Geomatrix

PROJECT NO. 8888.002
ROUTE:
FILE NO. 9437
cc FILE NO.
Master

Memorandum

TO:	Byung Maeng, Ecology Carl Bach, Boeing	**DATE:**	January 22, 2007
FROM:	Dave Haddock, Geomatrix	**PROJ. NO.:**	8888.002
CC:	Ray Power, Boeing	**PROJ. NAME:**	Boeing Renton Plant, Renton, Washington

SUBJECT: **Draft Additional Investigation of AOC-034 and -035, Building 4-41**

Introduction

This memorandum summarizes the additional investigational work for areas of concern (AOCs) AOC-034 and -035 at the Boeing Renton Plant (Facility) in Renton, Washington. These AOCs are located at the north end of the Renton Facility, on the south side of Building 4-41. The objective was to determine if remedial action will be necessary to reduce concentrations of volatile organic compounds (VOCs) in affected soil and groundwater. This was accomplished by collecting and analyzing five soil samples from directly above the water table (approximately 4 feet below ground surface [bgs]), and five grab groundwater samples.

Site Background and Previous Investigations

AOC-034 and AOC-035 are the locations of former underground storage tanks (USTs) URE-07 and URE-08, respectively. The former steel USTs were located adjacent to the south side of Building 4-41, as shown in Figure 1. Both USTs were installed in 1980 for storage of methyl ethyl ketone (MEK) and toluene, but were reportedly never used. Each steel tank had a capacity of 500 gallons (Roy F. Weston [Weston], 2001).

After these USTs were removed in September 1987, volatile organic vapors were detected in the northwest corner of the investigation. Subsequent subsurface investigation in 1999 identified vinyl chloride (VC) in soil (5.2 micrograms per kilogram [µg/kg]) and groundwater (1.8 micrograms per liter [µg/L]) samples collected in the area adjacent to URE-07 and URE-08; however, these levels were not high enough to warrant further investigation at that time.

Complete RI characterization results for these units are presented in Section 5.13 of the final Remedial Investigation (RI) report (Weston, 2001).

In 2006, Boeing met and exchanged correspondence with the Washington State Department of Ecology (Ecology) regarding the use of 0.2 µg/L as the appropriate cleanup level for vinyl chloride at various points of compliance (PoCs) at the Facility. The intent of these discussions was to define a cleanup level at these PoCs that will result in groundwater that does not exceed the ambient water quality criteria of 0.025 µg/L of vinyl chloride at the shoreline of Lake Washington or the bank of the Cedar River. As described in the AOC-034 and -035 Work Plan, Geomatrix Consultants, Inc. (Geomatrix) calculated and reported a cleanup standard of 1.8 µg/kg vinyl chloride for soil at the Facility that is protective of the adjusted groundwater cleanup level (Geomatrix, 2006). Because vinyl chloride was previously detected in samples from boring PP032 adjacent to AOC-034 and AOC-035 at concentrations higher than 1.8 µg/kg, the area was proposed for further investigation to determine whether remedial action would be necessary to reduce concentrations of VOC-affected soil and groundwater.

Sampling and Analysis

This section describes the approach that was used to complete the December 2006 investigation at AOC-034 and -035. Figures 1 and 2 show the location of AOC-034 and -035, and the approximate sampling locations.

Direct Push Sampling

On December 14, 2006, Geomatrix oversaw completion of five direct push borings (PP160 through PP164) in the area south and southwest of Building 4-41. Four borings were installed in the vicinity of former boring PP032 and one was located downgradient of PP032 and AOC-034 and -035 to complete additional source area delineation of VOCs in soil and groundwater. Drilling was completed with a direct push drill rig operated by Cascade Drilling of Woodinville, Washington.

Discrete soil cores were collected from each boring. Borings were logged in the field by a Geomatrix geologist, and soil samples were collected for laboratory analysis from each core from the depth located directly above the water table. Cores were screened in the field for potential VOCs using a photoionization detector (PID). At each boring a temporary well was screened across the water table from approximately 4 to 9 feet bgs using a 5-foot section of 3/4-inch diameter, Schedule 40 polyvinyl chloride (PVC). A grab groundwater sample was collected from each temporary well. Soil and groundwater samples were collected in laboratory-supplied sample jars, labeled, and stored in an ice-cooled chest for transport to the laboratory following chain-of-custody procedures.

Copies of the boring logs, including the soil descriptions and PID readings, are provided in Attachment A.

Field Procedures

Sample collection was conducted in accordance with the Ecology-approved RI Work Plan (Weston, 1998) as subsequently amended, which details field methods for sample collection, sample designation, equipment decontamination, and documentation. These methods include soil sampling procedures following U.S. Environmental Protection Agency (EPA) Method 5035A (EPA, 2002) and Ecology's Implementation Memo #5 (Ecology, 2004). Peristaltic pumps were used to collect groundwater samples from the temporary wells. Tables 1 and 2 list the specific samples collected from each location.

Analytical Methods

The samples were analyzed by Analytical Resources, Incorporated, of Tukwila, Washington. All soil and groundwater samples collected were analyzed for vinyl chloride, trichloroethene (TCE), and *cis*-1,2-dichloroethene (*cis*-1,2-DCE) using EPA Method 8260 low level 20-mL purge.

Quality Control

The quality assurance and quality control (QA/QC) procedures outlined in the Quality Assurance Project Plan (QAPP) presented in Section 6.0 of the approved RI Work Plan (Weston, 1998) were followed for sampling performed during this project. All analytical data generated by the

laboratory were reviewed in accordance with the QAPP. The data validation memorandum and the analytical data are presented in Attachment B.

Waste Management

Management of wastes generated during field activities followed the guidelines described in the approved RI Work Plan (Weston, 1998). Soil cuttings, decontamination water, and groundwater from the push probe sampling activities were managed by Boeing.

Results

Results of laboratory analysis of soil and groundwater samples are summarized in Tables 1 and 2, respectively. The PoC cleanup levels for VC were used to evaluate soil and groundwater results.

TCE was the only compound detected in soil samples. It was detected in one sample, collected from the downgradient boring location PP164, at a concentration of 1.9 µg/kg. This concentration is an order of magnitude lower than any of the Ecology-approved TCE cleanup levels established for other AOCs or Solid Waste Management Units (SWMUs) at the Facility.

VC and *cis*-1,2-DCE were detected in groundwater samples collected from two of the five boring locations, PP160 and PP161. Detected concentrations of *cis*-1,2-DCE were 0.2 and 0.5 µg/L, which is several orders of magnitude lower than the Ecology-approved *cis*-1,2-DCE cleanup level established for other AOCs/SWMUs at the Facility. The concentration of VC from samples collected at PP160 and PP161 was 0.6 and 2.7 µg/L, respectively. Both of these concentrations are above the PoC cleanup level of 0.2 µg/L proposed for several of the other AOCs/SWMUs at the Facility.

Recommendations

AOC-034 and AOC-035 were previously evaluated as part of the RI (Weston, 2001). VOC levels detected in soil and groundwater during the RI were not high enough to warrant further investigation at the time or inclusion in the Feasibility Study (FS) Work Plan (Geomatrix, 2004).

Based on the results of this 2006 investigation in relation to the renegotiated vinyl chloride PoC cleanup levels, AOC-034 and AOC-035 should be considered in the FS. Specific cleanup levels for this area will be developed during the Feasibility Study process. When the FS is finalized, these additional data will be considered and reevaluated to determine a preferred remedy for these AOCs.

References

Ecology (Washington State Department of), 2004, Implementation Memorandum #5, Collecting and Preparing Soil Samples for VOC Analysis, 04-09-087, June 17.

Geomatrix Consultants, Inc. (Geomatrix), 2004, Final Feasibility Study Work Plan: Prepared for the Boeing Company, June.

Geomatrix, 2006, AOC-034 and -035 Work Plan, Prepared for the Boeing Company, December.

EPA (U.S. Environmental Protection Agency), 2002, EPA Method 5035A, Closed-System Purge-and-Trap and Extraction for Volatile Organics in Soil and Waste Samples, EPA SW-846, July.

Weston (Roy F. Weston), 1998, Remedial Investigation Work Plan, Boeing Renton Plant, Renton, Washington.

Weston, 2001, Remedial Investigation Report, Boeing Renton Plant, Renton, Washington, August.

TABLES

TABLE 1

2006 SOIL INVESTIGATION RESULTS FOR AOC-034 AND AOC-035 [1]

Boeing Renton Facility
Renton, Washington

Constituent	PoC Cleanup Level	Sample Identifier					
		RI-SB-PP160-0-0040 12/14/2006	RI-SB-PP161-0-0040 12/14/2006	RI-SB-PP162-0-0040 12/14/2006	RI-SB-PP163-0-0040 12/14/2006	RI-SB-PP164-0-0040 12/14/2006	RI-SB-PP164-0-1040 [2] 12/14/2006
cis-1,2-Dichloroethene	--	<0.8 U [3]	<0.9 U	<1.2 U	<1.1 U	<1.1 U	<0.8 U
Trichloroethene	--	<0.8 U	<0.9 U	<1.2 U	<1.1 U	1.9	<0.8 U
Vinyl Chloride	1.8	<0.8 U	<0.9 U	<1.2 U	<1.1 U	<1.1 U	<0.8 U

Notes:

1. VOC Concentrations in µg/kg
2. Field duplicate
3. U = the analyte was not detected at value to the left which is the detection limit

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TABLE 2

2006 GROUNDWATER INVESTIGATION RESULTS FOR AOC-034 AND AOC-035 [1]

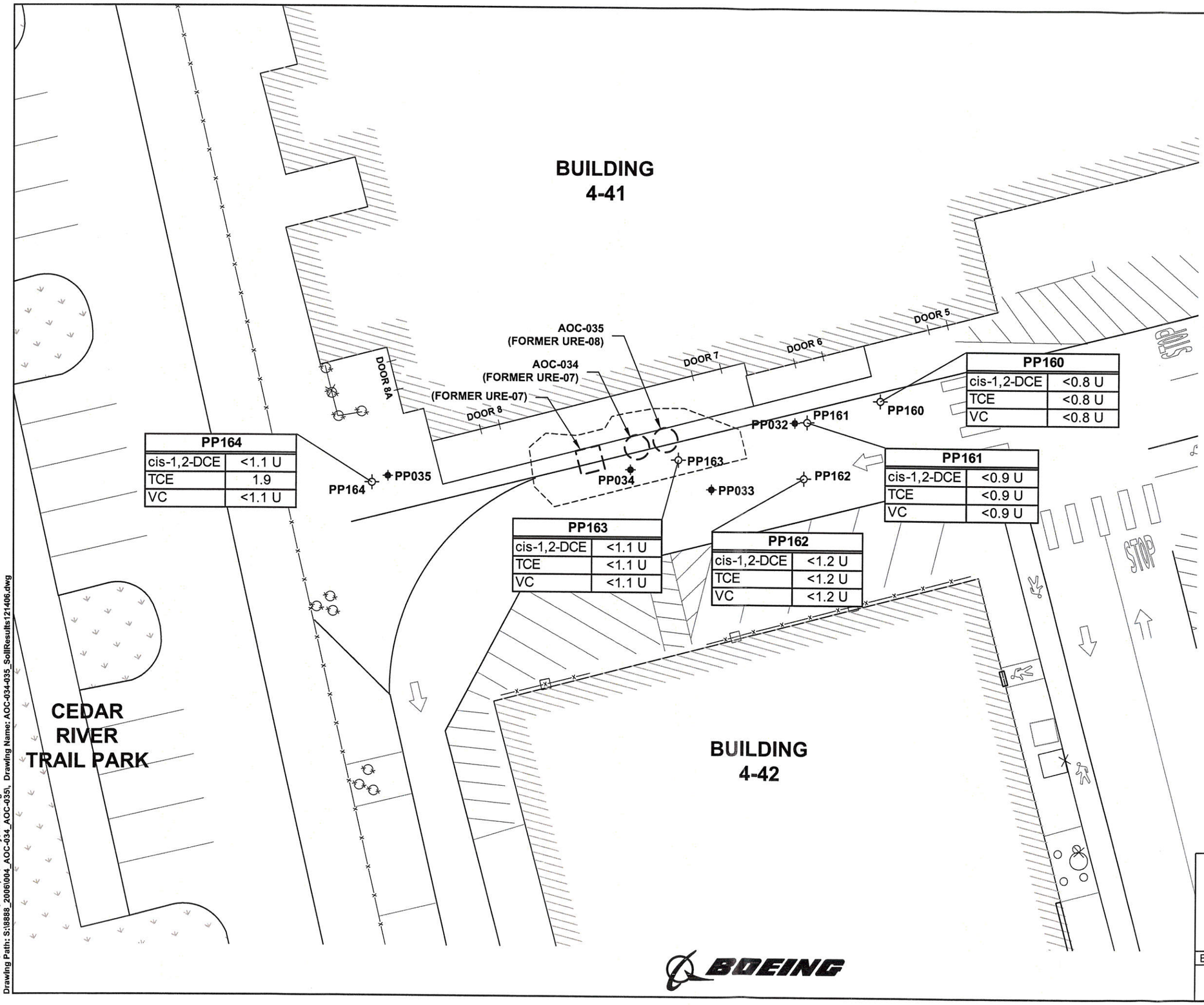
Boeing Renton Facility
Renton, Washington

Constituent	FSWP [2] Cleanup Level	Sample Identifier					
		RI-GW-PP160-0-0090 12/14/2006	RI-GW-PP161-0-0090 12/14/2006	RI-GW-PP162-0-0090 12/14/2006	RI-GW-PP163-0-0090 12/14/2006	RI-GW-PP163-0-1090 [3] 12/14/2006	RI-GW-PP164-0-0090 12/14/2006
cis -1,2-Dichloroethene	--	0.2	0.5	<0.2 U [4]	<0.2 U	<0.2 U	<0.2 U
Trichloroethene	--	<0.2 U	<0.2 U	<0.2 U	<0.2 U	<0.2 U	<0.2 U
Vinyl Chloride	0.2	0.6	2.7	<0.2 U	<0.2 U	<0.2 U	<0.2 U

Notes:

1. VOCs concentrations in µg/L
2. FSWP = Feasibility Study Work Plan
3. Field duplicate
4. U = the analyte was not detected at value to the left which is the detection limit.

FIGURES



PP164	
cis-1,2-DCE	<1.1 U
TCE	1.9
VC	<1.1 U

PP163	
cis-1,2-DCE	<1.1 U
TCE	<1.1 U
VC	<1.1 U

PP162	
cis-1,2-DCE	<1.2 U
TCE	<1.2 U
VC	<1.2 U

PP161	
cis-1,2-DCE	<0.9 U
TCE	<0.9 U
VC	<0.9 U

PP160	
cis-1,2-DCE	<0.8 U
TCE	<0.8 U
VC	<0.8 U

EXPLANATION

PP162 — 12/14/2006 Push-Probe Soil and Groundwater Sample Location

PP032 — Historical Push-Probe Location

Limits of Previous Excavation (Hart Crowser 1987)

Former UST Location

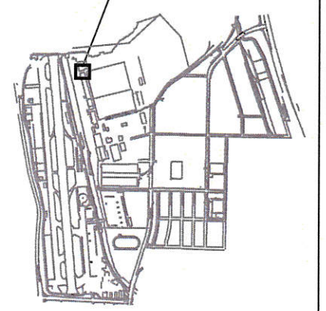
Fence

VOC	Volatile Organic Compound
cis-1,2-DCE	cis-1,2-Dichloroethene
TCE	Trichloroethene
VC	Vinyl Chloride
U	Analyte was not detected above value shown

NOTES

1. CONCENTRATIONS IN µg/kg
2. BASEMAP COMPILED BY DUANE HARTMAN & ASSOCIATES INC., DECEMBER, 1994

AOC-034 and AOC-035 LOCATION MAP



BOEING RENTON FACILITY MAP

N

0 10 20

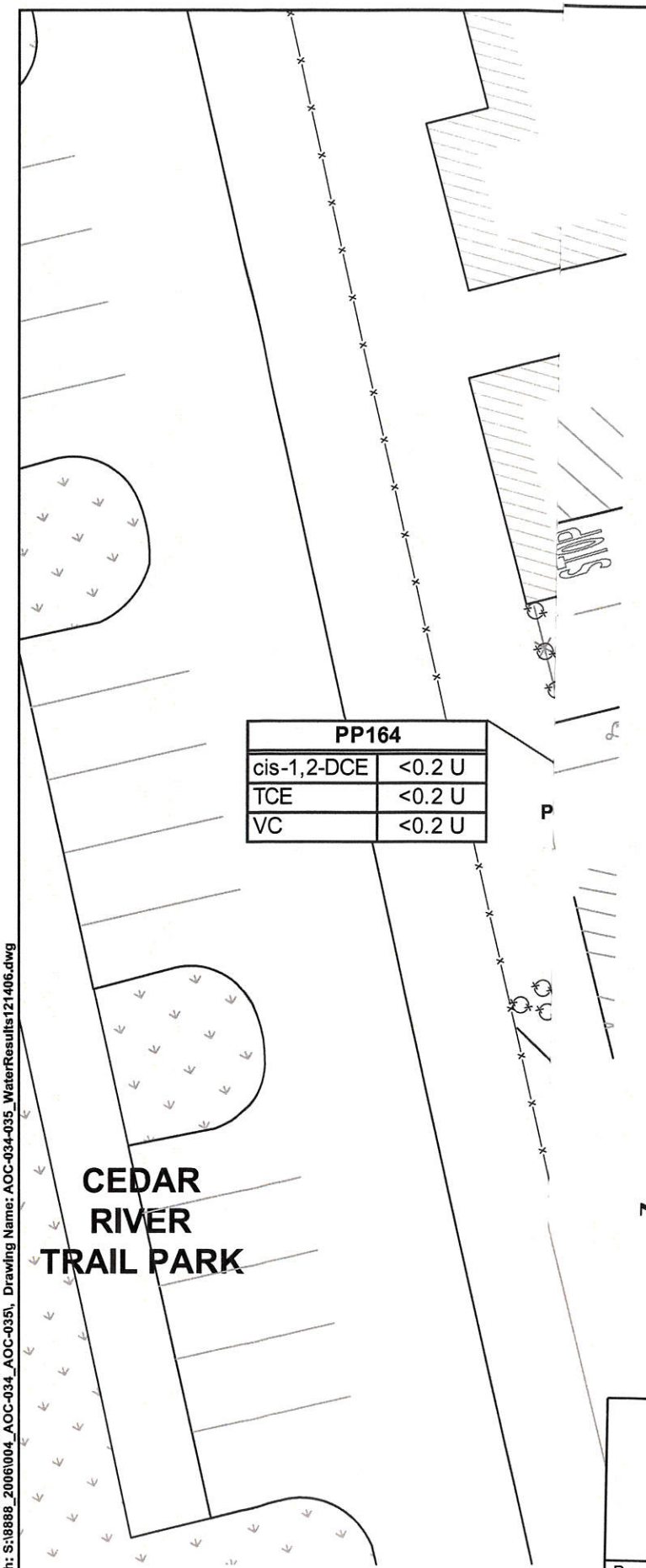
APPROXIMATE SCALE IN FEET

BOEING

SOIL RESULTS
AOC-034 and AOC-035
Boeing Renton Plant
Renton, Washington

By: APS	Date: 01/22/07	Project No. 8888
Geomatrix		Figure 1

Plot Date: 01/22/07 - 9:50am Plotted by: astenberg
Drawing Path: S:\8888_2006\004_AOC-034_AOC-035\ Drawing Name: AOC-034-035_SoilResults121406.dwg



EXPLANATION

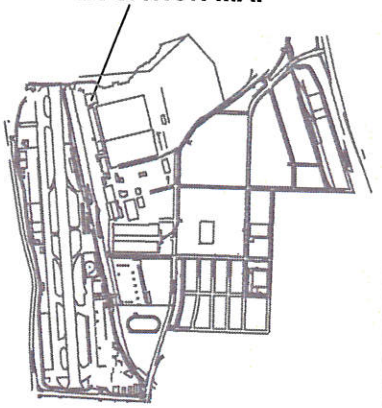
- PP162 — 12/14/2006 Push-Probe Soil and Groundwater Sample Location
- PP032 — Historical Push-Probe Location
- Limits of Previous Excavation (Hart Crowser 1987)
- Former UST Location
- Fence

VOC	Volatile Organic Compound
cis-1,2-DCE	cis-1,2-Dichloroethene
TCE	Trichloroethene
VC	Vinyl Chloride
U	Analyte was not detected above value shown

NOTES

1. CONCENTRATIONS IN µg/L
2. BASEMAP COMPILED BY DUANE HARTMAN & ASSOCIATES INC., DECEMBER, 1994

AOC-034 and AOC-035 LOCATION MAP



BOEING RENTON FACILITY MAP

N

0 10 20

APPROXIMATE SCALE IN FEET

GROUNDWATER RESULTS
AOC-034 and AOC-035
Boeing Renton Plant
Renton, Washington

By: APS	Date: 01/22/07	Project No. 8888
Geomatrix		Figure 2

Plot Date: 01/22/07 - 9:51am, Plotted by: astenberg
Drawing Path: S:\8888_2006\004_AOC-034_AOC-035\, Drawing Name: AOC-034-035_WaterResults121406.dwg

ATTACHMENT A

Boring Logs

PROJECT: Boeing Renton AOC-034, -035 Renton, Washington	**Log of Boring No. PP160**
BORING LOCATION: N 185274.5; E 1299150.0	ELEVATION AND DATUM: Not surveyed; datum is ground surface
DRILLING CONTRACTOR: Cascade Drilling, Inc.	DATE STARTED: 12/14/06 / DATE FINISHED: 12/14/06
DRILLING METHOD: Direct push	TOTAL DEPTH (ft.): 10.0 / MEASURING POINT: Ground surface
DRILLING EQUIPMENT: CME-25	DEPTH TO WATER (ft.) FIRST: 4.0 / COMPL.: NA
SAMPLING METHOD: Geoprobe macro-core sampler [4' x 2"]	LOGGED BY: T. Gray
HAMMER WEIGHT: NA / DROP: NA	RESPONSIBLE PROFESSIONAL: T. Gray / REG. NO.: L.Hg. 2557

DEPTH (feet)	SAMPLES: Sample No.	SAMPLES: Sample	SAMPLES: Blows/Foot	OVM READING (ppm)	DESCRIPTION NAME (USCS): color, moist, % by wt., plast. density, structure, cementation, react. w/HCl, geo. inter. Surface Elevation: Not surveyed	REMARKS
0					CONCRETE(1" asphalt at top)	
1					POORLY GRADED SAND (SP): dark grayish brown (2.5Y 4/2), moist, 95% fine sand, 5% fines	
2				0		OVM = ThermoEnvironmental 580B PID calibrated with 100 ppm isobutylene.
3	RI-SB-PP160-0-0040					
4					▼ wet	Grab groundwater sample RI-GW-PP160-0-0090 collected through 3/4-inch OD PVC screen (0.010" slot) from 4 to 9 feet bgs.
5						
6				0	SILT with SAND (ML): dark greenish gray (10Y 4/1), wet, 80% fines, 20% fine sand, nonplastic, firm	
7						
8					POORLY GRADED SAND (SP): very dark greenish gray (5GY 3/1), wet, 95% fine to medium sand, 5% fines	
9				0		
10					Bottom of boring at 10.0 feet.	Borehole abandoned with hydrated medium bentonite chips to ground surface, then sealed with asphalt.
11						
12						
13						
14						
15						

PROJECT: Boeing Renton AOC-034, -035
Renton, Washington

Log of Boring No. PP161

BORING LOCATION: N 185270.1; E 1299134.9

ELEVATION AND DATUM: Not surveyed; datum is ground surface

DRILLING CONTRACTOR: Cascade Drilling, Inc.

DATE STARTED: 12/14/06 | DATE FINISHED: 12/14/06

DRILLING METHOD: Direct push

TOTAL DEPTH (ft.): 10.0 | MEASURING POINT: Ground surface

DRILLING EQUIPMENT: CME-25

DEPTH TO WATER (ft.) | FIRST: 4.5 | COMPL.: NA

SAMPLING METHOD: Geoprobe macro-core sampler [4' x 2"]

LOGGED BY: T. Gray

HAMMER WEIGHT: NA | DROP: NA

RESPONSIBLE PROFESSIONAL: T. Gray | REG. NO.: L.Hg. 2557

DEPTH (feet)	SAMPLES: Sample No.	SAMPLES: Sample	SAMPLES: Blows/Foot	OVM READING (ppm)	DESCRIPTION: NAME (USCS): color, moist, % by wt., plast. density, structure, cementation, react. w/HCl, geo. inter.	REMARKS
					Surface Elevation: Not surveyed	
0					CONCRETE(1" asphalt at top)	
1					POORLY GRADED SAND (SP): dark grayish brown (2.5Y 4/2), moist, 95% fine sand, 5% fines	
2				0		OVM = ThermoEnvironmental 580B PID calibrated with 100 ppm isobutylene.
3	RI-SB-PP161-0-0040					
4						
5					▼ wet	Grab groundwater sample RI-GW-PP161-0-0090 collected through 3/4-inch OD PVC screen (0.010" slot) from 4 to 9 feet bgs.
6				0	SILT with SAND (ML): dark greenish gray (10Y 4/1), wet, 80% fines, 20% fine sand, nonplastic, firm	
7						
8					POORLY GRADED SAND (SP): very dark greenish gray (5GY 3/1), wet, 95% fine to medium sand, 5% fines	
9				0		
10					wood fragments	Borehole abandoned with hydrated medium bentonite chips to ground surface, then sealed with asphalt.
					Bottom of boring at 10.0 feet.	
11						
12						
13						
14						
15						

PROJECT: Boeing Renton AOC-034, -035 Renton, Washington	**Log of Boring No. PP162**
BORING LOCATION: N 185258.6; E 1299134.3	ELEVATION AND DATUM: Not surveyed; datum is ground surface
DRILLING CONTRACTOR: Cascade Drilling, Inc.	DATE STARTED: 12/14/06 / DATE FINISHED: 12/14/06
DRILLING METHOD: Direct push	TOTAL DEPTH (ft.): 10.0 / MEASURING POINT: Ground surface
DRILLING EQUIPMENT: CME-25	DEPTH TO WATER (ft.) FIRST: 4.0 / COMPL.: NA
SAMPLING METHOD: Geoprobe macro-core sampler [4' x 2"]	LOGGED BY: T. Gray
HAMMER WEIGHT: NA / DROP: NA	RESPONSIBLE PROFESSIONAL: T. Gray / REG. NO.: L.Hg. 2557

DEPTH (feet)	SAMPLES: Sample No.	SAMPLES: Sample	SAMPLES: Blows/Foot	OVM READING (ppm)	DESCRIPTION NAME (USCS): color, moist, % by wt., plast. density, structure, cementation, react. w/HCl, geo. inter. Surface Elevation: Not surveyed	REMARKS
0					ASPHALT	
1	RI-SB-PP162-0-0040				POORLY GRADED SAND (SP): olive brown (2.5Y 4/3), moist, 95% fine sand, 5% fines	
2				0	dark greenish gray (10GY 4/1)	OVM = ThermoEnvironmental 580B PID calibrated with 100 ppm isobutylene.
3						
4					wet	Grab groundwater sample RI-GW-PP162-0-0090 collected through 3/4-inch OD PVC screen (0.010" slot) from 4 to 9 feet bgs.
5					SILT with SAND (ML): dark greenish gray (10Y 4/1), wet, 80% fines, 20% fine sand, nonplastic, firm	
6				0		
7					SILT (ML)	
8					POORLY GRADED SAND (SP): very dark greenish gray (5GY 3/1), wet, 95% fine to medium sand, 5% fines	
9				0		
10					Bottom of boring at 10.0 feet.	Borehole abandoned with hydrated medium bentonite chips to ground surface, then sealed with asphalt.
11						
12						
13						
14						
15						

PROJECT: Boeing Renton AOC-034, -035
Renton, Washington

Log of Boring No. PP163

BORING LOCATION: N 185262.2; E 1299108.5

ELEVATION AND DATUM: Not surveyed; datum is ground surface

DRILLING CONTRACTOR: Cascade Drilling, Inc.

DATE STARTED: 12/14/06 | DATE FINISHED: 12/14/06

DRILLING METHOD: Direct push

TOTAL DEPTH (ft.): 10.0 | MEASURING POINT: Ground surface

DRILLING EQUIPMENT: CME-25

DEPTH TO WATER (ft.) | FIRST: 4.0 | COMPL.: NA

SAMPLING METHOD: Geoprobe macro-core sampler [4' x 2"]

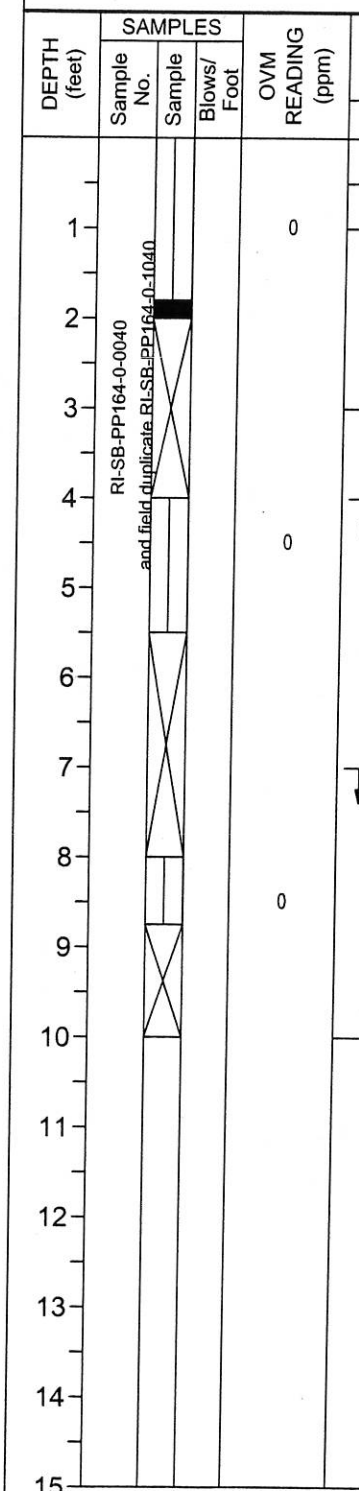
LOGGED BY: T. Gray

HAMMER WEIGHT: NA | DROP: NA

RESPONSIBLE PROFESSIONAL: T. Gray | REG. NO.: L.Hg. 2557

DEPTH (feet)	SAMPLES: Sample No.	SAMPLES: Sample	SAMPLES: Blows/Foot	OVM READING (ppm)	DESCRIPTION NAME (USCS): color, moist, % by wt., plast. density, structure, cementation, react. w/HCl, geo. inter.	REMARKS
					Surface Elevation: Not surveyed	
0					CONCRETE(1" asphalt at top)	
1						
2	RI-SB-PP163-0-0040			0	SILTY GRAVEL with SAND (GM): greenish gray (10Y 5/1), dry, 45% fine gravel, 40% fine to medium sand, 15% nonplastic fines	OVM = ThermoEnvironmental 580B PID calibrated with 100 ppm isobutylene.
3						
4					▼ wet	Grab groundwater sample RI-GW-PP163-0-0090 and field duplicate RI-GW-PP163-0-1090 collected through 3/4-inch OD PVC screen (0.010" slot) from 4 to 9 feet bgs.
5					pea gravel underlain by fabric	
6				0	SILT with SAND (ML): dark greenish gray (10Y 4/1), wet, 80% fines, 20% fine sand, nonplastic, firm	
7						
8					SILTY SAND (SM): very dark greenish gray (5GY 3/1), wet, 60% fine sand, 40% nonplastic fines	
9				0		Borehole abandoned with hydrated medium bentonite chips to ground surface, then sealed with asphalt.
10					Bottom of boring at 10.0 feet.	
11						
12						
13						
14						
15						

PROJECT: Boeing Renton AOC-034, -035 Renton, Washington	**Log of Boring No. PP164**
BORING LOCATION: N 185257.3; E 1299045.8	ELEVATION AND DATUM: Not surveyed; datum is ground surface
DRILLING CONTRACTOR: Cascade Drilling, Inc.	DATE STARTED: 12/14/06 / DATE FINISHED: 12/14/06
DRILLING METHOD: Direct push	TOTAL DEPTH (ft.): 10.0 / MEASURING POINT: Ground surface
DRILLING EQUIPMENT: CME-25	DEPTH TO WATER (ft.) FIRST ~4.0 / COMPL. NA
SAMPLING METHOD: Geoprobe macro-core sampler [4' x 2"]	LOGGED BY: T. Gray
HAMMER WEIGHT: NA / DROP: NA	RESPONSIBLE PROFESSIONAL: T. Gray / REG. NO. L.Hg. 2557



DESCRIPTION
NAME (USCS): color, moist, % by wt., plast. density, structure, cementation, react. w/HCl, geo. inter.

Surface Elevation: Not surveyed

ASPHALT

POORLY GRADED GRAVEL (GP): angular

POORLY GRADED SAND (SP): dark grayish brown (2.5Y 4/2), wet, 95% fine sand, 5% fines, nonplastic silt stringers ~ 1/8" thick

SILTY SAND (SM): dark grayish brown (2.5Y 4/2), wet, 75% fine to coarse sand, 25% nonplastic fines

wet

45% fines

Bottom of boring at 10.0 feet.

REMARKS

OVM = ThermoEnvironmental 580B PID calibrated with 100 ppm isobutylene.

Grab groundwater sample RI-GW-PP164-0-0090 collected through 3/4-inch OD PVC screen (0.010" slot) from 4 to 9 feet bgs.

Borehole abandoned with hydrated medium bentonite chips to ground surface, then sealed with asphalt.

ATTACHMENT B

Data Validation Memorandum and Analytical Data

Geomatrix

Memorandum

TO:	Dave Haddock, Project Manager (Geomatrix)	**DATE:**	January 9, 2007
FROM:	Tasya Gray, Geomatrix	**PROJ. NO.:**	8888
CC:	Project File	**PROJ. NAME:**	Boeing Renton
SUBJECT:	Summary Data Quality Review December 2006 Boeing Renton AOC-034, -035 Investigation ARI SDG: KI86		

This memo presents the summary data quality review of 5 primary groundwater samples, one field duplicate groundwater sample, 5 primary soil samples, one field duplicate soil sample, and one trip blank sample collected December 14, 2006. The samples were submitted to Analytical Resources, Inc. (ARI), a Washington State Department of Ecology (Ecology) accredited laboratory, located in Tukwila, Washington. The samples were analyzed for the following:

- Volatile Organic Compounds (VOCs) by EPA Method 8260B, using low level 20mL purge

The samples and the analyses conducted on the samples are listed in the table below.

Sample ID	Laboratory Sample ID	Requested Analyses
RI-SB-PP160-0-0040	KI86A	VOCs
RI-GW-PP160-0-0090	KI86B	VOCs
RI-SB-PP161-0-0040	KI86C	VOCs
RI-GW-PP161-0-0090	KI86D	VOCs
RI-SB-PP162-0-0040	KI86E	VOCs
RI-GW-PP162-0-0090	KI86F	VOCs
RI-SB-PP163-0-0040	KI86G	VOCs
RI-GW-PP163-0-0090	KI86H	VOCs
RI-GW-PP163-0-1090	KI86I	VOCs
RI-SB-PP164-0-0040	KI86J	VOCs
RI-SB-PP164-0-1040	KI86K	VOCs
RI-GW-PP164-0-0090	KI86L	VOCs
Trip Blank	KI86M	VOCs

Data were reviewed in accordance with the appropriate method procedures and criteria documented in the "Quality Assurance Project Plan" (QAPP), Section 6.0 of the "Remedial Investigation Work Plan" (RIWP), for the Boeing-Renton Plant, Renton, Washington, April 1999 and the "Draft QAPP Addendum" of the "Draft Remedial Investigation Work Plan

Addenda," for the Boeing Renton Facility, Renton, Washington, November 2006. The control limits provided in the QAPP are advisory limits; therefore, the most current control limits provided by the laboratory were used to evaluate the quality control data. In cases where the laboratory did not track limits for an analyte, the limits in the QAPP were used.

Hold times, method/trip blanks, surrogate recoveries, laboratory control samples, matrix spike/matrix spike duplicates, field duplicates, and reporting limits were reviewed where available to assess compliance with applicable methods. If qualification was required, data were qualified based on the definitions and use of qualifying flags outlined in the EPA documents "USEPA Contract Laboratory Program (CLP) National Functional Guidelines for Organic Data Review," October 1999.

Samples were received by ARI on December 14, 2006. The cooler temperatures were within the acceptable temperature range of 4 ± 2°C. There were no discrepancies noted at the time of receipt.

ORGANIC ANALYSES

Samples were analyzed for VOCs. Laboratory data were evaluated for the following parameters.

Preservation and Holding Times – Acceptable

Blanks – Acceptable

Surrogates – Acceptable except as noted

> Bromofluorobenzene was recovered greater than the control limit of 113% in the analysis of samples RI-GW-PP161-0-0090 at 116% and RI-GW-PP163-0-0090 at 115%. Both samples were reanalyzed with all surrogate recoveries within control limits. Results are reported from the reanalyses of these samples.

Laboratory Control Sample/Laboratory Control Sample Duplicates (LCS/LCSD) – Acceptable

Matrix Spike/Matrix Spike Duplicates (MS/MSD) – Acceptable except as noted:

> Additional sample volume was not submitted for soil MS/MSD analyses. Samples are evaluated based on LCS/LCSD results. Groundwater MS/MSD results were within control limits.

Field Duplicates – Acceptable

> One field duplicate was submitted for soil and one for groundwater during this sampling event, meeting the project frequency requirement of 5% or 1 for every 20 samples. The

field duplicate relative percent differences (RPDs) are within the project-specific control limit of 30 percent. Primary and duplicate results are summarized in the table below. The RPD is not calculated if the primary and duplicate results are not greater than five times the reporting limit, as indicated on the table below with "NC".

Sample ID/ Field Duplicate ID	Analyte	Primary Result	Duplicate Result	RPD (%)
RI-GW-PP163-0-0090/ RI-GW-PP163-0-1090	all analytes	ND	ND	--
RI-SB-PP164-0-0040/ RI-SB-PP164-0-1040	trichloroethene	1.9 µg/kg	<0.8 µg/kg	NC

Note: ND = not detected

Reporting Limits – Acceptable

Reporting limits met the project objectives of 0.2 µg/L for groundwater and 1.8 µg/kg for soil.

OVERALL ASSESSMENT OF DATA

The completeness of SDG KI86 is 100%. The usefulness of this data is based on EPA guidance documents listed in the introduction to this report. Few problems were identified and analytical performance was generally within specified limits. The data meet the project's data quality objectives.

Sample ID	Qualified Analyte	Qualified Result	Qualifier Reason
RI-SB-PP160-0-0040	None		
RI-GW-PP160-0-0090	None		
RI-SB-PP161-0-0040	None		
RI-GW-PP161-0-0090	None		
RI-SB-PP162-0-0040	None		
RI-GW-PP162-0-0090	None		
RI-SB-PP163-0-0040	None		
RI-GW-PP163-0-0090	None		
RI-GW-PP163-0-1090	None		
RI-SB-PP164-0-0040	None		
RI-SB-PP164-0-1040	None		
RI-GW-PP164-0-0090	None		
Trip Blank	None		

Analytical Resources, Incorporated
Analytical Chemists and Consultants

December 28, 2006

David R. Haddock
Geomatrix Consultants, Inc.
One Union Square
600 University Street, Suite 1020
Seattle, WA 98101

RE: Client Project: Boeing Renton AOC- 034, 035 (8888)
ARI Job No: KI86

Dear Mr. Haddock:

Please find enclosed original chain of custody (COC) and the analytical results for the project referenced above. Analytical Resources, Inc. accepted six water samples, six soil samples and a trip blank on December 14, 2006.

Samples were analyzed for volatile organics (trichloroethene, cis-1,2-dichloroethene, vinyl chloride), as requested on the COC. Per Carl Bach in November 2005, the samples were requested to be analyzed at 20mL purge levels to achieve a vinyl chloride reporting limit of 0.2ug/L.

The LCSD is out of control high for cis-1, 2- Dichloroethene for the soils 8260 analysis on 12/19/06. The LCS was in control, therefore no further corrective action was taken.

The surrogate Bromofluorobenzene is out of control high for samples **RI-GW-PP161-0-0090** and **RI-GW-PP163-0-0090** for the waters 8260 analysis 12/20/06. The samples were re-analyzed and both sets of data have been included for your review. No further corrective action was needed.

There were no other anomalies associated with these samples.

Copies of these reports and all associated raw data will be kept on file. If you have any questions or require additional information, please contact me at your convenience.

Sincerely,
ANALYTICAL RESOURCES, INC.

Kelly Bottem
Project Manager
(206) 695-6211
kellyb@arilabs.com
www.arilabs.com

Enclosures

cc: Carl Bach, The Boeing Company, carl.m.bach@Boeing.com

Chain of Custody Record & Laboratory Analysis Request

ARI Assigned Number: RI86	Turn-around Requested: Standard	Page: 1 of 2	
ARI Client Company: Geomatrix	Phone: 206-342-1760	Date: 12/14/06	Ice Present? Y
Client Contact: Dave Haddock		No. of Coolers: 1	Cooler Temps: 5.6°
Client Project Name: Boeing Renton AOC-034, -035			
Client Project #: 8888	Samplers: Tasya Gray		

Analytical Resources, Incorporated
Analytical Chemists and Consultants
4611 South 134th Place, Suite 100
Tukwila, WA 98168
206-695-6200 206-695-6201 (fax)

Sample ID	Date	Time	Matrix	No. Containers	Analysis Requested: VOCs * 8260D	Notes/Comments
RI-SB-PP160-0-0040	12/14/06	0850	S	4	X	
RI-GW-PP160-0-0090		0934	W	3	X	
RI-SB-PP161-0-0040		0959	S	4	X	
RI-GW-PP161-0-0090		1020	W	3	X	
RI-SB-PP162-0-0040		1042	S	4	X	
RI-GW-PP162-0-0090		1115	W	3	X	
RI-SB-PP163-0-0040		1136	S	4	X	
RI-GW-PP163-0-0090		1230	W	3	X	
RI-GW-PP163-0-1090		1230	W	3	X	
RI-SB-PP164-0-0040	—	1259	S	4	X	

Comments/Special Instructions:
* Trichloroethene, cis-1,2-dichloroethene, Vinyl chloride only
20ml purge-low level

	Relinquished by:	Received by:	Relinquished by:	Received by:
(Signature)	Tasya N Gray	Bob Congleton		
Printed Name:	Tasya Gray	Bob Congleton		
Company:	Geomatrix	ARI		
Date & Time:	12/14/06 1520	12/14/06 1520		

Limits of Liability: *ARI will perform all requested services in accordance with appropriate methodology following ARI Standard Operating Procedures and the ARI Quality Assurance Program. This program meets standards for the industry. The total liability of ARI, its officers, agents, employees, or successors, arising out of or in connection with the requested services, shall not exceed the Invoiced amount for said services. The acceptance by the client of a proposal for services by ARI release ARI from any liability in excess thereof, not withstanding any provision to the contrary in any contract, purchase order or co-signed agreement between ARI and the Client.*

Sample Retention Policy: All samples submitted to ARI will be appropriately discarded no sooner than 90 days after receipt or 60 days after submission of hardcopy data, whichever is longer, unless alternate retention schedules have been established by work-order or contract.

Chain of Custody Record & Laboratory Analysis Request

ARI Assigned Number: KI86	Turn-around Requested:	Page: 2 of 2	
ARI Client Company:	Phone:	Date: 12/14/06	Ice Present? Y
Client Contact:		No. of Coolers: 1	Cooler Temps: 5.6°
Client Project Name: same as P.1			
Client Project #:	Samplers:		

Analytical Resources, Incorporated
Analytical Chemists and Consultants
4611 South 134th Place, Suite 100
Tukwila, WA 98168
206-695-6200 206-695-6201 (fax)

Sample ID	Date	Time	Matrix	No. Containers	Analysis Requested: VOCs* 8260	Notes/Comments
RI-SB-PP164-0-1040	12/14/06	1259	S	4	X	
RI-GW-PP164-0-0090	"	1335	W	3	X	
TripBlank	"		W		X	

Comments/Special Instructions	Relinquished by: (Signature)	Received by: (Signature)	Relinquished by: (Signature)	Received by: (Signature)
	Printed Name: Tasya Gray	Printed Name: Bob Congleton	Printed Name:	Printed Name:
	Company: Geomatrix	Company: ARI	Company:	Company:
	Date & Time: 12/14/06 1520	Date & Time: 12/14/06 1520	Date & Time:	Date & Time:

Limits of Liability: *ARI will perform all requested services in accordance with appropriate methodology following ARI Standard Operating Procedures and the ARI Quality Assurance Program. This program meets standards for the industry. The total liability of ARI, its officers, agents, employees, or successors, arising out of or in connection with the requested services, shall not exceed the Invoiced amount for said services. The acceptance by the client of a proposal for services by ARI release ARI from any liability in excess thereof, not withstanding any provision to the contrary in any contract, purchase order or co-signed agreement between ARI and the Client.*

Sample Retention Policy: All samples submitted to ARI will be appropriately discarded no sooner than 90 days after receipt or 60 days after submission of hardcopy data, whichever is longer, unless alternate retention schedules have been established by work-order or contract.

Cooler Receipt Form

ANALYTICAL RESOURCES INCORPORATED

ARI Client: GMX/BOEING Project Name: AOC-034, 35

COC NO.: _____ Delivered By: HAND

Tracking NO.: _____ Date: _____

ARI Job No.: _____ Lims NO.: _____

Preliminary Examination Phase:

1. Were intact, properly signed and dated custody seals attached To the outside of the cooler? ..... YES (NO)
2. Were custody papers included with the cooler ..... (YES) NO
3. Were custody papers properly filled out (ink, signed etc.)? ..... (YES) NO
4. Complete custody forms and attach all shipping documents ..... OK (NA)

Cooler Accepted BY: BC Complete Date: 12/14/06 Time: 1520

Log-IN Phase:

5. Was a temperature blank include in the cooler? ..... YES (NO)
6. Record Cooler Temperature..... 5.6° °C
7. What kind of packing material was used? ..... ICE
8. Was sufficient ice used (if appropriate)? ..... (YES) NO
9. Were all bottles sealed in separate plastic bags? ..... YES (NO)
10. Did all bottles arrive in good condition (unbroken)? ..... YES NO
11. Were all bottle labels complete and legible? ..... YES NO
12. Did all bottle labels and tags agree with custody papers? ..... YES NO
13. Were all bottles used correct for the requested analyses? ..... (YES) NO
14. Do any of the analyses (bottles) require preservative? (If so, Preservation checklist must be attached) ..... YES (NO)
15. Were all VOA vials free of air bubbles? ..... YES NO
16. Was sufficient amount of sample sent in each bottle? ..... YES NO
17. Notify Project Manager of any discrepancies or concerns..... (OK) NA

Cooler Opened By: BC Date: 12/14/06 Time 1520

Explain any discrepancies or negative responses:

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260B

Sample ID: RI-GW-PP160-0-0090
SAMPLE

Lab Sample ID: KI86B
LIMS ID: 06-24870
Matrix: Water
Data Release Authorized:
Reported: 12/28/06

QC Report No: KI86-The Boeing Company
Project: AOC-034,035
Boeing Renton
Date Sampled: 12/14/06
Date Received: 12/14/06

Instrument/Analyst: FINN3/JLM
Date Analyzed: 12/20/06 18:53

Sample Amount: 20.0 mL
Purge Volume: 20.0 mL

CAS Number	Analyte	RL	Result	Q
75-01-4	Vinyl Chloride	0.2	0.6	
156-59-2	cis-1,2-Dichloroethene	0.2	0.2	
79-01-6	Trichloroethene	0.2	< 0.2	U

Reported in µg/L (ppb)

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	127%
d8-Toluene	115%
Bromofluorobenzene	110%
d4-1,2-Dichlorobenzene	120%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260B

Sample ID: RI-GW-PP161-0-0090
SAMPLE

Lab Sample ID: KI86D
LIMS ID: 06-24872
Matrix: Water
Data Release Authorized:
Reported: 12/28/06

QC Report No: KI86-The Boeing Company
Project: AOC-034,035
Boeing Renton
Date Sampled: 12/14/06
Date Received: 12/14/06

Instrument/Analyst: FINN3/JLM
Date Analyzed: 12/20/06 19:21

Sample Amount: 20.0 mL
Purge Volume: 20.0 mL

CAS Number	Analyte	RL	Result	Q	
75-01-4	Vinyl Chloride	0.2	2.8		DNR
156-59-2	cis-1,2-Dichloroethene	0.2	0.5		DNR
79-01-6	Trichloroethene	0.2	< 0.2	U	DNR

Reported in µg/L (ppb)

Volatile Surrogate Recovery	
d4-1,2-Dichloroethane	130%
d8-Toluene	114%
Bromofluorobenzene	116%
d4-1,2-Dichlorobenzene	118%

TGT 1/4/07

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260B

Sample ID: RI-GW-PP161-0-0090
REANALYSIS

Lab Sample ID: KI86D
LIMS ID: 06-24872
Matrix: Water
Data Release Authorized:
Reported: 12/28/06

QC Report No: KI86-The Boeing Company
Project: AOC-034,035
Boeing Renton
Date Sampled: 12/14/06
Date Received: 12/14/06

Instrument/Analyst: FINN3/PAB
Date Analyzed: 12/21/06 15:48

Sample Amount: 20.0 mL
Purge Volume: 20.0 mL

CAS Number	Analyte	RL	Result	Q
75-01-4	Vinyl Chloride	0.2	2.7	
156-59-2	cis-1,2-Dichloroethene	0.2	0.5	
79-01-6	Trichloroethene	0.2	< 0.2	U

Reported in µg/L (ppb)

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	110%
d8-Toluene	110%
Bromofluorobenzene	100%
d4-1,2-Dichlorobenzene	106%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260B

Sample ID: RI-GW-PP162-0-0090
SAMPLE

Lab Sample ID: KI86F
LIMS ID: 06-24874
Matrix: Water
Data Release Authorized:
Reported: 12/28/06

QC Report No: KI86-The Boeing Company
Project: AOC-034,035
Boeing Renton
Date Sampled: 12/14/06
Date Received: 12/14/06

Instrument/Analyst: FINN3/JLM
Date Analyzed: 12/20/06 19:49

Sample Amount: 20.0 mL
Purge Volume: 20.0 mL

CAS Number	Analyte	RL	Result	Q
75-01-4	Vinyl Chloride	0.2	< 0.2	U
156-59-2	cis-1,2-Dichloroethene	0.2	< 0.2	U
79-01-6	Trichloroethene	0.2	< 0.2	U

Reported in µg/L (ppb)

Volatile Surrogate Recovery	
d4-1,2-Dichloroethane	124%
d8-Toluene	112%
Bromofluorobenzene	112%
d4-1,2-Dichlorobenzene	117%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260B **Sample ID: RI-GW-PP163-0-0090**
Page 1 of 1 **SAMPLE**

Lab Sample ID: KI86H
LIMS ID: 06-24876
Matrix: Water
Data Release Authorized:
Reported: 12/28/06

QC Report No: KI86-The Boeing Company
Project: AOC-034,035
Boeing Renton
Date Sampled: 12/14/06
Date Received: 12/14/06

Instrument/Analyst: FINN3/JLM
Date Analyzed: 12/20/06 20:17

Sample Amount: 20.0 mL
Purge Volume: 20.0 mL

CAS Number	Analyte	RL	Result	Q
75-01-4	Vinyl Chloride	0.2	< 0.2	U DNR
156-59-2	cis-1,2-Dichloroethene	0.2	< 0.2	U DNR
79-01-6	Trichloroethene	0.2	< 0.2	U DNR

Reported in µg/L (ppb)

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	126%
d8-Toluene	116%
Bromofluorobenzene	115%
d4-1,2-Dichlorobenzene	119%

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ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260B

Sample ID: RI-GW-PP163-0-0090
REANALYSIS

Lab Sample ID: KI86H
LIMS ID: 06-24876
Matrix: Water
Data Release Authorized:
Reported: 12/28/06

QC Report No: KI86-The Boeing Company
Project: AOC-034,035
Boeing Renton
Date Sampled: 12/14/06
Date Received: 12/14/06

Instrument/Analyst: FINN3/PAB
Date Analyzed: 12/21/06 16:17

Sample Amount: 20.0 mL
Purge Volume: 20.0 mL

CAS Number	Analyte	RL	Result	Q
75-01-4	Vinyl Chloride	0.2	< 0.2	U
156-59-2	cis-1,2-Dichloroethene	0.2	< 0.2	U
79-01-6	Trichloroethene	0.2	< 0.2	U

Reported in µg/L (ppb)

Volatile Surrogate Recovery	
d4-1,2-Dichloroethane	114%
d8-Toluene	107%
Bromofluorobenzene	102%
d4-1,2-Dichlorobenzene	110%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260B
Page 1 of 1

Sample ID: RI-GW-PP163-0-1090
SAMPLE

Lab Sample ID: KI86I
LIMS ID: 06-24877
Matrix: Water
Data Release Authorized:
Reported: 12/28/06

QC Report No: KI86-The Boeing Company
Project: AOC-034,035
Boeing Renton
Date Sampled: 12/14/06
Date Received: 12/14/06

Instrument/Analyst: FINN3/JLM
Date Analyzed: 12/20/06 20:45

Sample Amount: 20.0 mL
Purge Volume: 20.0 mL

CAS Number	Analyte	RL	Result	Q
75-01-4	Vinyl Chloride	0.2	< 0.2	U
156-59-2	cis-1,2-Dichloroethene	0.2	< 0.2	U
79-01-6	Trichloroethene	0.2	< 0.2	U

Reported in µg/L (ppb)

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	124%
d8-Toluene	112%
Bromofluorobenzene	113%
d4-1,2-Dichlorobenzene	116%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260B
Sample ID: RI-GW-PP164-0-0090
SAMPLE
Page 1 of 1

Lab Sample ID: KI86L
LIMS ID: 06-24880
Matrix: Water
Data Release Authorized:
Reported: 12/28/06

QC Report No: KI86-The Boeing Company
Project: AOC-034,035
Boeing Renton
Date Sampled: 12/14/06
Date Received: 12/14/06

Instrument/Analyst: FINN3/PAB
Date Analyzed: 12/22/06 18:24

Sample Amount: 20.0 mL
Purge Volume: 20.0 mL

CAS Number	Analyte	RL	Result	Q
75-01-4	Vinyl Chloride	0.2	< 0.2	U
156-59-2	cis-1,2-Dichloroethene	0.2	< 0.2	U
79-01-6	Trichloroethene	0.2	< 0.2	U

Reported in µg/L (ppb)

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	116%
d8-Toluene	98.8%
Bromofluorobenzene	98.8%
d4-1,2-Dichlorobenzene	98.0%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260B

Sample ID: TRIP BLANK SAMPLE

Lab Sample ID: KI86M
LIMS ID: 06-24881
Matrix: Water
Data Release Authorized:
Reported: 12/28/06

QC Report No: KI86-The Boeing Company
Project: AOC-034,035
Boeing Renton
Date Sampled: 12/14/06
Date Received: 12/14/06

Instrument/Analyst: FINN3/JLM
Date Analyzed: 12/20/06 18:24

Sample Amount: 20.0 mL
Purge Volume: 20.0 mL

CAS Number	Analyte	RL	Result	Q
75-01-4	Vinyl Chloride	0.2	< 0.2	U
156-59-2	cis-1,2-Dichloroethene	0.2	< 0.2	U
79-01-6	Trichloroethene	0.2	< 0.2	U

Reported in µg/L (ppb)

Volatile Surrogate Recovery	
d4-1,2-Dichloroethane	124%
d8-Toluene	116%
Bromofluorobenzene	109%
d4-1,2-Dichlorobenzene	119%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260B

Sample ID: RI-GW-PP160-0-0090
MATRIX SPIKE

Lab Sample ID: KI86B
LIMS ID: 06-24870
Matrix: Water
Data Release Authorized:
Reported: 12/28/06

QC Report No: KI86-The Boeing Company
Project: AOC-034,035
Boeing Renton
Date Sampled: 12/14/06
Date Received: 12/14/06

Instrument/Analyst MS: FINN3/PAB
MSD: FINN3/PAB
Date Analyzed MS: 12/21/06 16:45
MSD: 12/21/06 17:13

Sample Amount MS: 20.0 mL
MSD: 20.0 mL
Purge Volume MS: 20.0 mL
MSD: 20.0 mL

Analyte	Sample	MS	Spike Added-MS	MS Recovery	MSD	Spike Added-MSD	MSD Recovery	RPD
Vinyl Chloride	0.6	4.5	4.0	97.5%	4.4	4.0	95.0%	2.2%
cis-1,2-Dichloroethene	0.2	3.8	4.0	90.0%	3.9	4.0	92.5%	2.6%
Trichloroethene	< 0.2 U	4.0	4.0	100%	3.8	4.0	95.0%	5.1%

Reported in µg/L (ppb)

RPD calculated using sample concentrations per SW846.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260B

Sample ID: RI-GW-PP160-0-0090
MATRIX SPIKE

Lab Sample ID: KI86B
LIMS ID: 06-24870
Matrix: Water
Data Release Authorized:
Reported: 12/28/06

QC Report No: KI86-The Boeing Company
Project: AOC-034,035
Boeing Renton
Date Sampled: 12/14/06
Date Received: 12/14/06

Instrument/Analyst: FINN3/PAB
Date Analyzed: 12/21/06 16:45

Sample Amount: 20.0 mL
Purge Volume: 20.0 mL

CAS Number	Analyte	RL	Result	Q
75-01-4	Vinyl Chloride	0.2	---	
156-59-2	cis-1,2-Dichloroethene	0.2	---	
79-01-6	Trichloroethene	0.2	---	

Reported in µg/L (ppb)

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	114%
d8-Toluene	105%
Bromofluorobenzene	107%
d4-1,2-Dichlorobenzene	102%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260B
Page 1 of 1

Sample ID: RI-GW-PP160-0-0090 MATRIX SPIKE DUP

Lab Sample ID: KI86B
LIMS ID: 06-24870
Matrix: Water
Data Release Authorized:
Reported: 12/28/06

QC Report No: KI86-The Boeing Company
Project: AOC-034,035
Boeing Renton
Date Sampled: 12/14/06
Date Received: 12/14/06

Instrument/Analyst: FINN3/PAB
Date Analyzed: 12/21/06 17:13

Sample Amount: 20.0 mL
Purge Volume: 20.0 mL

CAS Number	Analyte	RL	Result	Q
75-01-4	Vinyl Chloride	0.2	---	
156-59-2	cis-1,2-Dichloroethene	0.2	---	
79-01-6	Trichloroethene	0.2	---	

Reported in µg/L (ppb)

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	108%
d8-Toluene	99.2%
Bromofluorobenzene	102%
d4-1,2-Dichlorobenzene	104%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260B

Sample ID: MB-122006
METHOD BLANK

Lab Sample ID: MB-122006
LIMS ID: 06-24870
Matrix: Water
Data Release Authorized:
Reported: 12/28/06

QC Report No: KI86-The Boeing Company
Project: AOC-034,035
Boeing Renton
Date Sampled: NA
Date Received: NA

Instrument/Analyst: FINN3/JLM
Date Analyzed: 12/20/06 11:11

Sample Amount: 20.0 mL
Purge Volume: 20.0 mL

CAS Number	Analyte	RL	Result	Q
75-01-4	Vinyl Chloride	0.2	< 0.2	U
156-59-2	cis-1,2-Dichloroethene	0.2	< 0.2	U
79-01-6	Trichloroethene	0.2	< 0.2	U

Reported in µg/L (ppb)

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	108%
d8-Toluene	108%
Bromofluorobenzene	104%
d4-1,2-Dichlorobenzene	105%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260B
Page 1 of 1

Sample ID: MB-122106
METHOD BLANK

Lab Sample ID: MB-122106
LIMS ID: 06-24872
Matrix: Water
Data Release Authorized:
Reported: 12/28/06

QC Report No: KI86-The Boeing Company
Project: AOC-034,035
Boeing Renton
Date Sampled: NA
Date Received: NA

Instrument/Analyst: FINN3/PAB
Date Analyzed: 12/21/06 14:51

Sample Amount: 20.0 mL
Purge Volume: 20.0 mL

CAS Number	Analyte	RL	Result	Q
75-01-4	Vinyl Chloride	0.2	< 0.2	U
156-59-2	cis-1,2-Dichloroethene	0.2	< 0.2	U
79-01-6	Trichloroethene	0.2	< 0.2	U

Reported in µg/L (ppb)

Volatile Surrogate Recovery	
d4-1,2-Dichloroethane	115%
d8-Toluene	107%
Bromofluorobenzene	103%
d4-1,2-Dichlorobenzene	104%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260B
Page 1 of 1

Sample ID: MB-122206
METHOD BLANK

Lab Sample ID: MB-122206
LIMS ID: 06-24880
Matrix: Water
Data Release Authorized:
Reported: 12/28/06

QC Report No: KI86-The Boeing Company
Project: AOC-034,035
Boeing Renton
Date Sampled: NA
Date Received: NA

Instrument/Analyst: FINN3/PAB
Date Analyzed: 12/22/06 16:31

Sample Amount: 20.0 mL
Purge Volume: 20.0 mL

CAS Number	Analyte	RL	Result	Q
75-01-4	Vinyl Chloride	0.2	< 0.2	U
156-59-2	cis-1,2-Dichloroethene	0.2	< 0.2	U
79-01-6	Trichloroethene	0.2	< 0.2	U

Reported in µg/L (ppb)

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	112%
d8-Toluene	106%
Bromofluorobenzene	98.2%
d4-1,2-Dichlorobenzene	102%

ANALYTICAL RESOURCES INCORPORATED

VOA SURROGATE RECOVERY SUMMARY

Matrix: Water

QC Report No: KI86-The Boeing Company
Project: AOC-034,035
Boeing Renton

ARI ID	Client ID	PV	DCE	TOL	BFB	DCB	TOT OUT
MB-122006	Method Blank	20	108%	108%	104%	105%	0
LCS-122006	Lab Control	20	109%	114%	112%	108%	0
LCSD-122006	Lab Control Dup	20	101%	105%	103%	101%	0
KI86B	RI-GW-PP160-0-0090	20	127%	115%	110%	120%	0
KI86BMS	RI-GW-PP160-0-0090	20	114%	105%	107%	102%	0
KI86BMSD	RI-GW-PP160-0-0090	20	108%	99.2%	102%	104%	0
MB-122106	Method Blank	20	115%	107%	103%	104%	0
LCS-122106	Lab Control	20	116%	106%	109%	100%	0
LCSD-122106	Lab Control Dup	20	120%	114%	113%	107%	0
KI86D	RI-GW-PP161-0-0090	20	130%	114%	116%*	118%	1
KI86DRE	RI-GW-PP161-0-0090	20	110%	110%	100%	106%	0
KI86F	RI-GW-PP162-0-0090	20	124%	112%	112%	117%	0
KI86H	RI-GW-PP163-0-0090	20	126%	116%	115%*	119%	1
KI86HRE	RI-GW-PP163-0-0090	20	114%	107%	102%	110%	0
KI86I	RI-GW-PP163-0-1090	20	124%	112%	113%	116%	0
MB-122206	Method Blank	20	112%	106%	98.2%	102%	0
LCS-122206	Lab Control	20	115%	107%	105%	98.2%	0
LCSD-122206	Lab Control Dup	20	122%	114%	112%	110%	0
KI86L	RI-GW-PP164-0-0090	20	116%	98.8%	98.8%	98.0%	0
KI86M	TRIP BLANK	20	124%	116%	109%	119%	0

SW8260B	LCS/MB LIMITS		QC LIMITS	
	5mL Purge	20mL Purge	5mL Purge	20mL Purge
(DCE) = d4-1,2-Dichloroethane	70-134	63-127	66-142	66-139
(TOL) = d8-Toluene	78-123	77-117	75-124	82-123
(BFB) = Bromofluorobenzene	78-121	68-116	75-121	71-113
(DCB) = d4-1,2-Dichlorobenzene	79-116	79-113	78-124	84-125

Prep Method: SW5030B
Log Number Range: 06-24870 to 06-24881

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260B **Sample ID: LCS-122006**
Page 1 of 1 **LAB CONTROL SAMPLE**

Lab Sample ID: LCS-122006
LIMS ID: 06-24870
Matrix: Water
Data Release Authorized:
Reported: 12/28/06

QC Report No: KI86-The Boeing Company
Project: AOC-034,035
Boeing Renton
Date Sampled: NA
Date Received: NA

Instrument/Analyst LCS: FINN3/JLM
LCSD: FINN3/JLM
Date Analyzed LCS: 12/20/06 10:14
LCSD: 12/20/06 10:43

Sample Amount LCS: 20.0 mL
LCSD: 20.0 mL
Purge Volume LCS: 20.0 mL
LCSD: 20.0 mL

Analyte	LCS	Spike Added-LCS	LCS Recovery	LCSD	Spike Added-LCSD	LCSD Recovery	RPD
Vinyl Chloride	4.8	4.0	120%	4.4	4.0	110%	8.7%
cis-1,2-Dichloroethene	3.9	4.0	97.5%	3.5	4.0	87.5%	10.8%
Trichloroethene	4.3	4.0	108%	4.0	4.0	100%	7.2%

Reported in µg/L (ppb)

RPD calculated using sample concentrations per SW846.

Volatile Surrogate Recovery

	LCS	LCSD
d4-1,2-Dichloroethane	109%	101%
d8-Toluene	114%	105%
Bromofluorobenzene	112%	103%
d4-1,2-Dichlorobenzene	108%	101%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260B
Page 1 of 1

Sample ID: LCS-122106
LAB CONTROL SAMPLE

Lab Sample ID: LCS-122106
LIMS ID: 06-24872
Matrix: Water
Data Release Authorized:
Reported: 12/28/06

QC Report No: KI86-The Boeing Company
Project: AOC-034,035
Boeing Renton
Date Sampled: NA
Date Received: NA

Instrument/Analyst LCS: FINN3/PAB
LCSD: FINN3/PAB
Date Analyzed LCS: 12/21/06 13:53
LCSD: 12/21/06 14:23

Sample Amount LCS: 20.0 mL
LCSD: 20.0 mL
Purge Volume LCS: 20.0 mL
LCSD: 20.0 mL

Analyte	LCS	Spike Added-LCS	LCS Recovery	LCSD	Spike Added-LCSD	LCSD Recovery	RPD
Vinyl Chloride	4.4	4.0	110%	4.5	4.0	112%	2.2%
cis-1,2-Dichloroethene	3.7	4.0	92.5%	4.0	4.0	100%	7.8%
Trichloroethene	4.0	4.0	100%	4.3	4.0	108%	7.2%

Reported in µg/L (ppb)

RPD calculated using sample concentrations per SW846.

Volatile Surrogate Recovery

	LCS	LCSD
d4-1,2-Dichloroethane	116%	120%
d8-Toluene	106%	114%
Bromofluorobenzene	109%	113%
d4-1,2-Dichlorobenzene	100%	107%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260B
Page 1 of 1

Sample ID: LCS-122206
LAB CONTROL SAMPLE

Lab Sample ID: LCS-122206
LIMS ID: 06-24880
Matrix: Water
Data Release Authorized:
Reported: 12/28/06

QC Report No: KI86-The Boeing Company
Project: AOC-034,035
Boeing Renton
Date Sampled: NA
Date Received: NA

Instrument/Analyst LCS: FINN3/PAB
LCSD: FINN3/PAB
Date Analyzed LCS: 12/22/06 15:20
LCSD: 12/22/06 16:03

Sample Amount LCS: 20.0 mL
LCSD: 20.0 mL
Purge Volume LCS: 20.0 mL
LCSD: 20.0 mL

Analyte	LCS	Spike Added-LCS	LCS Recovery	LCSD	Spike Added-LCSD	LCSD Recovery	RPD
Vinyl Chloride	4.0	4.0	100%	4.2	4.0	105%	4.9%
cis-1,2-Dichloroethene	3.5	4.0	87.5%	3.8	4.0	95.0%	8.2%
Trichloroethene	4.0	4.0	100%	4.4	4.0	110%	9.5%

Reported in µg/L (ppb)

RPD calculated using sample concentrations per SW846.

Volatile Surrogate Recovery

	LCS	LCSD
d4-1,2-Dichloroethane	115%	122%
d8-Toluene	107%	114%
Bromofluorobenzene	105%	112%
d4-1,2-Dichlorobenzene	98.2%	110%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260B
Page 1 of 1

Sample ID: RI-SB-PP160-0-0040
SAMPLE

Lab Sample ID: KI86A
LIMS ID: 06-24869
Matrix: Soil
Data Release Authorized:
Reported: 12/28/06

QC Report No: KI86-The Boeing Company
Project: AOC-034,035
Boeing Renton
Date Sampled: 12/14/06
Date Received: 12/14/06

Instrument/Analyst: FINN5/JLM
Date Analyzed: 12/19/06 16:45

Sample Amount: 6.33 g-dry-wt
Purge Volume: 5.0 mL
Moisture: 14.3%

CAS Number	Analyte	RL	Result	Q
75-01-4	Vinyl Chloride	0.8	< 0.8	U
156-59-2	cis-1,2-Dichloroethene	0.8	< 0.8	U
79-01-6	Trichloroethene	0.8	< 0.8	U

Reported in µg/kg (ppb)

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	124%
d8-Toluene	109%
Bromofluorobenzene	101%
d4-1,2-Dichlorobenzene	97.3%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260B

Sample ID: RI-SB-PP161-0-0040
SAMPLE

Lab Sample ID: KI86C
LIMS ID: 06-24871
Matrix: Soil
Data Release Authorized:
Reported: 12/28/06

QC Report No: KI86-The Boeing Company
Project: AOC-034,035
Boeing Renton
Date Sampled: 12/14/06
Date Received: 12/14/06

Instrument/Analyst: FINN5/JLM
Date Analyzed: 12/19/06 17:11

Sample Amount: 5.30 g-dry-wt
Purge Volume: 5.0 mL
Moisture: 19.4%

CAS Number	Analyte	RL	Result	Q
75-01-4	Vinyl Chloride	0.9	< 0.9	U
156-59-2	cis-1,2-Dichloroethene	0.9	< 0.9	U
79-01-6	Trichloroethene	0.9	< 0.9	U

Reported in µg/kg (ppb)

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	128%
d8-Toluene	106%
Bromofluorobenzene	90.0%
d4-1,2-Dichlorobenzene	92.4%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260B
Page 1 of 1

Sample ID: RI-SB-PP162-0-0040
SAMPLE

Lab Sample ID: KI86E
LIMS ID: 06-24873
Matrix: Soil
Data Release Authorized:
Reported: 12/28/06

Instrument/Analyst: FINN5/JLM
Date Analyzed: 12/19/06 17:38

QC Report No: KI86-The Boeing Company
Project: AOC-034,035
Boeing Renton
Date Sampled: 12/14/06
Date Received: 12/14/06

Sample Amount: 4.34 g-dry-wt
Purge Volume: 5.0 mL
Moisture: 18.9%

CAS Number	Analyte	RL	Result	Q
75-01-4	Vinyl Chloride	1.2	< 1.2	U
156-59-2	cis-1,2-Dichloroethene	1.2	< 1.2	U
79-01-6	Trichloroethene	1.2	< 1.2	U

Reported in µg/kg (ppb)

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	129%
d8-Toluene	100%
Bromofluorobenzene	90.8%
d4-1,2-Dichlorobenzene	93.0%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260B
Page 1 of 1

Sample ID: RI-SB-PP163-0-0040
SAMPLE

Lab Sample ID: KI86G
LIMS ID: 06-24875
Matrix: Soil
Data Release Authorized:
Reported: 12/28/06

QC Report No: KI86-The Boeing Company
Project: AOC-034,035
Boeing Renton
Date Sampled: 12/14/06
Date Received: 12/14/06

Instrument/Analyst: FINN5/JLM
Date Analyzed: 12/19/06 18:05

Sample Amount: 4.67 g-dry-wt
Purge Volume: 5.0 mL
Moisture: 9.9%

CAS Number	Analyte	RL	Result	Q
75-01-4	Vinyl Chloride	1.1	< 1.1	U
156-59-2	cis-1,2-Dichloroethene	1.1	< 1.1	U
79-01-6	Trichloroethene	1.1	< 1.1	U

Reported in µg/kg (ppb)

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	128%
d8-Toluene	109%
Bromofluorobenzene	104%
d4-1,2-Dichlorobenzene	98.0%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260B **Sample ID: RI-SB-PP164-0-0040**
SAMPLE
Page 1 of 1

Lab Sample ID: KI86J
LIMS ID: 06-24878
Matrix: Soil
Data Release Authorized:
Reported: 12/28/06

QC Report No: KI86-The Boeing Company
Project: AOC-034,035
Boeing Renton
Date Sampled: 12/14/06
Date Received: 12/14/06

Instrument/Analyst: FINN5/JLM
Date Analyzed: 12/19/06 18:31

Sample Amount: 4.58 g-dry-wt
Purge Volume: 5.0 mL
Moisture: 21.7%

CAS Number	Analyte	RL	Result	Q
75-01-4	Vinyl Chloride	1.1	< 1.1	U
156-59-2	cis-1,2-Dichloroethene	1.1	< 1.1	U
79-01-6	**Trichloroethene**	**1.1**	**1.9**	

Reported in µg/kg (ppb)

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	125%
d8-Toluene	106%
Bromofluorobenzene	99.8%
d4-1,2-Dichlorobenzene	97.0%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260B

Sample ID: RI-SB-PP164-0-1040
SAMPLE

Lab Sample ID: KI86K
LIMS ID: 06-24879
Matrix: Soil
Data Release Authorized:
Reported: 12/28/06

QC Report No: KI86-The Boeing Company
Project: AOC-034,035
Boeing Renton
Date Sampled: 12/14/06
Date Received: 12/14/06

Instrument/Analyst: FINN5/JLM
Date Analyzed: 12/19/06 18:58

Sample Amount: 6.52 g-dry-wt
Purge Volume: 5.0 mL
Moisture: 12.8%

CAS Number	Analyte	RL	Result	Q
75-01-4	Vinyl Chloride	0.8	< 0.8	U
156-59-2	cis-1,2-Dichloroethene	0.8	< 0.8	U
79-01-6	Trichloroethene	0.8	< 0.8	U

Reported in µg/kg (ppb)

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	121%
d8-Toluene	106%
Bromofluorobenzene	97.4%
d4-1,2-Dichlorobenzene	93.0%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260B **Sample ID: MB-121906**
METHOD BLANK

Lab Sample ID: MB-121906
LIMS ID: 06-24869
Matrix: Soil
Data Release Authorized:
Reported: 12/28/06

QC Report No: KI86-The Boeing Company
Project: AOC-034,035
Boeing Renton
Date Sampled: NA
Date Received: NA

Instrument/Analyst: FINN5/JLM
Date Analyzed: 12/19/06 15:12

Sample Amount: 5.00 g-dry-wt
Purge Volume: 5.0 mL
Moisture: NA

CAS Number	Analyte	RL	Result	Q
75-01-4	Vinyl Chloride	1.0	< 1.0	U
156-59-2	cis-1,2-Dichloroethene	1.0	< 1.0	U
79-01-6	Trichloroethene	1.0	< 1.0	U

Reported in µg/kg (ppb)

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	113%
d8-Toluene	106%
Bromofluorobenzene	99.9%
d4-1,2-Dichlorobenzene	95.9%

ANALYTICAL RESOURCES INCORPORATED

VOA SURROGATE RECOVERY SUMMARY

Matrix: Soil

QC Report No: KI86-The Boeing Company
Project: AOC-034,035
Boeing Renton

ARI ID	Client ID	Level	DCE	TOL	BFB	DCB	TOT OUT
MB-121906	Method Blank	Low	113%	106%	99.9%	95.9%	0
LCS-121906	Lab Control	Low	105%	107%	102%	96.3%	0
LCSD-121906	Lab Control Dup	Low	106%	105%	102%	97.3%	0
KI86A	RI-SB-PP160-0-0040	Low	124%	109%	101%	97.3%	0
KI86C	RI-SB-PP161-0-0040	Low	128%	106%	90.0%	92.4%	0
KI86E	RI-SB-PP162-0-0040	Low	129%	100%	90.8%	93.0%	0
KI86G	RI-SB-PP163-0-0040	Low	128%	109%	104%	98.0%	0
KI86J	RI-SB-PP164-0-0040	Low	125%	106%	99.8%	97.0%	0
KI86K	RI-SB-PP164-0-1040	Low	121%	106%	97.4%	93.0%	0

SW8260B	LCS/MB LIMITS Low	LCS/MB LIMITS Med	QC LIMITS Low	QC LIMITS Med
(DCE) = d4-1,2-Dichloroethane	68-140	71-140	67-161	66-146
(TOL) = d8-Toluene	84-116	84-118	82-118	82-117
(BFB) = Bromofluorobenzene	79-114	79-116	63-122	69-130
(DCB) = d4-1,2-Dichlorobenzene	77-113	78-114	74-112	78-117

Log Number Range: 06-24869 to 06-24879

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260B
Page 1 of 1

Sample ID: LCS-121906
LAB CONTROL SAMPLE

Lab Sample ID: LCS-121906
LIMS ID: 06-24869
Matrix: Soil
Data Release Authorized:
Reported: 12/28/06

QC Report No: KI86-The Boeing Company
Project: AOC-034,035
Boeing Renton
Date Sampled: NA
Date Received: NA

Instrument/Analyst LCS: FINN5/JLM
LCSD: FINN5/JLM
Date Analyzed LCS: 12/19/06 14:10
LCSD: 12/19/06 14:46

Sample Amount LCS: 5.00 g-dry-wt
LCSD: 5.00 g-dry-wt
Purge Volume LCS: 5.0 mL
LCSD: 5.0 mL
Moisture: NA

Analyte	LCS	Spike Added-LCS	LCS Recovery	LCSD	Spike Added-LCSD	LCSD Recovery	RPD
Vinyl Chloride	52.9	50.0	106%	53.3	50.0	107%	0.8%
cis 1,2-Dichloroethene	59.4	50.0	119%	61.5	50.0	123%	3.5%
Trichloroethene	56.9	50.0	114%	57.7	50.0	115%	1.4%

Reported in µg/kg (ppb)

RPD calculated using sample concentrations per SW846.

Volatile Surrogate Recovery

	LCS	LCSD
d4-1,2-Dichloroethane	105%	106%
d8-Toluene	107%	105%
Bromofluorobenzene	102%	102%
d4-1,2-Dichlorobenzene	96.3%	97.3%