SOIL VAPOR

SOIL VAPOR CASE NARRATIVES AND COCS

CHAIN OF CUSTODY RECORD

COC # MV575
LAB SDG #

BOEING

Page: 1 of 1

Customer Information		Project Information	
Site:	Boeing-SSFL	Client:	NASA
Company:	MWH	Sampling Event:	Vapor Migration Study
Report to:	Lisa Tucker	Project. No.	
Address:	9444 Farnham Street	Project Manager:	Dixie Hambrick
	Suite 300	PM Contact #	626-568-6348
	San Diego, CA 92123	Field Contact:	Eric Vandervelde
Email:	boeingedms@ch2m.com	Field Contact #	818.391.4247
	lisa.tucker@mwhglobal.com	Lab Contact/PM:	Steve Hoyt / EAS, Inc
		Lab Address:	173 Cross Street, San Luis Obispo, CA
		Lab Phone:	805.781.3585

Project Information	
Sampler:	Chuck Schmidt
Contact #:	530-200-2473 - Cell #

No.	Sample ID	Description (for MWH use only)	Matrix (VF)	Date	Time	Preserv.	Cont. Type	No. of Containers	Field Filtered?	TO-15 SIM	TCE	LOX LIST with TCE	Can #	Initial Press.	Final Press.	HOLD	Instructions/TAT
1	MV575	BZVF01SD1	AIR	7/17/06	1041	NA	Summa	1	NA	X	X		789	686	925		TCE - Control/Soil
2	MV576	BZVF01ED1	VF		1039			1		X		X	603	699	969		"
3	MV577	CLVF01SD1	VF		1246			1		X	X		175	674	936		CTLIII North-Pre
4	MV578	CLVF02SD1	VF		1248			1		X	X		416	673	942		" - collocation
5	MV579	CLVF03SD1	VF		1404			1		X	X		190	689	959		CTLIII South
6	MV580	BIVF01SD1	VF		1502			1		X	X		642	662	975		B1 collocation
7	MV581	BIVF02SD1	VF		1505			1		X	X		101	677	949		" primary
8	MV582	LXVF01SD1	VF		1620			1		X	X		308	681	1032		LOX primary
9	MV583	LXVF01DD1	VF		1626			1		X	X		321	681	1068		LOX to EW0
10	MV584	LXVF02SD1	VF		1624			1		X	X		521	674	927		LOX collocation

(4) :002A8-1 -2 -3 -4 -5 -6 -7 -8 -9 -10

Shelf BB

Shelf AA

N2

1. Relinquished by:	Date:	2. Received by:	Date:	3. Relinquished by:	Date:	4. Received by:	Date:
Eric Vandervelde	7/17/06	C.E. SCHMIDT	7/17/06	C.E. SCHMIDT	7/18/06	FED EX	7/18/06
Company: MWH	Time: 1702	Company: ENVIR. CONSULT.	Time: 1705	Company: ENVR CONSL	Time: 1700	Company: SHIPPER	Time: 1700

Comments: PLEASE REPORT PARV, ug/m3, AND FLUX
- FLUX = (ug/m3)(0.0385) = ug/m2, min-1

Geotracker EDF [ ] Standard TAT [X]

Data Validation Package [X] Level IV Rush TAT Indicate Above

Rev 7/06

LOX LIST - TCE, 1,1-DCE, PERC, VINYL CHLORIDE, CIS-1,2-DCE, TRANS-1,2-DCE

Recieved by: Ashley Brandin Date: 7/19/06
Time: 9:30

CHAIN OF CUSTODY RECORD

COC # MV585 IV
LAB SDG # 206348

BOEING

Page: 1 of 1

Customer Information		Project Information		Project Information	
Site:	Boeing-SSFL	Client:	Boeing/NASA	Sampler:	Chuck Schmidt
Company:	MWH	Sampling Event:	Vapor Migration Study	Contact #:	(530) 200-2473
Report to:	Lisa Tucker	Project. No.	—		
Address:	9444 Farnham Street	Project Manager:	Dixie Hambrick		
	Suite 300	PM Contact #	626 568 6348		
	San Diego, CA 92123	Field Contact:	Eric Vandervelde		
Email:	boeingedms@ch2m.com	Field Contact #	818.391.4247		
	lisa.tucker@mwhglobal.com	Lab Contact/PM:	Steve Hoyt / EAS, Inc		
		Lab Address:	173 Cross Street, San Luis Obispo, CA		
		Lab Phone:	805.781.3585		

No.	Sample ID	Description (for MWH use only)	Matrix	Date	Time	Preserv.	Cont. Type	No. of Containers	Field Filtered?	TO-15 SIM	TO15	LOX LIST		Can #	Initial Pressure	Final Pressure		HOLD	Instructions/TAT
1	MV589	BTVF01S01	VF	7/18/06	0820	NA	Summa	1	NA	X	X			342	703	986			N2 ShelfAA
2	MV586	NCVF01S01	VF	7/18/06	0915	NA	Summa	1	NA	X	X			372	684	1106			
3	MV587	FSVF01S01	VF	7/18/06	1012	NA	Summa	1	NA	X	X			370	671	969			
4	MV588	CFVF01S01	VF	7/18/06	1104	NA	Summa	1	NA	X	X			318	669	955			
5	MV589	CFVF02S01	VF	7/18/06	1108	NA	Summa	1	NA	X	X			324	670	972			
6	MV590	DAVF01S01	VF	7/18/06	1204	NA	Summa	1	NA	X	X			371	683	935			= SHLF-P
7	MV591	DAVF02S01	VF	7/18/06	1206	NA	Summa	1	NA	X	X			345	686	955			↓
8																			
9																			
10																			

1. Relinquished by:	Date:	2. Received by:	Date:	3. Relinquished by:	Date:	4. Received by:	Date:
Ivon Vang	7/18/06	CESCHMIDT	7/18/06	CESCHMIDT	7/18/06	SHIPPER	7/18/06
Company: MWH	Time: 12:50	Company: ENVIR CONSULT	Time: 1300	Company: ENVIR CONSULT	Time: 1700	Company: Fed Ex	Time: 1700

Comments:
PLEASE REPORT ADBV, $\mu g/m^3$, FLUX
FLUX = $(\mu g/m^3)(0.0385) = \mu g/m^2, min^{-1}$

Geotracker EDF ☐ Standard TAT ☒
Data Validation Package ☒ Level IV Rush TAT Indicate Above

Rev 7/06

Recieved by: Ashley Anandhi Date: 7/19/06
Company: EAS Time: 9:30

ANALYTICAL REPORT, QUALITY ASSURANCE REPORT, AND DELIVERABLES

Project Name: Boeing-SSFL
Project #
Sample Date: 7/17/06 – 7/18/06

Sample Delivery Group: 206348

Prepared for:

MWH
San Diego, CA

Prepared by:

Steve Hoyt

ENVIRONMENTAL ANALYTICAL SERVICE, INC.
173 Cross St.
San Luis Obispo, CA 93401

(805) 781-3585, FAX (805) 541-4550

ENVIRONMENTAL ANALYTICAL SERVICE, INC.
DATA DELIVERABLE PACKAGE

COVER PAGE

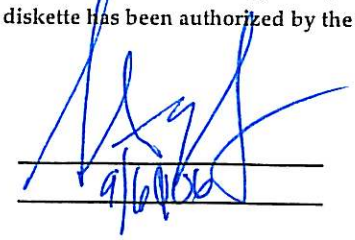
Lab Name: Environmental Analytical Service
Lab Code:
Case No.:
SOW No.:

Contract:
SAS No.:
SDG No.: 206348

EPA Sample No.	Lab Sample ID
206348-1	MV575
206348-2	MV576
206348-3	MV577
206348-4	MV578
206348-5	MV579
206348-6	MV580
206348-7	MV581
206348-8	MV582
206348-9	MV583
206348-10	MV584
206348-11	MV585
206348-12	MV586
206348-13	MV587
206348-14	MV588
206348-15	MV589
206348-16	MV590
206348-17	MV591

Comments:

I certify that this data package is in compliance with the Terms and Conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hardcopy data package and in the computer-readable data submitted on floppy diskette has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature.

Signature: 
Date: 9/6/96

Name: Steve Hoyt
Title: Lab Director

TABLE OF CONTENTS

SECTION 1
Project Summary

1.1 Analytical Batch and Log-in Batch Summary

The samples received by Environmental Analytical Service (EAS) for this project were logged in and assigned a Sample Delivery Group (SDG) Number. Each sample is also assigned an individual Laboratory ID number. The samples were then distributed to the analysts for the designated analysis. Each sample was analyzed in a daily analytical batch with associated QC. Each QC batch is assigned a QC analytical batch number. The Analytical Batch Reference Table is a summary of the SDG number, the client ID, the date collected, the EAS laboratory ID number, and the analytical batch number for each sample received. The QC Criteria for each analytical test is summarized in Section 1.4. For detailed information on Quality Control consult the EAS Quality Manual. Section 1.5 contains a Case Narrative for each QC analytical batch.

1.2 Sample Receipt Log-in Form and Chain-of-Custody Forms

The following page shows the Sample Receipt Log-In Form that was filled out by Sample Control when the samples were received by EAS. Following the Sample Receipt Log-In Form are the Chain-of-Custody form(s) received with the samples.

SAMPLE LOG-IN SHEET

Lab Name: Environmental Analytical Service
Received By (Print): Lesley Andrews-Wise

Page 1 of 1
Log-In Date: 7/19/2006

Case Number:
Sample Delivery Group No. 206348
SAS Number:

CIRCLE THE APPROPRIATE RESPONSE

1. Custody Seal(s): Present/Absent*
   Intact/Broken
   N/A
2. Custody Seal Nos.:
3. Chain-of-Custody Records: Present/Absent*
4. Traffic Reports or Packing List: Present/Absent*
   N/A
5. Airbill: Airbill/Sticker
   Present/Absent*
   N/A
6. Airbill No: 857534215115
7. Sample Tags: Present/Absent*
   Sample Tag Numbers: Listed/Not Listed on Chain-of-Custody
8. Sample Condition: Intact/Broken*/Leaking
9. Does information on custody records, traffic reports and sample tag agree? Yes / No *
10. Date Received at Lab: 7/19/2006
11. Time Received: 9:30 AM

Sample Transfer

Area #:
By:
On:

Sample #	Can/Sample Tag #	Assigned Lab #	REMARKS: Condition of Sample Shipment ETC.
MV575	789	206348-1	Intact
MV576	603	206348-2	Intact
MV577	175	206348-3	Intact
MV578	416	206348-4	Intact
MV579	190	206348-5	Intact
MV580	642	206348-6	Intact
MV581	161	206348-7	Intact
MV582	308	206348-8	Intact
MV583	321	206348-9	Intact
MV584	521	206348-10	Intact
MV585	342	206348-11	Intact
MV586	392	206348-12	Intact
MV587	370	206348-13	Intact
MV588	318	206348-14	Intact
MV589	324	206348-15	Intact
MV590	771	206348-16	Intact
MV591	345	206348-17	Intact

* If Circled, contact SMO and attach record of resolution

Received by:
Date: 7/19/2006

Logbook No.: N/A
Logbook Page No N/A

Form AADC - 1

1.3 Analytical Batch Reference Table(s)

EPA TO-15 SIM*

SDG Number	Lab ID Number	Date Collected	Client ID	Analysis Batch
206348	1	7/17/06	MV575	080306-MS3
206348	2	7/17/06	MV576	081406-MS3
206348	3	7/17/06	MV577	080306-MS3
206348	4	7/17/06	MV578	080306-MS3
206348	5	7/17/06	MV579	081706-MS1
206348	6	7/17/06	MV580	080406-MS3
206348	7	7/17/06	MV581	080406-MS3
206348	8	7/17/06	MV582	080406-MS3
206348	9	7/17/06	MV583	080306-MS3
206348	10	7/17/06	MV584	080306-MS3
206348	11	7/18/06	MV585	080406-MS3
206348	12	7/18/06	MV586	080406-MS3
206348	13	7/18/06	MV587	080406-MS3
206348	14	7/18/06	MV588	080406-MS3
206348	15	7/18/06	MV589	080406-MS3
206348	16	7/18/06	MV590	080606-MS3
206348	17	7/18/06	MV591	080606-MS3
206348	MS/MSD			081406-MS3

*Sample 206348-5 was analyzed using the TO-15 Full Scan Method because concentrations were outside of the range for a SIM analysis.

1.4 QC Criteria

The QC criteria are listed in the following tables by analytical test. The EAS QC Criteria described in the EAS Quality Manual was used as The QC criteria unless Project Specific QC Criteria was specified and supplied.

The daily analytical batch data was checked against the QC criteria and any criteria that did not pass are listed in the QC Comments section of the case narrative under the daily analytical batch number.

This package contains all the information needed for data validation for the requested samples. If level C package was requested the data for each daily analytical batch are provided in Section 4. If level D was requested on all or some samples the additional data (the ion spectra) for the samples and QC samples is given in Section 8.

TO-15 SIM

Parameter	EAS	Comments
Initial Calibration	5 points minimum	
Calibration Check Sample (CCS)	After Initial Calibration < 30% RSD	
Continuing Calibration Verification (CCV)	Daily (24 hours) < 30% RSD	
Internal Standard (IS)RT	A,a,a-trifluorotoluene Response 50% to 200%	
Surrogate	Toluene d-8 70-130% recovery	
Method Blank	Target analytes < ½ RL	
Laboratory Control Spike	1 per Daily Batch 70-130% recovery	Client does not need LCS/LCD for t-1,2-DCE
Duplicate (One of below) Lab Control Dup Sample Matrix Spike Dup	1 duplicate with each 20 samples <30% RSD	Only one duplicate is done in each DAB. This is usually an LCD
Canister Holding Times	30 days from sampling date	
Canister Certification	Certification <0.08 ppbv target compound GC/MS	
Field Duplicates	50% concentrations over 1 ppbv	

1.5 Project Case Narrative

The samples were received in good condition with canister pressure in an acceptable range for a valid sample event. All analyses were performed in holding time as specified by the QC criteria listed in Section 1.4. The QC criteria for each of the analytical methods used in this project has been met except as noted in the QC comments for the daily analytical batch.

Daily Analytical Batch #: 080306-MS3

All analysis met the QC requirements for the method.

Daily Analytical Batch #: 080406-MS3

All analysis met the QC requirements for the method.

Daily Analytical Batch #: 080606-MS3

All analysis met the QC requirements for the method.

Daily Analytical Batch #: 081406-MS3

All analysis met the QC requirements for the method except matrix spike and matrix spike duplicate exceed QC limits for % recovery of 1,1-dichloroethene and trichloroethene. The QC limit for % recovery is 70-130%. The % recovery of 1,1-dichloroethene on the matrix spike duplicate was 59%. The % RPD was 35%. The % recovery of trichloroethene on the matrix spike duplicate was 67%. The % RPD was 32%.

Trichloroethene exceeds QC limits for % recovery on the laboratory control spike duplicate analysis. The % recovery was 139%.

Daily Analytical Batch #: 081706-MS1

All analysis met the QC requirements for the method.

SECTION 2
Operational Information

2.1 SAMPLE ANALYSIS

EPA TO-14/15 Ambient Air by GC/MS SIM

The GC/MS method (EPA Method TO-14/15) uses a cryotrapping system and a high resolution capillary column to analyze for volatile organic compounds for the TO-14 method a nafion dryer is used for water management, on TO-15 no dryer is used so oxygenated compounds can be analyzed.

Samples are analyzed on an HP 5890 gas chromatograph and HP 5970 MSD quadrapole mass spectrometer detector. A 100 to 1000 mL ambient air sample is introduced from the air sampling container on to the freezeout loop constructed of 1/8" nickel tubing packed with glass beads. A gas phase internal standard mixture, as specified in the EPA SOW for ambient air samples, is injected with each sample. The freezeout loop is immersed in liquid oxygen and concentrates the air sample. After the sample is trapped, it is thermally desorbed using an electric heater at 225° C and is cryofocussed onto the beginning of a 0.25 mm ID deactivated fused silica capillary column. The cryofocussed loop is then warmed and the compounds are injected onto a 60 meter, DB-5, 0.25 mm ID fused silica capillary column in the GC. As the column is heated, the compounds elute off the column and enter the mass spectrometer. The GC/MS is tuned and operated according to the specifications outlined in EPA SW 846 Test Methods. Compounds are calibrated by the internal standard procedure using NIST traceable air standards as described below. The relative percent difference (RPD) of a duplicate pair is about 30% at 10 ppbV and the average MDL is approximately 0.10 ppbV for most compounds at a 500 ml load volume (SIM MDL's are typically 10 times lower).

2.2 Calibration Procedures

The standards used for the routine analytical tests are commercial NIST traceable gas standards. Special in-house standards are prepared when commercial standards are not available or when commercial standards need to be diluted. Details of the traceability and calibration program at EAS can be found in the EAS Quality Manual.

Working standards are prepared by using a gas dilution system on the gas chromatograph or by making static dilutions to atmospheric levels. The gas dilution system is constructed from an eight port gas sampling valve with various size sample loops. The loops are filled with the standard and flushed with "zero air". The gas dilution system is used for the daily instrument calibration.

The concentration of the individual target compounds is determined using the initial calibration response factors as shown below. The GC/MS methods us an internal standard in the calibration while the GC methods do not. If no IS used the terms involving IS are removed from the sample calculations below.

2.3 Sample Calculations

$$RF = \frac{\text{Area Cmpd.}}{\text{Area IS}} * \frac{\text{Conc. IS}}{\text{Std Conc of Cmpd (ppbV)}}$$

Std Conc Cmpd (ppbV) = (Std Conc cmpd (ppmV)*1000*(Std load Vol /1000 mls)

Avg. RF = $(RF_1 + RF_2 + \ldots + Rf_n)/ n$

The Concentration of Analyte in the sample is calculated:

$$\frac{\text{Area Cmpd.}}{\text{Area IS}} * \frac{\text{IS Conc.}}{\text{Avg. RF}} * \frac{\text{1000 ml}}{\text{Smple. Vol.}} * \text{DF}$$

Where IS = Internal Standard
RF = Response Factor
n = Number of calibration levels
DF = Final pressure/ Initial pressure of the SUMMA canister.
IS Conc. = 20 ppbV (except BFB = 10 ppbV)

2.4 GC/MS Specific Data Processing :

Qualifiers : Qualifiers are ions used to aid in the identification of a peak. These ions are usually the secondary ion peaks for the compound in question. A ratio between the area counts of the primary ion (used for quantitation) and the area counts of the secondary ion is established by analyzing a daily standard containing the ions of interest at a known concentration (generally a mid-level standard). The standard ratios are used to update the running method on a daily basis. The method sets an acceptable criteria window for the qualifier ion by using the ion ratios and the user specific qualifier criteria.

Example For Toluene :

Primary ion 91 : 341877 area counts Secondary ion 92 : 205126 area counts
The target ion 91 is automatically set at 100%.
The ratio of 92 ion to 91 ion is used to set a target qualifier amount for the 91 ion

205126 / 341877 * 100 = 60%.

The user then sets a +/- window based upon the experience and the industry standard criteria. EAS uses a window of +/-20 percent relative except for the early eluting compounds which use a window of +/-35 percent relative.

Qualifier Exceptions : An analyst must use his best judgment when positively identifying a compound using qualifiers, as several factors can affect the qualifier ratios. These factors include, but are not limited to, the amounts of carbon dioxide and water present in the sample, the ambient room temperature, coeluting peaks, baseline carry-over from compounds eluting prior to the peak in question and the actual amount of the compound in the sample.

If a compound is in question, the analyst will first compare the total peak spectra of the sample with the total compound spectra of a standard. If the two spectra are a fair match, the analyst will report a positive result. If the identity is still in question, the analyst runs a library search for compound matches with the NBS54K library. For a positive identification using this library, the peak in question must have a Q value match of 50% or above. If a positive peak identification still is not made, the analyst looks at the area counts for the target ion. If the area is less than 5000 counts and/or the compound result is near the instrument detection limit, the analyst will look for the presence of the qualifier. If it is present, a positive result will be reported. In the case that the compound result is less than 5 times the reported MDL, the presence of the target ion is sufficient to report a positive result. If none of this criteria is met, the compound is reported non-detected (ND).

Retention Time : Each day a calibration standard is analyzed. This calibration standard is used to check the compound target retention times in the running method prior to all other analyses. The normal retention time window is +/- 0.2 minutes of the target retention time, adjusted for any retention time shifts in the internal standard (IS), with all shifts being in the same direction.

Retention Time Exceptions : Air samples rarely fall within the retention time guidelines cited above. The retention times of the compounds are significantly affected by the amount of carbon dioxide and water present in the samples. As a general rule, compounds eluting prior to benzene will be shifted to the left (earlier Rts), while the later eluting compounds may be shifted to the right (later Rts). For retention times near benzene, the normal retention time criteria can be used with judgment. The earlier the peaks elute from benzene, the wider the acceptance window becomes with the earliest peaks having a possible shift of 2 to 3 minutes. The analyst should use the nearest positively identified peak's retention time window as a guide to what the window will be for compounds near that peak. Normally, the peak elution prior to benzene is in the same direction. However, if significant amounts of carbon dioxide or water are present, they can cause the earliest eluting peaks to shift to the right. Peaks eluting after benzene may shift slightly to the right with the window increasing slightly with increasing distance. This shift is normally no more than +/- 0.4 minute of the target RT adjusted for the IS shift and is in the same direction for all compounds. If the analyst has knowledge of certain peak patterns, he will also use this information in identifying peaks. Another important retention time criteria for air samples is that all compounds should elute in the same order as the daily calibration standard compounds.

2.5 QUALITY CONTROL PROGRAM

The quality assurance program at Environmental Analytical Service, Inc. is described in detail in the EAS Quality Manual.

2.6 Data Qualifiers and Definitions

Data Qualifiers

U Indicates compound was analyzed for but not detected.

B This compound was also detected in the blank.

DL The sample was analyzed at a lower volume.

E The amount reported is an estimated value. The result may exceed the calibration range or may be affected by possible carry-over from the previous sample.

N Indicates presumptive evidence of a compound. This flag is only used for tentatively identified compounds, where the identification is based on a mass spectral library search. It is applied to all TIC results.

J The amount reported is an estimated value. This flag is used when a compound is reported below the Lower Quantitation Limit (LQL) often called the Reporting Limit (RL).

NFS The ions do not fit the target spectra.

Definitions

ppbV = $\frac{\text{\# nanomoles cmpd}}{\text{\# moles air}}$

The compound (cmpd) is reported as ppb of compound by Volume. This unit is temperature independent.

ug/m3 = ppbV * $\frac{\text{MW cmpd}}{23.68}$

The compound is reported as ug of a compound in a m3 of air.
23.68 is the molar volume of a gas at 60 F and 1 atm pressure.
MW = molecular weight.
This unit is temperature dependent.

ppbC = ppbV * # carbons in compound.

CHAIN OF CUSTODY RECORD

BOEING

COC # MV 616
LAB SDG # 706355

Page: 1 of 1

Customer Information		Project Information		Project Information	
Site:	Boeing-SSFL	Client:	NASA	Sampler:	Chuck Schmidt
Company:	MWH	Sampling Event:	Vapor Migration Study	Contact #:	(530) 200-2473
Report to:	Lisa Tucker	Project. No.			
Address:	9444 Farnham Street	Project Manager:	Dixie Hambrick		
	Suite 300	PM Contact #	626-568-6348		
	San Diego, CA 92123	Field Contact:	Eric Vandervelde		
Email:	boeingedms@ch2m.com	Field Contact #	818.391.4247		
	lisa.tucker@mwhglobal.com	Lab Contact/PM:	Steve Hoyt / EAS, Inc		
		Lab Address:	173 Cross Street, San Luis Obispo, CA		
		Lab Phone:	805.781.3585		

No.	Sample ID	Description (for MWH use only)	Matrix	Date	Time	Preserv.	Cont. Type	No. of Containers	Field Filtered?	TO-15 SIM	TCE		Can #	Initial Pressure	Final Pressure			HOLD	Requested Analyses / Instructions/TAT
1	MV616	BTVF01502	VF	7/21/06	0746	NA	Summa	1	NA		X		601	706	999				RD-9 Area/ES-20 primary
2	MV617	NCVF01502	VF	7/21/06	0831	NA	Summa	1	NA		X		980	689	996				primary
3	MV618	FSVF01502	VF	7/21/06	0926	NA	Summa	1	NA		X		772	687	959				primary
4	MV619	CFVF01502	VF	7/21/06	1016	NA	Summa	1	NA		X		214	671	975				primary Compound A/B;
5	MV620	CFVF02502	VF	7/21/06	1017	NA	Summa	1	NA		X		822	680	980				co-located Compound A
6	MV621	PAVF01502	VF	7/21/06	1110	NA	Summa	1	NA		X		352	676	1008				primary Delta/HAA-5;
7	MV622	PAVF01D01	VF	7/21/06	1116	NA	Summa	1	NA		X		398	675	981				Collocated of 5 Delta/HAA-5
8	MV623	PAVF02502	VF	7/21/06	1117	NA	Summa	1	NA		X		380	674	985				co-located
9																			
10																			

1. Relinquished by:	Date:	2. Received by:	Date:	3. Relinquished by:	Date:	4. Received by:	Date:
IVSN Vorgs	7/21/06	CESCHMOT	7/21/06	CESCHMOT	7/21/06	SHIPPER	7/21/06
Company: MWH	Time: 1300	Company: Envl Const	Time: 1300	Company: Envl Const	Time: 1400	Company: FED EX	Time: 1400

Comments: please report ppbv, ug/m3, Flux (mg/m2 min-1)

Geotracker EDF ☐ Standard TAT ☒

Data Validation Package ☒ Level IV Rush TAT Indicate Above

Rev 7/06

Returned cans 159
unused 315

Recieved by: Ashley Guardia Date: 7/24/06
Company: EAS Time: 9:30

ENVIRONMENTAL ANALYTICAL SERVICE, INC.
DATA DELIVERABLE PACKAGE

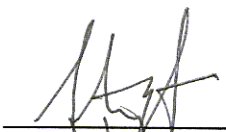
COVER PAGE

Lab Name:	Environmental Analytical Service	Contract:	
Lab Code:		SAS No.:	
Case No.:		SDG No.:	206355
SOW No.:			

EPA Sample No.	Lab Sample ID
206355-1	MV616
206355-2	MV617
206355-3	MV618
206355-4	MV619
206355-5	MV620
206355-6	MV621
206355-7	MV622
206355-8	MV623

Comments:

I certify that this data package is in compliance with the Terms and Conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hardcopy data package and in the computer-readable data submitted on floppy diskette has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature.

Signature:		Name:	Steve Hoyt
Date:	9/7/06	Title:	Lab Director

ANALYTICAL REPORT, QUALITY ASSURANCE REPORT, AND DELIVERABLES

Project Name: Boeing-SSFL
Project #
Sample Date: 7/21/06

Sample Delivery Group: 206355

Prepared for:

MWH
San Diego, CA

Prepared by:

Steve Hoyt

ENVIRONMENTAL ANALYTICAL SERVICE, INC.
173 Cross St.
San Luis Obispo, CA 93401

(805) 781-3585, FAX (805) 541-4550

TABLE OF CONTENTS

SECTION 1
Project Summary

1.1 Analytical Batch and Log-in Batch Summary

The samples received by Environmental Analytical Service (EAS) for this project were logged in and assigned a Sample Delivery Group (SDG) Number. Each sample is also assigned an individual Laboratory ID number. The samples were then distributed to the analysts for the designated analysis. Each sample was analyzed in a daily analytical batch with associated QC. Each QC batch is assigned a QC analytical batch number. The Analytical Batch Reference Table is a summary of the SDG number, the client ID, the date collected, the EAS laboratory ID number, and the analytical batch number for each sample received. The QC Criteria for each analytical test is summarized in Section 1.4. For detailed information on Quality Control consult the EAS Quality Manual. Section 1.5 contains a Case Narrative for each QC analytical batch.

1.2 Sample Receipt Log-in Form and Chain-of-Custody Forms

The following page shows the Sample Receipt Log-In Form that was filled out by Sample Control when the samples were received by EAS. Following the Sample Receipt Log-In Form are the Chain-of-Custody form(s) received with the samples.

SAMPLE LOG-IN SHEET

Lab Name: Environmental Analytical Service
Received By (Print): Lesley Andrews-Wise

Page 1 of 1
Log-In Date: 7/24/2006

Case Number:
Sample Delivery Group No. 206355
SAS Number:

CIRCLE THE APPROPRIATE RESPONSE

1. Custody Seal(s): Present/Absent* Intact/Broken N/A
2. Custody Seal Nos.:
3. Chain-of-Custody Records: Present/Absent*
4. Traffic Reports or Packing List: Present/Absent* N/A
5. Airbill: Airbill/Sticker Present/Absent* N/A
6. Airbill No: 857534215148
7. Sample Tags: Present/Absent* Sample Tag Numbers: Listed/Not Listed on Chain-of-Custody
8. Sample Condition: Intact/Broken*/Leaking
9. Does information on custody records, traffic reports and sample tag agree? Yes / No *
10. Date Received at Lab: 7/24/2006
11. Time Received: 9:30 AM

Sample Transfer

Area #:
By:
On:

Sample #	Can/Sample Tag #	Assigned Lab #	REMARKS: Condition of Sample Shipment ETC.
MV616	601	206355-1	Intact
MV617	980	206355-2	Intact
MV618	1772	206355-3	Intact
MV619	214	206355-4	Intact
MV620	822	206355-5	Intact
MV621	352	206355-6	Intact
MV622	398	206355-7	Intact
MV623	380	206355-8	Intact

* If Circled, contact SMO and attach record of resolution

Received by:
Date: 7/24/2006

Logbook No.: N/A
Logbook Page No N/A

Form AADC - 1

LBSERV_labtemp\samcon\samlogin.xls

1.3 Analytical Batch Reference Table(s)

EPA TO-15 SIM

SDG Number	Lab ID Number	Date Collected	Client ID	Analysis Batch
206355	1	7/21/06	MV616	081706-MS3
206355	2	7/21/06	MV617	081706-MS3
206355	3	7/21/06	MV618	081706-MS3
206355	4	7/21/06	MV619	081806-MS3
206355	5	7/21/06	MV620	081706-MS3
206355	6	7/21/06	MV621	081706-MS3
206355	7	7/21/06	MV622	081806-MS3
206355	8	7/21/06	MV623	081806-MS3
206355	MS/MSD			082306-MS3

1.4 QC Criteria

The QC criteria are listed in the following tables by analytical test. The EAS QC Criteria described in the EAS Quality Manual was used as The QC criteria unless Project Specific QC Criteria was specified and supplied.

The daily analytical batch data was checked against the QC criteria and any criteria that did not pass are listed in the QC Comments section of the case narrative under the daily analytical batch number.

This package contains all the information needed for data validation for the requested samples. If level C package was requested the data for each daily analytical batch are provided in Section 4. If level D was requested on all or some samples the additional data (the ion spectra) for the samples and QC samples is given in Section 8.

TO-15 SIM

Parameter	EAS	Comments
Initial Calibration	5 points minimum	
Calibration Check Sample (CCS)	After Initial Calibration < 30% RSD	
Continuing Calibration Verification (CCV)	Daily (24 hours) < 30% RSD	
Internal Standard (IS)RT	A,a,a-trifluorotoluene Response 50% to 200%	
Surrogate	Toluene d-8 70-130% recovery	
Method Blank	Target analytes < ½ RL	
Laboratory Control Spike	1 per Daily Batch 70-130% recovery	Client does not need LCS/LCD for t-1,2-DCE
Duplicate (One of below) Lab Control Dup Sample Matrix Spike Dup	1 duplicate with each 20 samples <30% RSD	Only one duplicate is done in each DAB. This is usually an LCD
Canister Holding Times	30 days from sampling date	
Canister Certification	Certification <0.08 ppbv target compound GC/MS	
Field Duplicates	50% concentrations over 1 ppbv	

1.5 Project Case Narrative

The samples were received in good condition with canister pressure in an acceptable range for a valid sample event. All analyses were performed in holding time as specified by the QC criteria listed in Section 1.4. The QC criteria for each of the analytical methods used in this project has been met except as noted in the QC comments for the daily analytical batch.

Daily Analytical Batch #: 081706-MS3

All analysis met the QC requirements for the method.

Daily Analytical Batch #: 081806-MS3

All analysis met the QC requirements for the method.

Daily Analytical Batch #: 082306-MS3

All analysis met the QC requirements for the method.

SECTION 2
Operational Information

2.1 SAMPLE ANALYSIS

EPA TO-14/15 Ambient Air by GC/MS SIM

The GC/MS method (EPA Method TO-14/15) uses a cryotrapping system and a high resolution capillary column to analyze for volatile organic compounds for the TO-14 method a nafion dryer is used for water management, on TO-15 no dryer is used so oxygenated compounds can be analyzed.

Samples are analyzed on an HP 5890 gas chromatograph and HP 5970 MSD quadrapole mass spectrometer detector. A 100 to 1000 mL ambient air sample is introduced from the air sampling container on to the freezeout loop constructed of 1/8" nickel tubing packed with glass beads. A gas phase internal standard mixture, as specified in the EPA SOW for ambient air samples, is injected with each sample. The freezeout loop is immersed in liquid oxygen and concentrates the air sample. After the sample is trapped, it is thermally desorbed using an electric heater at 225° C and is cryofocussed onto the beginning of a 0.25 mm ID deactivated fused silica capillary column. The cryofocussed loop is then warmed and the compounds are injected onto a 60 meter, DB-5, 0.25 mm ID fused silica capillary column in the GC. As the column is heated, the compounds elute off the column and enter the mass spectrometer. The GC/MS is tuned and operated according to the specifications outlined in EPA SW 846 Test Methods. Compounds are calibrated by the internal standard procedure using NIST traceable air standards as described below. The relative percent difference (RPD) of a duplicate pair is about 30% at 10 ppbV and the average MDL is approximately 0.10 ppbV for most compounds at a 500 ml load volume (SIM MDL's are typically 10 times lower).

2.2 Calibration Procedures

The standards used for the routine analytical tests are commercial NIST traceable gas standards. Special in-house standards are prepared when commercial standards are not available or when commercial standards need to be diluted. Details of the traceability and calibration program at EAS can be found in the EAS Quality Manual.

Working standards are prepared by using a gas dilution system on the gas chromatograph or by making static dilutions to atmospheric levels. The gas dilution system is constructed from an eight port gas sampling valve with various size sample loops. The loops are filled with the standard and flushed with "zero air". The gas dilution system is used for the daily instrument calibration.

The concentration of the individual target compounds is determined using the initial calibration response factors as shown below. The GC/MS methods us an internal standard in the calibration while the GC methods do not. If no IS used the terms involving IS are removed from the sample calculations below.

2.3 Sample Calculations

$$RF = \frac{\text{Area Cmpd.}}{\text{Area IS}} * \frac{\text{Conc. IS}}{\text{Std Conc of Cmpd (ppbV)}}$$

Std Conc Cmpd (ppbV) = (Std Conc cmpd (ppmV)*1000*(Std load Vol /1000 mls)

Avg. RF = $(RF_1 + RF_2 + \ldots + Rf_n)/ n$

The Concentration of Analyte in the sample is calculated:

$$\frac{\text{Area Cmpd.}}{\text{Area IS}} * \frac{\text{IS Conc.}}{\text{Avg. RF}} * \frac{1000 \text{ ml}}{\text{Smple. Vol.}} * DF$$

Where IS = Internal Standard
RF = Response Factor
n = Number of calibration levels
DF = Final pressure/ Initial pressure of the SUMMA canister.
IS Conc. = 20 ppbV (except BFB = 10 ppbV)

2.4 GC/MS Specific Data Processing :

Qualifiers : Qualifiers are ions used to aid in the identification of a peak. These ions are usually the secondary ion peaks for the compound in question. A ratio between the area counts of the primary ion (used for quantitation) and the area counts of the secondary ion is established by analyzing a daily standard containing the ions of interest at a known concentration (generally a mid-level standard). The standard ratios are used to update the running method on a daily basis. The method sets an acceptable criteria window for the qualifier ion by using the ion ratios and the user specific qualifier criteria.

Example For Toluene :

Primary ion 91 : 341877 area counts Secondary ion 92 : 205126 area counts
The target ion 91 is automatically set at 100%.
The ratio of 92 ion to 91 ion is used to set a target qualifier amount for the 91 ion

205126 / 341877 * 100 = 60%.

The user then sets a +/- window based upon the experience and the industry standard criteria. EAS uses a window of +/-20 percent relative except for the early eluting compounds which use a window of +/-35 percent relative.

Qualifier Exceptions : An analyst must use his best judgment when positively identifying a compound using qualifiers, as several factors can affect the qualifier ratios. These factors include, but are not limited to, the amounts of carbon dioxide and water present in the sample, the ambient room temperature, coeluting peaks, baseline carry-over from compounds eluting prior to the peak in question and the actual amount of the compound in the sample.

If a compound is in question, the analyst will first compare the total peak spectra of the sample with the total compound spectra of a standard. If the two spectra are a fair match, the analyst will report a positive result. If the identity is still in question, the analyst runs a library search for compound matches with the NBS54K library. For a positive identification using this library, the peak in question must have a Q value match of 50% or above. If a positive peak identification still is not made, the analyst looks at the area counts for the target ion. If the area is less than 5000 counts and/or the compound result is near the instrument detection limit, the analyst will look for the presence of the qualifier. If it is present, a positive result will be reported. In the case that the compound result is less than 5 times the reported MDL, the presence of the target ion is sufficient to report a positive result. If none of this criteria is met, the compound is reported non-detected (ND).

Retention Time : Each day a calibration standard is analyzed. This calibration standard is used to check the compound target retention times in the running method prior to all other analyses. The normal retention time window is +/- 0.2 minutes of the target retention time, adjusted for any retention time shifts in the internal standard (IS), with all shifts being in the same direction.

Retention Time Exceptions : Air samples rarely fall within the retention time guidelines cited above. The retention times of the compounds are significantly affected by the amount of carbon dioxide and water present in the samples. As a general rule, compounds eluting prior to benzene will be shifted to the left (earlier Rts), while the later eluting compounds may be shifted to the right (later Rts). For retention times near benzene, the normal retention time criteria can be used with judgment. The earlier the peaks elute from benzene, the wider the acceptance window becomes with the earliest peaks having a possible shift of 2 to 3 minutes. The analyst should use the nearest positively identified peak's retention time window as a guide to what the window will be for compounds near that peak. Normally, the peak elution prior to benzene is in the same direction. However, if significant amounts of carbon dioxide or water are present, they can cause the earliest eluting peaks to shift to the right. Peaks eluting after benzene may shift slightly to the right with the window increasing slightly with increasing distance. This shift is normally no more than +/- 0.4 minute of the target RT adjusted for the IS shift and is in the same direction for all compounds. If the analyst has knowledge of certain peak patterns, he will also use this information in identifying peaks. Another important retention time criteria for air samples is that all compounds should elute in the same order as the daily calibration standard compounds.

2.5 QUALITY CONTROL PROGRAM

The quality assurance program at Environmental Analytical Service, Inc. is described in detail in the EAS Quality Manual.

2.6 Data Qualifiers and Definitions

Data Qualifiers

U Indicates compound was analyzed for but not detected.

B This compound was also detected in the blank.

DL The sample was analyzed at a lower volume.

E The amount reported is an estimated value. The result may exceed the calibration range or may be affected by possible carry-over from the previous sample.

N Indicates presumptive evidence of a compound. This flag is only used for tentatively identified compounds, where the identification is based on a mass spectral library search. It is applied to all TIC results.

J The amount reported is an estimated value. This flag is used when a compound is reported below the Lower Quantitation Limit (LQL) often called the Reporting Limit (RL).

NFS The ions do not fit the target spectra.

Definitions

ppbV = $\frac{\text{\# nanomoles cmpd}}{\text{\# moles air}}$

The compound (cmpd) is reported as ppb of compound by Volume. This unit is temperature independent.

ug/m3 = ppbV * $\frac{\text{MW cmpd}}{23.68}$

The compound is reported as ug of a compound in a m3 of air.
23.68 is the molar volume of a gas at 60 F and 1 atm pressure.
MW = molecular weight.
This unit is temperature dependent.

ppbC = ppbV * # carbons in compound.

CHAIN OF CUSTODY RECORD

COC # MV641
LAB SDG # 206373

BOEING

Page: 1 of 1

Customer Information		Project Information		Project Information	
Site:	Boeing-SSFL	Client:	NASA	Sampler:	Ivan Vargas
Company:	MWH	Sampling Event:	Vapor Migration Study	Contact #:	(818) 391 4246
Report to:	Lisa Tucker	Project. No.		Requested Analyses	Instructions/TAT
Address:	9444 Farnham Street	Project Manager:	Dixie Hambrick		
	Suite 300	PM Contact #	(626) 568 6348		
	San Diego, CA 92123	Field Contact:	Eric Vandervelde		
Email:	boeingedms@ch2m.com	Field Contact #	818.391.4247		
	lisa.tucker@mwhglobal.com	Lab Contact/PM:	Steve Hoyt / EAS, Inc		
		Lab Address:	173 Cross Street, San Luis Obispo, CA		
		Lab Phone:	805.781.3585		

EAS ID 206373-

No.	Sample ID	Description (for MWH use only)	Matrix	Date	Time	Preserv.	Cont. Type	No. of Containers	Field Filtered?	TO-15 SIM LOX L37	Leak detection with Isopropyl Alcohol purge	Can #	IP	FP	HOLD	Initial / final Vacuum "Hg
-1	1	MV641	FSSV03S01	SV	7/27/06	0803	NA	Summa	1	NA	X	X	643	591	928		30 "Hg 5.0 "Hg
-2	2	MV642	FSSV03S02	SV	7/27/06	0814	NA	Summa	1	NA	X	X	770	418	911		30 "Hg 10 "Hg
-3	3	MV643	FSSV03D01	SV	7/27/06	0814	NA	Summa	1	NA	X	X	533	420	940		30 "Hg 10 "Hg
-4	4	MV644	BZSV01S01	SV	7/27/06	1050	NA	Summa	1	NA	X	X	183	593	915		30 "Hg 5.0 "Hg
-5	5	MV645	BZSV01S02	SV	7/27/06	1059	NA	Summa	1	NA	X	X	621	580	901		30 "Hg 4.5 "Hg
-6	6	MV646	BZSV01S03	SV	7/27/06	1223	NA	Summa	1	NA	X	X	657	563	916		30 "Hg 5.0 "Hg
-7	7	MV647	BZSV01E01	SV	7/27/06	1058	NA	Summa	1	NA	X		524	676	911		30 "Hg - 30 "Hg
-8	8	MV648	CLSVB9S01	SV	7/27/06	1349	NA	Summa	1	NA	X	X	407	545	930		30 Hg 5.0 "Hg
-9	9	MV649	CLSVB9S02	SV	7/27/06	1358	NA	Summa	1	NA	X	X	731	586	942		30 Hg 5.0 "Hg
-10	10	MV650	CLSVB9S03	SV	7/27/06	1522	NA	Summa	1	NA	X	X	618	561	906		30 Hg 5.0 "Hg

SHEL — SHEL AT

1. Relinquished by:	Date:	2. Received by:	Date:	3. Relinquished by:	Date:	4. Received by:	Date:
Ivan Vargas	7/27/06						7/28/06
Company: MWH	Time: 1705	Company:	Time:	Company:	Time:	Company: EAS	Time: 1057

Comments:

Geotracker EDF [ ] Standard TAT [X]

Data Validation Package [X] Level IV Rush TAT Indicate Above

Rev 7/06

Returned can #780

ENVIRONMENTAL
Analytical Service, Inc.

September 14, 2006
Sample Delivery Groups (SDG): 206373

Lisa Tucker
MWH
9444 Farnham Street, Suite 300
San Diego, CA 92123

Dear Mark:

Enclosed is the analytical report for the sample(s) received and analyzed by Environmental Analytical Service, Inc. for the following project:

Project Name : Boeing-SSFL
Project Number: None Given
Sample Received: 7/28/06

The report consists of the following sections:

I. Sample Description
II. Laboratory Narrative and Chain of Custody Forms
III. Laboratory Certification
IV. Quality Control Reports
V. Analytical Results

If you have any questions on the report or the analytical data please contact me at (805) 781-3585.

Sincerely,

Steven D. Hoyt, Ph.D.
Laboratory Director

SDH/lims
CC/ Elizabeth Wessling MECX, LLC

173 Cross Street
San Luis Obispo
CA
93401-7597
805.781.3585
Fax 805.541.4550

Analytical Report

SDG Number 206373

Client: MWH **Date Received:** 7/28/2006

I. SAMPLE DESCRIPTION AND ANALYSIS REQUESTED

Client Sample No.	EAS Lab No	Analysis Requested	Date Sample	Pressure (torr) Rec	Final
MV641	206373 1	EPA TO-15 SIM 1 to 5 target compounds	7/27/2006	591	928
MV642	206373 2	EPA TO-15 SIM 1 to 5 target compounds	7/27/2006	418	911
MV643	206373 3	EPA TO-15 SIM 1 to 5 target compounds	7/27/2006	420	940
MV644	206373 4	EPA TO-15 SIM 1 to 5 target compounds	7/27/2006	543	915
MV645	206373 5	EPA TO-15 SIM 1 to 5 target compounds	7/27/2006	580	901
MV646	206373 6	EPA TO-15 SIM 1 to 5 target compounds	7/27/2006	563	916
MV647	206373 7	EPA TO-15 SIM 1 to 5 target compounds	7/27/2006	676	911
MV648	206373 8	EPA TO-15 SIM 1 to 5 target compounds	7/27/2006	545	930
MV649	206373 9	EPA TO-15 SIM 1 to 5 target compounds	7/27/2006	586	942
MV650	206373 10	EPA TO-15 SIM 1 to 5 target compounds	7/27/2006	561	906

II. LABORATORY CASE NARRATIVE and CHAIN OF CUSTODY FORMS

SDG Numbers: 206373
Analysis performed for: MWH

All laboratory quality control criteria were met for the samples in this report.

III. LABORATORY CERTIFICATION

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the condition noted above.

Steven D. Hoyt, Ph.D.
Laboratory Director

IV. QUALITY CONTROL REPORT

SDG Numbers: 206373
Client: MWH

LABORATORY QC REPORT

QC NARRATIVE

Unless project specific QC was specified, these samples were analyzed with the standard EAS QC for the method as defined in the EAS Quality Manual.

STANDARD LABORATORY QC REPORT

Unless project specific QC reporting was requested, this Section contains the standard laboratory QC supplied with the analytical reports, which includes the daily method blank and the daily duplicate control samples as described below. Each day that samples are analyzed comprises a Daily Analytical Batch for a particular instrument. A Daily Analytical Batch QC report will be supplied for each method and each day samples from this SDG Group were analyzed.

METHOD BLANK

A method blank is a laboratory-generated sample which assesses the degree to which laboratory operations and procedures cause false-positive analytical results for your samples. A copy of each batch Method Blank is included with the report. If a compound is detected in the Method Blank between the RL and MDL, it will be flagged with a "J". If a compound is above the RL, it will be flagged with a "B"

DUPLICATE CONTROL SAMPLES

A duplicate or duplicate control sample (DCS) was analyzed as part of each daily analytical batch. A DCS is a well-characterized matrix (blank water, ambient air, or actual sample) which may or may not be spiked and run in duplicate with your sample batch. The results are on the attached Duplicate Sample/Spike results. Precision is measured in a duplicate test by Relative Percent Difference (RPD) as in:

$$RPD = \frac{[\%\ \text{Recovery Test 1} - \%\ \text{Recovery Test 2}] \times 100}{(\text{Recovery Test 1} + \text{Recovery Test 2}) / 2}$$

V. ANALYTICAL RESULTS

SDG Numbers: 206373
Client: MWH

The following pages contain the certified reports for the analytical methods and the compounds requested. The reports are in order of analytical method then EAS ID number. A brief description of the units that appear on the reports is given below:

ppbV, ppmV, Percent

Parts per billion by volume (also known as mole ratio) and other related units. This is the primary reporting unit for all volatile organic compound analysis except the hydrocarbon speciation and total hydrocarbons. This unit is independent of temperature and pressure.

$$\text{ppbV} = \frac{\text{nanomoles of compound}}{\text{moles of air}}$$

ug/m3, mg/m3

Micrograms of compound per cubic meter of air and other related units. This is the primary reporting unit for semi volatile organic compounds. It is not a primary reporting unit for volatile organic compounds because it is temperature and pressure dependent, so the result will vary depending on the conditions when the sample was collected. EAS provides the units on its analytical reports as a convenience to the client, but they should be used with caution. The following equation can be used to convert from ppbV to ug/m3.

$$\text{ug/m3} = \frac{\text{ppbV x MW compound}}{23.68}$$

23.68 is the molar volume of a gas at 60 F and 1 atm pressure

ppbC, ppmC

Parts per billion by volume as carbon (methane) and other related units. This unit is the primary reporting unit for hydrocarbon analysis, even if it does not appear on the report. This unit is used because the flame ionization detector response is proportional to the number of carbons in the compound, so an accurate concentration can be reported even if the identification of the compound is not known.

$$\text{ppbC} = \text{ppbV x number of carbons in compound}$$

DATA QUALIFIERS *and* ABBREVIATIONS

ENVIRONMENTAL
Analytical Service, Inc.

Qualifiers

*	See Case Narrative
B	This compound was detected in the blank above the Reporting Limit (RL)
D	This report was calculated from a secondary dilution factor
E	Compound exceeds the calibration range and is an estimated value
J	The amount reported is an estimated value because it is between the Reporting Limit (RL) and the Method Detection Limit (MDL)
F	Higher detection limit due to sample matrix
G	Higher detection limit due to limited sample size
Q	Compound secondary ion ratio qualifiers are outside the standard acceptance criteria
R	Compound secondary retention time (RT) is outside the acceptance criteria for the method
U	Compound is less than the Method Detection Limit (MDL)

Abbreviations

MDL Minimum Detection Limit– Instrument detection limit

The minimum detectable level (MDL) is the lowest concentration of a substance that can be measured with confidence. The MDL is calculated at the 99% confidence level from seven repetitive measurements on a sample whose concentration does not exceed 10 times the estimated MDL (Glasser et. al. 1981; Long and Winefordner, 1983). Generating an MDL study, a sample is prepared in the appropriate matrix with components near the estimated MDL, which is about 3 times the instrument noise level. This sample is run seven consecutive times and the standard deviation (S) is calculated. The MDL is determined using the following formula: MDL = 3.14*S

ND Not Detected – a reported limit

NA Not Applicable

RPD Relative Percent Difference

The relative percent difference for a pair of duplicate samples is calculated from repetitive runs on sample pairs representative of the types of samples that are analyzed. The RPD provides information on the precision or reproducibility of the actual measurement process. The RPD is calculated for a particular compound from the average using the following formula:

$$RPD(\%) = \frac{\text{Difference} * 100}{\text{Average}}$$

RSD Relative Standard Deviation

The relative standard deviation is reported as a percentage deviation at a particular concentration using the following equation:

$$RSD\ (\%) = \frac{S * 100}{\text{Average}}$$

DEFINITIONS

ppbV $= \frac{\text{\# nanomoles cmpd}}{\text{\# moles air}}$ $= \frac{\text{ppbC}}{\text{\# carbons in cmpd}}$

Compound is reported as ppb of compound by Volume

This unit is temperature independent

ug/m^3 $= \text{ppbV} \times \frac{\text{MW compound}}{23.68}$

Compound is reported as ug of a compound in a m^3 of air

23.68 is the molar volume of a gas at 60 ° F and 1 atm pressure

MW = molecular weight

This unit is temperature dependent

ppbC = ppbV x # carbons in compound

MW-251

HydroGeoSpectrum SOIL / POR CHAIN OF CUSTODY

PROJECT ROCKETDYNE CLIENT AMEC DATE 4/23/01

	SAMPLE ID-Depth(ft) AMEC ID#	Depth	EPA ID#	INSTALLED	SAMPLED	BULB ID	FLOW ml/min	TIME min	Purge Vol	Isopropyl Alcohol Leak Check	MISC SWMU #	ULS #
1	BISV12501	6'	RW343	4-19-01	1116-1126	N6	150	10	100ML	✓	4-1	20
2	BISV12502	12'	RW344	↓	1116-1128	X7	↓	12	↓	✓	↓	20
3	BISV17501	5'	RW345	4-18-01	1135-1145	E5		10		✓		20
4	BISV17502	10'	RW346	↓	1135-1147	S22		12		✓		20
5	BLSV17503	15'	RW347		1135-1147	X6		12		✓		20
6	BLSV17D03	15'	RW348		1135-1147	X8		12		✓		20
7	BLSV18501	6'	RW349		1155-1205	N2		10		✓		23a
8	BISV18502	12'	RW350	↓	1155-1207	X19	↓	12	↓	✓	↓	23a

SURROGATES: D6-Benzene____ D8-Toluene____ D-Chloroform____ D6-DMK____ D-DCM____

RELINQUISHED BY: [signature] RECEIVED BY [signature] DATE/TIME 4/23/01 1220

RELINQUISHED BY _____ RECEIVED BY _____ DATE/TIME _____

HydroGeoSpectrum SOIL VAPOR CHAIN OF CUSTODY

4.25 1

PROJECT ROCKETDYNE CLIENT AMEC DATE 4/23/01

	SAMPLE ID-Depth(ft) AMEC ID#	Depth	EPA ID#	INSTALLED	SAMPLED	BULB ID	FLOW ml/min	TIME min	Purge Vol	ISOPROPYL ALCOHOL Leak Check	MISC SWMU #	MISC ULS #
9	ESSV03501	15'	RW351	4/19/01	1348-1403	A16	150	15	100ML	✓	7.9	
10	ESSV04501	10'	RW352	↓	1349-1401	Y6	150	12	↓	✓	7.9	
11	ECSV23501	5'	RW353	4/18/01	1413-1423	E8	150	10		✓	6.1	
12	ECSV24501	5'	RW354	↓	1415-1425	H1	CLOGGED	10		✓	↓	
13	ECSV22501	3'	RW355		1419-1429	R6	150	10		✓		
14	ECSV19501	5'	RW356		1434-1444	B11	150	10		✓		
15	ECSV25501	5'	RW357		1436-1446	R8	150	10		✓		
16	ECSV27501	6'	RW358	↓	1438-1448	A5	150	10	↓	✓	↓	

SURROGATES: D6-Benzene____ D8-Toluene____ D-Chloroform____ D6-DMK____ D-DCM____

RELINQUISHED BY: [signature] RECEIVED BY [signature] DATE/TIME 1455 4/23/01

RELINQUISHED BY _____ RECEIVED BY _____ DATE/TIME _____

Chain of Custody Record

Centrum Analytical Laboratories, Inc.
www.centrum-labs.com
lab@centrum-labs.com

1401 Research Park Drive, Suite 100
Riverside, CA 92507
Voice: 909.779.0310 ● 800.798.9336
Fax: 909.779.0344

3299 Hill Street, Suite 305
Signal Hill, CA 90755
Voice: 562.498.7005
Fax: 562.498.8617

Centrum Job # M4-958a ~~-SF~~ JT 3/5

Project No: ~~1881565.010101~~ 189263.011181, 189264.011181

Project Name: Boeing SSFL Group 8

Project Manager: Travis Peterson

Phone: 925-975-3449 Fax:

Client Name: Montgomery Watson Harza
(Report and Billing)

Address: 1340 Treat Blvd, Suite 300, Walnut Creek, CA 94597
(Report and Billing)

Turn-Around Time
- ☐ 24 Hr. RUSH*
- ☐ 48 Hr. RUSH*
- ☐ Normal TAT

*Requires PRIOR approval, additional charges apply

Requested due date: _____

Centrum ID (Lab use only)	Sample ID (As it should appear on report)	Depth (ft)	EPA ID	BULB ID	Time Sampled start	Time Sampled stop	Flow (ml/min)	Date sampled	Sample matrix	Containers: # and type	Analyses Requested: Isopropyl Alcohol Leak Check	Analyses Requested: GCMS: 8260B mod. LARWQCB 23 soil gas	Remarks/Special Instructions
1	FSSV0004S02	8		M4-3	0824	0836	200	3-5-07	SV	125cc Glass Bulb	X	X	
2	FSQV0001F01	—		M4-5	0818	0837	200	"	"	" JT 3/5	~~X~~	X	
3	FSSV0005S02	10		M4-7	0843	0856	0	"	"	"	X	X	Flow=200 For 3 min, Fell to Zero.
4	FSSV0006S01	~~10~~ 9 3-5-07		M4-12	0900	0911	200	"	"	"	X	X	
5	FSSV0006D01	"		M4-13	"	"	200	"	"	"	X	X	

	Date	Time
1) Relinquished by: (Sampler's Signature) Chris Newson	3/5/07	1350
2) Received by:		
3) Relinquished by:		
4) Received by:		
5) Relinquished by:		
6) Received for Laboratory by: John Langer	3/5/07	1350

The delivery of samples and the signature on this chain of custody form constitutes authorization to perform the analyses specified above under the Terms and Conditions set forth on the back hereof.

To be completed by Laboratory personnel:
- Samples chilled? ☐ Yes ☐ No ☒ From Field
- Custody seals? ☐ Yes ☒ No
- All sample containers intact? ☒ Yes ☐ No
- ☐ Courier ☐ UPS/Fed Ex ☒ Hand carried

Sample Disposal
- ☐ Client will pick up
- ☐ Return to client
- ☐ Lab disposal

Laboratory Notes:

Sample Locator No.

Centrum
Analytical
Laboratories, Inc.
Certified Hazardous Waste Testing Mobile & In House Laboratories

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
LOS ANGELES REGION

LABORATORY REPORT FORM (COVER PAGE 1)

Laboratory Name:	Centrum Analytical Laboratories, Inc.
Address:	1401 Research Park Drive, Suite 100, Riverside, CA 92507
Telephone/Fax:	(951) 779-0310/(951) 779-0344
ELAP Certification No./ Expiration Date:	2373 / June 31, 2007
Authorized Signature Name, Title: (print)	Mark Horan, Mobile Laboratories Supervisor
Signature, Date:	
Client Name:	Montgomery Watson Harza
Project Name/No:	Boeing SSFL / 1891263.011181 / 1891264.0111811
Date(s) Sampled: (from - to)	03/05/07
Date(s) Received: (from - to)	03/05/07
Date(s) Reported: (from - to)	03/05/07
Chain of Custody received:	Yes X No
Comments	

(RWQCB Lab Form: Ver 6/00)

Centrum Analytical Laboratories, Inc.

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
LOS ANGELES REGION

LABORATORY REPORT FORM (COVER PAGE 2)

Organic Analyses	# of Samples	# of Samples Subcontracted
VOC's by GCMS	5	0

Sample Condition: Intact

Inorganic Analyses	# of Samples	# of Samples Subcontracted

Sample Condition:

Microbiological Analyses	# of Samples	# of Samples Subcontracted

Sample Condition:

Other Types of Analyses	# of Samples	# of Samples Subcontracted

Sample Condition:

(RWQCB Lab Form: Ver 6/00)

Centrum Analytical Laboratories, Inc.

Project No: Boeing SSFL / 1891263.011181 / 1891264.0111811 (RWQCB labForm 10A; Ver6/00)

QA/QC REPORT (Continued)

II. Matrix Spike (MS)/Matrix Spike Duplicate (MSD)

DATE PERFORMED: 03/05/07 ANALYTICAL METHOD: GCMS

BATCH #: 030507M4V1554

LAB SAMPLE I.D.: Laboratory Control Sample REPORTING UNITS: µg/L

ANALYTE	SAMPLE RESULT	SPK CONC	MS	% MS	SPIKE CONC (DUP)	MSD	% MSD	RPD	MS/MSD LIMIT	RPD Limit
1,1-Dichloroethene	0.0	50	47.40	95%	50	42.37	85%	11.2%	70-130	25
Benzene	0.0	50	48.42	97%	50	47.57	95%	1.8%	70-130	25
Trichloroethene	0.0	50	47.69	95%	50	46.90	94%	1.7%	70-130	25
Toluene	0.0	50	48.85	98%	50	47.95	96%	1.9%	70-130	25
Chlorobenzene	0.0	50	46.43	93%	50	46.48	93%	0.1%	70-130	25

III. Laboratory Quality Control Check Sample (LCS)

DATE PERFORMED: 03/05/07 ANALYTICAL METHOD: GCMS

STANDARD SUPPLY SOURCE: Centrum Analytical Laboratories DATE OF SOURCE: 02/06/07

INSTRUMENT I.D.: M4GCMS LOT NUMBER: VC-70-01

LAB LCS I.D.: Laboratory Control Sample REPORTING UNITS: µg/L

ANALYTE	SPIKE CONC	RESULT	% RECOVERY	ACP % REC LIMIT
1,1-Dichloroethene	50	47.40	95%	70-130
Benzene	50	48.42	97%	70-130
Trichloroethene	50	47.69	95%	70-130
Toluene	50	48.85	98%	70-130
Chlorobenzene	50	46.43	93%	70-130

Chain of Custody Record

Centrum Job # M4-961C

Centrum Analytical Laboratories, Inc.
www.centrum-labs.com
lab@centrum-labs.com

1401 Research Park Drive, Suite 100
Riverside, CA 92507
Voice: 909.779.0310 ● 800.798.9336
Fax: 909.779.0344

3299 Hill Street, Suite 305
Signal Hill, CA 90755
Voice: 562.498.7005
Fax: 562.498.8617

Page 1 of 1

Project No: ~~1881622.010105~~ 1891263.011181 / 1891264.011181 (XT 3/9)

Project Name: Boeing SSFL

Project Manager: Travis Peterson

Phone: 925-975-3449 Fax:

Client Name: (Report and Billing) Montgomery Watson Harza

Address: (Report and Billing) 1340 Treat Blvd, Suite 300, Walnut Creek, CA 94597

Turn-Around Time
- ☐ 24 Hr. RUSH*
- ☐ 48 Hr. RUSH*
- ☐ Normal TAT

*Requires PRIOR approval, additional charges apply

Requested due date: _____

Centrum ID (Lab use only)	Sample ID (As it should appear on report)	Depth (ft)	EPA ID	BULB ID	Time Sampled start	Time Sampled stop	Flow (ml/min)	Date sampled	Sample matrix	Containers: # and type	Analyses Requested: Isopropyl Alcohol Leak Check	Analyses Requested: GCMS: 8260B mod. LARWQCB 23 soil gas	Remarks/Special Instructions
	FSSV000550I	~~9~~ 15		M4-8	1001	1012	150	3/8/07	SV	125cc Glass Bulb	X	X	

1) Relinquished by: (Sampler's Signature) Date: 3/8/07 Time: 1030

2) Received by: Date: Time:

3) Relinquished by: Date: Time:

4) Received by: Date: Time:

5) Relinquished by: Date: Time:

6) Received for Laboratory by: Date: 3/8/07 Time: 1030

To be completed by Laboratory personnel:
- Samples chilled? ☐ Yes ☐ No ☒ From Field
- Custody seals? ☐ Yes ☒ No
- All sample containers intact? ☒ Yes ☐ No
- ☐ Courier ☐ UPS/Fed Ex ☒ Hand carried

Sample Disposal
- ☐ Client will pick up
- ☐ Return to client
- ☐ Lab disposal

The delivery of samples and the signature on this chain of custody form constitutes authorization to perform the analyses specified above under the Terms and Conditions set forth on the back hereof.

Laboratory Notes:

Sample Locator No.

Centrum
Analytical
Laboratories, Inc.
Certified Hazardous Waste Testing Mobile & In House Laboratories

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
LOS ANGELES REGION

LABORATORY REPORT FORM (COVER PAGE 1)

Laboratory Name:	Centrum Analytical Laboratories, Inc.
Address:	1401 Research Park Drive, Suite 100, Riverside, CA 92507
Telephone/Fax:	(951) 779-0310/(951) 779-0344
ELAP Certification No./ Expiration Date:	2373 / June 31, 2007
Authorized Signature Name, Title: (print)	Mark Horan, Mobile Laboratories Supervisor
Signature, Date:	
Client Name:	Montgomery Watson Harza
Project Name/No:	Boeing SSFL / 1891263.011181 / 1891264.011181
Date(s) Sampled: (from - to)	03/08/07
Date(s) Received: (from - to)	03/08/07
Date(s) Reported: (from - to)	03/08/07
Chain of Custody received:	Yes X No
Comments	

(RWQCB Lab Form: Ver 6/00)

Centrum Analytical Laboratories, Inc.

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
LOS ANGELES REGION

LABORATORY REPORT FORM (COVER PAGE 2)

Organic Analyses	# of Samples	# of Samples Subcontracted
VOC's by GCMS	1	0

Sample Condition: Intact

Inorganic Analyses	# of Samples	# of Samples Subcontracted

Sample Condition:

Microbiological Analyses	# of Samples	# of Samples Subcontracted

Sample Condition:

Other Types of Analyses	# of Samples	# of Samples Subcontracted

Sample Condition:

(RWQCB Lab Form: Ver 6/00)

Centrum Analytical Laboratories, Inc.

Project No: Boeing SSFL / 1891263.011181 / 1891264.011181 (RWQCB labForm 10A; Ver6/00)

QA/QC REPORT (Continued)

II. Matrix Spike (MS)/Matrix Spike Duplicate (MSD)

DATE PERFORMED: 03/08/07 ANALYTICAL METHOD: GCMS

BATCH #: 030807M4V1557

LAB SAMPLE I.D.: Laboratory Control Sample REPORTING UNITS: µg/L

ANALYTE	SAMPLE RESULT	SPK CONC	MS	% MS	SPIKE CONC (DUP)	MSD	% MSD	RPD	MS/MSD LIMIT	RPD Limit
1,1-Dichloroethene	0.0	50	46.61	93%	50	45.24	90%	3.0%	70-130	25
Benzene	0.0	50	48.64	97%	50	49.95	100%	2.7%	70-130	25
Trichloroethene	0.0	50	48.13	96%	50	48.63	97%	1.0%	70-130	25
Toluene	0.0	50	48.65	97%	50	50.45	101%	3.6%	70-130	25
Chlorobenzene	0.0	50	45.81	92%	50	47.77	96%	4.2%	70-130	25

III. Laboratory Quality Control Check Sample (LCS)

DATE PERFORMED: 03/08/07 ANALYTICAL METHOD: GCMS

STANDARD SUPPLY SOURCE: Centrum Analytical Laboratories DATE OF SOURCE: 02/06/07

INSTRUMENT I.D.: M4GCMS LOT NUMBER: VC-70-01

LAB LCS I.D.: Laboratory Control Sample REPORTING UNITS: µg/L

ANALYTE	SPIKE CONC	RESULT	% RECOVERY	ACP % REC LIMIT
1,1-Dichloroethene	50	46.61	93%	70-130
Benzene	50	48.64	97%	70-130
Trichloroethene	50	48.13	96%	70-130
Toluene	50	48.65	97%	70-130
Chlorobenzene	50	45.81	92%	70-130

SOIL VAPOR VALIDATION REPORTS

12269 East Vassar Drive, Aurora, CO 80014
720.535.5502, Fax 720.535.7555

DATA ASSESSMENT FORM

Project Title:	Vapor Migration Study
Project Manager:	D. Hambrick
Analysis/Method:	EPA Method TO-15
QC Level:	IV/V[1]
SDG:	206373
Matrix:	Air
No. of Samples:	10
No. of Reanalyses/Dilutions:	0
Date Reviewed:	September 24, 2006
Reviewer:	L. Calvin
Reference:	*MEC^X Data Validation Procedure for Volatile Organics (DVP-2, Rev. 0), EPA Method TO-15* (1/99), and USEPA *Contract Laboratory Program National Functional Guidelines for Organic Data Review* (2/94)
Samples Reviewed:	MV641, MV642, MV643, MV644, MV645, MV646, MV647, MV648, MV649, MV650

Data Validation Findings

	Findings	Qualifications
1. Sample Management	According to the case narrative for this SDG, the samples were received intact and in good condition, with acceptable canister pressures. The laboratory also provided canister QC certification records for the batches of canisters utilized. The COC was signed and dated by appropriate field and laboratory personnel, and accounted for the samples and analyses presented in this SDG. Although the COC indicated all samples were collected in Summa canisters, the sample result summary for sample MV650 indicated the sample was collected in a Tedlar bag. The laboratory confirmed that the COC was correct. The sample result summary was corrected by the reviewer. The air samples were analyzed within 30 days of collection.	No qualifications were required.

	Findings	Qualifications
3. Calibration	The initial calibration %RSDs and the continuing calibration %Ds were within the method QC limit of ≤30%, with the exception of a %D >30% for vinyl chloride in the continuing calibration analyzed 08/22/06.	As the only sample associated with the %D outlier was identified as a field QC sample, no qualifications were required.
4. Method Blanks 081706-MS1 082206-MS3 082506-MS3 082606-MS3	Four method blanks were analyzed with the samples in this SDG. The laboratory also supplied canister QC certification blanks for all canisters used in this SDG. Trichloroethene was detected between the MDL and the reporting limit in method blank 082206-MS3; however, the detect for trichloroethene in associated sample MV647 exceeded five times the method blank concentration. No target compounds were detected in the remaining method blanks or the canister QC certification blanks.	No qualifications were required.
5. LCS/LCSD 081706-MS1 082206-MS3 082506-MS3 082606-MS3	In the LCS only of 082206-MS3, trichloroethene was recovered below the QC limits but ≥10%, and in the LCSD only, vinyl chloride was recovered above the QC limits. All remaining LCS/LCSD recoveries were within the laboratory QC limits of 70-130%, and all RPDs were within the QC limit of ≤30%.	No qualifications were required.
6. Surrogates	The surrogate was recovered within the laboratory QC limits of 70-130% for all samples.	No qualifications were required.
7. MS/MSD MV642	In the MSD only, trichloroethene was recovered above the QC limits. The remaining MS/MSD recoveries were within laboratory QC limits of 70-130% and all RPDs were within the QC limit of ≤30%.	No qualifications were required.
8. Field QC FB: None ER: MV647 FD: MV642/MV643	The equipment blank had detects between the MDL and the reporting limit for vinyl chloride and 1,1-dichloroethene, and detects above the reporting limits for all remaining target compounds. Most target compound concentrations in the site samples exceeded five times the equipment blank concentrations; however, the exceptions were qualified as noted.	The following detects were qualified as estimated, "J:" 1,1-dichloroethene and trichloroethene in MV641, tetrachloroethene in MV642, MV643, and MV644, trichloroethene and tetrachloroethene in sample MV645, trans- and cis-1,2-dichloroethene and tetrachloroethene in sample MV646, and trichloroethene in sample MV648.

	Findings	Qualifications
8. Field QC (cont.) FB: None ER: MV647 FD: MV641/MV643	The field duplicate samples had four common detects above the reporting limit and one common detect between the reporting limit and the MDL. All RPDs were less than 100%. Vinyl chloride was detected below the reporting limit in MV642 only.	No qualifications were required.
10. Other	The laboratory used the acceptance criteria of -50%/+100% of the internal standard area of the associated continuing calibration; however, for validation purposes, the reviewer applied the more stringent Method TO-15 criteria of ±40% of the mean initial calibration internal standard area to evaluate samples. The internal standard was within the control limits for samples MV647 and MV649, and below the control limits for all remaining samples. Sample MV649 required analysis by full-scan method due to high concentrations of target compounds exceeding the calibration range of the SIM method, and the full-scan analysis was performed at a lower volume, or "dilution." All remaining samples analyzed by SIM also required significant diluations for target compounds. Only the acceptable dilutions and reanalyses were reported by the laboratory. MDLs and reporting limits were adjusted appropriately for dilution and/or full-scan analysis. The laboratory reported all nondetects at the MDL; however, at the professional discretion of the reviewer, those results were changed on the sample result summaries to nondetects at the reporting limit (for $\mu g/m^3$), rather than the MDL. Results were reported by the laboratory in both ppbv and units of $\mu g/m^3$. The reviewer noted that the laboratory reported results to three decimal places, rather than to three significant figures.	All results were qualified as estimated, "J," for detects and "UJ," for nondetects in samples MV641, MV642, MV643, MV644, MV645, MV646, MV648, and MV650. Detects reported between the MDL and the reporting limit were qualified as estimated, "J."

	Findings	Qualifications
10. Other (cont.)	Isopropanol leak tests were performed on all of the site samples in this SDG to demonstrate efficiency of the sampling procedure. Isopropanol was detected in samples MV641, MV645, and MV646.	Results for samples MV641, MV645, and MV646 were qualified as estimated, "J," for detects and "UJ," for nondetects.
Comments	None.	None.

[1] Level IV/V validation consists of cursory review of the summary forms and minimal review of the raw data as necessary. Based on the Level IV report it was determined by the reviewer that additional items required review. The reported values on the summary forms are presumed to be correct and no verification of the values from the raw instrument output is performed. Criteria not reviewed included instrument performance, analytical sequence, initial calibration, continuing calibration, compound identification, and compound quantification.

ANALYTICAL REPORT

ENVIRONMENTAL
Analytical Service, Inc.

EPA Method TO-15 SIM GC/MS
Analytical Method: **TO-15 SIM**

File: 0637301B.D
Description: MV641
Can/Tube#: 643
Sam_Type: SA
QC_Batch: 082606-MS3
Air Volume: 5 ml

SDG: 206373
Laboratory Number: 01

Date Sampled: 07/27/06 **Time:** 8:03
Date Received: 07/28/06
Date Extracted:
Date Analyzed: 08/26/06 **Time:** 20:02
Can Dilution Factor: 1.92 2
Not Detected Flag: U

CAS#	Compound	MDL ppbv	RL ppbv	Amount ppbv	MDL ug/m3	RL ug/m3	Amount ug/m3	Flag	Qual Code
75-01-4	Vinyl chloride	0.72	3.84	0.72	1.91	10.14	~~1.91~~ 10.14	U	UJ
75-35-4	1,1-Dichloroethene	0.45	3.84	2.37	1.82	15.71	9.72	J	J
156-60-5	trans-1,2-Dichloroethene	2.08	3.46	2.08	8.53	14.15	~~8.53~~ 14.15	U	UJ
156-59-2	cis-1,2-Dichloroethene	3.25	3.84	3.25	13.30	15.71	~~13.30~~ 15.71	U	↓
79-01-6	Trichloroethene	0.31	3.84	38.14	1.74	21.24	210.97	J	F
127-18-4	Tetrachloroethene	0.31	3.84	0.31	2.17	26.92	~~2.17~~ 26.92	U	UJ

Surrogate Recovery	Spike Amt. ppbV	Amount ppbV	% Rec.	QC Limits	Flag * = Out
Toluene-d8	0.200	0.208	104	70-130	

Notes: 1) Reported results are to be interpreted to two significant figures.
2) ug/m3 = ppbV*FW/23.68 calculated assuming conditions at 60 F and 1 atm.
3) MDL and RL are adjusted for sample volume and can dilution.
4) U and ND are Flags used for Not Detected
5) J is a flag for a result between the MDL and the RL (or lower quantitation limit, LQL)

MC 09.24.06
Level IV/V

Report File Name: 20637301.MS3
Printed on 8/28/2006

ANALYTICAL REPORT

ENVIRONMENTAL
Analytical Service, Inc.

EPA Method TO-15 SIM GC/MS
Analytical Method: **TO-15 SIM**

File: 0637302A.D
Description: MV642
Can/Tube#: 770
Sam_Type: SA
QC_Batch: 082506-MS3
Air Volume: 1 ml

SDG: 206373
Laboratory Number: 02

Date Sampled: 07/27/06 **Time:** 8:14
Date Received: 07/28/06
Date Extracted:
Date Analyzed: 08/25/06 **Time:** 18:37
Can Dilution Factor: 2.18 2
Not Detected Flag: U

CAS#	Compound	MDL ppbv	RL ppbv	Amount ppbv	MDL ug/m3	RL ug/m3	Amount ug/m3	Flag
75-01-4	Vinyl chloride	4.11	21.80	4.11	10.85	57.54	~~10.85~~ 57.54	U UJ
75-35-4	1,1-Dichloroethene	2.53	21.80	246.75	10.35	89.21	1,009.72	J
156-60-5	trans-1,2-Dichloroethene	11.83	19.62	38.49	48.43	80.32	157.55	
156-59-2	cis-1,2-Dichloroethene	18.46	21.80	166.50	75.53	89.21	681.34	
79-01-6	Trichloroethene	1.78	21.80	2,115.58	9.86	120.60	11,703.57	
127-18-4	Tetrachloroethene	1.76	21.80	3.75	12.33	152.82	26.28	J J

Surrogate Recovery	Spike Amt. ppbV	Amount ppbV	% Rec.	QC Limits	Flag * = Out
Toluene-d8	0.200	0.213	107	70-130	

Notes: 1) Reported results are to be interpreted to two significant figures.
2) ug/m3 = ppbV*FW/23.68 calculated assuming conditions at 60 F and 1 atm.
3) MDL and RL are adjusted for sample volume and can dilution.
4) U and ND are Flags used for Not Detected
5) J is a flag for a result between the MDL and the RL (or lower quantitation limit, LQL)

DAC 09.24.06
Level IV/V

Report File Name: 20637302.MS3
Printed on 8/26/2006

Environmental Analytical Service
Page 1 of 1

ANALYTICAL REPORT

ENVIRONMENTAL
Analytical Service, Inc.

EPA Method TO-15 SIM GC/MS
Analytical Method: TO-15 SIM

SDG: 206373
Laboratory Number: 03

File: 0637303A.D
Description: MV643
Can/Tube#: 533
Sam_Type: SA
QC_Batch: 082506-MS3
Air Volume: 1 ml

Date Sampled: 07/27/06 **Time:** 8:14
Date Received: 07/28/06
Date Extracted:
Date Analyzed: 08/25/06 **Time:** 20:31
Can Dilution Factor: 2.24 2
Not Detected Flag: U

CAS#	Compound	MDL ppbv	RL ppbv	Amount ppbv	MDL ug/m3	RL ug/m3	Amount ug/m3	Flag
75-01-4	Vinyl chloride	4.23	22.40	10.03	11.15	59.12	26.47	J
75-35-4	1,1-Dichloroethene	2.60	22.40	276.20	10.64	91.66	1,130.25	
156-60-5	trans-1,2-Dichloroethene	12.16	20.16	26.69	49.77	82.53	109.26	
156-59-2	cis-1,2-Dichloroethene	18.97	22.40	188.67	77.61	91.66	772.06	
79-01-6	Trichloroethene	1.83	22.40	2,226.16	10.13	123.92	12,315.35	
127-18-4	Tetrachloroethene	1.81	22.40	5.34	12.67	157.03	37.47	J

Surrogate Recovery	Spike Amt. ppbV	Amount ppbV	% Rec.	QC Limits	Flag * = Out
Toluene-d8	0.200	0.208	104	70-130	

Notes: 1) Reported results are to be interpreted to two significant figures.
2) ug/m3 = ppbV*FW/23.68 calculated assuming conditions at 60 F and 1 atm.
3) MDL and RL are adjusted for sample volume and can dilution.
4) U and ND are Flags used for Not Detected
5) J is a flag for a result between the MDL and the RL (or lower quantitation limit, LQL)

MC 09-24-06
Level III/IV

Report File Name: 20637303.MS3
Printed on 8/26/2006

ANALYTICAL REPORT

ENVIRONMENTAL
Analytical Service, Inc.

EPA Method TO-15 SIM GC/MS
Analytical Method: TO-15 SIM

SDG: 206373
Laboratory Number: 04

File: 0637304A.D
Description: MV644
Can/Tube#: 183
Sam_Type: SA
QC_Batch: 082506-MS3
Air Volume: 1 ml

Date Sampled: 07/27/06 **Time:** 10:50
Date Received: 07/28/06
Date Extracted:
Date Analyzed: 08/25/06 **Time:** 21:13
Can Dilution Factor: 1.69 2
Not Detected Flag: U

CAS#	Compound	MDL ppbv	RL ppbv	Amount ppbv	MDL ug/m3	RL ug/m3	Amount ug/m3	Flag
75-01-4	Vinyl chloride	3.19	16.90	3.23	8.41	44.61	8.53	J
75-35-4	1,1-Dichloroethene	1.96	16.90	1.96	8.02	69.16	~~8.02~~ 69.14	U
156-60-5	trans-1,2-Dichloroethene	9.17	15.21	14.04	37.55	62.27	57.48	J
156-59-2	cis-1,2-Dichloroethene	14.31	16.90	109.35	58.55	69.16	447.45	
79-01-6	Trichloroethene	1.38	16.90	1,324.15	7.64	93.49	7,325.31	
127-18-4	Tetrachloroethene	1.36	16.90	2.66	9.56	118.47	18.62	J

Surrogate Recovery	Spike Amt. ppbV	Amount ppbV	% Rec.	QC Limits	Flag * = Out
Toluene-d8	0.200	0.228	114	70-130	

Notes: 1) Reported results are to be interpreted to two significant figures.
2) ug/m3 = ppbV*FW/23.68 calculated assuming conditions at 60 F and 1 atm.
3) MDL and RL are adjusted for sample volume and can dilution.
4) U and ND are Flags used for Not Detected
5) J is a flag for a result between the MDL and the RL (or lower quantitation limit, LQL)

AC 09.24.06
Level IV / V

Report File Name: 20637304.MS3
Printed on 8/26/2006

Environmental Analytical Service
Page 1 of 1

ANALYTICAL REPORT

ENVIRONMENTAL
Analytical Service, Inc.

EPA Method TO-15 SIM GC/MS
Analytical Method: TO-15 SIM

SDG: 206373
Laboratory Number: 05

File: 0637305A.D
Description: MV645
Can/Tube#: 621
Sam_Type: SA
QC_Batch: 082606-MS3
Air Volume: 10 ml

Date Sampled: 07/27/06 **Time:** 10:59
Date Received: 07/28/06
Date Extracted:
Date Analyzed: 08/26/06 **Time:** 13:25
Can Dilution Factor: 1.55 2
Not Detected Flag: U

CAS#	Compound	MDL ppbv	RL ppbv	Amount ppbv	MDL ug/m3	RL ug/m3	Amount ug/m3	Flag
75-01-4	Vinyl chloride	0.29	1.55	0.29	0.77	4.09	0.77 4.09	U UJ
75-35-4	1,1-Dichloroethene	0.18	1.55	0.18	0.74	6.34	0.74 6.34	U
156-60-5	trans-1,2-Dichloroethene	0.84	1.40	0.84	3.44	5.71	3.44 5.71	U
156-59-2	cis-1,2-Dichloroethene	1.31	1.55	1.31	5.37	6.34	5.37 6.34	U
79-01-6	Trichloroethene	0.13	1.55	22.23	0.70	8.57	122.96	J
127-18-4	Tetrachloroethene	0.13	1.55	0.42	0.88	10.87	2.92	J

Surrogate Recovery	Spike Amt. ppbV	Amount ppbV	% Rec.	QC Limits	Flag * = Out
Toluene-d8	0.200	0.207	104	70-130	

Notes: 1) Reported results are to be interpreted to two significant figures.
2) ug/m3 = ppbV*FW/23.68 calculated assuming conditions at 60 F and 1 atm.
3) MDL and RL are adjusted for sample volume and can dilution.
4) U and ND are Flags used for Not Detected
5) J is a flag for a result between the MDL and the RL (or lower quantitation limit, LQL)

MC 09.24.06
Level IV / V

Report File Name: 20637305.MS3
Printed on 8/28/2006

Environmental Analytical Service

ANALYTICAL REPORT

ENVIRONMENTAL
Analytical Service, Inc.

EPA Method TO-15 SIM GC/MS
Analytical Method: TO-15 SIM

SDG: 206373
Laboratory Number: 06

File: 0637306A.D
Description: MV646
Can/Tube#: 657
Sam_Type: SA
QC_Batch: 082606-MS3
Air Volume: 10 ml

Date Sampled: 07/27/06 **Time:** 12:23
Date Received: 07/28/06
Date Extracted:
Date Analyzed: 08/26/06 **Time:** 14:10
Can Dilution Factor: 1.63 2
Not Detected Flag: U

CAS#	Compound	MDL ppbv	RL ppbv	Amount ppbv	MDL ug/m3	RL ug/m3	Amount ug/m3	Flag
75-01-4	Vinyl chloride	0.31	1.63	0.31	0.81	4.30	0.81 4.30	U UJ
75-35-4	1,1-Dichloroethene	0.19	1.63	0.19	0.77	6.67	0.77 6.67	U J
156-60-5	trans-1,2-Dichloroethene	0.88	1.47	3.64	3.62	6.01	14.88	
156-59-2	cis-1,2-Dichloroethene	1.38	1.63	11.97	5.65	6.67	48.98	
79-01-6	Trichloroethene	0.13	1.63	176.19	0.74	9.02	974.72	
127-18-4	Tetrachloroethene	0.13	1.63	0.42	0.92	11.43	2.94	J

Surrogate Recovery	Spike Amt. ppbV	Amount ppbV	% Rec.	QC Limits	Flag * = Out
Toluene-d8	0.200	0.211	105	70-130	

Notes: 1) Reported results are to be interpreted to two significant figures.
2) ug/m3 = ppbV*FW/23.68 calculated assuming conditions at 60 F and 1 atm.
3) MDL and RL are adjusted for sample volume and can dilution.
4) U and ND are Flags used for Not Detected
5) J is a flag for a result between the MDL and the RL (or lower quantitation limit, LQL)

MC 09.24.06
Level IV/V

Report File Name: 20637306.MS3
Printed on 8/28/2006

ANALYTICAL REPORT

ENVIRONMENTAL
Analytical Service, Inc.

ER

EPA Method TO-15 SIM GC/MS
Analytical Method: **TO-15 SIM**

SDG: **206373**
Laboratory Number: **07**

File: 0637307A.D
Description: MV647
Can/Tube#: 524
Sam_Type: SA
QC_Batch: 082206-MS3
Air Volume: 10 ml

Date Sampled: 07/27/06 **Time:** 10:58
Date Received: 07/28/06
Date Extracted:
Date Analyzed: 08/22/06 **Time:** 15:32
Can Dilution Factor: 1.35 3
Not Detected Flag: U

rev qual / qual code

CAS#	Compound	MDL ppbv	RL ppbv	Amount ppbv	MDL ug/m3	RL ug/m3	Amount ug/m3	Flag
75-01-4	Vinyl chloride	0.255	1.350	0.433	0.672	3.563	1.144	J
75-35-4	1,1-Dichloroethene	0.157	1.350	0.953	0.641	5.524	3.901	J
156-60-5	trans-1,2-Dichloroethene	0.733	1.215	2.397	2.999	4.974	9.815	
156-59-2	cis-1,2-Dichloroethene	1.143	1.350	5.902	4.677	5.524	24.152	
79-01-6	Trichloroethene	0.110	1.350	21.208	0.610	7.468	117.325	
127-18-4	Tetrachloroethene	0.109	1.350	3.061	0.763	9.464	21.456	

Surrogate Recovery	Spike Amt. ppbV	Amount ppbV	% Rec.	QC Limits	Flag * = Out
Toluene-d8	0.200	0.260	130	70-130	

Notes: 1) Reported results are to be interpreted to two significant figures.
2) ug/m3 = ppbV*FW/23.68 calculated assuming conditions at 60 F and 1 atm.
3) MDL and RL are adjusted for sample volume and can dilution.
4) U and ND are Flags used for Not Detected
5) J is a flag for a result between the MDL and the RL (or lower quantitation limit, LQL)

MC 09.24.06
Level III/IV

Report File Name: 20637307.MS3
Printed on 8/23/2006

ANALYTICAL REPORT

ENVIRONMENTAL
Analytical Service, Inc.

EPA Method TO-15 SIM GC/MS
Analytical Method: TO-15 SIM

SDG: 206373
Laboratory Number: 08

File: 0637308B.D
Description: MV648
Can/Tube#: 407
Sam_Type: SA
QC_Batch: 082606-MS3
Air Volume: 5 ml

Date Sampled: 07/27/06 **Time:** 13:49
Date Received: 07/28/06
Date Extracted:
Date Analyzed: 08/26/06 **Time:** 19:22
Can Dilution Factor: 1.71 2
Not Detected Flag: U

CAS#	Compound	MDL ppbv	RL ppbv	Amount ppbv	MDL ug/m3	RL ug/m3	Amount ug/m3	Flag
75-01-4	Vinyl chloride	0.65	3.42	0.65	1.70	9.03	~~1.70~~ 9.03	U
75-35-4	1,1-Dichloroethene	0.40	3.42	0.40	1.62	13.99	~~1.62~~ 13.99	U
156-60-5	trans-1,2-Dichloroethene	1.86	3.08	1.86	7.60	12.60	~~7.60~~ 12.60	U
156-59-2	cis-1,2-Dichloroethene	2.90	3.42	2.90	11.85	13.99	~~11.85~~ 13.99	U
79-01-6	Trichloroethene	0.28	3.42	99.80	1.55	18.92	552.08	
127-18-4	Tetrachloroethene	0.28	3.42	0.28	1.93	23.97	~~1.93~~ 23.97	U

Surrogate Recovery	Spike Amt. ppbV	Amount ppbV	% Rec.	QC Limits	Flag * = Out
Toluene-d8	0.200	0.204	102	70-130	

Notes: 1) Reported results are to be interpreted to two significant figures.
2) ug/m3 = ppbV*FW/23.68 calculated assuming conditions at 60 F and 1 atm.
3) MDL and RL are adjusted for sample volume and can dilution.
4) U and ND are Flags used for Not Detected
5) J is a flag for a result between the MDL and the RL (or lower quantitation limit, LQL)

MC 09.24.06
Level IV / V

Report File Name: 20637308.MS3
Printed on 8/28/2006

ANALYTICAL REPORT

ENVIRONMENTAL
Analytical Service, Inc.

EPA Method TO-15 Full Scan GC/MS
Analytical Method: TO-15

SDG: 206373
Laboratory Number: 09

File: 0637309A.D
Description: MV649
Can/Tube#: 731
Sam_Type: SA
QC_Batch: 081706-MS1
Air Volume: 0.05 ml

Date Sampled: 07/27/06 **Time:** 13:58
Date Received: 07/28/06
Date Extracted:
Date Analyzed: 08/17/06 **Time:** 21:44
Can Dilution Factor: 1.61 0
Not Detected Flag: U

CAS#	Compound	MDL ppbv	RL ppbv	Amount ppbv	MDL ug/m3	RL ug/m3	Amount ug/m3	Flag	new qual	qual code
75-01-4	Vinyl chloride	1,513	16,422	1,513	3,994	43,344	~~3,994~~ 43344	U	U	5
75-35-4	1,1-Dichloroethene	2,447	16,744	2,447	10,014	68,517	~~10,014~~ 68517	U		
156-60-5	trans-1,2-Dichloroethene	10,014	14,168	10,014	40,996	58,000	~~40,996~~ 58000	U		
156-59-2	cis-1,2-Dichloroethene	1,707	16,583	1,707	6,984	67,859	~~6,984~~ 67859	U		
79-01-6	Trichloroethene	2,093	16,583	262,976	11,579	91,739	1,454,810			
127-18-4	Tetrachloroethene	1,320	16,583	1,320	9,255	116,249	~~9,255~~ 116249	U	U	5

Surrogate Recovery	Spike Amt. ppbV	Amount ppbV	% Rec.	QC Limits	Flag * = Out
Toluene-d8	10.000	9.890	99	70-130	

Notes: 1) Reported results are to be interpreted to two significant figures.
2) ug/m3 = ppbV*FW/23.68 calculated assuming conditions at 60 F and 1 atm.
3) MDL and RL are adjusted for sample volume and can dilution.
4) U and ND are Flags used for Not Detected
5) J is a flag for a result between the MDL and the RL (or lower quantitation limit, LQL)

MC 09-24-06
Level IV/V

ANALYTICAL REPORT

ENVIRONMENTAL
Analytical Service, Inc.

EPA Method TO-15 SIM GC/MS
Analytical Method: **TO-15 SIM**

SDG: 206373
Laboratory Number: 10

File: 0637310B.D
Description: MV650
Can/Tube#: ~~TBAG~~ 618
Sam_Type: SA
QC_Batch: 082606-MS3
Air Volume: 0.5 ml

Date Sampled: 07/27/06 **Time:** 15:22
Date Received: 07/28/06
Date Extracted:
Date Analyzed: 08/26/06 **Time:** 20:41
Can Dilution Factor: 161.00 0
Not Detected Flag: U

CAS#	Compound	MDL ppbv	RL ppbv	Amount ppbv	MDL ug/m3	RL ug/m3	Amount ug/m3	Flag	val qual	qual code
75-01-4	Vinyl chloride	607	3,220	607	1,603	8,499	~~1,603~~ 8499	U	UJ	I
75-35-4	1,1-Dichloroethene	374	3,220	374	1,529	13,176	~~1,529~~ 13176	U		
156-60-5	trans-1,2-Dichloroethene	1,748	2,898	1,748	7,154	11,864	~~7,154~~ 11864	U		
156-59-2	cis-1,2-Dichloroethene	2,726	3,220	2,726	11,156	13,176	~~11,156~~ 13176	U		
79-01-6	Trichloroethene	263	3,220	155,518	1,456	17,813	860,340		J	
127-18-4	Tetrachloroethene	260	3,220	260	1,821	22,573	1,821 ~~22573~~	U	UJ	

Surrogate Recovery	Spike Amt. ppbV	Amount ppbV	% Rec.	QC Limits	Flag * = Out
Toluene-d8	0.200	0.202	101	70-130	

Notes: 1) Reported results are to be interpreted to two significant figures.
2) ug/m3 = ppbV*FW/23.68 calculated assuming conditions at 60 F and 1 atm.
3) MDL and RL are adjusted for sample volume and can dilution.
4) U and ND are Flags used for Not Detected
5) J is a flag for a result between the MDL and the RL (or lower quantitation limit, LQL)

MC 09.24.06
Level III / IV

Report File Name: 20637310.MS3
Printed on 8/28/2006

Environmental Analytical Service
Page 1 of 1

12269 East Vassar Drive, Aurora, CO 80014
720.535.5502, Fax 720.535.7555

DATA ASSESSMENT FORM

Project Title:	Vapor Migration Study
Project Manager:	D. Hambrick
Analysis/Method:	EPA Method TO-15
QC Level:	IV/V[1]
SDG:	206355
Matrix:	Air
No. of Samples:	8
No. of Reanalyses/Dilutions:	0
Date Reviewed:	September 24, 2006
Reviewer:	K. Shadowlight
Reference:	*MEC^X Data Validation Procedure for Volatile Organics (DVP-2, Rev. 0), EPA Method TO-15* (1/99), and USEPA *Contract Laboratory Program National Functional Guidelines for Organic Data Review* (2/94)
Samples Reviewed:	MV616, MV617, MV618, MV619, MV620, MV621, MV622, MV623

Data Validation Findings

	Findings	Qualifications
1. Sample Management	According to the case narrative for this SDG, the samples were received intact and in good condition, with acceptable canister pressures. The laboratory also provided canister QC certification records for the batches of canisters utilized. No problems were noted regarding sample handling and transport. The COC was signed and dated by appropriate field and laboratory personnel, and accounted for the samples and analyses presented in this SDG. The air samples were analyzed within 30 days of collection.	No qualifications were required.

	Findings	Qualifications
3. Calibration	The %RSDs for the initial calibrations and the %Ds for the continuing calibrations were all within the control limit of ≤30%.	No qualifications were required.
4. Method Blanks 081706-MS3 081806-MS3	There were two method blanks analyzed in association with the samples in this SDG. The laboratory also supplied canister QC certification blanks for both canisters used in this SDG. No target compounds were detected in the canister QC certification blanks. Method blanks from both QC batches had detects between the reporting limit and the MDL for trichloroethene. Target compound trichloroethene was also reported in samples MV616 and MV617 at concentrations less than five times the method blank concentration.	No qualifications were required. Results for trichloroethene reported between the MDL and reporting limit in samples MV616 and MV617 were qualified as nondetects, "U," at the reporting limit.
5. LCS/LCSD 081706-MS3 081806-MS3	Two LCS/LCSD pairs were analyzed with the samples in this SDG. The recoveries were within the laboratory QC limits of 70-130% and all RPDs were within the QC limit of ≤30%.	No qualifications were required.
6. Surrogates	The surrogate recoveries were within the method-established control limits of 70-130%.	No qualifications were required.
7. MS/MSD MV616	The recoveries for spiked target compound trichloroethene were within laboratory QC limits of 70-130% and the RPD was ≤30%.	No qualifications were required.
8. Field QC FB: None ER: MV654 (SDG 206359) FD: MV590 (SDG 206348) and MV622	The equipment blank had a detect between the MDL and the reporting limit for trichloroethene. Sample MV622 also had a detect for trichloroethene reported between the MDL and the reporting limit. The remaining reportable concentrations of trichloroethene in the associated site samples exceeded five times the concentration reported in the equipment blank. No other target compounds were reported in the equipment blank. Trichloroethene was reported at a	The detect for trichlorethene in sample MV622 was qualified as estimated, "J." No further qualifications were

	Findings	Qualifications
	Trichloroethene was reported at a concentration between the MDL and the reporting limit in sample MV622; however, the detect in sample MV590 was not reportable due to method blank contamination.	No further qualifications were required.
10. Other	The laboratory used the acceptance criteria of -50%/+100% of the internal standard area of the associated continuing calibration; however, for validation purposes, the reviewer applied the more stringent Method TO-15 criteria of ±40% of the mean initial calibration internal standard area. All internal standard area recoveries were checked from the raw data. The internal standard area was below control limit but >25% of the applicable initial calibration mean area for sample MV623. Results were reported by the laboratory in both ppbv and units of µg/m^3, and in addition, a flux measurement was provided for each result. The laboratory reported all nondetects at the MDL; however, at the professional discretion of the reviewer, those results were changed on the sample result summaries to nondetects at the reporting limit (for µg/m^3), rather than the MDL.	The detect for trichloroethene in sample MV623 was qualified as estimated, "J." Any detects reported between the MDL and the reporting limit were qualified as estimated, "J."
Comments	None.	None.

[1] Level IV/V validation consists of cursory review of the summary forms and minimal review of the raw data as necessary. Based on the Level IV report it was determined by the reviewer that additional items required review. The reported values on the summary forms are presumed to be correct and no verification of the values from the raw instrument output is performed. Criteria not reviewed included instrument performance, analytical sequence, initial calibration, continuing calibration, compound identification, and compound quantification.

ANALYTICAL REPORT

ENVIRONMENTAL
Analytical Service, Inc.

EPA Method TO-15 SIM GC/MS
Analytical Method: **TO-15 SIM**

SDG: **206355**
Laboratory Number: **01**

File: 0635501A.D
Description: MV616
Can/Tube#: 601
Sam_Type: SA
QC_Batch: 081706-MS3
Air Volume: 500 ml

Date Sampled: 07/21/06 **Time:** 7:46
Date Received: 07/24/06
Date Extracted:
Date Analyzed: 08/17/06 **Time:** 17:51
Can Dilution Factor: 1.42 3
Flux Factor: 0.0385 0.0036

CAS#	Compound	MDL ppbv	Amount ppbv	MDL ug/m3	RL ug/m3	Amount ug/m3	Flux ug/(m2*min)	Rev Qual	Qual code	Flag
79-01-6	Trichloroethene	0.002	0.020	0.013	0.157	0.109 0.157	0.0042	U	B,$	J

Surrogate Recovery	Spike Amt. ppbV	Amount ppbV	% Rec.	QC Limits	Flag * = Out
Toluene-d8	0.200	0.205	102	70-130	

Notes: 1) Reported results are to be interpreted to two significant figures.
2) ug/m3 = ppbV*FW/23.68 calculated assuming conditions at 60 F and 1 atm.
4) U and ND are Flags used for Not Detected
5) J is a flag for a result between the MDL and the RL (or lower quantitation limit, LQL)

IC 9/23/06

Level IV/V

ANALYTICAL REPORT

ENVIRONMENTAL
Analytical Service, Inc.

EPA Method TO-15 SIM GC/MS
Analytical Method: TO-15 SIM

SDG: 206355
Laboratory Number: 02

File: 0635502A.D
Description: MV617
Can/Tube#: 980
Sam_Type: SA
QC_Batch: 081706-MS3
Air Volume: 500 ml

Date Sampled: 07/21/06 **Time:** 8:31
Date Received: 07/24/06
Date Extracted:
Date Analyzed: 08/17/06 **Time:** 18:37
Can Dilution Factor: 1.45 3
Flux Factor: 0.0385 0.0036

CAS#	Compound	MDL ppbv	Amount ppbv	MDL ug/m3	RL ug/m3	Amount ug/m3	Flux ug/(m2*min)	Raw Qual	Qual Code	Flag
79-01-6	Trichloroethene	0.002	0.009	0.013	0.160	0.052 0.160	0.0020	U	B, $	J

	Surrogate Recovery	Spike Amt. ppbV	Amount ppbV	% Rec.	QC Limits	Flag * = Out
	Toluene-d8	0.200	0.211	106	70-130	

Notes: 1) Reported results are to be interpreted to two significant figures.
2) ug/m3 = ppbV*FW/23.68 calculated assuming conditions at 60 F and 1 atm.
4) U and ND are Flags used for Not Detected
5) J is a flag for a result between the MDL and the RL (or lower quantitation limit, LQL)

KS 9/13/06
Level IV/V

ANALYTICAL REPORT

ENVIRONMENTAL
Analytical Service, Inc.

EPA Method TO-15 SIM GC/MS
Analytical Method: **TO-15 SIM**

SDG: **206355**
Laboratory Number: **03**

File: 0635503A.D
Description: MV618
Can/Tube#: 1772
Sam_Type: SA
QC_Batch: 081706-MS3
Air Volume: 500 ml

Date Sampled: 07/21/06 **Time:** 9:26
Date Received: 07/24/06
Date Extracted:
Date Analyzed: 08/17/06 **Time:** 19:21
Can Dilution Factor: 1.40 3
Flux Factor: 0.0385 0.0036

CAS#	Compound	MDL ppbv	Amount ppbv	MDL ug/m3	RL ug/m3	Amount ug/m3	Flux ug/(m2*min)	Raw Qual	Qual code	Flag
79-01-6	Trichloroethene	0.002	0.031	0.013	0.155	0.172	0.0066			

Surrogate Recovery	Spike Amt. ppbV	Amount ppbV	% Rec.	QC Limits	Flag * = Out
Toluene-d8	0.200	0.186	93	70-130	

Notes: 1) Reported results are to be interpreted to two significant figures.
2) ug/m3 = ppbV*FW/23.68 calculated assuming conditions at 60 F and 1 atm.
4) U and ND are Flags used for Not Detected
5) J is a flag for a result between the MDL and the RL (or lower quantitation limit, LQL)

Level IV/V

ANALYTICAL REPORT

ENVIRONMENTAL
Analytical Service, Inc.

EPA Method TO-15 SIM GC/MS
Analytical Method: TO-15 SIM

SDG: 206355
Laboratory Number: 04

File: 0635504A.D
Description: MV619
Can/Tube#: 214
Sam_Type: SA
QC_Batch: 081806-MS3
Air Volume: 500 ml

Date Sampled: 07/21/06 **Time:** 10:16
Date Received: 07/24/06
Date Extracted:
Date Analyzed: 08/18/06 **Time:** 14:40
Can Dilution Factor: 1.45 3
Flux Factor: 0.0385 0.0036

CAS#	Compound	MDL ppbv	Amount ppbv	MDL ug/m3	RL ug/m3	Amount ug/m3	Flux ug/(m2*min)	Rev Qual	Qual code	Flag
79-01-6	Trichloroethene	0.002	0.030	0.013	0.160	0.166	0.0064			

	Surrogate Recovery	Spike Amt. ppbV	Amount ppbV	% Rec.	QC Limits	Flag * = Out
	Toluene-d8	0.200	0.173	87	70-130	

Notes: 1) Reported results are to be interpreted to two significant figures.
2) ug/m3 = ppbV*FW/23.68 calculated assuming conditions at 60 F and 1 atm.
4) U and ND are Flags used for Not Detected
5) J is a flag for a result between the MDL and the RL (or lower quantitation limit, LQL)

Level IV

ANALYTICAL REPORT

ENVIRONMENTAL
Analytical Service, Inc.

EPA Method TO-15 SIM GC/MS
Analytical Method: TO-15 SIM

SDG: 206355
Laboratory Number: 05

File: 0635505A.D
Description: MV620
Can/Tube#: 822
Sam_Type: SA
QC_Batch: 081706-MS3
Air Volume: 500 ml

Date Sampled: 07/21/06 **Time:** 10:17
Date Received: 07/24/06
Date Extracted:
Date Analyzed: 08/17/06 **Time:** 20:55
Can Dilution Factor: 1.37 3
Flux Factor: 0.0385 0.0036

CAS#	Compound	MDL ppbv	Amount ppbv	MDL ug/m3	RL ug/m3	Amount ug/m3	Flux ug/(m2*min)	Qual	Flag
79-01-6	Trichloroethene	0.002	0.074	0.012	0.152	0.407	0.0157		

Surrogate Recovery	Spike Amt. ppbV	Amount ppbV	% Rec.	QC Limits	Flag * = Out
Toluene-d8	0.200	0.208	104	70-130	

Notes: 1) Reported results are to be interpreted to two significant figures.
2) ug/m3 = ppbV*FW/23.68 calculated assuming conditions at 60 F and 1 atm.
4) U and ND are Flags used for Not Detected
5) J is a flag for a result between the MDL and the RL (or lower quantitation limit, LQL)

Level IV

ANALYTICAL REPORT

ENVIRONMENTAL
Analytical Service, Inc.

EPA Method TO-15 SIM GC/MS
Analytical Method: TO-15 SIM

SDG: 206355
Laboratory Number: 06

File: 0635506A.D
Description: MV621
Can/Tube#: 352
Sam_Type: SA
QC_Batch: 081706-MS3
Air Volume: 500 ml

Date Sampled: 07/21/06 **Time:** 11:10
Date Received: 07/24/06
Date Extracted:
Date Analyzed: 08/17/06 **Time:** 21:37
Can Dilution Factor: 1.49 3
Flux Factor: 0.0385 0.0036

CAS#	Compound	MDL ppbv	Amount ppbv	MDL ug/m3	RL ug/m3	Amount ug/m3	Flux ug/(m2*min)	Real Qual	Qual code	Flag
79-01-6	Trichloroethene	0.002	0.029	0.013	0.165	0.162	0.0062	J		J

	Surrogate Recovery	Spike Amt. ppbV	Amount ppbV	% Rec.	QC Limits	Flag * = Out
	Toluene-d8	0.200	0.224	112	70-130	

Notes: 1) Reported results are to be interpreted to two significant figures.
2) ug/m3 = ppbV*FW/23.68 calculated assuming conditions at 60 F and 1 atm.
4) U and ND are Flags used for Not Detected
5) J is a flag for a result between the MDL and the RL (or lower quantitation limit, LQL)

Level IV/V

ANALYTICAL REPORT

ENVIRONMENTAL
Analytical Service, Inc.

EPA Method TO-15 SIM GC/MS
Analytical Method: **TO-15 SIM**

SDG: **206355**
Laboratory Number: **07**

File: 0635507A.D
Description: MV622
Can/Tube#: 398
Sam_Type: SA
QC_Batch: 081806-MS3
Air Volume: 500 ml

Date Sampled: 07/21/06 **Time:** 11:16
Date Received: 07/24/06
Date Extracted:
Date Analyzed: 08/18/06 **Time:** 15:20
Can Dilution Factor: 1.39 3
Flux Factor: 0.0385 0.0036

CAS#	Compound	MDL ppbv	Amount ppbv	MDL ug/m3	RL ug/m3	Amount ug/m3	Flux ug/(m2*min)	Rev Qual	Qual code	Flag
79-01-6	Trichloroethene	0.002	0.021	0.013	0.154	0.116	0.0045	J	F	J

Surrogate Recovery	Spike Amt. ppbV	Amount ppbV	% Rec.	QC Limits	Flag * = Out
Toluene-d8	0.200	0.208	104	70-130	

Notes: 1) Reported results are to be interpreted to two significant figures.
2) ug/m3 = ppbV*FW/23.68 calculated assuming conditions at 60 F and 1 atm.
4) U and ND are Flags used for Not Detected
5) J is a flag for a result between the MDL and the RL (or lower quantitation limit, LQL)

Level IV/V

ANALYTICAL REPORT

ENVIRONMENTAL
Analytical Service, Inc.

EPA Method TO-15 SIM GC/MS **SDG: 206355**
Analytical Method: TO-15 SIM **Laboratory Number: 08**

File: 0635508A.D
Description: MV623
Can/Tube#: 380
Sam_Type: SA
QC_Batch: 081806-MS3
Air Volume: 500 ml

Date Sampled: 07/21/06 **Time:** 11:17
Date Received: 07/24/06
Date Extracted:
Date Analyzed: 08/18/06 **Time:** 16:00
Can Dilution Factor: 1.37 3
Flux Factor: 0.0385 0.0036

CAS#	Compound	MDL ppbv	Amount ppbv	MDL ug/m3	RL ug/m3	Amount ug/m3	Flux ug/(m2*min)	Rev Qual	Qual code	Flag
79-01-6	Trichloroethene	0.002	0.042	0.012	0.152	0.231	0.0089	J	I	

Surrogate Recovery	Spike Amt. ppbV	Amount ppbV	% Rec.	QC Limits	Flag * = Out
Toluene-d8	0.200	0.226	113	70-130	

Notes: 1) Reported results are to be interpreted to two significant figures.
2) ug/m3 = ppbV*FW/23.68 calculated assuming conditions at 60 F and 1 atm.
4) U and ND are Flags used for Not Detected
5) J is a flag for a result between the MDL and the RL (or lower quantitation limit, LQL)

Level IV

CONTRACT COMPLIANCE SCREENING FORM FOR HARDCOPY DATA

MEC[X]
12269 East Vassar Drive
Aurora, CO 80014

Package ID: B54VO8
Task Order: 1261.001D.05
SDG No.: 206348, 206350
No. of Analyses: 26

Laboratory: Environmental Analytical Service
Reviewer: L. Calvin
Analysis/Method: Volatiles by Method TO-15 SIM

Date: September 17, 2006
Reviewer's Signature: L Calvin

ACTION ITEMS[a]	
1. **Case Narrative Deficiencies**	
2. **Out of Scope Analyses**	
3. **Analyses Not Conducted**	
4. **Missing Hardcopy Deliverables**	
5. **Incorrect Hardcopy Deliverables**	Laboratory reported results to three decimal places rather than three significant figures.
6. **Deviations from Analysis Protocol, e.g.,**	Qualifications were assigned for the following:
Holding Times	--exceeding analytical holding time
GC/MS Tune/Inst. Performance	--method blank contamination
Calibration	--internal standard areas below method control limits
Method blanks	--detects between the MDL and reporting limit estimated
Surrogates	--nondetects at MDL ammended to nondetects at reporting limit
Matrix Spike/Dup LCS	
Field QC	
Internal Standard Performance	
Compound Identification	
Quantitation	
System Performance	

COMMENTS[b]

[a] Subcontracted analytical laboratory is not meeting contract and/or method requirements.
[b] Differences in protocol have been adopted by the laboratory but no action against the laboratory is required.

DATA VALIDATION REPORT

Vapor Migration Study

ANALYSIS: VOLATILES

SAMPLE DELIVERY GROUPS: 206348, 206350

Prepared by

MEC^X, LLC
12269 East Vassar Drive
Aurora, CO 80014

1. INTRODUCTION

Task Order Title:	Vapor Migration Study
MEC^X Project Number:	1261.001D.05
Sample Delivery Group:	206348, 206350
Project Manager:	D. Hambrick
Matrix:	Air
Analysis:	Volatiles
QC Level:	Level IV/V
No. of Samples:	26
No. of Reanalyses/Dilutions:	0
Reviewer:	L. Calvin
Date of Review:	September 17, 2006

The samples listed in Table 1 were validated based on the guidelines outlined in the *MEC^X Data Validation Procedure for Volatile Organics (DVP-2, Rev. 0), EPA Method TO-15* (1/99), and the *National Functional Guidelines for Organic Data Review* (2/94). Any deviations from these procedures are documented herein. Qualifiers were applied in cases where the data did not meet the required QC criteria or where special consideration by the data user is required. Data qualifiers were placed on Form Is with the associated qualification codes. Analytes that were rejected for any reason are denoted on the Form I as having only the "R" data qualifier and associated qualification code(s) denoting the reason for rejection. Any additional problems with the data that may have resulted in an estimated value were not denoted by a qualification code since the data had already been rejected.

Table 1. Sample Identification

Client ID	EPA ID	Laboratory ID	Matrix	COC Method
BZVF01S01	MV575	206348-01	Air	TO-15 SIM
BZVF01E01	MV576	206348-02	Air	TO-15 SIM
CLVF01S01	MV577	206348-03	Air	TO-15 SIM
CLVF02S01	MV578	206348-04	Air	TO-15 SIM
CLVF03S01	MV579	206348-05	Air	TO-15 SIM
B1VF01S01	MV580	206348-06	Air	TO-15 SIM
B1VF02S01	MV581	206348-07	Air	TO-15 SIM
LXVF01S01	MV582	206348-08	Air	TO-15 SIM
LXVF01D01	MV583	206348-09	Air	TO-15 SIM
LXVF02S01	MV584	206348-10	Air	TO-15 SIM
BTVF01S01	MV585	206348-11	Air	TO-15 SIM
NCVF01S01	MV586	206348-12	Air	TO-15 SIM
FSVF01S01	MV587	206348-13	Air	TO-15 SIM
CFVF01S01	MV588	206348-14	Air	TO-15 SIM
CFVF02S01	MV589	206348-15	Air	TO-15 SIM
DAVF01S01	MV590	206348-16	Air	TO-15 SIM
DAVF02S01	MV591	206348-17	Air	TO-15 SIM
LXVF03S01	MV592	206350-01	Air	TO-15 SIM
LXVF04S01	MV593	206350-02	Air	TO-15 SIM
LXVF03S02	MV594	206350-03	Air	TO-15 SIM
LXVF05S01	MV595	206350-04	Air	TO-15 SIM
LXVF03S03	MV596	206350-05	Air	TO-15 SIM
LXVF03D01	MV597	206350-06	Air	TO-15 SIM
LXVF06S01	MV598	206350-07	Air	TO-15 SIM
LXVF03E01	MV599	206350-08	Air	TO-15 SIM
LXVF03S04	MV600	206350-09	Air	TO-15 SIM

2. DATA VALIDATION FINDINGS

2.1 SAMPLE MANAGEMENT

According to the case narratives for these SDGs, the samples were received intact and in good condition, with acceptable canister pressures. The laboratory also provided canister QC certification records for the batches of canisters utilized. No problems were noted regarding sample handling and transport. No qualifications were required.

2.1.2 Chain of Custody

The COCs were signed and dated by appropriate field and laboratory personnel, and accounted for the samples and analyses presented in these SDGs. No qualifications were required.

2.1.3 Holding Times

The air samples were analyzed within 30 days of collection, with the exception of sample MV579. The sample required multiple analyses (see section 2.11) and the acceptable analysis reported by the laboratory was analyzed one day beyond the 30-day holding time. The result for sample MV579 was qualified as estimated, "J." No further qualifications were required.

2.2 GC/MS TUNING

A BFB tune was not provided for one of the eight analytical sequences of these SDGs. The reviewer noted that the laboratory usually incorporated the BFB into the CCV or method blank analysis; therefore, the BFB analysis was not always performed at the beginning of the analytical sequence, as prescribed by the method. However, in all cases, the analysis of the BFB preceded the analysis of samples in an analytical sequence. All provided tunes met the method ion abundance criteria which were derived from USEPA SW-846 Method 8240B, and all samples were analyzed within 24 hours of the BFB injection times. No qualifications were assigned.

2.3 CALIBRATION

Three initial calibrations (two SIM and one full-scan) were associated with the sample analyses of these SDGs, dated 08/02/06 and 08/09/06 (SIM), and 08/08/06 (full-scan). The %RSDs were within the method QC limit of ≤30% for all of the initial calibrations. Eight continuing calibrations were associated with the sample analyses, dated 08/03/06, 08/04/06, 08/06/06, 08/13/06, 08/14/06, 08/15/06 (two), and 08/17/06. The applicable target compound %Ds for all continuing calibrations were within the method QC limit of ≤30%.

Although the method does not specify minimum response factor criteria, the reviewer noted that average RRFs for the initial calibrations and RRFs for the continuing calibrations were ≥0.05 for all applicable target compounds. The %RSDs for the initial calibrations and %Ds for the continuing

calibrations were verified from the raw data for several analytes and no errors were found. No qualifications were required.

2.4 BLANKS

Eight method blanks (QC batches 080306-MS3, 080406-MS3, 080606-MS3, 081306-MS3, 081406-MS3, 081506-MS1, 081506-MS3, and 081706-MS1) were analyzed with these SDGs. The laboratory also supplied canister QC certification blanks for all canisters used in these SDGs. No target compounds were detected in the canister QC certification blanks.

Method blanks from QC batches 080306-MS3, 080606-MS3, and 081406-MS3 had target compound detects between the MDL and the reporting limit, and all had one or more associated samples with detects at concentrations less than five times the method blank concentrations. The reviewer recalculated rounded method blank and sample concentrations to more accurately determine contamination qualifications. Results for trichloroethene reported between the MDL and reporting limit in samples MV578, MV583, MV584, and MV591, tetrachloroethene in sample MV593, and both trichloroethene and tetrachloroethene in samples MV576 and MV599 were qualified as nondetects, "U," at the reporting limit.

Review of the method blank raw data indicated no false positives or false negatives. No further qualifications were required.

2.5 BLANK SPIKES AND LABORATORY CONTROL SAMPLES

Eight LCS/LCSD pairs (QC batches 080306-MS3, 080406-MS3, 080606-MS3, 081306-MS3, 081406-MS3, 081506-MS1, 081506-MS3, and 081706-MS1) were analyzed with these SDGs. Tetrachloroethene was recovered above the laboratory QC limits of 70-130% in the LCSD only of LCS/LCSD pairs 080306-MS3 and 081406-MS3. All remaining recoveries were within the QC limits, and all RPDs were within the QC limit of $\leq$30%. No qualifications were required.

2.6 SURROGATE RECOVERY

The surrogate recoveries were within the laboratory QC limits of 70-130% for all samples in these SDGs. A representative number of recoveries were calculated from the raw data, and no transcription or calculation errors were noted. No qualifications were required.

2.7 MATRIX SPIKE/MATRIX SPIKE DUPLICATE

Two sets of MS/MSD analyses were performed for the two SDGs, on site samples MV575 and MV592. Recoveries for 1,1-dichloroethene and trichloroethene were below the laboratory QC limits of 70-130% but $\geq$10% in the MSD only of MV575 MS/MSD, and the RPDs for both

compounds exceeded the QC limit of ≤30%. All recoveries and RPDs were within the QC limits for MV592 MS/MSD. No qualifications were required.

2.8 FIELD QC SAMPLES

Field QC samples were evaluated, and if necessary, qualified based on method blanks and other laboratory QC results affecting the usability of the field QC data. Any remaining detects were used to evaluate the associated site samples. Following are findings associated with field QC samples:

2.8.1 Trip Blanks

There was no trip blank sample associated with the site samples in these SDGs. No qualifications were required.

2.8.2 Field Blanks and Equipment Rinsates

Samples MV576 and MV599 were identified as equipment blanks for the samples of SDGs 206348 and 206350, respectively. Trichloroethene and tetrachlorothene were both reported by the laboratory between the MDL and reporting limit in both equipment blanks; however, all equipment blank results were qualified as nondetects due to method blank contamination (see section 2.4). No site sample qualifications were required.

2.8.3 Field Duplicates

Samples MV582/MV583 from SDG 206348 and samples MV592/MV597 from SDG 206350 were identified as field duplicates. Samples MV582 and MV583 had common detects for trichloroethene between the reporting limit and the MDL; however, the result in sample MV583 was qualified as a nondetect due to method blank contamination. Samples MV592 and MV597 had common detects above the reporting limit for trichloroethene. Tetrachloroethene was detected between the reporting limit and the MDL in sample MV592 and above the reporting limit in sample MV597, and cis-1,2-dichloroethene was detected only in sample MV597. The reviewer noted that sample MV592 was analyzed at a 50× dilution by SIM, and the field duplicate, MV597, was analyzed at approximately a 2× dilution by full-scan method. Although the resulting dilutions of the samples were roughly similar, the SIM and full-scan analyses were not comparable for duplicate purposes.

2.9 INTERNAL STANDARDS PERFORMANCE

The laboratory used the acceptance criteria of -50%/+100% of the internal standard area of the associated continuing calibration; however, for validation purposes, the reviewer applied the more stringent Method TO-15 criteria of ±40% of the mean initial calibration internal standard area. All internal standard area recoveries were checked from the raw data.

Internal standard areas were below control limits but >25% of the applicable initial calibration mean area for samples MV576, MV583, MV584, MV587, MV588, MV591, MV592, MV594, and MV599. Results for the aforementioned samples were qualified as estimated, "UJ," for nondetects, and "J," for detects. The internal standard area for sample MV579 was above the control limit. The result for trichloroethene in MV579 was qualified as estimated, "J." No further qualifications were required.

2.10 COMPOUND IDENTIFICATION

The laboratory analyzed for volatile target compound trichloroethene only in 16 samples, and for six volatile compounds in the remaining samples by modified EPA Method TO-15 SIM. Review of the sample chromatograms, retention times, and spectra indicated no problems with target compound identification. No qualifications were required.

2.11 COMPOUND QUANTIFICATION AND REPORTED DETECTION LIMITS

Compound quantification is verified at a Level IV data validation. No calculation or transcription errors were found. The reporting limits were supported by the low point of the initial calibration and the laboratory MDL study.

Samples MV579, MV592, MV594, MV595, MV596, MV597, MV598, and MV600 required lower volume analyses, or "dilution" due to either matrix interference or high concentrations of target compounds. In addition to dilution, samples MV579, MV595, MV596, and MV597 required reanalysis by full-scan method due to high concentrations of target compounds exceeding the calibration range of the SIM method. Only the acceptable dilutions and reanalyses were reported by the laboratory. MDLs and reporting limits were adjusted appropriately for dilution and/or full-scan analysis.

The laboratory reported all nondetects at the MDL; however, at the professional discretion of the reviewer, those results were changed on the sample result summaries to nondetects at the reporting limit (for $\mu g/m^3$), rather than the MDL. Results were reported by the laboratory in both ppbv and units of $\mu g/m^3$, and in addition, a flux measurement was provided for each result. The reviewer noted that the laboratory reported results to three decimal places, rather than to three significant figures. No qualifications were required.

2.12 TENTATIVELY IDENTIFIED COMPOUNDS

TICs were not reported by the laboratory for this SDG. No qualifications were required.

2.13 SYSTEM PERFORMANCE

Review of the raw data indicated no problems with system performance. No qualifications were required.

ANALYTICAL REPORT

ENVIRONMENTAL
Analytical Service, Inc.

EPA Method TO-15 SIM GC/MS
Analytical Method: TO-15 SIM

SDG: 206348
Laboratory Number: 01

File: 0634801A.D
Description: MV575
Can/Tube#: 789
Sam_Type: SA
QC_Batch: 080306-MS3
Air Volume: 500 ml

Date Sampled: 07/17/06 **Time:** 10:41
Date Received: 07/19/06
Date Extracted:
Date Analyzed: 08/03/06 **Time:** 14:34
Can Dilution Factor: 1.35 3
Flux Factor: 0.0385 0.0036

CAS#	Compound	MDL ppbv	Amount ppbv	MDL ug/m3	RL ug/m3	Amount ug/m3	Flux ug/(m2*min)	Flag
79-01-6	Trichloroethene	0.002	0.002	0.012	0.149	~~0.012~~ 0.149	0.0005	U

Surrogate Recovery	Spike Amt. ppbV	Amount ppbV	% Rec.	QC Limits	Flag * = Out
Toluene-d8	0.200	0.194	97	70-130	

Notes: 1) Reported results are to be interpreted to two significant figures.
2) ug/m3 = ppbV*FW/23.68 calculated assuming conditions at 60 F and 1 atm.
4) U and ND are Flags used for Not Detected
5) J is a flag for a result between the MDL and the RL (or lower quantitation limit, LQL)

MC 09.20.06
Level IV

20634801.MS3
Printed on 8/9/2006

Environmental Analytical Service
Page 1 of 1

ANALYTICAL REPORT

ENVIRONMENTAL
Analytical Service, Inc.

EPA Method TO-15 SIM GC/MS
Analytical Method: TO-15 SIM

SDG: 206348
Laboratory Number: 02

File: 0634802A.D
Description: MV576
Can/Tube#: 603
Sam_Type: SA
QC_Batch: 081406-MS1
Air Volume: 500 ml

Date Sampled: 07/17/06 **Time:** 10:39
Date Received: 07/19/06
Date Extracted:
Date Analyzed: 08/14/06 **Time:** 19:09
Can Dilution Factor: 1.39 3
Flux Factor: 0.0385 0.0036

CAS#	Compound	MDL ppbv	Amount ppbv	MDL ug/m3	RL ug/m3	Amount ug/m3	Flux ug/(m2*min)	Flag
75-01-4	Vinyl chloride	0.005	0.005	0.014	0.073	~~0.014~~ 0.073	0.0005	U
75-35-4	1,1-Dichloroethene	0.003	0.003	0.013	0.114	~~0.013~~ 0.114	0.0005	U
156-60-5	trans-1,2-Dichloroethene	0.015	0.015	0.062	0.102	~~0.062~~ 0.102	0.0024	U
156-59-2	cis-1,2-Dichloroethene	0.024	0.024	0.096	0.114	~~0.096~~ 0.114	0.0037	U
79-01-6	Trichloroethene	0.002	0.005	0.013	0.154	~~0.025~~ 0.154	0.0010	J
127-18-4	Tetrachloroethene	0.002	0.006	0.016	0.195	~~0.044~~ 0.195	0.0017	J

Surrogate Recovery	Spike Amt. ppbV	Amount ppbV	% Rec.	QC Limits	Flag * = Out
Toluene-d8	0.200	0.212	106	70-130	

Notes: 1) Reported results are to be interpreted to two significant figures.
2) ug/m3 = ppbV*FW/23.68 calculated assuming conditions at 60 F and 1 atm.
4) U and ND are Flags used for Not Detected
5) J is a flag for a result between the MDL and the RL (or lower quantitation limit, LQL)

MC 09.20.06
Level IV

ANALYTICAL REPORT

ENVIRONMENTAL
Analytical Service, Inc.

EPA Method TO-15 SIM GC/MS
Analytical Method: TO-15 SIM

SDG: 206348
Laboratory Number: 03

File: 0634803A.D
Description: MV577
Can/Tube#: 175
Sam_Type: SA
QC_Batch: 080306-MS3
Air Volume: 500 ml

Date Sampled: 07/17/06 **Time:** 12:46
Date Received: 07/19/06
Date Extracted:
Date Analyzed: 08/03/06 **Time:** 16:01
Can Dilution Factor: 1.39 3
Flux Factor: 0.0385 0.0036

CAS#	Compound	MDL ppbv	Amount ppbv	MDL ug/m3	RL ug/m3	Amount ug/m3	Flux ug/(m2*min)	Flag
79-01-6	Trichloroethene	0.002	0.002	0.013	0.154	~~0.013~~ 0.154	0.0005	U

Surrogate Recovery	Spike Amt. ppbV	Amount ppbV	% Rec.	QC Limits	Flag * = Out
Toluene-d8	0.200	0.174	87	70-130	

Notes: 1) Reported results are to be interpreted to two significant figures.
2) ug/m3 = ppbV*FW/23.68 calculated assuming conditions at 60 F and 1 atm.
4) U and ND are Flags used for Not Detected
5) J is a flag for a result between the MDL and the RL (or lower quantitation limit, LQL)

MC 09.20.06
Level IV

20634803.MS3
Printed on 8/9/2006

Environmental Analytical Service
Page 1 of 1

ANALYTICAL REPORT

ENVIRONMENTAL
Analytical Service, Inc.

EPA Method TO-15 SIM GC/MS
Analytical Method: TO-15 SIM

File: 0634804A.D
Description: MV578
Can/Tube#: 416
Sam_Type: SA
QC_Batch: 080306-MS3
Air Volume: 500 ml

SDG: 206348
Laboratory Number: 04

Date Sampled: 07/17/06 **Time:** 12:48
Date Received: 07/19/06
Date Extracted:
Date Analyzed: 08/03/06 **Time:** 16:43
Can Dilution Factor: 1.40 3
Flux Factor: 0.0385 0.0036

CAS#	Compound	MDL ppbv	Amount ppbv	MDL ug/m3	RL ug/m3	Amount ug/m3	Flux ug/(m2*min)		Flag
79-01-6	Trichloroethene	0.002	0.012	0.013	0.155	~~0.067~~ 0.155	0.0026	U	B $	J

very good
good Decade

	Surrogate Recovery	Spike Amt. ppbV	Amount ppbV	% Rec.	QC Limits	Flag * = Out
	Toluene-d8	0.200	0.177	88	70-130	

Notes: 1) Reported results are to be interpreted to two significant figures.
2) ug/m3 = ppbV*FW/23.68 calculated assuming conditions at 60 F and 1 atm.
4) U and ND are Flags used for Not Detected
5) J is a flag for a result between the MDL and the RL (or lower quantitation limit, LQL)

09.20.06
Level IV

ANALYTICAL REPORT

ENVIRONMENTAL
Analytical Service, Inc.

EPA Method TO-15 Full Scan GC/MS
Analytical Method: TO-15

File: 0634805A.D
Description: MV579
Can/Tube#: 190
Sam_Type: SA
QC_Batch: 081706-MS1
Air Volume: 462 ml

SDG: 206348
Laboratory Number: 05

Date Sampled: 07/17/06 **Time:** 14:04
Date Received: 07/19/06
Date Extracted:
Date Analyzed: 08/17/06 **Time:** 16:22
Can Dilution Factor: 1.46 2
Flux Factor: 0.0385 0.0036

CAS#	Compound	MDL ppbv	Amount ppbv	MDL ug/m3	RL ug/m3	Amount ug/m3	Flux ug/(m2*min)	Flag
79-01-6	Trichloroethene	0.21	22.32	1.14	9.00	123.45	4.753	J

Surrogate Recovery	Spike Amt. ppbV	Amount ppbV	% Rec.	QC Limits	Flag * = Out
Toluene-d8	10.000	10.550	105	70-130	

Notes: 1) Reported results are to be interpreted to two significant figures.
2) ug/m3 = ppbV*FW/23.68 calculated assuming conditions at 60 F and 1 atm.
4) U and ND are Flags used for Not Detected
5) J is a flag for a result between the MDL and the RL (or lower quantitation limit, LQL)

AM
9/25/06

Level IV

20634805.MS1
Printed on 8/22/2006

Environmental Analytical Service
Page 1 of 1

ANALYTICAL REPORT

ENVIRONMENTAL
Analytical Service, Inc.

EPA Method TO-15 SIM GC/MS
Analytical Method: TO-15 SIM

SDG: 206348
Laboratory Number: 06

File: 0634806A.D
Description: MV580
Can/Tube#: 642
Sam_Type: SA
QC_Batch: 080406-MS3
Air Volume: 500 ml

Date Sampled: 07/17/06 **Time:** 15:02
Date Received: 07/19/06
Date Extracted:
Date Analyzed: 08/04/06 **Time:** 16:55
Can Dilution Factor: 1.47 3
Flux Factor: 0.0385 0.0036

CAS#	Compound	MDL ppbv	Amount ppbv	MDL ug/m3	RL ug/m3	Amount ug/m3	Flux ug/(m2*min)	Flag
79-01-6	Trichloroethene	0.002	0.007	0.013	0.163	0.037	0.0014	J

Surrogate Recovery	Spike Amt. ppbV	Amount ppbV	% Rec.	QC Limits	Flag * = Out
Toluene-d8	0.200	0.183	91	70-130	

Notes: 1) Reported results are to be interpreted to two significant figures.
2) ug/m3 = ppbV*FW/23.68 calculated assuming conditions at 60 F and 1 atm.
4) U and ND are Flags used for Not Detected
5) J is a flag for a result between the MDL and the RL (or lower quantitation limit, LQL)

Level IV

ANALYTICAL REPORT

ENVIRONMENTAL
Analytical Service, Inc.

EPA Method TO-15 SIM GC/MS **SDG: 206348**
Analytical Method: TO-15 SIM **Laboratory Number: 07**

File:	0634807A.D	**Date Sampled:**	07/17/06	**Time:**	15:05
Description:	MV581	**Date Received:**	07/19/06		
Can/Tube#:	161	**Date Extracted:**			
Sam_Type:	SA	**Date Analyzed:**	08/04/06	**Time:**	17:41
QC_Batch:	080406-MS3	**Can Dilution Factor:**	1.40		3
Air Volume:	500 ml	**Flux Factor:**		0.0385	0.0036

CAS#	Compound	MDL ppbv	Amount ppbv	MDL ug/m3	RL ug/m3	Amount ug/m3	Flux ug/(m2*min)			Flag
79-01-6	Trichloroethene	0.002	0.002	0.013	0.155	~~0.013~~ 0.155	0.0005	U	ϕ	U

Surrogate Recovery	Spike Amt. ppbV	Amount ppbV	% Rec.	QC Limits	Flag * = Out
Toluene-d8	0.200	0.201	100	70-130	

Notes: 1) Reported results are to be interpreted to two significant figures.
2) ug/m3 = ppbV*FW/23.68 calculated assuming conditions at 60 F and 1 atm.
4) U and ND are Flags used for Not Detected
5) J is a flag for a result between the MDL and the RL (or lower quantitation limit, LQL)

Level IV

ANALYTICAL REPORT

ENVIRONMENTAL
Analytical Service, Inc.

EPA Method TO-15 SIM GC/MS
Analytical Method: TO-15 SIM

SDG: 206348
Laboratory Number: 08

File: 0634808A.D
Description: MV582
Can/Tube#: 308
Sam_Type: SA
QC_Batch: 080406-MS3
Air Volume: 500 ml

Date Sampled: 07/17/06 **Time:** 16:20
Date Received: 07/19/06
Date Extracted:
Date Analyzed: 08/04/06 **Time:** 18:25
Can Dilution Factor: 1.52 3
Flux Factor: 0.0385 0.0036

CAS#	Compound	MDL ppbv	Amount ppbv	MDL ug/m3	RL ug/m3	Amount ug/m3	Flux ug/(m2*min)	Qual Code	Flag
79-01-6	Trichloroethene	0.002	0.003	0.014	0.168	0.018	0.0007	J	J

Surrogate Recovery	Spike Amt. ppbV	Amount ppbV	% Rec.	QC Limits	Flag * = Out
Toluene-d8	0.200	0.183	92	70-130	

Notes: 1) Reported results are to be interpreted to two significant figures.
2) ug/m3 = ppbV*FW/23.68 calculated assuming conditions at 60 F and 1 atm.
4) U and ND are Flags used for Not Detected
5) J is a flag for a result between the MDL and the RL (or lower quantitation limit, LQL)

Level IV

ANALYTICAL REPORT

ENVIRONMENTAL
Analytical Service, Inc.

EPA Method TO-15 SIM GC/MS
Analytical Method: TO-15 SIM

File: 0634809A.D
Description: MV583
Can/Tube#: 321
Sam_Type: SA
QC_Batch: 080306-MS3
Air Volume: 500 ml

SDG: 206348
Laboratory Number: 09

Date Sampled: 07/17/06 **Time:** 16:26
Date Received: 07/19/06
Date Extracted:
Date Analyzed: 08/03/06 **Time:** 23:35
Can Dilution Factor: 1.42 3
Flux Factor: 0.0385 0.0036

CAS#	Compound	MDL ppbv	Amount ppbv	MDL ug/m3	RL ug/m3	Amount ug/m3	Flux ug/(m2*min)	Val Qual	Qual Code	Flag
79-01-6	Trichloroethene	0.002	0.002	0.013	0.157	~~0.013~~ 0.157	0.0005	UJ	BI$	J

Surrogate Recovery	Spike Amt. ppbV	Amount ppbV	% Rec.	QC Limits	Flag * = Out
Toluene-d8	0.200	0.192	96	70-130	

Notes: 1) Reported results are to be interpreted to two significant figures.
2) ug/m3 = ppbV*FW/23.68 calculated assuming conditions at 60 F and 1 atm.
4) U and ND are Flags used for Not Detected
5) J is a flag for a result between the MDL and the RL (or lower quantitation limit, LQL)

MC 09.20.06
Level IV

ANALYTICAL REPORT

ENVIRONMENTAL
Analytical Service, Inc.

EPA Method TO-15 SIM GC/MS
Analytical Method: TO-15 SIM

SDG: 206348
Laboratory Number: 10

File: 0634810A.D
Description: MV584
Can/Tube#: 521
Sam_Type: SA
QC_Batch: 080306-MS3
Air Volume: 500 ml

Date Sampled: 07/17/06 **Time:** 16:24
Date Received: 07/19/06
Date Extracted:
Date Analyzed: 08/03/06 **Time:** 0:12
Can Dilution Factor: 1.38 3
Flux Factor: 0.0385 0.0036

CAS#	Compound	MDL ppbv	Amount ppbv	MDL ug/m3	RL ug/m3	Amount ug/m3	Flux ug/(m2*min)	val qual	qual code	Flag
79-01-6	Trichloroethene	0.002	0.003	0.012	0.153	~~0.015~~ 0.153	0.0006	UJ	BI$	J

Surrogate Recovery	Spike Amt. ppbV	Amount ppbV	% Rec.	QC Limits	Flag * = Out
Toluene-d8	0.200	0.154	77	70-130	

Notes: 1) Reported results are to be interpreted to two significant figures.
2) ug/m3 = ppbV*FW/23.68 calculated assuming conditions at 60 F and 1 atm.
4) U and ND are Flags used for Not Detected
5) J is a flag for a result between the MDL and the RL (or lower quantitation limit, LQL)

MC 09.20.06
Level IV

ANALYTICAL REPORT

ENVIRONMENTAL
Analytical Service, Inc.

EPA Method TO-15 SIM GC/MS
Analytical Method: **TO-15 SIM**

SDG: 206348
Laboratory Number: 11

File: 0634811A.D
Description: MV585
Can/Tube#: 342
Sam_Type: SA
QC_Batch: 080406-MS3
Air Volume: 500 ml

Date Sampled: 07/18/06 **Time:** 8:20
Date Received: 07/19/06
Date Extracted:
Date Analyzed: 08/04/06 **Time:** 19:21
Can Dilution Factor: 1.40 3
Flux Factor: 0.0385 0.0036

CAS#	Compound	MDL ppbv	Amount ppbv	MDL ug/m3	RL ug/m3	Amount ug/m3	Flux ug/(m2*min)	Flag
79-01-6	Trichloroethene	0.002	0.007	0.013	0.155	0.036	0.0014	J

Surrogate Recovery	Spike Amt. ppbV	Amount ppbV	% Rec.	QC Limits	Flag * = Out
Toluene-d8	0.200	0.164	82	70-130	

Notes: 1) Reported results are to be interpreted to two significant figures.
2) ug/m3 = ppbV*FW/23.68 calculated assuming conditions at 60 F and 1 atm.
4) U and ND are Flags used for Not Detected
5) J is a flag for a result between the MDL and the RL (or lower quantitation limit, LQL)

Level IV

ANALYTICAL REPORT

ENVIRONMENTAL
Analytical Service, Inc.

EPA Method TO-15 SIM GC/MS **SDG:** 206348
Analytical Method: TO-15 SIM **Laboratory Number:** 12

File:	0634812A.D	**Date Sampled:**	07/18/06	**Time:**	9:15
Description:	MV586	**Date Received:**	07/19/06		
Can/Tube#:	392	**Date Extracted:**			
Sam_Type:	SA	**Date Analyzed:**	08/04/06	**Time:**	20:06
QC_Batch:	080406-MS3	**Can Dilution Factor:**	1.62		3
Air Volume:	500 ml	**Flux Factor:**		0.0385	0.0036

CAS#	Compound	MDL ppbv	Amount ppbv	MDL ug/m3	RL ug/m3	Amount ug/m3	Flux ug/(m2*min)	Flag
79-01-6	Trichloroethene	0.003	0.005	0.015	0.179	0.026	0.0010	J

Surrogate Recovery	Spike Amt. ppbV	Amount ppbV	% Rec.	QC Limits	Flag * = Out
Toluene-d8	0.200	0.181	91	70-130	

Notes: 1) Reported results are to be interpreted to two significant figures.
2) ug/m3 = ppbV*FW/23.68 calculated assuming conditions at 60 F and 1 atm.
4) U and ND are Flags used for Not Detected
5) J is a flag for a result between the MDL and the RL (or lower quantitation limit, LQL)

Level IV

ANALYTICAL REPORT

ENVIRONMENTAL
Analytical Service, Inc.

EPA Method TO-15 SIM GC/MS
Analytical Method: TO-15 SIM

SDG: 206348
Laboratory Number: 13

File: 0634813A.D
Description: MV587
Can/Tube#: 370
Sam_Type: SA
QC_Batch: 080406-MS3
Air Volume: 500 ml

Date Sampled: 07/18/06 **Time:** 10:12
Date Received: 07/19/06
Date Extracted:
Date Analyzed: 08/04/06 **Time:** 20:50
Can Dilution Factor: 1.44 3
Flux Factor: 0.0385 0.0036

CAS#	Compound	MDL ppbv	Amount ppbv	MDL ug/m3	RL ug/m3	Amount ug/m3	Flux ug/(m2*min)	Val Code	Flag
79-01-6	Trichloroethene	0.002	0.114	0.013	0.159	0.632	0.0243	J	I

Surrogate Recovery	Spike Amt. ppbV	Amount ppbV	% Rec.	QC Limits	Flag * = Out
Toluene-d8	0.200	0.193	96	70-130	

Notes: 1) Reported results are to be interpreted to two significant figures.
2) ug/m3 = ppbV*FW/23.68 calculated assuming conditions at 60 F and 1 atm.
4) U and ND are Flags used for Not Detected
5) J is a flag for a result between the MDL and the RL (or lower quantitation limit, LQL)

Level IV

ANALYTICAL REPORT

ENVIRONMENTAL
Analytical Service, Inc.

EPA Method TO-15 SIM GC/MS
Analytical Method: TO-15 SIM

SDG: 206348
Laboratory Number: 14

File: 0634814A.D
Description: MV588
Can/Tube#: 318
Sam_Type: SA
QC_Batch: 080406-MS3
Air Volume: 500 ml

Date Sampled: 07/18/06 **Time:** 11:04
Date Received: 07/19/06
Date Extracted:
Date Analyzed: 08/04/06 **Time:** 21:30
Can Dilution Factor: 1.43 3
Flux Factor: 0.0385 0.0036

CAS#	Compound	MDL ppbv	Amount ppbv	MDL ug/m3	RL ug/m3	Amount ug/m3	Flux ug/(m2*min)	rev Qual	qual Code	Flag
79-01-6	Trichloroethene	0.002	0.082	0.013	0.158	0.455	0.0175	J	I	

Surrogate Recovery	Spike Amt. ppbV	Amount ppbV	% Rec.	QC Limits	Flag * = Out
Toluene-d8	0.200	0.181	91	70-130	

Notes: 1) Reported results are to be interpreted to two significant figures.
2) ug/m3 = ppbV*FW/23.68 calculated assuming conditions at 60 F and 1 atm.
4) U and ND are Flags used for Not Detected
5) J is a flag for a result between the MDL and the RL (or lower quantitation limit, LQL)

Level IV

ANALYTICAL REPORT

ENVIRONMENTAL
Analytical Service, Inc.

EPA Method TO-15 SIM GC/MS **SDG: 206348**
Analytical Method: TO-15 SIM **Laboratory Number: 15**

File:	0634815A.D	**Date Sampled:**	07/18/06	**Time:**	11:06
Description:	MV589	**Date Received:**	07/19/06		
Can/Tube#:	324	**Date Extracted:**			
Sam_Type:	SA	**Date Analyzed:**	08/04/06	**Time:**	22:15
QC_Batch:	080406-MS3	**Can Dilution Factor:**	1.48		3
Air Volume:	500 ml	**Flux Factor:**		0.0385	0.0036

CAS#	Compound	MDL ppbv	Amount ppbv	MDL ug/m3	RL ug/m3	Amount ug/m3	Flux ug/(m2*min)	Flag
79-01-6	Trichloroethene	0.002	0.060	0.013	0.164	0.329	0.0127	

Surrogate Recovery	Spike Amt. ppbV	Amount ppbV	% Rec.	QC Limits	Flag * = Out
Toluene-d8	0.200	0.152	76	70-130	

Notes: 1) Reported results are to be interpreted to two significant figures.
2) ug/m3 = ppbV*FW/23.68 calculated assuming conditions at 60 F and 1 atm.
4) U and ND are Flags used for Not Detected
5) J is a flag for a result between the MDL and the RL (or lower quantitation limit, LQL)

Level IV

ANALYTICAL REPORT

ENVIRONMENTAL
Analytical Service, Inc.

EPA Method TO-15 SIM GC/MS
Analytical Method: TO-15 SIM

SDG: 206348
Laboratory Number: 16

File: 0634816A.D
Description: MV590
Can/Tube#: 771
Sam_Type: SA
QC_Batch: 080606-MS3
Air Volume: 500 ml

Date Sampled: 07/18/06 **Time:** 12:04
Date Received: 07/19/06
Date Extracted:
Date Analyzed: 08/06/06 **Time:** 13:32
Can Dilution Factor: 1.37 3
Flux Factor: 0.0385 0.0036

CAS#	Compound	MDL ppbv	Amount ppbv	MDL ug/m3	RL ug/m3	Amount ug/m3	Flux ug/(m2*min)	Rev Qual	Qual Code	Flag
79-01-6	Trichloroethene	0.002	0.027	0.012	0.152	0.150	0.0058	J		J

	Surrogate Recovery	Spike Amt. ppbV	Amount ppbV	% Rec.	QC Limits	Flag * = Out
	Toluene-d8	0.200	0.174	87	70-130	

Notes: 1) Reported results are to be interpreted to two significant figures.
2) ug/m3 = ppbV*FW/23.68 calculated assuming conditions at 60 F and 1 atm.
4) U and ND are Flags used for Not Detected
5) J is a flag for a result between the MDL and the RL (or lower quantitation limit, LQL)

LEVEL IV

ANALYTICAL REPORT

ENVIRONMENTAL
Analytical Service, Inc.

EPA Method TO-15 SIM GC/MS
Analytical Method: TO-15 SIM

SDG: 206348
Laboratory Number: 17

File: 0634817A.D
Description: MV591
Can/Tube#: 345
Sam_Type: SA
QC_Batch: 080606-MS3
Air Volume: 500 ml

Date Sampled: 07/18/06 **Time:** 12:06
Date Received: 07/19/06
Date Extracted:
Date Analyzed: 08/06/06 **Time:** 14:09
Can Dilution Factor: 1.39 3
Flux Factor: 0.0385 0.0036

CAS#	Compound	MDL ppbv	Amount ppbv	MDL ug/m3	RL ug/m3	Amount ug/m3	Flux ug/(m2*min)	val qual	qual code	Flag
79-01-6	Trichloroethene	0.002	0.016	0.013	0.154	~~0.087~~ 0.154	0.0033	UJ	BI$	J

Surrogate Recovery	Spike Amt. ppbV	Amount ppbV	% Rec.	QC Limits	Flag * = Out
Toluene-d8	0.200	0.189	95	70-130	

Notes: 1) Reported results are to be interpreted to two significant figures.
2) ug/m3 = ppbV*FW/23.68 calculated assuming conditions at 60 F and 1 atm.
4) U and ND are Flags used for Not Detected
5) J is a flag for a result between the MDL and the RL (or lower quantitation limit, LQL)

DC 09.20.06
Level IV

ANALYTICAL REPORT

ENVIRONMENTAL
Analytical Service, Inc.

EPA Method TO-15 SIM GC/MS
Analytical Method: TO-15 SIM

SDG: 206350
Laboratory Number: 01

File: 0635001A.D
Description: MV592
Can/Tube#: 673
Sam_Type: SA
QC_Batch: 081506-MS3
Air Volume: 10 ml

Date Sampled: 07/19/06 **Time:** 8:02
Date Received: 07/20/06
Date Extracted:
Date Analyzed: 08/15/06 **Time:** 16:36
Can Dilution Factor: 1.36 3
Flux Factor: 0.0385 0.0036

CAS#	Compound	MDL ppbv	Amount ppbv	MDL ug/m3	RL ug/m3	Amount ug/m3	Flux ug/(m2*min)	Flag
75-01-4	Vinyl chloride	0.257	0.257	0.677	3.590	0.677 3.590	0.0261	U
75-35-4	1,1-Dichloroethene	0.158	0.158	0.646	5.565	0.646 5.565	0.0249	U
156-60-5	trans-1,2-Dichloroethene	0.738	0.738	3.022	5.011	3.022 5.011	0.1163	U
156-59-2	cis-1,2-Dichloroethene	1.151	1.151	4.712	5.565	4.712 5.565	0.1814	U
79-01-6	Trichloroethene	0.111	40.632	0.615	7.524	224.782	8.6541	
127-18-4	Tetrachloroethene	0.110	0.120	0.769	9.534	0.844	0.0325	J

Surrogate Recovery	Spike Amt. ppbV	Amount ppbV	% Rec.	QC Limits	Flag * = Out
Toluene-d8	0.200	0.258	129	70-130	

Notes: 1) Reported results are to be interpreted to two significant figures.
2) ug/m3 = ppbV*FW/23.68 calculated assuming conditions at 60 F and 1 atm.
4) U and ND are Flags used for Not Detected
5) J is a flag for a result between the MDL and the RL (or lower quantitation limit, LQL)

MC 09.20.06
Level III/IV

ANALYTICAL REPORT

ENVIRONMENTAL
Analytical Service, Inc.

EPA Method TO-15 SIM GC/MS
Analytical Method: TO-15 SIM

SDG: 206350
Laboratory Number: 02

File: 0635002A.D
Description: MV593
Can/Tube#: 769
Sam_Type: SA
QC_Batch: 081406-MS1
Air Volume: 500 ml

Date Sampled: 07/19/06 **Time:** 9:03
Date Received: 07/20/06
Date Extracted:
Date Analyzed: 08/14/06 **Time:** 21:01
Can Dilution Factor: 1.38 3
Flux Factor: 0.0385 0.0036

CAS#	Compound	MDL ppbv	Amount ppbv	MDL ug/m3	RL ug/m3	Amount ug/m3	Flux ug/(m2*min)			Flag
75-01-4	Vinyl chloride	0.005	0.005	0.014	0.073	~~0.014~~ 0.073	0.0005	U	$	U
75-35-4	1,1-Dichloroethene	0.003	0.006	0.013	0.113	0.024	0.0009	J		J
156-60-5	trans-1,2-Dichloroethene	0.015	0.015	0.061	0.102	~~0.061~~ 0.102	0.0023	U	$	U
156-59-2	cis-1,2-Dichloroethene	0.023	0.023	0.096	0.113	~~0.096~~ 0.113	0.0037	U	$	U
79-01-6	Trichloroethene	0.002	0.030	0.012	0.153	0.168	0.0065			
127-18-4	Tetrachloroethene	0.002	0.007	0.016	0.193	~~0.047~~ 0.193	0.0018	U	B$	J

Surrogate Recovery	Spike Amt. ppbV	Amount ppbV	% Rec.	QC Limits	Flag * = Out
Toluene-d8	0.200	0.180	90	70-130	

Notes: 1) Reported results are to be interpreted to two significant figures.
2) ug/m3 = ppbV*FW/23.68 calculated assuming conditions at 60 F and 1 atm.
4) U and ND are Flags used for Not Detected
5) J is a flag for a result between the MDL and the RL (or lower quantitation limit, LQL)

09.20.06
Level IV/V

20635002.MS3
Printed on 8/16/2006

Environmental Analytical Service
Page 1 of 1

ANALYTICAL REPORT

ENVIRONMENTAL
Analytical Service, Inc.

EPA Method TO-15 SIM GC/MS **SDG: 206350**
Analytical Method: TO-15 SIM **Laboratory Number: 03**

File:	0635003A.D	**Date Sampled:**	07/19/06	**Time:**	10:02
Description:	MV594	**Date Received:**	07/20/06		
Can/Tube#:	532	**Date Extracted:**			
Sam_Type:	SA	**Date Analyzed:**	08/15/06	**Time:**	17:14
QC_Batch:	081506-MS3	**Can Dilution Factor:**	1.36		3
Air Volume:	10 ml	**Flux Factor:**		0.0385	0.0036

CAS#	Compound	MDL ppbv	Amount ppbv	MDL ug/m3	RL ug/m3	Amount ug/m3	Flux ug/(m2*min)	Flag
75-01-4	Vinyl chloride	0.257	0.257	0.677	3.590	~~0.677~~ 3.590	0.0261	U
75-35-4	1,1-Dichloroethene	0.158	0.158	0.646	5.565	~~0.646~~ 5.565	0.0249	U
156-60-5	trans-1,2-Dichloroethene	0.738	1.087	3.022	5.011	4.450	0.1713	J
156-59-2	cis-1,2-Dichloroethene	1.151	1.930	4.712	5.565	7.899	0.3041	
79-01-6	Trichloroethene	0.111	96.884	0.615	7.524	535.974	20.6350	
127-18-4	Tetrachloroethene	0.110	0.355	0.769	9.534	2.486	0.0957	J

Surrogate Recovery	Spike Amt. ppbV	Amount ppbV	% Rec.	QC Limits	Flag * = Out
Toluene-d8	0.200	0.206	103	70-130	

Notes: 1) Reported results are to be interpreted to two significant figures.
2) ug/m3 = ppbV*FW/23.68 calculated assuming conditions at 60 F and 1 atm.
4) U and ND are Flags used for Not Detected
5) J is a flag for a result between the MDL and the RL (or lower quantitation limit, LQL)

DC 09-20-06
Level IV/V

ANALYTICAL REPORT

ENVIRONMENTAL
Analytical Service, Inc.

EPA Method TO-15 Full Scan GC/MS
Analytical Method: TO-15

File: 0635004C.D
Description: MV595
Can/Tube#: 306
Sam_Type: SA
QC_Batch: 081706-MS1
Air Volume: 10 ml

SDG: 206350
Laboratory Number: 04

Date Sampled: 07/19/06 **Time:** 10:52
Date Received: 07/20/06
Date Extracted:
Date Analyzed: 08/17/06 **Time:** 17:08
Can Dilution Factor: 2.56 1
Flux Factor: 0.0385 0.0036

CAS#	Compound	MDL ppbv	Amount ppbv	MDL ug/m3	RL ug/m3	Amount ug/m3	Flux ug/(m2*min)	val	qual code	Flag
75-01-4	Vinyl chloride	12.0	12.0	31.8	344.6	~~31.8~~ 344.6	1.22	U	$	U
75-35-4	1,1-Dichloroethene	19.5	19.5	79.6	544.7	~~79.6~~ 544.7	3.06	↓	↓	U
156-60-5	trans-1,2-Dichloroethene	79.6	79.6	325.9	461.1	~~325.9~~ 461.1	12.55	↓	↓	U
156-59-2	cis-1,2-Dichloroethene	13.6	35.1	55.5	539.5	143.6	5.53	J		J
79-01-6	Trichloroethene	16.6	822.7	92.1	729.4	4,551.0	175.21			
127-18-4	Tetrachloroethene	10.5	10.5	73.6	924.2	~~73.6~~ 924.2	2.83	U	$	U

Surrogate Recovery	Spike Amt. ppbV	Amount ppbV	% Rec.	QC Limits	Flag * = Out
Toluene-d8	10.000	9.904	99	70-130	

Notes: 1) Reported results are to be interpreted to two significant figures.
2) ug/m3 = ppbV*FW/23.68 calculated assuming conditions at 60 F and 1 atm.
4) U and ND are Flags used for Not Detected
5) J is a flag for a result between the MDL and the RL (or lower quantitation limit, LQL)

VOC 09-20-06
Level IV / V

ANALYTICAL REPORT

ENVIRONMENTAL
Analytical Service, Inc.

EPA Method TO-15 Full Scan GC/MS **SDG: 206350**
Analytical Method: TO-15 **Laboratory Number: 05**

File:	0635005B.D	**Date Sampled:**	07/19/06	**Time:**	12:19
Description:	MV596	**Date Received:**	07/20/06		
Can/Tube#:	310	**Date Extracted:**			
Sam_Type:	SA	**Date Analyzed:**	08/17/06	**Time:**	14:45
QC_Batch:	081706-MS1	**Can Dilution Factor:**	1.81		1
Air Volume:	10 ml	**Flux Factor:**		0.0385	0.0036

CAS#	Compound	MDL ppbv	Amount ppbv	MDL ug/m3	RL ug/m3	Amount ug/m3	Flux ug/(m2*min)	req'd qual	qual code	Flag
75-01-4	Vinyl chloride	8.5	8.5	22.5	243.6	~~22.5~~ 243.6	0.87	U	4	U
75-35-4	1,1-Dichloroethene	13.8	13.8	56.3	385.1	~~56.3~~ 385.1	2.17	↓	↓	U
156-60-5	trans-1,2-Dichloroethene	56.3	56.3	230.4	326.0	~~230.4~~ 326.0	8.87	↓	↓	U
156-59-2	cis-1,2-Dichloroethene	9.6	9.8	39.3	381.4	40.2	1.55	J		J
79-01-6	Trichloroethene	11.8	249.5	65.1	515.7	1,380.4	53.15			
127-18-4	Tetrachloroethene	7.4	9.5	52.0	653.4	66.3	2.55	J		J

Surrogate Recovery	Spike Amt. ppbV	Amount ppbV	% Rec.	QC Limits	Flag * = Out
Toluene-d8	10.000	9.997	100	70-130	

Notes: 1) Reported results are to be interpreted to two significant figures.
2) ug/m3 = ppbV*FW/23.68 calculated assuming conditions at 60 F and 1 atm.
4) U and ND are Flags used for Not Detected
5) J is a flag for a result between the MDL and the RL (or lower quantitation limit, LQL)

MC 09.20.06
Level IV / V

ANALYTICAL REPORT

ENVIRONMENTAL
Analytical Service, Inc.

EPA Method TO-15 Full Scan GC/MS
Analytical Method: TO-15

SDG: 206350
Laboratory Number: 06

File: 0635006A.D
Description: MV597
Can/Tube#: 388
Sam_Type: SA
QC_Batch: 081506-MS1
Air Volume: 216 ml

Date Sampled: 07/19/06 **Time:** 12:43
Date Received: 07/20/06
Date Extracted:
Date Analyzed: 08/15/06 **Time:** 14:44
Can Dilution Factor: 1.41 2
Flux Factor: 0.0385 0.0036

CAS#	Compound	MDL ppbv	Amount ppbv	MDL ug/m3	RL ug/m3	Amount ug/m3	Flux ug/(m2*min)	val qual	code	Flag
75-01-4	Vinyl chloride	0.31	0.31	0.81	8.79	~~0.81~~ 8.79	0.031	U		U
75-35-4	1,1-Dichloroethene	0.50	0.50	2.03	13.89	~~2.03~~ 13.89	0.078			U
156-60-5	trans-1,2-Dichloroethene	2.03	2.03	8.31	11.76	~~8.31~~ 11.76	0.320			U
156-59-2	cis-1,2-Dichloroethene	0.35	2.27	1.42	13.76	9.31	0.358	J		J
79-01-6	Trichloroethene	0.42	131.22	2.35	18.60	725.91	27.948			
127-18-4	Tetrachloroethene	0.27	0.51	1.88	47.13	3.54	0.136	J		J

Surrogate Recovery	Spike Amt. ppbV	Amount ppbV	% Rec.	QC Limits	Flag * = Out
Toluene-d8	10.000	9.822	98	70-130	

Notes: 1) Reported results are to be interpreted to two significant figures.
2) ug/m3 = ppbV*FW/23.68 calculated assuming conditions at 60 F and 1 atm.
4) U and ND are Flags used for Not Detected
5) J is a flag for a result between the MDL and the RL (or lower quantitation limit, LQL)

MC 09.20.06
Level IV/V

ANALYTICAL REPORT

ENVIRONMENTAL
Analytical Service, Inc.

EPA Method TO-15 SIM GC/MS **SDG: 206350**
Analytical Method: TO-15 SIM **Laboratory Number: 07**

File:	0635007A.D	**Date Sampled:**	07/19/06	**Time:**	13:26
Description:	MV598	**Date Received:**	07/20/06		
Can/Tube#:	181	**Date Extracted:**			
Sam_Type:	SA	**Date Analyzed:**	08/15/06	**Time:**	15:56
QC_Batch:	081506-MS3	**Can Dilution Factor:**	1.40		3
Air Volume:	200 ml	**Flux Factor:**		0.0385	0.0036

CAS#	Compound	MDL ppbv	Amount ppbv	MDL ug/m3	RL ug/m3	Amount ug/m3	Flux ug/(m2*min)	val Qual	qual code	Flag
75-01-4	Vinyl chloride	0.013	0.013	0.035	0.185	~~0.035~~ 0.185	0.0013	U		U
75-35-4	1,1-Dichloroethene	0.008	0.008	0.033	0.286	~~0.033~~ 0.286	0.0013	U		U
156-60-5	trans-1,2-Dichloroethene	0.038	0.146	0.156	0.258	0.599	0.0231			
156-59-2	cis-1,2-Dichloroethene	0.059	0.075	0.243	0.286	0.306	0.0118			
79-01-6	Trichloroethene	0.006	4.543	0.032	0.387	25.134	0.9677			
127-18-4	Tetrachloroethene	0.006	0.017	0.040	0.491	0.122	0.0047	J		J

Surrogate Recovery	Spike Amt. ppbV	Amount ppbV	% Rec.	QC Limits	Flag * = Out
Toluene-d8	0.200	0.192	96	70-130	

Notes: 1) Reported results are to be interpreted to two significant figures.
2) ug/m3 = ppbV*FW/23.68 calculated assuming conditions at 60 F and 1 atm.
4) U and ND are Flags used for Not Detected
5) J is a flag for a result between the MDL and the RL (or lower quantitation limit, LQL)

VOC 0920.04
Level IV/V

ANALYTICAL REPORT

ENVIRONMENTAL
Analytical Service, Inc.

EPA Method TO-15 SIM GC/MS
Analytical Method: TO-15 SIM

SDG: 206350
Laboratory Number: 08

File: 0635008A.D
Description: MV599
Can/Tube#: 401
Sam_Type: SA
QC_Batch: 081406-MS1
Air Volume: 500 ml

Date Sampled: 07/19/06 **Time:** 14:10
Date Received: 07/20/06
Date Extracted:
Date Analyzed: 08/14/06 **Time:** 9:43
Can Dilution Factor: 1.40 3
Flux Factor: 0.0385 0.0036

CAS#	Compound	MDL ppbv	Amount ppbv	MDL ug/m3	RL ug/m3	Amount ug/m3	Flux ug/(m2*min)	Flag
75-01-4	Vinyl chloride	0.005	0.005	0.014	0.074	0.014 0.074	0.0005	U
75-35-4	1,1-Dichloroethene	0.003	0.003	0.013	0.115	0.013 0.115	0.0005	U
156-60-5	trans-1,2-Dichloroethene	0.015	0.015	0.062	0.103	0.062 0.103	0.0024	U
156-59-2	cis-1,2-Dichloroethene	0.024	0.024	0.097	0.115	0.097 0.115	0.0037	U
79-01-6	Trichloroethene	0.002	0.013	0.013	0.155	0.072 0.155	0.0028	J
127-18-4	Tetrachloroethene	0.002	0.003	0.016	0.196	0.020 0.196	0.0008	J

Surrogate Recovery	Spike Amt. ppbV	Amount ppbV	% Rec.	QC Limits	Flag * = Out
Toluene-d8	0.200	0.198	99	70-130	

Notes: 1) Reported results are to be interpreted to two significant figures.
2) ug/m3 = ppbV*FW/23.68 calculated assuming conditions at 60 F and 1 atm.
4) U and ND are Flags used for Not Detected
5) J is a flag for a result between the MDL and the RL (or lower quantitation limit, LQL)

MC 09.20.06
Level IV/V

ANALYTICAL REPORT

ENVIRONMENTAL
Analytical Service, Inc.

EPA Method TO-15 SIM GC/MS
Analytical Method: TO-15 SIM

SDG: 206350
Laboratory Number: 09

File: 0635009A.D
Description: MV600
Can/Tube#: 687
Sam_Type: SA
QC_Batch: 081306-MS3
Air Volume: 10 ml

Date Sampled: 07/19/06 **Time:** 15:33
Date Received: 07/20/06
Date Extracted:
Date Analyzed: 08/13/06 **Time:** 14:24
Can Dilution Factor: 1.37 3
Flux Factor: 0.0385 0.0036

CAS#	Compound	MDL ppbv	Amount ppbv	MDL ug/m3	RL ug/m3	Amount ug/m3	Flux ug/(m2*min)	qual	qual Code	Flag
75-01-4	Vinyl chloride	0.258	0.258	0.682	3.616	0.682 3.616	0.0263	U		U
75-35-4	1,1-Dichloroethene	0.159	0.159	0.651	5.606	0.651 5.606	0.0251	↓	↓	U
156-60-5	trans-1,2-Dichloroethene	0.744	0.835	3.044	5.048	3.420	0.1317	J		J
156-59-2	cis-1,2-Dichloroethene	1.160	1.722	4.746	5.606	7.048	0.2713			
79-01-6	Trichloroethene	0.112	74.412	0.619	7.579	411.653	15.8486			
127-18-4	Tetrachloroethene	0.111	0.274	0.775	9.604	1.922	0.0740	J		J

Surrogate Recovery	Spike Amt. ppbV	Amount ppbV	% Rec.	QC Limits	Flag * = Out
Toluene-d8	0.200	0.202	101	70-130	

Notes: 1) Reported results are to be interpreted to two significant figures.
2) ug/m3 = ppbV*FW/23.68 calculated assuming conditions at 60 F and 1 atm.
4) U and ND are Flags used for Not Detected
5) J is a flag for a result between the MDL and the RL (or lower quantitation limit, LQL)

MC 09.20.06
Level IV/V