SCREENING AIR QUALITY EVALUATION OF TETERBORO AIRPORT TETERBORO, NEW JERSEY

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EXECUTIVE SUMMARY

ENVIRON International Corporation (ENVIRON) was retained by the Coalition of Public Health and Safety (the Coalition) to conduct a screening-level evaluation of potential air quality impacts associated with operations of the Teterboro Airport, located in Teterboro, New Jersey. The objectives of ENVIRON's screening-level air sampling and analysis study are: (1) to assess ambient concentrations of selected air toxics; (2) to determine whether contributions from airport emissions can be distinguished from the contributions of other background sources; and (3) based on the results of the evaluation, determine if more extensive testing and/or modeling of airport operations is warranted.

Air sampling was conducted over a 48-hour period in June 2001 for volatile organic compounds (VOCs), aldehydes, and polycyclic aromatic hydrocarbons (PAHs). In response to complaints of soot and other surface deposition that may be associated with aircraft emissions, wipe samples were also collected from various residential, commercial, and municipal areas in the airport vicinity, and analyzed for PAHs. All samples were collected and analyzed in accordance with established regulatory methodologies.

Assessment of Ambient Concentrations

A preliminary risk screening was conducted based on the air sampling results, assuming long-term exposure to the concentrations measured during the study period. Both cancer and noncancer health effects were evaluated. The results of the preliminary risk screening are as follows:

- Of the compounds detected in ambient air near the airport, fuel-related compounds pose the highest risks. Furthermore, concentrations of fuel-related compounds such as benzene, toluene, ethylbenzene, xylene, 1,3-butadiene, and trimethylbenzene measured in air at the Teterboro Airport are higher than annual average levels that have been reported in Camden and Elizabeth, New Jersey by the New Jersey Department of Environmental Protection (NJDEP).

- The cancer risk associated with the levels of air toxics measured in the airport vicinity exceeds federal benchmarks. Carcinogenic risks ranging from eight in one hundred thousand (8×10^{-5}) to nine in ten thousand (9×10^{-4}) were calculated for an adult receptor using the average air concentration data collected from the airport fenceline.

The primary chemicals driving cancer risk are benzene and 1,3-butadiene, which are all fuel-related compounds. According to air toxics guidance published by the United States Environmental Protection Agency (USEPA), screening-level risk assessments that indicate cancer risks of greater than approximately one in one million (1×10^{-6}) generally suggest that a more refined analysis is necessary. Thus, the preliminary risk results exceed the regulatory benchmark (1×10^{-6}) by at least two orders of magnitude, and further evaluation is warranted.

- Noncarcinogenic risks associated with the levels of air toxics measured in the airport vicinity are up to five times greater than screening levels based on regulatory guidance. The primary chemicals driving noncancer risk are benzene and toluene, which are fuel-related compounds. Again, such results would suggest that further evaluation is appropriate.

Conservative exposure assumptions are used in the risk screening, and therefore these results do not necessarily indicate a significant health concern. However, as indicated above, the results of the preliminary risk screening suggest that a more refined evaluation of air quality in the vicinity of the Teterboro airport is warranted.

Effect of Airport Operations

Based on the overall results of the sampling program, airport operations appear to be affecting ambient air quality in the immediate vicinity of the airport. For certain fuel-related air toxics, measured concentrations are higher downwind of the airport than upwind. For many of the air toxics, however, the differences between levels measured upwind and downwind from the airport are relatively small. This finding is likely related to the close proximity of several emission sources (e.g., airport, motor vehicles) to the sampling locations and highlights the difficulty of differentiating between the various sources that may affect ambient air quality in urban areas such as Teterboro. It should also be recognized that the sampling results represent a single point in time and thus may not reflect long-term conditions. As a result of the limited duration of sampling, it is not possible to draw any conclusions regarding the statistical significance of observed differences between upwind and downwind concentrations measured at the airport. There is no evidence of fuel-related compounds in surface deposition.

Need for Further Evaluation

The results of the screening level evaluation, as discussed above, point to the need for a more comprehensive assessment of air quality in the vicinity of the Teterboro Airport. Such an assessment should include the following elements:

- First, longer-term sampling is necessary to determine whether the short-term concentrations measured in this study are indicative of long-term trends.

- Second, additional monitoring or modeling efforts are necessary to better understand the impact of major sources of air toxics on ambient air quality near the airport. Based on the compounds detected in this study, the two largest sources appear to be motor vehicles and the airport. However, further study is required to apportion the relative significance of these two sources.

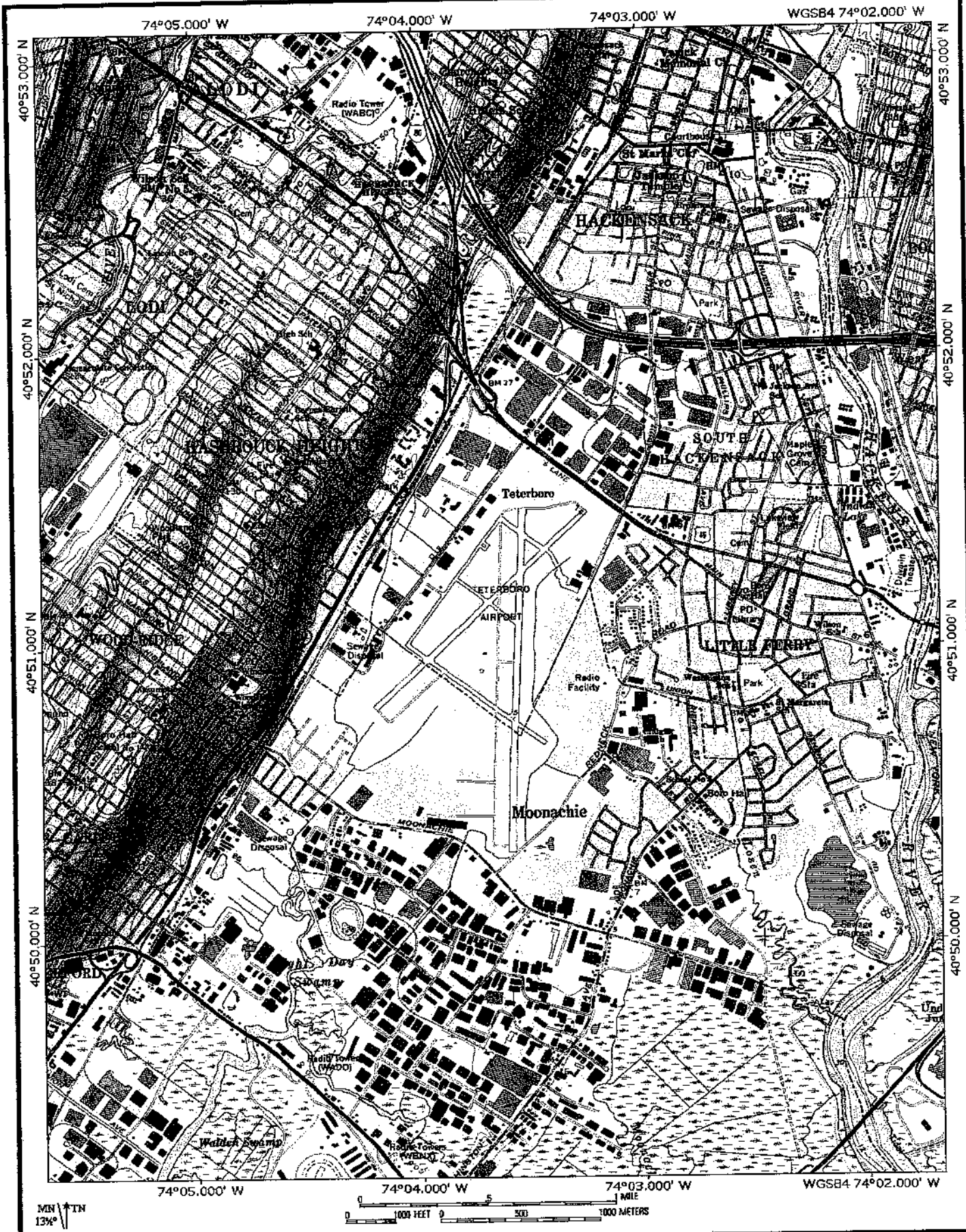
Based on the results of the more comprehensive assessment, regulatory authorities should be able to determine whether additional controls for significant sources of air toxics are needed.

I. INTRODUCTION

ENVIRON International Corporation (ENVIRON) was retained by the Coalition of Public Health and Safety (the Coalition) to conduct a screening-level evaluation of potential air quality impacts associated with operations of the Teterboro Airport, located near Teterboro New Jersey. Teterboro Airport (TEB) is located on a 827-acre property and consists of two runway configurations: Runway 1-19, which is 7,000 feet long with a North/South orientation, and Runway 6-24, which is 6,012 feet long with a NE/NW orientation. The airport is used primarily turboprops and business jets, although some standard jets (e.g., FedEx) also use TEB.

The airport is bordered by Route 46 to the north, Fred Wehran Drive to the northeast, Redneck Avenue to the southeast, Moonachie Avenue to the south, and Industrial Avenue and Route 17 to the west. The airport is located within the towns of Teterboro and Moonachie, and is bordered by the towns of Hasbrouck Heights and Woodridge to the west; Moonachie to the south; Little Ferry to the east; and South Hackensack to the north (see Figure 1). Other nearby towns include Bogota, Carlstadt, East Rutherford, Hackensack, Ridgefield Park, and Rutherford.

The objectives of ENVIRON's screening-level air sampling and analysis study are: (1) to assess ambient concentrations of selected air toxics (including chemicals regulated as hazardous air pollutants [HAPs]); (2) to determine whether contributions from airport emissions can be distinguished from the contributions of other background sources; and (3) based on the results of the evaluation, determine if more extensive testing and/or modeling of airport operations is warranted.



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SITE LOCATION MAP
TETERBORO AIRPORT
TETERBORO, NEW JERSEY

FIGURE
1

II. TECHNICAL APPROACH

A. Chemicals of Potential Concern

Several recent evaluations of air quality in the vicinity of airports have been conducted (Barbosa 2000; Eden 2000; ENVIRON 2000a, 2000b; McCulley Frick 1995). Based on these studies and other emission inventories (ERG 1999), chemicals associated with aircraft operations include various volatile organic compounds (VOCs) (including aldehydes) and polycyclic aromatic hydrocarbons (PAHs). When emitted from aircraft, these and other air toxics will first enter the atmosphere, where they can affect overall air quality. Certain of the air toxics may then deposit onto soil, surface water, vegetation, and other environmental media.

This study utilized several sampling and analytical methods developed by the United States Environmental Protection Agency (USEPA) to evaluate the presence of VOCs, aldehydes, and PAHs in ambient air. The method used for VOCs (i.e., Method TO-14A) included an analysis for 62 target compounds, including benzene and 1,3-butadiene. The method used for aldehydes (i.e., Method TO-11A) included an analysis for 12 target compounds, including formaldehyde, acetaldehyde, and crotonaldehyde. The method used for PAHs (i.e., Method TO-13A) included an analysis for 20 target compounds, including naphthalene and benzo[a]pyrene.

In addition to these chemicals, Pleil et al. (2000) noted that jet fuel tends to have higher concentrations of *n*-alkanes in the C_9 to C_{12} range than automotive fuel. Thus, these higher level alkanes may serve as indicator species of airport influences. The list of VOCs was therefore expanded to include butane, pentane, octane, nonane, decane, undecane, and dodecane, which increased the list of Method TO-14A target compounds to 69.

A complete list of all 101 chemical compounds included in the analysis for in this screening study is provided in Table 1.

B. Sampling and Analysis Methodologies and Sampling Locations

Sampling was conducted over a 48-hour period during June 27-29, 2001. Separate sampling methods were used for VOCs, aldehydes, and PAHs.

1. Volatile Organic Compounds

Equipment used to collect all air samples for VOCs followed USEPA guidelines outlined in *Compendium Method TO-14A: Determination of Volatile Organic Compounds (VOCs) in Ambient Air Using Specially Prepared Canisters with Subsequent Analysis by Gas Chromatography*. Integrated samples were collected in six-liter stainless steel SUMMA® canisters. The SUMMA® canisters were cleaned, individually certified,

and evacuated by the analytical laboratory in accordance with Method TO-14A. Using flow controllers, ambient air was pumped into the canisters at a constant flow rate over the duration of the sampling period. These whole air samples were subsequently analyzed for target VOCs by gas chromatography/mass spectrometry (GC/MS).

To distinguish between the collection of upwind and downwind sources, a Sector Sampling approach was used. This technique, which was developed by USEPA (Pleil et al. 1993), is useful for short-term screening of suspect sources or for long-term monitoring of the contribution from a specific source. Portable canister samplers (XonTech Model 911) were used, which have attached wind direction sensors and are programmable to direct whole air, sampled at a constant rate, into separate canisters depending on the direction the wind is blowing. When the wind was blowing within a 90-degree sector from the direction of the target source area (i.e., the airport), air was directed into the first "target" canister (IN). When the wind was blowing from any other direction, air was directed to the second "background" canister (OUT). Active sampling for approximately 24-hour sampling periods was conducted using pumps with flow rates of 10 to 15 cubic centimeters per minute (cc/min).

Samplers were set up in four locations around the airport (SE, SW, NE, NW), with a fifth sampler situated at the SE location to collect duplicate samples. The sampling locations are shown in Figure 2 and are described in Table 2. Photographs of the four sampling locations and the sampling equipment are provided in Figures 3 to 6. Samples were collected from the NW and SE locations only on the first day (four canisters), and from all four locations on the second day (eight canisters plus two duplicate canisters). A blank sample (using a canister of ultra high purity nitrogen) was also collected at the SE location each day (two canisters). Due to the nature of the sector sampling methodology, three of the canisters did not collect sufficient air for analysis. Thus, a total of 13 out of 16 canisters from the sector sampling were analyzed.

Sampling canisters were also placed on the airport property in the vicinity of the runway taxiways. A canister was placed at ground level in the vicinity of Runways 19 and 24 on the north end of the airport for the first day, and another canister was placed at ground level in the vicinity of Runway 1 on the south end of the airport for the second day. Each canister was equipped with a 24-hour flow controller for continuous passive sampling (i.e., pressure differential between evacuated canisters and ambient air causes air to flow into the canisters).

2. Aldehydes

Aldehydes were sampled in accordance with *Compendium Method TO-11A: Determination of Formaldehyde in Ambient Air Using Adsorbent Cartridge Followed by*

High Performance Liquid Chromatography (HPLC). A sampling pump (Gilian Model GilAir5) connected to a Sep-Pak cartridge coated with 2,4-dinitrophenylhydrazine (DNHP) was attached to the sector sampling tripod at the NW and SE sampling locations on the second day of the study. An air sampling rate of approximately 1.5 liters per minute (lpm) was used for a 24-hour sampling period. Prior to and after sampling, the DNPH cartridges were preserved on ice.

3. Polycyclic Aromatic Hydrocarbons

PAHs were sampled in accordance with *Compendium Method TO-13A: Determination of Polycyclic Aromatic Hydrocarbons in Ambient Air Using Gas Chromatography/Mass Spectrometry.* High volume polyurethane foam (PUF) samplers (Tisch Model TE-1000) were used in conjunction with PUF/XAD cartridges to collect semivolatile organic compounds (SVOCs) from ambient air. The PUF samplers were collocated with the sector samplers at the NW and SE sampling locations on the both days of sampling. An air sampling rate towards the upper end of the allowable range for the method (8 to 10 cubic feet per minute [cfm]) was used. Prior to and after sampling, the PUF/XAD cartridges were preserved on ice.

In response to complaints of soot and other surface deposition that may be associated with aircraft emissions, ENVIRON also collected wipe samples from various residential, commercial, and municipal areas in the airport vicinity. A description of the individual sampling locations is provided in Table 3. The wipe samples were collected in accordance with OSHA (2001) procedures, which involves the collection of surface material from a 100 square centimeters (cm^2) area using a glass fiber filter and a hexane solvent. Surfaces sampled included roofing surfaces, window sills, and outdoor furniture. These samples were analyzed for PAHs using NIOSH Method 5506. VOCs and aldehydes were not analyzed, since they are volatile and thus less likely to be present in deposited soot.

C. Data Analysis

To evaluate differences between the IN and OUT paired sector sampler data and allow comparisons of these data among chemicals, a normalized ratio parameter R was calculated for each compound, as utilized by USEPA (Pleil et al. 1993):

$$R = \frac{(IN - OUT)}{(IN + OUT)}$$

where IN and OUT are concentrations for individual compounds when the sampler is downwind (IN) or upwind (OUT) from the airport. The value of the parameter R can range from –1 to +1. Positive R values indicate an IN sector prevalence (i.e., concentrations are greater when the sampler is downwind from the airport), whereas negative values indicate an OUT sector prevalence (i.e., concentrations are greater when the sampler is upwind from the airport). The absolute value of R gives a relative measure of the importance of a compound in a sector.

For these calculations, chemicals that were not detected were considered to have a concentration of zero. In addition, some of the data were accompanied with data qualifying flags in the analytical report (see Appendices B to D). The data that were accompanied by the following data qualifiers were treated the same as unqualified data: J (indicating that the concentrations were estimated), E (indicating that the concentrations exceeded the instrument calibration range), and S (indicating that the concentrations reached a saturated peak). The effect of treating these qualified data the same as unqualified data is discussed in the Uncertainty section of Chapter III.

D. Risk Evaluation

A preliminary risk screening was conducted based on the average air sampling results for each sampling location. Assuming long-term exposure to the concentrations measured during the study period, risks to human health (both cancer and noncancer health effects) were evaluated.

TABLE 1
Chemicals Included in Screening Analysis

Compound Name	CAS#	Method	Compound Name	CAS#	Method
Acenaphthene	83-32-9	TO-13A	Ethylene Dibromide	106-93-4	TO-14A
Acenaphthylene	208-96-8	TO-13A	Ethyltoluene, 4-	622-96-8	TO-14A
Acetaldehyde	75-07-0	TO-11A	Fluoranthene	206-44-0	TO-13A
Acetone	67-64-1	TO-14A	Fluorene	86-73-7	TO-13A
Acetone	67-64-1	TO-11A	Fluorobiphenyl, 2-	321-60-8	TO-13A
Acrolein	107-02-8	TO-14A	Formaldehyde	50-00-0	TO-11A
Anthracene	120-12-7	TO-13A	Freon 11	75-69-4	TO-14A
Benzaldehyde	100-52-7	TO-11A	Freon 113	76-13-1	TO-14A
Benzene	71-43-2	TO-14A	Freon 114	76-14-2	TO-14A
Benzo(a)anthracene	56-55-3	TO-13A	Freon 12	75-71-8	TO-14A
Benzo(a)pyrene	50-32-8	TO-13A	Heptane	142-82-5	TO-14A
Benzo(b)fluoranthene	205-99-2	TO-13A	Hexachlorobutadiene	87-68-3	TO-14A
Benzo(g,h,i)perylene	191-24-2	TO-13A	Hexanal	66-25-1	TO-11A
Benzo(k)fluoranthene	207-08-9	TO-13A	Hexane	110-54-3	TO-14A
Bromodichloromethane	75-27-4	TO-14A	Hexanone, 2-	591-78-6	TO-14A
Bromofluorobenzene, 4-	460-00-4	TO-14A	Indeno(1,2,3-c,d)pyrene	193-39-5	TO-13A
Bromoform	75-25-2	TO-14A	Isopentanal	590-86-3	TO-11A
Bromomethane	74-83-9	TO-14A	Methyl tert-Butyl Ether	1634-04-4	TO-14A
Butadiene, 1,3-	106-99-0	TO-14A	Methyl-2-pentanone, 4-	108-10-1	TO-14A
Butane	106-97-8	TO-14A	Methylene Chloride	75-09-2	TO-14A
Butanone, 2- (Methyl Ethyl Ketone)	78-93-3	TO-14A	Methylnaphthalene, 2-	91-57-6	TO-13A
Butyraldehydes	NA	TO-11A	Naphthalene	91-20-3	TO-13A
Carbon Disulfide	75-15-0	TO-14A	Nonane	111-84-2	TO-14A
Carbon Tetrachloride	56-23-5	TO-14A	Octane	111-65-9	TO-14A
Chlorobenzene	108-90-7	TO-14A	Pentanal	110-62-3	TO-11A
Chloroethane	75-00-3	TO-14A	Pentane	109-66-0	TO-14A
Chloroform	67-66-3	TO-14A	Phenanthrene	85-01-8	TO-13A

TABLE 1
Chemicals Included in Screening Analysis

Compound Name	CAS#	Method	Compound Name	CAS#	Method
Chloromethane	74-87-3	TO-14A	Propanal	123-38-6	TO-11A
Chloronaphthalene, 2-	91-58-7	TO-13A	Propanol, 2-	67-63-0	TO-14A
Chlorotoluene	100-44-7	TO-14A	Propylene	115-07-1	TO-14A
Chrysene	218-01-9	TO-13A	Pyrene	129-00-0	TO-13A
Crotonaldehyde	123-73-9	TO-11A	Styrene	100-42-5	TO-14A
Cyclohexane	110-82-7	TO-14A	Terphenyl	98904-43-9	TO-13A
Decane	124-18-5	TO-14A	Tetrachloroethane, 1,1,2,2-	79-34-5	TO-14A
Dibenz(a,h)anthracene	53-70-3	TO-13A	Tetrachloroethene	127-18-4	TO-14A
Dibromochloromethane	124-48-1	TO-14A	Tetrahydrofuran	109-99-9	TO-14A
Dichlorobenzene, 1,2-	95-50-1	TO-14A	Tolualdehyde, m,p-	620-23-51	TO-11A
Dichlorobenzene, 1,3-	541-73-1	TO-14A	Tolualdehyde, o-	529-20-4	TO-11A
Dichlorobenzene, 1,4-	106-46-7	TO-14A	Toluene	108-88-3	TO-14A
Dichloroethane, 1,1-	75-34-3	TO-14A	Trichlorobenzene, 1,2,4-	120-82-1	TO-14A
Dichloroethane, 1,2-	107-06-2	TO-14A	Trichloroethane, 1,1,1-	71-55-6	TO-14A
Dichloroethene, 1,1-	75-35-4	TO-14A	Trichloroethane, 1,1,2-	79-00-5	TO-14A
Dichloroethene, cis-1,2-	156-59-2	TO-14A	Trichloroethene	79-01-6	TO-14A
Dichloroethene, trans-1,2-	156-60-5	TO-14A	Trimethylbenzene, 1,2,4-	95-63-6	TO-14A
Dichloropropane, 1,2-	78-87-5	TO-14A	Trimethylbenzene, 1,3,5-	108-67-8	TO-14A
Dichloropropene, cis-1,3-	10061-01-5	TO-14A	Undecane	1120-21-4	TO-14A
Dichloropropene, trans-1,3-	10061-02-6	TO-14A	Vinyl Acetate	108-05-4	TO-14A
Dioxane, 1,4-	123-91-1	TO-14A	Vinyl Chloride	75-01-4	TO-14A
Dodecane	112-40-3	TO-14A	Xylene, m,p-	108-38-3/ 106-42-3	TO-14A
Ethanol	64-17-5	TO-14A	Xylene, o-	95-47-6	TO-14A
Ethyl Benzene	100-41-4	TO-14A			

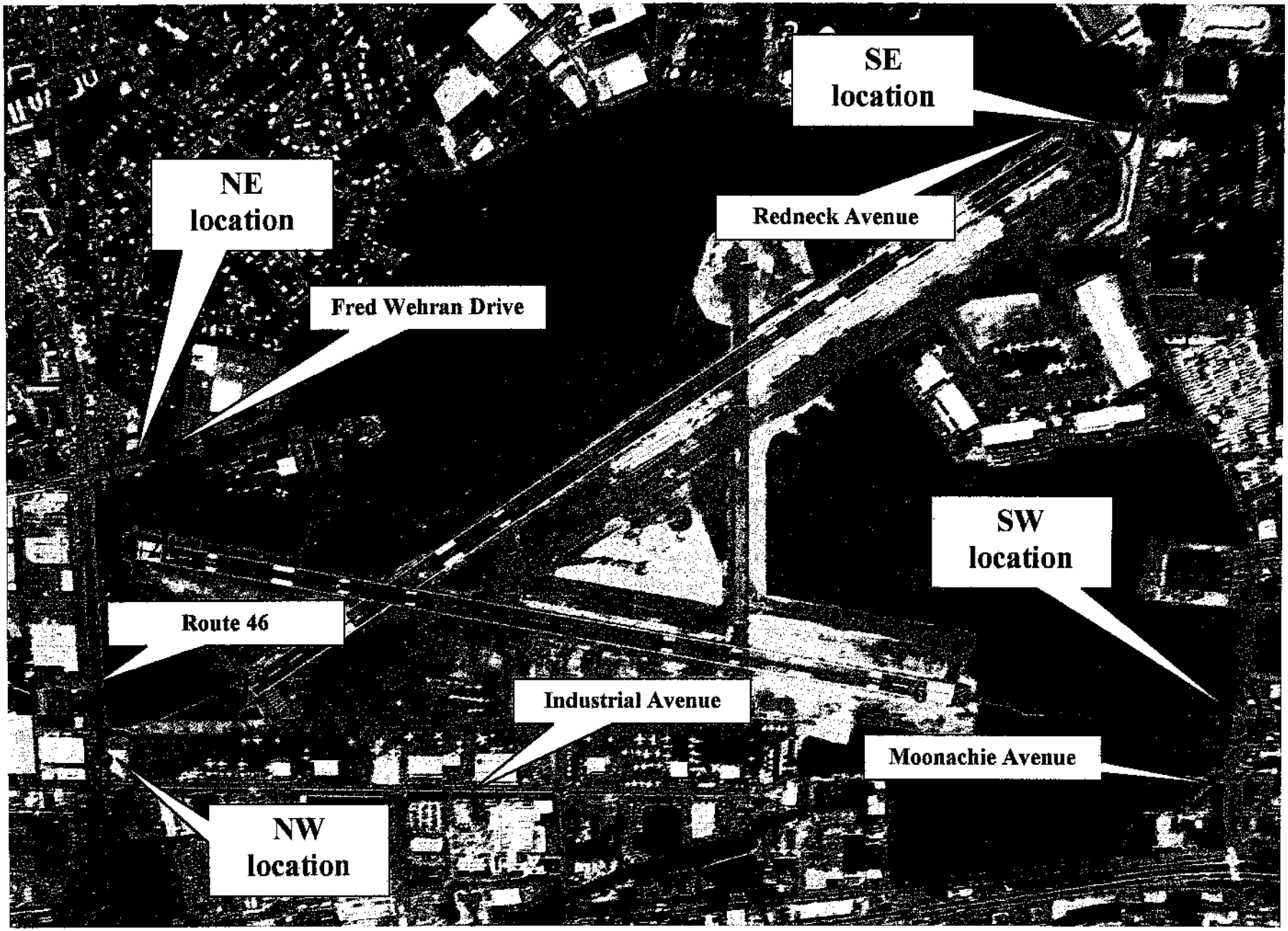
TABLE 2
Description of Air Sampling Locations

Location	Description	Sample ID	Analysis Conducted		
			VOCs (TO-14A)	Aldehydes (TO-11A)	PAHs (TO-13A)
NE	Parking area on Fred Wehran Drive, off of Route 46 East	FRED	Y		
NW	Near intersection of Route 46 East and Industrial Avenue	INDUSTRIAL	Y	Y	Y
SE	Redneck Avenue, off of Moonachie Avenue	RED	Y	Y	Y
SW	Moonachie Avenue, off of Industrial Avenue	MOON	Y		
Airport North	North end of airport, adjacent to airport meteorological station between Runways 19 and 24	AIRPORT NORTH	Y		
Airport South	South end of airport, near Runway 1, at intersection ofTaxiways Lima (TWL) and Killo (TWK)	AIRPORT SOUTH	Y		

TABLE 3
Description of Wipe Sampling Locations

ID	Location	Town	Type
1	Prospect Avenue	Hackensack	Residential
2	Larch Avenue	Bogota	Residential
3	Walnut Avenue	Bogota	Residential
4	Phillips Avenue	South Hackensack	Residential
5	Maple Avenue	South Hackensack	Residential
6	Route 46 West	Teterboro	Municipal
7	Moonachie Avenue	Moonachie	Trailer Park
8	Redneck Avenue	Little Ferry	Residential
9	Eckel Road	Little Ferry	Residential
10	Webb Place	Hasbrouck Heights	Residential
11	Woodridge Street	Woodridge	Residential
12	Anderson Street	Woodridge	Residential
13	Eighth Street	Carlstadt	Residential
14	Cornelia Street	East Rutherford	High School
15	Sylvan Street	Rutherford	Residential
16	Division Avenue	Carlstadt	Elementary School

Note:
Wipe sampling surfaces include rooftops, window sills, and outdoor furniture.



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AIR SAMPLING LOCATIONS
TETERBORO AIRPORT
TETERBORO, NEW JERSEY

FIGURE
2

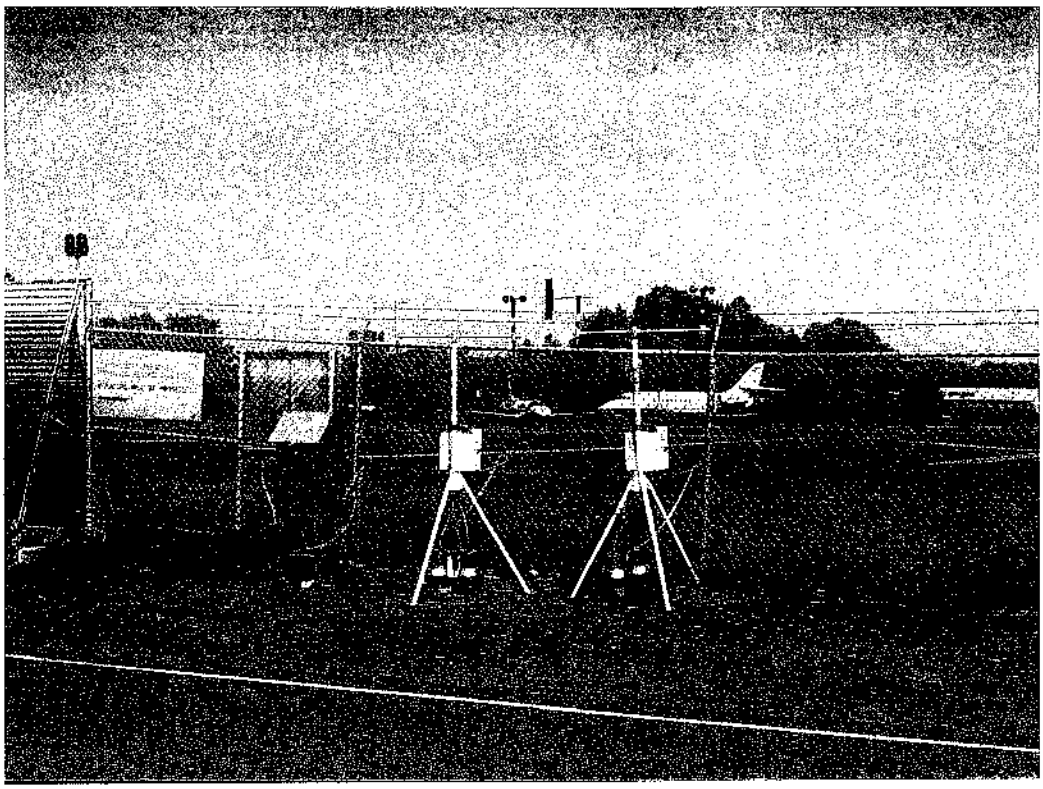

Figure 3. Photograph of Southeast Sampling Location on Redneck Avenue.

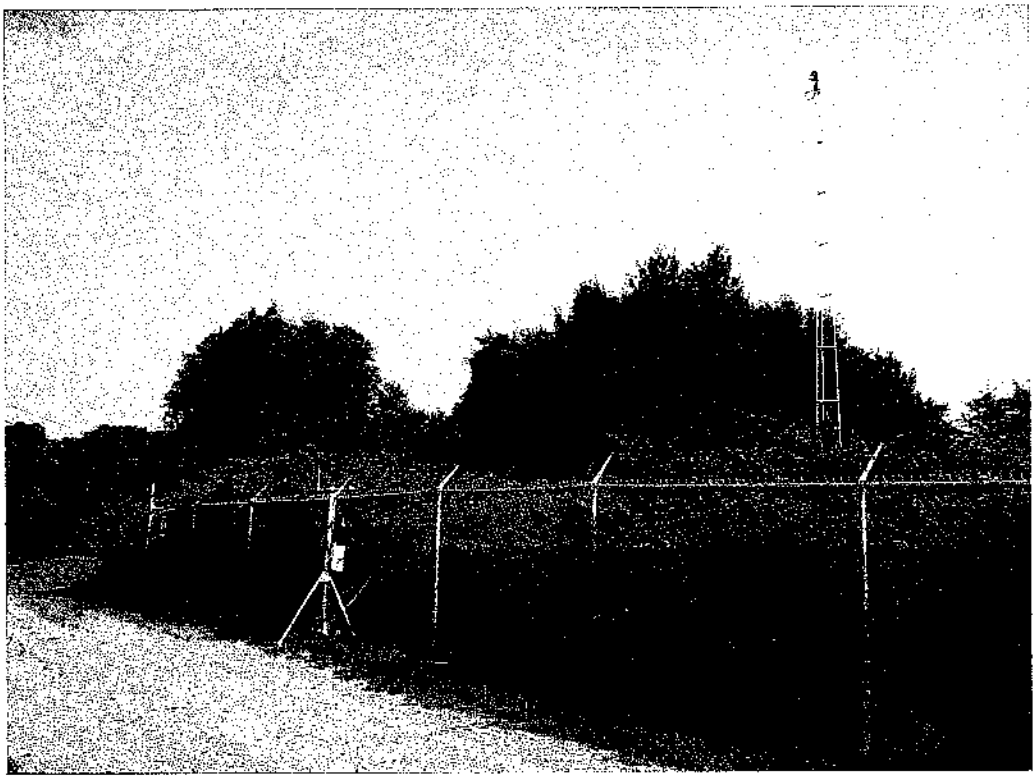

Figure 4. Photograph of Southwest Sampling Location on Moonachie Avenue.

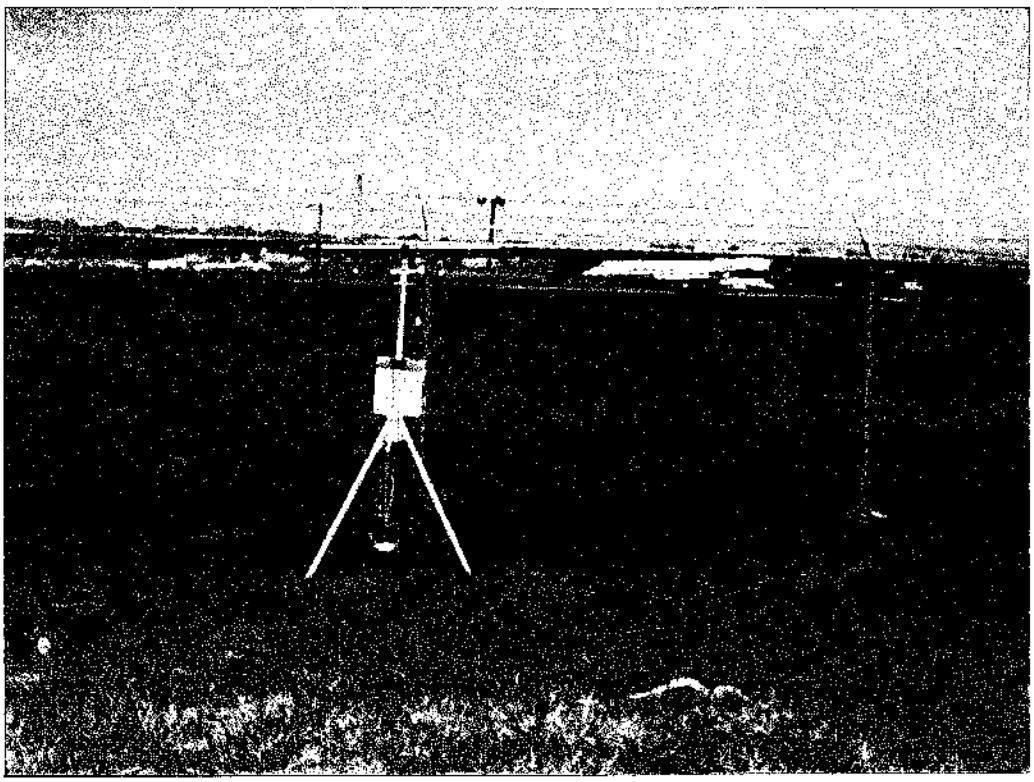

Figure 5. Photograph of Northeast Sampling Location on Fred Wehran Drive.

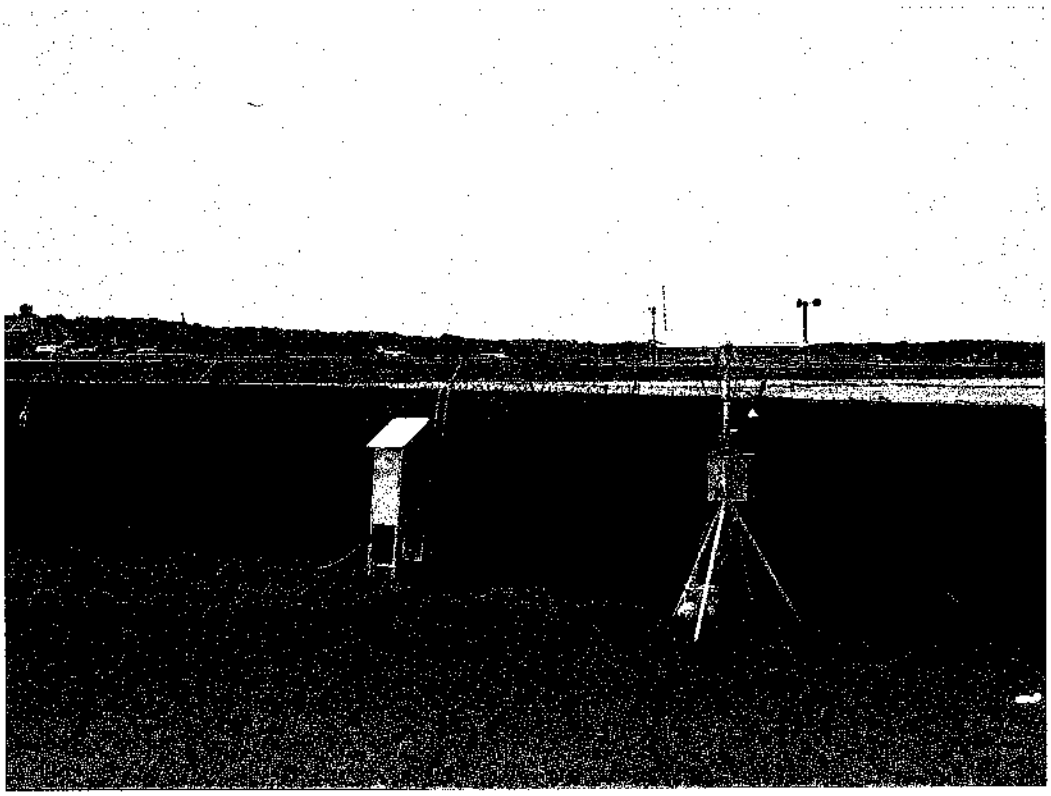

Figure 6. Photograph of Northwest Sampling Location on Industrial Avenue.

III. RESULTS AND DISCUSSION

A. Airport Runway Usage and Meteorology

Personnel at TEB provided ENVIRON with information regarding landings and takeoffs (LTO) on each of the runways for the period of the study. These data are summarized in Figure 7, and presented in Table A-1 of Appendix A. The highest frequency of LTO generally occurred between 3:00 and 7:00 PM each day.

Meteorological data were collected from the roof of the Teterboro Municipal Building during the period of the study, and for the month leading up to the study. The Municipal Building is located north of the airport, across Route 46. The wind direction data during the study are summarized in Tables 3 and 4, with detailed data provided in Table A-2 of Appendix A. The primary wind direction during the 48-hour sampling period was from the northwest (NW) quadrant (i.e., toward the SE quadrant), occurring approximately 75 percent of the time. The secondary wind direction was from the northwest (NE) quadrant (i.e., toward the SW quadrant), occurring approximately 25 percent of the time. Thus, the air samples collected from the SE and SW sampling locations are most likely to be impacted by airport-related emissions.

B. Air Sampling Results

Among the 101 chemicals analyzed in this study, 50 were detected in at least one sample. The average concentrations of the VOCs, aldehydes, and PAHs for the two sampling periods are summarized in Tables 5 and 6.

Table 5 shows the average concentrations for chemicals detected at each fenceline sampling location. The highest concentrations of benzene, toluene, ethylbenzene, and xylene were detected at the SW sector. Table 5 also shows the average concentrations for the on-site airport locations. The concentrations detected in these on-site samples were generally lower than those measured at the fenceline locations. However, as discussed in Section E of this Chapter, these on-site samples were collected at closer to ground level than the fenceline samples. The air at ground level is not likely to be well mixed, and therefore not necessarily comparable to the air collected at the fenceline stations.

Table 6 compares the average concentrations for VOCs at three of the four sampling locations (SE, SW, NW) in the IN and OUT sectors. At the fourth sampling location (NE), insufficient air was collected for the IN sector. The IN sector represents air collected while the wind was blowing from the direction of the airport towards the sampler; the OUT sector represents air collection while the wind was blowing in other directions. Table 6 also includes the sector ratio parameter R for each chemical detected at each of these three locations. In the

SE location, there is an IN sector prevalence for 21 chemicals, as compared to an OUT sector prevalence for 8 chemicals. In the SW location, there is an IN sector prevalence for 17 chemicals and an OUT sector prevalence for 14 chemicals. In the NW location, there is an IN sector prevalence for only 9 chemicals and an OUT sector prevalence for 16 chemicals. It should be noted that the NE location was situated closer to a major traffic intersection than the other locations. Figures 8 to 10 show the sector ratio parameters for each of these three sampling locations.

For the SE and SW locations, the chemicals showing an IN sector prevalence include benzene, toluene, ethylbenzene, xylene, 1,2,4-trimethylbenzene, 1,3,5-trimethylbenzene, and 4-ethyltoluene, all of which are fuel related compounds. In addition, two of the higher level alkanes (undecane and dodecane), that generally are present in higher concentrations in jet fuel than in automotive fuel, show an IN sector prevalence. For many chemicals, the absolute value of R is low (i.e., less than 0.10), which indicates that the relative difference between the IN and OUT sectors for these chemicals is not necessarily significant. This is likely related to the close proximity of several emission sources (e.g., airport, motor vehicles) to the sampling locations and highlights the difficulty of differentiating between the impact on ambient air concentrations of these multiple sources. However, the overall results of the sector sampling indicate that airport operations may be affecting ambient air quality in the immediate vicinity.

The New Jersey Department of Environmental Protection (NJDEP) conducts air toxics monitoring at certain locations within the state. Some of the chemicals monitored by NJDEP are included among the chemicals analyzed in this study. Table 7 compares the levels of certain chemicals measured at Teterboro with recent (2000) annual average concentration data for air toxics measured at the NJDEP Air Toxics monitoring stations in Camden and Elizabeth, New Jersey. The levels of fuel-related compounds such as benzene, toluene, ethylbenzene, xylene, 1,3-butadiene, and trimethylbenzene are higher at Teterboro than at Camden and Elizabeth. Concentrations of other non-fuel related air toxics such as carbon tetrachloride, chloromethane, and methylene chloride are comparable in magnitude among the three sites.

The laboratory reports from the air sampling are included in Appendices B (VOCs), C (aldehydes), and D (PAHs).

C. Wipe Sampling Results

PAHs were not detected in the laboratory analysis of the wipe samples collected from various residential, commercial, and municipal locations. The laboratory report from the wipe sampling is included in Appendix E.

D. Screening Risk Assessment

To evaluate the potential risks to human health of the concentrations of air toxics detected in the air samples, a screening risk assessment was performed using the average concentration data for each sampling location. Details of the risk assessment methodology and the assumptions used are provided in Appendix F. The results of the risk calculations are summarized in Table 8 and discussed below.

1. Potential Cancer Risks

The excess lifetime cancer risk is an upper bound on the probability that lifetime exposure to a chemical under specific conditions of exposure will lead to excess cancer risk. For example, an upper bound risk of one in one million (i.e., 1×10^{-6}) indicates that a lifetime exposure would not be expected to increase the chance of developing cancer by more than one in one million.

Carcinogenic risks ranging from eight in one hundred thousand (8×10^{-5}) to nine in ten thousand (9×10^{-4}) were calculated for an adult receptor using the average air concentration data collected from the airport fenceline. The carcinogenic risks calculated for a child receptor using the average air concentration data collected from the airport fenceline ranged from two in one hundred thousand (2×10^{-5}) to two in ten thousand (2×10^{-4}). The primary chemicals driving cancer risk are benzene and 1,3-butadiene.

Under its air toxics program, USEPA has adopted a tiered approach to evaluating the risks posed by air contaminants (USEPA 1999). If a screening-level assessment indicates that cancer risks for the most highly exposed individual are greater than approximately 1×10^{-6}, then a more refined analysis may be required. Thus, the preliminary risk results exceed the regulatory benchmark (1×10^{-6}) by two orders of magnitude. In a refined analysis, risks exceeding 1×10^{-4} are generally considered to be unacceptable, while the acceptability of risks between 1×10^{-6} and 1×10^{-4} are evaluated on a case-by-case basis considering various factors, including the size of the population exposed. The results of such assessments are used to help determine whether additional controls for sources of hazardous air pollutants are needed beyond the promulgated technology-based Maximum Achievable Control Technology (MACT) standards (USEPA 1999).

2. Potential Noncancer Health Effects

Unlike the measure of risk used for carcinogens on the basis of a theoretical probability of experiencing an adverse effect, the measure of the potential for noncarcinogenic risks to occur is expressed as a Hazard Quotient (HQ). The HQ

represents the ratio between the average daily exposure and a health-based reference concentration. To evaluate noncancer risk associated with exposure to multiple substances, the Hazard Index (HI) is calculated by summing the hazard quotients for the individual constituents. According to USEPA guidance, the risk associated with inhalation exposures to noncarcinogens is considered negligible if the HI is less than or equal to one.

An HI of greater than one was calculated at all four fenceline locations for both the adult and child receptors using the average air concentration data collected from the airport fenceline. Noncarcinogenic risks are up to five times greater than screening levels based on regulatory guidance. The primary chemicals driving noncancer risk are benzene and toluene.

E. Uncertainties

This screening evaluation was conducted to determine if there is any evidence that airport operations are having a measurable impact on air quality. The primary advantage of this approach is that it can provide direct data on air quality. However, several uncertainties are inherent in the type of study conducted:

- **Background Sources**
  Given the urban nature of environment near Teterboro Airport, it is difficult to distinguish between airport impacts and contributions from other nearby sources (e.g., motor vehicles). For example, many of the fenceline locations were situated within 50 feet of roadways or parking areas. Thus, automotive influences are likely, even in the IN sector samples. This may interfere with the ability to distinguish between the IN and OUT samples.

- **Data Qualifiers**
  Certain reported concentrations of chemicals were accompanied with data qualifier flags. The estimated values for chemicals that were detected above the method detection limit but below the reporting limit (i.e., qualified with a J flag) were treated as unqualified data in this assessment. In addition, chemicals that exceeded the calibration range (E flag) and that reached a saturated peak (S flag) were also treated as unqualified data.

- **Short-Term Variability**
  This screening assessment was based on the average of data collected over a 48-hour period. Due to variability in local meteorology and emission sources, the results of

this limited monitoring study (i.e., two days) are not necessarily reflective of long-term (e.g., annual) airport operations or ambient concentrations.

- **Analytical Detection Limits**
  Common detection limits for some chemicals (e.g., 1,3-butadiene) are higher than risk-based values; thus, for such constituents, a "non-detect" result may still pose a risk that is higher than risk targets established by USEPA under the Clean Air Act.

- **Indirect Exposure Pathways**
  Only direct exposure pathways (i.e., inhalation) were evaluated in this study. Certain air toxics may deposit onto soil, surface water, vegetation, and other environmental media, resulting in potential indirect exposure pathways. Such indirect exposure pathways were not evaluated in this screening assessment.

- **Sampling Height**
  Due to sampling constraints, the two air samples collected on the airport property were collected using canisters that were placed at ground level, with a sampling of about one foot. For the fenceline samples, the sampling inlet for the canisters was situated at a height of five feet. Thus, the on-site samples are not directly comparable to the results for the fenceline samples, due to the differences in sampling height. Furthermore, the air at ground level is not likely to be well mixed (being within the surface roughness height), and, therefore, not representative of the actual exposure a person might potentially receive.

TABLE 4
Distribution of Wind Direction over 48-Hour Sampling Period
(6/27/01 16:00 to 6/29/01 16:00)

Wind Direction	Frequency (%)
NW	18.69
NNW	17.30
N	13.49
WNW	12.46
W	11.76
SSW	5.54
E	4.84
NNE	3.11
NE	3.11
ENE	2.77
SSE	1.73
S	1.73
SE	1.04
WSW	1.04
ESE	0.69
SW	0.69
NW quadrant (N, NNW, NW, WNW, W)	73.70
NE quadrant (N, NNE, NE, ENE, E)	27.34
SW quadrant (S, SSW, SW, WSW, W)	20.76
SE quadrant (S, SSE, SE, ESE, E)	10.03

Notes:
1. Based on meteorological data recorded every ten minutes from the roof of the Teterboro Municipal Building, located across Route 46 from the airport to the north.
2. The frequency percentages for the four quadrants add up to greater than 100 percent because N, S, W, and E are counted in multiple quadrants.

TABLE 5
Distribution of Wind Direction During On-Site Sampling

Airport North (6/27/01 16:00 to 6/28/01 16:00)		Airport South (6/28/01 12:00 to 6/29/01 12:00)	
Wind Direction	**Frequency (%)**	**Wind Direction**	**Frequency (%)**
NW	24.14	NNW	25.52
W	22.76	N	24.14
WNW	22.76	NW	13.79
NNW	15.17	E	9.66
N	9.66	NNE	6.21
NNE	3.45	NE	6.21
WSW	2.07	ENE	5.52
NE	0.00	SSE	2.76
ENE	0.00	WNW	2.76
E	0.00	SE	2.07
ESE	0.00	ESE	1.38
SE	0.00	S	0.00
SSE	0.00	SSW	0.00
S	0.00	SW	0.00
SSW	0.00	WSW	0.00
SW	0.00	W	0.00
NW quadrant	94.48	NW quadrant	66.21
SW quadrant	24.83	NE quadrant	51.72
NE quadrant	13.10	SE quadrant	15.86
SE quadrant	0.00	SW quadrant	0.00

Notes:
1. Based on meteorological data recorded every ten minutes from the roof of the Teterboro Municipal Building, located across Route 46 from the airport to the north.
2. The frequency percentages for the four quadrants add up to greater than 100 percent because N, S, W, and E are counted in multiple quadrants.

TABLE 6
Summary of Average Concentrations Detected at Each Sampling Location

Compound	SE Location Average (ug/m^3)	NW Location Average (ug/m^3)	SW Location Average (ug/m^3)	NE Location Average (ug/m^3)	On-Site Airport Average (ug/m^3)
Acenaphthene	7.64E-06	2.80E-05	NS	NS	NS
Acenaphthylene	3.23E-06	9.59E-06	NS	NS	NS
Acetone	112.67	106.33	52.50	90	28.50
Anthracene	ND	6.20E-06	NS	NS	NS
Benzaldehyde	1.63E-04	1.81E-04	NS	NS	NS
Benzene	10.17	14.7	10.00	8.6	1.8
Butadiene, 1,3-	ND	2.77	ND	ND	ND
Butane	ND	ND	3.70	ND	4.30
Butyraldehydes	1.13E-03	1.10E-03	NS	NS	NS
Carbon Disulfide	1.47	3.03	2.40	5.9	0.49
Carbon Tetrachloride	0.19	0.34	ND	0.57	ND
Chloromethane	1.50	1.30	1.10	2.3	ND
Cyclohexane	1.97	18.50	0.60	1.5	ND
Decane	38.33	ND	48.00	46	ND
Dioxane, 1,4-	3.33	ND	3.25	ND	10.70
Dodecane	44.67	ND	72.50	34	ND
Ethanol	6433.33	52.00	65.00	96	9.70
Ethyl Benzene	13.81	4.10	21.0	17	1.6
Ethyltoluene, 4-	18.67	3.20	29.50	25	4.45
Fluoranthene	5.81E-06	2.39E-05	NS	NS	NS
Fluorene	1.37E-05	4.19E-05	NS	NS	NS
Formaldehyde	1.18E-03	1.55E-03	NS	NS	NS
Freon 11	1.37	0.90	1.45	1.5	1.35
Freon 113	0.20	ND	ND	ND	ND
Freon 12	2.80	1.90	3.10	3.2	2.60
Heptane	2.93	ND	4.20	8.3	ND
Hexane	14.33	ND	16.50	16	ND
2-Hexanone	ND	ND	1.55	ND	ND
Methyl Ethyl Ketone	22.87	15.37	28.50	17	10.20
Methyl-2-pentanone, 4-	192.00	0.30	ND	ND	ND
Methyl tert-Butyl Ether	39.30	20.33	12.50	16	13.50
Methylene Chloride	0.93	2.45	2.20	ND	1.55
Methylnaphthalene, 2-	1.14E-04	3.70E-04	NS	NS	NS
Naphthalene	1.03E-04	3.88E-04	NS	NS	NS
Nonane	ND	ND	5.50	12	ND
Pentane	15.33	2.07	12.50	12	ND
Phenanthrene	3.00E-05	1.05E-04	NS	NS	NS

TABLE 6
Summary of Average Concentrations Detected at Each Sampling Location

Compound	SE Location Average (ug/m^3)	NW Location Average (ug/m^3)	SW Location Average (ug/m^3)	NE Location Average (ug/m^3)	On-Site Airport Average (ug/m^3)
Propanal	1.39E-04	1.24E-04	NS	NS	NS
Propanol, 2-	12.07	2.70	3.85	8.6	830.00
Propylene	ND	7.00	ND	ND	ND
Pyrene	4.52E-06	2.78E-05	NS	NS	NS
Styrene	0.63	0.84	2.15	1.8	ND
Tolualdehyde, m,p-	1.55E-04	2.21E-04	NS	NS	NS
Toluene	411.47	28.7	680.0	530	7.6
Trichloroethene	ND	ND	2.40	4.1	ND
Trimethylbenzene, 1,2,4-	19.70	5.83	30.50	27	9.15
Trimethylbenzene, 1,3,5-	4.37	0.87	6.30	6.2	1.25
Undecane	21.33	ND	32.50	19	ND
Xylene, m,p-	68.37	19.0	110.0	89	7.3
Xylene, o-	18.84	7.03	28.0	26	3.8

Notes:
ND=Not Detected; NS=Not Sampled at this location
SE Average based on RED IN 1, IN 2B, and OUT 2B. RED IN and OUT 2A were not used because of operational difficulties with that sampler. NW Average based on INDUSTRIAL IN 1, OUT 1, and OUT 2. SW Average based on MOON IN 2 and OUT 2. NE Average based on FRED OUT 2.

TABLE 7
Summary of Sector Scores for Each Sector

Compound	SE IN	SE OUT	SE Sector Score	NW IN	NW OUT	NW Sector Score	SW IN	SW OUT	SW Sector Score
Acetone	160	99	0.24	160	120	0.14	46	59	-0.12
Benzene	17	12	0.17	14	21	-0.20	10	8.8	0.06
Butadiene, 1,3-	ND	ND	NA	0	5.6	-1.00	ND	ND	NA
Butane	ND	ND	NA	ND	ND	NA	7.4	0	1.00
Carbon Disulfide	1.8	0	1.00	0	4.1	-1.00	0	4.8	-1.00
Carbon Tetrachloride	0	0.56	-1.00	0	0.6	-1.00	ND	ND	NA
Chloromethane	0	1.3	-1.00	0	2.3	-1.00	0	2.2	-1.00
Cyclohexane	4.1	1.8	0.39	41	12	0.55	0	1.2	-1.00
Decane	75	40	0.30	ND	ND	NA	41	55	-0.15
Dioxane, 1,4-	10	0	1.00	ND	ND	NA	6.5	0	1.00
Dodecane	90	44	0.34	ND	ND	NA	74	71	0.02
Ethanol	1700	600	0.48	91	20	0.64	62	68	-0.05
Ethyl Benzene	24	17	0.17	3.9	4	-0.01	21	18.5	0.06
Ethyltoluene, 4-	34	22	0.21	0	4	-1.00	30	29	0.02
Freon 11	1.3	1.4	-0.04	0	1.4	-1.00	1.4	1.5	-0.03
Freon 113	ND	ND	NA	ND	ND	NA	ND	ND	NA
Freon 12	2.7	2.9	-0.04	0	3.1	-1.00	3	3.2	-0.03
Heptane	0	8.8	-1.00	ND	ND	NA	8.4	0	1.00
Hexane	27	16	0.26	ND	ND	NA	16	17	-0.03
Hexanone, 2-	ND	ND	NA	ND	ND	NA	0	3.1	-1.00
Methyl Ethyl Ketone	19	41	-0.37	25	14	0.28	11	46	-0.61
Methyl tert-Butyl Ether	88	28	0.52	24	20	0.09	13	12	0.04
Methyl-2-pentanone, 4-	280	96	0.49	0	0.9	-1.00	ND	ND	NA
Methylene Chloride	0	1.8	-1.00	5.5	0.99	0.69	2.6	1.8	0.18
Nonane	ND	ND	NA	ND	ND	NA	0	11	-1.00
Pentane	30	16	0.30	0	6.2	-1.00	14	11	0.12

TABLE 7
Summary of Sector Scores for Each Sector

Compound	SE IN	SE OUT	SE Sector Score	NW IN	NW OUT	NW Sector Score	SW IN	SW OUT	SW Sector Score
Propanol, 2-	10	5.2	0.32	0	1.9	-1.00	3.6	4.1	-0.06
Propylene	ND	ND	NA	0	21	-1.00	ND	ND	NA
Styrene	0	1.9	-1.00	0	1.6	-1.00	2.2	2.1	0.02
Toluene	740	490	0.20	27	33	-0.10	680	565	0.09
Trichloroethene	ND	ND	NA	ND	ND	NA	2.2	2.6	-0.08
Trimethylbenzene, 1,2,4-	35	23	0.21	6.7	4.9	0.16	31	30	0.02
Trimethylbenzene, 1,3,5-	7.5	4.2	0.28	0	1.3	-1.00	6.6	6	0.05
Undecane	42	22	0.31	ND	ND	NA	35	30	0.08
Xylene, m,p-	120	84	0.18	19	18	0.03	110	92.5	0.09
Xylene, o-	32	24	0.14	7.2	6.8	0.03	28	26	0.04

Notes: ND=Not Detected; NA=Not Applicable (sector score not calculated for non-detected chemicals)

1. Sector scores calculated for samples where appropriate paired IN and OUT data are available. SE IN and OUT based on sample RED 2B; NW IN and OUT based on sample INDUSTRIAL 1; SW IN and OUT based on sample MOON 1.
2. Shaded cells indicate chemicals and sectors that show an IN sector prevalance

TABLE 8
Comparison of Air Toxics Measured at Teterboro with Camden and Elizabeth, New Jersey

Compound	Teterboro SE Location (ug/m3)	Teterboro NW Location (ug/m3)	Teterboro SW Location (ug/m3)	Teterboro NE Location (ug/m3)	Camden, NJ (ug/m3)	Elizabeth, NJ (ug/m3)
Benzene	10.17	14.7	10.00	8.6	1.827	1.839
Butadiene, 1,3-	ND	2.77	ND	ND	0.085	0.139
Carbon Tetrachloride	0.19	0.34	ND	0.57	0.268	0.212
Chloromethane	1.50	1.30	1.10	2.3	1.432	1.229
Ethyl Benzene	13.81	4.10	21.0	17	0.874	1.027
Methyl Ethyl Ketone	22.87	15.37	28.50	17	2.323	2.537
Methyl tert-Butyl Ether	39.30	20.33	12.50	16	3.347	5.850
Methylene Chloride	0.93	2.45	2.20	ND	20.625	0.891
Propylene	ND	7.00	ND	ND	2.191	5.967
Styrene	0.63	0.84	2.15	1.8	0.145	0.159
Toluene	411.47	28.7	680.0	530	4.553	5.758
Trichloroethene	ND	ND	2.40	4.1	0.039	0.045
Trimethylbenzene, 1,2,4-	19.70	5.83	30.50	27	1.656	1.238
Trimethylbenzene, 1,3,5-	4.37	0.87	6.30	6.2	0.558	0.419
Xylene, m,p-	68.37	19.0	110.0	89	2.493	2.738
Xylene, o-	18.84	7.03	28.0	26	1.200	1.234

Notes: ND=Not Detected
Data for Camden and Elizabeth are annual average concentrations for 2000 from NJDEP Air Toxics Monitoring Stations, provided to ENVIRON by NJDEP Bureau of Air Monitoring. Data for Teterboro are based on average of all samples listed in Table 6 Notes (IN and OUT) collected at each location.

TABLE 9 Summary of Cancer and Noncancer Risks				
	SE Location	**NW Location**	**SW Location**	**NE Location**
Carcinogenic Risk Summary				
Adult Resident	**8.E-05**	**9.E-04**	**8.E-05**	**8.E-05**
Risk Drivers	Benzene*	Benzene* 1,3-Butadiene*	Benzene*	Benzene*
Child Resident	**2.E-05**	**2.E-04**	**2.E-05**	**2.E-05**
Risk Drivers	Benzene*	Benzene* 1,3-Butadiene*	Benzene*	Benzene*
Noncarcinogenic Risk Summary				
Adult Resident	**5.0**	**2.5**	**3.3**	**2.7**
Risk Drivers	Benzene* Methyl-2-pentanone, 4- Toluene*	Benzene*	Benzene* Toluene*	Benzene* Toluene*
Child Resident	**5.0**	**2.5**	**3.3**	**2.7**
Risk Drivers	Benzene* Methyl-2-pentanone, 4- Toluene*	Benzene*	Benzene* Toluene*	Benzene* Toluene*
Note: *=fuel-related compound				

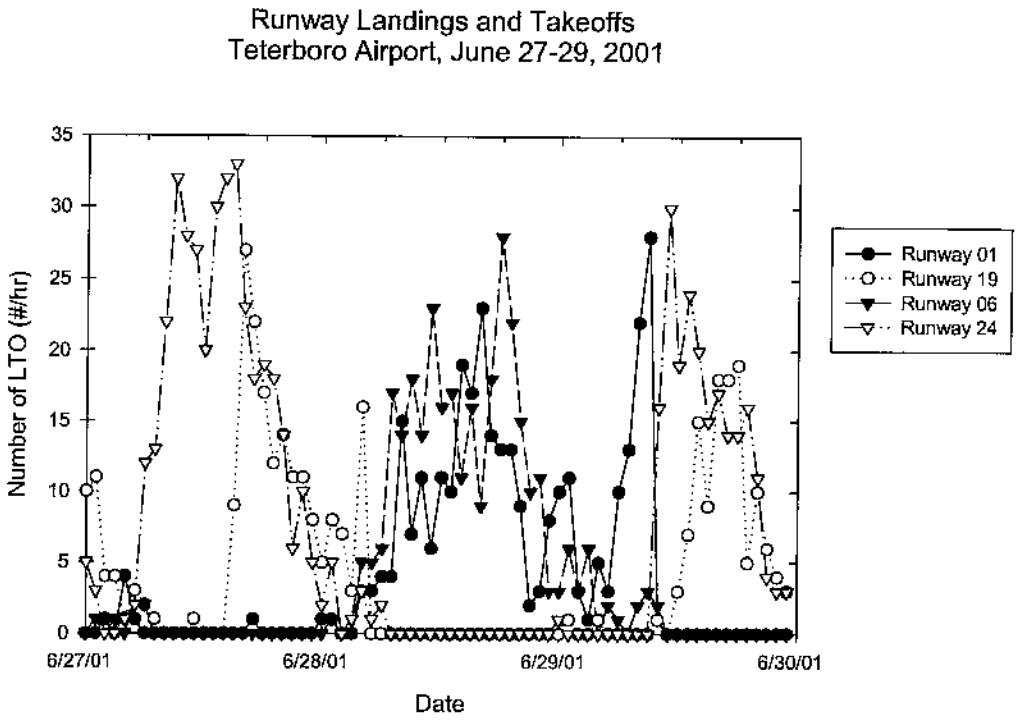

Figure 7. Landings and Takeoffs During Study Period (June 27-29, 2001)

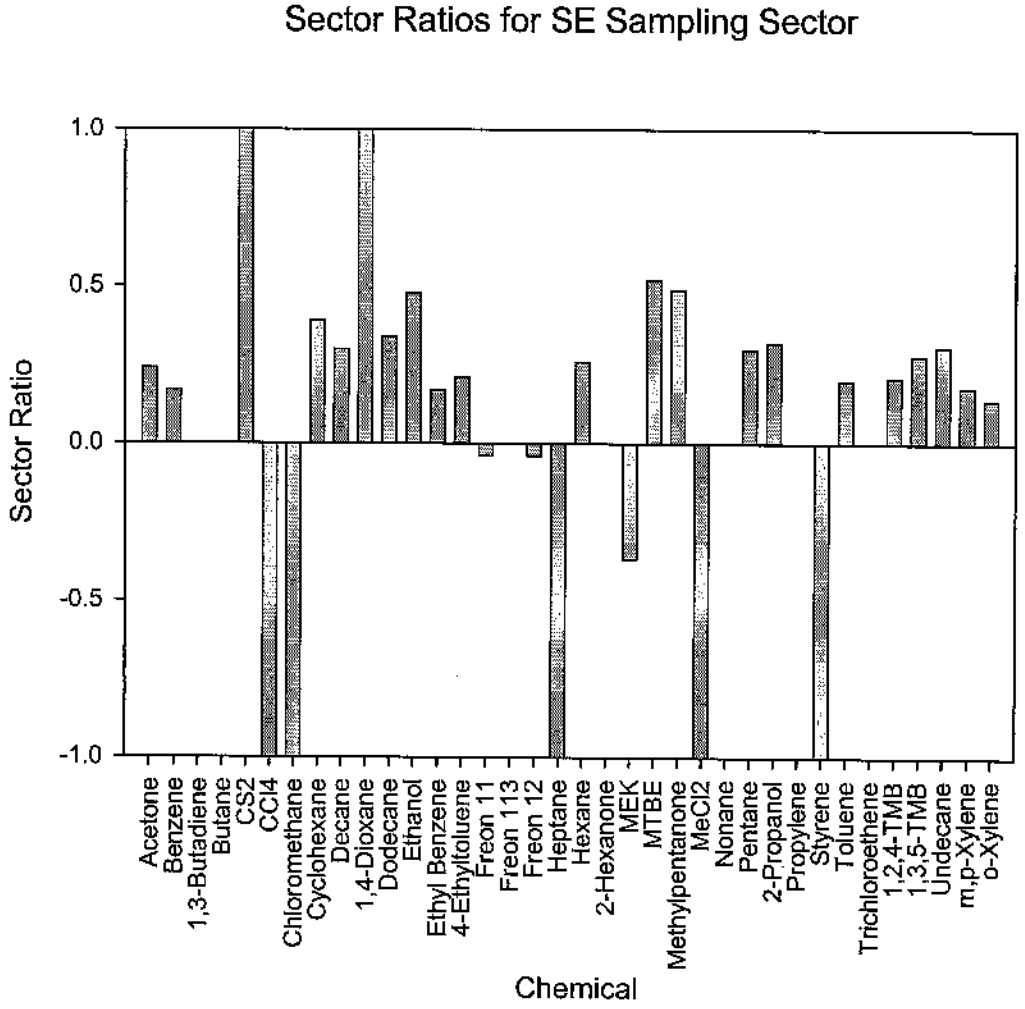

Figure 8. Sector Ratios for Chemicals Detected in Southeast Sampling Location. Positive ratio values indicate chemicals with higher concentrations downwind of the airport than upwind; negative ratio values indicate chemicals with lower concentrations downwind of the airport than upwind. Absolute value of ratio is a relative measure of the difference between upwind and downwind concentrations.

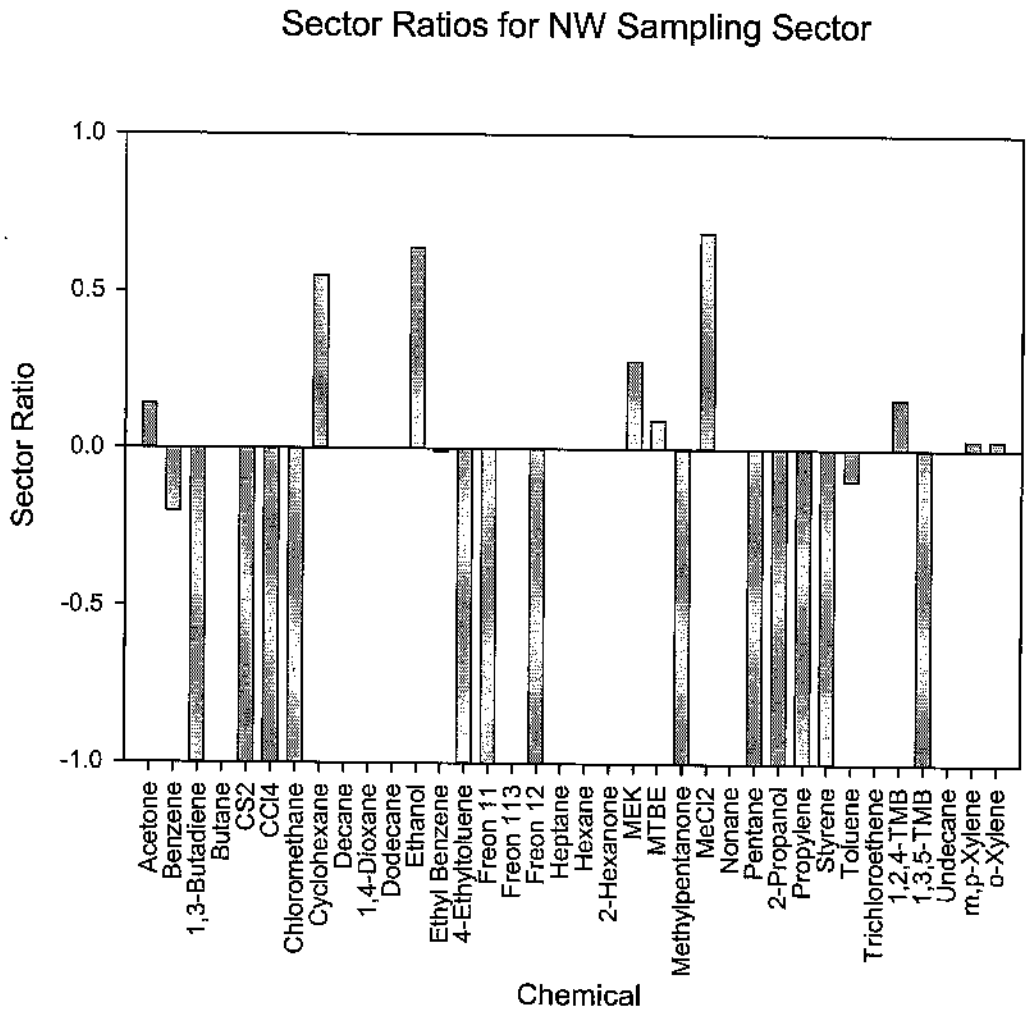

Figure 9. Sector Ratios for Chemicals Detected in Northwest Sampling Location. Positive ratio values indicate chemicals with higher concentrations downwind of the airport than upwind; negative ratio values indicate chemicals with lower concentrations downwind of the airport than upwind. Absolute value of ratio is a relative measure of the difference between upwind and downwind concentrations.

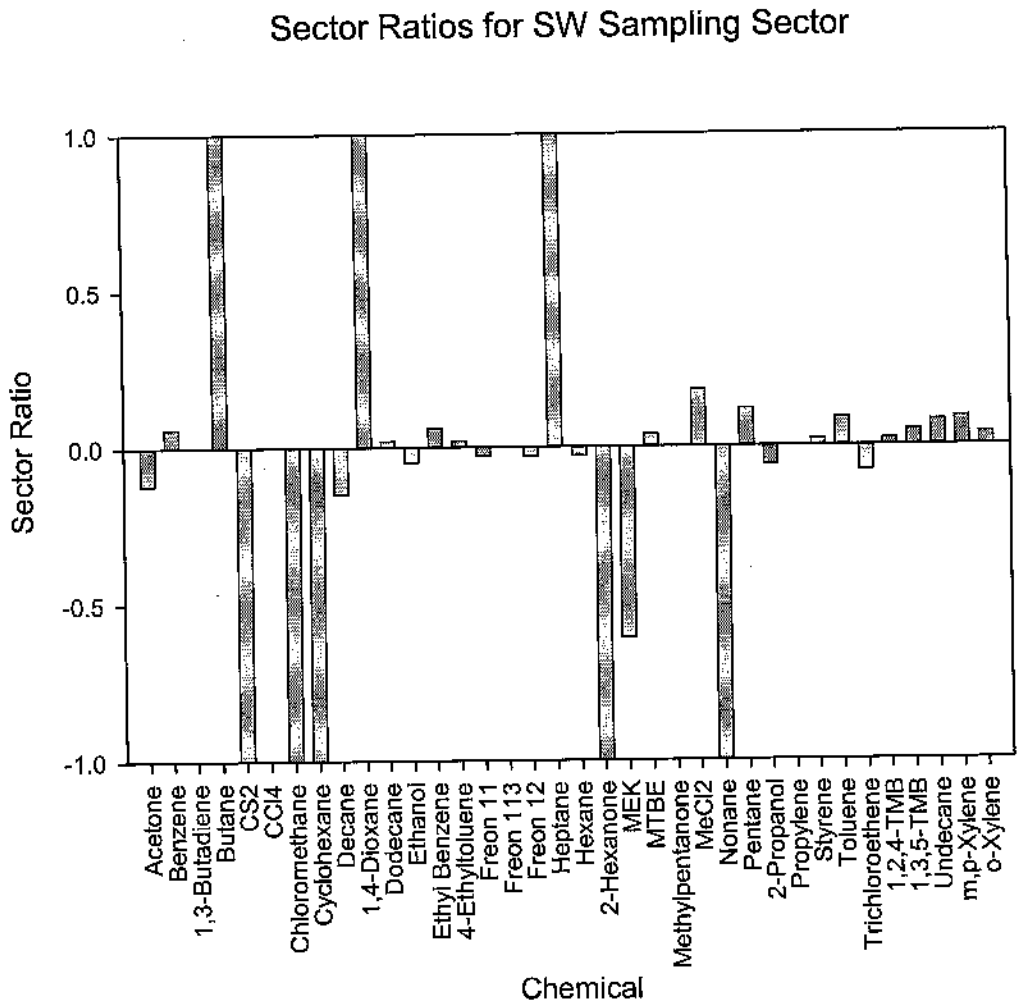

Figure 10. Sector Ratios for Chemicals Detected in Southwest Sampling Location. Positive ratio values indicate chemicals with higher concentrations downwind of the airport than upwind; negative ratio values indicate chemicals with lower concentrations downwind of the airport than upwind. Absolute value of ratio is a relative measure of the difference between upwind and downwind concentrations.

IV. CONCLUSIONS

ENVIRON conducted a screening-level evaluation of potential air quality impacts associated with operations of the Teterboro Airport, located near Teterboro New Jersey. This evaluation consisted of two parts – a screening-level air sampling and analysis study and a preliminary risk evaluation.

Concentrations of fuel-related compounds such as benzene, toluene, ethylbenzene, xylene, 1,3-butadiene, and trimethylbenzene measured in air at the Teterboro Airport during the June 2001 sampling program were higher than annual average levels that have been reported in Camden and Elizabeth, New Jersey by NJDEP. In contrast, concentrations of non-fuel related air toxics such as carbon tetrachloride, chloromethane, and methylene chloride are similar in magnitude at the three sites. Furthermore, based on the air sampling results, concentrations of a number of air toxics were elevated downwind from the airport, compared to background levels measured upwind from the airport. These chemicals include benzene, toluene, ethylbenzene, xylene, 1,2,4-trimethylbenzene, 1,3,5-trimethylbenzene, and 4-ethyltoluene, all of which are fuel related compounds. In addition, at locations in predominantly downwind directions relative to the airport, a greater number of air toxics were detected at higher concentrations downwind from the airport than upwind of the airport.

For many of the air toxics detected in the June 2001 sampling program, the differences between levels measured upwind and downwind from the airport are relatively small. This finding is likely related to the close proximity of several emission sources (e.g., airport, motor vehicles) to the sampling locations and highlights the difficulty of differentiating between the various sources that may affect ambient air quality in urban areas such as Teterboro. It should also be recognized that the sampling results represent a single point in time and thus may not reflect long-term conditions, and that the data are not sufficient to draw any conclusions regarding the statistical significance of observed differences between upwind and downwind concentrations measured at the airport.

A preliminary risk screening was conducted based on the air sampling results, using conservative assumptions that are more likely to overestimate than underestimate actual human health risks. Assuming long-term exposure to the concentrations measured during the study period, risks to human health (both cancer and noncancer health effects) were evaluated. Carcinogenic risks ranging from eight in one hundred thousand (8×10^{-5}) to nine in ten thousand (9×10^{-4}) were calculated for an adult receptor using the average air concentration data collected from the airport fenceline. The primary chemicals driving cancer risk are benzene and 1,3-butadiene, which are both fuel-related compounds. Screening-level assessments that indicate

cancer risks of greater than approximately one in one million (1×10^{-6}) generally suggest that a more refined analysis may be required. Thus, the preliminary risk results exceed the regulatory benchmark (1×10^{-6}) by two orders of magnitude, and a more refined analysis is warranted. This assessment also identified noncarcinogenic risks that are up to five times greater than screening levels based on regulatory guidance. The primary chemicals driving noncancer risk are benzene and toluene, which are also fuel-related compounds. Again, such results would suggest that a more refined analysis is warranted.

The overall results of the sampling indicate that airport operations may be affecting ambient air quality in the immediate vicinity. In addition, a screening risk evaluation indicates that potential cancer and noncancer risks exceed regulatory benchmarks. Conservative exposure assumptions are used in the risk screening, and thus the results do not necessarily indicate a significant health concern. However, the results of the preliminary risk screening suggest that a more refined analysis is warranted.

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APPENDIX A

Data Summary Tables

TABLE A-1 Number of Landings and Takeoffs (#/hr)					
Date	**Total LTO**	**Runway 01**	**Runway 19**	**Runway 06**	**Runway 24**
6/27/01 0:00	15	0	10	0	5
6/27/01 1:00	15	0	11	1	3
6/27/01 2:00	5	1	4	0	0
6/27/01 3:00	5	0	4	1	0
6/27/01 4:00	6	4	1	0	1
6/27/01 5:00	8	1	3	2	2
6/27/01 6:00	16	0	2	2	12
6/27/01 7:00	14	0	1	0	13
6/27/01 8:00	22	0	0	0	22
6/27/01 9:00	32	0	0	0	32
6/27/01 10:00	28	0	0	0	28
6/27/01 11:00	28	0	1	0	27
6/27/01 12:00	20	0	0	0	20
6/27/01 13:00	30	0	0	0	30
6/27/01 14:00	32	0	0	0	32
6/27/01 15:00	42	0	9	0	33
6/27/01 16:00	**50**	**0**	**27**	**0**	**23**
6/27/01 17:00	41	1	22	0	18
6/27/01 18:00	36	0	17	0	19
6/27/01 19:00	30	0	12	0	18
6/27/01 20:00	28	0	14	0	14
6/27/01 21:00	17	0	11	0	6
6/27/01 22:00	21	0	11	0	10
6/27/01 23:00	13	0	8	0	5
6/28/01 0:00	8	1	5	0	2
6/28/01 1:00	15	1	8	1	5
6/28/01 2:00	7	0	7	0	0
6/28/01 3:00	5	0	3	1	1
6/28/01 4:00	27	3	16	5	3
6/28/01 5:00	9	3	0	5	1
6/28/01 6:00	12	4	0	6	2
6/28/01 7:00	21	4	0	17	0
6/28/01 8:00	29	15	0	14	0
6/28/01 9:00	25	7	0	18	0
6/28/01 10:00	25	11	0	14	0
6/28/01 11:00	29	6	0	23	0
6/28/01 12:00	27	11	0	16	0
6/28/01 13:00	27	10	0	17	0
6/28/01 14:00	30	19	0	11	0
6/28/01 15:00	33	17	0	16	0
6/28/01 16:00	32	23	0	9	0
6/28/01 17:00	32	14	0	18	0
6/28/01 18:00	**41**	**13**	**0**	**28**	**0**
6/28/01 19:00	35	13	0	22	0

TABLE A-1 Number of Landings and Takeoffs (#/hr)					
Date	**Total LTO**	**Runway 01**	**Runway 19**	**Runway 06**	**Runway 24**
6/28/01 20:00	24	9	0	15	0
6/28/01 21:00	12	2	0	10	0
6/28/01 22:00	14	3	0	11	0
6/28/01 23:00	11	8	0	3	0
6/29/01 0:00	14	10	0	3	1
6/29/01 1:00	18	11	1	6	0
6/29/01 2:00	6	3	0	3	0
6/29/01 3:00	7	1	0	6	0
6/29/01 4:00	6	5	1	0	0
6/29/01 5:00	5	3	0	2	0
6/29/01 6:00	11	10	0	1	0
6/29/01 7:00	13	13	0	0	0
6/29/01 8:00	24	22	0	2	0
6/29/01 9:00	31	28	0	3	0
6/29/01 10:00	20	1	1	2	16
6/29/01 11:00	30	0	0	0	30
6/29/01 12:00	22	0	3	0	19
6/29/01 13:00	31	0	7	0	24
6/29/01 14:00	**35**	**0**	**15**	**0**	**20**
6/29/01 15:00	24	0	9	0	15
6/29/01 16:00	**35**	**0**	**18**	**0**	**17**
6/29/01 17:00	32	0	18	0	14
6/29/01 18:00	33	0	19	0	14
6/29/01 19:00	21	0	5	0	16
6/29/01 20:00	21	0	10	0	11
6/29/01 21:00	10	0	6	0	4
6/29/01 22:00	7	0	4	0	3
6/29/01 23:00	6	0	3	0	3

TABLE A-2
Summary of Meteorological Data During Study

Date	Temp	Wind Spd	Wind Dir	Date	Temp	Wind Spd	Wind Dir	Date	Temp	Wind Spd	Wind Dir
6/27/2001 0:00	77.9	1	WSW	6/28/2001 0:00	80.6	3	W	6/29/2001 0:00	79.5	1	NNW
6/27/2001 0:10	76.9	1	SW	6/28/2001 0:10	80.5	3	W	6/29/2001 0:10	79.2	2	NNW
6/27/2001 0:20	76.6	1	SE	6/28/2001 0:20	80.2	3	WNW	6/29/2001 0:20	79.1	3	N
6/27/2001 0:30	76.2	0	SE	6/28/2001 0:30	79.9	3	W	6/29/2001 0:30	79.1	4	NNW
6/27/2001 0:40	75.8	1	SE	6/28/2001 0:40	80	4	WSW	6/29/2001 0:40	78.9	3	NNW
6/27/2001 0:50	76	1	SE	6/28/2001 0:50	79.8	4	W	6/29/2001 0:50	78.7	2	NNW
6/27/2001 1:00	75.6	1	SE	6/28/2001 1:00	79.7	4	W	6/29/2001 1:00	78.5	3	N
6/27/2001 1:10	74.2	0	SE	6/28/2001 1:10	79.3	3	W	6/29/2001 1:10	78.5	3	NNE
6/27/2001 1:20	73.5	1	SE	6/28/2001 1:20	79.1	4	W	6/29/2001 1:20	78.4	2	N
6/27/2001 1:30	73.6	1	SE	6/28/2001 1:30	78.8	4	WNW	6/29/2001 1:30	78.4	2	N
6/27/2001 1:40	73.5	2	SE	6/28/2001 1:40	78.5	3	W	6/29/2001 1:40	78	2	N
6/27/2001 1:50	73.5	2	SE	6/28/2001 1:50	78.4	3	WNW	6/29/2001 1:50	78	5	N
6/27/2001 2:00	73.7	2	SE	6/28/2001 2:00	77.9	3	WNW	6/29/2001 2:00	77.9	6	NNE
6/27/2001 2:10	73.2	0	SE	6/28/2001 2:10	77.8	3	WNW	6/29/2001 2:10	77.6	5	N
6/27/2001 2:20	73.3	0	---	6/28/2001 2:20	77.6	3	W	6/29/2001 2:20	77.4	3	N
6/27/2001 2:30	73.3	0	SE	6/28/2001 2:30	77.3	3	WNW	6/29/2001 2:30	77.2	4	N
6/27/2001 2:40	72.9	0	SE	6/28/2001 2:40	77.3	3	NW	6/29/2001 2:40	76.6	4	N
6/27/2001 2:50	72.2	0	SE	6/28/2001 2:50	77.2	4	WNW	6/29/2001 2:50	76.4	4	NNE
6/27/2001 3:00	72.8	1	NNE	6/28/2001 3:00	77.2	4	WNW	6/29/2001 3:00	76.2	3	N
6/27/2001 3:10	73.1	0	N	6/28/2001 3:10	77.2	4	WNW	6/29/2001 3:10	76	3	N
6/27/2001 3:20	72.3	0	---	6/28/2001 3:20	77.1	5	W	6/29/2001 3:20	75.8	2	N
6/27/2001 3:30	71.6	0	N	6/28/2001 3:30	77.1	5	WNW	6/29/2001 3:30	75.6	1	N
6/27/2001 3:40	71.7	0	N	6/28/2001 3:40	77.2	4	WNW	6/29/2001 3:40	75.5	0	N
6/27/2001 3:50	71.4	0	---	6/28/2001 3:50	76.8	4	WNW	6/29/2001 3:50	75.1	0	N
6/27/2001 4:00	70.3	0	NE	6/28/2001 4:00	76.5	4	WNW	6/29/2001 4:00	74.8	1	NNW
6/27/2001 4:10	69	1	ENE	6/28/2001 4:10	76.3	4	W	6/29/2001 4:10	74.9	2	N
6/27/2001 4:20	68	0	E	6/28/2001 4:20	76	4	WNW	6/29/2001 4:20	74.7	1	N
6/27/2001 4:30	68	0	E	6/28/2001 4:30	75.8	3	WNW	6/29/2001 4:30	74.4	1	NW
6/27/2001 4:40	68.2	0	ESE	6/28/2001 4:40	75.5	2	WNW	6/29/2001 4:40	74.3	1	N
6/27/2001 4:50	68.3	1	ESE	6/28/2001 4:50	75.4	1	W	6/29/2001 4:50	74.2	1	NNW
6/27/2001 5:00	68.4	0	ESE	6/28/2001 5:00	75.2	2	NW	6/29/2001 5:00	73.3	1	WNW

TABLE A-2
Summary of Meteorological Data During Study

Date	Temp	Wind Spd	Wind Dir	Date	Temp	Wind Spd	Wind Dir	Date	Temp	Wind Spd	Wind Dir
6/27/2001 5:10	68	0	ESE	6/28/2001 5:10	75.1	2	NW	6/29/2001 5:10	72.5	0	WNW
6/27/2001 5:20	67.7	0	---	6/28/2001 5:20	75.1	2	NNW	6/29/2001 5:20	73.2	1	NNE
6/27/2001 5:30	67.9	1	ESE	6/28/2001 5:30	75.2	3	NW	6/29/2001 5:30	74	2	ENE
6/27/2001 5:40	67.6	1	SE	6/28/2001 5:40	74.8	3	WNW	6/29/2001 5:40	74.1	2	NE
6/27/2001 5:50	67.6	0	SE	6/28/2001 5:50	74.6	2	NW	6/29/2001 5:50	74.3	2	NE
6/27/2001 6:00	67.8	0	---	6/28/2001 6:00	74.4	2	N	6/29/2001 6:00	74.5	3	NE
6/27/2001 6:10	68.7	0	SE	6/28/2001 6:10	74.5	2	NW	6/29/2001 6:10	74.6	4	NE
6/27/2001 6:20	69.9	0	SE	6/28/2001 6:20	74.8	3	NW	6/29/2001 6:20	74.7	4	NE
6/27/2001 6:30	70.3	1	SSE	6/28/2001 6:30	75	3	NW	6/29/2001 6:30	75.1	3	NE
6/27/2001 6:40	71.1	1	SSE	6/28/2001 6:40	75.2	3	NW	6/29/2001 6:40	75.2	4	NE
6/27/2001 6:50	72.2	0	SSE	6/28/2001 6:50	75.3	3	NW	6/29/2001 6:50	75.4	4	NE
6/27/2001 7:00	73.3	1	SSE	6/28/2001 7:00	75.7	4	NW	6/29/2001 7:00	75.7	3	ENE
6/27/2001 7:10	74.4	1	SSE	6/28/2001 7:10	75.9	5	NW	6/29/2001 7:10	75.9	3	ENE
6/27/2001 7:20	75	2	NW	6/28/2001 7:20	76.4	4	NW	6/29/2001 7:20	76.2	3	ENE
6/27/2001 7:30	75.7	3	WNW	6/28/2001 7:30	77	5	NW	6/29/2001 7:30	77.1	3	ENE
6/27/2001 7:40	76.3	2	NW	6/28/2001 7:40	77.3	6	NW	6/29/2001 7:40	76.8	4	E
6/27/2001 7:50	77.2	2	N	6/28/2001 7:50	77.6	6	WNW	6/29/2001 7:50	77.8	4	E
6/27/2001 8:00	77.5	3	WNW	6/28/2001 8:00	78.2	6	WNW	6/29/2001 8:00	76.6	6	E
6/27/2001 8:10	77.4	3	WNW	6/28/2001 8:10	79.2	5	NW	6/29/2001 8:10	77.3	6	E
6/27/2001 8:20	78.2	2	WNW	6/28/2001 8:20	79.5	7	NW	6/29/2001 8:20	78	4	E
6/27/2001 8:30	78.6	3	NW	6/28/2001 8:30	79.9	8	NW	6/29/2001 8:30	78.2	4	E
6/27/2001 8:40	78.9	3	WNW	6/28/2001 8:40	80.3	7	NW	6/29/2001 8:40	78.3	4	E
6/27/2001 8:50	79.2	3	WNW	6/28/2001 8:50	80.7	6	NW	6/29/2001 8:50	78.5	5	ESE
6/27/2001 9:00	79.8	4	W	6/28/2001 9:00	81.6	5	NW	6/29/2001 9:00	77.6	4	E
6/27/2001 9:10	80.4	3	WNW	6/28/2001 9:10	81.8	7	NNW	6/29/2001 9:10	77.6	5	NE
6/27/2001 9:20	81.2	3	WNW	6/28/2001 9:20	82.6	5	NNW	6/29/2001 9:20	79	4	E
6/27/2001 9:30	82.1	3	W	6/28/2001 9:30	83	6	NNW	6/29/2001 9:30	79.3	4	ENE
6/27/2001 9:40	83.1	4	W	6/28/2001 9:40	83.5	8	NNW	6/29/2001 9:40	80	5	E
6/27/2001 9:50	82.8	6	NW	6/28/2001 9:50	83.2	9	N	6/29/2001 9:50	79.7	6	ENE
6/27/2001 10:00	83.4	5	NW	6/28/2001 10:00	84	7	NNW	6/29/2001 10:00	80.1	4	ESE
6/27/2001 10:10	84.5	5	WNW	6/28/2001 10:10	83.9	9	N	6/29/2001 10:10	82.3	5	E
6/27/2001 10:20	84.5	6	NW	6/28/2001 10:20	84.4	8	N	6/29/2001 10:20	81.2	5	E

TABLE A-2
Summary of Meteorological Data During Study

Date	Temp	Wind Spd	Wind Dir	Date	Temp	Wind Spd	Wind Dir	Date	Temp	Wind Spd	Wind Dir
6/27/2001 10:30	84.8	6	NW	6/28/2001 10:30	84.9	7	NW	6/29/2001 10:30	81.1	4	SSE
6/27/2001 10:40	85.2	5	WNW	6/28/2001 10:40	85.4	8	NNW	6/29/2001 10:40	81.4	4	SE
6/27/2001 10:50	85.3	5	WNW	6/28/2001 10:50	86.1	7	NNW	6/29/2001 10:50	81.2	3	E
6/27/2001 11:00	85.9	6	WNW	6/28/2001 11:00	85.9	9	NW	6/29/2001 11:00	82.4	4	ENE
6/27/2001 11:10	86.5	7	W	6/28/2001 11:10	86.5	6	NNW	6/29/2001 11:10	81.2	4	SSE
6/27/2001 11:20	86.6	7	W	6/28/2001 11:20	86.6	8	NW	6/29/2001 11:20	81.6	4	SE
6/27/2001 11:30	87.1	7	W	6/28/2001 11:30	87	10	NNW	6/29/2001 11:30	82.6	5	SE
6/27/2001 11:40	88	6	NW	6/28/2001 11:40	86.7	11	NW	6/29/2001 11:40	81.9	5	SSE
6/27/2001 11:50	87.9	5	W	6/28/2001 11:50	87.7	9	NNW	6/29/2001 11:50	83.2	4	E
6/27/2001 12:00	89.3	5	WNW	6/28/2001 12:00	87.4	11	NNW	6/29/2001 12:00	82.3	6	SSE
6/27/2001 12:10	89.3	7	NW	6/28/2001 12:10	87.7	10	NNW	6/29/2001 12:10	81.4	6	SW
6/27/2001 12:20	88.7	8	WNW	6/28/2001 12:20	87.6	9	N	6/29/2001 12:20	81.8	8	SSW
6/27/2001 12:30	88.8	8	WNW	6/28/2001 12:30	87.9	7	NNE	6/29/2001 12:30	81.8	9	SSW
6/27/2001 12:40	89.1	7	WNW	6/28/2001 12:40	88.6	8	NNW	6/29/2001 12:40	81.4	9	SSW
6/27/2001 12:50	90.5	6	NW	6/28/2001 12:50	89.1	8	NW	6/29/2001 12:50	81.4	7	SSW
6/27/2001 13:00	90	8	WNW	6/28/2001 13:00	88.9	10	N	6/29/2001 13:00	81.5	7	SSW
6/27/2001 13:10	88.9	8	W	6/28/2001 13:10	89.5	8	NNW	6/29/2001 13:10	82.5	6	SSW
6/27/2001 13:20	89.3	8	NW	6/28/2001 13:20	89.9	8	NNW	6/29/2001 13:20	82.3	7	SSW
6/27/2001 13:30	89.8	8	NW	6/28/2001 13:30	90.6	9	NW	6/29/2001 13:30	82.6	8	SSW
6/27/2001 13:40	89.5	9	W	6/28/2001 13:40	90	9	N	6/29/2001 13:40	82.3	9	SSW
6/27/2001 13:50	89.6	7	W	6/28/2001 13:50	90.4	9	N	6/29/2001 13:50	82.8	8	SSW
6/27/2001 14:00	90.2	7	NW	6/28/2001 14:00	89.7	11	N	6/29/2001 14:00	82.9	8	SSW
6/27/2001 14:10	90	7	WNW	6/28/2001 14:10	90.8	9	N	6/29/2001 14:10	83	8	SW
6/27/2001 14:20	90.4	9	W	6/28/2001 14:20	90.7	7	NW	6/29/2001 14:20	83.3	7	SSW
6/27/2001 14:30	89.9	8	WNW	6/28/2001 14:30	90.5	9	N	6/29/2001 14:30	83.9	7	SSW
6/27/2001 14:40	89.9	8	WNW	6/28/2001 14:40	90.5	7	WNW	6/29/2001 14:40	84.4	6	SSW
6/27/2001 14:50	89.9	7	W	6/28/2001 14:50	91.4	7	NW	6/29/2001 14:50	83.2	7	S
6/27/2001 15:00	90.8	7	NW	6/28/2001 15:00	92	5	NW	6/29/2001 15:00	84.2	7	SSE
6/27/2001 15:10	90.1	9	NW	6/28/2001 15:10	91.4	8	NW	6/29/2001 15:10	83.5	7	S
6/27/2001 15:20	90.2	9	W	6/28/2001 15:20	91.3	8	NNE	6/29/2001 15:20	83.8	7	S
6/27/2001 15:30	89.9	8	WNW	6/28/2001 15:30	90.1	8	N	6/29/2001 15:30	84	7	SSW
6/27/2001 15:40	90.2	8	WNW	6/28/2001 15:40	90	9	NNE	6/29/2001 15:40	83.1	8	S

TABLE A-2
Summary of Meteorological Data During Study

Date	Temp	Wind Spd	Wind Dir	Date	Temp	Wind Spd	Wind Dir	Date	Temp	Wind Spd	Wind Dir
6/27/2001 15:50	90.9	7	NW	6/28/2001 15:50	90.1	7	NNW	6/29/2001 15:50	82.9	8	S
6/27/2001 16:00	91.6	8	NW	6/28/2001 16:00	89.6	10	NNW	6/29/2001 16:00	83.1	8	SSW
6/27/2001 16:10	91.3	7	W	6/28/2001 16:10	89.9	7	NNW	6/29/2001 16:10	83.8	7	SSE
6/27/2001 16:20	90.6	8	NW	6/28/2001 16:20	90.5	7	N	6/29/2001 16:20	83.1	6	S
6/27/2001 16:30	91	8	NW	6/28/2001 16:30	91.1	7	NNW	6/29/2001 16:30	83.2	7	SSW
6/27/2001 16:40	90.5	8	NW	6/28/2001 16:40	90.5	9	NW	6/29/2001 16:40	82.8	7	SSW
6/27/2001 16:50	90.5	8	NW	6/28/2001 16:50	89.8	9	NNE	6/29/2001 16:50	82.2	7	SSW
6/27/2001 17:00	90.8	7	NNW	6/28/2001 17:00	90.4	8	NW	6/29/2001 17:00	82.1	7	SSE
6/27/2001 17:10	90.3	7	NW	6/28/2001 17:10	89.6	9	NNE	6/29/2001 17:10	82.3	6	SSE
6/27/2001 17:20	90.4	6	NW	6/28/2001 17:20	89.8	7	NNW	6/29/2001 17:20	82.4	6	SSE
6/27/2001 17:30	90	6	NW	6/28/2001 17:30	89.5	10	N	6/29/2001 17:30	82	6	SSE
6/27/2001 17:40	90.5	5	NNW	6/28/2001 17:40	88.9	12	N	6/29/2001 17:40	82	7	SSW
6/27/2001 17:50	90.5	5	NW	6/28/2001 17:50	89.6	7	NW	6/29/2001 17:50	81.5	6	S
6/27/2001 18:00	90.1	6	W	6/28/2001 18:00	89.8	8	NW	6/29/2001 18:00	81.4	6	S
6/27/2001 18:10	89.9	7	W	6/28/2001 18:10	89.1	7	NNW	6/29/2001 18:10	81	7	S
6/27/2001 18:20	89.5	6	WNW	6/28/2001 18:20	88.9	8	NNW	6/29/2001 18:20	81.2	6	S
6/27/2001 18:30	89.6	6	W	6/28/2001 18:30	88.5	9	N	6/29/2001 18:30	80.8	8	S
6/27/2001 18:40	89.6	7	W	6/28/2001 18:40	88.4	9	WNW	6/29/2001 18:40	80.5	7	S
6/27/2001 18:50	88.8	7	W	6/28/2001 18:50	88.1	8	NNW	6/29/2001 18:50	79.9	7	S
6/27/2001 19:00	88.9	6	WNW	6/28/2001 19:00	87.4	7	NNW	6/29/2001 19:00	79.8	7	S
6/27/2001 19:10	89	5	WNW	6/28/2001 19:10	87.5	6	NNW	6/29/2001 19:10	79.7	6	S
6/27/2001 19:20	88.6	5	W	6/28/2001 19:20	86.9	9	NNW	6/29/2001 19:20	79.6	6	S
6/27/2001 19:30	88.8	5	W	6/28/2001 19:30	86.3	7	NNW	6/29/2001 19:30	78.5	6	S
6/27/2001 19:40	88.1	6	W	6/28/2001 19:40	85.9	8	NNW	6/29/2001 19:40	77.9	7	S
6/27/2001 19:50	88.1	4	WSW	6/28/2001 19:50	85.6	7	NNW	6/29/2001 19:50	77.6	6	S
6/27/2001 20:00	87.4	6	W	6/28/2001 20:00	85.5	6	NNW	6/29/2001 20:00	77.5	6	S
6/27/2001 20:10	87.1	5	W	6/28/2001 20:10	85.3	6	NNW	6/29/2001 20:10	77.1	6	S
6/27/2001 20:20	86.7	4	W	6/28/2001 20:20	85.1	5	NW	6/29/2001 20:20	76.8	4	S
6/27/2001 20:30	86.7	4	W	6/28/2001 20:30	84.7	5	NW	6/29/2001 20:30	76.4	5	S
6/27/2001 20:40	86.2	4	WSW	6/28/2001 20:40	84.3	5	NW	6/29/2001 20:40	76.4	5	S
6/27/2001 20:50	86	2	W	6/28/2001 20:50	83.9	5	NNW	6/29/2001 20:50	76.4	4	S
6/27/2001 21:00	85.5	3	WNW	6/28/2001 21:00	83.7	4	NW	6/29/2001 21:00	76.1	4	S

TABLE A-2
Summary of Meteorological Data During Study

Date	Temp	Wind Spd	Wind Dir	Date	Temp	Wind Spd	Wind Dir	Date	Temp	Wind Spd	Wind Dir
6/27/2001 21:10	85.2	3	WNW	6/28/2001 21:10	83.3	4	NNW	6/29/2001 21:10	76.1	4	S
6/27/2001 21:20	85.1	3	W	6/28/2001 21:20	83.1	4	NNW	6/29/2001 21:20	76.3	4	S
6/27/2001 21:30	85	3	WNW	6/28/2001 21:30	82.9	3	NW	6/29/2001 21:30	76.3	4	S
6/27/2001 21:40	84.7	3	W	6/28/2001 21:40	82.6	4	NNW	6/29/2001 21:40	76.2	4	SSE
6/27/2001 21:50	84.3	3	WNW	6/28/2001 21:50	82.4	3	NNW	6/29/2001 21:50	76.4	5	SSE
6/27/2001 22:00	84.1	3	W	6/28/2001 22:00	82.1	3	NW	6/29/2001 22:00	76	7	SSW
6/27/2001 22:10	83.9	3	W	6/28/2001 22:10	82	3	NW	6/29/2001 22:10	75.5	6	SSW
6/27/2001 22:20	83.5	3	WNW	6/28/2001 22:20	81.9	2	NW	6/29/2001 22:20	74.9	5	SSW
6/27/2001 22:30	83.2	3	WNW	6/28/2001 22:30	81.5	3	NW	6/29/2001 22:30	74.8	5	SSW
6/27/2001 22:40	82.8	3	W	6/28/2001 22:40	81.5	3	NNW	6/29/2001 22:40	74.7	6	SSW
6/27/2001 22:50	82.6	3	WNW	6/28/2001 22:50	81.1	3	N	6/29/2001 22:50	74.5	5	SSW
6/27/2001 23:00	82.3	2	W	6/28/2001 23:00	80.9	3	N	6/29/2001 23:00	74.5	4	SSW
6/27/2001 23:10	81.8	3	WNW	6/28/2001 23:10	80.6	3	NNW	6/29/2001 23:10	74.7	2	SSW
6/27/2001 23:20	81.7	3	WNW	6/28/2001 23:20	80.5	3	N	6/29/2001 23:20	75	2	SSW
6/27/2001 23:30	81.5	2	W	6/28/2001 23:30	80.2	2	NNW	6/29/2001 23:30	75.2	2	SSW
6/27/2001 23:40	81.2	3	WNW	6/28/2001 23:40	79.9	1	NNW	6/29/2001 23:40	75.8	2	SSW
6/27/2001 23:50	80.8	3	W	6/28/2001 23:50	79.7	1	N	6/29/2001 23:50	76.2	2	SSW

APPENDIX B

Laboratory Results for TO-14 Air Analysis (Volatile Organic Compounds)

@ AIR TOXICS LTD.
AN ENVIRONMENTAL ANALYTICAL LABORATORY

WORK ORDER #: 0107019A

Work Order Summary

CLIENT:	Mr. Alan Kao Environ 274 Main Street Groton, MA 01450	**BILL TO:**	Mr. Alan Kao Environ 274 Main Street Groton, MA 01450
PHONE:	978-448-8824	**P.O. #**	
FAX:	978-448-8825	**PROJECT #**	02-9445A Teterboro
DATE RECEIVED:	7/2/01		
DATE COMPLETED:	8/1/01		

FRACTION #	NAME	TEST	RECEIPT VAC./PRES.
01A	RED BLANK 1	TO-15-S	0.5 "Hg
02A	RED BLANK 2	TO-15-S	1.4psi
03A	AIRPORT N	TO-15-S	4.5 "Hg
04A	RED IN 1	TO-15-S	15.8psi
05A	INDUSTRIAL & 46 OUT 1	TO-15-S	16.0psi
06A	AIRPORT SOUTH	TO-15-S	2.0 "Hg
07A	FRED OUT 2	TO-15-S	7.2psi
08A	RED IN 2A	TO-15-S	11.0 "Hg
09A	RED OUT 2A	TO-15-S	1.0 "Hg
10A	RED IN 2B	TO-15-S	4.5 "Hg
11A	RED OUT 2B	TO-15-S	5.4psi
12A	INDUSTRIAL OUT2	TO-15-S	7.0psi
13A	MOON IN2	TO-15-S	3.0 "Hg
14A	MOON OUT2	TO-15-S	7.2psi
14AA	MOON OUT2 Duplicate	TO-15-S	7.2psi
15A	INDUSTRIAL & 46 IN 1	TO-15-S	23.0 "Hg
16A	Method Spike	TO-15-S	NA
17A	Lab Blank	TO-15-S	NA

CERTIFIED BY: Linda S. Truman DATE: 08/01/01

Laboratory Director

Certfication numbers: CA ELAP - 1149, NY ELAP - 11291, UT ELAP - E-217, AZ ELAP - AZ0567, LA - AI 30763

180 BLUE RAVINE ROAD, SUITE B FOLSOM, CA - 95630
(916) 985-1000 . (800) 985-5955 . FAX (916) 985-1020

LABORATORY NARRATIVE
TO-15 SIM
Environ
Workorder# 0107019A

Fifteen 6 Liter Summa Canister (100% Certified) samples were received on July 02, 2001. The laboratory performed analysis via EPA Method TO-15 using GC/MS in the SIM acquisition mode. The method involves concentrating up to 0.5 liters of air. The concentrated aliquot is then flash vaporized and swept through a water management system to remove water vapor. Following dehumidification, the sample passes directly into the GC/MS for analysis. See the data sheets for the reporting limits for each compound.

Method modifications taken to run these samples include:

Requirement	*TO-14/15 SIM*	*ATL Modifications*
Sampling/concentrator system	Nafion Drier	Multisorbent concentrator
Canister cleaning - clean air supply	Cryogenic Trap	Use of Humidified UHP Air
Canister certification	Pressurize w/humidified zero air.	Pressurize w/dry UHP nitrogen
Sample load volume	400 mL	Up to 0.5 liter
Blank	Humid air blank	Dry air blank for low level analysis.
Blank acceptance criteria	< 0.2 ppbv	< DL
BFB absolute abundance criteria	Within 10% of that from previous day.	CCV surrogate recoveries demonstrate stability from one day to the next
BFB acceptance criteria	CLP protocol	SW-846 protocol
Concentration of IS spike	Not specified	10 ppbv
Dilutions for initial calibration	Dynamic dilutions or static using canisters	Syringe dilutions
Flow rates/operating parameters	Not specified	Optimized. See procedures section.
ICAL RRF %RSD acceptance criteria	Not specified	30% or less for standard compounds, 40% or less for non-standard and polar compounds
IS recoveries	Within 40% of mean over ICAL for blanks, and w/in 40% of daily CCV for samples.	Within 40% of CCV recoveries for blank and samples.
IS RTs	Within .33 min from most recent calibration (either ICAL or daily)	Within 0.5 min. of RT in daily CCV
Daily CCV	70 - 130%	Standard compounds:70 - 130% for at least 90%; Non-standard and polar compounds: 60 - 140% for at least 80%
RF for quantitation	From ICAL	From ICAL
Canister leak check	24 hour, positive pressure	20 minute, vacuum check
MSD scan range	35 - 300 amu	35 - 350 amu
Canister cleaning - clean air supply	Cryogenic Trap	Use of Humidified UHP Air

Requirement	*TO-14/15 SIM*	*ATL Modifications*
Canister certification	Pressurize w/humidified zero air.	Pressurize w/dry UHP nitrogen
Sampling/concentrator system	Nafion Drier	Multisorbent concentrator

Receiving Notes

There was a significant difference (ie. greater than 5.0" Hg) between the measured canister receipt vacuum and that which was reported on the chain of custody for RED IN 2B,
RED OUT 2B, and INDUSTRIAL OUT2. The client was notified and the vacuum measured in the laboratory was used to calculate results.

Sample INDUSTRIAL & 46 IN 1 was received with significant vacuum remaining in the canister. The client was contacted and analysis proceeded. The residual canister vacuum resulted in elevated reporting limits.

Analytical Notes

There were no analytical discrepancies.

Definition of Data Qualifying Flags

Six qualifiers may have been used on the data analysis sheets and indicates as follows:

B - Compound present in laboratory blank greater than reporting limit (background subtraction not performed).

J - Estimated value.

E - Exceeds instrument calibration range.

S - Saturated peak.

Q - Exceeds quality control limits.

U - Compound analyzed for but not detected above the reporting limit.

AIR TOXICS LTD.

SAMPLE NAME: RED BLANK 1

ID#: 0107019A-01A

EPA METHOD TO-14 GC/MS SIM

Dil. Factor:	1.06	Date of Analysis: 7/25/01	

Compound	Rpt. Limit (ppbv)	Rpt. Limit (uG/m3)	Amount (ppbv)	Amount (uG/m3)
Benzene	0.068	0.22	Not Detected	Not Detected
Toluene	0.027	0.10	0.92	3.5
Ethyl Benzene	0.027	0.12	0.14	0.61
m,p-Xylene	0.054	0.24	0.49	2.2
o-Xylene	0.027	0.12	0.22	0.99

Container Type: 6 Liter Summa Canister (100% Certified)

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	113	70-130
Toluene-d8	104	70-130
4-Bromofluorobenzene	100	70-130

AIR TOXICS LTD.

SAMPLE NAME: RED BLANK 2

ID#: 0107019A-02A

EPA METHOD TO-14 GC/MS SIM

Folder Name:	01r2524	Date of Collection:	6/28/01
Dil. Factor:	1.22	Date of Analysis:	7/25/01

Compound	Rpt. Limit (ppbv)	Rpt. Limit (uG/m3)	Amount (ppbv)	Amount (uG/m3)
Benzene	0.061	0.20	0.076	0.25
Toluene	0.024	0.093	0.039	0.15
Ethyl Benzene	0.024	0.11	0.039	0.17
m,p-Xylene	0.049	0.22	Not Detected	Not Detected
o-Xylene	0.024	0.11	Not Detected	Not Detected

Container Type: 6 Liter Summa Canister (100% Certified)

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	84	70-130
Toluene-d8	115	70-130
4-Bromofluorobenzene	102	70-130

AIR TOXICS LTD.

SAMPLE NAME: AIRPORT N

ID#: 0107019A-03A

EPA METHOD TO-14 GC/MS SIM

File Name:	072522	Date of Collection:	6/27/01
Dil Fact:	1.5	Date of Analysis:	7/25/01

Compound	Rpt. Limit (ppbv)	Rpt. Limit (uG/m3)	Amount (ppbv)	Amount (uG/m3)
Benzene	0.079	0.26	0.50	1.6
Toluene	0.032	0.12	2.0	7.8
Ethyl Benzene	0.032	0.14	0.43	1.9
m,p-Xylene	0.063	0.28	2.1	9.4
o-Xylene	0.032	0.14	1.1	4.9

Container Type: 6 Liter Summa Canister (100% Certified)

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	88	70-130
Toluene-d8	104	70-130
4-Bromofluorobenzene	96	70-130

AIR TOXICS LTD.

SAMPLE NAME: RED IN 1

ID#: 0107019A-04A

EPA METHOD TO-14 GC/MS SIM

File Name:	0107019	Date of Collection:	6/27/01
Dil Factor:	2.00	Date of Analysis:	7/25/01

Compound	Rpt. Limit (ppbv)	Rpt. Limit (uG/m3)	Amount (ppbv)	Amount (uG/m3)
Benzene	0.050	0.16	0.47	1.5
Toluene	0.020	0.076	1.1	4.4
Ethyl Benzene	0.020	0.088	0.095	0.42
m,p-Xylene	0.040	0.18	0.26	1.1
o-Xylene	0.020	0.088	0.12	0.51

Container Type: 6 Liter Summa Canister (100% Certified)

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	88	70-130
Toluene-d8	79	70-130
4-Bromofluorobenzene	80	70-130

AIR TOXICS LTD.

SAMPLE NAME: INDUSTRIAL & 46 OUT 1

ID#: 0107019A-05A

EPA METHOD TO-14 GC/MS SIM

File ID:	07252	Date Collected:	6/27/01
Dil. Factor:	1.00	Date Analyzed:	7/25/01

Compound	Rpt. Limit (ppbv)	Rpt. Limit (uG/m3)	Amount (ppbv)	Amount (uG/m3)
Benzene	0.050	0.16	6.5	21
Toluene	0.020	0.076	8.6	33
Ethyl Benzene	0.020	0.088	0.90	4.0
m,p-Xylene	0.040	0.18	4.1	18
o-Xylene	0.020	0.088	1.5	6.8

Container Type: 6 Liter Summa Canister (100% Certified)

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	104	70-130
Toluene-d8	126	70-130
4-Bromofluorobenzene	103	70-130

AIR TOXICS LTD.

SAMPLE NAME: AIRPORT SOUTH

ID#: 0107019A-06A

EPA METHOD TO-14 GC/MS SIM

Lab File ID:	07252	Date of Collection:	6/23/01
Dil. Factor:	1.4	Date of Analysis:	7/26/01

Compound	Rpt. Limit (ppbv)	Rpt. Limit (uG/m3)	Amount (ppbv)	Amount (uG/m3)
Benzene	0.072	0.23	0.59	1.9
Toluene	0.029	0.11	1.9	7.3
Ethyl Benzene	0.029	0.13	0.30	1.3
m,p-Xylene	0.058	0.25	1.2	5.2
o-Xylene	0.029	0.13	0.61	2.7

Container Type: 6 Liter Summa Canister (100% Certified)

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	104	70-130
Toluene-d8	120	70-130
4-Bromofluorobenzene	104	70-130

AIR TOXICS LTD.

SAMPLE NAME: FRED OUT 2

ID#: 0107019A-07A

EPA METHOD TO-14 GC/MS SIM

File Name:	0724r08	Date of Collection:	7/24/01
Dil. Factor:	4.00	Date of Analysis:	7/26/01

Compound	Rpt. Limit (ppbv)	Rpt. Limit (uG/m3)	Amount (ppbv)	Amount (uG/m3)
Benzene	0.25	0.81	2.6	8.6
Toluene	0.10	0.38	140	530
Ethyl Benzene	0.10	0.44	3.9	17
m,p-Xylene	0.20	0.88	20	89
o-Xylene	0.10	0.44	5.8	26

Container Type: 6 Liter Summa Canister (100% Certified)

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	90	70-130
Toluene-d8	123	70-130
4-Bromofluorobenzene	106	70-130

AIR TOXICS LTD.

SAMPLE NAME: RED IN 2A

ID#: 0107019A-08A

EPA METHOD TO-14 GC/MS SIM

File Name:	0107127	Date of Collection: 6/28/01
Dil. Factor:	2.12	Date of Analysis: 7/26/01

Compound	Rpt. Limit (ppbv)	Rpt. Limit (uG/m3)	Amount (ppbv)	Amount (uG/m3)
Benzene	0.11	0.34	0.60	1.9
Toluene	0.042	0.16	1.7	6.5
Ethyl Benzene	0.047	0.19	0.18	0.82
m,p-Xylene	0.085	0.37	0.62	2.7
o-Xylene	0.042	0.19	0.26	1.2

Container Type: 6 Liter Summa Canister (100% Certified)

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	92	70-130
Toluene-d8	119	70-130
4-Bromofluorobenzene	102	70-130

AIR TOXICS LTD.

SAMPLE NAME: RED OUT 2A

ID#: 0107019A-09A

EPA METHOD TO-14 GC/MS SIM

File Name:	07252r	Date of Collection:	6/28/01
Dil. Factor:	1.39	Date of Analysis:	7/25/01

Compound	Rpt. Limit (ppbv)	Rpt. Limit (uG/m3)	Amount (ppbv)	Amount (uG/m3)
Benzene	0.070	0.22	0.73	2.4
Toluene	0.028	0.11	1.4	5.3
Ethyl Benzene	0.028	0.12	0.33	1.4
m,p-Xylene	0.056	0.24	1.0	4.5
o-Xylene	0.028	0.12	0.26	1.2

Container Type: 6 Liter Summa Canister (100% Certified)

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	101	70-130
Toluene-d8	118	70-130
4-Bromofluorobenzene	104	70-130

AIR TOXICS LTD.

SAMPLE NAME: RED IN 2B

ID#: 0107019A-10A

EPA METHOD TO-14 GC/MS SIM

[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]

Compound	Rpt. Limit (ppbv)	Rpt. Limit (uG/m3)	Amount (ppbv)	Amount (uG/m3)
Benzene	0.79	2.6	5.3	17
Toluene	0.32	1.2	190	740
Ethyl Benzene	0.32	1.4	5.5	24
m,p-Xylene	0.63	2.8	27	120
o-Xylene	0.32	1.4	7.4	32

Container Type: 6 Liter Summa Canister (100% Certified)

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	92	70-130
Toluene-d8	121	70-130
4-Bromofluorobenzene	103	70-130

AIR TOXICS LTD.

SAMPLE NAME: RED OUT 2B

ID#: 0107019A-11A

EPA METHOD TO-14 GC/MS SIM

File Name:	t07251[illegible]	Date of Collection:	6/28/01
Dil. Factor:	1.33	Date of Analysis:	7/26/01

Compound	Rpt. Limit (ppbv)	Rpt. Limit (uG/m3)	Amount (ppbv)	Amount (uG/m3)
Benzene	0.17	0.54	3.6	12
Toluene	0.067	0.26	130	490
Ethyl Benzene	0.067	0.29	3.9	17
m,p-Xylene	0.13	0.59	19	84
o-Xylene	0.067	0.29	5.4	24

Container Type: 6 Liter Summa Canister (100% Certified)

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	98	70-130
Toluene-d8	115	70-130
4-Bromofluorobenzene	105	70-130

AIR TOXICS LTD.

SAMPLE NAME: INDUSTRIAL OUT2

ID#: 0107019A-12A

EPA METHOD TO-14 GC/MS SIM

[illegible]	[illegible]	Date of Collection: 7/2/01
Dil Factor:	7.00	Date of Analysis: 7/20/01

Compound	Rpt. Limit (ppbv)	Rpt. Limit (uG/m3)	Amount (ppbv)	Amount (uG/m3)
Benzene	0.050	0.16	2.8	9.1
Toluene	0.020	0.076	6.7	26
Ethyl Benzene	0.020	0.088	1.0	4.4
m,p-Xylene	0.040	0.18	4.4	20
o-Xylene	0.020	0.088	1.6	7.1

Container Type: 6 Liter Summa Canister (100% Certified)

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	100	70-130
Toluene-d8	118	70-130
4-Bromofluorobenzene	104	70-130

AIR TOXICS LTD.

SAMPLE NAME: MOON IN2

ID#: 0107019A-13A

EPA METHOD TO-14 GC/MS SIM

Compound	Rpt. Limit (ppbv)	Rpt. Limit (uG/m3)	Amount (ppbv)	Amount (uG/m3)
Benzene	0.25	0.80	3.1	10
Toluene	0.099	0.38	180	680
Ethyl Benzene	0.099	0.44	4.7	21
m,p-Xylene	0.20	0.88	24	110
o-Xylene	0.099	0.44	6.4	28

Container Type: 6 Liter Summa Canister (100% Certified)

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	94	70-130
Toluene-d8	113	70-130
4-Bromofluorobenzene	101	70-130

AIR TOXICS LTD.

SAMPLE NAME: MOON OUT2

ID#: 0107019A-14A

EPA METHOD TO-14 GC/MS SIM

File Name: [illegible] Date of Collection: 6/28/01
Dil. Factor: 5.00 Date of Analysis: 7/25/01

Compound	Rpt. Limit (ppbv)	Rpt. Limit (uG/m3)	Amount (ppbv)	Amount (uG/m3)
Benzene	0.25	0.81	2.7	8.7
Toluene	0.10	0.38	150	580
Ethyl Benzene	0.10	0.44	4.3	19
m,p-Xylene	0.20	0.88	22	96
o-Xylene	0.10	0.44	6.1	27

Container Type: 6 Liter Summa Canister (100% Certified)

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	99	70-130
Toluene-d8	113	70-130
4-Bromofluorobenzene	102	70-130

AIR TOXICS LTD.

SAMPLE NAME: MOON OUT2 Duplicate

ID#: 0107019A-14AA

EPA METHOD TO-14 GC/MS SIM

File Name:	010725-5	Date of Collection: 7/2/01	
Dil. Factor:	5.00	Date of Analysis: 7/25/01	

Compound	Rpt. Limit (ppbv)	Rpt. Limit (uG/m3)	Amount (ppbv)	Amount (uG/m3)
Benzene	0.25	0.81	2.7	8.9
Toluene	0.10	0.38	140	550
Ethyl Benzene	0.10	0.44	4.0	18
m,p-Xylene	0.20	0.88	20	89
o-Xylene	0.10	0.44	5.6	25

Container Type: 6 Liter Summa Canister (100% Certified)

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	87	70-130
Toluene-d8	107	70-130
4-Bromofluorobenzene	97	70-130

AIR TOXICS LTD.

SAMPLE NAME: INDUSTRIAL & 46 IN 1

ID#: 0107019A-15A

EPA METHOD TO-14 GC/MS SIM

File Name:	[illegible]		Date of Collection: 6/27/01
Dil. Factor:	[illegible]		Date of Analysis: 7/26/01

Compound	Rpt. Limit (ppbv)	Rpt. Limit (uG/m3)	Amount (ppbv)	Amount (uG/m3)
Benzene	0.29	0.93	4.2	14
Toluene	0.11	0.44	7.2	27
Ethyl Benzene	0.11	0.51	0.88	3.9
m,p-Xylene	0.23	1.0	4.3	19
o-Xylene	0.11	0.51	1.6	7.2

Container Type: 6 Liter Summa Canister (100% Certified)

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	104	70-130
Toluene-d8	104	70-130
4-Bromofluorobenzene	102	70-130

AIR TOXICS LTD.

SAMPLE NAME: Method Spike

ID#: 0107019A-16A

EPA METHOD TO-14 GC/MS SIM

File Name	072510	Date of Collection	NA
Dil. Factor	1.00	Date of Analysis	7/25/01

Compound	Rpt. Limit (ppbv)	Rpt. Limit (uG/m3)	%Recovery
Benzene	0.050	0.16	99
Toluene	0.020	0.076	99
Ethyl Benzene	0.020	0.088	87
m,p-Xylene	0.040	0.18	85
o-Xylene	0.020	0.088	84

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	102	70-130
Toluene-d8	123	70-130
4-Bromofluorobenzene	102	70-130

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CHAIN-OF-CUSTODY RECORD

Sample Transportation Notice
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180 BLUE RAVINE ROAD, SUITE B
FOLSOM, CA 95630-4719
(916) 985-1000 FAX: (916) 985-1020

Contact Person: Alan Kao
Company: ENVIRON
Address: 274 Main ST. City: Groton State: MA Zip: 01450
Phone: 978/448-8824 FAX: 978/448-8825
Collected By: Signature: [signature]

Project info:
P.O. #: 02-9445A
Project #:
Project Name: Teterboro

Turn Around Time:
☒ Normal
☐ Rush ____ Specify

90 7-3-01

Lab I.D.	Field Sample I.D.	Date & Time	Analyses Requested	Canister Pressure / Vacuum Initial	Final	Receipt
01A	RED BLANK 1	6/27 1600	TO-14 + acrolein + alkanes	-30"	0"	0.5 psi
02A	RED BLANK 2	6/28 1440	" " "	-30"	0"	1.0 psi

Relinquished By: (Signature) Date/Time: [signature] 6/28/01 — Received By: (Signature) Date/Time:
Relinquished By: (Signature) Date/Time: — Received By: (Signature) Date/Time:
Relinquished By: (Signature) Date/Time: — Received By: (Signature) Date/Time: [signature] 0945 7/2/01

Notes:

Lab Use Only	Shipper Name	Air Bill #	Opened By:	Temp. (°C)	Condition	Custody Seals Intact?	Work Order #
	FED EX	8268 6615 1711	TPS.	Ambient	Good	Yes No (None)	0107019

Form 1293 rev. 99

AIR TOXICS LTD.

SAMPLE NAME: Lab Blank

ID#: 0107019A-17A

EPA METHOD TO-14 GC/MS SIM

File Name: 072517	Date of Collection: NA
Dil Factor: 1.00	Date of Analysis: 7/25/01

Compound	Rpt. Limit (ppbv)	Rpt. Limit (uG/m3)	Amount (ppbv)	Amount (uG/m3)
Benzene	0.050	0.16	Not Detected	Not Detected
Toluene	0.020	0.076	Not Detected	Not Detected
Ethyl Benzene	0.020	0.088	Not Detected	Not Detected
m,p-Xylene	0.040	0.18	Not Detected	Not Detected
o-Xylene	0.020	0.088	Not Detected	Not Detected

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	98	70-130
Toluene-d8	112	70-130
4-Bromofluorobenzene	101	70-130

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180 BLUE RAVINE ROAD, SUITE B
FOLSOM, CA 95630-4719
(916) 985-1000 FAX: (916) 985-1020

Contact Person: Alan Kao
Company: ENVIRON
Address: 474 Main St. City: Groton State: MA Zip: 01450
Phone: 978/448-8824 FAX: 978/448-8825
Collected By: Signature [signature]

Project Info:
P.O. #
Project # 02-9445A
Project Name: Tetracorp

Turn Around Time:
☒ Normal
☐ Rush ______ Specify

Lab I.D.	Field Sample I.D.	Date & Time	Analyses Requested	Canister Pressure / Vacuum Initial	Final	Receipt
03A	AIRPORT N	6/27/01 17:30	TO-14 + acrolein + C8-C12 alkanes	-30" Hg	-4" Hg	4.5" Hg
04A	RED IN 1	6/27/01 16:00	"	-30" Hg	17.5 psi	15.8 psi
-15 05A	INDUSTRIAL & 46 IN 1	6/27/01 17:00	Insufficient sample - DO NOT ANALYZE			25.0" Hg
05A 06A	INDUSTRIAL & 46 OUT 1	6/27/01 17:20	TO-14 + acrolein + C8-C12 alkanes	-30" Hg	14 psi	16 psi

Relinquished By: (Signature) Date/Time	Received By: (Signature) Date/Time
[signature] 6/29/01	
Relinquished By: (Signature) Date/Time	Received By: (Signature) Date/Time
Relinquished By: (Signature) Date/Time	Received By: (Signature) Date/Time [signature] 0945 7/2/01

Notes:

Lab Use Only	Shipper Name	Air Bill #	Opened By:	Temp. (°C)	Condition	Custody Seals Intact?	Work Order #
	FedEx	8268 6615 1711	DSE	Ambient	Good	Yes No (None)	0107019

Form 1293 rev. 09

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180 BLUE RAVINE ROAD, SUITE B
FOLSOM, CA 95630-4719
(916) 985-1000 FAX: (916) 985-1020

Contact Person: Alan Kao
Company: ENVIRON
Address: 274 Main St. City: Groton State: MA Zip: 01450
Phone: 978/448-8814 FAX: 978/448-8825
Collected By: (Signature)

Project Info:
P.O. #:
Project #: 02-9445A
Project Name: Tetrahorn

Turn Around Time:
☒ Normal
☐ Rush ____ Specify
90
7-3-01

Lab I.D.	Field Sample I.D.	Date & Time	Analyses Requested	Canister Pressure / Vacuum: Initial	Final	Receipt
01A	RED IN 2A	6/28/01 1420	TO-14 + acrolein + C_3-C_{12} alkanes	-30" Hg	-11" Hg	11.0" Hg
02A	RED OUT 2A	6/28/01 1730		-30" Hg	0 psi	2.0" Hg
01B	RED IN 2B	6/28/01 1355		-30" Hg	6 psi	6.5" Hg
02B	RED OUT 2B	6/28/01 1355		-30" Hg	-5" Hg	5.4" Hg

Relinquished By: (Signature) Date/Time: 6/29/01
Received By: (Signature) Date/Time:
Relinquished By: (Signature) Date/Time:
Received By: (Signature) Date/Time: 0945
Relinquished By: (Signature) Date/Time:
Received By: (Signature) Date/Time: 7/2/01

Notes:

Lab Use Only	Shipper Name	Air Bill #	Opened By	Temp. (°C)	Condition	Custody Seals Intact?	Work Order #
	FEDEX	8268 6615 1711	TRS.	AMBIENT	GOOD	Yes No (None)	0107019

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180 BLUE RAVINE ROAD, SUITE B
FOLSOM, CA 95630-4719
(916) 985-1000 FAX: (916) 985-1020

CHAIN-OF-CUSTODY RECORD

Sample Transportation Notice
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Contact Person: Alan Kan
Company: ENVIRON
Address: 174 Main St. City: Groton State: MA Zip: 01450
Phone: 978/448-8824 FAX: 978/448-8825
Collected By: (Signature)

Project Info:
P.O. #:
Project #: 02-9445A
Project Name: Tekoro

Turn Around Time:
☒ Normal
☐ Rush ____ Specify
90
7-3-01

Lab ID	Field Sample I.D.	Date & Time	Analyses Requested	Canister Pressure / Vacuum Initial	Final	Receipt
	INDUSTRIAL IN2		None - DO NOT ANALYZE			
	INDUSTRIAL OUT2					
	INDUSTRIAL IN2	6/28/01 1515	NONE - DO NOT ANALYZE	-30 "Hg	-15 "Hg	7.0 psi
	INDUSTRIAL OUT2	" "	TO-14 + acrolein + C8-C12 alkanes	-30	14 psi	
	MOON IN2					
	MOON OUT2					
	MOON IN2	6/28/01 1709		-30 "Hg	-1 "Hg	5.0 psi
	MOON OUT2	" "		-30 "Hg	8.5 psi	7.2 psi

Relinquished By: (Signature) Date/Time: 6/29/01
Received By: (Signature) Date/Time:
Relinquished By: (Signature) Date/Time:
Received By: (Signature) Date/Time: 0935 7/2/01
Relinquished By: (Signature) Date/Time:
Received By: (Signature) Date/Time:

Notes:
INDUSTRIAL OUT2 lost some pressure prior to shipping; will be closer to 0 psi

Lab Use Only
Shipper Name: FED EX | Air Bill #: 8208 6615 7211 | Opened By: TNS. | Temp. (°C): Ambient | Condition: Good | Custody Seals Intact? Yes / No / (None) | Work Order #: 0107019

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CHAIN-OF-CUSTODY RECORD

Sample Transportation Notice
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180 BLUE RAVINE ROAD, SUITE B
FOLSOM, CA 95630-4719
(916) 985-1000 FAX: (916) 985-1020

Contact Person: Alan Kan
Company: ENVIRON
Address: 274 Main St. City: Acton State: MA Zip: 01450
Phone: 978/448-8824 FAX: 978/448-8825
Collected By: (signature) Alan Kan

Project Info:
P.O. #:
Project #: 02-9495A
Project Name: Petersburg

Turn Around Time:
☒ Normal
☐ Rush _____ Specify
7.3.01

Lab I.D.	Field Sample I.D.	Date & Time	Analyses Requested	Canister Pressure / Vacuum Initial	Final	Receipt
08A	AIRPORT SOUTH	6/28/01 1605	TO-14 + acrolein + C3-C12 alkanes	-30 "Hg	0	2.0 "Hg
08A01	FIRE DIST 2	6/28/01 1916	" " "	-30	8 psi	4.6 "Hg 7.2 psi

Relinquished By: (Signature) Date/Time: Alan Kan 6/29/01
Received By: (Signature) Date/Time:
Relinquished By: (Signature) Date/Time:
Received By: (Signature) Date/Time: 0945 7/2/01

Notes:
please recheck calibrations of FC 101-10 enclosed.

Lab Use Only	Shipper Name	Air Bill #	Opened By	Temp. (°C)	Condition	Custody Seals Intact?	Work Order #
	FEDEX	8268 6861 5711	TMS	AMBIENT	GOOD	Yes No None	0107019

Form 1861 rev 09

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AN ENVIRONMENTAL ANALYTICAL LABORATORY

WORK ORDER #: 0107019B

Work Order Summary

CLIENT:	Mr. Alan Kao Environ 274 Main Street Groton, MA 01450	**BILL TO:**	Mr. Alan Kao Environ 274 Main Street Groton, MA 01450
PHONE:	978-448-8824	**P.O. #**	
FAX:	978-448-8825	**PROJECT #**	02-9445A Teterboro
DATE RECEIVED:	7/2/01	**CONTACT:**	Betty Chu
DATE COMPLETED:	8/1/01		
DATE REISSUED:	8/17/01 Amend analyte list and J flag to the MDL per client's request.		

FRACTION #	NAME	TEST	RECEIPT VAC./PRES.
01A	RED BLANK 1	TO-15/TICs	0.5 "Hg
02A	RED BLANK 2	TO-15/TICs	1.4psi
03A	AIRPORT N	TO-15/TICs	4.5 "Hg
04A	RED IN 1	TO-15/TICs	15.8psi
05A	INDUSTRIAL & 46 OUT 1	TO-15/TICs	16.0psi
06A	AIRPORT SOUTH	TO-15/TICs	2.0 "Hg
07A	FRED OUT 2	TO-15/TICs	7.2psi
08A	RED IN 2A	TO-15/TICs	11.0 "Hg
09A	RED OUT 2A	TO-15/TICs	1.0 "Hg
10A	RED IN 2B	TO-15/TICs	4.5 "Hg
11A	RED OUT 2B	TO-15/TICs	5.4psi
12A	INDUSTRIAL OUT2	TO-15/TICs	7.0psi
13A	MOON IN2	TO-15/TICs	3.0 "Hg
14A	MOON OUT2	TO-15/TICs	7.2psi
15A	INDUSTRIAL & 46 IN 1	TO-15/TICs	23.0 "Hg
16A	Lab Blank	TO-15/TICs	NA
16B	Lab Blank	TO-15/TICs	NA

CERTIFIED BY: Linda J. Truman DATE: 08/02/01

Laboratory Director

Certfication numbers: CA ELAP - 1149, NY ELAP - 11291, UT ELAP - E-217, AZ ELAP - AZ0567, LA - AI 30763

180 BLUE RAVINE ROAD, SUITE B FOLSOM, CA - 95630
(916) 985-1000 . (800) 985-5955 . FAX (916) 985-1020

LABORATORY NARRATIVE
TO-14
Environ
Workorder# 0107019B

Fifteen 6 Liter Summa Canister (100% Certified) samples were received on July 02, 2001. The laboratory performed analysis via EPA Method TO-14 using GC/MS in the full scan mode. The method involves concentrating up to 0.5 liters of air. The concentrated aliquot is then flash vaporized and swept through a water management system to remove water vapor. Following dehumidification, the sample passes directly into the GC/MS for analysis. See the data sheets for the reporting limits for each compound.

During the five point calibration, two low-level standards are used. The low-level standard for TO-14 compounds is spiked at 0.5 ppbv and represents the reporting limit for these compounds. The low-level standard for the non-TO-14 compounds is spiked at 2.0 ppbv and represents the reporting limit for these compounds. The TO-14 compounds are present in both standards but are excluded from reporting in the 2.0 ppbv standard since a lower level is already included in the curve.

Method modifications taken to run these samples include:

Requirement	*TO-14*	*ATL Modifications*
Internal standard retention times.	Not specified.	Within 0.50 minutes of most recent daily CCV internal standards
Internal standard recoveries.	Not specified.	Within 40% of the daily CCV internal standard area for blanks and samples.
Initial calibration criteria.	Not specified.	RSD of 30% or less for standard compounds, 40% or less for non-standard and polar compounds
Continuing calibration verification criteria	Not specified.	70 - 130% for at least 90% of standard compounds, 60 - 140% for at least 80% of non-standard and polar compounds
Response factor for quantitation.	Average response factor (ICAL).	Average response factor (ICAL).

Receiving Notes

There was a significant difference (ie. greater than 5.0" Hg) between the measured canister receipt vacuum and that which was reported on the chain of custody for RED IN 2B,
RED OUT 2B, and INDUSTRIAL OUT2. The client was notified and the vacuum measured in the laboratory was used to calculate results.

Sample INDUSTRIAL & 46 IN 1 was received with significant vacuum remaining in the canister. The client was contacted and analysis proceeded. The residual canister vacuum resulted in elevated reporting limits.

Analytical Notes

All the quantitation for the specific alkanes was done on a one point curve at 2.0 ppbv.

DATA WAS RE-ISSUED ON 8/17/01 TO UPDATE THE ANALYTE LIST AND "J" FLAG RESULTS TO THE METHOD DETECTION LIMIT PER CLIENT'S REQUEST. THE CLIENT REQUESTED

ALKANES ARE REPORTED DOWN TO 2.0 PPBV.

AS PER PROJECT SPECIFIC CLIENT REQUEST THE LABORATORY HAS REPORTED ESTIMATED VALUES FOR TARGET COMPOUND HITS THAT ARE BELOW THE REPORTING LIMIT BUT GREATER THAN THE METHOD DETECTION LIMIT. CONCENTRATIONS THAT ARE BELOW THE LEVEL AT WHICH THE CANISTER WAS CERTIFIED MAY BE FALSE POSITIVES.

THE ANALYSIS OF SAMPLES AIRPORT SOUTH AND AIRPORT N EXCEEDED THE INSTRUMENT CALIBRATION LEVEL FOR 2-PROPANOL. THE DATA IS REPORTED AS QUALIFIED.

THE ANALYSIS OF SAMPLE RED IN 1 EXCEEDED THE INSTRUMENT CALIBRATION LEVEL FOR ETHANOL AND THE PEAK WAS ALSO SATURATED. THE DATA IS REPORTED AS QUALIFIED.

THE ANALYSIS OF SAMPLE RED IN 2A, RED IN 2B AND RED OUT 2B EXCEEDED THE INSTRUMENT CALIBRATION LEVEL FOR ETHANOL. THE DATA IS REPORTED AS QUALIFIED.

THE FIELD BLANKS CONTAIN APPECIABLE AMOUNTS OF TARGET COMPOUNDS.

SAMPLES WERE ANALYZED WITHIN A 30 DAY HOLD TIME.

UPON REVIEW OF DATA, PENTANE WAS DETERMINED TO BE PRESENT IN SAMPLES INDUSTRIAL & 46 OUT 1, FRED OUT 2, MOON OUT2.

Definition of Data Qualifying Flags

Seven qualifiers may have been used on the data analysis sheets and indicates as follows:

B - Compound present in laboratory blank greater than reporting limit(background subtraction not performed).

J - Estimated value.

E - Exceeds instrument calibration range.

S - Saturated peak.

Q - Exceeds quality control limits.

U - Compound analyzed for but not detected above the reporting limit.

N - The identification is based on presumptive evidence.

AIR TOXICS LTD.

SAMPLE NAME: RED BLANK 1

ID#: 0107019B-01A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	072618	Date of Collection:	6/27/01
Dil. Factor:	1.36	Date of Analysis:	7/26/01

Compound	Rpt. Limit (ppbv)	Rpt. Limit (uG/m3)	Amount (ppbv)	Amount (uG/m3)
Freon 12	0.68	3.4	0.48 J	2.4 J
Freon 114	0.68	4.8	Not Detected	Not Detected
Chloromethane	0.68	1.4	Not Detected	Not Detected
Vinyl Chloride	0.68	1.8	Not Detected	Not Detected
Bromomethane	0.68	2.7	Not Detected	Not Detected
Chloroethane	0.68	1.8	Not Detected	Not Detected
Freon 11	0.68	3.9	0.23 J	1.3 J
1,1-Dichloroethene	0.68	2.7	Not Detected	Not Detected
Freon 113	0.68	5.3	Not Detected	Not Detected
Methylene Chloride	0.68	2.4	0.19 J	0.67 J
1,1-Dichloroethane	0.68	2.8	Not Detected	Not Detected
cis-1,2-Dichloroethene	0.68	2.7	Not Detected	Not Detected
Chloroform	0.68	3.4	Not Detected	Not Detected
1,1,1-Trichloroethane	0.68	3.8	Not Detected	Not Detected
Carbon Tetrachloride	0.68	4.3	Not Detected	Not Detected
1,2-Dichloroethane	0.68	2.8	Not Detected	Not Detected
Trichloroethene	0.68	3.7	Not Detected	Not Detected
1,2-Dichloropropane	0.68	3.2	Not Detected	Not Detected
cis-1,3-Dichloropropene	0.68	3.1	Not Detected	Not Detected
trans-1,3-Dichloropropene	0.68	3.1	Not Detected	Not Detected
1,1,2-Trichloroethane	0.68	3.8	Not Detected	Not Detected
Tetrachloroethene	0.68	4.7	Not Detected	Not Detected
Ethylene Dibromide	0.68	5.3	Not Detected	Not Detected
Chlorobenzene	0.68	3.2	Not Detected	Not Detected
Styrene	0.68	2.9	Not Detected	Not Detected
1,1,2,2-Tetrachloroethane	0.68	4.7	Not Detected	Not Detected
1,3,5-Trimethylbenzene	0.68	3.4	Not Detected	Not Detected
1,2,4-Trimethylbenzene	0.68	3.4	Not Detected	Not Detected
1,3-Dichlorobenzene	0.68	4.2	Not Detected	Not Detected
1,4-Dichlorobenzene	0.68	4.2	Not Detected	Not Detected
Chlorotoluene	0.68	3.6	Not Detected	Not Detected
1,2-Dichlorobenzene	0.68	4.2	Not Detected	Not Detected
1,2,4-Trichlorobenzene	0.68	5.1	Not Detected	Not Detected
Hexachlorobutadiene	0.68	7.4	Not Detected	Not Detected
Propylene	2.7	4.8	Not Detected	Not Detected
1,3-Butadiene	2.7	6.1	Not Detected	Not Detected
Acetone	2.7	6.6	36	86
Carbon Disulfide	2.7	8.6	0.30 J	0.95 J
2-Propanol	2.7	6.8	36	89
trans-1,2-Dichloroethene	2.7	11	Not Detected	Not Detected
Vinyl Acetate	2.7	9.7	Not Detected	Not Detected
2-Butanone (Methyl Ethyl Ketone)	2.7	8.2	9.5	28

AIR TOXICS LTD.

SAMPLE NAME: RED BLANK 1

ID#: 0107019B-01A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	20-2011	Date of Collection:	6/27/01
Dil. Factor:	1.136	Date of Analysis:	7/2/01

Compound	Rpt. Limit (ppbv)	Rpt. Limit (uG/m3)	Amount (ppbv)	Amount (uG/m3)
Hexane	2.7	9.7	Not Detected	Not Detected
Tetrahydrofuran	2.7	8.2	Not Detected	Not Detected
Cyclohexane	2.7	9.5	Not Detected	Not Detected
1,4-Dioxane	2.7	10	Not Detected	Not Detected
Bromodichloromethane	2.7	18	Not Detected	Not Detected
4-Methyl-2-pentanone	2.7	11	0.34 J	1.4 J
2-Hexanone	2.7	11	1.0 J	4.4 J
Dibromochloromethane	2.7	24	Not Detected	Not Detected
Bromoform	2.7	28	Not Detected	Not Detected
4-Ethyltoluene	2.7	14	Not Detected	Not Detected
Ethanol	2.7	5.2	6.3	12
Methyl tert-Butyl Ether	2.7	10	0.40 J	1.4 J
Heptane	2.7	11	Not Detected	Not Detected
Butane	2.7	6.6	Not Detected	Not Detected
Pentane	2.7	8.2	Not Detected	Not Detected
Octane	2.7	13	Not Detected	Not Detected
Nonane	2.7	14	Not Detected	Not Detected
Decane	2.7	16	Not Detected	Not Detected
Undecane	2.7	18	Not Detected	Not Detected
Dodecane	2.7	19	Not Detected	Not Detected

TENTATIVELY IDENTIFIED COMPOUNDS

Compound	CAS Number	Match Quality	Amount (ppbv)
Acrolein	107-02-8	NA	Not Detected

J = Estimated value.

Container Type: 6 Liter Summa Canister (100% Certified)

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	97	70-130
Toluene-d8	103	70-130
4-Bromofluorobenzene	100	70-130

AIR TOXICS LTD.

SAMPLE NAME: RED BLANK 2

ID#: 0107019B-02A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name: 072617 Date of Collection: 6/28/01

Dil. Factor: 1.22 Date of Analysis: 7/26/01

Compound	Rpt. Limit (ppbv)	Rpt. Limit (uG/m3)	Amount (ppbv)	Amount (uG/m3)
Freon 12	0.61	3.1	Not Detected	Not Detected
Freon 114	0.61	4.3	Not Detected	Not Detected
Chloromethane	0.61	1.3	Not Detected	Not Detected
Vinyl Chloride	0.61	1.6	Not Detected	Not Detected
Bromomethane	0.61	2.4	Not Detected	Not Detected
Chloroethane	0.61	1.6	Not Detected	Not Detected
Freon 11	0.61	3.5	Not Detected	Not Detected
1,1-Dichloroethene	0.61	2.4	Not Detected	Not Detected
Freon 113	0.61	4.8	Not Detected	Not Detected
Methylene Chloride	0.61	2.2	Not Detected	Not Detected
1,1-Dichloroethane	0.61	2.5	Not Detected	Not Detected
cis-1,2-Dichloroethene	0.61	2.4	Not Detected	Not Detected
Chloroform	0.61	3.0	Not Detected	Not Detected
1,1,1-Trichloroethane	0.61	3.4	Not Detected	Not Detected
Carbon Tetrachloride	0.61	3.9	Not Detected	Not Detected
1,2-Dichloroethane	0.61	2.5	Not Detected	Not Detected
Trichloroethene	0.61	3.3	Not Detected	Not Detected
1,2-Dichloropropane	0.61	2.9	Not Detected	Not Detected
cis-1,3-Dichloropropene	0.61	2.8	Not Detected	Not Detected
trans-1,3-Dichloropropene	0.61	2.8	Not Detected	Not Detected
1,1,2-Trichloroethane	0.61	3.4	Not Detected	Not Detected
Tetrachloroethene	0.61	4.2	Not Detected	Not Detected
Ethylene Dibromide	0.61	4.8	Not Detected	Not Detected
Chlorobenzene	0.61	2.8	Not Detected	Not Detected
Styrene	0.61	2.6	Not Detected	Not Detected
1,1,2,2-Tetrachloroethane	0.61	4.2	Not Detected	Not Detected
1,3,5-Trimethylbenzene	0.61	3.0	Not Detected	Not Detected
1,2,4-Trimethylbenzene	0.61	3.0	Not Detected	Not Detected
1,3-Dichlorobenzene	0.61	3.7	Not Detected	Not Detected
1,4-Dichlorobenzene	0.61	3.7	Not Detected	Not Detected
Chlorotoluene	0.61	3.2	Not Detected	Not Detected
1,2-Dichlorobenzene	0.61	3.7	Not Detected	Not Detected
1,2,4-Trichlorobenzene	0.61	4.6	Not Detected	Not Detected
Hexachlorobutadiene	0.61	6.6	Not Detected	Not Detected
Propylene	2.4	4.3	Not Detected	Not Detected
1,3-Butadiene	2.4	5.5	Not Detected	Not Detected
Acetone	2.4	5.9	Not Detected	Not Detected
Carbon Disulfide	2.4	7.7	Not Detected	Not Detected
2-Propanol	2.4	6.1	Not Detected	Not Detected
trans-1,2-Dichloroethene	2.4	9.8	Not Detected	Not Detected
Vinyl Acetate	2.4	8.7	Not Detected	Not Detected
2-Butanone (Methyl Ethyl Ketone)	2.4	7.3	Not Detected	Not Detected

AIR TOXICS LTD.

SAMPLE NAME: RED BLANK 2

ID#: 0107019B-02A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	072601	Date of Collection:	6/28/01
Dil. Factor:	1.22	Date of Analysis:	7/26/01

Compound	Rpt. Limit (ppbv)	Rpt. Limit (uG/m3)	Amount (ppbv)	Amount (uG/m3)
Hexane	2.4	8.7	Not Detected	Not Detected
Tetrahydrofuran	2.4	7.3	Not Detected	Not Detected
Cyclohexane	2.4	8.5	Not Detected	Not Detected
1,4-Dioxane	2.4	8.9	Not Detected	Not Detected
Bromodichloromethane	2.4	17	Not Detected	Not Detected
4-Methyl-2-pentanone	2.4	10	Not Detected	Not Detected
2-Hexanone	2.4	10	Not Detected	Not Detected
Dibromochloromethane	2.4	21	Not Detected	Not Detected
Bromoform	2.4	26	Not Detected	Not Detected
4-Ethyltoluene	2.4	12	Not Detected	Not Detected
Ethanol	2.4	4.7	Not Detected	Not Detected
Methyl tert-Butyl Ether	2.4	8.9	Not Detected	Not Detected
Heptane	2.4	10	Not Detected	Not Detected
Butane	2.4	5.9	Not Detected	Not Detected
Pentane	2.4	7.3	Not Detected	Not Detected
Octane	2.4	12	Not Detected	Not Detected
Nonane	2.4	13	Not Detected	Not Detected
Decane	2.4	14	Not Detected	Not Detected
Undecane	2.4	16	Not Detected	Not Detected
Dodecane	2.4	17	Not Detected	Not Detected

TENTATIVELY IDENTIFIED COMPOUNDS

Compound	CAS Number	Match Quality	Amount (ppbv)
Acrolein	107-02-8	NA	Not Detected

Container Type: 6 Liter Summa Canister (100% Certified)

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	97	70-130
Toluene-d8	102	70-130
4-Bromofluorobenzene	104	70-130

AIR TOXICS LTD.

SAMPLE NAME: AIRPORT N

ID#: 0107019B-03A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	0107019	Date of Collection: 6/27/01
Dil. Factor:	1.58	Date of Analysis: 7/26/01

Compound	Rpt. Limit (ppbv)	Rpt. Limit (uG/m3)	Amount (ppbv)	Amount (uG/m3)
Freon 12	0.79	4.0	0.51 J	2.6 J
Freon 114	0.79	5.6	Not Detected	Not Detected
Chloromethane	0.79	1.6	Not Detected	Not Detected
Vinyl Chloride	0.79	2.0	Not Detected	Not Detected
Bromomethane	0.79	3.1	Not Detected	Not Detected
Chloroethane	0.79	2.1	Not Detected	Not Detected
Freon 11	0.79	4.5	0.22 J	1.3 J
1,1-Dichloroethene	0.79	3.2	Not Detected	Not Detected
Freon 113	0.79	6.2	Not Detected	Not Detected
Methylene Chloride	0.79	2.8	0.44 J	1.6 J
1,1-Dichloroethane	0.79	3.2	Not Detected	Not Detected
cis-1,2-Dichloroethene	0.79	3.2	Not Detected	Not Detected
Chloroform	0.79	3.9	Not Detected	Not Detected
1,1,1-Trichloroethane	0.79	4.4	Not Detected	Not Detected
Carbon Tetrachloride	0.79	5.0	Not Detected	Not Detected
1,2-Dichloroethane	0.79	3.2	Not Detected	Not Detected
Trichloroethene	0.79	4.3	Not Detected	Not Detected
1,2-Dichloropropane	0.79	3.7	Not Detected	Not Detected
cis-1,3-Dichloropropene	0.79	3.6	Not Detected	Not Detected
trans-1,3-Dichloropropene	0.79	3.6	Not Detected	Not Detected
1,1,2-Trichloroethane	0.79	4.4	Not Detected	Not Detected
Tetrachloroethene	0.79	5.4	Not Detected	Not Detected
Ethylene Dibromide	0.79	6.2	Not Detected	Not Detected
Chlorobenzene	0.79	3.7	Not Detected	Not Detected
Styrene	0.79	3.4	Not Detected	Not Detected
1,1,2,2-Tetrachloroethane	0.79	5.5	Not Detected	Not Detected
1,3,5-Trimethylbenzene	0.79	3.9	0.51 J	2.5 J
1,2,4-Trimethylbenzene	0.79	3.9	2.8	14
1,3-Dichlorobenzene	0.79	4.8	Not Detected	Not Detected
1,4-Dichlorobenzene	0.79	4.8	Not Detected	Not Detected
Chlorotoluene	0.79	4.2	Not Detected	Not Detected
1,2-Dichlorobenzene	0.79	4.8	Not Detected	Not Detected
1,2,4-Trichlorobenzene	0.79	6.0	Not Detected	Not Detected
Hexachlorobutadiene	0.79	8.6	Not Detected	Not Detected
Propylene	3.2	5.5	Not Detected	Not Detected
1,3-Butadiene	3.2	7.1	Not Detected	Not Detected
Acetone	3.2	7.6	11	28
Carbon Disulfide	3.2	10	0.31 J	0.98 J
2-Propanol	3.2	7.9	330 E	840 E
trans-1,2-Dichloroethene	3.2	13	Not Detected	Not Detected
Vinyl Acetate	3.2	11	Not Detected	Not Detected
2-Butanone (Methyl Ethyl Ketone)	3.2	9.5	4.0	12

AIR TOXICS LTD.

SAMPLE NAME: AIRPORT N

ID#: 0107019B-03A

EPA METHOD TO-15 GC/MS FULL SCAN

[illegible]	072613		Date of Collection: 6/27/01
Dil Factor:	1.56		Date of Analysis: 7/26/01

Compound	Rpt. Limit (ppbv)	Rpt. Limit (uG/m3)	Amount (ppbv)	Amount (uG/m3)
Hexane	3.2	11	Not Detected	Not Detected
Tetrahydrofuran	3.2	9.5	Not Detected	Not Detected
Cyclohexane	3.2	11	Not Detected	Not Detected
1,4-Dioxane	3.2	12	2.0 J	7.4 J
Bromodichloromethane	3.2	22	Not Detected	Not Detected
4-Methyl-2-pentanone	3.2	13	Not Detected	Not Detected
2-Hexanone	3.2	13	Not Detected	Not Detected
Dibromochloromethane	3.2	27	Not Detected	Not Detected
Bromoform	3.2	33	Not Detected	Not Detected
4-Ethyltoluene	3.2	16	1.1 J	5.7 J
Ethanol	3.2	6.0	5.0	9.6
Methyl tert-Butyl Ether	3.2	12	3.8	14
Heptane	3.2	13	Not Detected	Not Detected
Butane	3.2	7.6	3.5	8.6
Pentane	3.2	9.5	Not Detected	Not Detected
Octane	3.2	15	Not Detected	Not Detected
Nonane	3.2	17	Not Detected	Not Detected
Decane	3.2	19	Not Detected	Not Detected
Undecane	3.2	20	Not Detected	Not Detected
Dodecane	3.2	22	Not Detected	Not Detected

TENTATIVELY IDENTIFIED COMPOUNDS

Compound	CAS Number	Match Quality	Amount (ppbv)
Acrolein	107-02-8	NA	Not Detected

J = Estimated value.
E = Exceeds instrument calibration range.
Container Type: 6 Liter Summa Canister (100% Certified)

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	97	70-130
Toluene-d8	103	70-130
4-Bromofluorobenzene	100	70-130

AIR TOXICS LTD.

SAMPLE NAME: RED IN 1

ID#: 0107019B-04A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	07201	Date of Collection: 6/27/01
Dil. Factor:	100	Date of Analysis: 7/26/01

Compound	Rpt. Limit (ppbv)	Rpt. Limit (uG/m3)	Amount (ppbv)	Amount (uG/m3)
Freon 12	0.50	2.5	0.56	2.8
Freon 114	0.50	3.6	Not Detected	Not Detected
Chloromethane	0.50	1.0	1.5	3.2
Vinyl Chloride	0.50	1.3	Not Detected	Not Detected
Bromomethane	0.50	2.0	Not Detected	Not Detected
Chloroethane	0.50	1.3	Not Detected	Not Detected
Freon 11	0.50	2.8	0.24 J	1.4 J
1,1-Dichloroethene	0.50	2.0	Not Detected	Not Detected
Freon 113	0.50	3.9	0.078 J	0.60 J
Methylene Chloride	0.50	1.8	0.29 J	1.0 J
1,1-Dichloroethane	0.50	2.0	Not Detected	Not Detected
cis-1,2-Dichloroethene	0.50	2.0	Not Detected	Not Detected
Chloroform	0.50	2.5	Not Detected	Not Detected
1,1,1-Trichloroethane	0.50	2.8	Not Detected	Not Detected
Carbon Tetrachloride	0.50	3.2	Not Detected	Not Detected
1,2-Dichloroethane	0.50	2.0	Not Detected	Not Detected
Trichloroethene	0.50	2.7	Not Detected	Not Detected
1,2-Dichloropropane	0.50	2.3	Not Detected	Not Detected
cis-1,3-Dichloropropene	0.50	2.3	Not Detected	Not Detected
trans-1,3-Dichloropropene	0.50	2.3	Not Detected	Not Detected
1,1,2-Trichloroethane	0.50	2.8	Not Detected	Not Detected
Tetrachloroethene	0.50	3.4	Not Detected	Not Detected
Ethylene Dibromide	0.50	3.9	Not Detected	Not Detected
Chlorobenzene	0.50	2.3	Not Detected	Not Detected
Styrene	0.50	2.2	Not Detected	Not Detected
1,1,2,2-Tetrachloroethane	0.50	3.5	Not Detected	Not Detected
1,3,5-Trimethylbenzene	0.50	2.5	0.28 J	1.4 J
1,2,4-Trimethylbenzene	0.50	2.5	0.23 J	1.1 J
1,3-Dichlorobenzene	0.50	3.0	Not Detected	Not Detected
1,4-Dichlorobenzene	0.50	3.0	Not Detected	Not Detected
Chlorotoluene	0.50	2.6	Not Detected	Not Detected
1,2-Dichlorobenzene	0.50	3.0	Not Detected	Not Detected
1,2,4-Trichlorobenzene	0.50	3.8	Not Detected	Not Detected
Hexachlorobutadiene	0.50	5.4	Not Detected	Not Detected
Propylene	2.0	3.5	Not Detected	Not Detected
1,3-Butadiene	2.0	4.5	Not Detected	Not Detected
Acetone	2.0	4.8	33	79
Carbon Disulfide	2.0	6.3	0.83 J	2.6 J
2-Propanol	2.0	5.0	8.4	21
trans-1,2-Dichloroethene	2.0	8.0	Not Detected	Not Detected
Vinyl Acetate	2.0	7.2	Not Detected	Not Detected
2-Butanone (Methyl Ethyl Ketone)	2.0	6.0	2.8	8.6

AIR TOXICS LTD.

SAMPLE NAME: RED IN 1

ID#: 0107019B-04A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	01726r19	Date of Collection: 6/27/01
Dil. Factor:	1.00	Date of Analysis: 7/26/01

Compound	Rpt. Limit (ppbv)	Rpt. Limit (uG/m3)	Amount (ppbv)	Amount (uG/m3)
Hexane	2.0	7.2	Not Detected	Not Detected
Tetrahydrofuran	2.0	6.0	Not Detected	Not Detected
Cyclohexane	2.0	7.0	Not Detected	Not Detected
1,4-Dioxane	2.0	7.3	Not Detected	Not Detected
Bromodichloromethane	2.0	14	Not Detected	Not Detected
4-Methyl-2-pentanone	2.0	8.3	47	200
2-Hexanone	2.0	8.3	Not Detected	Not Detected
Dibromochloromethane	2.0	17	Not Detected	Not Detected
Bromoform	2.0	21	Not Detected	Not Detected
4-Ethyltoluene	2.0	10	Not Detected	Not Detected
Ethanol	2.0	3.8	>8700 S	17000 S
Methyl tert-Butyl Ether	2.0	7.3	0.52 J	1.9 J
Heptane	2.0	8.3	Not Detected	Not Detected
Butane	2.0	4.8	Not Detected	Not Detected
Pentane	2.0	6.0	Not Detected	Not Detected
Octane	2.0	9.5	Not Detected	Not Detected
Nonane	2.0	11	Not Detected	Not Detected
Decane	2.0	12	Not Detected	Not Detected
Undecane	2.0	13	Not Detected	Not Detected
Dodecane	2.0	14	Not Detected	Not Detected

TENTATIVELY IDENTIFIED COMPOUNDS

Compound	CAS Number	Match Quality	Amount (ppbv)
Acrolein	107-02-8	NA	Not Detected

J = Estimated value.
S = Saturated peak; data reported as estimated.
Container Type: 6 Liter Summa Canister (100% Certified)

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	103	70-130
Toluene-d8	101	70-130
4-Bromofluorobenzene	103	70-130

AIR TOXICS LTD.

SAMPLE NAME: INDUSTRIAL & 46 OUT 1

ID#: 0107019B-05A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	07252r	Date of Collection: 6/27/01
Dil Factor:	1.00	Date of Analysis: 7/2/01

Compound	Rpt. Limit (ppbv)	Rpt. Limit (uG/m3)	Amount (ppbv)	Amount (uG/m3)
Freon 12	0.50	2.5	0.61	3.1
Freon 114	0.50	3.6	Not Detected	Not Detected
Chloromethane	0.50	1.0	1.1	2.3
Vinyl Chloride	0.50	1.3	Not Detected	Not Detected
Bromomethane	0.50	2.0	Not Detected	Not Detected
Chloroethane	0.50	1.3	Not Detected	Not Detected
Freon 11	0.50	2.8	0.24 J	1.4 J
1,1-Dichloroethene	0.50	2.0	Not Detected	Not Detected
Freon 113	0.50	3.9	Not Detected	Not Detected
Methylene Chloride	0.50	1.8	0.28 J	0.99 J
1,1-Dichloroethane	0.50	2.0	Not Detected	Not Detected
cis-1,2-Dichloroethene	0.50	2.0	Not Detected	Not Detected
Chloroform	0.50	2.5	Not Detected	Not Detected
1,1,1-Trichloroethane	0.50	2.8	Not Detected	Not Detected
Carbon Tetrachloride	0.50	3.2	0.093 J	0.60 J
1,2-Dichloroethane	0.50	2.0	Not Detected	Not Detected
Trichloroethene	0.50	2.7	Not Detected	Not Detected
1,2-Dichloropropane	0.50	2.3	Not Detected	Not Detected
cis-1,3-Dichloropropene	0.50	2.3	Not Detected	Not Detected
trans-1,3-Dichloropropene	0.50	2.3	Not Detected	Not Detected
1,1,2-Trichloroethane	0.50	2.8	Not Detected	Not Detected
Tetrachloroethene	0.50	3.4	Not Detected	Not Detected
Ethylene Dibromide	0.50	3.9	Not Detected	Not Detected
Chlorobenzene	0.50	2.3	Not Detected	Not Detected
Styrene	0.50	2.2	0.38 J	1.6 J
1,1,2,2-Tetrachloroethane	0.50	3.5	Not Detected	Not Detected
1,3,5-Trimethylbenzene	0.50	2.5	0.26 J	1.3 J
1,2,4-Trimethylbenzene	0.50	2.5	0.98	4.9
1,3-Dichlorobenzene	0.50	3.0	Not Detected	Not Detected
1,4-Dichlorobenzene	0.50	3.0	Not Detected	Not Detected
Chlorotoluene	0.50	2.6	Not Detected	Not Detected
1,2-Dichlorobenzene	0.50	3.0	Not Detected	Not Detected
1,2,4-Trichlorobenzene	0.50	3.8	Not Detected	Not Detected
Hexachlorobutadiene	0.50	5.4	Not Detected	Not Detected
Propylene	2.0	3.5	12	21
1,3-Butadiene	2.0	4.5	2.5	5.6
Acetone	2.0	4.8	48	120
Carbon Disulfide	2.0	6.3	1.3 J	4.1 J
2-Propanol	2.0	5.0	0.74 J	1.9 J
trans-1,2-Dichloroethene	2.0	8.0	Not Detected	Not Detected
Vinyl Acetate	2.0	7.2	Not Detected	Not Detected
2-Butanone (Methyl Ethyl Ketone)	2.0	6.0	4.6	14

AIR TOXICS LTD.

SAMPLE NAME: INDUSTRIAL & 46 OUT 1

ID#: 0107019B-05A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	072620	Date of Collection: 7/7/01
Dil. Factor:	1.00	Date of Analysis: 7/26/01

Compound	Rpt. Limit (ppbv)	Rpt. Limit (uG/m3)	Amount (ppbv)	Amount (uG/m3)
Hexane	2.0	7.2	Not Detected	Not Detected
Tetrahydrofuran	2.0	6.0	Not Detected	Not Detected
Cyclohexane	2.0	7.0	3.5	12
1,4-Dioxane	2.0	7.3	Not Detected	Not Detected
Bromodichloromethane	2.0	14	Not Detected	Not Detected
4-Methyl-2-pentanone	2.0	8.3	0.22 J	0.90 J
2-Hexanone	2.0	8.3	Not Detected	Not Detected
Dibromochloromethane	2.0	17	Not Detected	Not Detected
Bromoform	2.0	21	Not Detected	Not Detected
4-Ethyltoluene	2.0	10	0.79 J	4.0 J
Ethanol	2.0	3.8	11	20
Methyl tert-Butyl Ether	2.0	7.3	5.6	20
Heptane	2.0	8.3	Not Detected	Not Detected
Butane	2.0	4.8	Not Detected	Not Detected
Pentane	2.0	6.0	2.1	6.2
Octane	2.0	9.5	Not Detected	Not Detected
Nonane	2.0	11	Not Detected	Not Detected
Decane	2.0	12	Not Detected	Not Detected
Undecane	2.0	13	Not Detected	Not Detected
Dodecane	2.0	14	Not Detected	Not Detected

TENTATIVELY IDENTIFIED COMPOUNDS

Compound	CAS Number	Match Quality	Amount (ppbv)
Acrolein	107-02-8	NA	Not Detected

J = Estimated value.

Container Type: 6 Liter Summa Canister (100% Certified)

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	104	70-130
Toluene-d8	98	70-130
4-Bromofluorobenzene	103	70-130

AIR TOXICS LTD.

SAMPLE NAME: AIRPORT SOUTH

ID#: 0107019B-06A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	072624	Date of Collection: 6/28/01
Dil. Factor:	1.44	Date of Analysis: 7/27/01

Compound	Rpt. Limit (ppbv)	Rpt. Limit (uG/m3)	Amount (ppbv)	Amount (uG/m3)
Freon 12	0.72	3.6	0.51 J	2.6 J
Freon 114	0.72	5.1	Not Detected	Not Detected
Chloromethane	0.72	1.5	Not Detected	Not Detected
Vinyl Chloride	0.72	1.9	Not Detected	Not Detected
Bromomethane	0.72	2.8	Not Detected	Not Detected
Chloroethane	0.72	1.9	Not Detected	Not Detected
Freon 11	0.72	4.1	0.24 J	1.4 J
1,1-Dichloroethene	0.72	2.9	Not Detected	Not Detected
Freon 113	0.72	5.6	Not Detected	Not Detected
Methylene Chloride	0.72	2.5	0.42 J	1.5 J
1,1-Dichloroethane	0.72	3.0	Not Detected	Not Detected
cis-1,2-Dichloroethene	0.72	2.9	Not Detected	Not Detected
Chloroform	0.72	3.6	Not Detected	Not Detected
1,1,1-Trichloroethane	0.72	4.0	Not Detected	Not Detected
Carbon Tetrachloride	0.72	4.6	Not Detected	Not Detected
1,2-Dichloroethane	0.72	3.0	Not Detected	Not Detected
Trichloroethene	0.72	3.9	Not Detected	Not Detected
1,2-Dichloropropane	0.72	3.4	Not Detected	Not Detected
cis-1,3-Dichloropropene	0.72	3.3	Not Detected	Not Detected
trans-1,3-Dichloropropene	0.72	3.3	Not Detected	Not Detected
1,1,2-Trichloroethane	0.72	4.0	Not Detected	Not Detected
Tetrachloroethene	0.72	5.0	Not Detected	Not Detected
Ethylene Dibromide	0.72	5.6	Not Detected	Not Detected
Chlorobenzene	0.72	3.4	Not Detected	Not Detected
Styrene	0.72	3.1	Not Detected	Not Detected
1,1,2,2-Tetrachloroethane	0.72	5.0	Not Detected	Not Detected
1,3,5-Trimethylbenzene	0.72	3.6	Not Detected	Not Detected
1,2,4-Trimethylbenzene	0.72	3.6	0.87	4.3
1,3-Dichlorobenzene	0.72	4.4	Not Detected	Not Detected
1,4-Dichlorobenzene	0.72	4.4	Not Detected	Not Detected
Chlorotoluene	0.72	3.8	Not Detected	Not Detected
1,2-Dichlorobenzene	0.72	4.4	Not Detected	Not Detected
1,2,4-Trichlorobenzene	0.72	5.4	Not Detected	Not Detected
Hexachlorobutadiene	0.72	7.8	Not Detected	Not Detected
Propylene	2.9	5.0	Not Detected	Not Detected
1,3-Butadiene	2.9	6.5	Not Detected	Not Detected
Acetone	2.9	7.0	12	29
Carbon Disulfide	2.9	9.1	Not Detected	Not Detected
2-Propanol	2.9	7.2	330 E	820 E
trans-1,2-Dichloroethene	2.9	12	Not Detected	Not Detected
Vinyl Acetate	2.9	10	Not Detected	Not Detected
2-Butanone (Methyl Ethyl Ketone)	2.9	8.6	2.8 J	8.4 J

AIR TOXICS LTD.

SAMPLE NAME: AIRPORT SOUTH

ID#: 0107019B-06A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	070727	Date of Collection:	6/28/01
Dil. Factor:	1.44	Date of Analysis:	7/27/01

Compound	Rpt. Limit (ppbv)	Rpt. Limit (uG/m3)	Amount (ppbv)	Amount (uG/m3)
Hexane	2.9	10	Not Detected	Not Detected
Tetrahydrofuran	2.9	8.6	Not Detected	Not Detected
Cyclohexane	2.9	10	Not Detected	Not Detected
1,4-Dioxane	2.9	10	3.8	14
Bromodichloromethane	2.9	20	Not Detected	Not Detected
4-Methyl-2-pentanone	2.9	12	Not Detected	Not Detected
2-Hexanone	2.9	12	Not Detected	Not Detected
Dibromochloromethane	2.9	25	Not Detected	Not Detected
Bromoform	2.9	30	Not Detected	Not Detected
4-Ethyltoluene	2.9	14	0.64 J	3.2 J
Ethanol	2.9	5.5	5.1	9.8
Methyl tert-Butyl Ether	2.9	10	3.4	13
Heptane	2.9	12	Not Detected	Not Detected
Butane	2.9	7.0	Not Detected	Not Detected
Pentane	2.9	8.6	Not Detected	Not Detected
Octane	2.9	14	Not Detected	Not Detected
Nonane	2.9	15	Not Detected	Not Detected
Decane	2.9	17	Not Detected	Not Detected
Undecane	2.9	19	Not Detected	Not Detected
Dodecane	2.9	20	Not Detected	Not Detected

TENTATIVELY IDENTIFIED COMPOUNDS

Compound	CAS Number	Match Quality	Amount (ppbv)
Acrolein	107-02-8	NA	Not Detected

J = Estimated value.
E = Exceeds instrument calibration range.
Container Type: 6 Liter Summa Canister (100% Certified)

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	101	70-130
Toluene-d8	101	70-130
4-Bromofluorobenzene	100	70-130

AIR TOXICS LTD.

SAMPLE NAME: FRED OUT 2

ID#: 0107019B-07A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name: 072622	Date of Collection: 7/28/01
Dil. Factor: 100	Date of Analysis: 7/27/01

Compound	Rpt. Limit (ppbv)	Rpt. Limit (uG/m3)	Amount (ppbv)	Amount (uG/m3)
Freon 12	0.50	2.5	0.63	3.2
Freon 114	0.50	3.6	Not Detected	Not Detected
Chloromethane	0.50	1.0	1.1	2.3
Vinyl Chloride	0.50	1.3	Not Detected	Not Detected
Bromomethane	0.50	2.0	Not Detected	Not Detected
Chloroethane	0.50	1.3	Not Detected	Not Detected
Freon 11	0.50	2.8	0.26 J	1.5 J
1,1-Dichloroethene	0.50	2.0	Not Detected	Not Detected
Freon 113	0.50	3.9	Not Detected	Not Detected
Methylene Chloride	0.50	1.8	Not Detected	Not Detected
1,1-Dichloroethane	0.50	2.0	Not Detected	Not Detected
cis-1,2-Dichloroethene	0.50	2.0	Not Detected	Not Detected
Chloroform	0.50	2.5	Not Detected	Not Detected
1,1,1-Trichloroethane	0.50	2.8	Not Detected	Not Detected
Carbon Tetrachloride	0.50	3.2	0.089 J	0.57 J
1,2-Dichloroethane	0.50	2.0	Not Detected	Not Detected
Trichloroethene	0.50	2.7	0.75	4.1
1,2-Dichloropropane	0.50	2.3	Not Detected	Not Detected
cis-1,3-Dichloropropene	0.50	2.3	Not Detected	Not Detected
trans-1,3-Dichloropropene	0.50	2.3	Not Detected	Not Detected
1,1,2-Trichloroethane	0.50	2.8	Not Detected	Not Detected
Tetrachloroethene	0.50	3.4	Not Detected	Not Detected
Ethylene Dibromide	0.50	3.9	Not Detected	Not Detected
Chlorobenzene	0.50	2.3	Not Detected	Not Detected
Styrene	0.50	2.2	0.41 J	1.8 J
1,1,2,2-Tetrachloroethane	0.50	3.5	Not Detected	Not Detected
1,3,5-Trimethylbenzene	0.50	2.5	1.2	6.2
1,2,4-Trimethylbenzene	0.50	2.5	5.4	27
1,3-Dichlorobenzene	0.50	3.0	Not Detected	Not Detected
1,4-Dichlorobenzene	0.50	3.0	Not Detected	Not Detected
Chlorotoluene	0.50	2.6	Not Detected	Not Detected
1,2-Dichlorobenzene	0.50	3.0	Not Detected	Not Detected
1,2,4-Trichlorobenzene	0.50	3.8	Not Detected	Not Detected
Hexachlorobutadiene	0.50	5.4	Not Detected	Not Detected
Propylene	2.0	3.5	Not Detected	Not Detected
1,3-Butadiene	2.0	4.5	Not Detected	Not Detected
Acetone	2.0	4.8	37	90
Carbon Disulfide	2.0	6.3	1.9 J	5.9 J
2-Propanol	2.0	5.0	3.4	8.6
trans-1,2-Dichloroethene	2.0	8.0	Not Detected	Not Detected
Vinyl Acetate	2.0	7.2	Not Detected	Not Detected
2-Butanone (Methyl Ethyl Ketone)	2.0	6.0	5.7	17

AIR TOXICS LTD.

SAMPLE NAME: FRED OUT 2

ID#: 0107019B-07A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name: 01262z2	Date of Collection: 6/28/01
Dil. Factor: 1.00	Date of Analysis: 7/27/01

Compound	Rpt. Limit (ppbv)	Rpt. Limit (uG/m3)	Amount (ppbv)	Amount (uG/m3)
Hexane	2.0	7.2	4.4	16
Tetrahydrofuran	2.0	6.0	Not Detected	Not Detected
Cyclohexane	2.0	7.0	0.44 J	1.5 J
1,4-Dioxane	2.0	7.3	Not Detected	Not Detected
Bromodichloromethane	2.0	14	Not Detected	Not Detected
4-Methyl-2-pentanone	2.0	8.3	Not Detected	Not Detected
2-Hexanone	2.0	8.3	Not Detected	Not Detected
Dibromochloromethane	2.0	17	Not Detected	Not Detected
Bromoform	2.0	21	Not Detected	Not Detected
4-Ethyltoluene	2.0	10	4.9	25
Ethanol	2.0	3.8	50	96
Methyl tert-Butyl Ether	2.0	7.3	4.5	16
Heptane	2.0	8.3	2.0 J	8.3 J
Butane	2.0	4.8	Not Detected	Not Detected
Pentane	2.0	6.0	3.9	12
Octane	2.0	9.5	Not Detected	Not Detected
Nonane	2.0	11	2.3	12
Decane	2.0	12	7.8	46
Undecane	2.0	13	2.9	19
Dodecane	2.0	14	4.7	34

TENTATIVELY IDENTIFIED COMPOUNDS

Compound	CAS Number	Match Quality	Amount (ppbv)
Acrolein	107-02-8	NA	Not Detected

J = Estimated value.

Container Type: 6 Liter Summa Canister (100% Certified)

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	107	70-130
Toluene-d8	105	70-130
4-Bromofluorobenzene	103	70-130

AIR TOXICS LTD.

SAMPLE NAME: RED IN 2A

ID#: 0107019B-08A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name: 0107019	Date of Collection: 6/28/01
Dil. Factor: 2.12	Date of Analysis: 7/27/01

Compound	Rpt. Limit (ppbv)	Rpt. Limit (uG/m3)	Amount (ppbv)	Amount (uG/m3)
Freon 12	1.1	5.3	0.50 J	2.5 J
Freon 114	1.1	7.5	Not Detected	Not Detected
Chloromethane	1.1	2.2	Not Detected	Not Detected
Vinyl Chloride	1.1	2.8	Not Detected	Not Detected
Bromomethane	1.1	4.2	Not Detected	Not Detected
Chloroethane	1.1	2.8	Not Detected	Not Detected
Freon 11	1.1	6.0	0.23 J	1.3 J
1,1-Dichloroethene	1.1	4.3	Not Detected	Not Detected
Freon 113	1.1	8.2	Not Detected	Not Detected
Methylene Chloride	1.1	3.7	0.21 J	0.74 J
1,1-Dichloroethane	1.1	4.4	Not Detected	Not Detected
cis-1,2-Dichloroethene	1.1	4.3	Not Detected	Not Detected
Chloroform	1.1	5.3	Not Detected	Not Detected
1,1,1-Trichloroethane	1.1	5.9	Not Detected	Not Detected
Carbon Tetrachloride	1.1	6.8	Not Detected	Not Detected
1,2-Dichloroethane	1.1	4.4	Not Detected	Not Detected
Trichloroethene	1.1	5.8	Not Detected	Not Detected
1,2-Dichloropropane	1.1	5.0	Not Detected	Not Detected
cis-1,3-Dichloropropene	1.1	4.9	Not Detected	Not Detected
trans-1,3-Dichloropropene	1.1	4.9	Not Detected	Not Detected
1,1,2-Trichloroethane	1.1	5.9	Not Detected	Not Detected
Tetrachloroethene	1.1	7.3	Not Detected	Not Detected
Ethylene Dibromide	1.1	8.3	Not Detected	Not Detected
Chlorobenzene	1.1	5.0	Not Detected	Not Detected
Styrene	1.1	4.6	Not Detected	Not Detected
1,1,2,2-Tetrachloroethane	1.1	7.4	Not Detected	Not Detected
1,3,5-Trimethylbenzene	1.1	5.3	Not Detected	Not Detected
1,2,4-Trimethylbenzene	1.1	5.3	Not Detected	Not Detected
1,3-Dichlorobenzene	1.1	6.5	Not Detected	Not Detected
1,4-Dichlorobenzene	1.1	6.5	Not Detected	Not Detected
Chlorotoluene	1.1	5.6	Not Detected	Not Detected
1,2-Dichlorobenzene	1.1	6.5	Not Detected	Not Detected
1,2,4-Trichlorobenzene	1.1	8.0	Not Detected	Not Detected
Hexachlorobutadiene	1.1	11	Not Detected	Not Detected
Propylene	4.2	7.4	Not Detected	Not Detected
1,3-Butadiene	4.2	9.5	Not Detected	Not Detected
Acetone	4.2	10	18	44
Carbon Disulfide	4.2	13	Not Detected	Not Detected
2-Propanol	4.2	10	Not Detected	Not Detected
trans-1,2-Dichloroethene	4.2	17	Not Detected	Not Detected
Vinyl Acetate	4.2	15	Not Detected	Not Detected
2-Butanone (Methyl Ethyl Ketone)	4.2	13	3.4 J	10 J

AIR TOXICS LTD.

SAMPLE NAME: RED IN 2A

ID#: 0107019B-08A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	c072623	Date of Collection: 6/28/01	
Dil. Factor:	2.12	Date of Analysis: 7/27/01	

Compound	Rpt. Limit (ppbv)	Rpt. Limit (uG/m3)	Amount (ppbv)	Amount (uG/m3)
Hexane	4.2	15	Not Detected	Not Detected
Tetrahydrofuran	4.2	13	Not Detected	Not Detected
Cyclohexane	4.2	15	Not Detected	Not Detected
1,4-Dioxane	4.2	16	Not Detected	Not Detected
Bromodichloromethane	4.2	29	Not Detected	Not Detected
4-Methyl-2-pentanone	4.2	18	32	130
2-Hexanone	4.2	18	Not Detected	Not Detected
Dibromochloromethane	4.2	37	Not Detected	Not Detected
Bromoform	4.2	44	Not Detected	Not Detected
4-Ethyltoluene	4.2	21	Not Detected	Not Detected
Ethanol	4.2	8.1	1100 E	2200 E
Methyl tert-Butyl Ether	4.2	16	Not Detected	Not Detected
Heptane	4.2	18	Not Detected	Not Detected
Butane	4.2	10	Not Detected	Not Detected
Pentane	4.2	13	Not Detected	Not Detected
Octane	4.2	20	Not Detected	Not Detected
Nonane	4.2	23	Not Detected	Not Detected
Decane	4.2	25	Not Detected	Not Detected
Undecane	4.2	28	Not Detected	Not Detected
Dodecane	4.2	30	Not Detected	Not Detected

TENTATIVELY IDENTIFIED COMPOUNDS

Compound	CAS Number	Match Quality	Amount (ppbv)
Acrolein	107-02-8	NA	Not Detected

J = Estimated value.
E = Exceeds instrument calibration range.
Container Type: 6 Liter Summa Canister (100% Certified)

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	99	70-130
Toluene-d8	103	70-130
4-Bromofluorobenzene	101	70-130

AIR TOXICS LTD.

SAMPLE NAME: RED OUT 2A

ID#: 0107019B-09A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	072721	Date of Collection:	7/20/01
Dil. Factor:	1.39	Date of Analysis:	7/27/01

Compound	Rpt. Limit (ppbv)	Rpt. Limit (uG/m3)	Amount (ppbv)	Amount (uG/m3)
Freon 12	0.70	3.5	0.51 J	2.6 J
Freon 114	0.70	4.9	Not Detected	Not Detected
Chloromethane	0.70	1.4	Not Detected	Not Detected
Vinyl Chloride	0.70	1.8	Not Detected	Not Detected
Bromomethane	0.70	2.7	Not Detected	Not Detected
Chloroethane	0.70	1.9	Not Detected	Not Detected
Freon 11	0.70	4.0	0.24 J	1.4 J
1,1-Dichloroethene	0.70	2.8	Not Detected	Not Detected
Freon 113	0.70	5.4	Not Detected	Not Detected
Methylene Chloride	0.70	2.4	0.23 J	0.82 J
1,1-Dichloroethane	0.70	2.8	Not Detected	Not Detected
cis-1,2-Dichloroethene	0.70	2.8	Not Detected	Not Detected
Chloroform	0.70	3.4	Not Detected	Not Detected
1,1,1-Trichloroethane	0.70	3.8	Not Detected	Not Detected
Carbon Tetrachloride	0.70	4.4	Not Detected	Not Detected
1,2-Dichloroethane	0.70	2.8	Not Detected	Not Detected
Trichloroethene	0.70	3.8	Not Detected	Not Detected
1,2-Dichloropropane	0.70	3.3	Not Detected	Not Detected
cis-1,3-Dichloropropene	0.70	3.2	Not Detected	Not Detected
trans-1,3-Dichloropropene	0.70	3.2	Not Detected	Not Detected
1,1,2-Trichloroethane	0.70	3.8	Not Detected	Not Detected
Tetrachloroethene	0.70	4.8	Not Detected	Not Detected
Ethylene Dibromide	0.70	5.4	Not Detected	Not Detected
Chlorobenzene	0.70	3.2	Not Detected	Not Detected
Styrene	0.70	3.0	Not Detected	Not Detected
1,1,2,2-Tetrachloroethane	0.70	4.8	Not Detected	Not Detected
1,3,5-Trimethylbenzene	0.70	3.5	Not Detected	Not Detected
1,2,4-Trimethylbenzene	0.70	3.5	0.42 J	2.1 J
1,3-Dichlorobenzene	0.70	4.2	Not Detected	Not Detected
1,4-Dichlorobenzene	0.70	4.2	Not Detected	Not Detected
Chlorotoluene	0.70	3.6	Not Detected	Not Detected
1,2-Dichlorobenzene	0.70	4.2	Not Detected	Not Detected
1,2,4-Trichlorobenzene	0.70	5.2	Not Detected	Not Detected
Hexachlorobutadiene	0.70	7.5	Not Detected	Not Detected
Propylene	2.8	4.9	Not Detected	Not Detected
1,3-Butadiene	2.8	6.2	0.62 J	1.4 J
Acetone	2.8	6.7	9.4	23
Carbon Disulfide	2.8	8.8	0.38 J	1.2 J
2-Propanol	2.8	6.9	Not Detected	Not Detected
trans-1,2-Dichloroethene	2.8	11	Not Detected	Not Detected
Vinyl Acetate	2.8	9.9	Not Detected	Not Detected
2-Butanone (Methyl Ethyl Ketone)	2.8	8.3	1.9 J	5.7 J

AIR TOXICS LTD.

SAMPLE NAME: RED OUT 2A

ID#: 0107019B-09A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	072624	Date of Collection: 5/23/01
Dil. Factor:	1.39	Date of Analysis: 7/24/01

Compound	Rpt. Limit (ppbv)	Rpt. Limit (uG/m3)	Amount (ppbv)	Amount (uG/m3)
Hexane	2.8	10	Not Detected	Not Detected
Tetrahydrofuran	2.8	8.3	Not Detected	Not Detected
Cyclohexane	2.8	9.7	Not Detected	Not Detected
1,4-Dioxane	2.8	10	Not Detected	Not Detected
Bromodichloromethane	2.8	19	Not Detected	Not Detected
4-Methyl-2-pentanone	2.8	12	1.7 J	7.3 J
2-Hexanone	2.8	12	Not Detected	Not Detected
Dibromochloromethane	2.8	24	Not Detected	Not Detected
Bromoform	2.8	29	Not Detected	Not Detected
4-Ethyltoluene	2.8	14	Not Detected	Not Detected
Ethanol	2.8	5.3	46	89
Methyl tert-Butyl Ether	2.8	10	0.68 J	2.5 J
Heptane	2.8	12	Not Detected	Not Detected
Butane	2.8	6.7	Not Detected	Not Detected
Pentane	2.8	8.3	Not Detected	Not Detected
Octane	2.8	13	Not Detected	Not Detected
Nonane	2.8	15	Not Detected	Not Detected
Decane	2.8	16	Not Detected	Not Detected
Undecane	2.8	18	Not Detected	Not Detected
Dodecane	2.8	20	Not Detected	Not Detected

TENTATIVELY IDENTIFIED COMPOUNDS

Compound	CAS Number	Match Quality	Amount (ppbv)
Acrolein	107-02-8	NA	Not Detected

J = Estimated value.

Container Type: 6 Liter Summa Canister (100% Certified)

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	100	70-130
Toluene-d8	101	70-130
4-Bromofluorobenzene	101	70-130

AIR TOXICS LTD.

SAMPLE NAME: RED IN 2B

ID#: 0107019B-10A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	07702	Date of Collection: 6/28/01
Dil. Factor:	1.58	Date of Analysis: 7/27/01

Compound	Rpt. Limit (ppbv)	Rpt. Limit (uG/m3)	Amount (ppbv)	Amount (uG/m3)
Freon 12	0.79	4.0	0.53 J	2.7 J
Freon 114	0.79	5.6	Not Detected	Not Detected
Chloromethane	0.79	1.6	Not Detected	Not Detected
Vinyl Chloride	0.79	2.0	Not Detected	Not Detected
Bromomethane	0.79	3.1	Not Detected	Not Detected
Chloroethane	0.79	2.1	Not Detected	Not Detected
Freon 11	0.79	4.5	0.23 J	1.3 J
1,1-Dichloroethene	0.79	3.2	Not Detected	Not Detected
Freon 113	0.79	6.2	Not Detected	Not Detected
Methylene Chloride	0.79	2.8	Not Detected	Not Detected
1,1-Dichloroethane	0.79	3.2	Not Detected	Not Detected
cis-1,2-Dichloroethene	0.79	3.2	Not Detected	Not Detected
Chloroform	0.79	3.9	Not Detected	Not Detected
1,1,1-Trichloroethane	0.79	4.4	Not Detected	Not Detected
Carbon Tetrachloride	0.79	5.0	Not Detected	Not Detected
1,2-Dichloroethane	0.79	3.2	Not Detected	Not Detected
Trichloroethene	0.79	4.3	Not Detected	Not Detected
1,2-Dichloropropane	0.79	3.7	Not Detected	Not Detected
cis-1,3-Dichloropropene	0.79	3.6	Not Detected	Not Detected
trans-1,3-Dichloropropene	0.79	3.6	Not Detected	Not Detected
1,1,2-Trichloroethane	0.79	4.4	Not Detected	Not Detected
Tetrachloroethene	0.79	5.4	Not Detected	Not Detected
Ethylene Dibromide	0.79	6.2	Not Detected	Not Detected
Chlorobenzene	0.79	3.7	Not Detected	Not Detected
Styrene	0.79	3.4	Not Detected	Not Detected
1,1,2,2-Tetrachloroethane	0.79	5.5	Not Detected	Not Detected
1,3,5-Trimethylbenzene	0.79	3.9	1.5	7.5
1,2,4-Trimethylbenzene	0.79	3.9	7.1	35
1,3-Dichlorobenzene	0.79	4.8	Not Detected	Not Detected
1,4-Dichlorobenzene	0.79	4.8	Not Detected	Not Detected
Chlorotoluene	0.79	4.2	Not Detected	Not Detected
1,2-Dichlorobenzene	0.79	4.8	Not Detected	Not Detected
1,2,4-Trichlorobenzene	0.79	6.0	Not Detected	Not Detected
Hexachlorobutadiene	0.79	8.6	Not Detected	Not Detected
Propylene	3.2	5.5	Not Detected	Not Detected
1,3-Butadiene	3.2	7.1	Not Detected	Not Detected
Acetone	3.2	7.6	68	160
Carbon Disulfide	3.2	10	0.56 J	1.8 J
2-Propanol	3.2	7.9	4.0	10
trans-1,2-Dichloroethene	3.2	13	Not Detected	Not Detected
Vinyl Acetate	3.2	11	Not Detected	Not Detected
2-Butanone (Methyl Ethyl Ketone)	3.2	9.5	6.5	19

AIR TOXICS LTD.

SAMPLE NAME: RED IN 2B

ID#: 0107019B-10A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	01702E	Date of Collection: 6/28/01
Dil. Factor:	1.58	Date of Analysis: 7/2/01

Compound	Rpt. Limit (ppbv)	Rpt. Limit (uG/m3)	Amount (ppbv)	Amount (uG/m3)
Hexane	3.2	11	7.5	27
Tetrahydrofuran	3.2	9.5	Not Detected	Not Detected
Cyclohexane	3.2	11	1.2 J	4.1 J
1,4-Dioxane	3.2	12	2.8 J	10 J
Bromodichloromethane	3.2	22	Not Detected	Not Detected
4-Methyl-2-pentanone	3.2	13	68	280
2-Hexanone	3.2	13	Not Detected	Not Detected
Dibromochloromethane	3.2	27	Not Detected	Not Detected
Bromoform	3.2	33	Not Detected	Not Detected
4-Ethyltoluene	3.2	16	6.9	34
Ethanol	3.2	6.0	890 E	1700 E
Methyl tert-Butyl Ether	3.2	12	24	88
Heptane	3.2	13	Not Detected	Not Detected
Butane	3.2	7.6	Not Detected	Not Detected
Pentane	3.2	9.5	10	30
Octane	3.2	15	Not Detected	Not Detected
Nonane	3.2	17	Not Detected	Not Detected
Decane	3.2	19	13	75
Undecane	3.2	20	6.5	42
Dodecane	3.2	22	13	90

TENTATIVELY IDENTIFIED COMPOUNDS

Compound	CAS Number	Match Quality	Amount (ppbv)
Acrolein	107-02-8	NA	Not Detected

J = Estimated value.
E = Exceeds instrument calibration range.
Container Type: 6 Liter Summa Canister (100% Certified)

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	100	70-130
Toluene-d8	99	70-130
4-Bromofluorobenzene	99	70-130

AIR TOXICS LTD.

SAMPLE NAME: RED OUT 2B

ID#: 0107019B-11A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	072626	Date of Collection: 6/28/01
Dil. Factor:	1.00	Date of Analysis: 7/27/01

Compound	Rpt. Limit (ppbv)	Rpt. Limit (uG/m3)	Amount (ppbv)	Amount (uG/m3)
Freon 12	0.50	2.5	0.58	2.9
Freon 114	0.50	3.6	Not Detected	Not Detected
Chloromethane	0.50	1.0	0.63	1.3
Vinyl Chloride	0.50	1.3	Not Detected	Not Detected
Bromomethane	0.50	2.0	Not Detected	Not Detected
Chloroethane	0.50	1.3	Not Detected	Not Detected
Freon 11	0.50	2.8	0.24 J	1.4 J
1,1-Dichloroethene	0.50	2.0	Not Detected	Not Detected
Freon 113	0.50	3.9	Not Detected	Not Detected
Methylene Chloride	0.50	1.8	0.53	1.8
1,1-Dichloroethane	0.50	2.0	Not Detected	Not Detected
cis-1,2-Dichloroethene	0.50	2.0	Not Detected	Not Detected
Chloroform	0.50	2.5	Not Detected	Not Detected
1,1,1-Trichloroethane	0.50	2.8	Not Detected	Not Detected
Carbon Tetrachloride	0.50	3.2	0.088 J	0.56 J
1,2-Dichloroethane	0.50	2.0	Not Detected	Not Detected
Trichloroethene	0.50	2.7	Not Detected	Not Detected
1,2-Dichloropropane	0.50	2.3	Not Detected	Not Detected
cis-1,3-Dichloropropene	0.50	2.3	Not Detected	Not Detected
trans-1,3-Dichloropropene	0.50	2.3	Not Detected	Not Detected
1,1,2-Trichloroethane	0.50	2.8	Not Detected	Not Detected
Tetrachloroethene	0.50	3.4	Not Detected	Not Detected
Ethylene Dibromide	0.50	3.9	Not Detected	Not Detected
Chlorobenzene	0.50	2.3	Not Detected	Not Detected
Styrene	0.50	2.2	0.45 J	1.9 J
1,1,2,2-Tetrachloroethane	0.50	3.5	Not Detected	Not Detected
1,3,5-Trimethylbenzene	0.50	2.5	0.85	4.2
1,2,4-Trimethylbenzene	0.50	2.5	4.6	23
1,3-Dichlorobenzene	0.50	3.0	Not Detected	Not Detected
1,4-Dichlorobenzene	0.50	3.0	Not Detected	Not Detected
Chlorotoluene	0.50	2.6	Not Detected	Not Detected
1,2-Dichlorobenzene	0.50	3.0	Not Detected	Not Detected
1,2,4-Trichlorobenzene	0.50	3.8	Not Detected	Not Detected
Hexachlorobutadiene	0.50	5.4	Not Detected	Not Detected
Propylene	2.0	3.5	Not Detected	Not Detected
1,3-Butadiene	2.0	4.5	Not Detected	Not Detected
Acetone	2.0	4.8	41	99
Carbon Disulfide	2.0	6.3	Not Detected	Not Detected
2-Propanol	2.0	5.0	2.1	5.2
trans-1,2-Dichloroethene	2.0	8.0	Not Detected	Not Detected
Vinyl Acetate	2.0	7.2	Not Detected	Not Detected
2-Butanone (Methyl Ethyl Ketone)	2.0	6.0	14	41

AIR TOXICS LTD.

SAMPLE NAME: RED OUT 2B

ID#: 0107019B-11A

EPA METHOD TO-15 GC/MS FULL SCAN

FILE No.	07202	Date of Collection:	6/28/01
Dil. Factor:	1.00	Date of Analysis:	7/7/01

Compound	Rpt. Limit (ppbv)	Rpt. Limit (uG/m3)	Amount (ppbv)	Amount (uG/m3)
Hexane	2.0	7.2	4.3	16
Tetrahydrofuran	2.0	6.0	Not Detected	Not Detected
Cyclohexane	2.0	7.0	0.53 J	1.8 J
1,4-Dioxane	2.0	7.3	Not Detected	Not Detected
Bromodichloromethane	2.0	14	Not Detected	Not Detected
4-Methyl-2-pentanone	2.0	8.3	23	96
2-Hexanone	2.0	8.3	Not Detected	Not Detected
Dibromochloromethane	2.0	17	Not Detected	Not Detected
Bromoform	2.0	21	Not Detected	Not Detected
4-Ethyltoluene	2.0	10	4.4	22
Ethanol	2.0	3.8	310 E	600 E
Methyl tert-Butyl Ether	2.0	7.3	7.7	28
Heptane	2.0	8.3	2.1	8.8
Butane	2.0	4.8	Not Detected	Not Detected
Pentane	2.0	6.0	5.4	16
Octane	2.0	9.5	Not Detected	Not Detected
Nonane	2.0	11	Not Detected	Not Detected
Decane	2.0	12	6.8	40
Undecane	2.0	13	3.4	22
Dodecane	2.0	14	6.3	44

TENTATIVELY IDENTIFIED COMPOUNDS

Compound	CAS Number	Match Quality	Amount (ppbv)
Acrolein	107-02-8	NA	Not Detected

J = Estimated value.
E = Exceeds instrument calibration range.

Container Type: 6 Liter Summa Canister (100% Certified)

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	101	70-130
Toluene-d8	100	70-130
4-Bromofluorobenzene	103	70-130

AIR TOXICS LTD.

SAMPLE NAME: INDUSTRIAL OUT2

ID#: 0107019B-12A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name: 0107027	Date of Collection: 6/28/01
Dil. Factor: 5.00	Date of Analysis: 7/27/01

Compound	Rpt. Limit (ppbv)	Rpt. Limit (uG/m3)	Amount (ppbv)	Amount (uG/m3)
Freon 12	0.50	2.5	0.51	2.6
Freon 114	0.50	3.6	Not Detected	Not Detected
Chloromethane	0.50	1.0	0.76	1.6
Vinyl Chloride	0.50	1.3	Not Detected	Not Detected
Bromomethane	0.50	2.0	Not Detected	Not Detected
Chloroethane	0.50	1.3	Not Detected	Not Detected
Freon 11	0.50	2.8	0.22 J	1.3 J
1,1-Dichloroethene	0.50	2.0	Not Detected	Not Detected
Freon 113	0.50	3.9	Not Detected	Not Detected
Methylene Chloride	0.50	1.8	0.24 J	0.86 J
1,1-Dichloroethane	0.50	2.0	Not Detected	Not Detected
cis-1,2-Dichloroethene	0.50	2.0	Not Detected	Not Detected
Chloroform	0.50	2.5	Not Detected	Not Detected
1,1,1-Trichloroethane	0.50	2.8	Not Detected	Not Detected
Carbon Tetrachloride	0.50	3.2	0.067 J	0.43 J
1,2-Dichloroethane	0.50	2.0	Not Detected	Not Detected
Trichloroethene	0.50	2.7	Not Detected	Not Detected
1,2-Dichloropropane	0.50	2.3	Not Detected	Not Detected
cis-1,3-Dichloropropene	0.50	2.3	Not Detected	Not Detected
trans-1,3-Dichloropropene	0.50	2.3	Not Detected	Not Detected
1,1,2-Trichloroethane	0.50	2.8	Not Detected	Not Detected
Tetrachloroethene	0.50	3.4	Not Detected	Not Detected
Ethylene Dibromide	0.50	3.9	Not Detected	Not Detected
Chlorobenzene	0.50	2.3	Not Detected	Not Detected
Styrene	0.50	2.2	0.21 J	0.93 J
1,1,2,2-Tetrachloroethane	0.50	3.5	Not Detected	Not Detected
1,3,5-Trimethylbenzene	0.50	2.5	0.26 J	1.3 J
1,2,4-Trimethylbenzene	0.50	2.5	1.2	5.9
1,3-Dichlorobenzene	0.50	3.0	Not Detected	Not Detected
1,4-Dichlorobenzene	0.50	3.0	Not Detected	Not Detected
Chlorotoluene	0.50	2.6	Not Detected	Not Detected
1,2-Dichlorobenzene	0.50	3.0	Not Detected	Not Detected
1,2,4-Trichlorobenzene	0.50	3.8	Not Detected	Not Detected
Hexachlorobutadiene	0.50	5.4	Not Detected	Not Detected
Propylene	2.0	3.5	Not Detected	Not Detected
1,3-Butadiene	2.0	4.5	1.2 J	2.7 J
Acetone	2.0	4.8	16	39
Carbon Disulfide	2.0	6.3	1.6 J	5.0 J
2-Propanol	2.0	5.0	2.5	6.2
trans-1,2-Dichloroethene	2.0	8.0	Not Detected	Not Detected
Vinyl Acetate	2.0	7.2	Not Detected	Not Detected
2-Butanone (Methyl Ethyl Ketone)	2.0	6.0	2.4	7.1

AIR TOXICS LTD.

SAMPLE NAME: INDUSTRIAL OUT2

ID#: 0107019B-12A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	072827	Date of Collection: 7/26/01
Dil. Factor:	1.00	Date of Analysis: 7/27/01

Compound	Rpt. Limit (ppbv)	Rpt. Limit (uG/m3)	Amount (ppbv)	Amount (uG/m3)
Hexane	2.0	7.2	Not Detected	Not Detected
Tetrahydrofuran	2.0	6.0	Not Detected	Not Detected
Cyclohexane	2.0	7.0	0.71 J	2.5 J
1,4-Dioxane	2.0	7.3	Not Detected	Not Detected
Bromodichloromethane	2.0	14	Not Detected	Not Detected
4-Methyl-2-pentanone	2.0	8.3	Not Detected	Not Detected
2-Hexanone	2.0	8.3	Not Detected	Not Detected
Dibromochloromethane	2.0	17	Not Detected	Not Detected
Bromoform	2.0	21	Not Detected	Not Detected
4-Ethyltoluene	2.0	10	1.1 J	5.6 J
Ethanol	2.0	3.8	23	45
Methyl tert-Butyl Ether	2.0	7.3	4.5	17
Heptane	2.0	8.3	Not Detected	Not Detected
Butane	2.0	4.8	Not Detected	Not Detected
Pentane	2.0	6.0	Not Detected	Not Detected
Octane	2.0	9.5	Not Detected	Not Detected
Nonane	2.0	11	Not Detected	Not Detected
Decane	2.0	12	Not Detected	Not Detected
Undecane	2.0	13	Not Detected	Not Detected
Dodecane	2.0	14	Not Detected	Not Detected

TENTATIVELY IDENTIFIED COMPOUNDS

Compound	CAS Number	Match Quality	Amount (ppbv)
Acrolein	107-02-8	NA	Not Detected

J = Estimated value.

Container Type: 6 Liter Summa Canister (100% Certified)

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	103	70-130
Toluene-d8	99	70-130
4-Bromofluorobenzene	107	70-130

AIR TOXICS LTD.

SAMPLE NAME: MOON IN2

ID#: 0107019B-13A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	072701	Date of Collection: 6/28/01
Dil. Factor:	1.49	Date of Analysis: 7/27/01

Compound	Rpt. Limit (ppbv)	Rpt. Limit (uG/m3)	Amount (ppbv)	Amount (uG/m3)
Freon 12	0.74	3.7	0.59 J	3.0 J
Freon 114	0.74	5.3	Not Detected	Not Detected
Chloromethane	0.74	1.6	Not Detected	Not Detected
Vinyl Chloride	0.74	1.9	Not Detected	Not Detected
Bromomethane	0.74	2.9	Not Detected	Not Detected
Chloroethane	0.74	2.0	Not Detected	Not Detected
Freon 11	0.74	4.2	0.25 J	1.4 J
1,1-Dichloroethene	0.74	3.0	Not Detected	Not Detected
Freon 113	0.74	5.8	Not Detected	Not Detected
Methylene Chloride	0.74	2.6	0.75	2.6
1,1-Dichloroethane	0.74	3.1	Not Detected	Not Detected
cis-1,2-Dichloroethene	0.74	3.0	Not Detected	Not Detected
Chloroform	0.74	3.7	Not Detected	Not Detected
1,1,1-Trichloroethane	0.74	4.1	Not Detected	Not Detected
Carbon Tetrachloride	0.74	4.8	Not Detected	Not Detected
1,2-Dichloroethane	0.74	3.1	Not Detected	Not Detected
Trichloroethene	0.74	4.1	0.41 J	2.2 J
1,2-Dichloropropane	0.74	3.5	Not Detected	Not Detected
cis-1,3-Dichloropropene	0.74	3.4	Not Detected	Not Detected
trans-1,3-Dichloropropene	0.74	3.4	Not Detected	Not Detected
1,1,2-Trichloroethane	0.74	4.1	Not Detected	Not Detected
Tetrachloroethene	0.74	5.1	Not Detected	Not Detected
Ethylene Dibromide	0.74	5.8	Not Detected	Not Detected
Chlorobenzene	0.74	3.5	Not Detected	Not Detected
Styrene	0.74	3.2	0.51 J	2.2 J
1,1,2,2-Tetrachloroethane	0.74	5.2	Not Detected	Not Detected
1,3,5-Trimethylbenzene	0.74	3.7	1.3	6.6
1,2,4-Trimethylbenzene	0.74	3.7	6.2	31
1,3-Dichlorobenzene	0.74	4.6	Not Detected	Not Detected
1,4-Dichlorobenzene	0.74	4.6	Not Detected	Not Detected
Chlorotoluene	0.74	3.9	Not Detected	Not Detected
1,2-Dichlorobenzene	0.74	4.6	Not Detected	Not Detected
1,2,4-Trichlorobenzene	0.74	5.6	Not Detected	Not Detected
Hexachlorobutadiene	0.74	8.1	Not Detected	Not Detected
Propylene	3.0	5.2	Not Detected	Not Detected
1,3-Butadiene	3.0	6.7	Not Detected	Not Detected
Acetone	3.0	7.2	19	46
Carbon Disulfide	3.0	9.4	Not Detected	Not Detected
2-Propanol	3.0	7.4	1.4 J	3.6 J
trans-1,2-Dichloroethene	3.0	12	Not Detected	Not Detected
Vinyl Acetate	3.0	11	Not Detected	Not Detected
2-Butanone (Methyl Ethyl Ketone)	3.0	8.9	3.6	11

AIR TOXICS LTD.

SAMPLE NAME: MOON IN2

ID#: 0107019B-13A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	01072[illegible]	Date of Collection: 7/2/01	
Dil. Factor:	1.49	Date of Analysis: 7/27/01	

Compound	Rpt. Limit (ppbv)	Rpt. Limit (uG/m3)	Amount (ppbv)	Amount (uG/m3)
Hexane	3.0	11	4.6	16
Tetrahydrofuran	3.0	8.9	Not Detected	Not Detected
Cyclohexane	3.0	10	Not Detected	Not Detected
1,4-Dioxane	3.0	11	1.8 J	6.5 J
Bromodichloromethane	3.0	20	Not Detected	Not Detected
4-Methyl-2-pentanone	3.0	12	Not Detected	Not Detected
2-Hexanone	3.0	12	Not Detected	Not Detected
Dibromochloromethane	3.0	26	Not Detected	Not Detected
Bromoform	3.0	31	Not Detected	Not Detected
4-Ethyltoluene	3.0	15	6.0	30
Ethanol	3.0	5.7	32	62
Methyl tert-Butyl Ether	3.0	11	3.6	13
Heptane	3.0	12	2.0 J	8.4 J
Butane	3.0	7.2	3.0	7.4
Pentane	3.0	8.9	4.6	14
Octane	3.0	14	Not Detected	Not Detected
Nonane	3.0	16	Not Detected	Not Detected
Decane	3.0	18	6.9	41
Undecane	3.0	19	5.4	35
Dodecane	3.0	21	10	74

TENTATIVELY IDENTIFIED COMPOUNDS

Compound	CAS Number	Match Quality	Amount (ppbv)
Acrolein	107-02-8	NA	Not Detected

J = Estimated value.

Container Type: 6 Liter Summa Canister (100% Certified)

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	97	70-130
Toluene-d8	98	70-130
4-Bromofluorobenzene	105	70-130

AIR TOXICS LTD.

SAMPLE NAME: MOON OUT2

ID#: 0107019B-14A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name: 072719	Date of Collection: 6/28/01
Dil. Factor: 1.00	Date of Analysis: 7/27/01

Compound	Rpt. Limit (ppbv)	Rpt. Limit (uG/m3)	Amount (ppbv)	Amount (uG/m3)
Freon 12	0.50	2.5	0.64	3.2
Freon 114	0.50	3.6	Not Detected	Not Detected
Chloromethane	0.50	1.0	1.1	2.2
Vinyl Chloride	0.50	1.3	Not Detected	Not Detected
Bromomethane	0.50	2.0	Not Detected	Not Detected
Chloroethane	0.50	1.3	Not Detected	Not Detected
Freon 11	0.50	2.8	0.26 J	1.5 J
1,1-Dichloroethene	0.50	2.0	Not Detected	Not Detected
Freon 113	0.50	3.9	Not Detected	Not Detected
Methylene Chloride	0.50	1.8	0.52	1.8
1,1-Dichloroethane	0.50	2.0	Not Detected	Not Detected
cis-1,2-Dichloroethene	0.50	2.0	Not Detected	Not Detected
Chloroform	0.50	2.5	Not Detected	Not Detected
1,1,1-Trichloroethane	0.50	2.8	Not Detected	Not Detected
Carbon Tetrachloride	0.50	3.2	Not Detected	Not Detected
1,2-Dichloroethane	0.50	2.0	Not Detected	Not Detected
Trichloroethene	0.50	2.7	0.47 J	2.6 J
1,2-Dichloropropane	0.50	2.3	Not Detected	Not Detected
cis-1,3-Dichloropropene	0.50	2.3	Not Detected	Not Detected
trans-1,3-Dichloropropene	0.50	2.3	Not Detected	Not Detected
1,1,2-Trichloroethane	0.50	2.8	Not Detected	Not Detected
Tetrachloroethene	0.50	3.4	Not Detected	Not Detected
Ethylene Dibromide	0.50	3.9	Not Detected	Not Detected
Chlorobenzene	0.50	2.3	Not Detected	Not Detected
Styrene	0.50	2.2	0.49 J	2.1 J
1,1,2,2-Tetrachloroethane	0.50	3.5	Not Detected	Not Detected
1,3,5-Trimethylbenzene	0.50	2.5	1.2	6.0
1,2,4-Trimethylbenzene	0.50	2.5	6.1	30
1,3-Dichlorobenzene	0.50	3.0	Not Detected	Not Detected
1,4-Dichlorobenzene	0.50	3.0	Not Detected	Not Detected
Chlorotoluene	0.50	2.6	Not Detected	Not Detected
1,2-Dichlorobenzene	0.50	3.0	Not Detected	Not Detected
1,2,4-Trichlorobenzene	0.50	3.8	Not Detected	Not Detected
Hexachlorobutadiene	0.50	5.4	Not Detected	Not Detected
Propylene	2.0	3.5	Not Detected	Not Detected
1,3-Butadiene	2.0	4.5	Not Detected	Not Detected
Acetone	2.0	4.8	24	59
Carbon Disulfide	2.0	6.3	1.5 J	4.8 J
2-Propanol	2.0	5.0	1.6 J	4.1 J
trans-1,2-Dichloroethene	2.0	8.0	Not Detected	Not Detected
Vinyl Acetate	2.0	7.2	Not Detected	Not Detected
2-Butanone (Methyl Ethyl Ketone)	2.0	6.0	15	46

AIR TOXICS LTD.

SAMPLE NAME: MOON OUT2

ID#: 0107019B-14A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name: [illegible]	Date of Collection: 6/28/01
Dil. Factor: 1.00	Date of Analysis: 7/27/01

Compound	Rpt. Limit (ppbv)	Rpt. Limit (uG/m3)	Amount (ppbv)	Amount (uG/m3)
Hexane	2.0	7.2	4.8	17
Tetrahydrofuran	2.0	6.0	Not Detected	Not Detected
Cyclohexane	2.0	7.0	0.36 J	1.2 J
1,4-Dioxane	2.0	7.3	Not Detected	Not Detected
Bromodichloromethane	2.0	14	Not Detected	Not Detected
4-Methyl-2-pentanone	2.0	8.3	Not Detected	Not Detected
2-Hexanone	2.0	8.3	0.74 J	3.1 J
Dibromochloromethane	2.0	17	Not Detected	Not Detected
Bromoform	2.0	21	Not Detected	Not Detected
4-Ethyltoluene	2.0	10	5.8	29
Ethanol	2.0	3.8	35	68
Methyl tert-Butyl Ether	2.0	7.3	3.4	12
Heptane	2.0	8.3	Not Detected	Not Detected
Butane	2.0	4.8	Not Detected	Not Detected
Pentane	2.0	6.0	3.7	11
Octane	2.0	9.5	Not Detected	Not Detected
Nonane	2.0	11	2.1	11
Decane	2.0	12	9.3	55
Undecane	2.0	13	4.7	30
Dodecane	2.0	14	10	71

TENTATIVELY IDENTIFIED COMPOUNDS

Compound	CAS Number	Match Quality	Amount (ppbv)
Acrolein	107-02-8	NA	Not Detected

J = Estimated value.

Container Type: 6 Liter Summa Canister (100% Certified)

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	108	70-130
Toluene-d8	98	70-130
4-Bromofluorobenzene	102	70-130

AIR TOXICS LTD.

SAMPLE NAME: INDUSTRIAL & 46 IN 1

ID#: 0107019B-15A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	0107019B-15A	Date of Collection: 6/27/01
Dil Factor:	2.74	Date of Analysis: 7/2/01

Compound	Rpt. Limit (ppbv)	Rpt. Limit (uG/m3)	Amount (ppbv)	Amount (uG/m3)
Freon 12	2.9	14	Not Detected	Not Detected
Freon 114	2.9	20	Not Detected	Not Detected
Chloromethane	2.9	6.0	Not Detected	Not Detected
Vinyl Chloride	2.9	7.4	Not Detected	Not Detected
Bromomethane	2.9	11	Not Detected	Not Detected
Chloroethane	2.9	7.7	Not Detected	Not Detected
Freon 11	2.9	16	Not Detected	Not Detected
1,1-Dichloroethene	2.9	12	Not Detected	Not Detected
Freon 113	2.9	22	Not Detected	Not Detected
Methylene Chloride	2.9	10	1.6 J	5.5 J
1,1-Dichloroethane	2.9	12	Not Detected	Not Detected
cis-1,2-Dichloroethene	2.9	12	Not Detected	Not Detected
Chloroform	2.9	14	Not Detected	Not Detected
1,1,1-Trichloroethane	2.9	16	Not Detected	Not Detected
Carbon Tetrachloride	2.9	18	Not Detected	Not Detected
1,2-Dichloroethane	2.9	12	Not Detected	Not Detected
Trichloroethene	2.9	16	Not Detected	Not Detected
1,2-Dichloropropane	2.9	13	Not Detected	Not Detected
cis-1,3-Dichloropropene	2.9	13	Not Detected	Not Detected
trans-1,3-Dichloropropene	2.9	13	Not Detected	Not Detected
1,1,2-Trichloroethane	2.9	16	Not Detected	Not Detected
Tetrachloroethene	2.9	20	Not Detected	Not Detected
Ethylene Dibromide	2.9	22	Not Detected	Not Detected
Chlorobenzene	2.9	13	Not Detected	Not Detected
Styrene	2.9	12	Not Detected	Not Detected
1,1,2,2-Tetrachloroethane	2.9	20	Not Detected	Not Detected
1,3,5-Trimethylbenzene	2.9	14	Not Detected	Not Detected
1,2,4-Trimethylbenzene	2.9	14	1.3 J	6.7 J
1,3-Dichlorobenzene	2.9	18	Not Detected	Not Detected
1,4-Dichlorobenzene	2.9	18	Not Detected	Not Detected
Chlorotoluene	2.9	15	Not Detected	Not Detected
1,2-Dichlorobenzene	2.9	18	Not Detected	Not Detected
1,2,4-Trichlorobenzene	2.9	22	Not Detected	Not Detected
Hexachlorobutadiene	2.9	31	Not Detected	Not Detected
Propylene	11	20	Not Detected	Not Detected
1,3-Butadiene	11	26	Not Detected	Not Detected
Acetone	11	28	67	160
Carbon Disulfide	11	36	Not Detected	Not Detected
2-Propanol	11	29	Not Detected	Not Detected
trans-1,2-Dichloroethene	11	46	Not Detected	Not Detected
Vinyl Acetate	11	41	Not Detected	Not Detected
2-Butanone (Methyl Ethyl Ketone)	11	34	8.5	25

AIR TOXICS LTD.

SAMPLE NAME: INDUSTRIAL & 46 IN 1

ID#: 0107019B-15A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	070727	Date of Collection: 7/27/01	
Dil Factor:	2.7	Date of Analysis: 7/27/01	

Compound	Rpt. Limit (ppbv)	Rpt. Limit (uG/m3)	Amount (ppbv)	Amount (uG/m3)
Hexane	11	41	Not Detected	Not Detected
Tetrahydrofuran	11	34	Not Detected	Not Detected
Cyclohexane	11	40	12	41
1,4-Dioxane	11	42	Not Detected	Not Detected
Bromodichloromethane	11	78	Not Detected	Not Detected
4-Methyl-2-pentanone	11	48	Not Detected	Not Detected
2-Hexanone	11	48	Not Detected	Not Detected
Dibromochloromethane	11	99	Not Detected	Not Detected
Bromoform	11	120	Not Detected	Not Detected
4-Ethyltoluene	11	57	Not Detected	Not Detected
Ethanol	11	22	48	91
Methyl tert-Butyl Ether	11	42	6.7 J	24 J
Heptane	11	48	Not Detected	Not Detected
Butane	11	28	Not Detected	Not Detected
Pentane	11	34	Not Detected	Not Detected
Octane	11	54	Not Detected	Not Detected
Nonane	11	61	Not Detected	Not Detected
Decane	11	68	Not Detected	Not Detected
Undecane	11	74	Not Detected	Not Detected
Dodecane	11	81	Not Detected	Not Detected

TENTATIVELY IDENTIFIED COMPOUNDS

Compound	CAS Number	Match Quality	Amount (ppbv)
Acrolein	107-02-8	NA	Not Detected

J = Estimated value.

Container Type: 6 Liter Summa Canister (100% Certified)

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	99	70-130
Toluene-d8	101	70-130
4-Bromofluorobenzene	107	70-130

AIR TOXICS LTD.

SAMPLE NAME: Lab Blank

ID#: 0107019B-16A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	072613a	Date of Collection: NA	
Dil. Factor:	1.00	Date of Analysis: 7/26/01	

Compound	Rpt. Limit (ppbv)	Rpt. Limit (uG/m3)	Amount (ppbv)	Amount (uG/m3)
Freon 12	0.50	2.5	Not Detected	Not Detected
Freon 114	0.50	3.6	Not Detected	Not Detected
Chloromethane	0.50	1.0	Not Detected	Not Detected
Vinyl Chloride	0.50	1.3	Not Detected	Not Detected
Bromomethane	0.50	2.0	Not Detected	Not Detected
Chloroethane	0.50	1.3	Not Detected	Not Detected
Freon 11	0.50	2.8	Not Detected	Not Detected
1,1-Dichloroethene	0.50	2.0	Not Detected	Not Detected
Freon 113	0.50	3.9	Not Detected	Not Detected
Methylene Chloride	0.50	1.8	Not Detected	Not Detected
1,1-Dichloroethane	0.50	2.0	Not Detected	Not Detected
cis-1,2-Dichloroethene	0.50	2.0	Not Detected	Not Detected
Chloroform	0.50	2.5	Not Detected	Not Detected
1,1,1-Trichloroethane	0.50	2.8	Not Detected	Not Detected
Carbon Tetrachloride	0.50	3.2	Not Detected	Not Detected
1,2-Dichloroethane	0.50	2.0	Not Detected	Not Detected
Trichloroethene	0.50	2.7	Not Detected	Not Detected
1,2-Dichloropropane	0.50	2.3	Not Detected	Not Detected
cis-1,3-Dichloropropene	0.50	2.3	Not Detected	Not Detected
trans-1,3-Dichloropropene	0.50	2.3	Not Detected	Not Detected
1,1,2-Trichloroethane	0.50	2.8	Not Detected	Not Detected
Tetrachloroethene	0.50	3.4	Not Detected	Not Detected
Ethylene Dibromide	0.50	3.9	Not Detected	Not Detected
Chlorobenzene	0.50	2.3	Not Detected	Not Detected
Styrene	0.50	2.2	Not Detected	Not Detected
1,1,2,2-Tetrachloroethane	0.50	3.5	Not Detected	Not Detected
1,3,5-Trimethylbenzene	0.50	2.5	Not Detected	Not Detected
1,2,4-Trimethylbenzene	0.50	2.5	Not Detected	Not Detected
1,3-Dichlorobenzene	0.50	3.0	Not Detected	Not Detected
1,4-Dichlorobenzene	0.50	3.0	Not Detected	Not Detected
Chlorotoluene	0.50	2.6	Not Detected	Not Detected
1,2-Dichlorobenzene	0.50	3.0	Not Detected	Not Detected
1,2,4-Trichlorobenzene	0.50	3.8	Not Detected	Not Detected
Hexachlorobutadiene	0.50	5.4	Not Detected	Not Detected
Propylene	2.0	3.5	Not Detected	Not Detected
1,3-Butadiene	2.0	4.5	Not Detected	Not Detected
Acetone	2.0	4.8	Not Detected	Not Detected
Carbon Disulfide	2.0	6.3	Not Detected	Not Detected
2-Propanol	2.0	5.0	Not Detected	Not Detected
trans-1,2-Dichloroethene	2.0	8.0	Not Detected	Not Detected
Vinyl Acetate	2.0	7.2	Not Detected	Not Detected
2-Butanone (Methyl Ethyl Ketone)	2.0	6.0	Not Detected	Not Detected

AIR TOXICS LTD.

SAMPLE NAME: Lab Blank

ID#: 0107019B-16A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name: 0107019B-16A	Date of Collection: NA
Dil. Factor: 1.00	Date of Analysis: 7/26/01

Compound	Rpt. Limit (ppbv)	Rpt. Limit (uG/m3)	Amount (ppbv)	Amount (uG/m3)
Hexane	2.0	7.2	Not Detected	Not Detected
Tetrahydrofuran	2.0	6.0	Not Detected	Not Detected
Cyclohexane	2.0	7.0	Not Detected	Not Detected
1,4-Dioxane	2.0	7.3	Not Detected	Not Detected
Bromodichloromethane	2.0	14	Not Detected	Not Detected
4-Methyl-2-pentanone	2.0	8.3	Not Detected	Not Detected
2-Hexanone	2.0	8.3	Not Detected	Not Detected
Dibromochloromethane	2.0	17	Not Detected	Not Detected
Bromoform	2.0	21	Not Detected	Not Detected
4-Ethyltoluene	2.0	10	Not Detected	Not Detected
Ethanol	2.0	3.8	Not Detected	Not Detected
Methyl tert-Butyl Ether	2.0	7.3	Not Detected	Not Detected
Heptane	2.0	8.3	Not Detected	Not Detected
Butane	2.0	4.8	Not Detected	Not Detected
Pentane	2.0	6.0	Not Detected	Not Detected
Octane	2.0	9.5	Not Detected	Not Detected
Nonane	2.0	11	Not Detected	Not Detected
Decane	2.0	12	Not Detected	Not Detected
Undecane	2.0	13	Not Detected	Not Detected
Dodecane	2.0	14	Not Detected	Not Detected

TENTATIVELY IDENTIFIED COMPOUNDS

Compound	CAS Number	Match Quality	Amount (ppbv)
Acrolein	107-02-8	NA	Not Detected

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	99	70-130
Toluene-d8	105	70-130
4-Bromofluorobenzene	101	70-130

AIR TOXICS LTD.

SAMPLE NAME: Lab Blank

ID#: 0107019B-16B

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	c072707	Date of Collection: NA
Dil. Factor:	1.00	Date of Analysis: 7/27/01

Compound	Rpt. Limit (ppbv)	Rpt. Limit (uG/m3)	Amount (ppbv)	Amount (uG/m3)
Freon 12	0.50	2.5	Not Detected	Not Detected
Freon 114	0.50	3.6	Not Detected	Not Detected
Chloromethane	0.50	1.0	Not Detected	Not Detected
Vinyl Chloride	0.50	1.3	Not Detected	Not Detected
Bromomethane	0.50	2.0	Not Detected	Not Detected
Chloroethane	0.50	1.3	Not Detected	Not Detected
Freon 11	0.50	2.8	Not Detected	Not Detected
1,1-Dichloroethene	0.50	2.0	Not Detected	Not Detected
Freon 113	0.50	3.9	Not Detected	Not Detected
Methylene Chloride	0.50	1.8	Not Detected	Not Detected
1,1-Dichloroethane	0.50	2.0	Not Detected	Not Detected
cis-1,2-Dichloroethene	0.50	2.0	Not Detected	Not Detected
Chloroform	0.50	2.5	Not Detected	Not Detected
1,1,1-Trichloroethane	0.50	2.8	Not Detected	Not Detected
Carbon Tetrachloride	0.50	3.2	Not Detected	Not Detected
1,2-Dichloroethane	0.50	2.0	Not Detected	Not Detected
Trichloroethene	0.50	2.7	Not Detected	Not Detected
1,2-Dichloropropane	0.50	2.3	Not Detected	Not Detected
cis-1,3-Dichloropropene	0.50	2.3	Not Detected	Not Detected
trans-1,3-Dichloropropene	0.50	2.3	Not Detected	Not Detected
1,1,2-Trichloroethane	0.50	2.8	Not Detected	Not Detected
Tetrachloroethene	0.50	3.4	Not Detected	Not Detected
Ethylene Dibromide	0.50	3.9	Not Detected	Not Detected
Chlorobenzene	0.50	2.3	Not Detected	Not Detected
Styrene	0.50	2.2	Not Detected	Not Detected
1,1,2,2-Tetrachloroethane	0.50	3.5	Not Detected	Not Detected
1,3,5-Trimethylbenzene	0.50	2.5	Not Detected	Not Detected
1,2,4-Trimethylbenzene	0.50	2.5	Not Detected	Not Detected
1,3-Dichlorobenzene	0.50	3.0	Not Detected	Not Detected
1,4-Dichlorobenzene	0.50	3.0	Not Detected	Not Detected
Chlorotoluene	0.50	2.6	Not Detected	Not Detected
1,2-Dichlorobenzene	0.50	3.0	Not Detected	Not Detected
1,2,4-Trichlorobenzene	0.50	3.8	Not Detected	Not Detected
Hexachlorobutadiene	0.50	5.4	Not Detected	Not Detected
Propylene	2.0	3.5	Not Detected	Not Detected
1,3-Butadiene	2.0	4.5	Not Detected	Not Detected
Acetone	2.0	4.8	Not Detected	Not Detected
Carbon Disulfide	2.0	6.3	Not Detected	Not Detected
2-Propanol	2.0	5.0	Not Detected	Not Detected
trans-1,2-Dichloroethene	2.0	8.0	Not Detected	Not Detected
Vinyl Acetate	2.0	7.2	Not Detected	Not Detected
2-Butanone (Methyl Ethyl Ketone)	2.0	6.0	Not Detected	Not Detected

AIR TOXICS LTD.

SAMPLE NAME: Lab Blank

ID#: 0107019B-16B

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	07Z707.D	Date of Collection: NA	
Dil. Fac.:	1.00	Date of Analysis: 7/27/01	

Compound	Rpt. Limit (ppbv)	Rpt. Limit (uG/m3)	Amount (ppbv)	Amount (uG/m3)
Hexane	2.0	7.2	Not Detected	Not Detected
Tetrahydrofuran	2.0	6.0	Not Detected	Not Detected
Cyclohexane	2.0	7.0	Not Detected	Not Detected
1,4-Dioxane	2.0	7.3	Not Detected	Not Detected
Bromodichloromethane	2.0	14	Not Detected	Not Detected
4-Methyl-2-pentanone	2.0	8.3	Not Detected	Not Detected
2-Hexanone	2.0	8.3	Not Detected	Not Detected
Dibromochloromethane	2.0	17	Not Detected	Not Detected
Bromoform	2.0	21	Not Detected	Not Detected
4-Ethyltoluene	2.0	10	Not Detected	Not Detected
Ethanol	2.0	3.8	Not Detected	Not Detected
Methyl tert-Butyl Ether	2.0	7.3	Not Detected	Not Detected
Heptane	2.0	8.3	Not Detected	Not Detected
Butane	2.0	4.8	Not Detected	Not Detected
Pentane	2.0	6.0	Not Detected	Not Detected
Octane	2.0	9.5	Not Detected	Not Detected
Nonane	2.0	11	Not Detected	Not Detected
Decane	2.0	12	Not Detected	Not Detected
Undecane	2.0	13	Not Detected	Not Detected
Dodecane	2.0	14	Not Detected	Not Detected

TENTATIVELY IDENTIFIED COMPOUNDS

Compound	CAS Number	Match Quality	Amount (ppbv)
Acrolein	107-02-8	NA	Not Detected

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	99	70-130
Toluene-d8	103	70-130
4-Bromofluorobenzene	104	70-130

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AN ENVIRONMENTAL ANALYTICAL LABORATORY

CHAIN-OF-CUSTODY RECORD

Sample Transportation Notice

Relinquishing signature on this document indicates that sample is being shipped in compliance with all applicable local, State, Federal, national, and international laws, regulations and ordinances of any kind. Air Toxics Limited assumes no liability with respect to the collection, handling or shipping of these samples. Relinquishing signature also indicates agreement to hold harmless, defend, and indemnify Air Toxics Limited against any claim, demand, or action of any kind, related to the collection, handling, or shipping of samples. D.O.T. Hotline (800) 467-4922

180 BLUE RAVINE ROAD, SUITE B
FOLSOM, CA 95630-4719
(916) 985-1000 FAX: (916) 985-1020

Contact Person: Alan Kao
Company: ENVIRON
Address: 274 Main ST. City: Groton State: MA Zip: 01450
Phone: 978/448-8824 FAX: 978/448-8825
Collected By: Signature [signature]

Project info:
P.O. #: 02-9445A
Project #:
Project Name: Teterboro

Turn Around Time:
☒ Normal
☐ Rush ____ Specify

90
7-3-01

Lab I.D.	Field Sample I.D.	Date & Time	Analyses Requested	Canister Pressure / Vacuum Initial	Final	Receipt
01A	RED BLANK 1	6/27 1600	TO-14 + acrolein + alkanes	-30"	0"	0.5 psi
02A	RED BLANK 2	6/28 1440	" " "	-30"	0"	1.0 psi

Relinquished By: (Signature) Date/Time: [signature] 6/28/01
Received By: (Signature) Date/Time:
Relinquished By: (Signature) Date/Time:
Received By: (Signature) Date/Time:
Relinquished By: (Signature) Date/Time:
Received By: (Signature) Date/Time: [signature] 0945 7/2/01

Notes:

Lab Use Only	Shipper Name	Air Bill #	Opened By:	Temp. (°C)	Condition	Custody Seals Intact?	Work Order #
	FED EX	8266 6615 1711	TAS.	Ambient	Good	Yes No (None)	0107019

Form 1293 rev. 99

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CHAIN-OF-CUSTODY RECORD

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180 BLUE RAVINE ROAD, SUITE B
FOLSOM, CA 95630-4719
(916) 985-1000 FAX: (916) 985-1020

Contact Person: Alan Kao
Company: ENVIRON
Address: 174 Main St. City: Groton State: MA Zip: 01450
Phone: 978/448-8824 FAX: 978/448-8825
Collected By: Signature:

Project Info:
P.O. #:
Project #: 02-9445A
Project Name: Tetronics

Turn Around Time:
☒ Normal
☐ Rush ____ Specify
30 days

Lab I.D.	Field Sample I.D.	Date & Time	Analyses Requested	Canister Pressure / Vacuum Initial	Final	Receipt
03A	AIRPORT IN	6/27/01 17:30	TO-14 + acrolein + C8-C12 alkanes	-30" Hg	-4" Hg	-4.5" Hg
04A	RED IN 2	6/27/01 16:00	"	-30" Hg	-3.5" Hg	-5.8" Hg
05A	INDUSTRIAL & 46 IN 1	6/27/01 17:00	Insufficient Sample - DO NOT ANALYZE	-30" Hg		-23.0" Hg
06A	INDUSTRIAL & 46 OUT 1	6/27/01 17:00	TO-14 + acrolein + C8-C12 alkanes	-30" Hg	-4 psc	-4 psc

Relinquished By: (Signature) Date/Time: 6/29/01
Received By: (Signature) Date/Time:
Relinquished By: (Signature) Date/Time:
Received By: (Signature) Date/Time: 7/2/01 0945

Notes:

Lab Use Only

Shipper Name	Air Bill #	Opened By:	Temp. (°C)	Condition	Custody Seals Intact?	Work Order #
FEDEX	8268661[illegible]4211	DSF	AMBIENT	GOOD	Yes No None	0107019

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AN ENVIRONMENTAL ANALYTICAL LABORATORY

CHAIN-OF-CUSTODY RECORD

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180 BLUE RAVINE ROAD, SUITE B
FOLSOM, CA 95630-4719
(916) 985-1000 FAX: (916) 985-1020

Contact Person: Alan Kao
Company: ENVIRON
Address: 274 Main ST. City: Groton State: MA Zip: 01450
Phone: 978/448-8824 FAX: 978/448-8825
Collected By: (Signature)

Project Info:
P.O. #:
Project #: 02-9445A
Project Name: Tewksbury

Turn Around Time:
☒ Normal
☐ Rush ____ Specify
90
7-3-01

Lab I.D.	Field Sample I.D.	Date & Time	Analyses Requested	Canister Pressure / Vacuum Initial	Final	Receipt
01A	RED IN 2A	6/28/01 1420	TO-14 + acrolein + C3-C12 alkanes	-30" Hg	-11" Hg	11.0" Hg
02A	RED OUT 2A	6/28/01 1730	↓	-30" Hg	0 psi	1.0" Hg
01B	RED IN 2B	6/28/01 1355	↓	-30" Hg	6 psi	14.5" Hg
02B	RED OUT 2B	6/28/01 1355	↓	-30" Hg	-5" Hg	5.4 psi

Relinquished By: (Signature) Date/Time: 6/29/01
Received By: (Signature) Date/Time:
Relinquished By: (Signature) Date/Time:
Received By: (Signature) Date/Time: 0945 7/2/01

Notes:

Lab Use Only	Shipper Name	Air Bill #	Opened By	Temp. (°C)	Condition	Custody Seals Intact?	Work Order #
	FEDEX	8268 6615 1711	TRS	AMBIENT	GOOD	Yes No (None)	0107019

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@ AIR TOXICS LTD.
AN ENVIRONMENTAL ANALYTICAL LABORATORY
180 BLUE RAVINE ROAD, SUITE B
FOLSOM, CA 95630-4719
(916) 985-1000 FAX: (916) 985-1020

CHAIN-OF-CUSTODY RECORD

Contact Person: Alan Kao
Company: ENVIRON
Address: 174 Main St. City: Groton State: MA Zip: 01450
Phone: 978/448-8824 FAX: 978/448-8825
Collected By: Signature [signature]

Project Info:
P.O. #
Project # 02-9445A
Project Name: Tewksbury

Turn Around Time:
☒ Normal
☐ Rush ______ Specify

9D
7-3-01

Lab I.D.	Field Sample I.D.	Date & Time	Analyses Requested	Canister Pressure / Vacuum Initial	Final	Receipt
	~~INDUSTRIAL IN2~~		~~None - Do NOT Ana...~~			
	~~INDUSTRIAL OUT2~~					
	INDUSTRIAL IN2	6/28/01 1515	NONE - DO NOT ANALYZE	-30"Hg	-15"Hg	7.0 psi
13A	INDUSTRIAL OUT2	" "	TO-14 + acrolein + C8-C12 alkanes	-30	14 psi	↓
	~~FORD IN2~~					
	~~FORD OUT2~~					
14A	MOON IN 2	6/28/01 1709	↓	-30"Hg	-1"Hg	5.0"Hg
15A	MOON OUT 2	" "	↓	-30"Hg	8.5 psi	7.2 psi

Relinquished By: (Signature) Date/Time: [signature] 6/29/01
Received By: (Signature) Date/Time:
Relinquished By: (Signature) Date/Time:
Received By: (Signature) Date/Time:
Relinquished By: (Signature) Date/Time:
Received By: (Signature) Date/Time: [signature] 7/2/01 0945

Notes:
INDUSTRIAL OUT2 lost some pressure prior to shipping, will be above to 0 psi

Lab Use Only	Shipper Name	Air Bill #	Opened By	Temp. (°C)	Condition	Custody Seals Intact?	Work Order #
	Fed Ex	8268 6615 1711	TPS	Ambient	Good	Yes No (None)	0107019

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AN ENVIRONMENTAL ANALYTICAL LABORATORY

CHAIN-OF-CUSTODY RECORD

Sample Transportation Notice
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180 BLUE RAVINE ROAD, SUITE B
FOLSOM, CA 95630-4719
(916) 985-1000 FAX: (916) 985-1020

Contact Person: Alan Kao
Company: ENVIRON
Address: 274 Main St. City: Groton State: MA Zip: 01450
Phone: 978/448-8824 FAX: 978/448-8825
Collected By: Signature: [signature]

Project Info:
P.O. #:
Project #: 02-9445A
Project Name: Peterboro

Turn Around Time:
☒ Normal
☐ Rush ______ Specify

9D 7-3-01

Lab I.D.	Field Sample I.D.	Date & Time	Analyses Requested	Canister Pressure / Vacuum Initial	Final	Receipt
01A	AIRPORT SOUTH	6/28/01 1205	TO-14 + acrolein + C8-C12 alkanes	-30"Hg	0	2.0"Hg
02A	FRED OUT 2	6/28/01 1916	" " "	-30	8 psi	7.2 psi

9D 7-3-01

Relinquished By: (Signature) Date/Time: [signature] 6/29/01
Received By: (Signature) Date/Time:
Relinquished By: (Signature) Date/Time:
Received By: (Signature) Date/Time:
Relinquished By: (Signature) Date/Time:
Received By: (Signature) Date/Time: [signature] 7/2/01 0945

Notes: please recheck calibration of FC 101-10 enclosed.

Lab Use Only	Shipper Name	Air Bill #	Opened By:	Temp. (°C)	Condition	Custody Seals Intact?	Work Order #
	FedEx	8268 6615 1711	TMG	Ambient	Good	Yes No (None)	0107019

Form 1293 rev 04

APPENDIX C

Laboratory Results for TO-11A Air Analysis (Aldehydes)

@AIR TOXICS LTD.
AN ENVIRONMENTAL ANALYTICAL LABORATORY

WORK ORDER #: 0107006B

Work Order Summary

CLIENT:	Mr. Alan Kao Environ 274 Main Street Groton, MA 01450	**BILL TO:**	Mr. Alan Kao Environ 274 Main Street Groton, MA 01450
PHONE:	978-448-8824	**P.O. #**	
FAX:	978-448-8825	**PROJECT #**	02-9445A Teterboro
DATE RECEIVED:	7/2/01		
DATE COMPLETED:	7/11/01		

FRACTION #	NAME	TEST
01A	Redneck 2A	TO-11
01AA	Redneck 2A Duplicate	TO-11
02A	Industrial 2	TO-11
03A	Trip Blank	TO-11
04A	LCS	TO-11
05A	Lab Blank	TO-11

CERTIFIED BY: _____ DATE: _____

Laboratory Director

LABORATORY NARRATIVE
Method TO-11
Environ
Workorder# 0107006B

Three TO-11 Cartridge samples were received on July 02, 2001. The laboratory performed analysis via Method TO-11 using reverse phase High Pressure Liquid Chromatography (HPLC) with an Ultraviolet (UV) Detector. The method involves eluting the sorbent tubes with acetonitrile using a gravity feed technique. See the data sheets for the reporting limits for each compound.

Receiving Notes

Samples were not received at the required temperature. The client was notified and the analysis proceeded. Data is reported as qualified.

The number of samples received did not match the information on the chain of custody. The client was contacted and sample Trip Blank was added to the analytical request.

Analytical Notes

Response for m,p-Tolualdehyde in sample 0107006B-01A was below the detection limit in the duplicate analysis and was not reported. As a result %RPD was not measured for the noted analyte.

Acetone and Acetaldehyde were detected in the laboratory blank. The "B" flag was applied to the associated results.

Definition of Data Qualifying Flags

Seven qualifiers may have been used on the data analysis sheets and indicate as follows:
B- Compound present in laboratory blank greater than reporting limit.
J - Estimated value.
E - Exceeds instrument calibration range.
S - Saturated peak.
Q - Exceeds quality control limits.
U - Compound analyzed for but not detected above the detection limit.
M - Reported value may be biased due to apparent matrix interferences.

AIR TOXICS LTD.

SAMPLE NAME: Redneck 2A

ID#: 0107006B-01A

AMBIENT AIR: EPA METHOD TO-11 HPLC

File Name:	**e0703010**	**Date of Collection:**	**6/28/01**
Dil. Factor:	**1.00**	**Date of Analysis:**	**7/3/01**
		Date of Extraction:	**7/3/01**

Compound	Rpt. Limit (ug)	Amount (ug)
Formaldehyde	0.050	2.6
Acetaldehyde	0.10	Not Detected
Propanal	0.25	0.27
Acetone	0.25	Not Detected
Crotonaldehyde	0.25	Not Detected
Methyl Ethyl Ketone/Butyraldehydes	0.25	2.4
Benzaldehyde	0.25	0.33
Isopentanal	0.25	Not Detected
Pentanal	0.25	Not Detected
o-Tolualdehyde	0.25	Not Detected
m,p-Tolualdehyde	0.25	0.33
Hexanal	0.25	Not Detected

Container Type: TO-11 Cartridge

AIR TOXICS LTD.

SAMPLE NAME: Redneck 2A Duplicate

ID#: 0107006B-01AA

AMBIENT AIR: EPA METHOD TO-11 HPLC

File Name:	**e0703011**	**Date of Collection:**	**6/28/01**
Dil. Factor:	**1.00**	**Date of Analysis:**	**7/3/01**
		Date of Extraction:	**7/3/01**

Compound	Rpt. Limit (ug)	Amount (ug)
Formaldehyde	0.050	2.4
Acetaldehyde	0.10	Not Detected
Propanal	0.25	0.32
Acetone	0.25	Not Detected
Crotonaldehyde	0.25	Not Detected
Methyl Ethyl Ketone/Butyraldehydes	0.25	2.4
Benzaldehyde	0.25	0.36
Isopentanal	0.25	Not Detected
Pentanal	0.25	Not Detected
o-Tolualdehyde	0.25	Not Detected
m,p-Tolualdehyde	0.25	Not Detected
Hexanal	0.25	Not Detected

Container Type: TO-11 Cartridge

AIR TOXICS LTD.

SAMPLE NAME: Industrial 2

ID#: 0107006B-02A

AMBIENT AIR: EPA METHOD TO-11 HPLC

File Name:	**e0703012**	**Date of Collection:**	**6/28/01**
Dil. Factor:	**1.00**	**Date of Analysis:**	**7/3/01**
		Date of Extraction:	**7/3/01**

Compound	Rpt. Limit (ug)	Amount (ug)
Formaldehyde	0.050	3.5
Acetaldehyde	0.10	Not Detected
Propanal	0.25	0.28
Acetone	0.25	Not Detected
Crotonaldehyde	0.25	Not Detected
Methyl Ethyl Ketone/Butyraldehydes	0.25	2.5
Benzaldehyde	0.25	0.41
Isopentanal	0.25	Not Detected
Pentanal	0.25	Not Detected
o-Tolualdehyde	0.25	Not Detected
m,p-Tolualdehyde	0.25	0.50
Hexanal	0.25	Not Detected

Container Type: TO-11 Cartridge

AIR TOXICS LTD.

SAMPLE NAME: Trip Blank

ID#: 0107006B-03A

AMBIENT AIR: EPA METHOD TO-11 HPLC

File Name:	**e0703004**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 7/3/01**	
		Date of Extraction: 7/3/01	

Compound	Rpt. Limit (ug)	Amount (ug)
Formaldehyde	0.050	Not Detected
Acetaldehyde	0.10	0.10 B
Propanal	0.25	Not Detected
Acetone	0.25	0.29 B
Crotonaldehyde	0.25	Not Detected
Methyl Ethyl Ketone/Butyraldehydes	0.25	Not Detected
Benzaldehyde	0.25	Not Detected
Isopentanal	0.25	Not Detected
Pentanal	0.25	Not Detected
o-Tolualdehyde	0.25	Not Detected
m,p-Tolualdehyde	0.25	Not Detected
Hexanal	0.25	Not Detected

B = Compound present in laboratory blank, background subtraction not performed.

Container Type: TO-11 Cartridge

AIR TOXICS LTD.

SAMPLE NAME: LCS

ID#: 0107006B-04A

AMBIENT AIR: EPA METHOD TO-11 HPLC

File Name:	**e0703007**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 7/3/01**	
		Date of Extraction: NA	

Compound	Rpt. Limit (ug)	%Recovery
Formaldehyde	0.050	99
Acetaldehyde	0.10	99
Propanal	0.25	97
Acetone	0.25	Not Spiked
Crotonaldehyde	0.25	Not Spiked
Methyl Ethyl Ketone/Butyraldehydes	0.25	98
Benzaldehyde	0.25	Not Spiked
Isopentanal	0.25	Not Spiked
Pentanal	0.25	99
o-Tolualdehyde	0.25	Not Spiked
m,p-Tolualdehyde	0.25	Not Spiked
Hexanal	0.25	98

Container Type: NA - Not Applicable

AIR TOXICS LTD.

SAMPLE NAME: Lab Blank

ID#: 0107006B-05A

AMBIENT AIR: EPA METHOD TO-11 HPLC

File Name:	**e0703003**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 7/3/01**	
		Date of Extraction: NA	

Compound	Rpt. Limit (ug)	Amount (ug)
Formaldehyde	0.050	Not Detected
Acetaldehyde	0.10	0.11
Propanal	0.25	Not Detected
Acetone	0.25	0.28
Crotonaldehyde	0.25	Not Detected
Methyl Ethyl Ketone/Butyraldehydes	0.25	Not Detected
Benzaldehyde	0.25	Not Detected
Isopentanal	0.25	Not Detected
Pentanal	0.25	Not Detected
o-Tolualdehyde	0.25	Not Detected
m,p-Tolualdehyde	0.25	Not Detected
Hexanal	0.25	Not Detected

Container Type: NA - Not Applicable

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(916) 985-1000 FAX: (916) 985-1020

Contact Person: Alan Kao
Company: ENVIRON
Address: 274 Main St City: Groton State: MA Zip: 01450
Phone: 978/448-8824 FAX: 978/448-8825
Collected By: Signature: [signature]

Project info:
P.O. #:
Project #: 02-9445A
Project Name: Tekniboro

Turn Around Time:
☒ Normal
☐ Rush ____ Specify

Lab I.D.	Field Sample I.D.	Date & Time	Analyses Requested	Canister Pressure / Vacuum Initial	Final	Receipt
0107006-01A	Redneck 2A	6/28 13:50	Aldehydes by TO-11A	(DNPH Cartridge)		
0107006-02A	Industrial 2	6/28 15:25	Aldehydes by TO-11A	(DNPH Cartridge)		
	Red One	6/27 16:08	PAHs by TO-13A	PUF/XAD		
	Red Two	6/28 14:35	PAHs by TO-13A	PUF/XAD		
	Industrial One	6/27 17:04	PAHs by TO-13A	PUF/XAD		
	Industrial Two	6/28 15:42	PAHs by TO-13A	PUF/XAD		

Relinquished By: (Signature) Date/Time: [signature] 6/29/01 18:09
Received By: (Signature) Date/Time:
Relinquished By: (Signature) Date/Time:
Received By: (Signature) Date/Time: [signature] 7/2/01 0945

Notes:

Lab Use Only	Shipper Name	Air Bill #	Opened By:	Temp. (°C)	Condition	Custody Seals Intact?	Work Order #
	FED EX	8273 2516 9602	TMS.	25°C	GOOD	Yes No (None)	0107006

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w 07/16/01
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APPENDIX D

Laboratory Results for TO-13A Air Analysis (Polycyclic Aromatic Hydrocarbons)

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WORK ORDER #: 0107006A

Work Order Summary

CLIENT:	Mr. Alan Kao Environ 274 Main Street Groton, MA 01450	**BILL TO:**	Mr. Alan Kao Environ 274 Main Street Groton, MA 01450
PHONE:	978-448-8824	**P.O. #**	
FAX:	978-448-8825	**PROJECT #**	02-9445A Teterboro
DATE RECEIVED:	7/2/01		
DATE COMPLETED:	7/16/01		

FRACTION #	NAME	TEST
01A	Red One	TO-13
01AA	Red One Duplicate	TO-13
02A	Red Two	TO-13
03A	Industrial One	TO-13
04A	Industrial Two	TO-13
05A	Trip Blank	TO-13
06A	LCS	TO-13
07A	Lab Blank	TO-13

CERTIFIED BY: Linda A. Truman DATE: 07/16/01

Laboratory Director

Certfication numbers: CA ELAP - 1149, NY ELAP - 11291, UT ELAP - E-217, AZ ELAP - AZ0567

180 BLUE RAVINE ROAD, SUITE B FOLSOM, CA - 95630
(916) 985-1000 . (800) 985-5955 . FAX (916) 985-1020

LABORATORY NARRATIVE
TO-13
Environ
Workorder# 0107006A

Five PUF/XAD Cartridge samples were received on July 02, 2001. The laboratory performed the analysis via Modified EPA Method TO-13 using GC/MS in the full scan mode. The soxhlet extraction and extract concentration to 1.0mL were performed via modified method 3540. See the data sheets for the reporting limits for each compound.
Duplicate extraction cannot be performed on PUF/XAD2 media, therefore duplicate results are derived from analyzing the extract twice.

Receiving Notes

Samples were not received at the required temperature. The client was notified and the analysis proceeded. Data is reported as qualified.

The number of samples received did not match the information on the chain of custody. The client was contacted and sample Trip Blank was added to the analytical request.

Analytical Notes

There were no analytical discrepancies.

Definition of Data Qualifying Flags

Seven qualifiers may have been used on the data analysis sheets and indicate as follows:
E - Exceeds instrument calibration range.
Q - Exceeds quality control limits.
S - Saturated peak.
J - Estimated value.
B - Compound present in laboratory blank greater than reporting limit (background subtraction not performed).
U - Compound analyzed for but not detected above the reporting limit.
N - The identification is based on presumptive evidence.

AIR TOXICS LTD.

SAMPLE NAME: Red One

ID#: 0107006A-01A

EPA METHOD TO-13 GC/MS FULL SCAN

File Name:	**k070512**	**Date of Collection:**	**6/27/01**
Dil. Factor:	**1.00**	**Date of Analysis:**	**7/5/01**
		Date of Extraction:	**7/2/01**

Compound	Rpt. Limit (ug)	Amount (ug)
Naphthalene	1.0	26
2-Methylnaphthalene	1.0	30
2-Chloronaphthalene	1.0	Not Detected
Acenaphthylene	1.0	Not Detected
Acenaphthene	1.0	2.3
Fluorene	1.0	4.1
Phenanthrene	1.0	9.4
Anthracene	1.0	Not Detected
Fluoranthene	1.0	1.8
Pyrene	1.0	Not Detected
Chrysene	1.0	Not Detected
Benzo(a)anthracene	1.0	Not Detected
Benzo(b)fluoranthene	1.0	Not Detected
Benzo(k)fluoranthene	1.0	Not Detected
Benzo(a)pyrene	1.0	Not Detected
Indeno(1,2,3-c,d)pyrene	1.0	Not Detected
Dibenz(a,h)anthracene	1.0	Not Detected
Benzo(g,h,i)perylene	1.0	Not Detected

Container Type: PUF/XAD Cartridge

Surrogates	%Recovery	Method Limits
2-Fluorobiphenyl	72	15-98
Terphenyl-d14	86	19-162

AIR TOXICS LTD.

SAMPLE NAME: Red One Duplicate

ID#: 0107006A-01AA

EPA METHOD TO-13 GC/MS FULL SCAN

File Name:	**k070526**	**Date of Collection:**	**6/27/01**
Dil. Factor:	**1.00**	**Date of Analysis:**	**7/6/01**
		Date of Extraction:	**7/2/01**

Compound	Rpt. Limit (ug)	Amount (ug)
Naphthalene	1.0	26
2-Methylnaphthalene	1.0	32
2-Chloronaphthalene	1.0	Not Detected
Acenaphthylene	1.0	Not Detected
Acenaphthene	1.0	2.4
Fluorene	1.0	3.8
Phenanthrene	1.0	9.1
Anthracene	1.0	Not Detected
Fluoranthene	1.0	1.9
Pyrene	1.0	Not Detected
Chrysene	1.0	Not Detected
Benzo(a)anthracene	1.0	Not Detected
Benzo(b)fluoranthene	1.0	Not Detected
Benzo(k)fluoranthene	1.0	Not Detected
Benzo(a)pyrene	1.0	Not Detected
Indeno(1,2,3-c,d)pyrene	1.0	Not Detected
Dibenz(a,h)anthracene	1.0	Not Detected
Benzo(g,h,i)perylene	1.0	Not Detected

Container Type: PUF/XAD Cartridge

Surrogates	%Recovery	Method Limits
2-Fluorobiphenyl	73	15-98
Terphenyl-d14	87	19-162

AIR TOXICS LTD.

SAMPLE NAME: Red Two

ID#: 0107006A-02A

EPA METHOD TO-13 GC/MS FULL SCAN

File Name:	**k070511**	**Date of Collection:**	**6/28/01**
Dil. Factor:	**1.00**	**Date of Analysis:**	**7/5/01**
		Date of Extraction:	**7/2/01**

Compound	Rpt. Limit (ug)	Amount (ug)
Naphthalene	1.0	44
2-Methylnaphthalene	1.0	44
2-Chloronaphthalene	1.0	Not Detected
Acenaphthylene	1.0	1.0
Acenaphthene	1.0	2.4
Fluorene	1.0	4.8
Phenanthrene	1.0	9.4
Anthracene	1.0	Not Detected
Fluoranthene	1.0	1.7
Pyrene	1.0	1.4
Chrysene	1.0	Not Detected
Benzo(a)anthracene	1.0	Not Detected
Benzo(b)fluoranthene	1.0	Not Detected
Benzo(k)fluoranthene	1.0	Not Detected
Benzo(a)pyrene	1.0	Not Detected
Indeno(1,2,3-c,d)pyrene	1.0	Not Detected
Dibenz(a,h)anthracene	1.0	Not Detected
Benzo(g,h,i)perylene	1.0	Not Detected

Container Type: PUF/XAD Cartridge

Surrogates	%Recovery	Method Limits
2-Fluorobiphenyl	83	15-98
Terphenyl-d14	94	19-162

AIR TOXICS LTD.

SAMPLE NAME: Industrial One

ID#: 0107006A-03A

EPA METHOD TO-13 GC/MS FULL SCAN

File Name:	**y071109**	**Date of Collection:**	**6/27/01**
Dil. Factor:	**2.00**	**Date of Analysis:**	**7/11/01**
		Date of Extraction:	**7/2/01**

Compound	Rpt. Limit (ug)	Amount (ug)
Naphthalene	2.0	130
2-Methylnaphthalene	2.0	140
2-Chloronaphthalene	2.0	Not Detected
Acenaphthylene	2.0	3.8
Acenaphthene	2.0	10
Fluorene	2.0	16
Phenanthrene	2.0	39
Anthracene	2.0	2.7
Fluoranthene	2.0	9.2
Pyrene	2.0	11
Chrysene	2.0	Not Detected
Benzo(a)anthracene	2.0	Not Detected
Benzo(b)fluoranthene	2.0	Not Detected
Benzo(k)fluoranthene	2.0	Not Detected
Benzo(a)pyrene	2.0	Not Detected
Indeno(1,2,3-c,d)pyrene	2.0	Not Detected
Dibenz(a,h)anthracene	2.0	Not Detected
Benzo(g,h,i)perylene	2.0	Not Detected

Container Type: PUF/XAD Cartridge

Surrogates	%Recovery	Method Limits
2-Fluorobiphenyl	89	15-98
Terphenyl-d14	90	19-162

AIR TOXICS LTD.

SAMPLE NAME: Industrial Two

ID#: 0107006A-04A

EPA METHOD TO-13 GC/MS FULL SCAN

File Name:	**k070509**	**Date of Collection:**	**6/28/01**
Dil. Factor:	**1.00**	**Date of Analysis:**	**7/5/01**
		Date of Extraction:	**7/2/01**

Compound	Rpt. Limit (ug)	Amount (ug)
Naphthalene	1.0	110
2-Methylnaphthalene	1.0	88
2-Chloronaphthalene	1.0	Not Detected
Acenaphthylene	1.0	2.1
Acenaphthene	1.0	7.3
Fluorene	1.0	9.8
Phenanthrene	1.0	26
Anthracene	1.0	1.1
Fluoranthene	1.0	5.5
Pyrene	1.0	6.1
Chrysene	1.0	Not Detected
Benzo(a)anthracene	1.0	Not Detected
Benzo(b)fluoranthene	1.0	Not Detected
Benzo(k)fluoranthene	1.0	Not Detected
Benzo(a)pyrene	1.0	Not Detected
Indeno(1,2,3-c,d)pyrene	1.0	Not Detected
Dibenz(a,h)anthracene	1.0	Not Detected
Benzo(g,h,i)perylene	1.0	Not Detected

Container Type: PUF/XAD Cartridge

Surrogates	%Recovery	Method Limits
2-Fluorobiphenyl	84	15-98
Terphenyl-d14	94	19-162

AIR TOXICS LTD.

SAMPLE NAME: Trip Blank

ID#: 0107006A-05A

EPA METHOD TO-13 GC/MS FULL SCAN

File Name:	**k070508**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 7/5/01**	
		Date of Extraction: 7/2/01	

Compound	Rpt. Limit (ug)	Amount (ug)
Naphthalene	1.0	Not Detected
2-Methylnaphthalene	1.0	Not Detected
2-Chloronaphthalene	1.0	Not Detected
Acenaphthylene	1.0	Not Detected
Acenaphthene	1.0	Not Detected
Fluorene	1.0	Not Detected
Phenanthrene	1.0	Not Detected
Anthracene	1.0	Not Detected
Fluoranthene	1.0	Not Detected
Pyrene	1.0	Not Detected
Chrysene	1.0	Not Detected
Benzo(a)anthracene	1.0	Not Detected
Benzo(b)fluoranthene	1.0	Not Detected
Benzo(k)fluoranthene	1.0	Not Detected
Benzo(a)pyrene	1.0	Not Detected
Indeno(1,2,3-c,d)pyrene	1.0	Not Detected
Dibenz(a,h)anthracene	1.0	Not Detected
Benzo(g,h,i)perylene	1.0	Not Detected

Container Type: PUF/XAD Cartridge

Surrogates	%Recovery	Method Limits
2-Fluorobiphenyl	72	15-98
Terphenyl-d14	95	19-162

AIR TOXICS LTD.

SAMPLE NAME: LCS

ID#: 0107006A-06A

EPA METHOD TO-13 GC/MS FULL SCAN

File Name:	**k070512a**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 7/5/01**	
		Date of Extraction: 7/2/01	

Compound	Rpt. Limit (ug)	%Recovery
Naphthalene	1.0	Not Spiked
2-Methylnaphthalene	1.0	Not Spiked
2-Chloronaphthalene	1.0	Not Spiked
Acenaphthylene	1.0	Not Spiked
Acenaphthene	1.0	68
Fluorene	1.0	Not Spiked
Phenanthrene	1.0	Not Spiked
Anthracene	1.0	Not Spiked
Fluoranthene	1.0	Not Spiked
Pyrene	1.0	80
Chrysene	1.0	Not Spiked
Benzo(a)anthracene	1.0	Not Spiked
Benzo(b)fluoranthene	1.0	Not Spiked
Benzo(k)fluoranthene	1.0	Not Spiked
Benzo(a)pyrene	1.0	Not Spiked
Indeno(1,2,3-c,d)pyrene	1.0	Not Spiked
Dibenz(a,h)anthracene	1.0	Not Spiked
Benzo(g,h,i)perylene	1.0	Not Spiked

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
2-Fluorobiphenyl	70	15-98
Terphenyl-d14	83	19-162

AIR TOXICS LTD.

SAMPLE NAME: Lab Blank

ID#: 0107006A-07A

EPA METHOD TO-13 GC/MS FULL SCAN

File Name:	**k070503**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 7/5/01**	
		Date of Extraction: 7/2/01	

Compound	Rpt. Limit (ug)	Amount (ug)
Naphthalene	1.0	Not Detected
2-Methylnaphthalene	1.0	Not Detected
2-Chloronaphthalene	1.0	Not Detected
Acenaphthylene	1.0	Not Detected
Acenaphthene	1.0	Not Detected
Fluorene	1.0	Not Detected
Phenanthrene	1.0	Not Detected
Anthracene	1.0	Not Detected
Fluoranthene	1.0	Not Detected
Pyrene	1.0	Not Detected
Chrysene	1.0	Not Detected
Benzo(a)anthracene	1.0	Not Detected
Benzo(b)fluoranthene	1.0	Not Detected
Benzo(k)fluoranthene	1.0	Not Detected
Benzo(a)pyrene	1.0	Not Detected
Indeno(1,2,3-c,d)pyrene	1.0	Not Detected
Dibenz(a,h)anthracene	1.0	Not Detected
Benzo(g,h,i)perylene	1.0	Not Detected

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
2-Fluorobiphenyl	82	15-98
Terphenyl-d14	96	19-162

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Company: ENVIRON
Address: 274 Main St City: Groton State: MA Zip: 01450
Phone: 978/448-8824 FAX: 978/448-8825
Collected By: Signature: [signature]

Project info:
P.O. #:
Project #: 02-9495A
Project Name: Tekwood

Turn Around Time:
☒ Normal
☐ Rush ____ Specify

Lab I.D.	Field Sample I.D.	Date & Time	Analyses Requested	Canister Pressure / Vacuum: Initial	Final	Receipt
	Redneck 2A	6/28 13:50	Aldehydes by TO-11A	(DNPH Cartridge)		
	Industrial 2	6/28 15:25	Aldehydes by TO-11A	(DNPH Cartridge)		
-01A	Red One	6/27 16:08	PAHs by TO-13A	PUF/XAD		
-02A	Red Two	6/28 14:35	PAHs by TO-13A	PUF/XAD		
-03A	Industrial One	6/27 17:04	PAHs by TO-13A	PUF/XAD		
-04A	Industrial Two	6/28 15:42	PAHs by TO-13A	PUF/XAD		

Page 2 of 2

Relinquished By: (Signature) Date/Time: [signature] 6/29/01 18:09
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Received By: (Signature) Date/Time: 09:45 7/2/01

Notes:

Lab Use Only	Shipper Name	Air Bill #	Opened By:	Temp. (°C)	Condition	Custody Seals Intact?	Work Order #
	FED Ex	8273 2516 9602	TMS.	25°C	Good	Yes No (None)	0107006A

Form 1293 rev. 09

APPENDIX E

Laboratory Results for Wipe Sample Analysis

NATLSCO
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LABORATORY, K-2
1 Kemper Drive
Long Grove, IL 60049-0075
Phone (847) 320-2488
Fax (847) 320-4331
Toll Free (888) 576-7522

LABORATORY ANALYSIS REPORT

REPORT DATE JUL 11, 2001
SAMPLES REC'D JUL 02, 2001
REQUEST NUMBER 373136

TO: ALYSSA POHLMAN
ENVIRON
4350 N. FAIRFAX DR.
STE. #300
ARLINGTON VA 22203
USA

SAMPLE	AIR VOLUME / ANALYSIS REQUESTED	MEDIA TYPE / RESULTS
#26EIFELTOWER		7cm Glass Fiber Filter
		micrograms
	ACENAPHTHENE	< 0.1
	ACENAPHTHYLENE	< 0.1
	ANTHRACENE	< 0.1
	BENZ(A)ANTHRACENE	< 0.1
	BENZO(b)FLUORANTHENE	< 0.1
	BENZO(k)FLUORANTHENE	< 0.1
	BENZO(ghi)PERYLENE	< 0.1
	BENZO ALPHA PYRENE	< 0.1
	CHRYSENE	< 0.1
	DIBENZ[a,b]ANTHRACENE	< 0.1
	FLUORANTHENE	< 0.1
	FLUORENE	< 0.1
	INDENO[1,2,3-cd]PYRENE	< 0.1
	NAPHTHALENE	< 0.1

COMMENTS:

IF PRESENT, DE MEANS DESORPTION EFFICIENCY

Respectfully submitted,

William M. Walsh, CIH, ROH
Manager of Operations
Environmental Sciences Laboratory

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TO: ALYSSA POHLMAN
ENVIRON
4350 N. FAIRFAX DR.
STE. #300
ARLINGTON VA 22203
USA

SAMPLE	AIR VOLUME / ANALYSIS REQUESTED	MEDIA TYPE / RESULTS
#26EIFELTOWER		7cm Glass Fiber Filter
	PHENANTHRENE	< 0.1
	PYRENE	< 0.1

COMMENTS:

IF PRESENT, DE MEANS DESORPTION EFFICIENCY

Respectfully submitted,

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ENVIRON
4350 N. FAIRFAX DR.
STE. #300
ARLINGTON VA 22203
USA

SAMPLE	AIR VOLUME / ANALYSIS REQUESTED	MEDIA TYPE / RESULTS
#2212LARCH AVE		7cm Glass Fiber Filter
		micrograms
	ACENAPHTHENE	< 0.1
	ACENAPHTHYLENE	< 0.1
	ANTHRACENE	< 0.1
	BENZ(A)ANTHRACENE	< 0.1
	BENZO(b)FLUORANTHENE	< 0.1
	BENZO(k)FLUORANTHENE	< 0.1
	BENZO(ghi)PERYLENE	< 0.1
	BENZO ALPHA PYRENE	< 0.1
	CHRYSENE	< 0.1
	DIBENZ[a,b]ANTHRACENE	< 0.1
	FLUORANTHENE	< 0.1
	FLUORENE	< 0.1
	INDENO[1,2,3-cd]PYRENE	< 0.1
	NAPHTHALENE	< 0.1

COMMENTS:

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STE. #300
ARLINGTON VA 22203
USA

SAMPLE	AIR VOLUME / ANALYSIS REQUESTED	MEDIA TYPE / RESULTS
#2212LARCH AVE		7cm Glass Fiber Filter
	PHENANTHRENE	< 0.1
	PYRENE	< 0.1

COMMENTS:

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ARLINGTON VA 22203
USA

SAMPLE	AIR VOLUME / ANALYSIS REQUESTED	MEDIA TYPE / RESULTS
		7cm Glass Fiber Filter
#3143WALNU TAVE		micrograms
	ACENAPHTHENE	< 0.1
	ACENAPHTHYLENE	< 0.1
	ANTHRACENE	< 0.1
	BENZ(A)ANTHRACENE	< 0.1
	BENZO(b)FLUORANTHENE	< 0.1
	BENZO(k)FLUORANTHENE	< 0.1
	BENZO(ghi)PERYLENE	< 0.1
	BENZO ALPHA PYRENE	< 0.1
	CHRYSENE	< 0.1
	DIBENZ[a,b]ANTHRACENE	< 0.1
	FLUORANTHENE	< 0.1
	FLUORENE	< 0.1
	INDENO[1,2,3-cd]PYRENE	< 0.1
	NAPHTHALENE	< 0.1

COMMENTS:

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ARLINGTON VA 22203
USA

SAMPLE	AIR VOLUME / ANALYSIS REQUESTED	MEDIA TYPE / RESULTS
		7cm Glass Fiber Filter
#3143WALNU TAVE	PHENANTHRENE	< 0.1
	PYRENE	< 0.1

COMMENTS:

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PAGE NUMBER 7 OF 42

TO: ALYSSA POHLMAN
ENVIRON
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STE. #300
ARLINGTON VA 22203
USA

SAMPLE	AIR VOLUME / ANALYSIS REQUESTED	MEDIA TYPE / RESULTS
		7cm Glass Fiber Filter
#21227PHIL IPSAVE		micrograms
	ACENAPHTHENE	< 0.1
	ACENAPHTHYLENE	< 0.1
	ANTHRACENE	< 0.1
	BENZ(A)ANTHRACENE	< 0.1
	BENZO(b)FLUORANTHENE	< 0.1
	BENZO(k)FLUORANTHENE	< 0.1
	BENZO(ghi)PERYLENE	< 0.1
	BENZO ALPHA PYRENE	< 0.1
	CHRYSENE	< 0.1
	DIBENZ[a,b]ANTHRACENE	< 0.1
	FLUORANTHENE	< 0.1
	FLUORENE	< 0.1
	INDENO[1,2,3-cd]PYRENE	< 0.1
	NAPHTHALENE	< 0.1

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ARLINGTON VA 22203
USA

SAMPLE	AIR VOLUME / ANALYSIS REQUESTED	MEDIA TYPE / RESULTS
		7cm Glass Fiber Filter
#21227PHIL IPSAVE	PHENANTHRENE	< 0.1
	PYRENE	< 0.1

COMMENTS:

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Respectfully submitted,

William M. Walsh/bc

William M. Walsh, CIH, ROH
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USA

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		7cm Glass Fiber Filter
#21A1MAPLE AVE		micrograms
	ACENAPHTHENE	< 0.1
	ACENAPHTHYLENE	< 0.1
	ANTHRACENE	< 0.1
	BENZ(A)ANTHRACENE	< 0.1
	BENZO(b)FLUORANTHENE	< 0.1
	BENZO(k)FLUORANTHENE	< 0.1
	BENZO(ghi)PERYLENE	< 0.1
	BENZO ALPHA PYRENE	< 0.1
	CHRYSENE	< 0.1
	DIBENZ[a,b]ANTHRACENE	< 0.1
	FLUORANTHENE	< 0.1
	FLUORENE	< 0.1
	INDENO[1,2,3-cd]PYRENE	< 0.1
	NAPHTHALENE	< 0.1

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PAGE NUMBER 10 OF 42

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ARLINGTON VA 22203
USA

SAMPLE	AIR VOLUME / ANALYSIS REQUESTED	MEDIA TYPE / RESULTS
		7cm Glass Fiber Filter
#21A1MAPLE AVE	PHENANTHRENE	< 0.1
	PYRENE	< 0.1

COMMENTS:

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ENVIRON
4350 N. FAIRFAX DR.
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ARLINGTON VA 22203
USA

SAMPLE	AIR VOLUME / ANALYSIS REQUESTED	MEDIA TYPE / RESULTS
#22510RTE4 6W		7cm Glass Fiber Filter
		micrograms
	ACENAPHTHENE	< 0.1
	ACENAPHTHYLENE	< 0.1
	ANTHRACENE	< 0.1
	BENZ(A)ANTHRACENE	< 0.1
	BENZO(b)FLUORANTHENE	< 0.1
	BENZO(k)FLUORANTHENE	< 0.1
	BENZO(ghi)PERYLENE	< 0.1
	BENZO ALPHA PYRENE	< 0.1
	CHRYSENE	< 0.1
	DIBENZ[a,b]ANTHRACENE	< 0.1
	FLUORANTHENE	< 0.1
	FLUORENE	< 0.1
	INDENO[1,2,3-cd]PYRENE	< 0.1
	NAPHTHALENE	< 0.1

COMMENTS:

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4350 N. FAIRFAX DR.
STE. #300
ARLINGTON VA 22203
USA

SAMPLE	AIR VOLUME / ANALYSIS REQUESTED	MEDIA TYPE / RESULTS
		7cm Glass Fiber Filter
#22510RTE4 6W	PHENANTHRENE	< 0.1
	PYRENE	< 0.1

COMMENTS:

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Respectfully submitted,

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ARLINGTON VA 22203
USA

SAMPLE	AIR VOLUME / ANALYSIS REQUESTED	MEDIA TYPE / RESULTS
		7cm Glass Fiber Filter
#17MOONACH IETAILERPA		micrograms
	ACENAPHTHENE	< 0.1
	ACENAPHTHYLENE	< 0.1
	ANTHRACENE	< 0.1
	BENZ(A)ANTHRACENE	< 0.1
	BENZO(b)FLUORANTHENE	< 0.1
	BENZO(k)FLUORANTHENE	< 0.1
	BENZO(ghi)PERYLENE	< 0.1
	BENZO ALPHA PYRENE	< 0.1
	CHRYSENE	< 0.1
	DIBENZ[a,b]ANTHRACENE	< 0.1
	FLUORANTHENE	< 0.1
	FLUORENE	< 0.1
	INDENO[1,2,3-cd]PYRENE	< 0.1
	NAPHTHALENE	< 0.1

COMMENTS:

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REQUEST NUMBER 373136
PAGE NUMBER 14 OF 42

TO: ALYSSA POHLMAN
ENVIRON
4350 N. FAIRFAX DR.
STE. #300
ARLINGTON VA 22203
USA

SAMPLE	AIR VOLUME / ANALYSIS REQUESTED	MEDIA TYPE / RESULTS
		7cm Glass Fiber Filter
#17MOONACH IETAILERPA	PHENANTHRENE	< 0.1
	PYRENE	< 0.1

COMMENTS:

IF PRESENT, DE MEANS DESORPTION EFFICIENCY

Respectfully submitted,

William M. Walsh

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PAGE NUMBER 15 OF 42

TO: ALYSSA POHLMAN
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STE. #300
ARLINGTON VA 22203
USA

SAMPLE	AIR VOLUME / ANALYSIS REQUESTED	MEDIA TYPE / RESULTS
		7cm Glass Fiber Filter
#16181REDN ECKAVE		micrograms
	ACENAPHTHENE	< 0.1
	ACENAPHTHYLENE	< 0.1
	ANTHRACENE	< 0.1
	BENZ(A)ANTHRACENE	< 0.1
	BENZO(b)FLUORANTHENE	< 0.1
	BENZO(k)FLUORANTHENE	< 0.1
	BENZO(ghi)PERYLENE	< 0.1
	BENZO ALPHA PYRENE	< 0.1
	CHRYSENE	< 0.1
	DIBENZ[a,b]ANTHRACENE	< 0.1
	FLUORANTHENE	< 0.1
	FLUORENE	< 0.1
	INDENO[1,2,3-cd]PYRENE	< 0.1
	NAPHTHALENE	< 0.1

COMMENTS:

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SAMPLE	AIR VOLUME / ANALYSIS REQUESTED	MEDIA TYPE / RESULTS
		7cm Glass Fiber Filter
#16181REDN ECKAVE	PHENANTHRENE	< 0.1
	PYRENE	< 0.1

COMMENTS:

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ARLINGTON VA 22203
USA

SAMPLE	AIR VOLUME / ANALYSIS REQUESTED	MEDIA TYPE / RESULTS
		7cm Glass Fiber Filter
#14153ECKE LRD.		micrograms
	ACENAPHTHENE	< 0.1
	ACENAPHTHYLENE	< 0.1
	ANTHRACENE	< 0.1
	BENZ(A)ANTHRACENE	< 0.1
	BENZO(b)FLUORANTHENE	< 0.1
	BENZO(k)FLUORANTHENE	< 0.1
	BENZO(ghi)PERYLENE	< 0.1
	BENZO ALPHA PYRENE	< 0.1
	CHRYSENE	< 0.1
	DIBENZ[a,b]ANTHRACENE	< 0.1
	FLUORANTHENE	< 0.1
	FLUORENE	< 0.1
	INDENO[1,2,3-cd]PYRENE	< 0.1
	NAPHTHALENE	< 0.1

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ARLINGTON VA 22203
USA

SAMPLE	AIR VOLUME / ANALYSIS REQUESTED	MEDIA TYPE / RESULTS
		7cm Glass Fiber Filter
#14153ECKE LRD.	PHENANTHRENE	< 0.1
	PYRENE	< 0.1

COMMENTS:

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ARLINGTON VA 22203
USA

SAMPLE	AIR VOLUME / ANALYSIS REQUESTED	MEDIA TYPE / RESULTS
#1012WEBBP LACE		7cm Glass Fiber Filter
		micrograms
	ACENAPHTHENE	< 0.1
	ACENAPHTHYLENE	< 0.1
	ANTHRACENE	< 0.1
	BENZ(A)ANTHRACENE	< 0.1
	BENZO(b)FLUORANTHENE	< 0.1
	BENZO(k)FLUORANTHENE	< 0.1
	BENZO(ghi)PERYLENE	< 0.1
	BENZO ALPHA PYRENE	< 0.1
	CHRYSENE	< 0.1
	DIBENZ[a,b]ANTHRACENE	< 0.1
	FLUORANTHENE	< 0.1
	FLUORENE	< 0.1
	INDENO[1,2,3-cd]PYRENE	< 0.1
	NAPHTHALENE	< 0.1

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ARLINGTON VA 22203
USA

SAMPLE	AIR VOLUME / ANALYSIS REQUESTED	MEDIA TYPE / RESULTS
#16181REDN ECKDUPLICA		7cm Glass Fiber Filter
		micrograms
	ACENAPHTHENE	< 0.1
	ACENAPHTHYLENE	< 0.1
	ANTHRACENE	< 0.1
	BENZ(A)ANTHRACENE	< 0.1
	BENZO(b)FLUORANTHENE	< 0.1
	BENZO(k)FLUORANTHENE	< 0.1
	BENZO(ghi)PERYLENE	< 0.1
	BENZO ALPHA PYRENE	< 0.1
	CHRYSENE	< 0.1
	DIBENZ[a,b]ANTHRACENE	< 0.1
	FLUORANTHENE	< 0.1
	FLUORENE	< 0.1
	INDENO[1,2,3-cd]PYRENE	< 0.1
	NAPHTHALENE	< 0.1

COMMENTS:

IF PRESENT, DE MEANS DESORPTION EFFICIENCY

Respectfully submitted,

William M. Walsh, CIH, ROH
Manager of Operations
Environmental Sciences Laboratory

ACCREDITED BY THE AMERICAN INDUSTRIAL HYGIENE ASSOCIATION

LABORATORY ANALYSIS REPORT

NATLSCO
www.natlsco.com
LABORATORY, K-2
1 Kemper Drive
Long Grove, IL 60049-0075
Phone (847) 320-2488
Fax (847) 320-4331
Toll Free (888) 576-7522

REPORT DATE JUL 11, 2001
SAMPLES REC'D JUL 02, 2001
REQUEST NUMBER 373136

TO: ALYSSA POHLMAN
ENVIRON
4350 N. FAIRFAX DR.
STE. #300
ARLINGTON VA 22203
USA

SAMPLE	AIR VOLUME / ANALYSIS REQUESTED	MEDIA TYPE / RESULTS
#16181REDN ECKDUPLICA		7cm Glass Fiber Filter
	PHENANTHRENE	< 0.1
	PYRENE	< 0.1

COMMENTS:

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REPORT DATE JUL 11, 2001
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PAGE NUMBER 23 OF 42

TO: ALYSSA POHLMAN
ENVIRON
4350 N. FAIRFAX DR.
STE. #300
ARLINGTON VA 22203
USA

SAMPLE	AIR VOLUME / ANALYSIS REQUESTED	MEDIA TYPE / RESULTS
#24220WOOD RIDGEST		7cm Glass Fiber Filter
		micrograms
	ACENAPHTHENE	< 0.1
	ACENAPHTHYLENE	< 0.1
	ANTHRACENE	< 0.1
	BENZ(A)ANTHRACENE	< 0.1
	BENZO(b)FLUORANTHENE	< 0.1
	BENZO(k)FLUORANTHENE	< 0.1
	BENZO(ghi)PERYLENE	< 0.1
	BENZO ALPHA PYRENE	< 0.1
	CHRYSENE	< 0.1
	DIBENZ[a,b]ANTHRACENE	< 0.1
	FLUORANTHENE	< 0.1
	FLUORENE	< 0.1
	INDENO[1,2,3-cd]PYRENE	< 0.1
	NAPHTHALENE	< 0.1

COMMENTS:

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PAGE NUMBER 24 OF 42

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ENVIRON
4350 N. FAIRFAX DR.
STE. #300
ARLINGTON VA 22203
USA

SAMPLE	AIR VOLUME / ANALYSIS REQUESTED	MEDIA TYPE / RESULTS
		7cm Glass Fiber Filter
#24220WOOD RIDGEST	PHENANTHRENE	< 0.1
	PYRENE	< 0.1

COMMENTS:

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ENVIRON
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STE. #300
ARLINGTON VA 22203
USA

SAMPLE	AIR VOLUME / ANALYSIS REQUESTED	MEDIA TYPE / RESULTS
#23676ANDERSONAVE		7cm Glass Fiber Filter
		micrograms
	ACENAPHTHENE	< 0.1
	ACENAPHTHYLENE	< 0.1
	ANTHRACENE	< 0.1
	BENZ(A)ANTHRACENE	< 0.1
	BENZO(b)FLUORANTHENE	< 0.1
	BENZO(k)FLUORANTHENE	< 0.1
	BENZO(ghi)PERYLENE	< 0.1
	BENZO ALPHA PYRENE	< 0.1
	CHRYSENE	< 0.1
	DIBENZ[a,b]ANTHRACENE	< 0.1
	FLUORANTHENE	< 0.1
	FLUORENE	< 0.1
	INDENO[1,2,3-cd]PYRENE	< 0.1
	NAPHTHALENE	< 0.1

COMMENTS:

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STE. #300
ARLINGTON VA 22203
USA

SAMPLE	AIR VOLUME / ANALYSIS REQUESTED	MEDIA TYPE / RESULTS
		7cm Glass Fiber Filter
#23676ANDERSONAVE	PHENANTHRENE	< 0.1
	PYRENE	< 0.1

COMMENTS:

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4350 N. FAIRFAX DR.
STE. #300
ARLINGTON VA 22203
USA

SAMPLE	AIR VOLUME / ANALYSIS REQUESTED	MEDIA TYPE / RESULTS
#43378THST		7cm Glass Fiber Filter
		micrograms
	ACENAPHTHENE	< 0.1
	ACENAPHTHYLENE	< 0.1
	ANTHRACENE	< 0.1
	BENZ(A)ANTHRACENE	< 0.1
	BENZO(b)FLUORANTHENE	< 0.1
	BENZO(k)FLUORANTHENE	< 0.1
	BENZO(ghi)PERYLENE	< 0.1
	BENZO ALPHA PYRENE	< 0.1
	CHRYSENE	< 0.1
	DIBENZ[a,b]ANTHRACENE	< 0.1
	FLUORANTHENE	< 0.1
	FLUORENE	< 0.1
	INDENO[1,2,3-cd]PYRENE	< 0.1
	NAPHTHALENE	< 0.1
	PHENANTHRENE	< 0.1

COMMENTS:

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ARLINGTON VA 22203
USA

SAMPLE	AIR VOLUME / ANALYSIS REQUESTED	MEDIA TYPE / RESULTS
		7cm Glass Fiber Filter
#43378THST	PYRENE	< 0.1

COMMENTS:

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ARLINGTON VA 22203
USA

SAMPLE	AIR VOLUME / ANALYSIS REQUESTED	MEDIA TYPE / RESULTS
#8BECTONH. S.		7cm Glass Fiber Filter
		micrograms
	ACENAPHTHENE	< 0.1
	ACENAPHTHYLENE	< 0.1
	ANTHRACENE	< 0.1
	BENZ(A)ANTHRACENE	< 0.1
	BENZO(b)FLUORANTHENE	< 0.1
	BENZO(k)FLUORANTHENE	< 0.1
	BENZO(ghi)PERYLENE	< 0.1
	BENZO ALPHA PYRENE	< 0.1
	CHRYSENE	< 0.1
	DIBENZ[a,b]ANTHRACENE	< 0.1
	FLUORANTHENE	< 0.1
	FLUORENE	< 0.1
	INDENO[1,2,3-cd]PYRENE	< 0.1
	NAPHTHALENE	< 0.1

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STE. #300
ARLINGTON VA 22203
USA

SAMPLE	AIR VOLUME / ANALYSIS REQUESTED	MEDIA TYPE / RESULTS
		7cm Glass Fiber Filter
#8BECTONH. S.	PHENANTHRENE	< 0.1
	PYRENE	< 0.1

COMMENTS:

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ENVIRON
4350 N. FAIRFAX DR.
STE. #300
ARLINGTON VA 22203
USA

SAMPLE	AIR VOLUME / ANALYSIS REQUESTED	MEDIA TYPE / RESULTS
#19238SYLV ANST		7cm Glass Fiber Filter
		micrograms
	ACENAPHTHENE	< 0.1
	ACENAPHTHYLENE	< 0.1
	ANTHRACENE	< 0.1
	BENZ(A)ANTHRACENE	< 0.1
	BENZO(b)FLUORANTHENE	< 0.1
	BENZO(k)FLUORANTHENE	< 0.1
	BENZO(ghi)PERYLENE	< 0.1
	BENZO ALPHA PYRENE	< 0.1
	CHRYSENE	< 0.1
	DIBENZ[a,b]ANTHRACENE	< 0.1
	FLUORANTHENE	< 0.1
	FLUORENE	< 0.1
	INDENO[1,2,3-cd]PYRENE	< 0.1
	NAPHTHALENE	< 0.1

COMMENTS:

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4350 N. FAIRFAX DR.
STE. #300
ARLINGTON VA 22203
USA

SAMPLE	AIR VOLUME / ANALYSIS REQUESTED	MEDIA TYPE / RESULTS
		7cm Glass Fiber Filter
#19238SYLV ANST	PHENANTHRENE	< 0.1
	PYRENE	< 0.1

COMMENTS:

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Respectfully submitted,

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REPORT DATE JUL 11, 2001
SAMPLES REC'D JUL 02, 2001
REQUEST NUMBER 373137
PAGE NUMBER 33 OF 42

TO: ALYSSA POHLMAN
ENVIRON
4350 N. FAIRFAX DR.
STE. #300
ARLINGTON VA 22203
USA

SAMPLE	AIR VOLUME / ANALYSIS REQUESTED	MEDIA TYPE / RESULTS
#7LINCOLNS CHOOL		7cm Glass Fiber Filter
		micrograms
	ACENAPHTHENE	< 0.1
	ACENAPHTHYLENE	< 0.1
	ANTHRACENE	< 0.1
	BENZ(A)ANTHRACENE	< 0.1
	BENZO(b)FLUORANTHENE	< 0.1
	BENZO(k)FLUORANTHENE	< 0.1
	BENZO(ghi)PERYLENE	< 0.1
	BENZO ALPHA PYRENE	< 0.1
	CHRYSENE	< 0.1
	DIBENZ[a,b]ANTHRACENE	< 0.1
	FLUORANTHENE	< 0.1
	FLUORENE	< 0.1
	INDENO[1,2,3-cd]PYRENE	< 0.1
	NAPHTHALENE	< 0.1

COMMENTS:

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ENVIRON
4350 N. FAIRFAX DR.
STE. #300
ARLINGTON VA 22203
USA

SAMPLE	AIR VOLUME / ANALYSIS REQUESTED	MEDIA TYPE / RESULTS
		7cm Glass Fiber Filter
#7LINCOLNS CHOOL	PHENANTHRENE	< 0.1
	PYRENE	< 0.1

COMMENTS:

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ARLINGTON VA 22203
USA

SAMPLE	AIR VOLUME / ANALYSIS REQUESTED	MEDIA TYPE / RESULTS
#7LINCOLNS CHOOLDUPLI		7cm Glass Fiber Filter
		micrograms
	ACENAPHTHENE	< 0.1
	ACENAPHTHYLENE	< 0.1
	ANTHRACENE	< 0.1
	BENZ(A)ANTHRACENE	< 0.1
	BENZO(b)FLUORANTHENE	< 0.1
	BENZO(k)FLUORANTHENE	< 0.1
	BENZO(ghi)PERYLENE	< 0.1
	BENZO ALPHA PYRENE	< 0.1
	CHRYSENE	< 0.1
	DIBENZ[a,b]ANTHRACENE	< 0.1
	FLUORANTHENE	< 0.1
	FLUORENE	< 0.1
	INDENO[1,2,3-cd]PYRENE	< 0.1
	NAPHTHALENE	< 0.1

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USA

SAMPLE	AIR VOLUME / ANALYSIS REQUESTED	MEDIA TYPE / RESULTS
#7LINCOLNS CHOOLDUPLI		7cm Glass Fiber Filter
	PHENANTHRENE	< 0.1
	PYRENE	< 0.1

COMMENTS:

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ENVIRON
4350 N. FAIRFAX DR.
STE. #300
ARLINGTON VA 22203
USA

SAMPLE	AIR VOLUME / ANALYSIS REQUESTED	MEDIA TYPE / RESULTS
		7cm Glass Fiber Filter
LAB BLANK		micrograms
	ACENAPHTHENE	< 0.1
	(BLANK)	NONE DETECTED
	ACENAPHTHYLENE	< 0.1
	(BLANK)	NONE DETECTED
	ANTHRACENE	< 0.1
	(BLANK)	NONE DETECTED
	BENZ(A)ANTHRACENE	< 0.1
	(BLANK)	NONE DETECTED
	BENZO(b)FLUORANTHENE	< 0.1
	(BLANK)	NONE DETECTED
	BENZO(k)FLUORANTHENE	< 0.1
	(BLANK)	NONE DETECTED
	BENZO(ghi)PERYLENE	< 0.1
	(BLANK)	NONE DETECTED

COMMENTS:

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ARLINGTON VA 22203
USA

SAMPLE	AIR VOLUME / ANALYSIS REQUESTED	MEDIA TYPE / RESULTS
		7cm Glass Fiber Filter
LAB BLANK	BENZO ALPHA PYRENE	< 0.1
	(BLANK)	NONE DETECTED
	CHRYSENE	< 0.1
	(BLANK)	NONE DETECTED
	DIBENZ[a,b]ANTHRACENE	< 0.1
	(BLANK)	NONE DETECTED
	FLUORANTHENE	< 0.1
	(BLANK)	NONE DETECTED
	FLUORENE	< 0.1
	(BLANK)	NONE DETECTED
	INDENO[1,2,3-cd]PYRENE	< 0.1
	(BLANK)	NONE DETECTED
	NAPHTHALENE	< 0.1
	(BLANK)	NONE DETECTED

COMMENTS:

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PAGE NUMBER 39 OF 42

TO: ALYSSA POHLMAN
ENVIRON
4350 N. FAIRFAX DR.
STE. #300
ARLINGTON VA 22203
USA

SAMPLE	AIR VOLUME / ANALYSIS REQUESTED	MEDIA TYPE / RESULTS
		7cm Glass Fiber Filter
LAB BLANK	PHENANTHRENE	< 0.1
	(BLANK)	NONE DETECTED
	PYRENE	< 0.1
	(BLANK)	NONE DETECTED

COMMENTS:

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LLD *	ANALYSIS REQUESTED	METHODOLOGY	CAS #
.1	ACENAPHTHENE SW2	NIOSH 5506 HIGH PRESSURE LIQUID CHROMATOGRAPHY	83-32-9
.1	ACENAPHTHYLENE SW2	NIOSH 5506 HIGH PRESSURE LIQUID CHROMATOGRAPHY	208-96-8
.1	ANTHRACENE SW2	NIOSH 5506 HIGH PRESSURE LIQUID CHROMATOGRAPHY	120-12-7
.1	BENZ(A)ANTHRACENE SW2	NIOSH 5506 HIGH PRESSURE LIQUID CHROMATOGRAPHY	56-55-3
.1	BENZO ALPHA PYRENE SW2	NIOSH 5506 HIGH PRESSURE LIQUID CHROMATOGRAPHY	50-32-8
.1	BENZO(b)FLUORANTHENE SW2	NIOSH 5506 HIGH PRESSURE LIQUID CHROMATOGRAPHY	205-99-2

COMMENTS:

CONCENTRATION CALCULATED USING AIR VOLUMES SUPPLIED BY CLIENT
* LLD IS THE REPORTING LIMIT IN MICROGRAMS

Respectfully submitted,

William M. Walsh, CIH, ROH
Manager of Operations
Environmental Sciences Laboratory

ACCREDITED BY THE AMERICAN INDUSTRIAL HYGIENE ASSOCIATION

LABORATORY ANALYSIS REPORT

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REPORT DATE JUL 11, 2001
SAMPLES REC'D JUL 02, 2001
REQUEST NUMBER 373136

TO: ALYSSA POHLMAN
ENVIRON
4350 N. FAIRFAX DR.
STE. #300
ARLINGTON VA 22203
USA

LLD *	ANALYSIS REQUESTED	METHODOLOGY	CAS #
.1	BENZO(ghi)PERYLENE SW2	NIOSH 5506 HIGH PRESSURE LIQUID CHROMATOGRAPHY	191-24-2
.1	BENZO(k)FLUORANTHENE SW2	NIOSH 5506 HIGH PRESSURE LIQUID CHROMATOGRAPHY	207-8-9
.1	CHRYSENE SW2	NIOSH 5506 HIGH PRESSURE LIQUID CHROMATOGRAPHY	218-1-9
.1	DIBENZ[a,b]ANTHRACENE SW2	NIOSH 5506 HIGH PRESSURE LIQUID CHROMATOGRAPHY	206-44-0
.1	FLUORANTHENE SW2	NIOSH 5506 HIGH PRESSURE LIQUID CHROMATOGRAPHY	206-44-0
.1	FLUORENE SW2	NIOSH 5506 HIGH PRESSURE LIQUID CHROMATOGRAPHY	86-73-7

COMMENTS:

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REPORT DATE JUL 11, 2001
SAMPLES REC'D JUL 02, 2001
REQUEST NUMBER 373136
PAGE NUMBER 42 OF 42

TO: ALYSSA POHLMAN
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USA

LLD *	ANALYSIS REQUESTED	METHODOLOGY	CAS #
.1	INDENO[1,2,3-cd]PYRENE SW2	NIOSH 5506 HIGH PRESSURE LIQUID CHROMATOGRAPHY	193-39-5
.1	NAPHTHALENE SW2	NIOSH 5506 HIGH PRESSURE LIQUID CHROMATOGRAPHY	91-80-3
.1	PHENANTHRENE SW2	NIOSH 5506 HIGH PRESSURE LIQUID CHROMATOGRAPHY	85-1-8
.1	PYRENE SW2	NIOSH 5506 HIGH PRESSURE LIQUID CHROMATOGRAPHY	129-00-0

COMMENTS:

CONCENTRATION CALCULATED USING AIR VOLUMES SUPPLIED BY CLIENT
* LLD IS THE REPORTING LIMIT IN MICROGRAMS

Respectfully submitted,

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APPENDIX F

Details of Risk Screening Calculations

Appendix F
Details of Risk Screening Calculations

A. Introduction

The sampling data were evaluated using a residential scenario in the risk calculations. In the adult resident scenario, exposure was assumed to occur for 350 days per year, for a period of 70 years. In the child (age 1 to 7) resident scenario, exposure was assumed to occur for 350 days per year for a period of 6 years.

B. Exposure Assessment

Exposure parameters used in assessing potential risks to off-site residents are presented in Table 2. Potential inhalation risks are estimated by combining the inhalation toxicity values (in units of concentration) with the air concentration over the period of exposure. Exposure concentrations are calculated as shown below:

$$C_e = \frac{C_a \times EF \times ED}{AT}$$

where:

C_e	=	Exposure concentration; time-weighted concentration of chemical in air, $\mu g/m^3$
C_a	=	Concentration of chemical in air, $\mu g/m^3$
EF	=	Exposure frequency, days/year
ED	=	Exposure duration, years
AT	=	Averaging time, days.

The exposure parameters used to estimate the exposure concentrations for the adult and child residents are described below:

- Exposure Frequency (EF). An exposure frequency (EF) of 350 days per year was used for both the adult and child resident, based on USEPA (1991) guidance.

- Exposure Duration (ED). An exposure duration (ED) of 70 years was used for the adult, as recommended by USEPA (2000) for conducting screening-level assessments for air contaminants. This exposure duration is also consistent with USEPA (1999a) guidance for conducting screening-level evaluations of hazardous air pollutants. An

exposure duration of 6 years was used for the child, based on the total number of years in the 1 to 7 year old age range for the child.

- Averaging Time (*AT*). For carcinogens, the averaging time (*AT*) is the number of days in a lifetime. A lifetime of 70 years was used for the adult and child residents, based on USEPA (1989) guidance. For noncarcinogens, the averaging time is the same as the exposure duration in units of days (USEPA 1989).

The equation for exposure concentration, as presented above, does not include body weight and inhalation rate, because the inhalation toxicity factors are already adjusted for these parameters. However, body weight and inhalation rate are defined for the residents in order to adjust the inhalation cancer unit risk factor values, which are applied in this analysis to calculate carcinogenic risk.

An inhalation rate of 20 m^3/day was assumed for both the adult and child resident, based on the inhalation rate presented in USEPA 1991. This is a conservative inhalation rate for a child, given that USEPA (1997a) recommends an inhalation rate of 8.3 m^3/day for children between the ages of 3 to 5 years and 10 m^3/day for children between the ages of 6 to 8 years.

A body weight of 70 kg was assumed for the adult resident, based on the mean adult body weight presented in USEPA (1991). A body weight of 15 kg was used for the child, based on the mean body weight for 6 year old children presented in USEPA (1991).

C. Toxicity Evaluation

Toxicity values have been developed by USEPA for the evaluation of hazards posed by different types of chemical exposures. In this risk assessment, inhalation is the primary route of potential exposure for the off-site community. Relevant toxicity criteria for the chemicals of potential concern in this assessment are presented in Tables F-1 (carcinogenic effects) and F-2 (noncarcinogenic effects), and discussed below.

It should be noted that USEPA toxicity criteria are unavailable for many chemicals detected in this study. Of the 50 compounds detected, toxicity values were identified for only about 30. Chemicals without adequate toxicity criteria could not be included in the quantitative risk assessment; this may result in an underestimate of the risks.

1. Toxicity Values for Evaluating Potential Cancer Risk

There are two steps involved in assessing carcinogenic potential; first, the evaluation of the likelihood that the substance is a human carcinogen (i.e., a weight-of-evidence assessment), and second, definition of the quantitative relationship between dose and carcinogenic response.

USEPA classifies a chemical into one of five groups, based on the weight of evidence of carcinogenicity from human and animal investigations. These groups are as follows (USEPA 1989, 1997b):

- Group A: Human Carcinogen (sufficient evidence of carcinogenicity in humans)
- Group B: Probable Human Carcinogen (B1 - limited evidence of carcinogenicity in humans; B2 - sufficient evidence of carcinogenicity in animals with inadequate or lack of evidence in humans)
- Group C: Possible Human Carcinogen (limited evidence of carcinogenicity in animals and inadequate or lack of human data)
- Group D: Not Classifiable as to Human Carcinogenicity (inadequate or no evidence)
- Group E: Evidence of Noncarcinogenicity for Humans (no evidence of carcinogenicity in adequate studies).

The outcome of the second part of the evaluation for assessing carcinogenic risk is the derivation of a unit risk factor (URF) for each chemical in Groups A, B1 and B2. (USEPA estimates URFs for chemicals in Group C on a case-by-case basis.) The inhalation URF is an estimate of the upper-bound probability of an individual developing cancer from a lifetime of exposure to a unit concentration of a given chemical in air (USEPA 1989). The URF values used in this assessment are presented in Table F-1. Where available, inhalation URFs for the chemicals at the site were obtained directly from the USEPA Integrated Risk Information System (IRIS) database and USEPA's Health Effects Assessment Summary Tables (HEAST). For some chemicals of potential concern, toxicity values published by USEPA's National Center for Environmental Assessment (NCEA) or USEPA Region III were used, due to a lack of toxicity values in IRIS and HEAST. For benzene, USEPA provides a range of URF values; given the preliminary nature of this evaluation, the high end of the range was used.

For those chemicals where an inhalation URF has not been published, but an inhalation slope factor (SF) is available from IRIS, HEAST, NCEA or USEPA Region III, the inhalation SF was converted to a URF using the following standard conversion methodology published in HEAST (USEPA 1997b):

$$URF(\mu g/m^3) = \frac{SF(mg/kg/day)^{-1} \times 20m^3/day \times 10^{-3}(mg/\mu g)}{70kg}$$

2. Toxicity Values for Evaluating the Potential for Non-Cancer Health Effects

The inhalation reference concentration (RfC) is an estimate of the chemical concentration in air to which an individual in the general population may be exposed over a substantial portion of a lifetime without experiencing adverse noncarcinogenic effects. The RfC values used in this assessment are presented in Table F-2. Chronic inhalation RfC values were taken directly from IRIS and HEAST where available. For some chemicals of potential concern, toxicity values published by USEPA's NCEA or USEPA Region III were used, due to a lack of toxicity values in IRIS and HEAST.

For those chemicals where a chronic RfC has not been published, but a chronic inhalation reference dose (RfD) is available from IRIS, HEAST, NCEA or USEPA Region III, the RfD was converted to an RfC using the following standard conversion methodology published in HEAST (USEPA 1997b):

$$RfC(mg/m^3) = RfD(mg/kg/day) \times \frac{70kg}{20m^3/day}$$

Route-specific toxicity values were used when available. As a conservative measure, oral RfD values were used for the inhalation pathway for those constituents that do not have inhalation RfCs or RfDs. The oral RfDs were converted to inhalation RfCs using the standard conversion methodology published in HEAST, as shown above (USEPA 1997b).

D. Risk Characterization

The theoretical risk of an individual developing cancer as a result of exposure to each potentially carcinogenic chemical detected in this study was calculated as follows:

$$Risk = C_e \times URF$$

where:

Risk	=	the incremental risk of developing cancer over the course of a lifetime, (unitless);
C_e	=	exposure concentration in air (averaged over a 70-year lifetime), ($\mu g/m^3$); and
URF	=	unit cancer risk factor, $(\mu g/m^3)^{-1}$.

When estimating carcinogenic risk, care must be taken to ensure that the exposure parameters used to estimate the exposure concentration (C_e) are consistent with those used to develop the URF. The following exposure parameters have been traditionally used to develop URF values:

- inhalation rate = 20 m^3/day;

- body weight = 70 kg; and
- lifetime = 70 years.

When the exposure parameters used to develop the URF differ from the site-specific exposure factors used to develop the exposure concentration, the URF is adjusted as follows (USEPA 1997a):

$$adjustedURF_{inhalation}(\mu g/m^3)^{-1} = URF_{inhalation} \times \frac{IR}{20m^3/day} \times \left(\frac{70kg}{BW}\right)^{2/3}$$

For this assessment, the adult resident was assumed to have standard exposure factors for inhalation rate (20 m^3/day) and body weight (70 kg), while the child resident was assumed to have a standard inhalation rate (20 m^3/day) and a body weight of 15 kg. Therefore, the URF values were adjusted using the equation above for the child resident.

The potential for noncancer health effects was evaluated by calculating separate Hazard Quotient (HQ) values for each chemical, as follows:

$$HQ = \frac{C_e}{RfC}$$

where:

HQ = Hazard Quotient, (unitless);
C_e = exposure concentration in air (averaged over the period of exposure), ($\mu g/m^3$); and
RfC = reference concentration, ($\mu g/m^3$).

Hazard Index (HI) values were calculated by summing HQ values, across all chemicals of potential concern.

E. References

United States Environmental Protection Agency (USEPA). Office of Emergency and Remedial Response. 1989. *Risk Assessment Guidance for Superfund.* Vol. I, *Human Health Evaluation Manual (Part A). Interim Final.* EPA/540/1-89/002.

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United States Environmental Protection Agency (USEPA). 2000a. Personal Communication. Risk and Exposure Assessment Group (REAG) of EPA's Office of Air Quality Planning and Standards. August.

United States Environmental Protection Agency (USEPA). 2000b. Integrated Risk Information System (IRIS). On-line database.

TABLE F-1 Toxicity Values – Carcinogenic Effects									
Chemical Name	**CASRN**	**Wt**	**Ref**	**Inhalation URF $(ug/m3)^{-1}$**	**Ref**	**Note**	**Inhalation SF $(mg/kg/d)^{-1}$**	**Ref**	**Note**
Acenaphthene	83-32-9								
Acenaphthylene	208-96-8	D	1						
Acetone	67-64-1	D	1						
Anthracene	120-12-7	D	1						
Benzaldehyde	100-52-7								
Benzene	71-43-2	A	1	7.80E-06	1	60	2.73E-02	1	1,2
Butadiene, 1,3-	106-99-0	B2	1	2.80E-04	1	81	1.80E+00	2	
Butane, n-	106-97-8								
Carbon disulfide	75-15-0								
Carbon tetrachloride	56-23-5	B2	1	1.50E-05	1		5.25E-02	1	1
Chloromethane	74-87-3	C	2	1.80E-06	2		6.30E-03	2	1
Cyclohexane	110-82-7								
Decane, n-	124-18-5								
Dioxane, 1,4-	123-91-1	B2	1						
Dodecane, n-	112-40-3								
Ethanol	64-17-5								
Ethylbenzene	100-41-4	D	1						
Ethyltoluene, 4-	622-96-8								
Fluoranthene	206-44-0	D	1						
Fluorene	86-73-7	D	1						
Formaldehyde	50-00-0	B1	1	1.30E-05	1		4.55E-02	1	1
Freon 11	75-69-4								
Freon 113	76-13-1								
Freon 12	75-71-8								
Heptane, n-	142-82-5								
Hexane, n-	110-54-3								

TABLE F-1 Toxicity Values – Carcinogenic Effects									
Chemical Name	**CASRN**	**Wt**	**Ref**	**Inhalation URF $(ug/m3)^{-1}$**	**Ref**	**Note**	**Inhalation SF $(mg/kg/d)^{-1}$**	**Ref**	**Note**
Hexanone, 2-	591-78-6								
Methyl ethyl ketone (2-Butanone)	78-93-3	D	1						
Methyl tert-Butyl Ether	1634-04-4								
Methyl-2-pentanone, 4-	108-10-1								
Methylene chloride	75-09-2	B2	1	4.70E-07	1		1.65E-03	1	1
Methylnaphthalene, 2-	91-57-6								
Naphthalene	91-20-3	C	1						
Nonane, p-	111-84-2								
Pentane, n-	109-66-0								
Phenanthrene	85-01-8	D	1						
Propanal	123-38-6								
Propanol, 2-	67-63-0								
Propylene	115-07-1								
Pyrene	129-00-0	D	1						
Styrene	100-42-5								
Tolualdehyde, m,p-	620-23-51								
Toluene	108-88-3	D	1						
Trichloroethene	79-01-6	C-B2	3	1.70E-06	3		6.00E-03	3	
Trimethylbenzene, 1,2,4-	95-63-6								
Trimethylbenzene, 1,3,5-	108-67-8								
Undecane, n-	1120-21-4								
Xylene, o-	95-47-6								
Xylenes, m- & p-	136777-61-2								
Xylenes, total	1330-20-7	D	1						

TABLE F-1
Toxicity Values – Carcinogenic Effects

Chemical Name	CASRN	Wt	Ref	Inhalation URF $(ug/m3)^{-1}$	Ref	Note	Inhalation SF $(mg/kg/d)^{-1}$	Ref	Note

References and Notes

Ref	Source
1	USEPA. Integrated Risk Information System (IRIS). On-line database.
2	USEPA. 1997. Health Effects Assessment Summary Tables (HEAST). FY-1997 Update. EPA 540/R-97-036. July.
3	USEPA. NCEA. 1995. Risk Assessment Issue paper for: Carcinogenicity Information for Trichloroethylene (TCE) [CASRN 79-01-6]. September 6.

Note	Comment
1	ENVIRON derived inhalation SF from URFI value presented in the indicated reference, using standard USEPA methodology presented in HEAST.
2	IRIS provides a range of 2.2E-6 to 7.8E-6 (ug/m3)-1as the Inhalation Unit Risk Factor (URFI) for Benzene.

TABLE F-2
Toxicity Values – Noncarcinogenic Effects

Chemical Name	CASRN	Inhalation RFC (ug/m3)	Ref	Note	Inhalation RFD (mg/kg/d)	Ref	Note	Oral RFD (mg/kg/d)	Ref	Note
Acenaphthene	83-32-9							6.00E-02	1	
Acenaphthylene	208-96-8							3.00E-02	1	5
Acetone	67-64-1							1.00E-01	1	
Anthracene	120-12-7		2	1		2	1,4	3.00E-01	1	
Benzaldehyde	100-52-7									
Benzene	71-43-2	6.00E+00	6							
Butadiene, 1,3-	106-99-0									
Butane, n-	106-97-8									
Carbon disulfide	75-15-0	7.00E+02	1		2.00E-01	1	4	1.00E-01	1	
Carbon tetrachloride	56-23-5							7.00E-04	1	
Chloromethane	74-87-3									
Cyclohexane	110-82-7				5.70E+00	4				
Decane, n-	124-18-5									
Dioxane, 1,4-	123-91-1									
Dodecane, n-	112-40-3									
Ethanol	64-17-5									
Ethylbenzene	100-41-4	1.00E+03	1		2.86E-01	1	4	1.00E-01	1	
Ethyltoluene, 4-	622-96-8									
Fluoranthene	206-44-0							4.00E-02	1	
Fluorene	86-73-7							4.00E-02	1	
Formaldehyde	50-00-0							2.00E-01	1	
Freon 11	75-69-4	7.00E+02	2	2	2.00E-01	2		3.00E-01	1	
Freon 113	76-13-1									
Freon 12	75-71-8	2.00E+02	2		5.71E-02	2	4	2.00E-01	1	
Heptane, n-	142-82-5									
Hexane, n-	110-54-3							6.00E-02	2	

TABLE F-2
Toxicity Values – Noncarcinogenic Effects

Chemical Name	CASRN	Inhalation RFC (ug/m3)	Ref	Note	Inhalation RFD (mg/kg/d)	Ref	Note	Oral RFD (mg/kg/d)	Ref	Note
Hexanone, 2-	591-78-6				1.40E-03	3		4.00E-02	5	
Methyl ethyl ketone (2-Butanone)	78-93-3	1.00E+03	1		2.86E-01	1	4	6.00E-01	1	
Methyl tert-Butyl Ether	1634-04-4	3.00E+03	1		8.57E-01	1	4			
Methyl-2-pentanone, 4-	108-10-1	8.00E+01	2	2	2.00E-02	2	2	8.00E-02	2	6
Methylene chloride	75-09-2	3.00E+03	2		8.60E-01	2		6.00E-02	1	
Methylnaphthalene, 2-	91-57-6	3.00E+00	1	3	8.57E-04	1	3,4	2.00E-02	1	3
Naphthalene	91-20-3	3.00E+00	1		8.57E-04	1	4	2.00E-02	1	
Nonane, p-	111-84-2									
Pentane, n-	109-66-0									
Phenanthrene	85-01-8							3.00E-02	1	5
Propanal	123-38-6									
Propanol, 2-	67-63-0									
Propylene	115-07-1									
Pyrene	129-00-0							3.00E-02	1	
Styrene	100-42-5	1.00E+03	1		2.86E-01	1	4	2.00E-01	1	6
Tolualdehyde, m,p-	620-23-51									
Toluene	108-88-3	4.00E+02	1		1.14E-01	1	4	2.00E-01	1	
Trichloroethene	79-01-6							6.00E-03	3	
Trimethylbenzene, 1,2,4-	95-63-6				1.70E-03	4		5.00E-02	4	
Trimethylbenzene, 1,3,5-	108-67-8				1.70E-03	4		5.00E-02	4	
Undecane, n-	1120-21-4									
Xylene, o-	95-47-6							2.00E+00	2	
Xylenes, m- & p-	136777-61-2									
Xylenes, total	1330-20-7							2.00E+00	1	

References and Notes

Ref	Source

TABLE F-2
Toxicity Values – Noncarcinogenic Effects

Chemical Name	CASRN	Inhalation RFC (ug/m3)	Ref	Note	Inhalation RFD (mg/kg/d)	Ref	Note	Oral RFD (mg/kg/d)	Ref	Note

1	USEPA. Integrated Risk Information System (IRIS). On-line database.
2	USEPA. 1997. Health Effects Assessment Summary Tables (HEAST). FY-1997 Update. EPA 540/R-97-036. July.
3	USEPA. Region III. 2000. Risk-Based Concentration Table. April.
4	USEPA. Region IX. 2000. Preliminary Remediation Goal Table. November.
5	USEPA. NCEA. 1993. Risk Assessment Issue paper for: Derivation of a Provisional RfD for 2-Hexanone (Methyl-n-butyl ketone) [CASRN 591-78-6]. June 24.
6	USEPA. 1994. Risk Assessment Issue Paper for: Derivation of a Provisional Chronic Inhalation RfC for Benzene (CASRN 71-43-2). March.

Note	Comment
1	Not verifiable, according to IRIS.
2	HEAST Alternate Method.
3	ENVIRON used Naphthalene [CASRN 91-20-3] value from indicated reference as a surrogate.
4	ENVIRON derived inhalation RfD from inhalation RfC published in the indicated reference, using standard USEPA methodology presented in HEAST.
5	ENVIRON used Pyrene [CASRN 129-00-0] value from IRIS (reference 1) as a surrogate.
6	Under review, according to IRIS.