STS 120 Return Samples: Assessment of Air Quality aboard the Shuttle (STS-120) and International Space Station (10A)

The toxicological assessments of 2 grab sample canisters (GSCs) from the Shuttle are reported in Table 1. Formaldehyde badges were not used. 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 111, 82, and 78%, respectively. 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)	T Value[b] (units)	Alcohols (mg/m^3)	Formaldehyde (µg/m^3)
Flight deck (preflight)	10/23/07	0.3	0.03	0.2	--
Middeck (end mission)	11/07/07	3.4	0.27	0.8	--

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

The toxicological assessment of 7 GSCs from the ISS is shown in Table 2. Formaldehyde badges were not returned. The recoveries of the 3 standards (as listed above) from the GSCs averaged 100, 95 and 97%, respectively.

Table 2. Analytical Summary of ISS Results

Module/Sample	Approx. Date	NMVOCs[a] (mg/m^3)	T Value[b] (units)	Alcohols (mg/m^3)	Formaldehyde (µg/m^3)
Lab	9/04/07	4.1	0.57	3.0	--
FGB	9/04/07	5.5	0.78	3.7	--
SM	9/04/07	4.3	0.61	3.1	--
ANITA	10/10/07	7.7	0.98	4.8	--
FGB	10/10/07	5.8	0.68	4.4	--
SM (CM)	10/10/07	5.3	0.55	4.4	--
Node 2 First entry	10/27/07	10	1.07	5.7	--
Guideline		*<25*	*<1.0*	*<5*	*<120*

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

Based on these limited samples, the ISS atmosphere is acceptable for human respiration. The alcohol levels were well controlled throughout the period of sampling. As expected, the first entry sample into Node 2 was somewhat higher in pollutants than the nominal samples taken from standard modules.

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Enclosures
Table 1A: Analytical concentrations of compounds found in the STS-120 GSCs
Table 1B: Analytical concentrations of compounds found in 10A 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-120 RETURN GRAB SAMPLE CONTAINER AIR SAMPLES

CHEMICAL CONTAMINANT	CONCENTRATION (mg/m3)	
	AA04405 Mid-Deck SN 1091 11/07/07 @ 10:15 GMT	AA04407 Preflight SN 1098 10/23/07 @ 06:12 EDT
TARGET COMPOUNDS (TO-14/POLAR)* **		
FREON12	<0.025	<0.025
CHLOROMETHANE	TRACE	<0.025
FREON114	<0.025	<0.025
METHANOL	0.12	0.034
ACETALDEHYDE	0.24	0.090
VINYLCHLORIDE	<0.025	<0.025
BROMOMETHANE	<0.025	<0.025
ETHANOL	0.41	0.072
CHLOROETHANE	<0.025	<0.025
ACETONITRILE	TRACE	TRACE
PROPENAL	TRACE	<0.025
ACETONE	0.21	0.036
PROPANAL	0.054	TRACE
ISOPROPANOL	TRACE	TRACE
FREON11	<0.025	<0.025
FURAN	<0.025	<0.025
ACRYLONITRILE	<0.025	<0.025
PENTANE	<0.025	<0.025
2-METHYL-2-PROPANOL	<0.025	<0.025
METHYLACETATE	<0.025	<0.025
1,1-DICHLOROETHENE	<0.025	<0.025
DICHLOROMETHANE	TRACE	<0.025
3-CHLOROPROPENE	<0.025	<0.025
FREON113	<0.025	<0.025
N-PROPANOL	TRACE	<0.025
1,1-DICHLOROETHANE	<0.025	<0.025
BUTANAL	0.028	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	<0.025	<0.025
1,2-DICHLOROETHANE	<0.025	<0.025
1,1,1-TRICHLOROETHANE	<0.025	<0.025
N-BUTANOL	TRACE	<0.025
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	TRACE	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	TRACE	TRACE
MESITYLOXIDE	<0.025	<0.025
1,2-DIBROMOETHANE	<0.025	<0.025
BUTYLACETATE	<0.025	<0.025
OCTANE	<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	<0.025	<0.025
CYCLOHEXANONE	<0.025	<0.025
HEPTANAL	TRACE	<0.025
STYRENE	<0.025	<0.025
1,1,2,2-TETRACHLOROETHANE	<0.025	<0.025
O-XYLENE	<0.025	<0.025
NONANE	<0.025	<0.025
1,3,5-TRIMETHYLBENZENE	<0.025	<0.025
1,2,4-TRIMETHYLBENZENE	<0.025	<0.025
DECANE	<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		
SULFURHEXAFLUORIDE	0.054	<0.025
OCTAFLUOROPROPANE	**	**
BROMOTRIFLUOROMETHANE	1.3	<0.025
FORMALDEHYDE	*	*
HEXAMETHYLCYCLOTRISILOXANE	*	*
C12-ALKANE	0.83	<0.025
DECAMETHYLCYCLOPENTASILOXANE	*	*

TOTAL ALCOHOLS PLUS ACETONE	**0.78**	**0.15**

TARGET COMPOUNDS (GC)***		
CARBON MONOXIDE	TRACE	<0.57
METHANE	31	<1.4
HYDROGEN	12	<0.74
CARBON DIOXIDE	4900	TRACE

TOTAL CONCENTRATION (NON-METHANE HYDROCARBONS)	**3.4**	**0.32**

***Present, subject to large, random variability, therefore not quantifiable**
**** Present but not quantified**
< : 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
10A RETURN GRAB SAMPLE CONTAINER AIR SAMPLES

CHEMICAL CONTAMINANT	CONCENTRATION (mg/m3)						
	AA04398 S/N 1073 LAB 09/04/07 @ 12:00 GMT	AA04399 S/N 1084 FGB 09/04/07 @ 12:05 GMT	AA04400 S/N 1082 SM 09/04/07 @ 12:08 GMT	AA04401 S/N 1090 LAB-ANITA! 10/10/07 @ 20:18 GMT	AA04402 S/N 1085 FGB 10/10/07 @ 20:21 GMT	AA04403 S/N 1032 SM 10/10/07 @ 20:24 GMT	AA04404 S/N 1006 NODE 2 10/27/07 @ 12:30 GMT
TARGET COMPOUNDS (TO-14/POLAR)* **							
FREON12	TRACE	TRACE	TRACE	TRACE	TRACE	TRACE	<0.025
CHLOROMETHANE	TRACE	TRACE	TRACE	TRACE	TRACE	TRACE	TRACE
FREON114	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	0.074
**METHANOL ** **	0.21	**0.86**	**0.47**	0.25	0.24	0.23	0.34
ACETALDEHYDE	0.073	0.31	0.11	0.51	0.28	0.093	0.20
VINYLCHLORIDE	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025
BROMOMETHANE	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025
ETHANOL *	**2.4**	**2.5**	**2.3**	**3.8**	**3.8**	**3.8**	**2.3**
CHLOROETHANE	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025
ACETONITRILE	TRACE	TRACE	TRACE	TRACE	TRACE	TRACE	TRACE
PROPENAL	TRACE	TRACE	TRACE	TRACE	TRACE	TRACE	TRACE
ACETONE	0.16	0.24	0.18	0.51	0.23	0.17	0.51
PROPANAL	TRACE	0.099	TRACE	0.23	0.074	TRACE	0.090
ISOPROPANOL *	0.064	0.065	0.058	0.13	0.081	0.079	**1.4**
FREON11	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	0.026
FURAN	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025
ACRYLONITRILE	TRACE	TRACE	TRACE	TRACE	TRACE	TRACE	TRACE
PENTANE	<0.025	<0.025	<0.025	TRACE	<0.025	<0.025	TRACE
2-METHYL-2-PROPANOL	TRACE	TRACE	TRACE	TRACE	TRACE	<0.025	TRACE
METHYLACETATE	TRACE	TRACE	TRACE	TRACE	TRACE	<0.025	TRACE
1,1-DICHLOROETHENE	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025
DICHLOROMETHANE	TRACE	TRACE	TRACE	0.025	0.025	TRACE	TRACE
3-CHLOROPROPENE	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025
FREON113	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025
N-PROPANOL	0.073	0.033	0.026	0.084	0.034	0.032	0.30
1,1-DICHLOROETHANE	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025
BUTANAL	TRACE	0.064	TRACE	0.16	0.057	TRACE	TRACE
2-BUTANONE	TRACE	0.037	TRACE	0.15	0.032	TRACE	0.92
CIS-1,2-DICHLOROETHENE	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025
2-METHYLFURAN	<0.025	<0.025	<0.025	TRACE	<0.025	<0.025	<0.025
ETHYLACETATE	0.031	0.032	0.032	TRACE	TRACE	TRACE	TRACE
HEXANE	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	TRACE
CHLOROFORM	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025
2-BUTENAL	TRACE	TRACE	TRACE	TRACE	TRACE	<0.025	<0.025
1,2-DICHLOROETHANE	TRACE	TRACE	TRACE	TRACE	TRACE	TRACE	0.12
1,1,1-TRICHLOROETHANE	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025
N-BUTANOL	0.081	0.080	0.076	0.11	0.078	0.082	0.82
BENZENE	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	TRACE
CARBONTETRACHLORIDE	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025
2-PENTANONE	<0.025	TRACE	TRACE	0.072	TRACE	<0.025	TRACE
2-METHYLHEXANE	TRACE	TRACE	TRACE	<0.025	<0.025	<0.025	<0.025
2,3-DIMETHYLPENTANE	TRACE	TRACE	TRACE	<0.025	<0.025	<0.025	<0.025
PENTANAL	TRACE	0.040	TRACE	0.13	0.033	TRACE	TRACE
3-METHYLHEXANE	TRACE	TRACE	TRACE	TRACE	TRACE	TRACE	<0.025
1,2-DICHLOROPROPANE	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025
1,4-DIOXANE	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025
TRICHLOROETHENE	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025
2,5-DIMETHYLFURAN	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025
N-HEPTANE	TRACE	TRACE	TRACE	TRACE	<0.025	<0.025	<0.025
4-METHYL2-PENTANONE	<0.025	<0.025	<0.025	TRACE	<0.025	<0.025	TRACE
CIS-1,3-DICHLOROPROPENE	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025
2-PENTENAL	TRACE	TRACE	TRACE	TRACE	TRACE	<0.025	TRACE

TRANS-1,3-DICHLOROPROPENE	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025
1,1,2-TRICHLOROETHANE	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025
TOLUENE	0.026	0.026	0.025	0.031	0.030	0.031	0.14
HEXANAL	TRACE	0.030	TRACE	0.11	TRACE	TRACE	TRACE
MESITYLOXIDE	<0.025	<0.025	<0.025	TRACE	<0.025	<0.025	<0.025
1,2-DIBROMOETHANE	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025
BUTYLACETATE	TRACE	TRACE	TRACE	TRACE	TRACE	TRACE	0.031
OCTANE	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025
TETRACHLOROETHENE	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025
CHLOROBENZENE	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025
ETHYLBENZENE	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	0.026
M/P-XYLENES	TRACE	TRACE	TRACE	TRACE	TRACE	TRACE	0.10
2-HEPTANONE	<0.025	TRACE	<0.025	0.042	<0.025	<0.025	TRACE
CYCLOHEXANONE	0.037	0.042	0.038	0.047	0.033	0.029	0.28
HEPTANAL	<0.025	TRACE	TRACE	0.077	TRACE	<0.025	TRACE
STYRENE	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025
1,1,2,2-TETRACHLOROETHANE	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025
O-XYLENE	0.060	0.063	0.060	0.039	0.038	0.036	0.029
NONANE	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025
1,3,5-TRIMETHYLBENZENE	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025
1,2,4-TRIMETHYLBENZENE	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	TRACE
DECANE	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	TRACE
1,3-DICHLOROBENZENE	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025
1,4-DICHLOROBENZENE	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025
1,2-DICHLOROBENZENE	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025
1,2,4-TRICHLOROBENZENE	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025
HEXACHLORO-1,3-BUTADIENE	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025

TARGET COMPOUNDS (TOXIC)							
1,3-BUTADIENE	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025
ETHYLENE OXIDE	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025
CARBON DISULFIDE	TRACE	TRACE	<0.025	<0.025	<0.025	<0.025	0.038
2-METHYL-2-PROPENAL	<0.025	<0.025	<0.025	TRACE	<0.025	<0.025	TRACE
3-BUTEN-2-ONE	<0.025	TRACE	<0.025	TRACE	TRACE	<0.025	TRACE
2-ETHOXYETHANOL	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025
DIMETHYLDISULFIDE	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025
OCTAMETHYLCYCLOTETRASILOXANE	##	##	##	##	##	##	##

NON-TARGET COMPOUNDS							
OCTAFLUOROPROPANE	#	#	#	#	#	#	#
SULFURHEXAFLUORIDE	0.076	0.075	0.079	0.076	0.073	0.085	TRACE
PROPENE	TRACE	TRACE	TRACE	0.033	TRACE	TRACE	TRACE
CARBONYLSULFIDE	TRACE	TRACE	TRACE	TRACE	TRACE	TRACE	0.16
1-BUTENE	TRACE	TRACE	TRACE	TRACE	TRACE	TRACE	0.038
FLUOROTRIMETHYLSILANE	TRACE	TRACE	TRACE	TRACE	TRACE	TRACE	0.070
2-METHYL-1,3-BUTADIENE	0.050	0.048	0.046	0.041	0.044	0.043	TRACE
TRIMETHYLSILANOL	0.17	0.16	0.15	0.15	0.14	0.14	1.3
1,3-DIOXOLANE	0.094	0.070	0.071	0.085	0.066	0.073	TRACE
CARBONICACID, DIMETHYLESTER	TRACE	TRACE	TRACE	TRACE	TRACE	TRACE	0.027
1,2-DIMETHOXYETHANE	0.038	0.032	0.028	0.037	0.027	TRACE	TRACE
1-PENTANOL	<0.025	<0.025	<0.025	TRACE	<0.025	<0.025	<0.025
3-METHYLPENTANAL	<0.025	TRACE	<0.025	0.031	<0.025	<0.025	<0.025
2-HEXANONE	<0.025	TRACE	<0.025	0.062	TRACE	<0.025	TRACE
HEXAMETHYLCYCLOTRISILOXANE	##	##	##	##	##	##	##
C8-KETONE	<0.025	TRACE	TRACE	0.18	TRACE	<0.025	TRACE
BENZALDEHYDE	TRACE	0.15	0.050	0.069	0.092	TRACE	TRACE
C9-KETONE	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	0.22
OCTANAL	TRACE	0.038	TRACE	0.082	TRACE	TRACE	TRACE
LIMONENE	0.081	0.073	0.078	0.031	0.026	0.028	TRACE
DECAMETHYLCYCLOPENTASILOXANE	##	##	##	##	##	##	##

TOTAL ALCOHOLS PLUS ACETONE	**3.0**	**3.7**	**3.1**	**4.8**	**4.4**	**4.4**	**5.7**

TARGET COMPOUNDS (GC)* **							
CARBON MONOXIDE	<0.57	<0.57	<0.57	<0.57	<0.57	<0.57	<0.57

METHANE	TRACE	TRACE	TRACE	TRACE	TRACE	TRACE	TRACE
HYDROGEN	2.1	TRACE	2.2	<0.74	<0.74	<0.74	<0.74
CARBON DIOXIDE	4800	4800	5000	6300	7100	6500	3200

TOTAL CONCENTRATION (NON-METHANE HYDROCARBONS)	**4.1**	**5.5**	**4.3**	**7.7**	**5.8**	**5.3**	**10**

! GSC LAB sample was taken near the ANITA instrument
*** FROM GC/FID RESULTS**
*****FROM GC/FID RESULTS; MeOH Conc.=GC MeOH Conc.-(2* GC/MS ACETALDEHYDE Conc.)***
 # Present, but not quantitated
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 2
ANALYTICAL RESULTS OF
STS-120 RETURN GRAB SAMPLE CONTAINER AIR SAMPLES

CHEMICAL CONTAMINANT	T-VALUE (7-d SMAC)	
	AA04405 Mid-Deck SN 1091 11/07/07 @ 10:15 GMT	AA04407 Preflight SN 1098 10/23/07 @ 06:12 EDT
TARGET COMPOUNDS (TO-14/POLAR)		
FREON12	ND	ND
CHLOROMETHANE	0.00030	ND
FREON114	ND	ND
METHANOL	0.01316	0.00376
ACETALDEHYDE	0.05992	0.02253
VINYLCHLORIDE	ND	ND
BROMOMETHANE	ND	ND
ETHANOL	0.00021	0.00004
CHLOROETHANE	ND	ND
ACETONITRILE	0.00187	0.00187
PROPENAL	0.10468	ND
ACETONE	0.00408	0.00069
PROPANAL	0.00376	0.00087
ISOPROPANOL	0.00008	0.00008
FREON11	ND	ND
FURAN	ND	ND
ACRYLONITRILE	ND	ND
PENTANE	ND	ND
2-METHYL-2-PROPANOL	ND	ND
METHYLACETATE	ND	ND
1,1-DICHLOROETHENE	ND	ND
DICHLOROMETHANE	0.00025	ND
3-CHLOROPROPENE	ND	ND
FREON113	ND	ND
N-PROPANOL	0.00013	ND
1,1-DICHLOROETHANE	ND	ND
BUTANAL	0.00160	0.00071
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	ND	ND
1,2-DICHLOROETHANE	ND	ND
1,1,1-TRICHLOROETHANE	ND	ND
N-BUTANOL	0.00016	ND
BENZENE	ND	ND
CARBONTETRACHLORIDE	ND	ND
2-PENTANONE	0.00018	ND
2-METHYLHEXANE	ND	ND
2,3-DIMETHYLPENTANE	ND	ND
PENTANAL	0.00059	0.00059
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	0.00051	0.00051
MESITYLOXIDE	ND	ND
1,2-DIBROMOETHANE	ND	ND
BUTYLACETATE	ND	ND
OCTANE	ND	ND
TETRACHLOROETHENE	ND	ND
CHLOROBENZENE	ND	ND
ETHYLBENZENE	ND	ND
M/P-XYLENES	ND	ND
2-HEPTANONE	ND	ND
CYCLOHEXANONE	ND	ND
HEPTANAL	0.00045	ND
STYRENE	ND	ND
1,1,2,2-TETRACHLOROETHANE	ND	ND
O-XYLENE	ND	ND
NONANE	ND	ND
1,3,5-TRIMETHYLBENZENE	ND	ND
1,2,4-TRIMETHYLBENZENE	ND	ND
DECANE	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		
SULFURHEXAFLUORIDE	0.00005	ND
OCTAFLUOROPROPANE	**	**
BROMOTRIFLUOROMETHANE	0.00011	ND
FORMALDEHYDE	*	*
HEXAMETHYLCYCLOTRISILOXANE	*	*
C12-ALKANE	0.00596	ND
DECAMETHYLCYCLOPENTASILOXANE	*	*

TARGET COMPOUNDS (GC)		
CARBON MONOXIDE	0.02603	0.00000
METHANE	0.00825	0.00000
HYDROGEN	0.03474	0.00000
CARBON DIOXIDE	0.37364	0.01538

TOTAL T-VALUE	**0.64110**	**0.04744**

***Present, but not included in total T-Value**
**** Present, but not quantified**
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
10A RETURN GRAB SAMPLE CONTAINER AIR SAMPLES

CHEMICAL CONTAMINANT	T-VALUE (180-d SMAC)						
	AA04398 S/N 1073 LAB 09/04/07 @ 12:00 GMT	AA04399 S/N 1084 FGB 09/04/07 @ 12:05 GMT	AA04400 S/N 1082 SM 09/04/07 @ 12:08 GMT	AA04401 S/N 1090 LAB-ANITA! 10/10/07 @ 20:18 GMT	AA04402 S/N 1085 FGB 10/10/07 @ 20:21 GMT	AA04403 S/N 1032 SM 10/10/07 @ 20:24 GMT	AA04404 S/N 1006 NODE 2 10/27/07 @ 12:30 GMT
TARGET COMPOUNDS (TO-14/POLAR)							
FREON12	0.00003	0.00003	0.00003	0.00003	0.00003	0.00003	ND
CHLOROMETHANE	0.00030	0.00030	0.00030	0.00030	0.00030	0.00030	0.00030
FREON114	ND	ND	ND	ND	ND	ND	0.00011
METHANOL **	0.02285	**0.09607**	**0.05240**	0.02770	0.02650	0.02565	0.03792
ACETALDEHYDE	0.01831	0.07700	0.02768	0.12671	0.06951	0.02316	0.05084
VINYLCHLORIDE	ND	ND	ND	ND	ND	ND	ND
BROMOMETHANE	ND	ND	ND	ND	ND	ND	ND
ETHANOL *	**0.00119**	**0.00123**	**0.00114**	**0.00189**	**0.00188**	**0.00192**	**0.00116**
CHLOROETHANE	ND	ND	ND	ND	ND	ND	ND
ACETONITRILE	0.00187	0.00187	0.00187	0.00187	0.00187	0.00187	0.00187
PROPENAL	0.41667	0.41667	0.41667	0.41667	0.41667	0.41667	0.41667
ACETONE	0.00315	0.00457	0.00340	0.00972	0.00440	0.00327	0.00971
PROPANAL	0.00347	0.02760	0.00347	0.06314	0.02063	0.00347	0.02513
ISOPROPANOL *	0.00043	0.00044	0.00039	0.00087	0.00054	0.00053	**0.00944**
FREON11	ND	ND	ND	ND	ND	ND	0.00003
FURAN	ND	ND	ND	ND	ND	ND	ND
ACRYLONITRILE	0.00446	0.00446	0.00446	0.00446	0.00446	0.00446	0.00446
PENTANE	ND	ND	ND	0.00002	ND	ND	0.00002
2-METHYL-2-PROPANOL	0.00010	0.00010	0.00010	0.00010	0.00010	ND	0.00010
METHYLACETATE	0.00010	0.00010	0.00010	0.00010	0.00010	ND	0.00010
1,1-DICHLOROETHENE	ND	ND	ND	ND	ND	ND	ND
DICHLOROMETHANE	0.00125	0.00125	0.00125	0.00253	0.00250	0.00125	0.00125
3-CHLOROPROPENE	ND	ND	ND	ND	ND	ND	ND
FREON113	ND	ND	ND	ND	ND	ND	ND
N-PROPANOL	0.00074	0.00034	0.00027	0.00085	0.00035	0.00033	0.00301
1,1-DICHLOROETHANE	ND	ND	ND	ND	ND	ND	ND
BUTANAL	0.00284	0.01462	0.00284	0.03655	0.01299	0.00284	0.00284
2-BUTANONE	0.00042	0.00124	0.00042	0.00507	0.00106	0.00042	0.03081
CIS-1,2-DICHLOROETHENE	ND	ND	ND	ND	ND	ND	ND
2-METHYLFURAN	ND	ND	ND	0.09615	ND	ND	ND
ETHYLACETATE	0.00017	0.00018	0.00018	0.00007	0.00007	0.00007	0.00007
HEXANE	ND	ND	ND	ND	ND	ND	0.00007
CHLOROFORM	ND	ND	ND	ND	ND	ND	ND
2-BUTENAL	0.00735	0.00735	0.00735	0.00735	0.00735	ND	ND
1,2-DICHLOROETHANE	0.01250	0.01250	0.01250	0.01250	0.01250	0.01250	0.12095
1,1,1-TRICHLOROETHANE	ND	ND	ND	ND	ND	ND	ND
N-BUTANOL	0.00201	0.00200	0.00190	0.00263	0.00194	0.00205	0.02048
BENZENE	ND	ND	ND	ND	ND	ND	0.06250
CARBONTETRACHLORIDE	ND	ND	ND	ND	ND	ND	ND
2-PENTANONE	ND	0.00018	0.00018	0.00104	0.00018	ND	0.00018
2-METHYLHEXANE	0.00043	0.00043	0.00043	ND	ND	ND	ND
2,3-DIMETHYLPENTANE	0.00006	0.00006	0.00006	ND	ND	ND	ND
PENTANAL	0.00236	0.00748	0.00236	0.02471	0.00627	0.00236	0.00236
3-METHYLHEXANE	0.00043	0.00043	0.00043	0.00043	0.00043	0.00043	ND
1,2-DICHLOROPROPANE	ND	ND	ND	ND	ND	ND	ND
1,4-DIOXANE	ND	ND	ND	ND	ND	ND	ND
TRICHLOROETHENE	ND	ND	ND	ND	ND	ND	ND
2,5-DIMETHYLFURAN	ND	ND	ND	ND	ND	ND	ND
N-HEPTANE	0.00006	0.00006	0.00006	0.00006	ND	ND	ND
4-METHYL2-PENTANONE	ND	ND	ND	0.00009	ND	ND	0.00009
CIS-1,3-DICHLOROPROPENE	ND	ND	ND	ND	ND	ND	ND
2-PENTENAL	0.00595	0.00595	0.00595	0.00595	0.00595	ND	0.00595
TRANS-1,3-DICHLOROPROPENE	ND	ND	ND	ND	ND	ND	ND
1,1,2-TRICHLOROETHANE	ND	ND	ND	ND	ND	ND	ND
TOLUENE	0.00043	0.00044	0.00042	0.00052	0.00051	0.00051	0.00241
HEXANAL	0.00205	0.00485	0.00205	0.01756	0.00205	0.00205	0.00205
MESITYLOXIDE	ND	ND	ND	0.00031	ND	ND	ND
1,2-DIBROMOETHANE	ND	ND	ND	ND	ND	ND	ND
BUTYLACETATE	0.00007	0.00007	0.00007	0.00007	0.00007	0.00007	0.00016

OCTANE	ND	ND	ND	ND	ND	ND	ND
TETRACHLOROETHENE	ND	ND	ND	ND	ND	ND	ND
CHLOROBENZENE	ND	ND	ND	ND	ND	ND	ND
ETHYLBENZENE	ND	ND	ND	ND	ND	ND	0.00052
M/P-XYLENES	0.00006	0.00006	0.00006	0.00006	0.00006	0.00006	0.00045
2-HEPTANONE	ND	0.00054	ND	0.00181	ND	ND	0.00054
CYCLOHEXANONE	0.00061	0.00070	0.00063	0.00078	0.00055	0.00049	0.00474
HEPTANAL	ND	0.00179	0.00179	0.01106	0.00179	ND	0.00179
STYRENE	ND	ND	ND	ND	ND	ND	ND
1,1,2,2-TETRACHLOROETHANE	ND	ND	ND	ND	ND	ND	ND
O-XYLENE	0.00027	0.00029	0.00027	0.00018	0.00017	0.00017	0.00013
NONANE	ND	ND	ND	ND	ND	ND	ND
1,3,5-TRIMETHYLBENZENE	ND	ND	ND	ND	ND	ND	ND
1,2,4-TRIMETHYLBENZENE	ND	ND	ND	ND	ND	ND	0.00083
DECANE	ND	ND	ND	ND	ND	ND	0.00005
1,3-DICHLOROBENZENE	ND	ND	ND	ND	ND	ND	ND
1,4-DICHLOROBENZENE	ND	ND	ND	ND	ND	ND	ND
1,2-DICHLOROBENZENE	ND	ND	ND	ND	ND	ND	ND
1,2,4-TRICHLOROBENZENE	ND	ND	ND	ND	ND	ND	ND
HEXACHLORO-1,3-BUTADIENE	ND	ND	ND	ND	ND	ND	ND

TARGET COMPOUNDS (TOXIC)							
1,3-BUTADIENE	ND	ND	ND	ND	ND	ND	ND
ETHYLENE OXIDE	ND	ND	ND	ND	ND	ND	ND
CARBON DISULFIDE	0.00078	0.00078	ND	ND	ND	ND	0.00237
2-METHYL-2-PROPENAL	ND	ND	ND	0.00735	ND	ND	0.00735
3-BUTEN-2-ONE	ND	0.02907	ND	0.02907	0.02907	ND	0.02907
2-ETHOXYETHANOL	ND	ND	ND	ND	ND	ND	ND
DIMETHYLDISULFIDE	ND	ND	ND	ND	ND	ND	ND
OCTAMETHYLCYCLOTETRASILOXANE	##	##	##	##	##	##	##

NON-TARGET COMPOUNDS							
OCTAFLUOROPROPANE	#	#	#	#	#	#	#
SULFURHEXAFLUORIDE	0.00006	0.00006	0.00007	0.00006	0.00006	0.00007	0.00001
PROPENE	0.00001	0.00001	0.00001	0.00004	0.00001	0.00001	0.00001
CARBONYLSULFIDE	0.00104	0.00104	0.00104	0.00104	0.00104	0.00104	0.01310
1-BUTENE	0.00003	0.00003	0.00003	0.00003	0.00003	0.00003	0.00008
FLUOROTRIMETHYLSILANE	0.02500	0.02500	0.02500	0.02500	0.02500	0.02500	0.13913
2-METHYL-1,3-BUTADIENE	0.01652	0.01595	0.01524	0.01357	0.01474	0.01446	0.00417
TRIMETHYLSILANOL	0.00471	0.00442	0.00412	0.00415	0.00370	0.00376	0.03436
1,3-DIOXOLANE	0.00261	0.00194	0.00197	0.00236	0.00184	0.00203	0.00035
CARBONICACID, DIMETHYLESTER	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00001
1,2-DIMETHOXYETHANE	0.00010	0.00009	0.00007	0.00010	0.00007	0.00003	0.00003
1-PENTANOL	ND	ND	ND	0.00010	ND	ND	ND
3-METHYLPENTANAL	ND	0.00205	ND	0.00503	ND	ND	ND
2-HEXANONE	ND	0.00030	ND	0.00152	0.00030	ND	0.00030
HEXAMETHYLCYCLOTRISILOXANE	##	##	##	##	##	##	##
C8-KETONE	ND	0.00048	0.00048	0.00700	0.00048	ND	0.00048
BENZALDEHYDE	0.00007	0.00088	0.00029	0.00040	0.00053	0.00007	0.00007
C9-KETONE	ND	ND	ND	ND	ND	ND	0.00775
OCTANAL	0.00158	0.00480	0.00158	0.01041	0.00158	0.00158	0.00158
LIMONENE	0.00014	0.00013	0.00014	0.00006	0.00005	0.00005	0.00002
DECAMETHYLCYCLOPENTASILOXANE	##	##	##	##	##	##	##

TARGET COMPOUNDS (GC)							
CARBON MONOXIDE	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
METHANE	0.00019	0.00019	0.00019	0.00019	0.00019	0.00019	0.00019
HYDROGEN	0.00616	0.00109	0.00643	0.00000	0.00000	0.00000	0.00000
CARBON DIOXIDE	0.36940	0.37074	0.38443	0.48643	0.54539	0.50137	0.24309

TOTAL T-VALUE	**0.94142**	**1.15231**	**0.99459**	**1.47583**	**1.22788**	**1.05663**	**1.30566**

! GSC LAB sample was taken near the ANITA instrument
*** FROM GC/FID RESULTS**
*****FROM GC/FID RESULTS; MeOH Conc.=GC MeOH Conc.-(2* GC/MS ACETALDEHYDE Conc.)***
 # Present, but not calculated
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.