STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY
Northwest Regional Office • 3190 160th Avenue SE • Bellevue, Washington 98008-5452 • (425) 649-7000

August 7, 2006

CERTIFIED MAIL
7005 2570 0001 0182 2770

Mr. Jim Sumner
Manager, Group Environmental Programs
General Electric Aircraft Engine
One Neumann Way MD T165
Cincinnati, OH 45215

Dear Mr. Sumner:

Re: Ecology Response Letter: Evaluation for the Potential for Subsurface Vapor Intrusion of the Interior Environments Building, dated July 17, 2006

Ecology has received the report, *Evaluation for the Potential for Subsurface Vapor Intrusion of the Interior Environments Building, dated July 17, 2006.* Ecology received this report on July 18, 2006.

Thank you for submitting the report per the schedule in the Ecology approval certified letter (7005 2570 0001 0182 2749) dated May 2, 2006. The report contains a good accounting of the May 30, 2006 sampling event. The indoor air and crawl space air samples collected and analyzed were below the MTCA Method C indoor air cleanup levels for trichloroethylene (TCE) and additional air sampling will not be required at this building as long as the shallow volatile organic groundwater concentrations below this building do not increase, the current use of the building remains commercial, and additional indoor air vapor intrusion pathways are not created or identified that could lead to unacceptable exposures to the building occupants.

During the course of Ecology's review of the July 2006 report there were several statements or conclusions that we feel were inaccurate and our comments are therefore provided below. Ecology is not requesting that GE revise the July 2006 report, however, these Ecology comments serve to clarify Ecology's position on some of the statements in the GE report as well as to document Ecology's differing interpretation of the results.

Executive Summary:

1. Paragraph 3: No contaminants of concern (COC) were detected above the MTCA Method C indoor air cleanup level which is being used as a screening

level for determining if there are unacceptable exposures to the building occupants.

2. Paragraph 4: The conclusions regarding subsurface vapor intrusion are based on the evaluation of current (May 2006) data and assume the results were representative of vapor intrusion conditions year round.

Section 2 Field Methods:

3. Page 2-1, Section 2, paragraph 1: Ecology assumes that statements regarding sub-slab sampling, pneumatic testing, and measurement of pressure differential were inadvertently copied from the former GE building vapor intrusion assessment work plan. Ecology does not recall the collection of these data as part of the approved work plan.
4. Page 2-3, Section 2.3.2: GE has verbally stated that the crawlspace access hatch was closed and this is Ecology's assumption while reviewing the report.
5. Page 2-3, Section 2.3.2: The outdoor temperature on May 30, 2006 should have been documented in this report. This will indicate whether the day sampled "represented" building pressurization & ventilation conditions likely to occur during the heating season in the winter months when vapor intrusion is most significant.

Section 3 Data Quality:

6. Page 3-1, Section 3.3, last sentence: The last sentence should have been stated, *"...so the eastern ambient sample data set was not used in representing upwind ambient air quality."*
7. Page 3-2, Section 3.4, paragraph 1: The crawl space air sample was selected because of the potential for TCE subsurface vapors to enter this space as a result of horizontal flow of vadose zone gases from the southern portion of the building or from TCE subsurface vapors from a portion of the TCE contaminated groundwater plume below. The groundwater TCE contaminant characterization below the building has enough uncertainty that this crawl space is likely directly above a portion of the TCE gw plume. Ecology has stated that it will assume no attenuation of crawl space TCE vapors to the indoor air above (alpha = 1.0).

Section 4 Results:

8. Page 4-1, Section 4.1, paragraph 3: According to Section 3.3, the wind direction was primarily from the north and west.
9. Page 4-2, Section 4.2, paragraph 2, second statement: This sentence is better stated, "It was hypothesized that crawl space air, *if impacted via vapor intrusion*, would contain higher..."
10. Page 4-2, Section 4.3: Chloroform was also detected in the groundwater and indoor air samples. The chloroform indoor air concentrations were below the MTCA Method C indoor air cleanup levels.

11. Page 4-2, Section 4.4, paragraph 2: Ecology has previously stated to GE that Ecology is using the NCEA TCE cancer slope factor of 0.4 $(mg/kg\text{-}day)^{-1}$ since the IRIS cancer slope factor was withdrawn. Use of the NCEA TCE cancer slope factor is required under the Washington MTCA until the IRIS data base for the TCE cancer slope factor is finalized[1].
12. Table 4-2: The reporting limit in the Ecology approved work plan for TCE was 0.02 ppbv or 0.11 ug/m^3 using SIM analysis. The TCE reporting limits (RLs) for the indoor/crawl space samples were 0.18-0.22 ug/m^3. This should have been identified in the data validation section of the report. Ecology approved this TCE reporting limit in the work plan because it provided a higher level of assurance that TCE concentrations documented below the 'reporting limit' were also sufficiently below the MTCA Method C indoor air cleanup level.

Appendix C:

13. Chain of Custody: Ecology notes that the Air Toxics LTD laboratory narrative (page 2 of 18) stated, "Sample collection date was incomplete on the chain of custody for all samples" and "The Chain of Custody was not relinquished properly."

Please feel free to call me at (425) 649-7264 if you have any questions regarding this letter.

Sincerely,

Dean Yasuda

Dean Yasuda, P.E.
Environmental Engineer
Hazardous Waste and Toxics Reduction Program

DY:sd

cc: Julie Sellick, HWTR/NWRO
Ed Jones, Ecology HWTR/NWRO
Jim Schwartz, Ecology AAG
Tong Li, Ground Water Solutions
Marcia Bailey, EPA Region 10
Stephen R. Black, Black & Yund
Alex Cordas, Keymac, LCC
Bill Joyce, Salter, Joyce, Ziker, PLLC
WAD009278706 HZW 6.2

[1] Ecology certified letter (7004 0750 0001 8363 3463) to GE, dated May 27, 2005

General Electric
WA0009278706
HZW 6.7.1

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GE
Aviation

Original / Signed
Letter sent
separate from
report

James W. Sumner, Manager
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July 17, 2006

Mr. Dean Yasuda
Washington Department of Ecology
Northwest Regional Office
3190 – 160th Avenue S.E.
Bellevue, Washington 98008-5452

RE: Evaluation of the Potential for Subsurface Vapor Intrusion
at the Interior Environments Building

Dear Mr. Yasuda:

Attached please find the Evaluation of the Potential for Subsurface Vapor Intrusion at the Interior Environments Building for the Interior Environments Building down gradient of the former GE site on South Dawson Street, Seattle. We are pleased that the results of this evaluation support the conclusion that subsurface vapor migration is not a pathway of concern for this building.

Should you have any questions or concerns about the information presented in this report, please do not hesitate to call me at (513) 672-3986 or Jill Lantz at (206) 624-9349.

Sincerely,

James W. Sumner

Attachment – Evaluation of the Potential for Subsurface Vapor Intrusion at the Interior Environments Building

cc: Alex Cordas – KeyMac
Bill Joyce – Salter Joyce Ziker
Tong Li, Ground Water Solutions
Linda Baker, Jill Lantz, Jamie Stevens – RETEC

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General Electric
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GE
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James W. Sumner

Attachment – Evaluation of the Potential for Subsurface Vapor Intrusion at the Interior Environments Building

cc: Alex Cordas – KeyMac
Bill Joyce – Salter Joyce Ziker
Tong Li, Ground Water Solutions
Linda Baker, Jill Lantz, Jamie Stevens – RETEC

RETEC

Evaluation of the Potential for Subsurface Vapor Intrusion at the Interior Environments Building

Prepared by:

The RETEC Group, Inc.
1011 SW Klickitat Way, Suite 207
Seattle, Washington 98134

RETEC Project Number: GE001-19314-750

Prepared for:

GE Aviation
One Neumann Way, Mail Drop T165
Cincinnati, Ohio 45215

July 17, 2006

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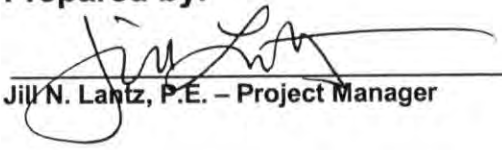
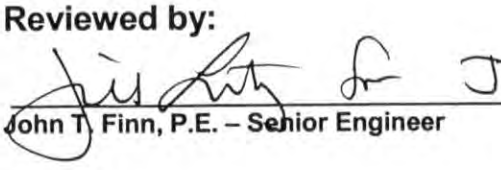


Jill N. Lantz, P.E. – Project Manager

Reviewed by:



John T. Finn, P.E. – Senior Engineer

July 17, 2006

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Executive Summary

General Electric Company's Aviation division (GE) is conducting this evaluation of the potential for subsurface vapor intrusion, as part of the overall environmental investigation at, and downgradient of its former facility, 220 South Dawson Street in Seattle, Washington.

The scope of the work described in this report includes collection of indoor and outdoor air samples at the Interior Environments building, located 2 blocks downgradient of the former GE facility. Groundwater sampling was also conducted in wells in the vicinity of the Interior Environments building, to provide a complete assessment of the potential for vapor migration in the building.

No contaminants of concern (COC) were detected at concentrations above MTCA Method C screening values. In fact, the primary COC, trichloroethylene (TCE) was not detected in any samples above the detection limits, which ranged from 0.17 to 0.25 $\mu g/m^3$. The detection limits for the indoor samples were all at or below the MTCA Method C screening level of 0.22 $\mu g/m^3$.

The results of this evaluation support the conclusion that subsurface vapor migration is not a pathway of concern at the Interior Environments building.

1 Introduction

General Electric Company's Aviation division (GE) is currently evaluating environmental impacts to soil and groundwater at, and downgradient of its former facility, 220 South Dawson Street in Seattle, Washington. GE and the Washington Department of Ecology (Ecology) entered into an Agreed Order (#DE02HWTRNR-4686) in 2002, under which GE will complete the investigation phase of the project so that a final remedy can be implemented. The work to be completed under the Agreed Order is detailed in the *Interim Action Work Plan* (IAWP; RETEC, 2002).

This report presents an evaluation of the potential for subsurface vapor intrusion to indoor air in accordance with the *Work Plan for Evaluation of Sub-Surface Vapor Intrusion at the Interior Environments Building*, dated April 16, 2006 (Work Plan; RETEC, 2006). This Work Plan was approved by the Department of Ecology with conditions in a letter dated May 2, 2006 (attached in Appendix A). The scope of the Work Plan included collection of air samples from indoor and outdoor sampling locations on May 30, 2006, with a contingency for and sub-slab sampling should TCE concentrations in indoor air exceed applicable screening levels. Groundwater sampling was also conducted in wells in the vicinity of the building approximately 2 weeks prior to the indoor air study, as part of the regular quarterly groundwater sampling schedule.

1.1 Report Organization

The remainder of this document is organized as follows:

- Section 2 describes the field sampling activities, including collection of ambient air, indoor air and sub-slab vapor samples, as well as measurement of the pressure differential.
- Section 3 describes overall data quality.
- Section 4 presents the analytical data from the field sampling activities and presents conclusions and findings.
- Section 5 lists reference documents cited in this report.

2 Field Methods

This section describes the activities undertaken to collect data and information for the purposes of the indoor air quality screening evaluation. The methods and rationale are described for the pre-sampling site visit, indoor, ambient and sub-slab sampling, pneumatic testing, and measurement of pressure differential. The sampling results are presented in Section 4 of this report.

2.1 Pre-Sampling Site Visit and Communications

In February and March, 2006, RETEC communicated with the building tenants, Interior Environments, regarding the status of the air conditioning unit at the building, as well as chemicals used in the facility. Brenda Henry of Interior Environments informed RETEC that the air conditioning system was not installed or operational at this time. She also consulted with the head finisher at the facility, who looked through the on-site MSDS files and compiled a list of the chemicals in use, and their components:

- Lacquer Thinner 2: toluene, acetone, isopropyl alcohol, methyl alcohol, diacetone alcohol, solvent naphtha, heptane, methylcyclohexane, cyclohexane
- VM&P Thinner: solvent naphtha, light aliphatic
- Reducer 84: toluene, isopropyl acetate, n-butyl acetate
- Reducer 27: xylenes, toluene, methyl isobutyl ketone
- VKW Gun Wash Thinner II: toluene, methyl ethyl ketone, isopropyl alcohol
- Add Wash: acetone, toluene, solvent naphtha, light aliphatic.

None of these contains chlorinated solvents of interest in the indoor air study. Furthermore, use of these chemicals is reportedly limited to the finishing area of the facility. The majority of the facility is used for woodworking only.

On May 25, 2006, representatives of RETEC, Ecology and Interior Environments participated in a site walk-through. The purpose of this visit was to observe and mitigate potential sources of volatile organic compounds (VOC) contamination in indoor air, to mark the locations of the samples, and to obtain agreement from Ecology on the specific sampling locations.

During the site inspection, no potential indoor air sources of CVOCs were identified which might affect the indoor air results. A fork lift operates

occasionally in the southern portion of the building, but is not a potential source of the target compounds in this study.

Five potential ambient air locations were selected around the outside of the building. The original two ambient locations IE-AA-1 and IE-AA-2 were moved farther away from the building than were originally proposed, to better represent the wind flow. Three additional ambient air sample locations were discussed, in order to represent potential wind patterns. Final sample locations are shown on Figure 2-1.

2.2 Groundwater Sampling

The regular May quarterly sampling event was conducted during the week of May 15, 2006. The regularly scheduled sampling of monitoring wells included water table wells MW-11 and MW-21S, which are located upgradient and down/cross-gradient of the Interior Environments building, respectively. Groundwater samples were collected using low-flow techniques, using dedicated QED Well Wizard sampling pumps, and dedicated sampling tubing, as described in the site Sampling and Analysis Plan, included in the IAWP.

2.3 Air Sampling Program

Field work for the air sampling was conducted on Tuesday, May 30, 2006. Five ambient air samples and three indoor air samples were collected, along with one field duplicate. The sample locations are shown in Figure 2-1.

In order to minimize the potential for introducing interference, all sampling personnel ensured appropriate hygiene and behaviors during the sampling events. For instance, sampling personnel did not handle hazardous substances such as gasoline or permanent marking pens, or smoke cigarettes during the sampling episodes. All sampling was also conducted to the extent practicable in accordance with the standard operating procedures discussed in the Work Plan.

All sampling canisters were individually certified clean by GC/MS analysis before being used in the field. Certification of cleaning and evacuation was noted prior to collection of samples. A vacuum gauge was used to check both the initial and final vacuum in the canisters; the initial vacuum was checked to ensure mechanical integrity of the canisters and was approximately 30 inches mercury (inches Hg). The final vacuum after sample collection read from approximately 1 to 10 inches Hg, and was verified upon receipt by the laboratory to ensure sample integrity during return shipment (Table 2-1). Two different pressure gauges were used to record vacuum readings on the canisters – a glycerin-filled gauge provided by the laboratory, and the built-in gauge on each flow controller. Table 2-1 presents the vacuum readings for each sample. The laboratory was satisfied that all vacuum readings indicated that appropriate sample volumes were collected (see Section 3 for data quality review).

The sample ID, sample date, sample time, starting and ending vacuum readings, and canister number were recorded on the sampling forms and in the field notes. Once samples were collected, they were stored according to the method protocol and shipped to the analytical laboratory on the next business day under Chain of Custody procedures. Copies of all field forms and a photographic record of the sampling events are provided in Appendix B.

2.3.1 Ambient Air Sampling Event

One round of ambient air sampling was performed on Tuesday, May 30, 2006. The ambient air samples were set up and collected in accordance with the Work Plan. Six-liter Summa canisters with 8-hour flow controllers were used to collect each ambient air sample during the field event. The canisters and controllers were SIM-certified at the laboratory along with sampling "canes" that were attached to the sample inlet points in the event of rain. IE-AA-5 was not equipped with a sampling cane as it was added in the field, and was not a planned ambient sample. The canisters were placed approximately five to seven feet above the ground. The higher sample locations were selected to minimize exposure to vehicle exhaust and to better represent air flowing towards building air intakes. Starting and ending vacuum readings were recorded for each canister, and recorded on the sample labels and the Chain of Custody for laboratory quality control purposes.

Table 2-1 lists the full sample numbers, locations, sampling times, and vacuum readings for each sample.

2.3.2 Indoor/Crawl Space Air Sampling Event

The indoor air sampling event was conducted concurrent with the ambient air sampling, on Tuesday, May 30, 2006. This event occurred after a 3-day weekend. Although there had been a significant amount of rain in the several days prior to the sampling event, the day before the event and the day of the event exhibited little to no rain. The samples were collected over an eight-hour time period to capture a normal worker's exposure. This event was conducted during the normal operating hours for Interior Environments.

The indoor and crawl space samples were set up and collected in accordance with the Work Plan. Six-liter Summa canisters with 8-hour flow controllers were used to collect each indoor air sample during the field event. The canisters and controllers were SIM-certified at the laboratory. The canisters for IE-IA-1 and IE-IA-2 were placed approximately four to five feet above the ground (at approximate breathing zone height). The canister for IE-IA-3 was located in the crawl space, on the ground, and the crawl space was closed during the sampling period.

A field duplicate sample was collected at the IE-IA-2 location. Two canisters were set up side by side on the same work table. A photograph of the setup is

shown in Appendix B. The field duplicate was used in data validation for quality control/quality assurance purposes.

Sample IDs, sample dates, sample times and canister numbers were recorded for each sample. Signs were also posted on each unit stating the purpose of the sampler and asking that no smoking occur in the vicinity. In addition, starting and ending vacuum readings were recorded for each canister, and recorded on the sample labels and the Chain of Custody for laboratory quality control purposes. Canisters for indoor and outdoor samples were individually certified along with their flow controllers, as required for SIM analyses.

Table 2-1 lists the full sample numbers, locations, sampling times, and vacuum readings for each sample.

3 Data Quality

3.1 Methods of Laboratory Analysis

Indoor and outdoor air samples were analyzed for target chlorinated VOCs using EPA Method TO-15 with Selective Ion Monitoring (SIM), to provide a standard reporting limit of 0.01 to 0.02 ppbv, at Air Toxics Laboratory of Folsom, California. SIM analysis is required for the indoor and ambient samples, due to the low target concentration for trichloroethylene (TCE).

3.2 Data Quality Review

Quality assurance/quality control (QA/QC) procedures described in the Work Plan were implemented during the field work. Both field and laboratory QA/QC procedures were implemented to ensure that the data were of acceptable quality and reproducibility.

The laboratory reviewed the sampling canisters and the beginning and ending canister vacuum readings. No problems were identified with the sample integrity. Final laboratory vacuum readings are included on the Chains of Custody (Appendix C) and on Table 2-1.

Data validation was performed using method and project specific requirements outlined in the Work Plan. The data validation report identified no quality control issues with the laboratory analysis. Two "J" qualifiers were added to results that were reported at concentrations less than the PQL but greater than the MDL. No other qualifiers were added to the laboratory data. The field duplicate sample (IE-IA-20) was within acceptable limits from the primary sample, indicating good reproducibility of sample results. The laboratory data and data validation reports are included in Appendix C.

3.3 Canister Preparation

During prep of one ambient sampling canister (IE-AA-5), after the glycerin gauge was attached to the canister and the valve opened, a quick hissing noise was heard and the valve was immediately closed. The gauge was reattached and the initial vacuum measured was -27.5 inches Hg, indicating that only a small volume of air was allowed to enter the canister during this time. This sample was located on the eastern side of the building, and the incidental intake of air also occurred on the eastern side of the building where the canisters were being prepared. In any event, this sample was not crucial to the sampling event overall, as wind direction was primarily from the north and west, so the eastern ambient sample was not used as an upwind sampling point.

3.4 Representativeness

The sample locations were chosen to be representative of site conditions. As described in the Work Plan, the sample locations were chosen to be representative of discrete areas in the building with different construction. The two indoor samples are also representative of the breathing zone for workers in the building, while the crawl space sample is representative of air which has the potential to migrate into the breathing zone. Previous observations at the building have indicated that air flows at least occasionally from the crawl space into the overlying building.

Ambient sample locations were selected to be representative of outdoor air conditions on all sides of the building, to ensure that good data were available for upwind locations based on the wind direction observed on the sampling day.

Sample collection procedures were also designed to provide representative samples. Indoor and ambient samples were collected over an eight-hour interval to be representative of worker conditions. Further, the indoor air was sampled on a Tuesday, after the building was closed over the three-day weekend, providing a conservative approach to sampling.

The Work Plan was developed in cooperation with Ecology, to ensure that sample locations were selected to be representative of indoor air and ambient air at the site. GE and Ecology agreed on the sampling program and considered representativeness during the design of this program.

4 Results

VOCs in samples collected at the Interior Environments building are compared to relevant screening levels, and are presented in Table 4-1. For indoor air, the relevant screening level is the MTCA Method C formula value. The laboratory data and data validation reports are included in Appendix C.

4.1 Ambient Air

Only tetrachloroethylene (PCE) was detected at low concentrations in ambient air at the site. PCE concentrations of 0.21 and 0.46 $\mu g/m^3$ were detected in ambient air samples IE-AA-2 and IE-AA-4, respectively. These values are approximately 10 times lower than the MTCA Method C value of 4.2 $\mu g/m^3$.

Trichloroethylene (TCE) was not detected in any ambient samples.

The wind during the day on May 30 was very light and variable, often completely slack based on observations of a nearby flag on top of a building. Wind speed and direction data were obtained from Boeing Field and from the Puget Sound Clean Air Agency (PSCAA) station located at 4752 East Marginal Way South, less than one-half mile from the former GE facility. Wind roses showing the wind speed and direction recorded at the two locations throughout the day on May 30, 2006 between 7:00 AM and 4:00 PM are shown in Figure 4-1. These measurements show that wind was generally from a northerly direction, with the occasional measurements from the southeast.

Based on the wind data for the test period, samples IE-AA-3 and IE-AA-4 are the most representative of upwind conditions at the former GE facility. It should be noted that the upwind sample results are not significantly different from the downwind or crosswind samples at the site, suggesting these are typical ambient concentrations in the area.

4.2 Indoor/Crawl Space Air

Raw indoor air VOC concentrations are presented at the top of Table 4-1. These data show detections of 1,1,1-trichloroethane (TCA), PCE and chloroform only. The remaining compounds were not detected above the detection limits, which were below applicable screening values.

PCE levels in indoor and crawl space air were very similar to levels detected in outdoor air. 1,1,1-TCA, which was not detected in ambient air, was detected at a concentration of approximately 7 $\mu g/m^3$ in indoor air at IE-IA-2 and the duplicate IE-IA-20. This is well below the MTCA Method C value of 2,205 $\mu g/m^3$. Likewise, chloroform was detected in one sample – 0.33 $\mu g/m^3$ in the duplicate sample IE-IA-20 – but was not detected in ambient air. Again, this is well below the MTCA Method C level of 1.1 $\mu g/m^3$. Low

levels of VOCs are ubiquitous in indoor air in residences and commercial buildings (NYSDOH, 1997), so these low level detections are not unexpected.

Notably, the crawl space sample (IE-IA-3) contained VOCs at similar or lower concentrations than the indoor air samples. It was hypothesized that crawl space air would contain higher concentrations, as it is in more direct contact with the subsurface. The only compound detected in this sample was PCE at a concentration of 0.36 $\mu g/m^3$, similar to the outdoor samples, suggesting no additional impact from the subsurface.

Ambient air contributions will add to any contributions from interior or subsurface sources. The concentrations of VOCs in outdoor air can be subtracted from the indoor air concentrations, to provide concentrations that may be attributable the sum of interior and subsurface sources (i.e., "corrected" indoor air concentrations). In this case, PCE was detected at higher concentrations in one of the upwind ambient samples (IE-AA-4) than in any indoor samples, suggesting that the PCE detected in indoor air is from ambient sources. Since no other compounds were detected in outdoor air, no other "corrections" were calculated.

No exceedances of MTCA Method C values were observed in indoor air at the Interior Environments building.

4.3 Groundwater

Groundwater samples collected from MW-11 and MW-21S show low levels of VOCs in groundwater, similar to those observed in previous groundwater sampling events. Groundwater concentrations in these wells were below the MTCA Method B surface water cleanup levels for all compounds except TCE, which was detected at concentrations of 7.6 and 6.1 µg/L, respectively (Table 4-1).

It should be noted that the only compounds detected in indoor air – PCE and 1,1-TCA – were not detected in groundwater samples, further suggesting that vapor migration is not a pathway of concern at this facility.

4.4 Summary

None of the measured indoor air concentrations exceed MTCA Method C cleanup levels, and, in fact, TCE was not detected in any samples.

It is noteworthy that the MTCA Method C values are conservative. The default exposure scenario for a commercial/industrial worker under MTCA's Equation 750-2 includes continuous exposure for a 30-year duration. This assumes 24 hours a day, 7 days a week during this exposure period. Furthermore, the current slope factor in use by Ecology is the most conservative value currently under consideration, but not yet approved, by EPA.

Although not relevant as action levels, the OSHA permissible exposure limit (PEL) is a time-weighted average (TWA) of 100 ppm. ATSDR (http://www.atsdr.cdc.gov/HEC/CSEM/tce/tce.pdf) further reports that The National Institute for Occupational Safety and Health recommends an exposure limit of 25 ppm as a 10-hour TWA. According to the American Conference of Industrial Hygienists (ACGIH), an 8-hour TWA of 50 ppm is recommended. The most conservative of these values (25 ppm) is equivalent to 134 mg/m^3, or 134,000 $\mu g/m^3$. This value is over 600,000 times the MTCA Method C level of 0.22 $\mu g/m^3$.

All of the lines of evidence support the conclusion that subsurface vapor migration is not a pathway of concern at the Interior Environments facility, that current conditions are protective of human health, and no further action is required on this pathway.

5 References

Johnson and Ettinger (1991) *Model for Subsurface Vapor Intrusion into buildings.* Web Address: http://www.epa.gov/oswer/riskassessment/airmodel/johnson_ettinger.htm

NYSDOH, 1997, NYSDOH (New York State Department of Health). 1997. *Background Indoor/Outdoor Air Levels of Volatile Organic Compounds in Homes Sampled by the New York State Department of Health, 1989-1996.* Bureau of Toxic Substance Assessment.

RETEC, 2002. *Interim Action Work Plan (Revision 4).* October 28.

RETEC, 2006. *Work Plan for Evaluation of Sub-Surface Vapor Intrusion at the Interior Environments Building.* April 16.

Tables

Table 2-1 Summary of Sample Collection Information

Location ID	Canister ID	Initial Vacuum Readings		Final Vacuum Readings		Final Vacuum Reading at Laboratory	Start Time	End Time	Duration (hours)	Analysis
		Glycerin Gauge	Flow Controller	Glycerin Gauge	Flow Controller					
IE-AA-1	35178	-28.25	-30	-8	-9	-8.0	7:46	15:46	8:00	TO-15 SIM
IE-AA-2	12022	-28	-30	-5	-8	-5.0	7:54	15:51	7:57	TO-15 SIM
IE-AA-3	33787	-27.5	-23.5	-12	-8.5	-12.5	7:36	15:26	7:50	TO-15 SIM
IE-AA-4	35158	-25.5	-30	-9.25	-9	-8.0	8:01	16:01	8:00	TO-15 SIM
IE-AA-5	32126	-27.5	-27	-9	-7	-9.0	8:11	16:11	8:00	TO-15 SIM
IE-IA-1	33584	-30	-30	-7	-8	-7.5	7:14	14:46	7:32	TO-15 SIM
IE-IA-2	94945	-28	-30	-5	-6.5	-6.0	7:08	14:43	7:35	TO-15 SIM
IE-IA-20	31434	-28	-30	-6	-8	-7.0	7:08	14:43	7:35	TO-15 SIM
IE-IA-3	33909	-30	-30	-10	-10	-10.5	7:05	14:46	7:41	TO-15 SIM

Notes:

NR - not recorded

TO-15 analysis included: 1,1,1-trichloroethane (1,1,1-TCA), 1,1-dichloroethane (1,1-DCA), 1,1-dichloroethylene (1,1-DCE), chloroform, cis 1,2-dichloroethylene (1,2-DCE), tetrachloroethylene (PCE), trichloroethylene (TCE), and vinyl chloride

All vacuum readings in units of inches Hg

Initial Vacum Readings of -30psi were greater than -30psi, the gaugue only recorded to -30psi.

All ambient sampling equipment except IE-AA-5 was equipped with a sampling cane.

Table 4-1 Laboratory Analytical Data – May 2006

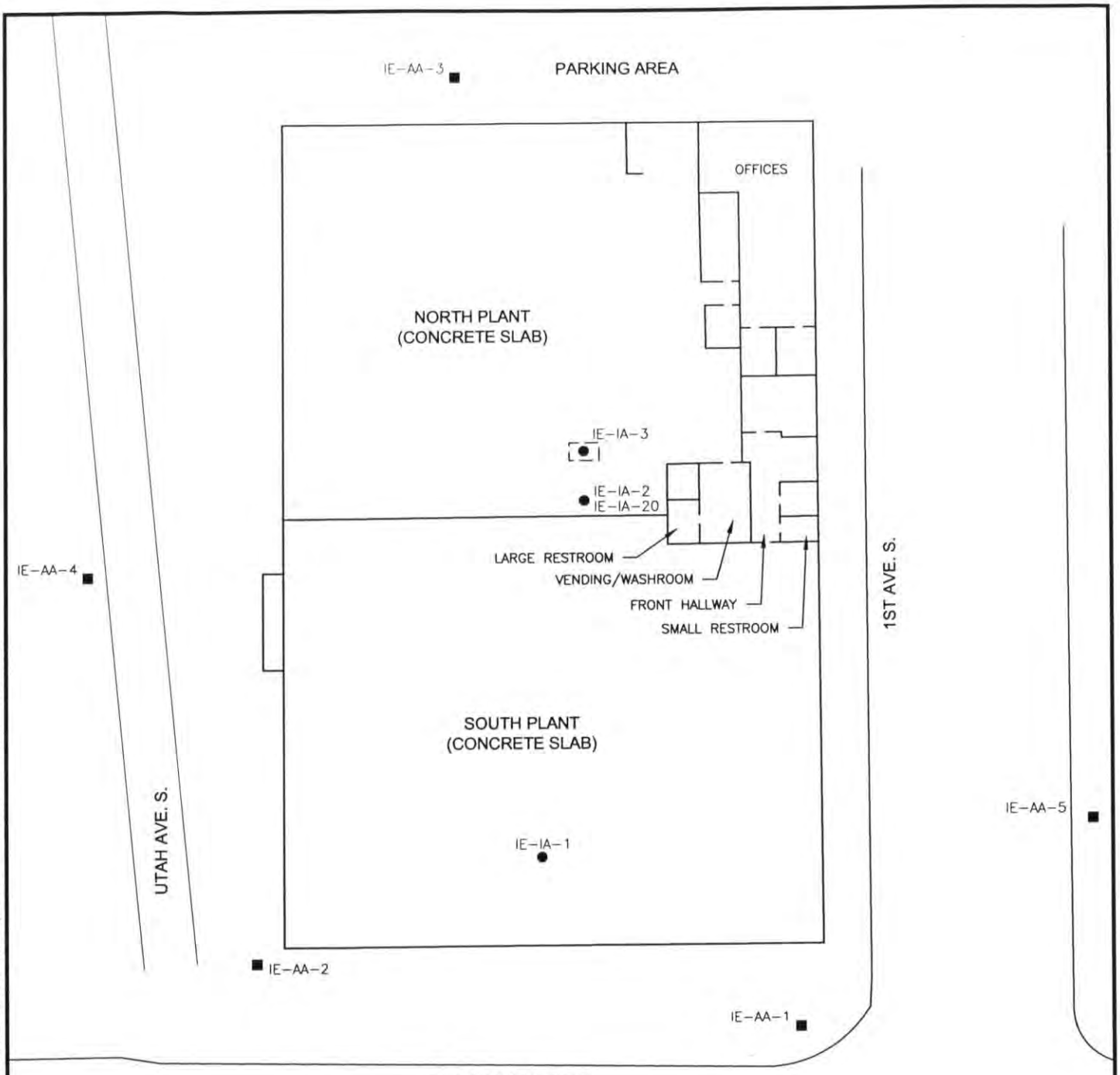
Location ID	Sample Date	Chemical Name / Sample ID	1,1,1-TCA	1,1-DCA	1,1-DCE	Chloroform	cis-1,2-DCE	PCE	TCE	Vinyl Chloride
Indoor Air Samples (µg/m³)										
IE-IA-1	5/30/2006	IE-IA-1	**0.19 J**	< 0.14	< 0.071	< 0.17	< 0.14	**0.25**	< 0.19	< 0.046
IE-IA-2	5/30/2006	IE-IA-2	**7**	< 0.14	< 0.067	< 0.16	< 0.13	**0.31**	< 0.18	< 0.043
IE-IA-2 (duplicate)	5/30/2006	IE-IA-20	**7.2**	< 0.14	< 0.069	**0.33**	< 0.14	**0.37**	< 0.19	< 0.045
IE-IA-3	5/30/2006	IE-IA-3	< 0.22	< 0.17	< 0.082	< 0.2	< 0.16	**0.36**	< 0.22	< 0.053
Upwind Ambient Samples (µg/m³)										
IE-AA-3	5/30/2006	IE-AA-3	< 0.25	< 0.19	< 0.091	< 0.22	< 0.18	< 0.31	< 0.25	< 0.059
IE-AA-4	5/30/2006	IE-AA-4	< 0.2	< 0.15	< 0.072	< 0.18	< 0.14	**0.46**	< 0.2	< 0.047
Average Upwind for Indoor Air Correction			*0*	*0*	*0*	*0*	*0*	***0.23***	*0*	*0*
Down/Crosswind Ambient Samples (µg/m³)										
IE-AA-1	5/30/2006	IE-AA-1	< 0.2	< 0.15	< 0.072	< 0.18	< 0.14	< 0.25	< 0.2	< 0.047
IE-AA-2	5/30/2006	IE-AA-2	< 0.18	< 0.13	< 0.064	< 0.16	< 0.13	**0.21 J**	< 0.17	< 0.041
IE-AA-5	5/30/2006	IE-AA-5	< 0.21	< 0.15	< 0.076	< 0.19	< 0.15	< 0.26	< 0.2	< 0.049
Corrected Indoor Air Results (Indoor Air minus Ambient) (µg/m³)										
IE-IA-1	5/30/2006	IE-IA-1	**0.19 J**	< 0.14	< 0.071	< 0.17	< 0.14	**0.02**	< 0.19	< 0.046
IE-IA-2	5/30/2006	IE-IA-2	**7**	< 0.14	< 0.067	< 0.16	< 0.13	**0.08**	< 0.18	< 0.043
IE-IA-2 (duplicate)	5/30/2006	IE-IA-20	**7.2**	< 0.14	< 0.069	**0.33**	< 0.14	**0.14**	< 0.19	< 0.045
IE-IA-3	5/30/2006	IE-IA-3	< 0.22	< 0.17	< 0.082	< 0.2	< 0.16	**0.13**	< 0.22	< 0.053
Indoor Air Screening Level			*2,205*	*350*	*200*	*1.1*	*35*	*4.2*	*0.22*	*2.82*
Groundwater Samples (µg/L)										
MW-11	5/17/2006	MW-11-0506	< 0.2	**0.6**	**0.30**	< 0.2	**7.3**	< 0.02	**7.6**	**0.05**
MW-21S	5/18/2006	MW-21S-0506	< 0.2	< 0.2	< 0.2	**0.7**	**4.3**	< 0.02	**6.1**	< 0.020

Notes: Sub-slab vapor samples analyzed by Method TO-15 SIM
Indoor and ambient air samples analyzed by Method TO-15
Groundwater samples analyzed by Method 8260 and Method 8260 SIM
Shading indicates an exceedance of air/vapor screening levels.
Alpha factors calculated using 1/2 detection limit for non-detects in indoor air.

Table 4-2 VOC Screening Values

Analyte	Indoor Air
	MTCA Method C ($\mu g/m^3$)
1,1,1-Trichloroethane (1,1,1-TCA)	2,205
1,1-Dichloroethane (1,1-DCA)	350
1,1-Dichloroethylene (1,1-DCE)	200
Chloroform	1.1
cis 1,2-Dichloroethylene (1,2-DCE)	35
Tetrachloroethylene (PCE)	4.2
Trichloroethylene (TCE)	0.22
Vinyl Chloride	2.82

Figures



LEGEND

- ● INDOOR AIR SAMPLE LOCATION
- ■ AMBIENT AIR SAMPLE LOCATION
- APPROXIMATE LOCATION OF CRAWL SPACE ENTRY

NOTES:

1. CURRENT TENANT OF PLANT: INTERIOR ENVIRONMENTS
2. BUILDING OWNER AND SOURCE OF MAP: LIBERTY RIDGE
3. CURRENT BUILDING LAYOUT DOES NOT REPRESENT MINOR REMODELING IN THE OFFICES.
4. BUILDING NOT TO SCALE.
5. LOCATIONS APPROXIMATE

N

25 0 50

APPROX. SCALE IN FEET

RETEC

GEAE - S. DAWSON STREET

GE001-19314-750

DATE: 07/14/06 | DRWN: A.S./SEA

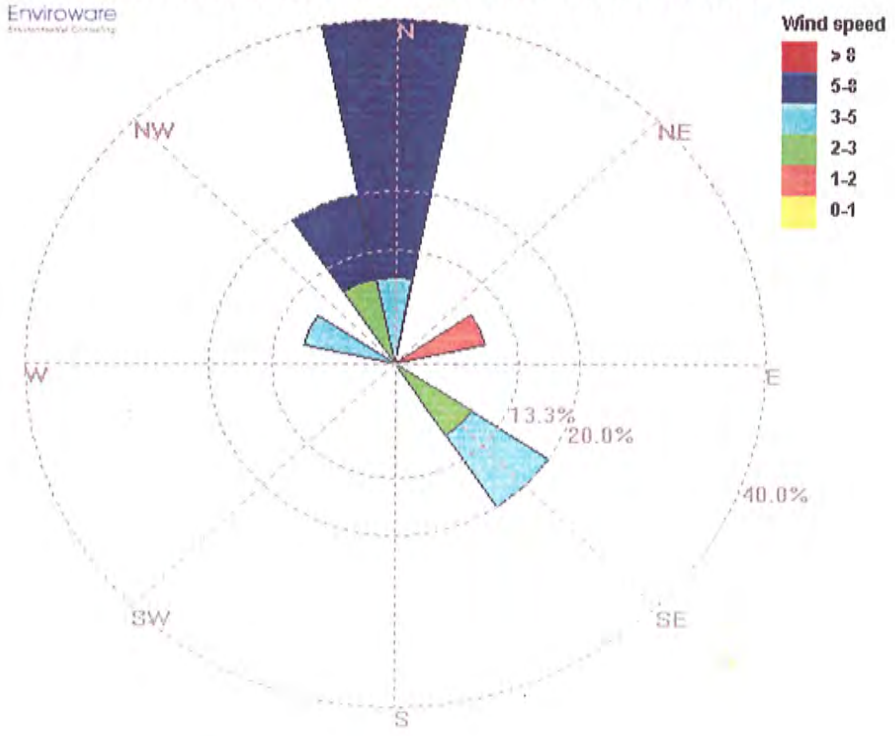
SAMPLE LOCATIONS

FIGURE 2-1

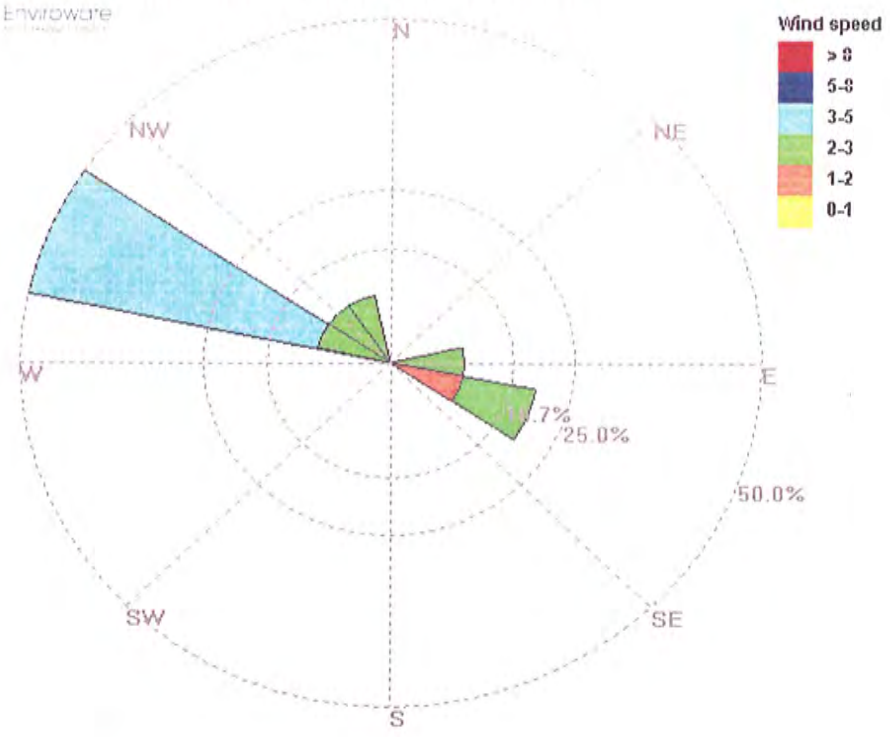
File: H:\19314\193145029.dwg Layout: FIGURE 2-1 User: emarshall Plotted: Jul 14, 2006 - 11:30am Xref's: 186008002

Figure 4-1 Wind Roses

May 30, 2006: 7AM to 4PM – PSCAA Duwamish Station



May 30, 2006: 7AM to 4PM – Boeing Field



Plots generated with WindRose (http://www.enviroware.com)

Appendix A

Ecology Approval of Work Plan

STATE OF WASHINGTON

DEPARTMENT OF ECOLOGY

Northwest Regional Office • 3190 160th Avenue SE • Bellevue, Washington 98008-5452 • (425) 649-7000

May 2, 2006

CERTIFIED MAIL
7005 2570 0001 0182 2749

Mr. Jim Sumner
Manager, Group Environmental Programs
General Electric Aircraft Engine
One Neumann Way MD T165
Cincinnati, OH 45215

Dear Mr. Sumner:

Re: Ecology Comments on the Work Plan for Evaluation of Sub-Surface Vapor Intrusion at the Interior Environments Building, dated April 17, 2006

Ecology has received the *Work Plan for Evaluation of Sub-Surface Vapor Intrusion at the Interior Environments Building*, dated April 17, 2006, further referenced in this letter as the "Draft Work Plan." Ecology received this Draft Work Plan on April 18, 2006. Submittal of the Draft Work Plan was required under the RCRA Corrective Action Agreed Order DE02HWTRNR-4686.

Ecology does not concur with a number of the statements made in the Section 1 Introduction of the Draft Work Plan as these statements are opinions of GE alone. Therefore Ecology does *not approve* the Section 1 Introduction as written. We see no reason to present a written rebuttal here that GE could feel compelled to answer, which then would likely delay approval of the sampling proposals contained in the Draft Work Plan's main body. The language will simply continue to stand as GE's point of view, with which Ecology does not agree.

The Draft Work Plan submittal does not include timelines for the completion of work milestones. Therefore, Ecology has established due dates in this letter for these milestones based on previous experience with this type of sampling activity.

Sections 1.1 through 6.0 of the Draft Work Plan are hereby approved contingent on the full incorporation of all *conditions* identified by number below. Today's letter and the Draft Work Plan constitute the approved work plan which is incorporated by reference into the Ecology-approved Interim Action Work Plan and Agreed Order, DE02HWTRNR-4686.

any GE proposal to confirm the extent of concrete slab beneath the crawlspace, Ecology will not assume a continuous concrete pour underlies the entire crawlspace, or even most of the area in the northern portion of the building. Nor should the assessment report make this assumption.

7. Section 2.1, page 2-1, paragraph 1 and Figure 2-1. Crawlspace sample location IA-3 should be located below/inside the most southerly floor *opening*, the one closest to the wall separating the north and south shop spaces.

Please see our attached mark-up of Figure 2-1.

8. Section 2.1, page 2-1, second paragraph. Point of clarification: From Ecology's standpoint, when sampling ambient air for a VI assessment it is not necessary to "obtain representative samples around the building." Instead, the objective is to collect a sample of ambient air that is representative of the air going into the building and impacting indoor air quality in the particular area(s) we are sampling.

9. Section 2.1, page 2-1, second paragraph and Figure 2-1. It is reasonable to sample ambient air at AA-1 at a height corresponding to 5-8' above ground surface if the wind is coming from the south and the big doors at the south end of the building are open. Otherwise (if the doors are closed), the height should correspond to where we think the outdoor air inlet is. If the building air intake location is on the roof, for example, we would want to position the ambient air sample inlet as high (8-10 foot minimum) as the roof and/or, horizontally, several yards away from and upwind of the building.

In addition, the AA-2 canister should be place as far south as possible from the Interior Environments building and have the inlet 8-10 feet above ground, to represent ambient air that is likely being pulled into the building roof air intake vents and to minimize the collection of automobile exhaust. An alternative is to locate AA-2 at the southeast corner of the intersection of Dawson and Utah Streets and again locate the inlet 8-10 feet above ground, to represent ambient air that is likely being pulled into the Interior Environments building roof air intake vents and to minimize the collection of automobile exhaust.

Please see our attached mark-up of Figure 2-1.

10. Section 2.1, page 2-1, paragraph 2 and Figure 2-1. Ecology intends to be present during the air sampling activity and based on wind direction and other site conditions present on the day of sampling, we may recommend adjustment of certain locations at that time.

11. Section 2.1. The Draft Work Plan does not recommend locations for the contingency sub-slab vapor sampling (and the other air sampling which would accompany it). Upon Ecology's determination that such contingency sampling is required, Ecology and GE will discuss by telephone conference call the location and number of such sub-slab vapor

identify, catalogue, and remove (if possible) all sources of CVOCs (particularly TCE) in the building. This inspection should be conducted several days in advance of the Monday indoor air sampling date. The results of the inspection should be documented in the assessment report submitted to Ecology.

19. Section 5, page 5-1, last paragraph. If GE calculates and proposes any remediation levels (RLs) in the assessment report (for indoor air TCE concentrations, e.g.), the proposed levels should be properly supported. Written documentation from discussions with the Interior Environment tenant and property owner should be included that justifies the RL exposure assumptions (hours of work per day, week, and year) for workers in the building and offices.

In the interests of moving ahead quickly and minimizing GE outlays for continued Work Plan modification and preparation, Ecology has chosen to approve those portions of your April 17, 2006, Draft Work Plan we concur with and establish "conditions" that GE must additionally meet to gain Work Plan approval. It is in the best interests of both Ecology and GE to minimize additional time spent revising and re-reviewing proposed plans if there are ways – such as setting out these *conditions* – that will accelerate the ability of Ecology to approve the April 17, 2006 Draft Work Plan.

GE shall coordinate (through me) with Ecology, the Interior Environments building pre-sampling walk-through and air sampling days. Ecology's team prefers a sampling event in mid-late May 2006 if this possible for GE and the building tenants.

Please feel free to call me at (425) 649-7264 if you have any questions regarding this letter.

Sincerely,

Dean Yasuda

Dean Yasuda, P.E.
Environmental Engineer
Hazardous Waste and Toxics Reduction Program

DY:sd

cc: Julie Sellick, HWTR/NWRO
Ed Jones, Ecology HWTR/NWRO
Jim Schwartz, Ecology AAG
Tong Li, Ground Water Solutions
Marcia Bailey, EPA Region 10
Stephen R. Black, Black & Yund
Alex Cordas, Keymac, LCC
Bill Joyce, Salter, Joyce, Ziker, PLLC
WAD009278706 HZW 6.2

FIELD ACTIVITY LOG

PROJECT GEAE
PROJECT NO. GEOOI-19314
DAY & DATE Tuesday 5/30/06

COMPLETED BY J. Stevens
REVIEWED BY _____
SHEET 1 **OF** 3

TIME	SUMMARY OF DAILY ACTIVITIES AND EVENTS
0605	JS arrives at RETEC
	starts loading van
0630	Jill arrive on site
	leave Retec to set up samples canisters
	set up inside canisters - light to no wind
	-check all pressures
	IE-IA-3- set inside crawl space to right
	IA-2/20 set on table top
	* worker not in today - no activity near this
	area IA-3 covered, lid placed upside down
	covered hole completly
	IE-IA-1 - placed on ladder
0730	outside samples
	place on the East/South
	West/South
	West- middle of fence (on fence)
	North- middle of fence (on fence)
	East- placed ~~with~~ on light pole - no
	sample cane.
0815	JS and JL leave site
11:45	JS check on Samples
	AA-3 -15 AA-5 - 16.5 IA-2 -13.0
	AA-4 -17.5 IA-20 -14.5
	AA-2 -16.0 IA-3- did not check*
	AA-1 -17 (aprox) IA-1 -15.0
	Inter. Env. Bay doors open (photo)
	flag pointed towards the south, ⊥ to flag pole

VISITORS ON SITE:
NONE

CHANGES FROM PLANS OR IMPORTANT DECISIONS

WEATHER CONDITIONS:
sunny. Light wind

IMPORTANT TELEPHONE CALLS:
NONE

CONTRACTOR PERSONNEL & EQUIPMENT ON SITE:
Jill Lantz
Jamie Stevens

* Did not check IA-3 because I did not want to open crawl space during sampling

FIELD ACTIVITY LOG

PROJECT GEAE
PROJECT NO. GEO01-1934-750
DAY & DATE Tuesday 5/30/06

COMPLETED BY J. Steven
REVIEWED BY
SHEET 2 **OF** 3

SUMMARY OF DAILY ACTIVITIES AND EVENTS

Indoor/Outdoor Air Summa Canister Set Up

→ Indoor

	Sample	(Summa) Canister #	Inital vac oil	Inital vac Canister	Time start	Final oil	Final can	Time End
table top	IA-20	31434	-28.0	-30	7:08	-6.0	-8	14:43
table top	IA-2	94945	-28.0	-30	7:08	-5.0	-6.5	1443
inside ladder	IA-3	33909	-30.0	-30	7:05	-10	-10	14:42
	IA-1	33584	-30.0	-30	7:14	-7	-8	14:46

→ Outdoor

→ bus stop	IE-AA-5	32124 **	-27.5	-27	8:11	9.0	7.0	16:11
W. fence	IE-AA-4	35158 *	-25.5	-30.0	8:01	9.25	9.0	16.01
N. fence	IE-AA-3	33787 *	-27.5	-23.5	7:36	-12.0	8.5	15:24
light pole	IE-AA-1	35178 *	-28.25	-30.0	7:46	-8.0	9.0	15:46
telephone pole	IE-AA-2	12022 *	-28.0	-30.0	7:54	-5.0	8.0	15,51

No sample can

Note:
Final vacuum should be less than 5 but greater than 1.0 in Hg

* Denote is sample can used on outside canisters
** Canister made a hissing sound when opened - no sample can placed on IE-AA-5

FIELD ACTIVITY LOG

PROJECT GEAE
PROJECT NO. G6001-19314
DAY & DATE Tuesday, 5/30/06

COMPLETED BY J. Stevens
REVIEWED BY _____
SHEET 2 **OF** 3

TIME	SUMMARY OF DAILY ACTIVITIES AND EVENTS
1410	JS and JL arrive on site
	check pressure gauge
1440	Back on site start removing sample canisters
1443	Stop 1A-20 and 1A-2
1442	Stop 1A-3
1446	Stop 1A-1
15:26	Stop AA-3
15:46	Stop AA-1
1551	Stop AA-2
1601	Stop AA-4
1611	Stop 1E-AA-5
1640	JS and JL leave Site
1655	JS packs up samples for Fed-Ex
	end 5/30/06
	J. Stevens

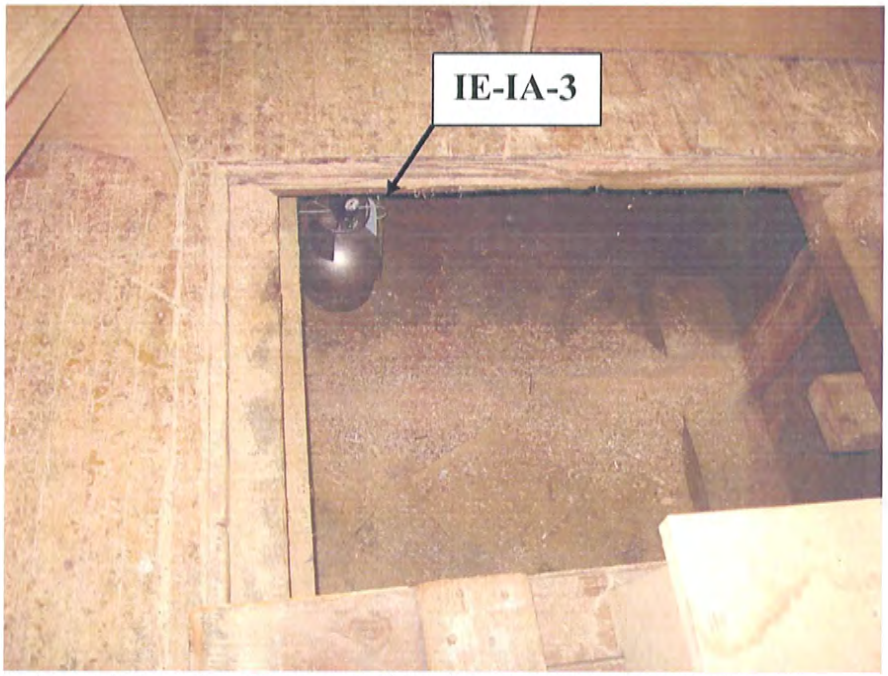
Appendix B

Air Sampling Photographs and Field Notes

May 2006 Indoor and Ambient Air Investigation Field Work Photo Log
Interior Environmental Building

Indoor Air Location IE-IA-1, facing west

Indoor Air Location IE-IA-2, facing south – duplicate canister shown in photo

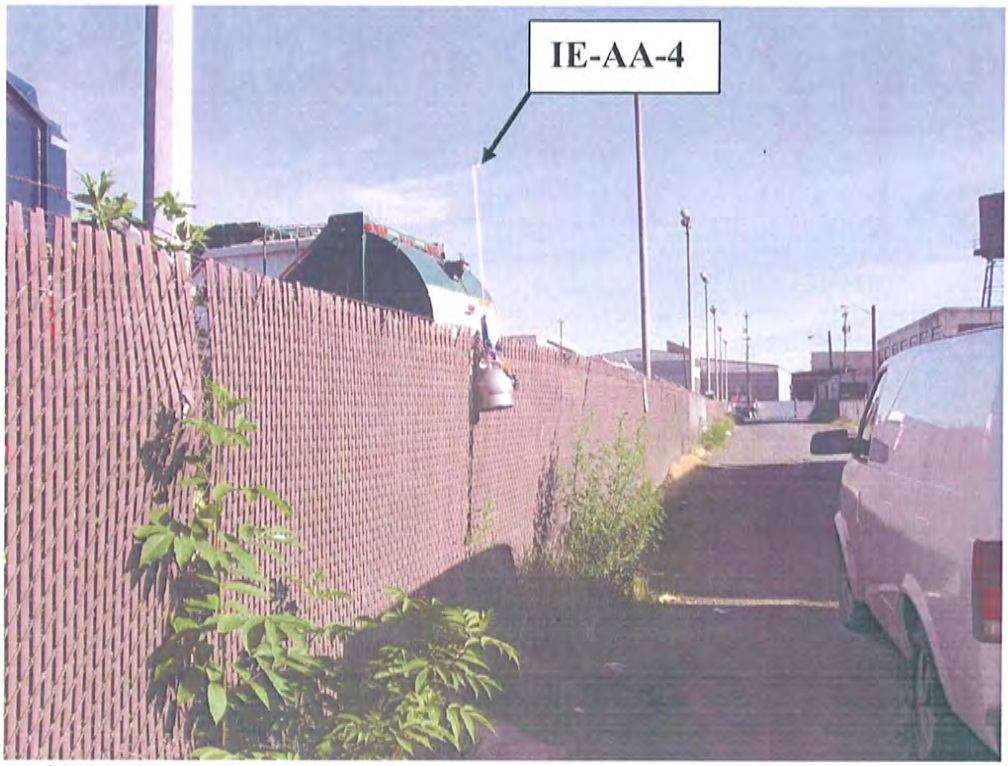


Indoor Air Location IE-IA-3, looking into crawl space from above

Ambient Air Location IE-AA-1, looking north

Ambient Air Location IE-AA-2, looking north-west

Ambient Air Location IE-AA-3, looking north



Ambient Air Location IE-AA-4, looking north

Ambient Air Location IE-AA-5, looking south

Appendix C

Laboratory Data Reports and Data Validation Reports

Air Toxics Ltd. Introduces the Electronic Report

Thank you for choosing Air Toxics Ltd. To better serve our customers, we are providing your report by e-mail. This document is provided in Portable Document Format which can be viewed with Acrobat Reader by Adobe.

This electronic report includes the following:

- Work order Summary;
- Laboratory Narrative;
- Results; and
- Chain of Custody (copy).

180 BLUE RAVINE ROAD, SUITE B FOLSOM, CA - 95630

(916) 985-1000 .FAX (916) 985-1020
Hours 8:00 A.M to 6:00 P.M. Pacific

@ AIR TOXICS LTD.
AN ENVIRONMENTAL ANALYTICAL LABORATORY

WORK ORDER #: 0606020

Work Order Summary

CLIENT:	Ms. Jill Lantz The RETEC Group, Inc. 1011 SW Klickitat Way Suite 207 Seattle, WA 98134	**BILL TO:**	Ms. Jill Lantz The RETEC Group, Inc. 1011 SW Klickitat Way Suite 207 Seattle, WA 98134
PHONE:		**P.O. #**	
FAX:		**PROJECT #**	GE001-19314-750 GE-Interior Env.
DATE RECEIVED:	06/01/2006	**CONTACT:**	Nicole Danbacher
DATE COMPLETED:	05/22/2006		

FRACTION #	NAME	TEST	RECEIPT VAC./PRES.
01A	IE-1A-20	Modified TO-15 SIM	7.0 "Hg
02A	IE-1A-2	Modified TO-15 SIM	6.0 "Hg
03A	IE-1A-3	Modified TO-15 SIM	10.5 "Hg
04A	IE-1A-1	Modified TO-15 SIM	7.5 "Hg
05A	IE-AA-5	Modified TO-15 SIM	9.0 "Hg
06A	IE-AA-4	Modified TO-15 SIM	8.0 "Hg
07A	IE-AA-3	Modified TO-15 SIM	12.5 "Hg
08A	IE-AA-1	Modified TO-15 SIM	8.0 "Hg
09A	IE-AA-2	Modified TO-15 SIM	5.0 "Hg
09AA	IE-AA-2 Duplicate	Modified TO-15 SIM	5.0 "Hg
10A	Lab Blank	Modified TO-15 SIM	NA
11A	CCV	Modified TO-15 SIM	NA
12A	LCS	Modified TO-15 SIM	NA

CERTIFIED BY: Linda D. Fruman DATE: 06/14/06

Laboratory Director

Certfication numbers: CA NELAP - 02110CA, LA NELAP/LELAP- AI 30763, NJ NELAP - CA004
NY NELAP - 11291, UT NELAP - 9166389892
Name of Accrediting Agency: NELAP/Florida Department of Health, Scope of Application: Clean Air Act,
Accreditation number: E87680, Effective date: 07/01/05, Expiration date: 06/30/06
Air Toxics Ltd. certifies that the test results contained in this report meet all requirements of the NELAC standards

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

LABORATORY NARRATIVE
Modified TO-15 SIM
The RETEC Group, Inc.
Workorder# 0606020

Nine 6 Liter Summa Canister (SIM Certified) samples were received on June 01, 2006. The laboratory performed analysis via modified 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.

Method modifications taken to run these samples are summarized in the below table. Specific project requirements may over-ride the ATL modifications.

Requirement	*TO-15*	*ATL Modifications*
ICAL %RSD acceptance criteria	</=30% RSD with 2 compounds allowed out to < 40% RSD	Project specific; default criteria is </=30% RSD with 10% of compounds allowed out to < 40% RSD
Daily Calibration	+- 30% Difference	Project specific; default criteria is </= 30% Difference with 10% of compounds allowed out up to </=40%.; flag and narrate outliers
Blank and standards	Zero air	Nitrogen
Method Detection Limit	Follow 40CFR Pt.136 App. B	The MDL met all relevant requirements in Method TO-15 (statistical MDL less than the LOQ). The concentration of the spiked replicate may have exceeded 10X the calculated MDL in some cases

Receiving Notes

Sample collection date was incomplete on the chain of custody for all samples. The sampling date was taken from the tag and the discrepancy was noted in the Sample Receipt Confirmation email/fax.

The Chain of Custody was not relinquished properly. The discrepancy was noted in the Sample Receipt Confirmation email/fax.

Analytical Notes

There were no analytical discrepancies.

Definition of Data Qualifying Flags

Eight 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.
UJ- Non-detected compound associated with low bias in the CCV
N - The identification is based on presumptive evidence.

File extensions may have been used on the data analysis sheets and indicates as follows:
a-File was requantified
b-File was quantified by a second column and detector
r1-File was requantified for the purpose of reissue

Summary of Detected Compounds
MODIFIED EPA METHOD TO-15 GC/MS SIM

Client Sample ID: IE-1A-20

Lab ID#: 0606020-01A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (uG/m3)	Amount (uG/m3)
Chloroform	0.035	0.067	0.17	0.33
1,1,1-Trichloroethane	0.035	1.3	0.19	7.2
Tetrachloroethene	0.035	0.054	0.24	0.37

Client Sample ID: IE-1A-2

Lab ID#: 0606020-02A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (uG/m3)	Amount (uG/m3)
1,1,1-Trichloroethane	0.034	1.3	0.18	7.0
Tetrachloroethene	0.034	0.045	0.23	0.31

Client Sample ID: IE-1A-3

Lab ID#: 0606020-03A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (uG/m3)	Amount (uG/m3)
Tetrachloroethene	0.041	0.054	0.28	0.36

Client Sample ID: IE-1A-1

Lab ID#: 0606020-04A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (uG/m3)	Amount (uG/m3)
1,1,1-Trichloroethane	0.036	0.036	0.20	0.19 J
Tetrachloroethene	0.036	0.037	0.24	0.25

Client Sample ID: IE-AA-5

Lab ID#: 0606020-05A

No Detections Were Found.

Client Sample ID: IE-AA-4

Lab ID#: 0606020-06A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (uG/m3)	Amount (uG/m3)
Tetrachloroethene	0.037	0.068	0.25	0.46

Summary of Detected Compounds
MODIFIED EPA METHOD TO-15 GC/MS SIM

Client Sample ID: IE-AA-3

Lab ID#: 0606020-07A

No Detections Were Found.

Client Sample ID: IE-AA-1

Lab ID#: 0606020-08A

No Detections Were Found.

Client Sample ID: IE-AA-2

Lab ID#: 0606020-09A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (uG/m3)	Amount (uG/m3)
Tetrachloroethene	0.032	0.032	0.22	0.21 J

Client Sample ID: IE-AA-2 Duplicate

Lab ID#: 0606020-09AA

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (uG/m3)	Amount (uG/m3)
Tetrachloroethene	0.032	0.034	0.22	0.23

AIR TOXICS LTD.

AN ENVIRONMENTAL ANALYTICAL LABORATORY

Client Sample ID: IE-1A-20

Lab ID#: 0606020-01A

MODIFIED EPA METHOD TO-15 GC/MS SIM

File Name:	**a060518**	**Date of Collection: 5/30/06**	
Dil. Factor:	**1.75**	**Date of Analysis: 6/6/06 12:31 AM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (uG/m3)	Amount (uG/m3)
Vinyl Chloride	0.018	Not Detected	0.045	Not Detected
cis-1,2-Dichloroethene	0.035	Not Detected	0.14	Not Detected
Trichloroethene	0.035	Not Detected	0.19	Not Detected
1,1-Dichloroethene	0.018	Not Detected	0.069	Not Detected
Chloroform	0.035	0.067	0.17	0.33
1,1,1-Trichloroethane	0.035	1.3	0.19	7.2
Tetrachloroethene	0.035	0.054	0.24	0.37
1,1-Dichloroethane	0.035	Not Detected	0.14	Not Detected

Container Type: 6 Liter Summa Canister (SIM Certified)

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	88	70-130
Toluene-d8	97	70-130
4-Bromofluorobenzene	103	70-130

AIR TOXICS LTD.

AN ENVIRONMENTAL ANALYTICAL LABORATORY

Client Sample ID: IE-1A-2

Lab ID#: 0606020-02A

MODIFIED EPA METHOD TO-15 GC/MS SIM

File Name:	**a060519**	**Date of Collection: 5/30/06**	
Dil. Factor:	**1.68**	**Date of Analysis: 6/6/06 01:21 AM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (uG/m3)	Amount (uG/m3)
Vinyl Chloride	0.017	Not Detected	0.043	Not Detected
cis-1,2-Dichloroethene	0.034	Not Detected	0.13	Not Detected
Trichloroethene	0.034	Not Detected	0.18	Not Detected
1,1-Dichloroethene	0.017	Not Detected	0.067	Not Detected
Chloroform	0.034	Not Detected	0.16	Not Detected
1,1,1-Trichloroethane	0.034	1.3	0.18	7.0
Tetrachloroethene	0.034	0.045	0.23	0.31
1,1-Dichloroethane	0.034	Not Detected	0.14	Not Detected

Container Type: 6 Liter Summa Canister (SIM Certified)

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	87	70-130
Toluene-d8	98	70-130
4-Bromofluorobenzene	103	70-130

AIR TOXICS LTD.

AN ENVIRONMENTAL ANALYTICAL LABORATORY

Client Sample ID: IE-1A-3

Lab ID#: 0606020-03A

MODIFIED EPA METHOD TO-15 GC/MS SIM

File Name:	**a060520**	**Date of Collection: 5/30/06**	
Dil. Factor:	**2.06**	**Date of Analysis: 6/6/06 02:01 AM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (uG/m3)	Amount (uG/m3)
Vinyl Chloride	0.021	Not Detected	0.053	Not Detected
cis-1,2-Dichloroethene	0.041	Not Detected	0.16	Not Detected
Trichloroethene	0.041	Not Detected	0.22	Not Detected
1,1-Dichloroethene	0.021	Not Detected	0.082	Not Detected
Chloroform	0.041	Not Detected	0.20	Not Detected
1,1,1-Trichloroethane	0.041	Not Detected	0.22	Not Detected
Tetrachloroethene	0.041	0.054	0.28	0.36
1,1-Dichloroethane	0.041	Not Detected	0.17	Not Detected

Container Type: 6 Liter Summa Canister (SIM Certified)

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	86	70-130
Toluene-d8	98	70-130
4-Bromofluorobenzene	103	70-130

AIR TOXICS LTD.

AN ENVIRONMENTAL ANALYTICAL LABORATORY

Client Sample ID: IE-1A-1

Lab ID#: 0606020-04A

MODIFIED EPA METHOD TO-15 GC/MS SIM

File Name:	**a060521**	**Date of Collection: 5/30/06**	
Dil. Factor:	**1.79**	**Date of Analysis: 6/6/06 02:38 AM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (uG/m3)	Amount (uG/m3)
Vinyl Chloride	0.018	Not Detected	0.046	Not Detected
cis-1,2-Dichloroethene	0.036	Not Detected	0.14	Not Detected
Trichloroethene	0.036	Not Detected	0.19	Not Detected
1,1-Dichloroethene	0.018	Not Detected	0.071	Not Detected
Chloroform	0.036	Not Detected	0.17	Not Detected
1,1,1-Trichloroethane	0.036	0.036	0.20	0.19 J
Tetrachloroethene	0.036	0.037	0.24	0.25
1,1-Dichloroethane	0.036	Not Detected	0.14	Not Detected

J = Estimated value.

Container Type: 6 Liter Summa Canister (SIM Certified)

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	86	70-130
Toluene-d8	96	70-130
4-Bromofluorobenzene	103	70-130

AIR TOXICS LTD.

AN ENVIRONMENTAL ANALYTICAL LABORATORY

Client Sample ID: IE-AA-5

Lab ID#: 0606020-05A

MODIFIED EPA METHOD TO-15 GC/MS SIM

File Name:	**a060522**	**Date of Collection: 5/30/06**	
Dil. Factor:	**1.91**	**Date of Analysis: 6/6/06 03:10 AM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (uG/m3)	Amount (uG/m3)
Vinyl Chloride	0.019	Not Detected	0.049	Not Detected
cis-1,2-Dichloroethene	0.038	Not Detected	0.15	Not Detected
Trichloroethene	0.038	Not Detected	0.20	Not Detected
1,1-Dichloroethene	0.019	Not Detected	0.076	Not Detected
Chloroform	0.038	Not Detected	0.19	Not Detected
1,1,1-Trichloroethane	0.038	Not Detected	0.21	Not Detected
Tetrachloroethene	0.038	Not Detected	0.26	Not Detected
1,1-Dichloroethane	0.038	Not Detected	0.15	Not Detected

Container Type: 6 Liter Summa Canister (SIM Certified)

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	88	70-130
Toluene-d8	98	70-130
4-Bromofluorobenzene	102	70-130

AIR TOXICS LTD.

AN ENVIRONMENTAL ANALYTICAL LABORATORY

Client Sample ID: IE-AA-4

Lab ID#: 0606020-06A

MODIFIED EPA METHOD TO-15 GC/MS SIM

File Name:	**a060523**	**Date of Collection: 5/30/06**	
Dil. Factor:	**1.83**	**Date of Analysis: 6/6/06 03:48 AM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (uG/m3)	Amount (uG/m3)
Vinyl Chloride	0.018	Not Detected	0.047	Not Detected
cis-1,2-Dichloroethene	0.037	Not Detected	0.14	Not Detected
Trichloroethene	0.037	Not Detected	0.20	Not Detected
1,1-Dichloroethene	0.018	Not Detected	0.072	Not Detected
Chloroform	0.037	Not Detected	0.18	Not Detected
1,1,1-Trichloroethane	0.037	Not Detected	0.20	Not Detected
Tetrachloroethene	0.037	0.068	0.25	0.46
1,1-Dichloroethane	0.037	Not Detected	0.15	Not Detected

Container Type: 6 Liter Summa Canister (SIM Certified)

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	89	70-130
Toluene-d8	98	70-130
4-Bromofluorobenzene	103	70-130

AIR TOXICS LTD.

AN ENVIRONMENTAL ANALYTICAL LABORATORY

Client Sample ID: IE-AA-3

Lab ID#: 0606020-07A

MODIFIED EPA METHOD TO-15 GC/MS SIM

File Name:	**a060524**	**Date of Collection: 5/30/06**	
Dil. Factor:	**2.30**	**Date of Analysis: 6/6/06 04:26 AM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (uG/m3)	Amount (uG/m3)
Vinyl Chloride	0.023	Not Detected	0.059	Not Detected
cis-1,2-Dichloroethene	0.046	Not Detected	0.18	Not Detected
Trichloroethene	0.046	Not Detected	0.25	Not Detected
1,1-Dichloroethene	0.023	Not Detected	0.091	Not Detected
Chloroform	0.046	Not Detected	0.22	Not Detected
1,1,1-Trichloroethane	0.046	Not Detected	0.25	Not Detected
Tetrachloroethene	0.046	Not Detected	0.31	Not Detected
1,1-Dichloroethane	0.046	Not Detected	0.19	Not Detected

Container Type: 6 Liter Summa Canister (SIM Certified)

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	90	70-130
Toluene-d8	99	70-130
4-Bromofluorobenzene	103	70-130

AIR TOXICS LTD.

AN ENVIRONMENTAL ANALYTICAL LABORATORY

Client Sample ID: IE-AA-1

Lab ID#: 0606020-08A

MODIFIED EPA METHOD TO-15 GC/MS SIM

File Name:	a060525	Date of Collection: 5/30/06
Dil. Factor:	1.83	Date of Analysis: 6/6/06 05:05 AM

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (uG/m3)	Amount (uG/m3)
Vinyl Chloride	0.018	Not Detected	0.047	Not Detected
cis-1,2-Dichloroethene	0.037	Not Detected	0.14	Not Detected
Trichloroethene	0.037	Not Detected	0.20	Not Detected
1,1-Dichloroethene	0.018	Not Detected	0.072	Not Detected
Chloroform	0.037	Not Detected	0.18	Not Detected
1,1,1-Trichloroethane	0.037	Not Detected	0.20	Not Detected
Tetrachloroethene	0.037	Not Detected	0.25	Not Detected
1,1-Dichloroethane	0.037	Not Detected	0.15	Not Detected

Container Type: 6 Liter Summa Canister (SIM Certified)

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	90	70-130
Toluene-d8	98	70-130
4-Bromofluorobenzene	102	70-130

AIR TOXICS LTD.

AN ENVIRONMENTAL ANALYTICAL LABORATORY

Client Sample ID: IE-AA-2

Lab ID#: 0606020-09A

MODIFIED EPA METHOD TO-15 GC/MS SIM

File Name:	**a060526**	**Date of Collection: 5/30/06**	
Dil. Factor:	**1.61**	**Date of Analysis: 6/6/06 05:35 AM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (uG/m3)	Amount (uG/m3)
Vinyl Chloride	0.016	Not Detected	0.041	Not Detected
cis-1,2-Dichloroethene	0.032	Not Detected	0.13	Not Detected
Trichloroethene	0.032	Not Detected	0.17	Not Detected
1,1-Dichloroethene	0.016	Not Detected	0.064	Not Detected
Chloroform	0.032	Not Detected	0.16	Not Detected
1,1,1-Trichloroethane	0.032	Not Detected	0.18	Not Detected
Tetrachloroethene	0.032	0.032	0.22	0.21 J
1,1-Dichloroethane	0.032	Not Detected	0.13	Not Detected

J = Estimated value.

Container Type: 6 Liter Summa Canister (SIM Certified)

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	91	70-130
Toluene-d8	98	70-130
4-Bromofluorobenzene	102	70-130

AIR TOXICS LTD.

AN ENVIRONMENTAL ANALYTICAL LABORATORY

Client Sample ID: IE-AA-2 Duplicate

Lab ID#: 0606020-09AA

MODIFIED EPA METHOD TO-15 GC/MS SIM

File Name:	**a060527**	**Date of Collection: 5/30/06**	
Dil. Factor:	**1.61**	**Date of Analysis: 6/6/06 06:07 AM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (uG/m3)	Amount (uG/m3)
Vinyl Chloride	0.016	Not Detected	0.041	Not Detected
cis-1,2-Dichloroethene	0.032	Not Detected	0.13	Not Detected
Trichloroethene	0.032	Not Detected	0.17	Not Detected
1,1-Dichloroethene	0.016	Not Detected	0.064	Not Detected
Chloroform	0.032	Not Detected	0.16	Not Detected
1,1,1-Trichloroethane	0.032	Not Detected	0.18	Not Detected
Tetrachloroethene	0.032	0.034	0.22	0.23
1,1-Dichloroethane	0.032	Not Detected	0.13	Not Detected

Container Type: 6 Liter Summa Canister (SIM Certified)

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	92	70-130
Toluene-d8	98	70-130
4-Bromofluorobenzene	103	70-130

Client Sample ID: Lab Blank

Lab ID#: 0606020-10A

MODIFIED EPA METHOD TO-15 GC/MS SIM

File Name:	**a060507**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 6/5/06 03:34 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (uG/m3)	Amount (uG/m3)
Vinyl Chloride	0.010	Not Detected	0.026	Not Detected
cis-1,2-Dichloroethene	0.020	Not Detected	0.079	Not Detected
Trichloroethene	0.020	Not Detected	0.11	Not Detected
1,1-Dichloroethene	0.010	Not Detected	0.040	Not Detected
Chloroform	0.020	Not Detected	0.098	Not Detected
1,1,1-Trichloroethane	0.020	Not Detected	0.11	Not Detected
Tetrachloroethene	0.020	Not Detected	0.14	Not Detected
1,1-Dichloroethane	0.020	Not Detected	0.081	Not Detected

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	84	70-130
Toluene-d8	97	70-130
4-Bromofluorobenzene	103	70-130

AIR TOXICS LTD.

AN ENVIRONMENTAL ANALYTICAL LABORATORY

Client Sample ID: CCV

Lab ID#: 0606020-11A

MODIFIED EPA METHOD TO-15 GC/MS SIM

File Name:	**a060502**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 6/5/06 11:30 AM**	

Compound	%Recovery
Vinyl Chloride	86
cis-1,2-Dichloroethene	98
Trichloroethene	101
1,1-Dichloroethene	97
Chloroform	86
1,1,1-Trichloroethane	85
Tetrachloroethene	108
1,1-Dichloroethane	86

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	78	70-130
Toluene-d8	97	70-130
4-Bromofluorobenzene	100	70-130

Client Sample ID: LCS

Lab ID#: 0606020-12A

MODIFIED EPA METHOD TO-15 GC/MS SIM

File Name:	**a060503**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 6/5/06 12:01 PM**	

Compound	%Recovery
Vinyl Chloride	86
cis-1,2-Dichloroethene	100
Trichloroethene	103
1,1-Dichloroethene	96
Chloroform	87
1,1,1-Trichloroethane	86
Tetrachloroethene	111
1,1-Dichloroethane	87

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	78	70-130
Toluene-d8	97	70-130
4-Bromofluorobenzene	101	70-130

Chain of Custody Record

Nº 101382

The RETEC Group, Inc.
1011 S.W. Klickitat Way, Suite 207 · Seattle, WA 98134-1162
(206) 624-9349 Phone · (206) 624-2839 Fax
www.retec.com

RETEC

Page 1 of 1

Project Name: GE - Interior Env.	Project Number: G5001-19314-750
Send Report To: Jill Lantz	Sampler (Print Name): J. Stevens
Address: see above	Sampler (Print Name): J. Lantz
	Shipment Method: Fed-ex - 2 Boxes
	Airbill Number:
Phone: above	Laboratory Receiving: AIR TOXICS LTD
Fax: above	

Analyses Requested: TO-15 SIM

Purchase Order #:

Lab ID	Field Sample ID	Sample Date	Sample Time	Sample Matrix	Number of Containers	Comments, Special Instructions, etc.		Lab Sample ID (to be completed by lab)	
	Field Sample	Date	start time	matrix	can #	Initial	Final	Receipt	Final
01A	IE-1A-20	5/30	07:08	indoor	31434	-28	-6.0	7.0"Hg	5.0psi
02A	IE-1A-2	5/30	07:08	indoor	94945	-28	-5.0	6.0"Hg	
03A	IE-1A-3	5/30	07:05	indoor	33709	-30	-10	10.5"Hg	
04A	IE-1A-1	5/30	07:14	indoor	32584	-30	-7	7.5"Hg	
05A	IE-AA-5	5/30	08:11	outdoor	32126	-27.5	-9.0	9.0"Hg	
06A	IE-AA-4	5/30	08:01	outdoor	35158	-25.5	-9.25	8.0"Hg	
07A	IE-AA-3	5/30	07:36	outdoor	33787	-27.5	-12.0	12.5"Hg	
08A	IE-AA-1	5/30	07:46	outdoor	35178	-28.25	-8.0	8.0"Hg	
09A	IE-AA-2	5/30	07:54	outdoor	12022	-28.0	-5.0	5.0"Hg	

CUSTODY SEAL INTACT?
Y N NONE TEMP N/A

Relinquished by: (Signature)	Received by: (Signature)	Date	Time
Retec Jamie C. Stevens	8:30 6/01/06	5/31	09:30
Relinquished by: (Signature)	Received by: (Signature)	Date	Time
Relinquished by: (Signature)	Received by: (Signature)	Date	Time

Sample Custodian Remarks (Completed By Laboratory):

QA/QC Level		Turnaround		Sample Receipt	
Level I	☐	Routine	☒	Total # Containers Received?	
Level II	☐	24 Hour	☐	COC Seals Present?	
Level III	☐	1 Week	☐	COC Seals Intact?	
Other	☐	Other 15 days		Received Containers Intact?	
				Temperature?	

White: Lab Copy Yellow: PM Copy Pink: Field Copy Gold: PM/QA/QC Copy

0606020

July 6, 2006

Organic Data Verification Report

General Electric – South Dawson Street

Indoor and Outdoor Air Sampling

May 2006

Prepared for:

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RETEC Project No.: GE001-19314-750

Overview

The samples analyzed for the General Electric South Dawson Street air sampling event from May 2006 are listed in the Table of Samples Analyzed (page 2). Data verification was performed on nine air samples.

Samples were analyzed by Air Toxics Ltd of Folsom, CA. The verified analyses were Volatile Organic Compounds (VOCs) by modified GC/MS method TO15 SIM.

The RETEC Analytical Data Verification Checklist is presented as pages 4-7. Data were evaluated based on validation criteria set forth in the *USEPA Contract Laboratory Program (CLP) National Functional Guidelines for Superfund Organic Methods Data Review*, document number EPA540/R-99/008, October 1999 with additional reference to document 540-R-04-009, January 2005 as they applied to the reported methodology. Field duplicate RPD control limits were taken from the USEPA Region I Laboratory Data Validation Functional Guidelines for Evaluating Organics Analyses, February 1988, upheld in DRAFT 1993.

The following data components were reviewed during the data verification procedure:

Submitted Deliverables
Case Narratives
Chain-of-Custody form(s) and sample integrity
Sample results, reporting detection limits, method detection limits, dilution factors
Holding times
Method blank results
LCS/LCSD (blank spike) results
Laboratory duplicate results
Organic surrogate recoveries
Blind field duplicate results
Electronic data deliverables (EDDs)

Data Validation Qualifiers Assigned During this Review

J estimated concentration

Assigned qualifiers are detailed in the RETEC Analytical Data Verification Checklist and are summarized in the Table of Qualified Analytical Results (page 3).

Overall Data Assessment

Precision, accuracy, method compliance, and completeness of the data set have been determined to be acceptable, based on the data submitted. The data are suitable for their intended use with the qualifications noted.

Table of Samples Analyzed
General Electric South Dawson Street
Indoor and Outdoor Air Samples
Air Toxics Ltd. Laboratory Project 0606020
May 2006 Sampling

Matrix	Sample Name	Parent Sample ID	Sample Date and Time		Lab SDG	Lab Sample ID
Outdoor Air	IE-AA-1		5/30/2006	7:46	606020	0606020-08A
Outdoor Air	IE-AA-2		5/30/2006	7:54	606020	0606020-09A
Outdoor Air	IE-AA-3		5/30/2006	7:36	606020	0606020-07A
Outdoor Air	IE-AA-4		5/30/2006	8:01	606020	0606020-06A
Outdoor Air	IE-AA-5		5/30/2006	8:11	606020	0606020-05A
Indoor Air	IE-IA-1		5/30/2006	7:14	606020	0606020-04A
Indoor Air	IE-IA-2		5/30/2006	7:08	606020	0606020-02A
Indoor Air	IE-IA-20	IE-IA-2	5/30/2006	7:08	606020	0606020-01A
Indoor Air	IE-IA-3		5/30/2006	7:05	606020	0606020-03A

Table of Qualified Analytical Results
General Electric South Dawson Street
Indoor and Outdoor Air Samples
Air Toxics Ltd. Laboratory Project 0606020
May 2006 Sampling

Sample ID	Method	Dilution	Analyte	Concentration		Qualifier	Reason Code
IE-AA-2	TO-15 Mod	1.61	Tetrachloroethene	0.21	ug/m3	J	<PQL
IE-IA-1	TO-15 Mod	1.79	1,1,1-Trichloroethane	0.19	ug/m3	J	<PQL

Qualifier Definitions
J Estimated concentration.

Reason Code Definitions
< PQL Reported concentration is greater than the MDL but less than the PQL.

RETEC ANALYTICAL DATA VERIFICATION CHECKLIST

Project Name: General Electric	Laboratory: Air Toxics Ltd. Folsom, CA
Project Reference: South Dawson Street Indoor and Outdoor Air Sampling	Sample Matrix: Air
RETEC Project: GE001-19314-750	Sample Start Date: 05/30/2006
Verified By/Date Verified: Ann Biegelsen / 07/06/2006 (completed)	Sample End Date: 05/30/2006
Samples Analyzed: Refer to the Table of Samples Analyzed (page 2).	
Parameters Verified: Volatile Organic Compounds (VOCs) by modified GC/MS method TO15 SIM.	
Laboratory Project ID: 0606020	

PRECISION, ACCURACY, METHOD COMPLIANCE, AND COMPLETENESS ASSESSMENT

Precision:	X	Acceptable		Unacceptable	AB	Initials
Comments: Precision is the measure of variability of individual sample measurements. Field precision was determined by comparison of field duplicate sample results. Laboratory precision was determined by examination of laboratory duplicate results. Evaluation of both field and laboratory duplicates for precision was done using the Relative Percent Difference (RPD). The RPD is defined as the difference between two duplicate samples divided by the mean and expressed as a percent. Laboratory RPD limits referenced EPA published QC limits. No data require qualification based on field or laboratory duplicate precision measurements, and overall field and laboratory precision is acceptable. Precision measurements are reviewed in items 17, 20, and 21.						
Accuracy:	X	Acceptable		Unacceptable	AB	Initials
Comments: Field accuracy, a measure of the sampling bias, could not be determined as there were no trip blank, field blank, or equipment rinse blank samples included in this data set. Laboratory accuracy is a measure of the system bias, and was measured by evaluating laboratory control sample/laboratory control sample duplicate (LCS/LCSD), and organic system monitoring compounds (surrogate) percent recoveries (%Rs). LCS/LCSD %Rs, which demonstrated the overall performance of the analysis, were compared to EPA published QC limits. System monitoring compound or surrogate recoveries, which measured system performance and efficiency during organic analysis, were compared to EPA published QC limits or laboratory control charted limits. No data require qualification based on laboratory accuracy measurements, and overall laboratory accuracy is acceptable. Accuracy measurements are reviewed in items 12, 14, 15 and 16.						
Method Compliance:	X	Acceptable		Unacceptable	AB	Initials
Comments: Method compliance was determined by evaluating sample integrity, holding time, and laboratory blanks against method specified requirements, while applying EPA data validation guidelines. Although some data require qualification based on analytes detected below the reporting limits but above the laboratory method detection limits (see item 6), overall method compliance is acceptable based on the supplied data. Method compliance measurements are reviewed in items 4, 6, 8, 11, 13, 18, 19, 20 and 22.						
Completeness:	X	Acceptable		Unacceptable	AB	Initials
Comments: Completeness is the overall ratio of the number of samples planned versus the number of samples with verified analyses. Completeness goals are set at 90-100%. Determination of completeness included a review of chain of custody records, laboratory analytical methods and detection limits, laboratory case narratives, and project requirements. Completeness also included 100% review of the laboratory sample data results, QC summary reports, and electronic data deliverables (EDDs). All of the data received from the laboratory are useable with qualification. Completeness of the data is 100% and is acceptable.						

RETEC ANALYTICAL DATA VERIFICATION CHECKLIST

VERIFICATION CRITERIA CHECK						
Data verification flags used in this review: J – estimated concentration The following comments requiring qualification are in bold type. The other comments are of interest, but qualification of the samples was not necessary. Refer to the Table of Qualified Analytical Results for a listing of the samples, analytes, and concentrations qualified (page 3).						
1. Did the laboratory identify any non-conformances related to the analytical results?	X	Yes		No	AB	Initials
Explanation by laboratory: Sample Receipt: Sample collection dates were incomplete on the COC for all samples. The sampling date was taken from the tag and the discrepancy was noted in the Sample Receipt Confirmation email/fax. The COC was not relinquished properly. The discrepancy was noted in the Sample Receipt Confirmation email/fax. Method TO-15: Modifications to method TO-15 were noted. Data qualification, if any, related to the laboratory observations are discussed in the following sections.						
2. Were sample Chain-of-Custody forms complete?		Yes	X	No	AB	Initials
Comments: COC records from field to laboratory were complete, and custody was maintained as evidenced by field and laboratory personnel signatures, dates, and times of receipt except as noted in paragraph one of item 1. No action is required other than to note these discrepancies.						
3. Were all the analyses requested for the samples on the COCs completed by the laboratory?	X	Yes		No	AB	Initials
Comments: All requested analyses were completed.						
4. Were samples received in good condition and at the appropriate temperature?	X	Yes		No	AB	Initials
Comments: No discrepancies or problems were identified on the chains of custody or in the case narrative.						
5. Were the requested analytical methods in compliance with WP/QAPP, permit, or COC?	X	Yes		No	AB	Initials
Comments: Reported methods and target analyte lists were in compliance with COC records.						
6. Were detection limits in accordance with WP/QAPP, permit, or method?	X	Yes		No	AB	Initials
Comments: Reported detection limits are achievable by the quoted methods. **Analytes reported below the laboratory reporting limits, but above the laboratory method detection limits, were qualified as J to indicate that the concentrations are estimated.** Refer to the Table of Qualified Analytical Results for a listing of the samples, analytes, and concentrations qualified (page 3).						
7. Do the laboratory reports include only those constituents requested to be reported for a specific analytical method?	X	Yes		No	AB	Initials
Comments: Only the requested target analytes were reported.						
8. Were sample holding times met?	X	Yes		No	AB	Initials
Comments: Extraction and analytical holding times were met for all samples and analyses.						

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9. Were correct concentration units reported?	X	Yes		No	AB	Initials
Comments: All results are reported in units of $\mu g/m^3$.						
10. Were the reporting requirements for flagged data met?	X	Yes		No	AB	Initials
Comments: Data verification qualifiers override any assigned laboratory flags.						
11. Were laboratory blank samples free of target analyte contamination?	X	Yes		No	AB	Initials
Comments: All laboratory blanks were free of target analyte contamination.						
12. Were trip blank, field blank, and/or equipment rinse blank samples free of target analyte contamination?	NA	Yes	NA	No	AB	Initials
Comments: There were no trip blank, field blank or equipment rinse blank samples included in this data set. Field accuracy could not be evaluated for this data set.						
13. Were instrument calibrations within method or data validation control limits?	NA	Yes	NA	No	AB	Initials
Comments: Not applicable for this level of data verification – Instrument calibration data were not supplied in analytical laboratory reports and were therefore not included in this data review.						
14. Were surrogate recoveries within control limits?	X	Yes		No	AB	Initials
Comments: Surrogate percent recoveries (%Rs) for organic analyses were within data verification QC criteria for all samples.						
15. Were laboratory control sample recoveries within control limits?	X	Yes		No	AB	Initials
Comments: LCS and LCSD (blank spike) recoveries were within data verification or laboratory control-charted QC limits for all target analytes.						
16. Were matrix spike recoveries within control limits?	NA	Yes	NA	No	AB	Initials
Comments: The analysis of MS and MSD samples is not required for the reported air method.						
17. Were duplicate RPDs and/or serial dilution %Ds within control limits?	X	Yes		No	AB	Initials
Comments: Laboratory RPDs for target analytes in LCS/LCSD samples were within data verification control limits. All laboratory duplicate samples met data verification RPD criteria. *Serial Dilution %D data is not applicable for the reported methods.*						
18. Were organic system performance criteria met?	NA	Yes	NA	No	AB	Initials
Comments: Not applicable for this level of data verification – Organic system performance data was not supplied in analytical laboratory reports and was therefore not included in this data review.						
19. Were internal standards within method criteria for GC/MS sample analyses?	NA	Yes	NA	No	AB	Initials
Comments: Not applicable for this level of data verification – GC/MS internal standard data was not supplied in analytical laboratory reports and was therefore not included in this data review.						
20. Were inorganic system performance criteria met?	NA	Yes	NA	No	AB	Initials
Comments: Not applicable for the reported method – There were no inorganic parameters requested for the samples in this data set.						

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21. Were blind field duplicates collected? If so, discuss the precision (RPD) of the results.	X	Yes		No	AB	Initials

Duplicate Sample No.	IE-IA-20		Primary Sample No.	IE-IA-2

Comments: The RPDs for the duplicates were within the 0-30% data verification QC limits for air samples, or RPDs were not applicable due to results that were ± the detection limit or were undetected in both samples, as indicated in the table below. Field duplicate and native sample concentrations that were both undetected are not reflected in the table below since RPDs are not applicable.

The following RPDs were calculated:

Method	Analyte	IE-IA-2	IE-IA-20	RPD	Qualifier	Samp RL	Dup RL	Units
TO-15 SIM	1,1,1-Trichloroethane	7	7.2	2.82		0.18	0.19	ug/m3
TO-15 SIM	Chloroform	ND	0.33	200.00	<2XRL	0.16	0.17	ug/m3
TO-15 SIM	Tetrachloroethene	0.31	0.37	17.65		0.23	0.24	ug/m3

No data require qualification based on the field duplicate RPDs.

22. Were qualitative criteria for organic target analyte identification met?	NA	Yes	NA	No	AB	Initials

Comments: Not applicable for this level of data verification – GC and GC/MS quantitation reports and chromatograms were not supplied in analytical laboratory reports and were therefore not included in this data review.

23. Were 100% of the EDD concentrations and reporting limits compared to the hardcopy data reports?	X	Yes		No	AB	Initials

Comments: There were no discrepancies between the EDD concentrations and reporting limits and the hardcopy data reports.

24. General Comments: Data were evaluated based on validation criteria set forth in the *USEPA Contract Laboratory Program (CLP) National Functional Guidelines for Superfund Organic Methods Data Review*, document number EPA540/R-99/008, October 1999 with additional reference to document 540-R-04-009, January 2005, as they applied to the reported methodology. Field duplicate RPD control limits were taken from the USEPA Region I Laboratory Data Validation Functional Guidelines for Evaluating Organics Analyses, February 1988, upheld in DRAFT 1993.

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