

**Countywide Recycling & Disposal Facility
Ambient Air Monitoring
Monthly Report #17**

October 20, 2008

**To Fulfill the Requirements Set Forth in Order 5.A. of the Ohio EPA
Director's Findings and Orders Dated March 28, 2007**

**Republic Services of Ohio II, LLC
Countywide Recycling & Disposal Facility
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Monitoring Events #77 through 80

October 20, 2008

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1.0 INTRODUCTION

On behalf of Republic Services of Ohio II, LLC (Republic), Lawhon & Associates, Inc. (L&A) has been conducting ambient air sampling and analysis every six days beginning on Monday May 21, 2007, as mandated by Order 5.A. of the Ohio EPA Director's Findings and Orders dated March 28, 2007. This report summarizes the analytical results from the following Monitoring Events.

Event #77: Sampling conducted Monday August 25 to Tuesday August 26

Event #78: Sampling conducted Sunday August 31 to Monday September 01

Event #79: Sampling conducted Saturday September 6 to Sunday September 7

Event #80: Sampling conducted Friday September 12 to Saturday September 13

The sampling and analysis has been conducted at four community monitoring stations in accordance with the Task-Specific Quality Work Plan for Air Monitoring Activities, as amended. In August 2008, we continued to make incremental but significant changes to the community monitoring stations and sampling protocol in an effort to identify and (if possible) eliminate sources of variability that may have been contributing to anomalously high results for benzene and a few other VOCs. Recent major changes to the sample collection procedures are as follows:

- All four of the monitoring stations are secured in chain-link enclosures topped with razor wire;
- The Summa® canisters are now suspended from a wire strung across the enclosure in an inverted orientation with the sample port at approximately 2 meters above grade. This has allowed the elimination of tubing previously used at the inlet to achieve a collection height of two meters for the TO-15 samples; and
- The *Wetland* monitor has been moved from a temporary location on high ground off of Gracemont Street back to the low-lying, flood-prone public lands accessible from Dueber Avenue;
- The *Campground* monitor has been moved to the far (South) side of the gravel parking area farther away from the road;
 - Reportedly unused construction equipment and a petroleum storage tank are present within 100 feet of this monitor location f

- The **School** monitor has been relocated (twice) from the school roof. The monitor station is now in an area west of the tennis courts and north of the ballfield;
- The sampling schedule has been provided to the Countywide maintenance and operations personnel so that they might better ensure that maintenance activities (e.g., lawn mowing, etc.) are not conducted in the vicinity of the **Cell Tower** when sampling is occurring;
- Beginning with Event #75 on August 13/14, an additional Summa canister is co-located at one of the four monitoring sites. The co-located sample location is rotated amongst the four monitoring sites on a pre-determined schedule;
- L&A has replaced the sampling unit tubing with new Teflon® tubing to the extent practical; and
- L&A has implemented rigorous requirements for handling remaining tubing used in the sampling devices to minimize the potential for introducing contamination during transport of the equipment.

As specified by the Ohio EPA in Bryan Zima's March 28, 2007, letter to Jason Perdion of Baker & Hostetler, air samples were analyzed for the following groups of compounds:

- Volatile Organic Compounds (VOCs): EPA Method TO-15 modified with Tentatively Identified Compounds (TICs)
- Sulfur Compounds: EPA Method TO-15 modified
- Aldehydes and Ketones: EPA Method TO-11A
- Hydrogen Fluoride and Hydrogen Chloride: NIOSH Method 7903

The EPA Method TO-15 Modified analyses were performed by Test America Laboratories, Inc. 5815 Middlebrook Pike, Knoxville, TN 37921. The EPA Method TO-11A and NIOSH Method 7903 were performed by Integrated Analytical Laboratory (IAL), Randolph, NJ. Certification numbers: ELAP-11402; NJDEP-14751; AIHA-100201.

In order to identify conditions that may be of potential concern, results from the community monitoring are compared to conservative risk-based concentrations for chemicals in air in non-occupational settings. The most conservative (lowest) value against which data were compared is the respective USEPA Region 9 Preliminary Remediation Goals (PRGs). In addition, the found values of individual constituents were also compared to the Agency for Toxic Substances and Disease Registry (ATSDR) Minimum Risk Levels (MRLs) and the Ohio EPA's Air Toxics Policy Maximum Acceptable Ground Level Concentrations (MAGLCs). The differences between these screening levels are briefly discussed below.

The USEPA Region 9 PRG is the concentration of a chemical in the ambient air that is estimated to be without significant risk to a person who would breathe that level of chemical continuously over many decades. The Region 9 PRGs are derived using conservative mathematical formulas and do not represent the level of a chemical in the air (or other environmental media) where health effects are likely to occur. Region 9 PRGs

are generally accepted as conservative screening values, such that if the concentration of a chemical in the air is less than the corresponding PRG, most public health officials and regulators are confident that there is no risk to human health. On the other hand, an analytical result that exceeds the corresponding PRG does not mean that there is an unacceptable risk to public health.

The chemicals that are detected in the community monitoring events are commonly found at low levels in ambient air. For some compounds such as benzene, the mathematically-derived Region 9 PRG of 0.25 ug/m³ is lower than the average background concentration of 1.96 ug/m³ in ambient air in Ohio (Ohio EPA, *Portsmouth Ohio Air Quality Study 2003*). Consequently, finding certain chemicals in ambient air at levels above PRGs that are very close to analytical detection limits is not uncommon and may simply reflect fluctuations in background sources. It should be noted that not all of the compounds found in the air samples have corresponding PRGs.

Analytical results for VOCs are also compared to the ATSDR Acute and Chronic Minimum Risk Levels (MRLs) where available. An MRL is an estimate of the daily human exposure to a hazardous substance that is likely to be without appreciable risk of adverse non-cancer health effects over a specified duration of exposure. L&A has also compared the concentrations of VOCs detected at the site against the Ohio EPA MAGLCs – screening level concentrations developed using Ohio EPA's air toxics policy by adjusting published occupational health values to 24-hr and 7-day per week exposure and adding a level of conservatism to adjust for sensitive populations. PRGs, MRLs, and MAGLCs are useful screening levels that assist risk assessors in identifying those chemicals that may pose a health concern. PRGs, MRLs, and MAGLCs do not represent levels of exposure that have been documented to cause actual health effects.

Constituents that were detected below PRGs, MRLs, or MAGLCs will not be further discussed unless those particular results help to explain other findings.

Ambient environmental/climate conditions are discussed in Section 2.0. Results of the monitoring are discussed in Section 3.0 and summarized in Section 4.0 of this report. Analytical results from the laboratory are provided in the Appendices.

2.0 AMBIENT CONDITIONS

The descriptions of ambient conditions are taken from the Daily Odor Monitoring Summary compiled by Countywide's consultant, Diversified Engineering.

Event #77: Monday August 25 to Tuesday August 26

August 25: Average temperature in degrees F: 71, Max. 82, Min. 59.

Winds were 4 mph with max gusts of 17 mph out of the NE.

Average relative humidity 66% with no precipitation recorded.

Complaints: There were no odor complaints during this time.

August 26: Average temperature in degrees F: 67, Max. 84, Min. 50

Winds were 2 mph with max gusts of 18 mph out of the E.

Average relative humidity 58% with no precipitation recorded.

Complaints: There were no odor complaints during this time.

Event #78: Sunday August 31 to Monday September 01

August 31: Average temperature in degrees F: 70, Max. 87, Min. 53.

Winds were calm with max gusts of 16 mph out of the E.

Average relative humidity 73% with no precipitation recorded.

Complaints: There were no odor complaints during this time.

September 1: Average temperature in degrees F: 70, Max. 89, Min. 52

Winds were calm with a max speed of 12 mph out of the SE.

Average relative humidity 63% with 0.01 inches of precipitation recorded.

Complaints: There were no odor complaints during this time.

Event #79: Saturday September 6 to Sunday September 7

September 6: Average temperature in degrees F: 64, Max. 73, Min. 55.

Winds were 4 mph with max gusts of 22 mph out of the N.

Average relative humidity 80% with no precipitation recorded.

Complaints: There were no odor complaints during this time.

September 7: Average temperature in degrees F: 64, Max. 77, Min. 52

Winds were 1 mph with a max speed of 8 mph out of the WNW.

Average relative humidity 83% with 0.01 inches of precipitation recorded.

Complaints: There were no odor complaints during this time.

Event #80: Friday September 12 to Saturday September 13

September 12: Average temperature in degrees F: 69, Max. 71, Min. 66.

Winds were 8 mph with max gusts of 24 mph out of the SW.

Average relative humidity 92% with 0.90 inches of precipitation recorded.

Complaints: There were no odor complaints during this time.

September 13: Average temperature in degrees F: 74, Max. 80, Min. 68

Winds were 8 mph with max gusts of 20 mph out of the S.

Average relative humidity 86% with 1.61 inches of precipitation recorded.

Complaints: There were no odor complaints during this time.

3.0 ANALYTICAL RESULTS

The laboratory analyzed the air samples for a large number of constituents. Analytical summaries are provided in the Appendix. Only those results that exceed Region 9 PRGs, ATSDR MRLs, or Ohio Air Toxics Policy MAGLCs will be discussed in the body of this report as constituent present at concentrations below these levels are not considered to be of concern.

Prevailing wind direction for each monitoring station relative to the landfill is designated as:

C: Crosswind
D: Downwind
U: Upwind

Wind direction is indicated for the first and second days of the monitoring event separated by /.

3.1 Volatile Organic Compounds

Compounds detected by Method TO-15 Modified (TO-15M) and present at concentrations above PRGs are summarized in Tables 1 through 6. TO-15M analyzes air samples collected in a summa canister for the presence of an extensive list of volatile organic compounds. In addition to a "standard analyte" list, we have requested that the laboratory tentatively identify and estimate the concentration of numerous compounds that are not on the "standard" list. These Tentatively Identified Compounds (TICs) include some compounds for which there are other specific analytical methods, such as acetaldehyde which is a target analyte for EPA Method TO-11A (TO-11A). All of the TO-15M analyses presented in this monthly report were performed by Test America. Laboratory data reports are provided in the Appendices. The QA/QC packages from Test America are not included in the Appendices because of their large size but can be made available upon request. L&A's QA/QC team is in the process of reviewing and validating the data presented in this report. Any unusual findings will be addressed as an addendum.

It should be noted that the EPA Method TO-15 Target Analyte List used by Test America includes several compounds that Integrated Analytical Laboratories reports as Tentatively Identified Compounds (TICs). On the other hand Test America quantifies fewer TICs than Integrated Analytical.

Only VOCs that were detected at concentrations exceeding the respective Region 9 PRG (most conservative screening level) in one or more samples during a monitoring event are presented in the summary tables that follow. The results from the analytical laboratory can be found in the Appendices.

Event #77: Monday August 25 to Tuesday August 26

Analytical results are summarized in Table 1 and provided in Appendix A.

Event #77: VOCs Detected Above PRGs. Concentrations in ug/m³

Compound	Acute MRL	Chronic MRL	MAGLC	PRG	School	Cell Tower	Camp ground	C-Loc Camp ground	Wetland
Relative Wind Direction					D/C	D/C	U/C	U/C	C/U
Benzene	29	10	80 (8)	0.25	0.50	2.6	0.55J	1.2	0.31J
Carbon tetrachloride	188	188	1498 (299)	0.13	0.56J	0.72J	0.70J	0.60J	0.51J
Chloroform	488	98	232	0.083	ND	3.1	ND	0.42J	ND
Tetrahydrofuran	NA	NA	2101	0.99	ND	1.7J	ND	0.88J	ND

() MAGLC calculated using NIOSH value

Wind Direction Relative to Landfill:

Bold indicates result exceeded Region 9 PRG

Laboratory Data Qualifiers

B = Compound was detected in the blank

J = Estimated concentration below laboratory reporting limit

Event #78: Sunday August 31 to Monday September 01

Analytical results are summarized in Table 2 and provided in Appendix B.

Event #78: VOCs Detected Above PRGs. Concentrations in ug/m³

Compound	Acute MRL	Chronic MRL	MAGLC	PRG	School	Cell Tower	Camp ground	Wetland	Co-loc Wetland
Relative Wind Direction					C/C	D/C	C/C	U/C	
Benzene	29	10	80 (8)	0.25	0.47J	2.2	0.87	0.66	0.86
Carbon tetrachloride	188	188	1498 (299)	0.13	0.43J	0.53J	0.51J	0.59J	0.52J
Chloroethane	39583	NA	63810	2.3	0.33J	0.98	ND	ND	0.44J
Chloroform	488	98	232	0.083	0.26J	0.58J	ND	0.20J	0.59J

() MAGLC calculated using NIOSH value

Bold indicates result exceeded Region 9 PRG

Laboratory Data Qualifiers:

B = Compound was detected in the blank

J = Estimated concentration below laboratory reporting limit

Event #79: Saturday September 6 to Sunday September 7

Analytical results are summarized in Table 3 and provided in Appendix C.

Event #79: VOCs Detected Above PRGs. Concentrations in ug/m³

Compound	Acute MRL	Chronic MRL	MAGLC	PRG	School	Cell Tower	Co-loc Cell Tower	Camp ground	Wet land
Relative Wind Direction					D/C	D/C		U/C	C/D
Benzene	29	10	80 (8)	0.25	0.78	0.75	0.64	0.58J	0.40J
Carbon tetrachloride	188	188	1498 (299)	0.13	0.62J	0.93J	0.62J	0.51J	0.62J
Chloroform	488	98	232	0.083	0.27J	0.55J	0.64J	ND	0.64J
Tetrachloroethene	1356	271	5155	0.32	ND	ND	3.3	ND	3.3

() MAGLC calculated using NIOSH value

Bold indicates result exceeded Region 9 PRG

Laboratory Data Qualifiers:

B = Compound was detected in the blank

J = Estimated concentration below laboratory reporting limit

Event #80: Friday September 12 to Saturday September 13

Analytical results are summarized in Table 4 and provided in Appendix D.

Event #80: VOCs Detected Above PRGs. Concentrations in ug/m³

Compound	Acute MRL	Chronic MRL	MAGLC	PRG	School	Co-loc School	Cell Tower	Camp ground	Wet land	
Relative Wind Direction					U/C			U/C	D/D	C/C
Benzene	29	10	80 (8)	0.25	0.96B	1.0B	4.3B	0.73B	0.63B	
Carbon tetrachloride	188	188	1498 (299)	0.13	0.77J	0.70J	0.67J	0.71J	0.81J	
Chloroform	488	98	232	0.083	0.32J	0.30J	ND	0.19J	0.33J	
Tetrachloroethene	1356	271	5155	0.32	ND	1.8	ND	ND	ND	

() MAGLC calculated using NIOSH value

Bold indicates result exceeded Region 9 PRG

Laboratory Data Qualifiers:

B = Compound was detected in the blank

J = Estimated concentration below laboratory reporting limit

3.2 Sulfur Compounds

Carbon disulfide was the only sulfur compound detected during the five rounds of sampling reviewed in this report. All detections were extremely low concentrations and are included on the TO-15M Summary Tables.

3.3 Aldehydes and Ketones

In order to obtain a continuous 24 hours of data, three separate gel collection tubes were sequentially exposed to ambient air for a period of approximately 8-hours each. Consequently there are three separate sample results for each location for each monitoring event. Analysis for aldehydes and ketones by TO-11A was performed by Integrated Analytical Laboratories.

Event #77: Monday August 25 to Tuesday August 26

The laboratory report is in Appendix A.

Event #77: Aldehydes. Concentrations in ug/m³

Aldehyde	Acute MRL ¹	Chronic MRL ¹	MAGL C	PR G	School			Cell Tower			Campground			Wetland		
					1	2	3	1	2	3	1	2	3	1	2	3
Formaldehyde	50	10	22 (0.47)	0.15	NR	2.4	0.95	17	31	4.7	5.4	15	2.3	6.9	20	1.0
Acetaldehyde	NA	NA	8571	0.87	NR	1.2	0.76	3.5	6.2	2.1	1.4	3.3	1.3	1.9	6.1	0.91

ATSDR Minimal Risk Levels (MRL) (ATSDR Toxicological Profile for Formaldehyde, July 1999)

Acute MRL 0.04 ppm = 50 ug/m³; Chronic MRL 0.008 ppm=10 ug/m³

NA: Not available

NR: No result available

*Breakthrough from front to back of tube. i.e. (10% or more of the mass of the compound found in the front section of the tube was detected in the back section of the tube).

Event #78: Sunday August 31 to Monday September 01

The laboratory report is in Appendix B.

Event #78: Aldehydes. Concentrations in ug/m³

Aldehyde	Acute MRL ¹	Chronic MRL ¹	MAGLC	PRG	School			Cell Tower			Campground			Wetland		
					1	2	3	1	2	3	1	2	3	1	2	3
Formaldehyde	50	10	22 (0.47)	0.15	12	13	3.2	35	35	11	30	20	5.7	14	25	8.2
Acetaldehyde	NA	NA	8571	0.87	1.5	3.6	1.2	9.2	9.1	3.8	7.8	6.1	2.4	4.6	3.0	1.9

ATSDR Minimal Risk Levels (MRL) (ATSDR Toxicological Profile for Formaldehyde, July 1999)

Acute MRL 0.04 ppm = 50 ug/m³; Chronic MRL 0.008 ppm=10 ug/m³

NA: Not available

*Break through from front to back of sorbent tube (i.e. 10% or more of the mass of the compound found in the front section of the tube was detected in the back section of the tube).

Event #79: Saturday September 6 to Sunday September 7

The laboratory report is in Appendix C.

Event #79: Aldehydes. Concentrations in ug/m³

Aldehyde	Acute MRL ¹	Chronic MRL ¹	MAGLC	PRG	School			Cell Tower			Campground			Wetland		
					1	2	3	1	2	3	1	2*	3	1*	2	3
Formaldehyde	50	10	22 (0.47)	0.15	7.6	5.2	2.9	1.1	ND	0.47	5.6	2.7	1.7	12	11	5.5
Acetaldehyde	NA	NA	8571	0.87	1.3	1.2	0.92	0.57	ND	ND	0.88	ND	ND	3.4	2.9	1.1

ATSDR Minimal Risk Levels (MRL) (ATSDR Toxicological Profile for Formaldehyde, July 1999)

Acute MRL 0.04 ppm = 50 ug/m³; Chronic MRL 0.008 ppm=10 ug/m³

*Break through from front to back of sorbent tube (i.e. 10% or more of the mass of the compound found in the front section of the tube was detected in the back section of the tube).

Event #80: Friday September 12 to Saturday September 13

The laboratory report is in Appendix D.

Event #80: Aldehydes. Concentrations in ug/m³

Aldehyde	Acute MRL ¹	Chronic MRL ¹	MAGLC	PRG	School			Cell Tower			Campground			Wetland		
					1	2	3	1*	2*	3	1	2	3	1*	2*	3*
Formaldehyde	50	10	22 (0.47)	0.15	8.8	4.1	2.6	14	15	4.9	6.1	6.6	5.0	18	15	10
Acetaldehyde	NA	NA	8571	0.87	1.6	1.2	0.87	3.1	3.6	1.4	1.5	1.6	1.5	3.6	3.9	3.2

ATSDR Minimal Risk Levels (MRL) (ATSDR Toxicological Profile for Formaldehyde, July 1999)

Acute MRL 0.04 ppm = 50 ug/m³; Chronic MRL 0.008 ppm=10 ug/m³

*Break through from front to back of sorbent tube (i.e. 10% or more of the mass of the compound found in the front section of the tube was detected in the back section of the tube).

3.4 Hydrogen Chloride and Hydrogen Fluoride

As with the aldehyde and ketone samples, three separate gel collection tubes were sequentially exposed to ambient air for a period of approximately 8-hours each. Consequently there are three separate sample results for each location for each monitoring event. The concentrations of HF and HCl in the air are quantified based on the mass of fluoride and chloride ion captured on the gel inside the tubes and the volume of air that was passed through the tube. Analytical results for sampling events #77 through #80 are summarized below.

Event #77: Monday August 25 to Tuesday August 26

Event #77: Hydrogen Fluoride and Hydrogen Chloride. Concentrations in ug/m3

Compound	MAGLC	PRG	School			Cell Tower			Campground			Wetland		
			1	2	3	1	2	3	1	2	3	1	2	3
HF	59	NA	NA	12	3.7	13	21*	9.7	11	9	7.6	20*	23*	4.3
HCl	177	21	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

* Denotes breakthrough from the front to the back of the sorbent tube.

Event #78: Sunday August 31 to Monday September 01

Event #78: Hydrogen Fluoride and Hydrogen Chloride. Concentrations in ug/m3

Compound	MAGLC	PRG	School			Cell Tower			Campground			Wetland		
			1	2	3	1	2	3	1	2	3	1	2	3
HF	59	NA	ND	6	ND	18	12	ND	12	7.5	6.5	8.4	8.3	5.3
HCl	177	21	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

Event #79: Saturday September 6 to Sunday September 7

Event #79: Hydrogen Fluoride and Hydrogen Chloride. Concentrations in ug/m3

Compound	MAGLC	PRG	School			Cell Tower			Campground			Wetland		
			1	2	3	1	2	3	1	2	3	1	2	3
HF	59	NA	8.1	4.9	ND	ND	ND	ND	ND	ND	ND	10	6.6	4.8
HCl	177	21	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

Event #80: Friday September 12 to Saturday September 13

Event #80: Hydrogen Fluoride and Hydrogen Chloride. Concentrations in ug/m3

Compound	MAGLC	PRG	School			Cell Tower			Campground			Wetland		
			1	2	3	1	2	3	1	2	3	1	2	3*
HF	59	NA	9.1	4.8	ND	6.4	4.3	4.2	5.1	ND	7.0	6.2	6.5	12
HCl	177	21	ND	ND	ND	ND	3.1	ND	ND	ND	ND	ND	ND	ND

4.0 SUMMARY

4.1 Volatile Organic Compounds

Only six VOCs (benzene, chloroform, chloroethene, tetrachloroethene, carbon tetrachloride, tetrahydrofuran) were detected at low levels with a small amount of variability, as expected due to sampling and analytical laboratory-variability at such very low concentrations. These six constituents were the only VOCs with concentrations that exceeded the respective PRG for even one sample result. None of the VOCs exceeded any MRL nor MAGLC.

Even those VOCs whose concentration exceeded Region 9 PRGs, have PRG values that are very near or in some cases below the reporting limit for the analytical laboratory for that constituent. Consequently, almost any quantifiable detection of the constituent will exceed the highly conservative Region 9 PRG.

None of these compounds were found at levels even approaching the ATSDR Chronic MRLs or MAGLCs, except for benzene. All of these constituents were detected at concentrations that are very close to the laboratory reporting limit.

Benzene was present in almost all samples at very low concentrations that were above the Region 9 PRG but below the ATSDR chronic MRL or the MAGLC.

All of the benzene and other VOC concentrations measured during the monitoring events were within the range of background levels reported in the literature and by other investigators. As mentioned in previous Monthly Reports, there are numerous local and area sources of benzene and related compounds, including lawn mowing, emissions from the heavy equipment working on the nearby expansion area of the landfill, motor vehicles near the monitoring equipment, the Marathon refinery on the south side of Canton, and the landfill.

None of the results exhibited the variability seen in samples collected from September 2007 through July 2008. The adjustments made to the sampling apparatus and protocol have continued to eliminate the variability in the benzene/VOC analyses.

4.2 Aldehydes (Carbonyl Compounds)

Formaldehyde and acetaldehyde (less frequently) were detected at all sampling locations. The Region 9 PRGs for formaldehyde (0.15 ug/m^3) and acetaldehyde (0.87 ug/m^3) are very close to the laboratory reporting limits for these chemicals. Consequently, almost any measurable levels of formaldehyde and acetaldehyde exceed the respective Region 9 PRG.

The concentrations of both formaldehyde and acetaldehyde measured during late August through mid September were higher than recorded during the winter and spring months.

On some occasions, one or more of the individual sample tubes from a given monitoring location were reported to contain concentrations of formaldehyde exceeding the ATSDR Chronic MRL for this compound. However, the concentrations were within the ranges reported from various studies summarized in the ATSDR Toxicological Profile for Formaldehyde. Neither of these constituents is present at a level that exceeds its respective MAGLC.

The reason(s) for measuring these somewhat higher levels of aldehydes (as compared to previous months) may be associated with higher-than-typical automobile exhaust emissions or higher than typical refinery emissions combined with direction changes. Other sources of aldehyde emissions include power plant exhaust, building materials, smoking, and manufacturing facilities. There may be some contribution to the increase associated with the weather in that August and September had hot, dry weather and is part of the peak of ozone season.

4.3 Hydrogen Fluoride and Hydrogen Chloride

Low concentrations of these two inorganic acids were found sporadically at all monitoring locations. Hydrogen fluoride was detected more frequently than hydrogen chloride. As with the aldehydes, there were no apparent differences in the concentrations detected in upwind vs. downwind locations with respect to the landfill. The occasional low levels of HF and HCl detected in the ambient air do not present a risk to public health and are not clearly related to any single source.

4.4 Sampling and Laboratory Issues

With the exception of contamination noted in the Method TO-15 Blank for Event #80, and occasional breakthrough issues with the HF and HCl sorbent tubes, no major sampling or laboratory issues have been identified as of the date of this report that would alter the conclusions based upon the monitoring results presented here. Results from the co-located (duplicate) TO-15 samples were similar for all locations and events.

5.0 CONCLUSIONS

The apparently-random sources of anomalously high benzene concentrations encountered in the results of samples collected from October 2007 through July 2008 have apparently been eliminated by altering the sampling apparatus and sampling protocols for the community monitoring. Thus, we have great confidence in the results provided in this monthly report. Our specific conclusions are summarized below:

- The levels of benzene recorded at the community monitoring locations during late August through mid-September are very low and well within concentrations typical of Ohio ambient air background as reported by Ohio EPA (Portsmouth Ohio Air Quality Study, 2003).
- None of the results for benzene exceeded the health-based ATSDR Chronic MRL (or the Acute MRL), nor the Ohio EPA Air Toxics Policy MAGLC. No other VOC approached or exceeded the corresponding ATSDR Chronic or Acute MRL.
- Because there are numerous local and regional sources of VOCs, it is expected that many of these compounds will continue to be detected at low levels in the community monitoring program.
- There are no apparent trends for the concentrations of detected compounds with respect to whether the monitoring location was upwind or downwind of the landfill during the monitoring event.
- The concentrations of formaldehyde and acetaldehyde reported during late August through mid-September are somewhat higher than those reported during the winter and spring months. The increases are apparently due to non-landfill sources such as vehicle exhaust or refinery emissions in that the increases are not accompanied by increases to other constituents known to be associated with landfill gas emissions. It is also possible that increases are related to the hot dry weather conditions typical of the summer ozone season.
- The results presented in this Monthly Report #17 support our conclusions that the occurrence of low levels of VOCs, aldehydes, and inorganic acids in the air of the community surrounding Countywide reflect local and regional sources and typical background levels; and that the levels of these constituents present in the ambient air do not represent either an immediate or long-term threat to public health as a result of emissions from the Countywide landfill.

**Countywide Recycling & Disposal Facility
Ambient Air Monitoring
Monthly Report #17**

October 20, 2008

EPA Method TO-15 SUMMARY TABLES

- Table 1. Event #77: Sampling conducted Monday August 25 to Tuesday August 26**
- Table 2. Event #78: Sampling conducted Sunday August 31 to Monday September 01**
- Table 3. Event #79: Sampling conducted Saturday September 6 to Sunday September 7**
- Table 4. Event #80: Sampling conducted Friday September 12 to Saturday September 13**

Countywide Recycling & Disposal Facility									
EPA Method TO-15 Modified: Volatile Organic Compounds									
Table 1: Event #77 August 25/26, 2008									
Analyte	Monitoring Location								
	School		Cell Tower		Campground		Wetland		
	Downwind / Cross	Downwind / Cross	Upwind / Cross	Upwind / Cross	Co-located	Crosswind / Up			
All results in ug/m3									
Method TO-15 Modified	Acute MRL	Chronic MRL	MAGLC	PRG					
Acetone	61762	30881	14405	3300	14	110	21	24	9.9J
Benzene	29	10	80 (8)	0.25	0.5J	2.6	0.55J	1.2	0.31J
tert-Butyl alcohol	NA	NA	7214	NA	0.34J	5.7J	0.53J	1.2J	0.29J
Carbon disulfide	NA	934	75	730	0.18J	1.5J	ND	0.64J	ND
Carbon tetrachloride	188	188	1498 (299)	0.13	0.56J	0.72J	0.70J	0.60J	0.51J
Chloroform	488	98	232	0.083	ND	3.1	ND	0.42J	ND
Chloromethane	1033	103	5000	95	1.7	1.7J	1.9	1.8	1.3
Cyclohexane	NA	NA	25000	6200	ND	23	ND	3	ND
Dichlorodifluoromethane	NA	NA	119762	210	2.3	3.6	2.8	2.9	2.4
1,2-Dichloroethane			19619		ND	2.3	ND	0.42J	ND
1,2-Dichloropropane			8250		ND	1.0J	ND	0.26J	ND
Ethylbenzene	43419	1303	10500	1100	ND	12	ND	1.7	ND
4-Ethyltoluene	NA	NA	NA	NA	ND	2	ND	ND	ND
Heptane	NA	NA	8439	NA	0.64J	7.2	0.97J	1.5j	0.49J
Hexane	NA	2115	4262	210	0.55J	7.3	0.63J	1.7J	0.47J
Methyl ethyl ketone	NA	NA	14286	5100	1.5J	92	3.7	13	1.5J
Methyl isobutyl ketone	NA	NA	10024	3100	ND	2.0J	0.32J	0.46J	ND
Methylene chloride	2084	1042	2101	4.1	0.71JB	12B	0.67JB	8.7	1.3JB
Styrene	8520	852	5155	1100	ND	17	ND	1.8	ND
Tetrahydrofuran	NA	NA	14286	0.99	ND	1.7J	ND	0.88	ND
Toluene	3768	301	9119	400	1.4	120	1.4	24	0.84
1,1,2-Trichloro-1,2,2-trifluoroethane	NA	NA	182619	NA	0.56J	0.60J	0.68J	0.58J	0.54J
Trichlorofluoromethane	NA	NA	136190	730	1.5	3.0	1.7	2.4	1.5
1,2,4-Trimethylbenzene	NA	NA	2976	6.2	ND	4.7	0.31J	0.85J	ND
1,3,5-Trimethylbenzene	NA	NA	2976	6.2	ND	1.6J	ND	ND	ND
2,2,4-Trimethylpentane	NA	NA	NA	NA	ND	1.3J	ND	0.32J	ND
Vinyl Chloride	1278	77	62	0.11	ND	ND	ND	ND	ND
m/p-Xylene	8687	8687	10500	110	0.72J	26	0.56J	3.6	ND
o-Xylene	8687	8687	10500	110	ND	9.6	ND	1.3	ND
Tentatively Identified Compounds									
Heptane, 3-methylene	NA	NA	NA	NA	N	N	N	N	N
1-Propene-2-methyl	NA	NA	NA	NA	N	N	N	N	N
Butanal	NA	NA	NA	NA	N	N	N	N	N
Octane	NA	NA	NA	NA	N	N	N	N	N
Propene	NA	NA	NA	NA	N	N	N	N	N
Ethyl alcohol	NA	NA	NA	NA	N	Y	N	N	N
Limonene	NA	NA	NA	NA	N	Y	N	N	N
Butane, 2-Methyl-	NA	NA	NA	NA	N	N	N	Y	N
Laboratory Data Qualifiers:					ND = Not Detected				
B = Compound present in blank					NA = Not Available				
J = Estimated concentration below laboratory reporting limit					Bold indicates result exceeds Region 9 PRG				
D = Dilution					Shading indicates result exceeds ATSDR MRL				
E = Exceeds calibration range of instrument									
TICs: Compound has been tentatively identified but the estimated concentration is highly uncertain.									

Countywide Recycling & Disposal Facility

EPA Method TO-15 Modified: Volatile Organic Compounds

Table 2: Event #78 August 31/September 01, 2008

Analyte	Monitoring Location								
	School		Cell Tower		Campground		Wetland		Co-located
	Crosswind / Cross	Downwind / Cross	Crosswind / Cross	Downwind / Cross	Crosswind / Cross	Upwind / Cross			
All results in ug/m3									
Method TO-15 Modified	Acute MRL	Chronic MRL	MAGLC	PRG					
Acetone	61762	30881	14405	3300	22	22	15	13	15
Benzene	29	10	80 (8)	0.25	0.47J	2.2	0.87	0.66	0.86
Bromomethane	194	19	1852	5.2	ND	ND	ND	ND	ND
1,3-Butadiene	NA	NA	54	0.061	ND	ND	ND	ND	ND
tert-Butyl alcohol	NA	NA	7214	NA	0.69J	0.72	0.39J	0.45J	0.46J
Carbon disulfide	NA	934	75	730	0.39J	0.39J	0.16J	0.31J	0.20J
Carbon tetrachloride	188	188	1498 (299)	0.13	0.43J	0.53J	0.51J	0.59J	0.52J
Chloroethane	39583	NA	63810	2.3	0.33J	0.98	ND	ND	0.44J
Chloroform	488	98	232	0.083	0.26J	0.58J	ND	0.20J	0.59J
Chloromethane	1033	103	5000	95	1.9	3.3	1.2	1.0J	2.2
Cyclohexane	NA	NA	25000	6200	0.34J	0.31J	0.33J	0.16J	0.25J
Dichlorodifluoromethane	NA	NA	119762	210	2.3	2.4	2.3	2.3	2.4
Ethylbenzene	43419	1303	19619	1100	ND	0.31J	ND	ND	ND
4-Ethyltoluene	NA	NA	8250	NA	ND	ND	ND	ND	ND
Heptane	NA	NA	10500	NA	ND	0.69J	0.88J	0.48J	0.46J
Hexane	NA	2115	NA	210	1.3J	0.97J	0.99J	0.62J	0.93J
Methyl ethyl ketone	NA	NA	8439	5100	2.0J	3.1	2.3J	2.2J	2.0J
Methyl isobutyl ketone	NA	NA	4262	3100	ND	ND	ND	ND	ND
Methylene chloride	2084	1042	14286	4.1	1.1JB	1.4JB	0.83JB	0.81JB	1.1JB
Styrene	8520	852	10024	1100	ND	ND	ND	ND	ND
Tetrahydrofuran	NA	NA	2101	0.99	ND	0.98J	ND	ND	ND
Tetrachloroethene	1356	271	5155	0.32	ND	ND	ND	ND	ND
Toluene	3768	301	14286	400	0.43	1.8	1.5	1.3	1.1
1,1,1-Trichloroethane	10912	3819	9119	2300	ND	ND	ND	ND	ND
1,1,2-Trichloro-1,1,2-trifluoroethane	NA	NA	182619	NA	0.58J	0.58J	0.60J	0.61J	0.62J
Trichlorofluoromethane	NA	NA	136190	730	1.3	1.3	1.3	1.2	1.3
1,2,4-Trimethylbenzene	NA	NA	2976	6.2	ND	ND	0.33J	ND	0.34J
1,3,5-Trimethylbenzene	NA	NA	2976	6.2	ND	ND	ND	ND	ND
2,2,4-Trimethylpentane	NA	NA	NA	NA	ND	0.21J	0.22J	ND	ND
Vinyl Chloride	1278	77	62	0.11	ND	ND	ND	ND	ND
m/p-Xylene	8687	8687	10500	110	ND	0.72J	0.63J	ND	ND
o-Xylene	8687	8687	10500	110	ND	ND	ND	ND	ND
Tentatively Identified Compounds									
Cyclopropane, ethyl	NA	NA	NA	NA	N	N	N	N	N
Propene	NA	NA	NA	NA	N	N	N	N	N
1-Propene, 2-methyl	NA	NA	NA	NA	N	N	N	N	N
Propane	NA	NA	NA	NA	N	N	N	Y	N
Laboratory Data Qualifiers									
B Compound was present in the blank					ND = Not Detected				
J Estimated concentration					NA = Not Available				
D Dilution					Bold indicates result exceeds Region 9 PRG				
E Exceeds calibration range					Shading indicates result exceeds ATSDR MRL				
TICs: Compound has been tentatively identified but the estimated concentration is highly uncertain.									

Countywide Recycling & Disposal Facility

EPA Method TO-15 Modified: Volatile Organic Compounds

Table 3: Event # 79 September 06/07, 2008

Analyte					Monitoring Location				
					School	Cell Tower	Campground	Wetland	
					Downwind / Cross	Downwind / Cross	Upwind / Cross	Crosswind / Down	
						Co-located			
All results in ug/m3									
Method TO-15 Modified	Acute MRL	Chronic MRL	MAGLC	PRG					
Acetone	61762	30881	14405	3300	9.5J	11J	25	13	16
Benzene	29	10	80 (8)	0.25	0.78	0.75	0.64	0.58J	0.40J
Bromomethane	194	19	1852	5.2	ND	ND	ND	0.17	ND
tert-Butyl alcohol	NA	NA	7214	NA	0.29J	0.25J	0.20J	0.26J	0.20J
Carbon disulfide	NA	934	75	730	0.39J	0.11J	0.28J	0.17J	0.28J
Carbon tetrachloride	188	188	1498 (299)	0.13	0.62J	0.93J	0.62J	0.51J	0.62J
Chloroethane	39583	NA	63810	2.3	ND	ND	ND	ND	ND
Chloroform	488	98	232	0.083	0.27J	0.55J	0.64J	ND	0.64J
Chloromethane	1033	103	5000	95	1.3	1.1	1.2	1.1	1.2
Cyclohexane	NA	NA	25000	NA	0.30J	0.19J	ND	0.21J	ND
Dichlorodifluoromethane	NA	NA	119762	210	2.3	2.5	2.4	2.3	2.4
Ethylbenzene	43419	1303	19619	1100	0.32J	0.52J	ND	ND	ND
Heptane	NA	NA	10500	NA	0.60J	0.43J	0.39J	0.60J	0.39J
Hexane	NA	2115	NA	210	0.81J	1.4J	0.46J	0.72J	0.46J
Methyl ethyl ketone	NA	NA	8439	5100	1.6J	2.2J	2.5J	2.2J	2.5J
Methyl isobutyl ketone	NA	NA	4262	3100	ND	ND	0.21J	ND	0.21J
Methylene chloride	2084	1042	14286	4.1	1.9B	13B	1.5JB	1.1JB	1.5JB
Tetrachloroethene	1356	271	5155	0.32	ND	ND	3.3	ND	3.3
Tetrahydrofuran	NA	NA	2101						
Toluene	3768	301	14286	0.99	ND	ND	ND	ND	ND
1,1,2-Trichloro-1,2,2-trifluoroethane	NA	NA	182619	400	2.3	2.4	1.3	1.3	1.3
Trichlorofluoromethane	NA	NA	136190	NA	0.62J	0.63J	0.79J	0.58J	0.79J
1,2,4-Trimethylbenzene	NA	NA	2976	730	1.4	2.3	1.4	1.3	1.4
1,3,5-Trimethylbenzene	NA	NA	2976	6.2	0.38J	ND	1.3	ND	1.3
Vinyl Chloride	1278	77	62	6.2	ND	ND	0.83J	ND	0.83J
m/p-Xylene	8687	8687	10500	0.11	ND	ND	ND	ND	ND
o-Xylene	8687	8687	10500	110	0.88	1.1	3	ND	3
				110	0.33J	0.39J	1.8	ND	1.8
Tentatively Identified Compounds									
2-Butene, 2-methyl	NA	NA	NA	NA	N	N	N	N	N
1-Propene, 2-methyl-	NA	NA	NA	NA	N	N	N	N	N
1-Butanol	NA	NA	NA	NA	N	N	N	N	N
Ethylene oxide	NA	NA	NA	NA	N	N	N	N	N
Cyclopropane, ethyl	NA	NA	NA	NA	N	N	N	N	N
Ethanol	NA	NA	NA	NA	N	N	N	N	N
Heptane, 3-methylene	NA	NA	NA	NA	N	N	N	N	N
Propene	NA	NA	NA	NA	N	N	N	N	N
Propane	NA	NA	NA	NA	N	N	N	Y	N
Acetaldehyde	NA	NA	NA	NA	N	N	Y	N	Y
Laboratory Data Qualifiers									
B = Compound was present in the trip blank					ND = Not Detected				
J = Estimated concentration below laboratory reporting limits					NA = Not Available				
D = Dilution					Bold indicates result exceeds Region 9 PRG				
E = Exceeds calibration range of instrument					Shading indicates result exceeds ATSDR MRL				
TICs: Compound has been tentatively identified but the estimated concentration is highly uncertain.									

Countywide Recycling & Disposal Facility									
EPA Method TO-15 Modified: Volatile Organic Compounds									
Table 4: Event # 80 September 12/13, 2008									
Analyte	Monitoring Location								
	School					Cell Tower	Camp ground	Wetland	
	Upwind / Cross		Co-Located			Upwind / Cross	Downwind / Down	Cross / Cross	
All results in ug/m3									
Method TO-15 Modified	Acute MRL	Chronic MRL	MAGLC	PRG					
Acetone	61762	30881	14405	3300	37	51	35	32	78
Benzene	29	10	80 (8)	0.25	0.96B	1.0B	4.3B	0.73B	0.63B
Bromomethane	194	19	1852	5.2	ND	ND	ND	ND	ND
1,3-Butadiene	NA	NA	54	0.061	ND	ND	ND	ND	ND
tert-Butyl alcohol	NA	NA	7214	NA	0.62J	0.98J	0.37J	0.40J	1.5J
Carbon disulfide	NA	934	75	730	0.55JB	0.34JB	0.39JB	0.33JB	0.37JB
Carbon tetrachloride	188	188	1498 (299)	0.13	0.77J	0.70J	0.67J	0.71J	0.81J
Chloroethane	39583	NA	63810	2.3	ND	ND	ND	ND	ND
Chloroform	488	98	232	0.083	0.32J	0.30J	ND	0.19J	0.33J
Chloromethane	1033	103	5000	95	1.1	0.97J	1.1	1.3	ND
Cyclohexane	NA	NA	25000	6200	0.31J	0.21J	0.74J	0.28J	0.20J
1,2-Dichlorobenzene			7155		ND	5.8	ND	ND	ND
1,3-Dichlorobenzene					ND	1.1J	ND	ND	ND
1,4-Dichlorobenzene			10732		ND	1.7	ND	ND	ND
Dichlorodifluoromethane	NA	NA	119762	210	2.5	2.2	2.5	2.8	2.5
1,2 Dichloroethane			19619		ND	ND	ND	ND	0.21J
cis-1,2-Dichloroethene			19190		ND	ND	ND	0.31J	ND
1,2-Dichloropropane			8250		ND	ND	ND	0.43J	ND
Ethylbenzene	43419	1303	19619	1100	0.53J	0.94	0.37J	0.41J	ND
4-Ethyltoluene	NA	NA	8250	NA	ND	ND	ND	ND	ND
Heptane	NA	NA	10500	NA	0.90J	0.93J	0.80J	0.90J	0.94J
Hexane	NA	2115	NA	210	0.96J	0.78J	0.72J	0.84J	0.55J
Methyl ethyl ketone	NA	NA	8439	5100	4.5	8.1	6.1	4.5	14
Methyl isobutyl ketone	NA	NA	4262	3100	0.22J	0.92J	0.43J	0.30J	1.1J
Methylene chloride	2084	1042	14286	4.1	1.6JB	1.5JB	1.4JB	2.0B	1.5
Styrene	8520	852	10024	1100	ND	ND	ND	ND	ND
Tetrahydrofuran	NA	NA	2101	0.99	0.25J	ND	ND	0.23J	0.28J
Tetrachloroethene	1356	271	5155	0.32	ND	1.8	ND	ND	ND
Toluene	3768	301	14286	400	3.5B	7.8B	3.0B	5.4B	3.3B
1,1,1-Trichloroethane	10912	3819	9119	2300	ND	0.20J	0.20J	0.18J	ND
1,1,2-Trichloro-1,1,2-trifluoroethane	NA	NA	182619	NA	0.76J	0.66J	0.76J	0.80J	0.72J
Trichlorofluoromethane	NA	NA	136190	730	1.4	1.2	1.4	1.8	1.4
1,2,4-Trimethylbenzene	NA	NA	2976	6.2	0.75J	1.7	1.1	0.35J	ND
1,3,5-Trimethylbenzene	NA	NA	2976	6.2	ND	0.61J	ND	ND	ND
2,2,4-Trimethylpentane	NA	NA	NA	NA	0.39J	0.28J	ND	0.23J	ND
Vinyl Chloride	1278	77	62	0.11	ND	ND	ND	ND	ND
m/p-Xylene	8687	8687	10500	110	1.4	3.4	1.5	1	ND
o-Xylene	8687	8687	10500	110	0.54J	1.5	1.1	0.38J	ND
Tentatively Identified Compounds									
Acetaldehyde	NA	NA		NA	N	N	N	N	N
Undecane	NA	NA		NA	Y	N	N	N	N
Butane, 2-methyl-	NA	NA		NA	N	N	N	Y	N
Nonanal	NA	NA		NA	N	N	N	N	Y
Laboratory Data Qualifiers									
B = Compound was present in the trip blank				ND = Not Detected					
J = Estimated concentration below laboratory reporting limit				NA = Not Available					
D = Dilution				Bold indicates result exceeds Region 9 PRG					
E = Exceeds calibration range				Shading indicates result exceeds ATSDR MRL					
TICs: Compound has been tentatively identified but the estimated concentration is highly uncertain.									