Lockheed Martin
Scientific Engineering Response and Analytical Services
2890 Woodbridge Ave, Building 209
Edison, NJ 08837-3679
Telephone: 732-321-4200 Facsimile: 732-494-4021

LOCKHEED MARTIN

DATE: May 21, 2010

TO: Gary Newhart and Cheryl Hawkins, U.S. EPA/ERT

FROM: Michael Cartwright, SERAS Task Leader

SUBJECT: APPLETON, WISCONSIN SUB-SLAB SOIL GAS SAMPLING
MARCH 2010 MOBILIZATION
WORK ASSIGNMENT #SER00068 – SUMMARY REPORT

OBSERVATIONS AND ACTIVITIES

Mobilizations

From March 7 to 11, 2010 Scientific, Engineering, Response and Analytical Services (SERAS) personnel, at the request of the EPA/Environmental Response Team (ERT), traveled to Appleton, Outagamie County, Wisconsin (WI) to conduct a study to evaluate potential sub-slab soil gas contamination. During this mobilization, SERAS personnel installed two sub-slab soil gas wells within the interior of a commercial building (Unit 001). A total of two sub-slab soil gas samples and one ambient air sample were collected at Unit 001 for EPA Toxic Organic (TO-15) method volatile organic compound (VOC) analysis.

This summary report details the tasks and results associated with the samples collected at Unit 001 during the March 2010 mobilization.

Air Sampling Procedures

SERAS personnel installed two sub-slab soil gas wells on the first floor of Unit 001, at locations chosen by the ERT Work Assignment Manager (WAM). Wells were installed flush with the slab and capped with a Teflon® fitting that was removed during sampling operations. Wells were installed in accordance with SERAS standard operating procedure (SOP) #2082, *Construction and Installation of Permanent Sub-Slab Soil Gas Wells.*

Samples were collected from both sub-slab soil gas wells and one exterior ambient air location using 6-liter (L) SUMMA® canisters in accordance with SERAS SOP #1704, *SUMMA® Canister Sampling.* A 4 to 5-L time-weighted average (TWA) sample was collected during a 24-hour sampling event at each location. The samples, along with a trip blank sample, were properly documented and shipped to the ERT/SERAS laboratory for TO-15 VOC analysis. Sub-slab soil gas and ambient air sampling locations are presented on Figure 1.

Analysis of the sub-slab soil gas and ambient air samples was performed in accordance with modified EPA Method TO-15, *Determination of Volatile Organic Compounds (VOCs) in Air Collected in Specially-Prepared Canisters and Analyzed by Gas Chromatography/Mass Spectrometry (GC/MS).* The target compound list (TCL) included tetrachloroethene (PCE), trichloroethene (TCE), cis-1,2-dichloroethene (DCE), trans-1,2-DCE, 1,1-DCE, 1,1-dichloroethane, 1,1,1-trichloroethane, vinyl chloride, methylene chloride, 1,1,2-trichloroethane, and carbon tetrachloride. Reporting Limits (RLs) were set at 0.030 parts per billion by volume (ppbv) for all samples, and results were reported in both micrograms per cubic meter ($\mu g/m^3$) and ppbv.

RESULTS

Air Sampling

PCE, carbon tetrachloride, 1,1,1-trichloroethane and methylene chloride were detected in the sample collected from sub-slab soil gas well SS1 (Sample 0-068-0001) at concentrations of 2.60 $\mu g/m^3$, 0.377 $\mu g/m^3$, 0.217 $\mu g/m^3$ and an estimated concentration of 0.601 $\mu g/m^3$, respectively. In the sample collected from sub-slab soil gas well SS2 (Sample 0-068-0002), PCE, carbon tetrachloride and methylene chloride were detected at concentrations of 19.1 $\mu g/m^3$, 0.202 $\mu g/m^3$ and an estimated concentration of 0.542 $\mu g/m^3$, respectively. PCE, carbon tetrachloride and methylene chloride were detected in the ambient air sample (Sample 0-068-0003) at concentrations of 0.286 $\mu g/m^3$, 0.454 $\mu g/m^3$ and an estimated concentration of 0.504 $\mu g/m^3$, respectively.

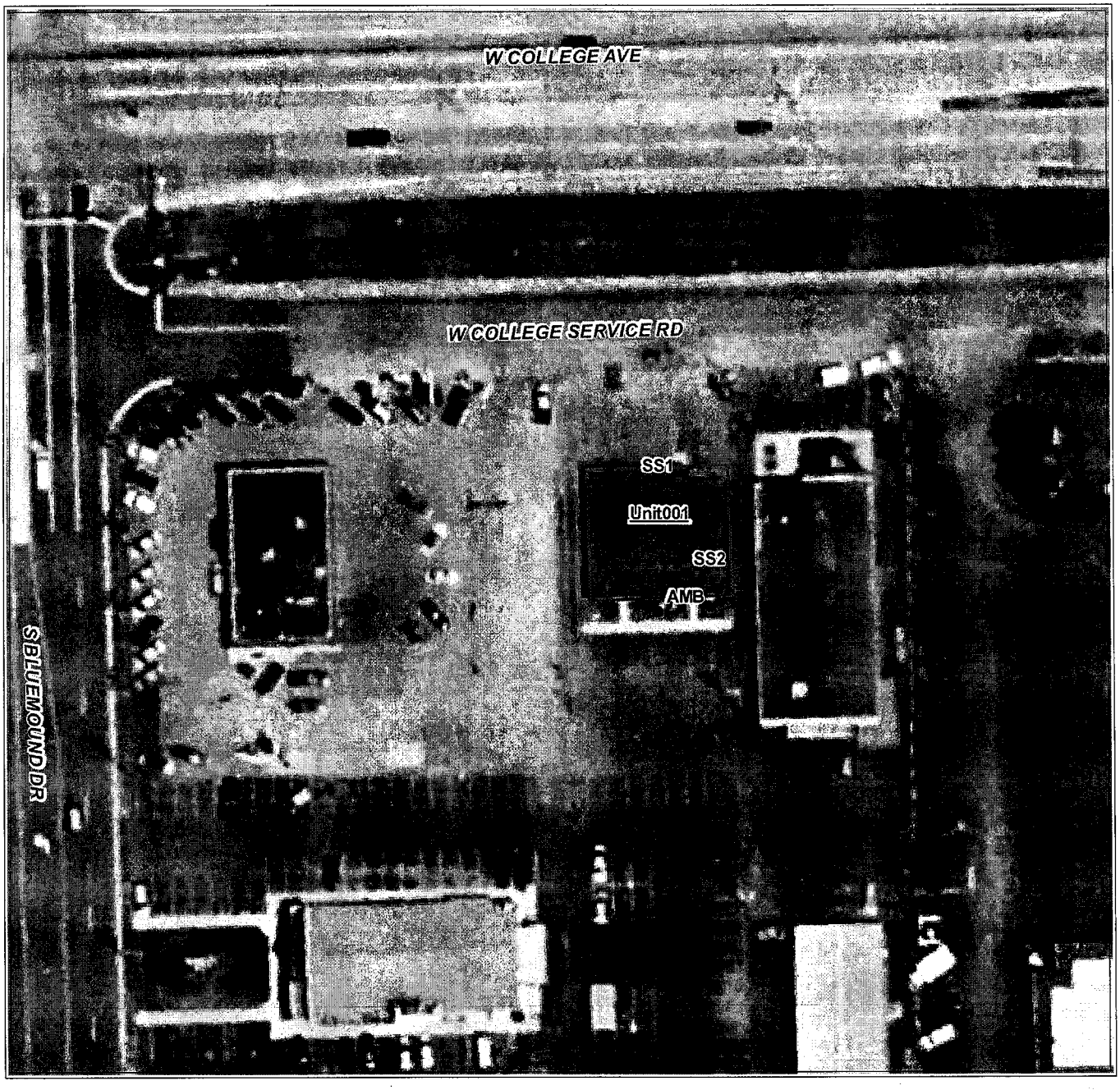
A summary of analytical results for the sub-slab soil gas and ambient air samples collected at Unit 001 during the March 2010 sampling event can be found in Tables 1.1 and 1.2, *Sub-slab Soil Gas and Ambient Air SUMMA® Canister Results – March 2010*, in $\mu g/m^3$ and ppbv, respectively. Complete analytical results are presented in the final analytical report, presented as Appendix A. SUMMA® Air Sampling Worksheets are presented in Appendix B.

FUTURE ACTIVITIES

Future activities will be determined by ERT and EPA Region V personnel.

FIGURE
Appleton, Wisconsin Sub-Slab Soil Gas Sampling
March 2010 Mobilization
May 2010

SERAS068-052110

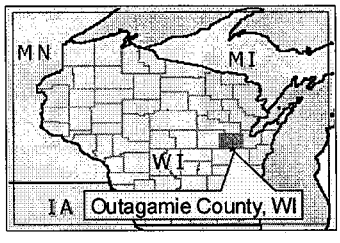


Map created using orthoimagery data, and sample location data.

Map Creation Date: 21 April 2010

Coordinate system: Wisconsin State Plane
FIPS: 4802
Datum: NAD83
Units: Feet

70 0 70
Feet



Magnetic North

Legend

● Sub-slab Soil Gas / Air Sampling Location

Data: g:\Air Team\SERAS\arcviewprojects\00-068
MXD file: g:\AirTeam\SERAS\arcinfoprojects\SER00068\068_SoilGasAir_Sample_Location__W_f1rev001
Revision Number: 00

U.S EPA Environmental Response Team
Scientific Engineering Response and Analytical Services
EP-W-09-031
W.A.# 0-068

Figure 1
Soil Gas and Air Sample Locations
March 2010 Mobilization
Appleton, WI

TABLES
Appleton, Wisconsin Sub-Slab Soil Gas Sampling
March 2010 Mobilization
May 2010

TABLE 1.1

Sub-slab Soil Gas and Ambient Air SUMMA® Canister Results - March 2010

Appleton, WI Sub-Slab Soil Gas Sampling

May 2010

(All results in $\mu g/m^3$)

Sample Number	Project Action Limits*	0-068-0001	0-068-0002	0-068-0003
Location		**Unit001**	**Unit001**	**Unit001**
Sub Location		SS1	SS2	AMB
Matrix		Soil Gas	Soil Gas	Air
Date	Air / Soil Gas	3/10/2010	3/10/2010	3/10/2010
1,1,1-Trichloroethane	2200 / 22000	0.217	ND	ND
1,1,2-Trichloroethane	1.5 / 15	ND	ND	ND
1,1-Dichloroethane	500 / 5000	ND	ND	ND
1,1-Dichloroethene	200 / 2000	ND	ND	ND
Carbon Tetrachloride	1.6 / 16	0.377	0.202	0.454
cis-1,2-Dichloroethene	35 / 350	ND	ND	ND
Methylene Chloride	52 / 520	0.601 J	0.542 J	0.504 J
Tetrachloroethene	8.1 / 81	2.6	19.1	0.286
trans-1,2-Dichloroethene	70 / 700	ND	ND	ND
Trichloroethene	0.22 / 2.2	ND	ND	ND
Vinyl Chloride	2.8 / 28	ND	ND	ND

$\mu g/m^3$ - Micrograms per cubic meter

ND - Not detected above the reporting limit

J - Value is estimated

SS - Sub-slab

AMB - Ambient

* - Project Action Limits from OSWER Draft Guidance for Evaluating the Vapor Intrusion to Indoor Air Pathway from Groundwater and Soils (Subsurface Vapor Intrusion Guidance)

TABLE 1.2

Sub-slab Soil Gas and Ambient Air SUMMA® Canister Results - March 2010

Appleton, WI Sub-Slab Soil Gas Sampling

May 2010

(All results in ppbv)

Sample Number	Project Action Limits*	0-068-0001	0-068-0002	0-068-0003
Location		**Unit001**	**Unit001**	**Unit001**
Sub Location		SS1	SS2	AMB
Matrix		Soil Gas	Soil Gas	Air
Date	Air / Soil Gas	3/10/2010	3/10/2010	3/10/2010
1,1,1-Trichloroethane	400 / 4000	0.0397	ND	ND
1,1,2-Trichloroethane	0.28 / 2.8	ND	ND	ND
1,1-Dichloroethane	120 / 1200	ND	ND	ND
1,1-Dichloroethene	50 / 500	ND	ND	ND
Carbon Tetrachloride	0.26 / 2.6	0.06	0.0321	0.0721
cis-1,2-Dichloroethene	8.8 / 88	ND	ND	ND
Methylene Chloride	15 / 150	0.173 J	0.156 J	0.145 J
Tetrachloroethene	1.2 / 12	0.384	2.81	0.0422
trans-1,2-Dichloroethene	18 / 180	ND	ND	ND
Trichloroethene	0.041 / 0.41	ND	ND	ND
Vinyl Chloride	1.1 / 11	ND	ND	ND

ppbv - Parts per billion by volume

ND - Not detected above the reporting limit

J - Value is estimated

SS - Sub-slab

AMB - Ambient

* - Project Action Limits from OSWER Draft Guidance for Evaluating the Vapor Intrusion to Indoor Air Pathway from Groundwater and Soils (Subsurface Vapor Intrusion Guidance)

APPENDIX A
Analytical Reports
Appleton, Wisconsin Sub-Slab Soil Gas Sampling
March 2010 Mobilization
May 2010

ANALYTICAL REPORT

Prepared by
LOCKHEED MARTIN, Inc.

Sterling Cleaners Site
Appleton, Wisconsin

April 2010

EPA Work Assignment No. SERAS-068
LOCKHEED MARTIN Work Order SER00068
EPA Contract No. EP-W-09-031

Submitted to
G. Newhart
EPA-ERT

Vinod Kansal 4/14/10
V. Kansal Date
Analytical Group Leader

Analysis by:
ERT/SERAS

D. Killeen 4/9/10
D. Killeen Date
QA/QC Officer

Prepared by:
Y. Mehra

D. Miller 4/10/10
D. Miller Date
Program Manager

Validated by:
R. Varsolona

Table of Contents

Appendix A will be furnished on request.

Introduction

SERAS personnel, in response to WA# SERAS-068, provided analytical support for environmental samples collected from the Sterling Cleaners Site located in Appleton, Wisconsin, as described in the following table. The support included QA/QC, data review and preparation of an analytical report containing a summary of the analytical and the QA/QC results.

The samples were treated with procedures consistent with those described in SERAS SOP #1008.

Chain of Custody #	Number of Samples	Sampling Date	Date Received	Matrix	Analysis/ Method	Laboratory	Data Package
0-068-03/10/10-0003	2	03/10/10	03/11/10	Soil Gas	VOC/SERAS SOP 1814	ERT/SERAS[1]	V 159
0-068-03/10/10-0004	1			Air			
0-068-03/10/10-0005	1						
	1			Soil Gas			
0-068-03/10/10-0006	1			Air			
0-068-03/10/10-0007	2						
0-068-03/10/10-0008	2						
0-068-03/10/10-0009	1						
	1			Soil Gas			

[1] ERT/SERAS is NELAC certified for TO-15 analysis in air.

Case Narrative

The data in this report have been validated to three significant figures as reported by the laboratory. Any other representation of the data is the responsibility of the user. All data validation flags have been inserted into the results tables. The laboratories did not report results less than the RL.

VOC in Air Package V 159

Methylene chloride did not meet the percent (%) RSD criterion for the initial calibration of 03/02/10. Methylene chloride is qualified estimated (J) for samples numbers 0-068-0001 through 0-068-0003, 0-068-0005 through 0-068-0007 and 0-068-0009 through 0-068-0013.

Summary of Abbreviations

BFB	Bromofluorobenzene
C	Centigrade
CLP	Contract Laboratory Program
COC	Chain of Custody
conc	concentration
cont	continued
CRDL	Contract Required Detection Limit
CRQL	Contract Required Quantitation Limit
D	(Surrogate Table) value is from a diluted sample and was not calculated
Dioxin	Polychlorinated dibenzo-p-dioxins (PCDD) and Polychlorinated dibenzofurans (PCDF)
DFTPP	Decafluorotriphenylphosphine
EMPC	Estimated maximum possible concentration
GC/MS	Gas Chromatography/ Mass Spectrometry
IS	Internal Standard
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MDA	Minimum Detectable Activity
MS (BS)	Matrix Spike (Blank Spike)
MSD (BSD)	Matrix Spike Duplicate (Blank Spike Duplicate)
MW	Molecular Weight
NA	Not Applicable or Not Available
NAD	Normalized Absolute Difference
NC	Not Calculated
NR	Not Requested/Not Reported
NS	Not Spiked
% D	Percent Difference
% REC	Percent Recovery
SOP	Standard Operating Procedure
ppbv	parts per billion by volume
ppm	parts per million
pptv	parts per trillion by volume
PQL	Practical Quantitation Limit
PAL	Performance Acceptance Limit
QA/QC	Quality Assurance/Quality Control
QL	Quantitation Limit
SERAS	Scientific Engineering Response and Analytical Services
RL	Reporting Limit
RPD	Relative Percent Difference
RSD	Relative Standard Deviation
SIM	Selective Ion Monitoring
Sur	Surrogate
TIC	Tentatively Identified Compound
TCLP	Toxicity Characteristic Leaching Procedure
VOC	Volatile Organic Compound
*	Value exceeds the acceptable QC limits

m^3	cubic meter	g	gram	kg	kilogram	L	liter
µg	microgram	µL	microliter	mg	milligram	mL	milliliter
ng	nanogram	pg	picogram	pCi	picocurie	s	sigma

Data Validation Flags

J	Value is estimated	R	Value is unusable
J+	Value is estimated high (metals only)	U	Not detected
J-	Value is estimated low (metals only)	UJ	Not detected and RL is estimated
N	Presumptively present (Aroclors only)		

Rev. 12/18/09

Table 1.1a Results of the Analysis for VOC (ppbv) in Air
WA# SERAS-068 Sterling Cleaners Site

Method SERAS SOP#1814

Sample Number	3/12/2010		0-068-0001		0-068-0002		0-068-0003		0-068-0005	
Sample Location	Method Blank		Unit001		Unit001		Unit001		Unit003	
Sub Location			SS1		SS2		AMB		IA1	
Analyte	Results ppbv	RL ppbv	Results ppbv	RL ppbv	Results ppbv	RL ppbv	Results ppbv	RL ppbv	Results ppbv	RL ppbv
Vinyl Chloride	U	0.0200	U	0.0225	U	0.0273	U	0.0206	U	0.0266
1,1-Dichloroethene	U	0.0200	U	0.0225	U	0.0273	U	0.0206	0.0348	0.0266
Methylene Chloride	U	0.0200	0.173 J	0.0225	0.156 J	0.0273	0.145 J	0.0206	0.212 J	0.0266
trans-1,2-Dichloroethene	U	0.0200	U	0.0225	U	0.0273	U	0.0206	U	0.0266
1,1-Dichloroethane	U	0.0200	U	0.0225	U	0.0273	U	0.0206	U	0.0266
cis-1,2-Dichloroethene	U	0.0200	U	0.0225	U	0.0273	U	0.0206	0.972	0.0266
1,1,1-Trichloroethane	U	0.0200	0.0397	0.0225	U	0.0273	U	0.0206	U	0.0266
Carbon Tetrachloride	U	0.0200	0.0600	0.0225	0.0321	0.0273	0.0721	0.0206	0.0797	0.0266
Trichloroethene	U	0.0200	U	0.0225	U	0.0273	U	0.0206	0.617	0.0266
1,1,2-Trichloroethane	U	0.0200	U	0.0225	U	0.0273	U	0.0206	U	0.0266
Tetrachloroethene	U	0.0200	0.384	0.0225	2.81	0.0273	0.0422	0.0206	5510	16.7

Table 1.1a (cont) Results of the Analysis for VOC (ppbv) in Air
WA# SERAS-068 Sterling Cleaners Site

Method SERAS SOP#1814

Sample Number	0-068-0006		0-068-0007		0-068-0009		0-068-0010		0-068-0011	
Sample Location	Unit003		Unit003		Unit002		Unit002		Unit002	
Sub Location	SS2		IA2		IA1		IA2		IA2_COL	
Analyte	Results ppbv	RL ppbv	Results ppbv	RL ppbv	Results ppbv	RL ppbv	Results ppbv	RL ppbv	Results ppbv	RL ppbv
Vinyl Chloride	U	0.0239	U	0.0239	U	0.0257	U	0.0275	U	0.0266
1,1-Dichloroethene	U	0.0239	0.109	0.0239	U	0.0257	U	0.0275	U	0.0266
Methylene Chloride	0.141 J	0.0239	0.335 J	0.0239	0.113 J	0.0257	0.161 J	0.0275	0.140 J	0.0266
trans-1,2-Dichloroethene	U	0.0239	0.0288	0.0239	U	0.0257	U	0.0275	U	0.0266
1,1-Dichloroethane	U	0.0239	U	0.0239	U	0.0257	U	0.0275	U	0.0266
cis-1,2-Dichloroethene	0.0654	0.0239	0.229	0.0239	0.0822	0.0257	0.0405	0.0275	0.0431	0.0266
1,1,1-Trichloroethane	U	0.0239	U	0.0239	U	0.0338	U	0.0275	U	0.0266
Carbon Tetrachloride	0.0688	0.0239	0.0975	0.0239	0.101	0.0338	0.0733	0.0275	0.0708	0.0266
Trichloroethene	3.59	0.0239	0.829	0.0239	0.238	0.0338	0.145	0.0275	0.156	0.0266
1,1,2-Trichloroethane	U	0.0239	U	0.0239	U	0.0257	U	0.0275	U	0.0266
Tetrachloroethene	404	5.00	46100	50.0	3.56	0.0257	2.23	0.0275	2.32	0.0266

Table 1.1a (cont) Results of the Analysis for VOC (ppbv) in Air
WA# SERAS-068 Sterling Cleaners Site

Method SERAS SOP#1814

Sample Number	0-068-0012		0-068-0013		3/17/2010		0-068-0014	
Sample Location	Unit002		Unit004		Method Blank		Trip Blank	
Sub Location	AMB		SG1					
Analyte	Results ppbv	RL ppbv	Results ppbv	RL ppbv	Results ppbv	RL ppbv	Results ppbv	RL ppbv
Vinyl Chloride	U	0.0200	U	0.0200	U	0.0200	U	0.0200
1,1-Dichloroethene	U	0.0200	U	0.0200	U	0.0200	U	0.0200
Methylene Chloride	0.300 J	0.0200	0.0261 J	0.0200	U	0.0200	U	0.0200
trans-1,2-Dichloroethene	U	0.0200	U	0.0200	U	0.0200	U	0.0200
1,1-Dichloroethane	U	0.0200	U	0.0200	U	0.0200	U	0.0200
cis-1,2-Dichloroethene	U	0.0200	U	0.0200	U	0.0200	U	0.0200
1,1,1-Trichloroethane	U	0.0200	U	0.0200	U	0.0200	U	0.0200
Carbon Tetrachloride	0.0660	0.0200	0.0367	0.0200	U	0.0200	U	0.0200
Trichloroethene	0.0204	0.0200	U	0.0200	U	0.0200	U	0.0200
1,1,2-Trichloroethane	U	0.0200	U	0.0200	U	0.0200	U	0.0200
Tetrachloroethene	1.04	0.0200	0.615	0.0200	U	0.0200	U	0.0200

Table 1.1b Results of the Analysis for VOC (µg/m^3) in Air
WA# SERAS-068 Sterling Cleaners Site

Method SERAS SOP#1814

Sample Number	3/12/2010		0-068-0001		0-068-0002		0-068-0003		0-068-0005	
Sample Location	Method Blank		Unit001		Unit001		Unit001		Unit003	
Sub Location			SS1		SS2		AMB		IA1	
Analyte	Results µg/m^3	RL µg/m^3	Results µg/m^3	RL µg/m^3	Results µg/m^3	RL µg/m^3	Results µg/m^3	RL µg/m^3	Results µg/m^3	RL µg/m^3
Vinyl Chloride	U	0.0511	U	0.0575	U	0.0698	U	0.0527	U	0.0680
1,1-Dichloroethene	U	0.0793	U	0.0892	U	0.108	U	0.0817	0.138	0.105
Methylene Chloride	U	0.0695	0.601 J	0.0782	0.542 J	0.0948	0.504 J	0.0716	0.736 J	0.0924
trans-1,2-Dichloroethene	U	0.0793	U	0.0892	U	0.108	U	0.0817	U	0.105
1,1-Dichloroethane	U	0.0809	U	0.0911	U	0.110	U	0.0834	U	0.108
cis-1,2-Dichloroethene	U	0.0793	U	0.0892	U	0.108	U	0.0817	3.85	0.105
1,1,1-Trichloroethane	U	0.109	0.217	0.123	U	0.149	U	0.112	U	0.145
Carbon Tetrachloride	U	0.126	0.377	0.142	0.202	0.172	0.454	0.130	0.501	0.167
Trichloroethene	U	0.107	U	0.121	U	0.147	U	0.111	3.32	0.143
1,1,2-Trichloroethane	U	0.109	U	0.123	U	0.149	U	0.112	U	0.145
Tetrachloroethene	U	0.136	2.60	0.153	19.1	0.185	0.286	0.140	37400	113

Table 1.1b (cont) Results of the Analysis for VOC (µg/m^3) in Air
WA# SERAS-068 Sterling Cleaners Site

Method SERAS SOP#1814

Sample Number	0-068-0006		0-068-0007		0-068-0009		0-068-0010		0-068-0011	
Sample Location	Unit003		Unit003		Unit002		Unit002		Unit002	
Sub Location	SS2		IA2		IA1		IA2		IA2_COL	
Analyte	Results µg/m^3	RL µg/m^3	Results µg/m^3	RL µg/m^3	Results µg/m^3	RL µg/m^3	Results µg/m^3	RL µg/m^3	Results µg/m^3	RL µg/m^3
Vinyl Chloride	U	0.0611	U	0.0611	U	0.0657	U	0.0703	U	0.0680
1,1-Dichloroethene	U	0.0948	0.432	0.0948	U	0.102	U	0.109	U	0.105
Methylene Chloride	0.490 J	0.0830	1.16 J	0.0830	0.393 J	0.0893	0.559 J	0.0955	0.486 J	0.0924
trans-1,2-Dichloroethene	U	0.0948	0.114	0.0948	U	0.102	U	0.109	U	0.105
1,1-Dichloroethane	U	0.0967	U	0.0967	U	0.104	U	0.111	U	0.108
cis-1,2-Dichloroethene	0.259	0.0948	0.908	0.0948	0.326	0.102	0.161	0.109	0.171	0.105
1,1,1-Trichloroethane	U	0.130	U	0.130	U	0.185	U	0.150	U	0.145
Carbon Tetrachloride	0.433	0.150	0.613	0.150	0.632	0.213	0.461	0.173	0.445	0.167
Trichloroethene	19.3	0.128	4.45	0.128	1.28	0.182	0.779	0.148	0.838	0.143
1,1,2-Trichloroethane	U	0.130	U	0.130	U	0.140	U	0.150	U	0.145
Tetrachloroethene	2740	33.9	313000	339	24.1	0.174	15.1	0.187	15.7	0.180

Table 1.1b (cont) Results of the Analysis for VOC (µg/m^3) in Air
WA# SERAS-068 Sterling Cleaners Site

Method SERAS SOP#1814

Sample Number	0-068-0012		0-068-0013		3/17/2010		0-068-0014	
Sample Location	Unit002		Unit004		Method Blank		Trip Blank	
Sub Location	AMB		SG1					
Analyte	Results µg/m^3	RL µg/m^3	Results µg/m^3	RL µg/m^3	Results µg/m^3	RL µg/m^3	Results µg/m^3	RL µg/m^3
Vinyl Chloride	U	0.0511	U	0.0511	U	0.0511	U	0.0511
1,1-Dichloroethene	U	0.0793	U	0.0793	U	0.0793	U	0.0793
Methylene Chloride	1.04 J	0.0695	0.0907 J	0.0695	U	0.0695	U	0.0695
trans-1,2-Dichloroethene	U	0.0793	U	0.0793	U	0.0793	U	0.0793
1,1-Dichloroethane	U	0.0809	U	0.0809	U	0.0809	U	0.0809
cis-1,2-Dichloroethene	U	0.0793	U	0.0793	U	0.0793	U	0.0793
1,1,1-Trichloroethane	U	0.109	U	0.109	U	0.109	U	0.109
Carbon Tetrachloride	0.415	0.126	0.231	0.126	U	0.126	U	0.126
Trichloroethene	0.110	0.107	U	0.107	U	0.107	U	0.107
1,1,2-Trichloroethane	U	0.109	U	0.109	U	0.109	U	0.109
Tetrachloroethene	7.05	0.136	4.17	0.136	U	0.136	U	0.136

Table 2.1 Results of the LCS Analysis for VOC in Air
WA# SERAS-068 Sterling Cleaners Site

Sample Number 03/12/10

Analyte	LCS Spike Added ppbv	LCS Recovered ppbv	LCS % Recovery	QC Limits % Recovery
Vinyl Chloride	1.03	0.868	84	47 - 141
1,1-Dichloroethene	1.05	0.834	79	65 - 136
Methylene Chloride	1.05	0.777	74	66 - 129
trans-1,2-Dichloroethene	1.05	0.870	83	64 - 131
1,1-Dichloroethane	1.05	0.929	88	69 - 140
cis-1,2-Dichloroethene	1.05	0.922	88	67 - 137
1,1,1-Trichloroethane	1.05	0.969	92	66 - 147
Carbon Tetrachloride	1.04	0.939	90	64 - 150
Trichloroethene	1.04	0.970	93	70 - 133
1,1,2-Trichloroethane	1.03	0.958	93	64 - 140
Tetrachloroethene	1.04	0.939	90	61 - 151

Table 2.2 Results of the Duplicate Analysis for VOC in Air
WA# SERAS-068 Sterling Cleaners Site

Sample Number 0-068-0001

Analyte	Initial Analysis ppbv	Duplicate Analysis ppbv	RPD	QC Limit % RPD
Vinyl Chloride	U	U	NC	25
1,1-Dichloroethene	U	U	NC	25
Methylene Chloride	0.173	0.188	8	25
trans-1,2-Dichloroethene	U	U	NC	25
1,1-Dichloroethane	U	U	NC	25
cis-1,2-Dichloroethene	U	U	NC	25
1,1,1-Trichloroethane	0.0397	0.0392	1	25
Carbon Tetrachloride	0.0600	0.0638	6	25
Trichloroethene	U	U	NC	25
1,1,2-Trichloroethane	U	U	NC	25
Tetrachloroethene	0.384	0.410	7	25

SERAS-068-DAR-041410

ERT
SERAS, Edison, NJ

CHAIN OF CUSTODY RECORD
Site #: 0-068
Contact Name: Michael Cartwright
Contact Phone: 732-321-4284

No: 0-068-03/10/10-0003

Lab: ERT/SERAS
Lab Phone: 732-321-4200

WO# R003003

Lab #	Sample #	Location	Sub Location	Analyses	Matrix	Numb Cont	Container	Collected	Pump #	OrificeID	Sample_Remarks
48	0-068-0001	Unit001	SS1	VOCs - TO-15	Soil Gas	1	SUMMA	3/10/2010	000155	013177	Front closet
49	0-068-0002	Unit001	SS2	VOCs - TO-15	Soil Gas	1	SUMMA	3/10/2010	000066	013091	Utility room

07

Special Instructions: Analyze per PWA. See sample remarks for elevated PID concentrations.

SAMPLES TRANSFERRED FROM
CHAIN OF CUSTODY #

Items/Reason	Relinquished by	Date	Received by	Date	Time	Items/Reason	Relinquished By	Date	Received by	Date	Time
All/Analysis	[signature]	3/10/10	[signature]	3/11/10	15:30	All/Analysis	[signature]	3/11/10	[signature]	3/11/10	1540

Page 1 of

SERAS-068-DAR-041410

ERT
SERAS, Edison, NJ

CHAIN OF CUSTODY RECORD

Site #: 0-068
Contact Name: Michael Cartwright
Contact Phone: 732-321-4284

No: 0-068-03/10/10-0004

Lab: ERT/SERAS
Lab Phone: 732-321-4200

WO# R003003

Lab #	Sample #	Location	Sub Location	Analyses	Matrix	Numb Cont	Container	Collected	Pump #	OrificeID	Sample_Remarks
50	0-068-0003	Unit001	AMB	VOCs - TO-15	Air	1	SUMMA	3/10/2010	000248	001045	Rear of property, on AC unit
~~50~~	~~0-068-0004~~	~~Unit003~~	~~SB1~~	~~VOCs - TO-15~~	~~Soil Gas~~	~~1~~	~~SUMMA~~	~~3/10/2010~~	~~000247~~	~~013791~~	~~Basement. PID = 7ppm~~ MC 3/14/10

08

Special Instructions: Analyze per PWA. See sample remarks for elevated PID concentrations.

SAMPLES TRANSFERRED FROM
CHAIN OF CUSTODY #

Items/Reason	Relinquished by	Date	Received by	Date	Time	Items/Reason	Relinquished By	Date	Received by	Date	Time
All/Analysis	[signature]	3/10/10	[signature]	3/11/10	15:30	All/Analysis	[signature]	3/11/10	[signature]	3/11/10	1540

Page 1 of 1

SERAS-068-DAR-041410

ERT
SERAS, Edison, NJ

CHAIN OF CUSTODY RECORD
Site #: 0-068
Contact Name: Michael Cartwright
Contact Phone: 732-321-4284

No: 0-068-03/10/10-0005

Lab: ERT/SERAS
Lab Phone: 732-321-4200

WO# R003003

Lab #	Sample #	Location	Sub Location	Analyses	Matrix	Numb Cont	Container	Collected	Pump #	OrificeID	Sample_Remarks
51	0-068-0005	Unit003	IA1	VOCs - TO-15	Air	1	SUMMA	3/10/2010	000001	013176	Basement with SS1
52	0-068-0006	Unit003	SS2	VOCs - TO-15	Soil Gas	1	SUMMA	3/10/2010	000141	013174	Next to drycleaning machine. PID = 33 ppm

09

Special Instructions: Analyze per PWA. See sample remarks for elevated PID concentrations.

SAMPLES TRANSFERRED FROM
CHAIN OF CUSTODY #

Items/Reason	Relinquished by	Date	Received by	Date	Time	Items/Reason	Relinquished By	Date	Received by	Date	Time
All Analysis	[signature]	3/10/10	[signature]	3/11/10	15:30	All Analysis	[signature]	3/11/10	[signature]	3/11/10	1540

Page 1 of 1

SERAS-068-DAR-041410

ERT
SERAS, Edison, NJ

CHAIN OF CUSTODY RECORD
Site #: 0-068
Contact Name: Michael Cartwright
Contact Phone: 732-321-4284

No: 0-068-03/10/10-0006

Lab: ERT/SERAS
Lab Phone: 732-321-4200

WO# R003003

Lab #	Sample #	Location	Sub Location	Analyses	Matrix	Numb Cont	Container	Collected	Pump #	OrificeID	Sample_Remarks
S3	0-068-0007	Unit003	IA2	VOCs - TO-15	Air	1	SUMMA	3/10/2010	000202	013800	On table, with SS2. PID = 30 ppm.
~~S4~~	~~0-068-0008~~	~~Unit002~~	~~SS1~~	~~VOCs - TO-15~~	~~Soil Gas~~	~~1~~	~~SUMMA~~	~~3/10/2010~~	~~012217~~	~~013762~~	~~Basement~~ MC 3/10/10

010

Special Instructions: Analyze per PWA. See sample remarks for elevated PID concentrations.

SAMPLES TRANSFERRED FROM
CHAIN OF CUSTODY #

Items/Reason	Relinquished by	Date	Received by	Date	Time	Items/Reason	Relinquished By	Date	Received by	Date	Time
All Analysis		3/10/10		3/11/10	15:30	All Analysis		3/11/10		3/11/10	15:40

Page 1 of 1

SERAS-068-DAR-041410

ERT
SERAS, Edison, NJ

CHAIN OF CUSTODY RECORD

Site #: 0-068
Contact Name: Michael Cartwright
Contact Phone: 732-321-4284

No: 0-068-03/10/10-0007

Lab: ERT/SERAS
Lab Phone: 732-321-4200

WO#R003003

Lab #	Sample #	Location	Sub Location	Analyses	Matrix	Numb Cont	Container	Collected	Pump #	OrificeID	Sample_Remarks
54	0-068-0009	Unit002	IA1	VOCs - TO-15	Air	1	SUMMA	3/10/2010	000241	013778	Basement on freezer.
55	0-068-0010	Unit002	IA2	VOCs - TO-15	Air	1	SUMMA	3/10/2010	000004	013795	TV Room on table.

011

Special Instructions: Analyze per PWA. See sample remarks for elevated PID concentrations.

SAMPLES TRANSFERRED FROM
CHAIN OF CUSTODY #

Items/Reason	Relinquished by	Date	Received by	Date	Time	Items/Reason	Relinquished By	Date	Received by	Date	Time
All Analysis		3/10/10		3/11/10	15:30	All Analysis		3/11/10		3/11/10	1540

Page 1 of

SERAS-068-DAR-041410

ERT
SERAS, Edison, NJ

CHAIN OF CUSTODY RECORD
Site #: 0-068
Contact Name: Michael Cartwright
Contact Phone: 732-321-4284

No: 0-068-03/10/10-0008

Lab: ERT/SERAS
Lab Phone: 732-321-4200

WO# R003003

Lab #	Sample #	Location	Sub Location	Analyses	Matrix	Numb Cont	Container	Collected	Pump #	OrificeID	Sample_Remarks
56	0-068-0011	Unit002	IA2_COL	VOCs - TO-15	Air	1	SUMMA	3/10/2010	000226	001022	TV Room on table.
57	0-068-0012	Unit002	AMB	VOCs - TO-15	Air	1	SUMMA	3/10/2010	000221	013171	Rear deck.

012

Special Instructions: Analyze per PWA. See sample remarks for elevated PID concentrations.

SAMPLES TRANSFERRED FROM CHAIN OF CUSTODY #

Items/Reason	Relinquished by	Date	Received by	Date	Time	Items/Reason	Relinquished By	Date	Received by	Date	Time
All Analysis		3/10/10		3/11/10	15:30	All Analysis		3/11/10		3/11/10	1540

Page 1 of

ERT
SERAS, Edison, NJ

SERAS-068-DAR-041410

CHAIN OF CUSTODY RECORD

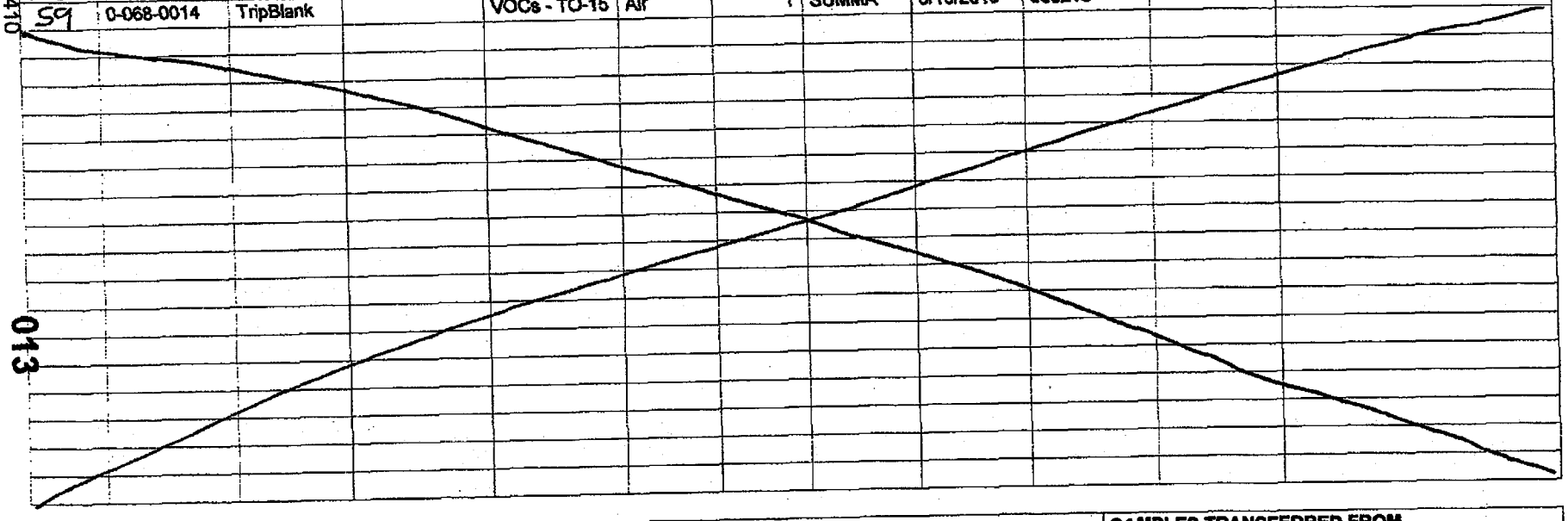
Site #: 0-068
Contact Name: Michael Cartwright
Contact Phone: 732-321-4284

No: 0-068-03/10/10-0009

Lab: ERT/SERAS
Lab Phone: 732-321-4200

WO#R0030003

Lab #	Sample #	Location	Sub Location	Analyses	Matrix	Numb Cont	Container	Collected	Pump #	OrificeID	Sample_Remarks
58	0-068-0013	Unit004	SG1	VOCs - TO-15	Soil Gas	1	SUMMA	3/10/2010	000096		Right-of-way in front of Unit004.
59	0-068-0014	TripBlank		VOCs - TO-15	Air	1	SUMMA	3/10/2010	000218		



013

Special Instructions: Analyze per PWA. See sample remarks for elevated PID concentrations.

SAMPLES TRANSFERRED FROM
CHAIN OF CUSTODY #

Items/Reason	Relinquished by	Date	Received by	Date	Time	Items/Reason	Relinquished By	Date	Received by	Date	Time
All Analysis		3/10/10		3/11/10	15:30	All Analysis		3/11/10		3/11/10	1540

APPENDIX B
SUMMA® Air Sampling Worksheets
Appleton, Wisconsin Sub-Slab Soil Gas Sampling
March 2010 Mobilization
May 2010

SERAS

Air Sampling Air Sampling Work Sheet

Lockheed Martin
SERAS, Edison NJ

: 0-068
: Gary Newhart
SERAS Contact: Michael Cartwright

Appleton, WI

Sample #	0-068-0001	0-068-0002	0-068-0003		
Location	Unit001	Unit001	Unit001		
Sub Location	SS1	SS2	AMB		
Matrix	Soil Gas	Soil Gas	Air		
Pump #	000155	000066	000248		
Orifice_ID	013177	013091	001045		
Start_Pressure	-30	-30	-30		
Start Date	3/9/2010	3/9/2010	3/9/2010		
Stop Date	3/10/2010	3/10/2010	3/10/2010		
Start Time	1:28:00 PM	1:31:00 PM	1:34:00 PM		
Stop_Pressure	-4	-6	-3		
Stop Time	1:25:00 PM	1:28:00 PM	1:27:00 PM		
Flow Rate (Avg)	-3.75	-3.7	-4.04		
Remarks	Front closet	Utility room	Rear of property, on AC unit		
Analysis	VOCs - TO-15	VOCs - TO-15	VOCs - TO-15		