STS 126 Return Samples: Assessment of Air Quality aboard the Shuttle (STS-126) and International Space Station (ULF2)

The toxicological assessments of 2 grab sample canisters (GSCs) from the Shuttle are reported in Table 1. Analytical methods have not changed from earlier reports. The recoveries of the 3 surrogates (^{13}C-acetone, fluorobenzene, and chlorobenzene) from the 2 GSCs averaged 106, 107, and 109 %, respectively. Based on the end-of-mission sample, the Shuttle atmosphere was acceptable for human respiration.

Table 1. Analytical Summary of Shuttle Samples

Sample Location	Date of Sample	NMVOCs [a] (mg/m^3)	Freon 218 (mg/m^3)	T Value[b] (units)	Alcohols (mg/m^3)	Formaldehyde (µg/m^3)
Preflight	11/14/08	0.3	0	0.02	0.1	--
Middeck (end mission)	11/29/08	2	201	0.44	0.8	--

[a] Non-methane volatile organic hydrocarbons, excluding Freon 218
[b] Calculated excluding CO_2, formaldehyde, and siloxanes.

The toxicological assessment of 17 GSCs and 10 pairs of formaldehyde badges from the ISS is shown in Table 2. The recoveries of the 3 standards (as listed above) from the GSCs averaged 87, 76 and 81%, respectively. Two formaldehyde badge lab controls averaged 99% recovery.

Table 2. Analytical Summary of ISS Results

Module/Sample	Approx. Date	NMVOCs[a] (mg/m^3)	Freon 218 (mg/m^3)	T Value[b] (units)	Alcohols (mg/m^3)	Formaldehyde (µg/m^3)
Lab	6/18/08	9	327	0.22	7	24
JEM	6/18/08	6	294	0.97	5	--
SM	6/18/08	12	321	0.20	10	22
JEM	7/18/08	8	289	1.72[c]	4	--
Lab	7/18/08	5	327	0.16	3	25
SM	7/18/08	5	344	0.18	4	20
SM	8/12/08	8	352	1.15[c]	7	21
Lab	8/12/08	9	462	0.17	8	32
JEM	8/12/08	8	525	0.52	6	--
Lab	9/29/08	15	392	0.86	6	32
Columbus	9/29/08	7	519	0.19	5	--
SM	9/29/08	7	501	0.17	5	26
JEM	10/22/08	10	469	0.46	8	--
Lab	10/22/08	12	531	0.51	10	34
SM	10/22/08	10	559	0.44	8	28
MPLM (first entry)	11/13/08	10	43	1.29[d]	3	--
Lab	11/27/08	5	500	0.17	4	--
Guideline		*<25*	*none*	*<1.0*	*<5*	*<120*

[a] Non-methane volatile organic hydrocarbons, excluding Frreon 218
[b] Calculated excluding CO_2, formaldehyde, and siloxanes.
[c] Elevated T values due to trace amount of propenal, an irritant.
[d] Elevated T value due to trimethylsilanol, a central nervous system depressant and offgas product.

Based on these limited samples (Table 2), the ISS atmosphere is acceptable for human respiration. The Freon 218 levels suggest that little scrubbing of this compound was taking place and that the levels increased between the July and August samples, perhaps from an additional small leak.

The amount of Freon 218 in the MPLM first entry sample is typical of the reality that about 10% of the ISS atmosphere is mixed with the air of a newly opened module before the first-entry sample is acquired. The relatively high level of trimethylsilanol in the MPLM first entry sample was expected given that this compound is a common offgas product. There is no risk to crew health because crew exposure is momentary as the vapor is dispersed into the general ISS atmosphere and scrubbed.

The alcohol levels were often above the target limit of 5 mg/m^3. Formaldehyde levels continue to show consistently lower values in the SM when compared to the Lab. Levels in either module are well below the acceptable level for formaldehyde exposure.

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Enclosures
Table 1A: Analytical concentrations of compounds found in the STS-126 GSCs
Table 1B: Analytical concentrations of compounds found in ULF2 GSCs
Table 2A: T-values of the compounds in table 1A
Table 2B: T-values of the compounds in table 1B

TABLE 1
ANALYTICAL RESULTS OF
STS-126 RETURN GRAB SAMPLE CONTAINER AIR SAMPLES

CHEMICAL CONTAMINANT	CONCENTRATION (mg/m3)	
	AA04629 SN 1083 Mid-Deck 11/29/08 @ 20:25 GMT	AA04576 SN 1008 Preflight 11/14/08 @ 14:25 EST
TARGET COMPOUNDS (TO-14/POLAR)* **		
FREON12	<0.025	<0.025
CHLOROMETHANE	<0.025	<0.025
FREON114	<0.025	<0.025
METHANOL	0.12	TRACE
ACETALDEHYDE	0.18	TRACE
VINYLCHLORIDE	<0.025	<0.025
BROMOMETHANE	<0.025	<0.025
ETHANOL	0.47	0.043
CHLOROETHANE	<0.025	<0.025
ACETONITRILE	TRACE	0.030
PROPENAL	TRACE	<0.025
ACETONE	0.18	TRACE
PROPANAL	0.054	TRACE
ISOPROPANOL	0.041	0.028
FREON11	<0.025	<0.025
FURAN	<0.025	<0.025
ACRYLONITRILE	<0.025	<0.025
PENTANE	<0.025	<0.025
2-METHYL-2-PROPANOL	TRACE	<0.025
METHYLACETATE	<0.025	<0.025
1,1-DICHLOROETHENE	<0.025	<0.025
DICHLOROMETHANE	TRACE	0.030
3-CHLOROPROPENE	<0.025	<0.025
FREON113	<0.025	<0.025
N-PROPANOL	TRACE	<0.025
1,1-DICHLOROETHANE	<0.025	<0.025
BUTANAL	0.038	TRACE
2-BUTANONE	TRACE	TRACE
CIS-1,2-DICHLOROETHENE	<0.025	<0.025
2-METHYLFURAN	<0.025	<0.025
ETHYLACETATE	<0.025	<0.025
HEXANE	<0.025	<0.025
CHLOROFORM	<0.025	<0.025
2-BUTENAL	TRACE	<0.025
1,2-DICHLOROETHANE	<0.025	<0.025
1,1,1-TRICHLOROETHANE	<0.025	<0.025
N-BUTANOL	TRACE	TRACE
BENZENE	<0.025	<0.025
CARBONTETRACHLORIDE	<0.025	<0.025
2-PENTANONE	TRACE	<0.025
2-METHYLHEXANE	<0.025	<0.025
2,3-DIMETHYLPENTANE	<0.025	<0.025
PENTANAL	0.030	TRACE
3-METHYLHEXANE	<0.025	<0.025
1,2-DICHLOROPROPANE	<0.025	<0.025
1,4-DIOXANE	<0.025	<0.025
TRICHLOROETHENE	<0.025	<0.025
2,5-DIMETHYLFURAN	<0.025	<0.025
N-HEPTANE	<0.025	<0.025

4-METHYL2-PENTANONE	<0.025	<0.025
CIS-1,3-DICHLOROPROPENE	<0.025	<0.025
2-PENTENAL	<0.025	<0.025
TRANS-1,3-DICHLOROPROPENE	<0.025	<0.025
1,1,2-TRICHLOROETHANE	<0.025	<0.025
TOLUENE	<0.025	<0.025
HEXANAL	0.026	TRACE
MESITYLOXIDE	TRACE	<0.025
1,2-DIBROMOETHANE	<0.025	<0.025
BUTYLACETATE	<0.025	<0.025
TETRACHLOROETHENE	<0.025	<0.025
CHLOROBENZENE	<0.025	<0.025
ETHYLBENZENE	<0.025	<0.025
M/P-XYLENES	<0.025	<0.025
2-HEPTANONE	TRACE	<0.025
CYCLOHEXANONE	TRACE	<0.025
HEPTANAL	0.025	TRACE
STYRENE	<0.025	<0.025
1,1,2,2-TETRACHLOROETHANE	<0.025	<0.025
O-XYLENE	<0.025	<0.025
1,3,5-TRIMETHYLBENZENE	<0.025	<0.025
1,2,4-TRIMETHYLBENZENE	<0.025	<0.025
1,3-DICHLOROBENZENE	<0.025	<0.025
1,4-DICHLOROBENZENE	<0.025	<0.025
1,2-DICHLOROBENZENE	<0.025	<0.025
1,2,4-TRICHLOROBENZENE	<0.025	<0.025
HEXACHLORO-1,3-BUTADIENE	<0.025	<0.025

TARGET COMPOUNDS (TOXIC)		
1,3-BUTADIENE	<0.025	<0.025
ETHYLENE OXIDE	<0.025	<0.025
CARBON DISULFIDE	<0.025	<0.025
2-METHYL-2-PROPENAL	<0.025	<0.025
3-BUTEN-2-ONE	<0.025	<0.025
2-ETHOXYETHANOL	<0.025	<0.025
DIMETHYLDISULFIDE	<0.025	<0.025
OCTAMETHYLCYCLOTETRASILOXANE	##	##

NON-TARGET COMPOUNDS		
OCTAFLUOROPROPANE ***	201	<0.025
SULFURHEXAFLUORIDE	TRACE	<0.025
BROMOTRIFLUOROMETHANE	0.47	<0.025
2-BUTOXYETHANOL**	**0.069**	**0.083**
HEXAMETHYLCYCLOTRISILOXANE	##	##
DECAMETHYLCYCLOPENTASILOXANE	##	##

TOTAL ALCOHOLS PLUS ACETONE	**0.84**	**0.11**

TARGET COMPOUNDS (GC)* **		
CARBON MONOXIDE	TRACE	TRACE
METHANE	50	<1.6
HYDROGEN	9.6	<0.41
CARBON DIOXIDE	5400	TRACE

TOTAL CONCENTRATION (NON-METHANE HYDROCARBONS)	**203**	**0.34**

TOTAL CONCENTRATION (NON-METHANE HYDROCARBONS) MINUS OCTAFLUOROPROPANE	**1.9**	**0.34**

****BLANK CORRECTED**

Present, subject to large, random variability, therefore not quantifiable

< : Value is less than the laboratory report detection limit.

TRACE: Amount detected is sufficient for compound identification only.

*** Measurements are calibrated by multi-point initial calibration and verified by mid-point continuing calibration.

TABLE 1
ANALYTICAL RESULTS OF
ULF2 RETURN GRAB SAMPLE CONTAINER AIR SAMPLES

CHEMICAL CONTAMINANT	CONCENTRATION (mg/m3)																
	AA04606 S/N 1009 LAB 06/18/08 @ 17:20 GMT	AA04607 S/N 1084 JEM 06/18/08 @ 17:23 GMT	AA04608 S/N 1004 SM 06/18/08 @ 17:27 GMT	AA04609 S/N 1090 JEM 07/18/08 @ 19:57 GMT	AA04610 S/N 1073 LAB 07/18/08 @ 20:00 GMT	AA04611 S/N 1082 SM 07/18/08 @ 20:03 GMT	AA04612 S/N 1089 SM 8/12/08 @ 16:08 GMT	AA04613 S/N 1057 LAB 8/12/08 @ 16:11 GMT	AA04614 S/N 1079 JEM 8/12/08 @ 16:15 GMT	AA04615& S/N 1038 LAB 9/29/08 @ 16:50 GMT	AA04616 S/N 1010 COLUMBUS 9/29/08 @ 16:55 GMT	AA04617 S/N 1048 SM 9/29/08 @ 17:07 GMT	AA04618 S/N 1011 JEM 10/22/08 @ 10:40 GMT	AA04619 S/N 1078 LAB 10/22/08 @ 10:42 GMT	AA04620 S/N 1031 SM 10/22/08 @ 10:45 GMT	AA04621 S/N 1003 MPLM 11/17/08 @ 23:38 GMT	AA04622 S/N 1050 LAB 11/27/08 @ 20:20 GMT
TARGET COMPOUNDS (TO-14/POLAR)* **																	
FREON12	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
CHLOROMETHANE	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
FREON114	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
METHANOL	0.19	0.40	0.19	0.20	0.19	0.43	0.18	0.21	0.24	0.16	0.21	0.24	0.36	0.41	0.26	0.22	0.71
ACETALDEHYDE	0.073	0.23	0.063	0.48	0.060	0.093	0.32	0.080	0.12	0.44	0.070	0.074	0.14	0.16	0.13	0.069	0.090
VINYLCHLORIDE	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
BROMOMETHANE	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
ETHANOL *	**6.8**	**4.1**	**9.6**	**3.0**	**2.8**	**2.9**	**6.2**	**6.8**	**5.7**	**5.0**	**4.3**	**4.5**	**7.2**	**8.3**	**7.4**	0.55	**2.9**
CHLOROETHANE	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
ACETONITRILE	TRACE	TRACE	TRACE	TRACE	TRACE	TRACE	TRACE	TRACE	TRACE	TRACE	TRACE	TRACE	TRACE	TRACE	TRACE	TRACE	TRACE
PROPENAL	<0.050	TRACE	<0.050	TRACE	<0.050	<0.050	TRACE	<0.050	TRACE	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
ACETONE	0.18	0.19	0.17	0.45	0.13	0.16	0.21	0.21	0.19	0.18	0.17	0.18	0.32	0.37	0.32	0.26	0.26
PROPANAL	TRACE	0.065	TRACE	0.24	TRACE	TRACE	0.10	TRACE	TRACE	TRACE	TRACE	TRACE	TRACE	TRACE	TRACE	TRACE	TRACE
ISOPROPANOL *	0.12	0.11	0.11	0.12	0.10	0.11	0.14	0.16	0.18	0.17	0.17	0.16	0.19	0.21	0.16	**1.4**	0.13
FREON11	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	TRACE	<0.050
FURAN	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
ACRYLONITRILE	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	TRACE	<0.050	<0.050	<0.050
PENTANE	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	TRACE	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
2-METHYL-2-PROPANOL	<0.050	<0.050	<0.050	TRACE	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	TRACE	<0.050	0.053	<0.050
METHYLACETATE	TRACE	TRACE	TRACE	<0.050	<0.050	<0.050	<0.050	TRACE	<0.050	TRACE	TRACE	TRACE	TRACE	TRACE	TRACE	TRACE	TRACE
1,1-DICHLOROETHENE	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
DICHLOROMETHANE	TRACE	TRACE	TRACE	TRACE	TRACE	TRACE	TRACE	TRACE	TRACE	TRACE	TRACE	TRACE	TRACE	TRACE	TRACE	TRACE	TRACE
3-CHLOROPROPENE	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
FREON113	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
N-PROPANOL	TRACE	TRACE	TRACE	TRACE	TRACE	TRACE	TRACE	TRACE	TRACE	TRACE	TRACE	TRACE	0.083	0.092	0.072	TRACE	TRACE
1,1-DICHLOROETHANE	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
BUTANAL	TRACE	TRACE	TRACE	0.15	TRACE	TRACE	0.061	TRACE	TRACE	TRACE	TRACE	<0.050	TRACE	TRACE	TRACE	TRACE	<0.050
2-BUTANONE	TRACE	TRACE	TRACE	0.15	TRACE	TRACE	TRACE	TRACE	TRACE	TRACE	TRACE	TRACE	TRACE	TRACE	TRACE	0.37	TRACE
CIS-1,2-DICHLOROETHENE	<0.050	<0.050	TRACE	TRACE	TRACE	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
2-METHYLFURAN	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	TRACE	TRACE	TRACE	<0.050	<0.050
ETHYLACETATE	0.055	TRACE	0.059	0.084	0.099	0.12	TRACE	TRACE	TRACE	0.089	TRACE	TRACE	TRACE	TRACE	TRACE	0.055	TRACE
HEXANE	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	TRACE	<0.050	<0.050	<0.050	<0.050	<0.050	0.072	<0.050
CHLOROFORM	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
2-BUTENAL	<0.050	TRACE	<0.050	TRACE	<0.050	<0.050	TRACE	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
1,2-DICHLOROETHANE	TRACE	TRACE	TRACE	TRACE	TRACE	TRACE	TRACE	TRACE	TRACE	TRACE	TRACE	TRACE	TRACE	TRACE	TRACE	<0.050	TRACE
1,1,1-TRICHLOROETHANE	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
N-BUTANOL	0.067	0.062	0.073	0.079	0.067	0.080	0.069	0.081	0.092	0.087	0.095	0.11	0.15	0.17	0.15	0.24	0.063
BENZENE	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	TRACE	<0.050
CARBONTETRACHLORIDE	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
2-PENTANONE	<0.050	<0.050	<0.050	0.076	<0.050	<0.050	TRACE	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
2-METHYLHEXANE	TRACE	<0.050	TRACE	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	TRACE	<0.050	<0.050	TRACE	TRACE	TRACE	TRACE	<0.050
2,3-DIMETHYLPENTANE	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	TRACE	<0.050	<0.050	TRACE	TRACE	TRACE	TRACE	<0.050
PENTANAL	TRACE	TRACE	<0.050	0.14	<0.050	TRACE	TRACE	TRACE	TRACE	TRACE	TRACE	<0.050	TRACE	TRACE	TRACE	TRACE	<0.050
3-METHYLHEXANE	TRACE	TRACE	TRACE	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	TRACE	<0.050	<0.050	TRACE	TRACE	TRACE	TRACE	<0.050
1,2-DICHLOROPROPANE	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
1,4-DIOXANE	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
TRICHLOROETHENE	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
2,5-DIMETHYLFURAN	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
N-HEPTANE	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	TRACE	<0.050	<0.050	<0.050	<0.050	<0.050	TRACE	<0.050
4-METHYL2-PENTANONE	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	TRACE	<0.050
CIS-1,3-DICHLOROPROPENE	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
2-PENTENAL	<0.050	<0.050	<0.050	TRACE	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
TRANS-1,3-DICHLOROPROPENE	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
1,1,2-TRICHLOROETHANE	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
TOLUENE	TRACE	TRACE	TRACE	TRACE	TRACE	TRACE	TRACE	TRACE	TRACE	TRACE	TRACE	TRACE	TRACE	TRACE	TRACE	0.52	TRACE
HEXANAL	TRACE	TRACE	<0.050	0.14	TRACE	TRACE	TRACE	TRACE	TRACE	TRACE	TRACE	TRACE	TRACE	TRACE	TRACE	TRACE	<0.050
MESITYLOXIDE	<0.050	<0.050	<0.050	TRACE	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
1,2-DIBROMOETHANE	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
BUTYLACETATE	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	TRACE	TRACE	TRACE	TRACE	TRACE	TRACE	TRACE	<0.050
TETRACHLOROETHENE	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
CHLOROBENZENE	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	TRACE	TRACE	TRACE	<0.050	<0.050
ETHYLBENZENE	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	TRACE	<0.050
M/P-XYLENES	TRACE	TRACE	TRACE	TRACE	TRACE	TRACE	TRACE	TRACE	TRACE	TRACE	TRACE	TRACE	TRACE	TRACE	TRACE	TRACE	<0.050
2-HEPTANONE	<0.050	<0.050	<0.050	0.088	<0.050	<0.050	TRACE	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
CYCLOHEXANONE	TRACE	TRACE	TRACE	0.064	TRACE	TRACE	TRACE	TRACE	0.057	TRACE	0.061	0.055	0.060	0.064	TRACE	TRACE	TRACE
HEPTANAL	TRACE	TRACE	<0.050	0.10	<0.050	TRACE	TRACE	TRACE	TRACE	TRACE	TRACE	<0.050	TRACE	TRACE	<0.050	TRACE	<0.050
STYRENE	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
1,1,2,2-TETRACHLOROETHANE	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
O-XYLENE	TRACE	TRACE	TRACE	TRACE	TRACE	TRACE	TRACE	TRACE	TRACE	0.068	0.065	0.070	0.074	0.084	0.076	TRACE	TRACE
1,3,5-TRIMETHYLBENZENE	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
1,2,4-TRIMETHYLBENZENE	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
1,3-DICHLOROBENZENE	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
1,4-DICHLOROBENZENE	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	TRACE	TRACE	<0.050	TRACE
1,2-DICHLOROBENZENE	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
1,2,4-TRICHLOROBENZENE	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
HEXACHLORO-1,3-BUTADIENE	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
TARGET COMPOUNDS (TOXIC)																	
1,3-BUTADIENE	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
ETHYLENE OXIDE	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
CARBON DISULFIDE	<0.050	<0.050	<0.050	TRACE	TRACE	TRACE	TRACE	TRACE	TRACE	TRACE	<0.050	<0.050	TRACE	TRACE	TRACE	TRACE	<0.050
2-METHYL-2-PROPENAL	TRACE	TRACE	TRACE	TRACE	<0.050	TRACE	TRACE	<0.050	TRACE	TRACE	<0.050	<0.050	TRACE	TRACE	TRACE	TRACE	<0.050
3-BUTEN-2-ONE	<0.050	TRACE	<0.050	TRACE	<0.050	<0.050	TRACE	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
2-ETHOXYETHANOL	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
DIMETHYLDISULFIDE	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
OCTAMETHYLCYCLOTETRASILOXANE	##	##	##	##	##	##	##	##	##	##	##	##	##	##	##	##	##
NON-TARGET COMPOUNDS																	
OCTAFLUOROPROPANE***	327	294	321	289	327	344	352	462	525	392	519	501	469	531	559	43	500
SULFURHEXAFLUORIDE	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	TRACE	<0.050	<0.050
UNIDENTIFIEDFLUORINATEDHYDROCARBON	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.065	0.074	0.077	<0.050	<0.050	<0.050	0.47	<0.050
PROPENE	TRACE	TRACE	TRACE	TRACE	TRACE	TRACE	TRACE	TRACE	TRACE	TRACE	TRACE	TRACE	TRACE	TRACE	TRACE	0.11	TRACE
CARBONYLSULFIDE	TRACE	TRACE	TRACE	TRACE	TRACE	TRACE	TRACE	TRACE	TRACE	TRACE	TRACE	TRACE	TRACE	TRACE	TRACE	TRACE	TRACE
PROPANE	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	TRACE	<0.050	<0.050	<0.050	<0.050	<0.050	TRACE	<0.050
!SOBUTANE +	**<0.050**	**<0.050**	**<0.050**	**<0.050**	**<0.050**	**<0.050**	**<0.050**	**<0.050**	**<0.050**	**3.7**	**<0.050**	**<0.050**	**<0.050**	**<0.050**	**<0.050**	**<0.050**	**<0.050**
BUTANE	<0.050	<0.050	<0.050	TRACE	<0.050	<0.050	<0.050	<0.050	<0.050	3.4	<0.050	<0.050	<0.050	<0.050	<0.050	TRACE	<0.050
1,1-DICHLORO-1-FLUOROETHANE	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.19	<0.050
2-METHYL-1,3-BUTADIENE(ISOPRENE)	0.12	0.081	0.10	0.054	0.058	0.065	0.051	0.054	0.054	TRACE	0.052	0.060	0.12	0.14	0.12	TRACE	0.068
TRIMETHYLSILANOL	0.19	0.21	0.17	0.23	0.19	0.19	0.17	0.21	0.29	0.21	0.27	0.20	0.31	0.34	0.24	4.0	0.14
1,3-DIOXOLANE	0.064	TRACE	0.062	0.056	0.070	0.064	0.052	0.067	0.072	0.39	0.12	0.091	0.11	0.12	0.097	TRACE	TRACE
C6-KETONE	TRACE	TRACE	<0.050	0.26	<0.050	TRACE	TRACE	<0.050	TRACE	TRACE	<0.050	<0.050	TRACE	TRACE	<0.050	TRACE	<0.050
PENTAMETHYLDISILOXANE-1-OL	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.090	<0.050
HEXAMETHYLCYCLOTRISILOXANE	##	##	##	##	##	##	##	##	##	##	##	##	##	##	##	##	##
C9-ALKENE	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
2-BUTOXYETHANOL**	**0.19**	**0.17**	**0.20**	**0.22**	**0.21**	**0.18**	**0.12**	**0.10**	**0.12**	**0.11**	**0.091**	**0.074**	**0.088**	**0.092**	**0.076**	**0.078**	**0.086**
C8-KETONE	TRACE	TRACE	<0.050	0.40	<0.050	TRACE	TRACE	<0.050	TRACE	<0.050	<0.050	<0.050	TRACE	<0.050	<0.050	<0.050	<0.050
C8-KETONE	<0.050	<0.050	<0.050	TRACE	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
BENZALDEHYDE	TRACE	TRACE	TRACE	TRACE	TRACE	0.056	TRACE	TRACE	TRACE	TRACE	TRACE	TRACE	TRACE	TRACE	TRACE	TRACE	TRACE
C8-ALCOHOL	0.48	0.15	0.46	0.61	0.46	0.32	TRACE	0.33	0.31	0.27	0.45	0.44	0.49	0.58	0.36	0.39	0.45
C8-ALCOHOL	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	TRACE	<0.050	<0.050	<0.050	<0.050	<0.050	TRACE	<0.050
LIMONENE	0.089	TRACE	0.11	0.059	0.12	0.13	TRACE	0.12	0.13	TRACE	0.051	0.053	0.061	0.056	0.061	<0.050	TRACE

C9-KETONE	<0.050	<0.050	<0.050	0.12	<0.050	<0.050	TRACE	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
C10-KETONE	<0.050	<0.050	<0.050	TRACE	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
DECAMETHYLCYCLOPENTASILOXANE	##	##	##	##	##	##	##	##	##	##	##	##	##	##	##	##	##
TOTAL ALCOHOLS PLUS ACETONE	**7.4**	**4.8**	**10**	**3.8**	**3.3**	**3.7**	**6.8**	**7.5**	**6.5**	**5.7**	**4.9**	**5.2**	**8.3**	**9.5**	**8.4**	**2.7**	**4.1**
TARGET COMPOUNDS (GC)* **																	
CARBON MONOXIDE	TRACE	TRACE	TRACE	TRACE	<0.29	<0.29	<0.29	<0.29	<0.29	<0.29	TRACE	<0.29	<0.29	TRACE	TRACE	TRACE	TRACE
METHANE	TRACE	TRACE	TRACE	<1.6	<1.6	<1.6	<1.6	<1.6	<1.6	<1.6	<1.6	<1.6	TRACE	TRACE	TRACE	TRACE	16
HYDROGEN	2.0	2.2	2.1	1.9	2.1	2.1	2.2	2.2	2.3	3.2	3.2	3.2	2.6	2.7	2.6	<0.41	2.8
CARBON DIOXIDE	7800	7400	8500	6500	6900	6600	9900	8900	9400	8400	8900	9700	8200	8400	9700	1500	7300
TOTAL CONCENTRATION (NON-METHANE HYDROCARBONS)	**340**	**300**	**330**	**300**	**330**	**350**	**360**	**470**	**530**	**410**	**530**	**510**	**480**	**540**	**570**	**52**	**510**
TOTAL CONCENTRATION (NON-METHANE HYDROCARBONS) MINUS OCTAFLUOROPROPANE	**9.2**	**6.4**	**12**	**8.1**	**4.9**	**5.4**	**8.4**	**8.9**	**8.1**	**15**	**6.7**	**6.7**	**10**	**12**	**10**	**9.9**	**5.4**

*** FROM GC/FID ANALYSIS**
****BLANK CORRECTED**
+ CORRECTED FOR ACETALDEHYDE
Present, subject to large, random variability, therefore not quantifiable
& POSSIBLE LEAK
< : Value is less than the laboratory report detection limit.
TRACE: Amount detected is sufficient for compound identification only.
*** Measurements are calibrated by multi-point initial calibration and verified by mid-point continuing calibration.

TABLE 2
ANALYTICAL RESULTS OF
STS-126 RETURN GRAB SAMPLE CONTAINER AIR SAMPLES

CHEMICAL CONTAMINANT	T-VALUE (7-d SMAC)	
	AA04629 SN 1083 Mid-Deck 11/29/08 @ 20:25 GMT	AA04576 SN 1008 Preflight 11/14/08 @ 14:25 EST
TARGET COMPOUNDS (TO-14/POLAR)		
FREON12	ND	ND
CHLOROMETHANE	ND	ND
FREON114	ND	ND
METHANOL	0.00137	0.00014
ACETALDEHYDE	0.04587	0.00313
VINYLCHLORIDE	ND	ND
BROMOMETHANE	ND	ND
ETHANOL	0.00023	0.00002
CHLOROETHANE	ND	ND
ACETONITRILE	0.00187	0.00441
PROPENAL	0.31327	ND
ACETONE	0.00348	0.00024
PROPANAL	0.00492	0.00114
ISOPROPANOL	0.00028	0.00019
FREON11	ND	ND
FURAN	ND	ND
ACRYLONITRILE	ND	ND
PENTANE	ND	ND
2-METHYL-2-PROPANOL	0.00008	ND
METHYLACETATE	ND	ND
1,1-DICHLOROETHENE	ND	ND
DICHLOROMETHANE	0.00026	0.00060
3-CHLOROPROPENE	ND	ND
FREON113	ND	ND
N-PROPANOL	0.00013	ND
1,1-DICHLOROETHANE	ND	ND
BUTANAL	0.00295	0.00096
2-BUTANONE	0.00042	0.00042
CIS-1,2-DICHLOROETHENE	ND	ND
2-METHYLFURAN	ND	ND
ETHYLACETATE	ND	ND
HEXANE	ND	ND
CHLOROFORM	ND	ND
2-BUTENAL	0.00735	ND
1,2-DICHLOROETHANE	ND	ND
1,1,1-TRICHLOROETHANE	ND	ND
N-BUTANOL	0.00016	0.00016
BENZENE	ND	ND
CARBONTETRACHLORIDE	ND	ND
2-PENTANONE	0.00018	ND
2-METHYLHEXANE	ND	ND
2,3-DIMETHYLPENTANE	ND	ND
PENTANAL	0.00187	0.00078
3-METHYLHEXANE	ND	ND
1,2-DICHLOROPROPANE	ND	ND
1,4-DIOXANE	ND	ND
TRICHLOROETHENE	ND	ND
2,5-DIMETHYLFURAN	ND	ND
N-HEPTANE	ND	ND

4-METHYL2-PENTANONE	ND	ND
CIS-1,3-DICHLOROPROPENE	ND	ND
2-PENTENAL	ND	ND
TRANS-1,3-DICHLOROPROPENE	ND	ND
1,1,2-TRICHLOROETHANE	ND	ND
TOLUENE	ND	ND
HEXANAL	0.00143	0.00069
MESITYLOXIDE	0.00031	ND
1,2-DIBROMOETHANE	ND	ND
BUTYLACETATE	ND	ND
TETRACHLOROETHENE	ND	ND
CHLOROBENZENE	ND	ND
ETHYLBENZENE	ND	ND
M/P-XYLENES	ND	ND
2-HEPTANONE	0.00054	ND
CYCLOHEXANONE	0.00021	ND
HEPTANAL	0.00120	0.00060
STYRENE	ND	ND
1,1,2,2-TETRACHLOROETHANE	ND	ND
O-XYLENE	ND	ND
1,3,5-TRIMETHYLBENZENE	ND	ND
1,2,4-TRIMETHYLBENZENE	ND	ND
1,3-DICHLOROBENZENE	ND	ND
1,4-DICHLOROBENZENE	ND	ND
1,2-DICHLOROBENZENE	ND	ND
1,2,4-TRICHLOROBENZENE	ND	ND
HEXACHLORO-1,3-BUTADIENE	ND	ND

TARGET COMPOUNDS (TOXIC)		
1,3-BUTADIENE	ND	ND
ETHYLENE OXIDE	ND	ND
CARBON DISULFIDE	ND	ND
2-METHYL-2-PROPENAL	ND	ND
3-BUTEN-2-ONE	ND	ND
2-ETHOXYETHANOL	ND	ND
DIMETHYLDISULFIDE	ND	ND
OCTAMETHYLCYCLOTETRASILOXANE	##	##

NON-TARGET COMPOUNDS		
OCTAFLUOROPROPANE	0.00237	ND
SULFURHEXAFLUORIDE	0.00001	ND
BROMOTRIFLUOROMETHANE	0.00004	ND
2-BUTOXYETHANOL**	0.00288	0.00347
HEXAMETHYLCYCLOTRISILOXANE	##	##
DECAMETHYLCYCLOPENTASILOXANE	##	##

TARGET COMPOUNDS (GC)		
CARBON MONOXIDE	0.00227	0.00227
METHANE	0.01171	0.00000
HYDROGEN	0.02824	0.00000
CARBON DIOXIDE	0.41290	0.01538

TOTAL T-VALUE	**0.84880**	**0.03458**

****BLANK CORRECTED**

Present, subject to large, random variability, therefore not quantifiable

ND : Value is less than the laboratory report detection limit.

Note: Number of decimal places in T-Values do not represent significant figures of measurements.

TABLE 2
ANALYTICAL RESULTS OF
ULF2 RETURN GRAB SAMPLE CONTAINER AIR SAMPLES

CHEMICAL CONTAMINANT	T-VALUE (180-d SMAC)																
	AA04606 S/N 1009 LAB 06/18/08 @ 17:20 GMT	AA04607 S/N 1084 JEM 06/18/08 @ 17:23 GMT	AA04608 S/N 1004 SM 06/18/08 @ 17:27 GMT	AA04609 S/N 1090 JEM 07/18/08 @ 19:57 GMT	AA04610 S/N 1073 LAB 07/18/08 @ 20:00 GMT	AA04611 S/N 1082 SM 07/18/08 @ 20:03 GMT	AA04612 S/N 1089 SM 8/12/08 @ 16:08 GMT	AA04613 S/N 1057 LAB 8/12/08 @ 16:11 GMT	AA04614 S/N 1079 JEM 8/12/08 @ 16:15 GMT	AA04615& S/N 1038 LAB 9/29/08 @ 16:50 GMT	AA04616 S/N 1010 COLUMBUS 9/29/08 @ 16:55 GMT	AA04617 S/N 1048 SM 9/29/08 @ 17:07 GMT	AA04618 S/N 1011 JEM 10/22/08 @ 10:40 GMT	AA04619 S/N 1078 LAB 10/22/08 @ 10:42 GMT	AA04620 S/N 1031 SM 10/22/08 @ 10:45 GMT	AA04621 S/N 1003 MPLM 11/17/08 @ 23:38 GMT	AA04622 S/N 1050 LAB 11/27/08 @ 20:20 GMT
TARGET COMPOUNDS (TO-14/POLAR)																	
FREON12	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
CHLOROMETHANE	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
FREON114	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
METHANOL	0.00212	0.00442	0.00212	0.00225	0.00213	0.00483	0.00203	0.00237	0.00266	0.00181	0.00231	0.00270	0.00403	0.00459	0.00286	0.00247	0.00793
ACETALDEHYDE	0.01815	0.05709	0.01583	0.11991	0.01507	0.02323	0.08076	0.01989	0.02891	0.10988	0.01749	0.01848	0.03471	0.04076	0.03191	0.01716	0.02254
VINYLCHLORIDE	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
BROMOMETHANE	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
ETHANOL *	**0.00339**	**0.00203**	**0.00482**	**0.00148**	**0.00138**	**0.00145**	**0.00309**	**0.00338**	**0.00287**	**0.00252**	**0.00214**	**0.00224**	**0.00360**	**0.00413**	**0.00371**	0.00027	**0.00147**
CHLOROETHANE	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
ACETONITRILE	0.00373	0.00373	0.00373	0.00373	0.00373	0.00373	0.00373	0.00373	0.00373	0.00373	0.00373	0.00373	0.00373	0.00373	0.00373	0.00373	0.00373
PROPENAL	ND	0.66017	ND	1.23437	ND	ND	0.83552	ND	0.30945	ND	ND	ND	ND	ND	ND	ND	ND
ACETONE	0.00343	0.00367	0.00334	0.00861	0.00242	0.00308	0.00402	0.00412	0.00362	0.00348	0.00320	0.00343	0.00612	0.00706	0.00618	0.00491	0.00498
PROPANAL	0.00227	0.00595	0.00227	0.02150	0.00227	0.00227	0.00942	0.00227	0.00227	0.00227	0.00227	0.00227	0.00227	0.00227	0.00227	0.00227	0.00227
ISOPROPANOL *	0.00082	0.00075	0.00077	0.00083	0.00068	0.00075	0.00094	0.00105	0.00117	0.00110	0.00112	0.00106	0.00127	0.00138	0.00107	**0.00967**	0.00084
FREON11	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00003	ND
FURAN	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
ACRYLONITRILE	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00893	ND	ND	ND
PENTANE	ND	ND	ND	ND	ND	ND	ND	0.00278	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-METHYL-2-PROPANOL	ND	ND	ND	0.00021	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00021	ND	0.00045	ND
METHYLACETATE	0.00021	0.00021	0.00021	ND	ND	ND	ND	0.00021	ND	0.00021	0.00021	0.00021	0.00021	0.00021	0.00021	0.00021	0.00021
1,1-DICHLOROETHENE	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
DICHLOROMETHANE	0.00250	0.00250	0.00250	0.00250	0.00250	0.00250	0.00250	0.00250	0.00250	0.00250	0.00250	0.00250	0.00250	0.00250	0.00250	0.00250	0.00250
3-CHLOROPROPENE	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
FREON113	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
N-PROPANOL	0.00026	0.00026	0.00026	0.00026	0.00026	0.00026	0.00026	0.00026	0.00026	0.00026	0.00026	0.00026	0.00085	0.00094	0.00074	0.00026	0.00026
1,1-DICHLOROETHANE	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
BUTANAL	0.00192	0.00192	0.00192	0.01122	0.00192	0.00192	0.00471	0.00192	0.00192	0.00192	0.00192	ND	0.00192	0.00192	0.00192	0.00192	ND
2-BUTANONE	0.00083	0.00083	0.00083	0.00513	0.00083	0.00083	0.00083	0.00083	0.00083	0.00083	0.00083	0.00083	0.00083	0.00083	0.00083	0.01221	0.00083
CIS-1,2-DICHLOROETHENE	ND	ND	0.00063	0.00063	0.00063	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-METHYLFURAN	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.19231	0.19231	0.19231	ND	ND
ETHYLACETATE	0.00030	0.00014	0.00033	0.00047	0.00055	0.00067	0.00014	0.00014	0.00014	0.00049	0.00014	0.00014	0.00014	0.00014	0.00014	0.00030	0.00014
HEXANE	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00227	ND	ND	ND	ND	ND	0.00652	ND
CHLOROFORM	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-BUTENAL	ND	0.01471	ND	0.01471	ND	ND	0.01471	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-DICHLOROETHANE	0.01563	0.01563	0.01563	0.01563	0.01563	0.01563	0.01563	0.01563	0.01563	0.01563	0.01563	0.01563	0.01563	0.01563	0.01563	ND	0.01563
1,1,1-TRICHLOROETHANE	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
N-BUTANOL	0.00167	0.00155	0.00182	0.00196	0.00167	0.00200	0.00172	0.00202	0.00231	0.00217	0.00237	0.00264	0.00364	0.00437	0.00384	0.00590	0.00158
BENZENE	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.12500	ND
CARBONTETRACHLORIDE	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-PENTANONE	ND	ND	ND	0.00109	ND	ND	0.00036	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-METHYLHEXANE	0.00208	ND	0.00208	ND	ND	ND	ND	ND	ND	0.00208	ND	ND	0.00208	0.00208	0.00208	0.00208	ND
2,3-DIMETHYLPENTANE	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00208	ND	ND	0.00208	0.00208	0.00208	0.00208	ND
PENTANAL	0.00156	0.00156	ND	0.00903	ND	0.00156	0.00156	0.00156	0.00156	0.00156	0.00156	ND	0.00156	0.00156	0.00156	0.00156	ND
3-METHYLHEXANE	0.00208	0.00208	0.00208	ND	ND	ND	ND	ND	ND	0.00208	ND	ND	0.00208	0.00208	0.00208	0.00208	ND
1,2-DICHLOROPROPANE	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,4-DIOXANE	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
TRICHLOROETHENE	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2,5-DIMETHYLFURAN	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
N-HEPTANE	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00208	ND	ND	ND	ND	ND	0.00208	ND
4-METHYL2-PENTANONE	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00018	ND
CIS-1,3-DICHLOROPROPENE	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-PENTENAL	ND	ND	ND	0.01190	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
TRANS-1,3-DICHLOROPROPENE	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,2-TRICHLOROETHANE	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
TOLUENE	0.00167	0.00167	0.00167	0.00167	0.00167	0.00167	0.00167	0.00167	0.00167	0.00167	0.00167	0.00167	0.00167	0.00167	0.00167	0.03499	0.00167
HEXANAL	0.00139	0.00139	ND	0.00774	0.00139	0.00139	0.00139	0.00139	0.00139	0.00139	0.00139	0.00139	0.00139	0.00139	0.00139	0.00139	ND
MESITYLOXIDE	ND	ND	ND	0.00063	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-DIBROMOETHANE	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
BUTYLACETATE	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00013	0.00013	0.00013	0.00013	0.00013	0.00013	0.00013	ND
TETRACHLOROETHENE	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
CHLOROBENZENE	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00054	0.00054	0.00054	ND	ND
ETHYLBENZENE	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00050	ND
M/P-XYLENES	0.00068	0.00068	0.00068	0.00068	0.00068	0.00068	0.00068	0.00068	0.00068	0.00068	0.00068	0.00068	0.00068	0.00068	0.00068	0.00068	ND
2-HEPTANONE	ND	ND	ND	0.00383	ND	ND	0.00109	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
CYCLOHEXANONE	0.00042	0.00042	0.00042	0.00107	0.00042	0.00042	0.00042	0.00042	0.00096	0.00042	0.00101	0.00092	0.00100	0.00106	0.00042	0.00042	0.00042
HEPTANAL	0.00119	0.00119	ND	0.00499	ND	0.00119	0.00119	0.00119	0.00119	0.00119	0.00119	ND	0.00119	0.00119	ND	0.00119	ND
STYRENE	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,2,2-TETRACHLOROETHANE	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
O-XYLENE	0.00068	0.00068	0.00068	0.00068	0.00068	0.00068	0.00068	0.00068	0.00068	0.00185	0.00176	0.00189	0.00200	0.00228	0.00206	0.00068	0.00068
1,3,5-TRIMETHYLBENZENE	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2,4-TRIMETHYLBENZENE	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,3-DICHLOROBENZENE	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,4-DICHLOROBENZENE	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00083	0.00083	ND	0.00083
1,2-DICHLOROBENZENE	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2,4-TRICHLOROBENZENE	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
HEXACHLORO-1,3-BUTADIENE	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
TARGET COMPOUNDS (TOXIC)																	
1,3-BUTADIENE	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
ETHYLENE OXIDE	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
CARBON DISULFIDE	ND	ND	ND	0.00156	0.00156	0.00156	0.00156	0.00156	0.00156	0.00156	ND	ND	0.00156	0.00156	0.00156	0.00156	ND
2-METHYL-2-PROPENAL	0.01471	0.01471	0.01471	0.01471	ND	0.01471	0.01471	ND	0.01471	0.01471	ND	ND	0.01471	0.01471	0.01471	0.01471	ND
3-BUTEN-2-ONE	ND	0.05814	ND	0.05814	ND	ND	0.05814	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-ETHOXYETHANOL	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
DIMETHYLDISULFIDE	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
OCTAMETHYLCYCLOTETRASILOXANE	##	##	##	##	##	##	##	##	##	##	##	##	##	##	##	##	##
NON-TARGET COMPOUNDS																	
OCTAFLUOROPROPANE	0.00385	0.00346	0.00378	0.00341	0.00385	0.00404	0.00414	0.00543	0.00617	0.00461	0.00611	0.00590	0.00552	0.00625	0.00658	0.00050	0.00588
SULFURHEXAFLUORIDE	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00002	ND	ND
UNIDENTIFIEDFLUORINATEDHYDROCARBON	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00025	0.00029	0.00030	ND	ND	ND	0.00179	ND
PROPENE	0.00003	0.00003	0.00003	0.00003	0.00003	0.00003	0.00003	0.00003	0.00003	0.00003	0.00003	0.00003	0.00003	0.00003	0.00003	0.00013	0.00003
CARBONYLSULFIDE	0.00208	0.00208	0.00208	0.00208	0.00208	0.00208	0.00208	0.00208	0.00208	0.00208	0.00208	0.00208	0.00208	0.00208	0.00208	0.00208	0.00208
PROPANE	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00003	ND	ND	ND	ND	ND	0.00003	ND
ISOBUTANE +	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**0.01522**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**
BUTANE	ND	ND	ND	0.00417	ND	ND	ND	ND	ND	0.56387	ND	ND	ND	ND	ND	0.00417	ND
1,1-DICHLORO-1-FLUOROETHANE	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00126	ND
2-METHYL-1,3-BUTADIENE(ISOPRENE)	0.04127	0.02704	0.03492	0.01807	0.01926	0.02166	0.01687	0.01814	0.01812	0.00833	0.01727	0.02001	0.03956	0.04667	0.04153	0.00833	0.02267
TRIMETHYLSILANOL	0.04853	0.05250	0.04224	0.05702	0.04784	0.04852	0.04319	0.05210	0.07175	0.05272	0.06688	0.05100	0.07734	0.08497	0.05919	0.99206	0.03513
1,3-DIOXOLANE	0.00179	0.00069	0.00172	0.00154	0.00195	0.00179	0.00144	0.00186	0.00199	0.01087	0.00326	0.00252	0.00313	0.00339	0.00269	0.00069	0.00069
C6-KETONE	0.00125	0.00125	ND	0.01313	ND	0.00125	0.00125	ND	0.00125	0.00125	ND	ND	0.00125	0.00125	ND	0.00125	ND
PENTAMETHYLDISILOXANE-1-OL	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00179	ND
HEXAMETHYLCYCLOTRISILOXANE	##	##	##	##	##	##	##	##	##	##	##	##	##	##	##	##	##
C9-ALKENE	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-BUTOXYETHANOL**	**0.00799**	**0.00715**	**0.00823**	**0.00900**	**0.00864**	**0.00738**	**0.00517**	**0.00421**	**0.00495**	**0.00456**	**0.00377**	**0.00310**	**0.00368**	**0.00384**	**0.00318**	**0.00323**	**0.00359**
C8-KETONE	0.00096	0.00096	ND	0.01523	ND	0.00096	0.00096	ND	0.00096	ND	ND	ND	0.00096	ND	ND	ND	ND
C8-KETONE	ND	ND	ND	0.00096	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
BENZALDEHYDE	0.00015	0.00015	0.00015	0.00015	0.00015	0.00033	0.00015	0.00015	0.00015	0.00015	0.00015	0.00015	0.00015	0.00015	0.00015	0.00015	0.00015
C8-ALCOHOL	0.00915	0.00292	0.00864	0.01148	0.00877	0.00610	0.00047	0.00631	0.00585	0.00502	0.00841	0.00839	0.00924	0.01094	0.00682	0.00728	0.00851
C8-ALCOHOL	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00047	ND	ND	ND	ND	ND	0.00047	ND
LIMONENE	0.00077	0.00022	0.00095	0.00051	0.00105	0.00112	0.00022	0.00103	0.00116	0.00022	0.00044	0.00046	0.00053	0.00049	0.00053	ND	0.00022

C9-KETONE	ND	ND	ND	0.00410	ND	ND	0.00086	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
C10-KETONE	ND	ND	ND	0.00078	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
DECAMETHYLCYCLOPENTASILOXANE	##	##	##	##	##	##	##	##	##	##	##	##	##	##	##	##	##

TARGET COMPOUNDS (GC)																	
CARBON MONOXIDE	0.00842	0.00842	0.00842	0.00842	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00842	0.00000	0.00000	0.00842	0.00842	0.00842	0.00842
METHANE	0.00023	0.00023	0.00023	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00023	0.00023	0.00023	0.00023	0.00468
HYDROGEN	0.00577	0.00645	0.00613	0.00556	0.00628	0.00619	0.00638	0.00657	0.00663	0.00934	0.00925	0.00942	0.00770	0.00779	0.00764	0.00000	0.00813
CARBON DIOXIDE	0.60089	0.57005	0.65437	0.50229	0.52791	0.50679	0.76130	0.68140	0.72538	0.64960	0.68768	0.74381	0.63055	0.64281	0.74273	0.11794	0.55806

TOTAL T-VALUE	**0.81682**	**1.54166**	**0.85118**	**2.22102**	**0.68586**	**0.69525**	**1.90793**	**0.85156**	**1.24914**	**1.51318**	**0.87953**	**0.90994**	**1.08839**	**1.14507**	**1.18347**	**1.41389**	**0.72674**

*** FROM GC/FID ANALYSIS**
****BLANK CORRECTED**
+ CORRECTED FOR ACETALDEHYDE
Present, subject to large, random variability, therefore not quantifiable
& POSSIBLE LEAK
ND : Value is less than the laboratory report detection limit.
Note: Number of decimal places in T-Values do not represent significant figures of measurements.