05	0.0053	0.34217	NA
1,3,5-Trimethylbenzene	108-67-8	29,300[3]	7.8	*	38.97	3.08E-05	0.0053	0.34217	1.2E-03
1,1-Dichloroethane	75-34-3	--	7.8	*	32.09	2.54E-05	0.0043	0.28176	NA
1,1-Dichloroethene (Vinylidene Chloride)	75-35-4	380[3]	7.8	*	31.44	2.48E-05	0.0042	0.27601	7.3E-02
1,2-Dibromoethane	106-93-4	70[3]	7.8	*	60.92	4.81E-05	0.0082	0.53488	7.6E-01
1,2-Dichlorobenzene	95-50-1	30,000	7.8	*	47.67	3.77E-05	0.0064	0.41853	1.4E-03
1,2-Dichloroethane	107-06-2	950[3]	7.8	*	32.09	2.54E-05	0.0043	0.28173	3.0E-02
1,2-Dichloropropane	78-87-5	83,300[3]	7.8	*	36.64	2.90E-05	0.0049	0.32167	3.9E-04
1,3-Dichlorobenzene	541-73-1	NS	7.8	*	47.67	3.77E-05	0.0064	0.41853	NA
1,4-Dichlorobenzene	106-46-7	2,500[3]	7.8	*	47.67	3.77E-05	0.0064	0.41853	1.7E-02
2-Propanol (Isopropyl alcohol)	67-63-0	98,000	31	*	77.45	6.12E-05	0.0105	0.68001	6.9E-04
Benzene	71-43-2	1,300	7.8	*	25.33	2.00E-05	0.0034	0.22237	1.7E-02
Bromomethane	74-83-9	3,900	7.8	*	30.79	2.43E-05	0.0042	0.27032	6.9E-03
Carbon Tetrachloride	56-23-5	1,900	7.8	*	49.88	3.94E-05	0.0067	0.43797	2.3E-02
Chlorobenzene	108-90-7	10,900[3]	7.8	*	36.50	2.88E-05	0.0049	0.32045	2.9E-03
Chloroethane	75-00-3	--	31	*	83.15	6.57E-05	0.0112	0.73002	NA
Chloroform	67-66-3	150	7.8	*	38.71	3.06E-05	0.0052	0.33989	2.3E-01
Chloromethane	74-87-3	22,000	31	*	65.07	5.14E-05	0.0088	0.57128	2.6E-03
cis-1,2 - Dichloroethylene	156-59-2	190,000[3]	7.8	*	31.44	2.48E-05	0.0042	0.27601	1.5E-04
Dichlorofluoromethane (Freon 12)	75-71-8	--	7.8	*	39.20	3.10E-05	0.0053	0.34419	NA
Ethylbenzene	100-41-4	54,000	7.8	*	34.42	2.72E-05	0.0046	0.30223	5.6E-04
Freon 113	76-13-1	960,000	7.8	*	60.76	4.80E-05	0.0082	0.53346	5.6E-05

See notes on last page.

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Table B-2. NYSDEC DAR-1 Air Modeling Data, Operational Year 10, Colesville Landfill, Broome County, New York.

Calculation of the Short-Term Guideline Concentration (SGC) for 9/28/2011 Monitoring Event

Compounds	CAS Numbers	Maximum Limit (SGC[1]) (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)[2] (ug/m^3)	Short Term Impact (Step III.A.5 in DAR-1)[2] (ug/m^3)	Percent of the SGC (%)
Freon 114	76-14-2	--	7.8	*	55.42	4.38E-05	0.0075	0.48660	NA
Methylene Chloride (Dichloromethane)	75-09-2	14,000	7.8	*	27.54	2.18E-05	0.0037	0.24182	1.7E-03
Methyl tert-butyl ether	1634-04-4	34,500[3]	7.8	*	28.58	2.26E-05	0.0039	0.25096	7.3E-04
o-Xylene	95-47-6	4,300	7.8	*	34.42	2.72E-05	0.0046	0.30223	7.0E-03
m,p-Xylene	108-38-3/106-42-3	4,300	7.8	*	33.77	2.67E-05	0.0046	0.29648	6.9E-03
Tetrachloroethene	127-18-4	1,000	7.8	*	53.78	4.25E-05	0.0073	0.47216	4.7E-02
Toluene	108-88-3	37,000	7.8	*	29.87	2.36E-05	0.0040	0.26229	7.1E-04
trans-1,2-dichloroethene	156-60-5	190,000[3]	7.8	*	31.45	2.49E-05	0.0042	0.27615	1.5E-04
Trichloroethene	79-01-6	14,000	7.8	*	42.61	3.37E-05	0.0058	0.37409	2.7E-03
Trichlorofluoromethane	75-69-4	9,000	7.8	*	44.55	3.52E-05	0.0060	0.39111	4.3E-03
Vinyl Chloride	75-01-4	180,000	7.8	*	20.27	1.60E-05	0.0027	0.17793	9.9E-05

Notes:

1. SGC refers to the Short-Term Guideline Concentration as determined using the hand calculations in the DAR-1 AGC/SGC Tables, revised October 18, 2010.
2. DAR-1 refers to DAR-1 AGC/SGC Tables revised October 18, 2010.
3. An SGC was not provided in the DAR-1 AGC/SGC Tables, revised October 18, 2010. An interim SGC was developed based on Section IV.A.2.b.1 of the guidance provided in the New York State DAR-1 Guidelines for the Control of Toxic Ambient Air Contaminants, 1991 edition. For compounds which are defined as moderate-toxicity compounds, the interim SGC = (smaller of Time Weighted Average [TWA] - Threshold Limit Value or TWA - Recommended Exposure Limit)/4.2. An interim SGC was developed for these compounds because they have moderate-toxicity ratings, as specified in the DAR-1 AGC/SGC Tables, revised October 18, 2010.

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; an interim SGC was not developed for these compounds because they have low toxicity ratings, as specified in the NYSDEC DAR-1 AGC/SGC tables revised October 18, 2010.

NA: Not applicable.

NS: No SGC listed; an interim SGC was not developed for this compound even though it has a moderate toxicity rating because there are no established exposure limits.

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Table B-3. NYSDEC DAR-1 Air Modeling Data, Operational Year 10, Colesville Landfill, Broome County, New York.

Calculation of AGC based on 9/28/2011 Monitoring Event

Compounds	CAS Numbers	Maximum Limit on C_a (AGC[1]) (ug/m^3)	Maximum Mass Flow Q_a (lb/yr)	Lab Data (ppb)	Detection Limit Used	Actual Emissions C_a (ug/m^3)	Actual Mass Flow per Hour (lb/hr)	Actual Mass Flow per Year (lb/yr)	**Percent of Annual** (%)
1,1,2,2-Tetrachloroethane	79-34-5	16	1,564.87	7.8	*	34.42	2.72E-05	0.23822	**0.02**
1,1,1-Trichloroethane	71-55-6	5,000	489,022.48	7.8	*	43.26	3.42E-05	0.29939	**0.00**
1,1,2-Trichloroethane	79-00-5	1.4	136.93	7.8	*	43.26	3.42E-05	0.29939	**0.22**
1,2,4-Trimethylbenzene	95-63-6	6.0	586.83	7.8	*	38.97	3.08E-05	0.26970	**0.05**
1,3,5-Trimethylbenzene	108-67-8	290	28,363.30	7.8	*	38.97	3.08E-05	0.26970	**0.00**
1,1-Dichloroethane	75-34-3	0.63	61.62	7.8	*	32.09	2.54E-05	0.22208	**0.36**
1,1-Dichloroethene (Vinylidene Chloride)	75-35-4	70	6,846.31	7.8	*	31.44	2.48E-05	0.21755	**0.00**
1,2-Dibromoethane[2]	106-93-4	0.0017	0.17	7.8	*	60.92	4.81E-05	0.42159	**253.56**
1,2-Dichlorobenzene	95-50-1	200	19,560.90	7.8	*	47.67	3.77E-05	0.32988	**0.00**
1,2-Dichloroethane	107-06-2	0.038	3.72	7.8	*	32.09	2.53E-05	0.22206	**5.97**
1,2-Dichloropropane	78-87-5	4.0	391.22	7.8	*	36.64	2.89E-05	0.25354	**0.06**
1,3-Dichlorobenzene	541-73-1	10	978.04	7.8	*	47.67	3.77E-05	0.32988	**0.03**
1,4-Dichlorobenzene	106-46-7	0.09	8.80	7.8	*	47.67	3.77E-05	0.32988	**3.75**
2-Propanol (Isopropyl alcohol)	67-63-0	7,000	684,631.48	31	*	77.45	6.12E-05	0.53599	**0.00**
Benzene	71-43-2	0.13	12.71	7.8	*	25.33	2.00E-05	0.17528	**1.38**
Bromomethane	74-83-9	5.0	489.02	7.8	*	30.79	2.43E-05	0.21306	**0.04**
Carbon Tetrachloride	56-23-5	0.17	16.63	7.8	*	49.88	3.94E-05	0.34521	**2.08**
Chlorobenzene	108-90-7	110	10,758.49	7.8	*	36.50	2.88E-05	0.25258	**0.00**
Chloroethane	75-00-3	10,000	978,044.97	31	*	83.15	6.57E-05	0.57541	**0.00**
Chloroform	67-66-3	0.043	4.21	7.8	*	38.71	3.06E-05	0.26791	**6.37**
Chloromethane	74-87-3	90	8,802.40	31	*	65.07	5.14E-05	0.45028	**0.01**
cis-1,2 - Dichloroethylene	156-59-2	63	6,161.68	7.8	*	31.44	2.48E-05	0.21755	**0.00**
Dichlorofluoromethane (Freon 12)	75-71-8	12,000	1,173,653.96	7.8	*	39.20	3.10E-05	0.27129	**0.00**
Ethylbenzene	100-41-4	1,000	97,804.50	7.8	*	34.42	2.72E-05	0.23822	**0.00**
Freon 113	76-13-1	180,000	17,604,809.41	7.8	*	60.76	4.80E-05	0.42047	**0.00**

See notes on last page.

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Table B-3. NYSDEC DAR-1 Air Modeling Data, Operational Year 10, Colesville Landfill, Broome County, New York.

Calculation of AGC based on 9/28/2011 Monitoring Event

Compounds	CAS Numbers	Maximum Limit on C_a (AGC[1]) (ug/m^3)	Maximum Mass Flow Q_a (lb/yr)	Lab Data (ppb)	Detection Limit Used	Actual Emissions C_a (ug/m^3)	Actual Mass Flow per Hour (lb/hr)	Actual Mass Flow per Year (lb/yr)	**Percent of Annual** (%)
Freon 114	76-14-2	17,000	1,662,676.44	7.8	*	55.42	4.38E-05	0.38354	**0.00**
Methylene Chloride (Dichloromethane)	75-09-2	2.1	205.39	7.8	*	27.54	2.18E-05	0.19060	**0.09**
Methyl tert-butyl ether	1634-04-4	3,000	293,413.49	7.8	*	28.58	2.26E-05	0.19780	**0.00**
o-Xylene	95-47-6	100	9,780.45	7.8	*	34.42	2.72E-05	0.23822	**0.00**
m,p-Xylene	108-38-3/106-42-3	100	9,780.45	7.8	*	33.77	2.67E-05	0.23369	**0.00**
Tetrachloroethene	127-18-4	1.0	97.80	7.8	*	53.78	4.25E-05	0.37216	**0.38**
Toluene	108-88-3	5,000	489,022.48	7.8	*	29.87	2.36E-05	0.20674	**0.00**
trans-1,2-dichloroethylene	156-60-5	63	6,161.68	7.8	*	31.45	2.48E-05	0.21766	**0.00**
Trichloroethene	79-01-6	0.5	48.90	7.8	*	42.61	3.37E-05	0.29486	**0.60**
Trichlorofluoromethane	75-69-4	5,000	489,022.48	7.8	*	44.55	3.52E-05	0.30828	**0.00**
Vinyl Chloride	75-01-4	0.11	10.76	7.8	*	20.27	1.60E-05	0.14025	**1.30**

Notes/Assumptions:

1. AGC refers to the Annual Guideline Concentration as determined using the hand calculations in the DAR-1 AGC/SGC Tables, revised October 18, 2010.
2. The currently available method detection limit exceeds the AGC for this compound resulting in a percent of AGC greater than 100 percent. However, 1,2-Dibromomethane has not been historically detected in the influent groundwater or effluent vapor sample and is therefore not considered a site-related constituent of concern.

ug/m^3: Micrograms per cubic meter.

lb/yr: Pounds per year.

lb/hr: Pounds per hour.

ppb: Parts per billion.

*: Analyte concentration below detection limit, detection limit was used in calculations.

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Appendix **C**

Automated Reagent Injection System

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Table C-1. Automated Reagent Injection System Summary of Operational Year 10 Injection Quantities, Groundwater Remediation System, Colesville Landfill, Broome County, New York.

Summary of Automated Reagant Injections

Date	Total Quantity of Mol-Whey Solution Injected (gal.)	Total Quantity of Mol-Whey Injected (gal.)	Total Quantity of Molasses Solution Injected (gal.)	Total Quantity of Molasses Injected (gal.)	Total Quantity of Rinse Water Injected (gal.)
5/1/2012	100,004	1,000	0	0	1300
Quarter Totals (gal.) =	**100,004**	**1,000**	**0**	**0**	**1,300**
Totals for Operational Year 10 (gal.) =	**100,004**	**1,000**	**0**	**0**	**1,300**
Totals Since Startup (gal.) =	**300,014**	**3,000**	**249,124**	**9,794**	**11,576**

Notes:

gal.	Gallons
mol-whey	Westway feed molasses-whey blend; product code 464-1128

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Table C-2. Automated Reagent Injection System, Operational Year 10, Quarter Numbers 3 and 4 Operating Parameters, Groundwater Remediation System, Colesville Landfill, Broome County, New York.

Injection Number 67

Injection Start Date =	4/11/2012		
Injection Completion Date =	5/1/2012		
Mol-Whey to Water Ratio (%) =	1.0	Programmed Mixing Time (min.)[1] =	30

Injection Well ID	Mol-Whey Solution Injection Quantity (gal.)	Rinse Quantity (gal.)	Raw Mol-Whey Per Well (gal.)	Min. Injection[2] Flowrate (gpm)	Max. Injection[2] Pressure (psi)
PW-6	1,934	20	19	NM	NM
IW-3	2,330	80	23	NM	NM
IW-1	2,330	80	23	NM	NM
IW-2	2,330	80	23	NM	NM
GMMW-1	2,330	80	23	NM	NM
IW-4	6,646	80	66	NM	NM
IW-5	6,646	80	66	NM	NM
IW-6	6,646	80	66	NM	NM
IW-7	6,646	80	66	NM	NM
IW-8	8,065	80	81	NM	NM
IW-9	8,065	80	81	NM	NM
IW-10	8,065	80	81	NM	NM
IW-11	8,065	80	81	NM	NM
IW-12	7,477	80	75	NM	NM
IW-13	7,477	80	75	NM	NM
IW-14	7,477	80	75	NM	NM
IW-15	7,477	80	75	NM	NM
Totals (gal.) =	100,004	1,300	1,000	NA	NA

Notes:

1. Programmed mixing time is calculated from the expiration time of the injection countdown timer to the startup of transfer pump TP-900 during an injection sequence or from the end of transfer pump TP-600 operation to the restart of an injection during a mixing sequence.
2. Parameter not measured due to SCADA malfunction.

gal. Gallons.
gpm Gallons per minute.
min. Minutes.
psi Pounds per square inch.
NA Not applicable.
NM Not measured.
SCADA Supervisory control and data acquisition.
mol-whey Westway feed molasses-whey blend; product code 464-1128.

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Table C-3. NYSDEC DAR-1 Air Modeling Data, Operational Year 10, Colesville Landfill, Broome County, New York.

Calculation of AGC based on 9/28/2011 Monitoring Event

Compounds	CAS Numbers	Maximum Limit on C_a (AGC[1]) (ug/m^3)	Maximum Mass Flow Q_a (lb/yr)	Lab Data (ppb)	Detection Limit Used	Actual Emissions C_a (ug/m^3)	Actual Mass Flow per Hour (lb/hr)	Actual Mass Flow per Year (lb/yr)	**Percent of Annual** (%)
1,1,2,2-Tetrachloroethane	79-34-5	16	1,564.87	7.8	*	34.42	2.72E-05	0.23822	**0.02**
1,1,1-Trichloroethane	71-55-6	5,000	489,022.48	7.8	*	43.26	3.42E-05	0.29939	**0.00**
1,1,2-Trichloroethane	79-00-5	1.4	136.93	7.8	*	43.26	3.42E-05	0.29939	**0.22**
1,2,4-Trimethylbenzene	95-63-6	6.0	586.83	7.8	*	38.97	3.08E-05	0.26970	**0.05**
1,3,5-Trimethylbenzene	108-67-8	290	28,363.30	7.8	*	38.97	3.08E-05	0.26970	**0.00**
1,1-Dichloroethane	75-34-3	0.63	61.62	7.8	*	32.09	2.54E-05	0.22208	**0.36**
1,1-Dichloroethene (Vinylidene Chloride)	75-35-4	70	6,846.31	7.8	*	31.44	2.48E-05	0.21755	**0.00**
1,2-Dibromoethane[2]	106-93-4	0.0017	0.17	7.8	*	60.92	4.81E-05	0.42159	**253.56**
1,2-Dichlorobenzene	95-50-1	200	19,560.90	7.8	*	47.67	3.77E-05	0.32988	**0.00**
1,2-Dichloroethane	107-06-2	0.038	3.72	7.8	*	32.09	2.53E-05	0.22206	**5.97**
1,2-Dichloropropane	78-87-5	4.0	391.22	7.8	*	36.64	2.89E-05	0.25354	**0.06**
1,3-Dichlorobenzene	541-73-1	10	978.04	7.8	*	47.67	3.77E-05	0.32988	**0.03**
1,4-Dichlorobenzene	106-46-7	0.09	8.80	7.8	*	47.67	3.77E-05	0.32988	**3.75**
2-Propanol (Isopropyl alcohol)	67-63-0	7,000	684,631.48	31	*	77.45	6.12E-05	0.53599	**0.00**
Benzene	71-43-2	0.13	12.71	7.8	*	25.33	2.00E-05	0.17528	**1.38**
Bromomethane	74-83-9	5.0	489.02	7.8	*	30.79	2.43E-05	0.21306	**0.04**
Carbon Tetrachloride	56-23-5	0.17	16.63	7.8	*	49.88	3.94E-05	0.34521	**2.08**
Chlorobenzene	108-90-7	110	10,758.49	7.8	*	36.50	2.88E-05	0.25258	**0.00**
Chloroethane	75-00-3	10,000	978,044.97	31	*	83.15	6.57E-05	0.57541	**0.00**
Chloroform	67-66-3	0.043	4.21	7.8	*	38.71	3.06E-05	0.26791	**6.37**
Chloromethane	74-87-3	90	8,802.40	31	*	65.07	5.14E-05	0.45028	**0.01**
cis-1,2 - Dichloroethylene	156-59-2	63	6,161.68	7.8	*	31.44	2.48E-05	0.21755	**0.00**
Dichlorofluoromethane (Freon 12)	75-71-8	12,000	1,173,653.96	7.8	*	39.20	3.10E-05	0.27129	**0.00**
Ethylbenzene	100-41-4	1,000	97,804.50	7.8	*	34.42	2.72E-05	0.23822	**0.00**
Freon 113	76-13-1	180,000	17,604,809.41	7.8	*	60.76	4.80E-05	0.42047	**0.00**

See notes on last page.

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Table C-3. NYSDEC DAR-1 Air Modeling Data, Operational Year 10, Colesville Landfill, Broome County, New York.

Calculation of AGC based on 9/28/2011 Monitoring Event

Compounds	CAS Numbers	Maximum Limit on C_a (AGC[1]) (ug/m^3)	Maximum Mass Flow Q_a (lb/yr)	Lab Data (ppb)	Detection Limit Used	Actual Emissions C_a (ug/m^3)	Actual Mass Flow per Hour (lb/hr)	Actual Mass Flow per Year (lb/yr)	**Percent of Annual** (%)
Freon 114	76-14-2	17,000	1,662,676.44	7.8	*	55.42	4.38E-05	0.38354	**0.00**
Methylene Chloride (Dichloromethane)	75-09-2	2.1	205.39	7.8	*	27.54	2.18E-05	0.19060	**0.09**
Methyl tert-butyl ether	1634-04-4	3,000	293,413.49	7.8	*	28.58	2.26E-05	0.19780	**0.00**
o-Xylene	95-47-6	100	9,780.45	7.8	*	34.42	2.72E-05	0.23822	**0.00**
m,p-Xylene	108-38-3/106-42-3	100	9,780.45	7.8	*	33.77	2.67E-05	0.23369	**0.00**
Tetrachloroethene	127-18-4	1.0	97.80	7.8	*	53.78	4.25E-05	0.37216	**0.38**
Toluene	108-88-3	5,000	489,022.48	7.8	*	29.87	2.36E-05	0.20674	**0.00**
trans-1,2-dichloroethylene	156-60-5	63	6,161.68	7.8	*	31.45	2.48E-05	0.21766	**0.00**
Trichloroethene	79-01-6	0.5	48.90	7.8	*	42.61	3.37E-05	0.29486	**0.60**
Trichlorofluoromethane	75-69-4	5,000	489,022.48	7.8	*	44.55	3.52E-05	0.30828	**0.00**
Vinyl Chloride	75-01-4	0.11	10.76	7.8	*	20.27	1.60E-05	0.14025	**1.30**

Notes/Assumptions:

1. AGC refers to the Annual Guideline Concentration as determined using the hand calculations in the DAR-1 AGC/SGC Tables, revised October 18, 2010.
2. The currently available method detection limit exceeds the AGC for this compound resulting in a percent of AGC greater than 100 percent. However, 1,2-Dibromomethane has not been historically detected in the influent groundwater or effluent vapor sample and is therefore not considered a site-related constituent of concern.

$ug/m^{3:}$ Micrograms per cubic meter.

lb/yr: Pounds per year.

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*: Analyte concentration below detection limit, detection limit was used in calculations.