



STS 134, 135 & 26S Return Samples: Air Quality aboard Shuttle (STS-134) and International Space Station

Space Shuttle: The toxicological assessments of 2 canisters (mini-GSC or GSC) from the STS-134 Shuttle are reported in Table 1. Analytical methods have not changed from earlier reports. The percent recoveries of the 3 surrogates (¹³C-acetone, fluorobenzene, and chlorobenzene) from the 2 Shuttle samples averaged 109, 101, and 88%, respectively. Based on the end-of-mission sample, the Shuttle atmosphere was acceptable for human respiration. Although samplers were available, no preflight or in-flight samples were obtained in association with STS-135.

Table 1. Analytical Summary of STS-134 Shuttle Samples (GSC in black and mini-GSC in blue)

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	5/16/11	0.2	0	0.02	0.12	---
Flight-deck (end of mission)	6/01/11	2.4	17 ^c	0.13	0.73	---

^a Non-methane volatile organic hydrocarbons, excluding Freon 218

^b Based on 7-day SMACs and calculated excluding CO₂, formaldehyde, and siloxanes

^c Freon 218 is residual from the ISS during docked phase.

International Space Station: The toxicological assessment of 13 mini-GSCs from the ISS is shown in Table 2, along with formaldehyde data from two kit returns. The recoveries of the 3 standards (as listed above) from the mini-GSCs averaged 106, 108 and 85%, respectively. Although recoveries were widely dispersed, the average recovery of formaldehyde from 6 controls was 94%.

Table 2. Analytical Summary of ISS Results (mini-GSC in blue)

Module/Sample	Date of Sample	NMVOCs ^a (mg/m ³)	Freon 218 (mg/m ³)	T Value ^b (units)	Alcohols (mg/m ³)	Formaldehyde ^c (μg/m ³)		
						Approx. Date	Lab	SM
Lab	6/21/11	7.6	40	0.36	5.5	9/18/10	29	21
SM	6/21/11	8.6	25	0.40	6.0	10/15/10	25	20
JPM	6/21/11	8.9	18	0.40	6.3	11/24/10 ^c	--	--
SM	7/05/11	7.9	29	0.37	5.5	12/22/10	42	22
Lab	7/05/11	6.1	56	0.31	4.4	1/15/11	40	27
Columbus	7/05/11	8.0	36	0.39	5.6	2/15/11	33	23
MPLM (first entry)	7/11/11	12	1	0.89	4.4	3/16/11	31	31
SM	8/1/11	7.8	20	0.33	6.3	4/14/11	27	27
Lab	8/1/11	6.1	21	0.33	4.8	5/5/11	34	24
JPM	8/1/11	5.7	17	0.33	4.4	6/2/11	29	27
SM	8/24/11	5.0	27	0.34	3.3	7/6/11	32	27
Columbus	8/24/11	5.2	26	0.35	3.6	8/2/11	26	26
Lab	8/24/11	5.4	15	0.35	3.7			
Guideline		<25	none	<1.0	<5	<120		

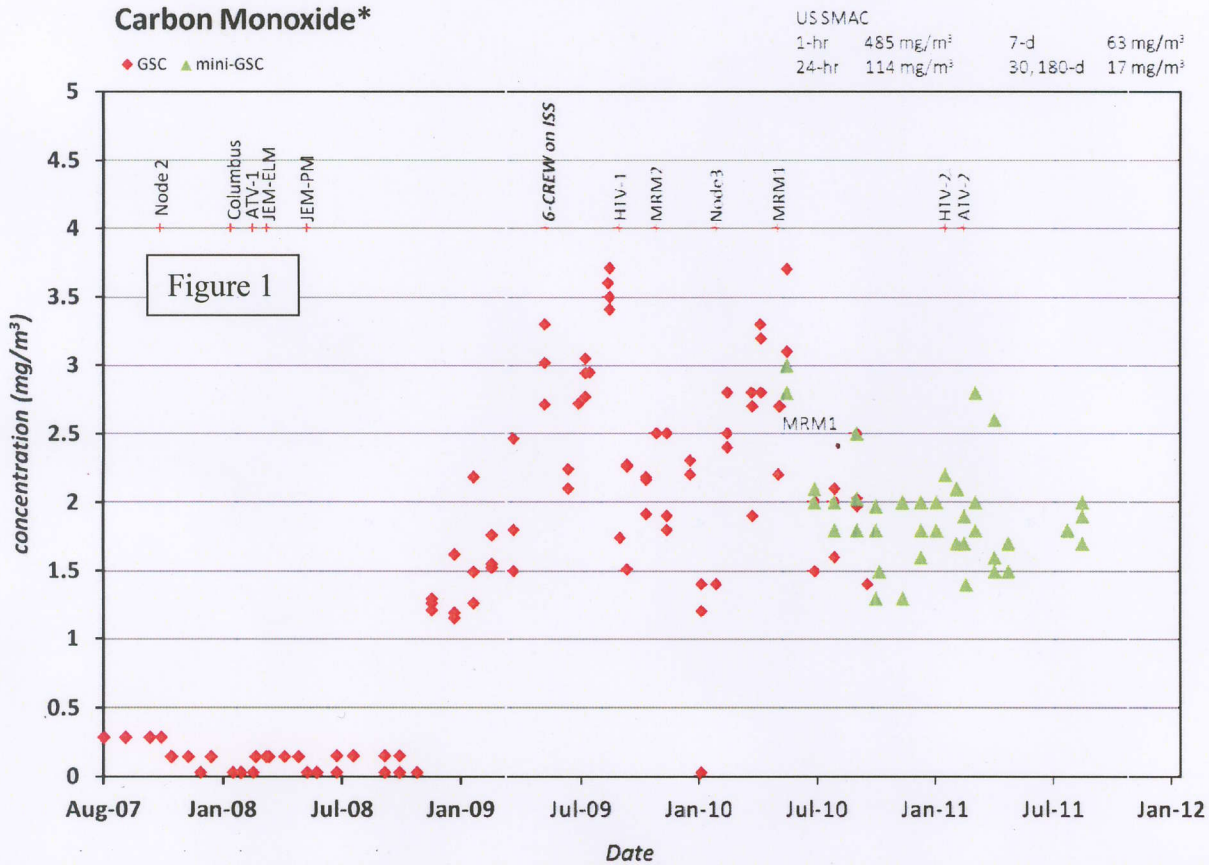
^a Non-methane volatile organic hydrocarbons, excluding Freon 218

^b Based on 180-d SMACs and calculated excluding CO₂ and formaldehyde. Siloxanes are now quantified in ISS samples.

^c Formaldehyde badges returned on STS-134 and 26S. November 2010 results not reported due to uncertain time of badge exposure.

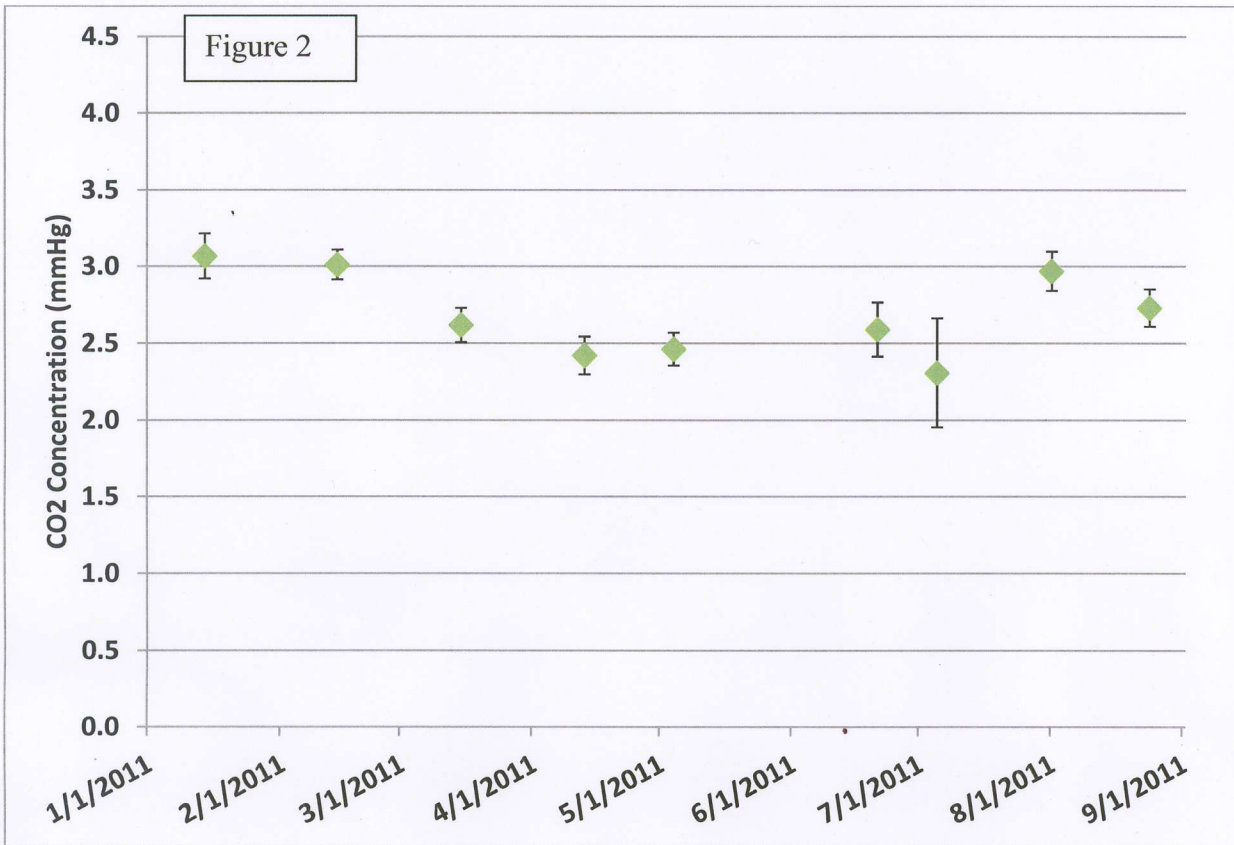
General Observations about ISS Air Quality:

This is a very limited set of samples on which to perform an air quality assessment. However, based on these samples, we have no reason to believe that nominal ISS air is unsafe to breathe. We must continue to be vigilant when dealing with nominal atmospheres in ISS. New, unmanned modules require special attention when the crew first enters.



Carbon Monoxide Accumulation aboard ISS: Beginning in late 2008 the nominal concentrations of CO began increasing gradually (Figure 1). The results from samples returned on this flight indicate that the CO concentrations, after dropping in late 2009, have cycled upward and then settled back to concentrations near 2 mg/m³. In any case, these changes are well below the 180-day SMAC for CO, which is 17 mg/m³. There is no threat to crew health.

Carbon Dioxide: This anthropogenic compound has drawn much attention recently because of the possibility that it could contribute to the effects of intracranial hypertension experienced because of spaceflight-induced fluid shifts. From now on we will maintain a plot (Figure 2) of carbon dioxide concentrations (±SD) by averaging the values found in the 3-5 mini-GSC samples taken each month in diverse locations of the ISS. This will enable us to estimate the average exposure of crewmembers to carbon dioxide during their stay aboard the ISS. In general, concentrations are being maintained below 3.5 mmHg.



[Handwritten Signature]
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Enclosures

- Table 1A: Analytical concentrations of compounds found in the STS-134 samples
- Table 1B: Analytical concentrations of compounds found in ULF7 samples
- Table 1C: Analytical concentrations of compounds found in 26S return samples
- Table 2A: T-values of the compounds in table 1A
- Table 2B: T-values of the compounds in table 1B
- Table 2C: T-values of the compounds in table 1C

TABLE 1C
ANALYTICAL RESULTS OF
STS-134 RETURN GRAB SAMPLE CONTAINER AIR SAMPLES

CHEMICAL CONTAMINANT	CONCENTRATION (mg/m3)	
	AA050851 PRE-FLIGHT SN 1100 05/16/11 @ 3:30 EDT	AA051462 FLIGHT-DECK SN 2034 06/01/11 @ 00:55 GMT
TARGET COMPOUNDS (TO-14/POLAR)		
FREON12	<0.025	<0.050
CHLOROMETHANE	<0.025	TRACE
FREON114	<0.025	<0.050
METHANOL	TRACE	0.15
ACETALDEHYDE	0.060	0.10
VINYLCHLORIDE	<0.025	<0.050
BROMOMETHANE	<0.025	<0.050
ETHANOL	0.056	0.34
CHLOROETHANE	<0.025	<0.050
ACETONITRILE	<0.025	<0.050
PROPENAL	<0.025	<0.050
ACETONE	0.034	0.14
PROPANAL	TRACE	<0.050
ISOPROPANOL	TRACE	0.10
FREON11	<0.025	<0.050
FURAN	<0.025	<0.050
ACRYLONITRILE	<0.025	<0.050
PENTANE	<0.025	<0.050
2-METHYL-2-PROPANOL	<0.025	<0.050
METHYLACETATE	<0.025	<0.050
1,1-DICHLOROETHENE	<0.025	<0.050
DICHLOROMETHANE	<0.025	<0.050
3-CHLOROPROPENE	<0.025	<0.050
FREON113	<0.025	<0.050
N-PROPANOL	<0.025	<0.050
1,1-DICHLOROETHANE	<0.025	<0.050
BUTANAL	TRACE	<0.050
2-BUTANONE	<0.025	<0.050
CIS-1,2-DICHLOROETHENE	<0.025	<0.050
2-METHYLFURAN	<0.025	<0.050
ETHYLACETATE	<0.025	<0.050
HEXANE	<0.025	<0.050
CHLOROFORM	<0.025	<0.050
2-BUTENAL	<0.025	<0.050
1,2-DICHLOROETHANE	<0.025	<0.050
1,1,1-TRICHLOROETHANE	<0.025	<0.050
N-BUTANOL	<0.025	<0.050
BENZENE	<0.025	<0.050
CARBONTETRACHLORIDE	<0.025	<0.050
2-PENTANONE	<0.025	<0.050
2-METHYLHEXANE	<0.025	<0.050
2,3-DIMETHYLPENTANE	<0.025	<0.050
PENTANAL	TRACE	<0.050

3-METHYLHEXANE	<0.025	<0.050
1,2-DICHLOROPROPANE	<0.025	<0.050
1,4-DIOXANE	<0.025	<0.050
TRICHLOROETHENE	<0.025	<0.050
2,5-DIMETHYLFURAN	<0.025	<0.050
N-HEPTANE	<0.025	<0.050
4-METHYL2-PENTANONE	<0.025	<0.050
CIS-1,3-DICHLOROPROPENE	<0.025	<0.050
2-PENTENAL	<0.025	<0.050
TRANS-1,3-DICHLOROPROPENE	<0.025	<0.050
1,1,2-TRICHLOROETHANE	<0.025	<0.050
TOLUENE	<0.025	<0.050
HEXANAL	<0.025	<0.050
MESITYLOXIDE	<0.025	<0.050
1,2-DIBROMOETHANE	<0.025	<0.050
BUTYLACETATE	<0.025	<0.050
OCTANE	<0.025	<0.050
TETRACHLOROETHENE	<0.025	<0.050
CHLOROBENZENE	<0.025	<0.050
ETHYLBENZENE	<0.025	<0.050
M/P-XYLENES	<0.025	<0.050
2-HEPTANONE	<0.025	<0.050
CYCLOHEXANONE	<0.025	<0.050
HEPTANAL	<0.025	<0.050
STYRENE	<0.025	<0.050
1,1,2,2-TETRACHLOROETHANE	<0.025	<0.050
O-XYLENE	<0.025	<0.050
NONANE	<0.025	<0.050
1,3,5-TRIMETHYLBENZENE	<0.025	<0.050
1,2,4-TRIMETHYLBENZENE	<0.025	<0.050
1,3-DICHLOROBENZENE	<0.025	<0.050
1,4-DICHLOROBENZENE	<0.025	<0.050
1,2-DICHLOROBENZENE	<0.025	<0.050
1,2,4-TRICHLOROBENZENE	<0.025	<0.050
HEXACHLORO-1,3-BUTADIENE	<0.025	<0.050

TARGET COMPOUNDS (TOXIC)***

1,3-BUTADIENE	<0.025	<0.050
ETHYLENE OXIDE	<0.025	<0.050
CARBON DISULFIDE	<0.025	<0.050
2-METHYL-2-PROPENAL	<0.025	<0.050
3-BUTEN-2-ONE	<0.025	<0.050
2-ETHOXYETHANOL	<0.025	<0.050
DIMETHYLDISULFIDE	<0.025	<0.050
OCTAMETHYLCYCLOTETRAILOXANE	*	*

NON-TARGET COMPOUNDS***

OCTAFLUOROPROPANE**	<0.025	17
SULFURHEXAFLUORIDE	<0.025	0.066
BROMOTRIFLUOROMETHANE	<0.025	1.5
HEXAMETHYLCYCLOTTRISILOXANE	*	*
DECAMETHYLCYCLOPENTASILOXANE	*	*

TOTAL ALCOHOLS PLUS ACETONE	0.12	0.73
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2-METHYLFURAN	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
ETHYLACETATE	0.14	0.21	0.19	0.13	0.080	0.10	0.32
HEXANE	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
CHLOROFORM	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
2-BUTENAL	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
1,2-DICHLOROETHANE	TRACE	TRACE	TRACE	TRACE	TRACE	TRACE	<0.050
1,1,1-TRICHLOROETHANE	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
N-BUTANOL	0.068	0.074	0.081	0.069	TRACE	0.068	0.27
BENZENE	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
CARBONTETRACHLORIDE	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
2-PENTANONE	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
2-METHYLHEXANE	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.44
2,3-DIMETHYLPENTANE	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.42
PENTANAL	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
3-METHYLHEXANE	TRACE	TRACE	TRACE	TRACE	TRACE	TRACE	0.68
1,2-DICHLOROPROPANE	<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
TRICHLOROETHENE	<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
N-HEPTANE	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.15
4-METHYL2-PENTANONE	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
CIS-1,3-DICHLOROPROPENE	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
2-PENTENAL	<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
1,1,2-TRICHLOROETHANE	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
TOLUENE	0.068	0.083	0.069	0.074	0.055	0.067	1.1
HEXANAL	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
MESITYLOXIDE	<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
BUTYLACETATE	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.10
OCTANE	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
TETRACHLOROETHENE	<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
ETHYLBENZENE	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
M/P-XYLENES	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	TRACE
2-HEPTANONE	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
CYCLOHEXANONE	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
HEPTANAL	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
STYRENE	<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
O-XYLENE	0.056	0.067	0.067	0.11	0.069	0.089	TRACE

NONANE	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
1,3,5-TRIMETHYLBENZENE	<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
1,3-DICHLOROBENZENE	<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
1,2-DICHLOROBENZENE	<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
HEXACHLORO-1,3-BUTADIENE	<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
ETHYLENE OXIDE	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
CARBON DISULFIDE	TRACE	TRACE	<0.050	<0.050	<0.050	<0.050	TRACE
2-METHYL-2-PROPENAL	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	TRACE
3-BUTEN-2-ONE	<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
DIMETHYLDISULFIDE	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
OCTAMETHYLCYCLOTETRAILOXANE	0.066	0.065	0.066	0.056	TRACE	0.057	0.073

NON-TARGET COMPOUNDS***							
OCTAFLUOROPROPANE**	40	25	18	29	56	36	1.2
1,1,1,2-TETRAFLUROETHANE	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	TRACE
SULFURHEXAFLUORIDE	0.18	0.20	0.14	0.14	0.17	0.24	<0.050
CARBONYLSULFIDE	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.18
1-BUTENE	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.067
2-METHYL-1,3-BUTADIENE(ISOPRENE)	0.072	0.086	0.076	0.079	0.052	0.073	<0.050
TRIMETHYLSILANOL	0.21	0.23	0.26	0.19	0.16	0.23	1.1
1,3-DIOXOLANE	TRACE	0.054	0.051	TRACE	TRACE	TRACE	0.25
C7-ALKANE	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.070
C6-ALKENE	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	TRACE
C7-ALKANE	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.25
C7-ALKANE	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.13
HEXAMETHYLCYCLOTRIILOXANE	0.35	0.35	0.41	0.30	0.23	0.35	0.96
PINENE	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.10
LIMONENE	0.067	0.073	0.080	0.082	0.051	0.075	<0.050
DECAMETHYLCYCLOPENTASILOXANE	0.62	0.81	0.86	0.82	0.55	0.82	0.12

TOTAL ALCOHOLS PLUS ACETONE	5.5	6.0	6.3	5.5	4.4	5.6	4.4
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TARGET COMPOUNDS (GC)							
CARBON MONOXIDE	1.9	2.0	1.8	1.8	1.7	1.9	1.9

METHANE	12	11.7	11.6	14.7	11.2	15	< 1.6
HYDROGEN	2.9	2.9	2.9	4.3	3.4	4.3	< 0.41
CARBON DIOXIDE	5800	6000	6600	6000	4500	5900	1100

TOTAL CONCENTRATION (NON-METHANE HYDROCARBONS)	48	33	27	37	62	44	13
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TOTAL CONCENTRATION - OFP (NON-METHANE HYDROCARBONS)	7.6	8.6	8.9	7.9	6.1	8.0	12
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*** From GC/FID Results**

** Quantified using one-point calibration

*** Quantified using "B" response factor

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

TRACE: Amount detected is sufficient for compound identification only.

N-PROPANOL	TRACE	TRACE	TRACE	TRACE	TRACE	TRACE
1,1-DICHLOROETHANE	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
BUTANAL	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
2-BUTANONE	TRACE	TRACE	TRACE	<0.050	<0.050	TRACE
CIS-1,2-DICHLOROETHENE	<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
ETHYLACETATE	0.057	TRACE	TRACE	0.055	TRACE	0.058
HEXANE	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
CHLOROFORM	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
2-BUTENAL	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
1,2-DICHLOROETHANE	TRACE	TRACE	TRACE	TRACE	TRACE	TRACE
1,1,1-TRICHLOROETHANE	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
N-BUTANOL	0.092	0.086	0.084	0.079	0.081	0.087
BENZENE	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
CARBONTETRACHLORIDE	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
2-PENTANONE	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
2-METHYLHEXANE	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
2,3-DIMETHYLPENTANE	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
PENTANAL	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
3-METHYLHEXANE	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
1,2-DICHLOROPROPANE	<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
TRICHLOROETHENE	<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
N-HEPTANE	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
4-METHYL2-PENTANONE	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
CIS-1,3-DICHLOROPROPENE	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
2-PENTENAL	<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
1,1,2-TRICHLOROETHANE	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
TOLUENE	0.063	0.060	0.060	0.057	0.054	0.060
HEXANAL	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
MESITYLOXIDE	<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
BUTYLACETATE	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
OCTANE	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050

TETRACHLOROETHENE	<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
ETHYLBENZENE	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
M/P-XYLENES	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
2-HEPTANONE	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
CYCLOHEXANONE	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
HEPTANAL	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
STYRENE	<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
O-XYLENE	0.067	0.056	0.056	0.058	TRACE	0.059
NONANE	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
1,3,5-TRIMETHYLBENZENE	<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
1,3-DICHLOROBENZENE	<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
1,2-DICHLOROBENZENE	<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
HEXACHLORO-1,3-BUTADIENE	<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
ETHYLENE OXIDE	TRACE	<0.050	<0.050	<0.050	<0.050	<0.050
CARBON DISULFIDE	TRACE	<0.050	<0.050	<0.050	<0.050	<0.050
2-METHYL-2-PROPENAL	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
3-BUTEN-2-ONE	<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
DIMETHYLDISULFIDE	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
OCTAMETHYLCYCLOTETRAILOXANE	TRACE	0.17	0.051	TRACE	0.053	TRACE

NON-TARGET COMPOUNDS***						
OCTAFLUOROPROPANE**	20	21	17	27	26	15
SULFURHEXAFLUORIDE	0.11	0.12	0.084	0.096	0.11	0.082
PROPENE	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
CARBONYLSULFIDE	TRACE	<0.050	<0.050	<0.050	<0.050	<0.050
1-BUTENE	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
2-METHYL-1,3-BUTADIENE(ISOPRENE)	0.091	0.082	0.080	0.084	0.083	0.088

TRIMETHYLSILANOL	0.20	0.25	0.26	0.18	0.23	0.21
HEXAMETHYLCYCLOTTRISILOXANE	##	##	##	##	##	##
DECAMETHYLCYCLOPENTASILOXANE	0.61	0.22	0.46	0.98	0.78	0.88

TOTAL ALCOHOLS PLUS ACETONE	6.3	4.8	4.4	3.3	3.6	3.7
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TARGET COMPOUNDS (GC)						
CARBON MONOXIDE	1.8	1.8	1.7	1.9	2.0	1.7
METHANE	19	19	19	19	19	19
HYDROGEN	5.0	5.0	5.0	4.2	4.0	4.3
CARBON DIOXIDE	7300	7100	6700	6300	6800	6300

TOTAL CONCENTRATION (NON-METHANE HYDROCARBONS)	28	27	23	32	31	20
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TOTAL CONCENTRATION - OFP (NON-METHANE HYDROCARBONS)	7.8	6.1	5.7	5.0	5.2	5.4
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Present, subject to large, random variability, therefore not quantifiable

* From GC/FID Results

** Quantified using one-point calibration

*** Quantified using "B" response factor

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

TRACE: Amount detected is sufficient for compound identification only.

TABLE 2A
ANALYTICAL RESULTS OF
STS-134 RETURN GRAB SAMPLE CONTAINER AIR SAMPLES

CHEMICAL CONTAMINANT	T-VALUE (7-day SMAC)	
	AA050851 PRE-FLIGHT SN 1100 05/16/11 @ 3:30 EDT	AA051462 FLIGHT-DECK SN 2034 06/01/11 @ 00:55 GMT
TARGET COMPOUNDS (TO-14/POLAR)		
FREON12	ND	ND
CHLOROMETHANE	ND	0.00061
FREON114	ND	ND
METHANOL	0.00014	0.00164
ACETALDEHYDE	0.01496	0.02492
VINYLCHLORIDE	ND	ND
BROMOMETHANE	ND	ND
ETHANOL	0.00003	0.00017
CHLOROETHANE	ND	ND
ACETONITRILE	ND	ND
PROPENAL	ND	ND
ACETONE	0.00065	0.00266
PROPANAL	0.00114	ND
ISOPROPANOL	0.00008	0.00069
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	ND	ND
3-CHLOROPROPENE	ND	ND
FREON113	ND	ND
N-PROPANOL	ND	ND
1,1-DICHLOROETHANE	ND	ND
BUTANAL	0.00096	ND
2-BUTANONE	ND	ND
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	ND	ND
BENZENE	ND	ND
CARBONTETRACHLORIDE	ND	ND
2-PENTANONE	ND	ND
2-METHYLHEXANE	ND	ND
2,3-DIMETHYLPENTANE	ND	ND
PENTANAL	0.00078	ND
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	ND	ND
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	ND	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
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
OCTAMETHYLCYCLOTETRAILOXANE	*	*

NON-TARGET COMPOUNDS		
OCTAFLUOROPROPANE	ND	0.00020
SULFURHEXAFLUORIDE	ND	0.00006
BROMOTRIFLUOROMETHANE	ND	0.00014
HEXAMETHYLCYCLOTTRISILOXANE	*	*
DECAMETHYLCYCLOPENTASILOXANE	*	*

TARGET COMPOUNDS (GC)		
CARBON MONOXIDE	0.00000	0.05919
METHANE	0.00000	0.01565
HYDROGEN	0.00000	0.02171
CARBON DIOXIDE	0.01538	0.28763

TOTAL T-VALUE	0.03413	0.41527
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TOTAL T-VALUE MINUS OCTAFLUOROPROPANE	0.03413	0.41507
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1Grab sample container

2Mini-grab sample container

* Present, but not included in total T-Value

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 2B
ANALYTICAL RESULTS OF
ULF7 RETURN MINI-GRAB SAMPLE CONTAINER AIR SAMPLES

CHEMICAL CONTAMINANT	T-VALUE (180-d SMAC)						
	AA05151 S/N 2030 LAB 06/21/11 @ 8:00 GMT	AA05152 S/N 2031 SM 06/21/11 @ 8:05 GMT	AA05153 S/N 2032 JEM 06/21/11 @ 8:10 GMT	AA05154 S/N 2059 SM 07/05/11 @ 13:45 GMT	AA05155 S/N 2060 LAB 07/05/11 @ 13:47 GMT	AA05156 S/N 2061 COL 07/05/11 @ 13:50 GMT	AA05157 S/N 2064 MPLM Ingress 07/11/11 @ 16:10 GMT
TARGET COMPOUNDS (TO-14/POLAR)							
FREON12	ND	ND	ND	ND	ND	ND	ND
CHLOROMETHANE	ND	ND	ND	ND	ND	ND	ND
FREON114	ND	ND	ND	ND	ND	ND	ND
METHANOL	0.00352	0.00526	0.00521	0.00481	0.00375	0.00442	0.00405
ACETALDEHYDE	0.03113	0.03715	0.03157	0.03828	0.03401	0.03747	0.03533
VINYLCHLORIDE	ND	ND	ND	ND	ND	ND	ND
BROMOMETHANE	ND	ND	ND	ND	ND	ND	ND
ETHANOL	0.00226	0.00232	0.00243	0.00224	0.00159	0.00231	0.00017
CHLOROETHANE	ND	ND	ND	ND	ND	ND	ND
ACETONITRILE	ND	ND	ND	ND	ND	ND	ND
PROPENAL	ND	ND	ND	ND	ND	ND	ND
ACETONE	0.00473	0.00643	0.00682	0.00578	0.00430	0.00521	0.00977
PROPANAL	ND	ND	ND	ND	ND	ND	ND
ISOPROPANOL	0.00197	0.00290	0.00333	0.00136	0.00378	0.00148	0.01918
FREON11	ND	ND	ND	ND	ND	ND	ND
FURAN	ND	ND	ND	ND	ND	ND	ND
ACRYLONITRILE	ND	ND	ND	ND	ND	ND	ND
PENTANE	ND	ND	ND	ND	ND	ND	ND
2-METHYL-2-PROPANOL	ND	ND	ND	ND	ND	ND	0.00021
METHYLACETATE	0.00073	0.00107	0.00082	0.00091	0.00056	0.00071	ND
1,1-DICHLOROETHENE	ND	ND	ND	ND	ND	ND	ND
DICHLOROMETHANE	ND	ND	ND	ND	ND	ND	ND
3-CHLOROPROPENE	ND	ND	ND	ND	ND	ND	ND
FREON113	ND	ND	ND	ND	ND	ND	ND
N-PROPANOL	0.00026	0.00026	0.00026	0.00026	0.00026	0.00026	0.00026
1,1-DICHLOROETHANE	ND	ND	ND	ND	ND	ND	ND
BUTANAL	ND	ND	ND	ND	ND	ND	0.00192
2-BUTANONE	0.00083	0.00083	0.00083	0.00083	ND	0.00083	0.01631
CIS-1,2-DICHLOROETHENE	ND	ND	ND	ND	ND	ND	ND

2-METHYLFURAN	ND	ND	ND	ND	ND	ND	ND
ETHYLACETATE	0.00075	0.00119	0.00104	0.00074	0.00044	0.00057	0.00180
HEXANE	ND	ND	ND	ND	ND	ND	ND
CHLOROFORM	ND	ND	ND	ND	ND	ND	ND
2-BUTENAL	ND	ND	ND	ND	ND	ND	ND
1,2-DICHLOROETHANE	0.01563	0.01563	0.01563	0.01563	0.01563	0.01563	ND
1,1,1-TRICHLOROETHANE	ND	ND	ND	ND	ND	ND	ND
N-BUTANOL	0.00170	0.00185	0.00202	0.00173	0.00063	0.00169	0.00666
BENZENE	ND	ND	ND	ND	ND	ND	ND
CARBONTETRACHLORIDE	ND	ND	ND	ND	ND	ND	ND
2-PENTANONE	ND	ND	ND	ND	ND	ND	ND
2-METHYLHEXANE	ND	ND	ND	ND	ND	ND	0.03630
2,3-DIMETHYLPENTANE	ND	ND	ND	ND	ND	ND	0.03460
PENTANAL	ND	ND	ND	ND	ND	ND	ND
3-METHYLHEXANE	0.00208	0.00208	0.00208	0.00208	0.00208	0.00208	0.05683
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	ND	ND	ND	ND	ND	ND	0.01224
4-METHYL2-PENTANONE	ND	ND	ND	ND	ND	ND	ND
CIS-1,3-DICHLOROPROPENE	ND	ND	ND	ND	ND	ND	ND
2-PENTENAL	ND	ND	ND	ND	ND	ND	ND
TRANS-1,3-DICHLOROPROPENE	ND	ND	ND	ND	ND	ND	ND
1,1,2-TRICHLOROETHANE	ND	ND	ND	ND	ND	ND	ND
TOLUENE	0.00456	0.00555	0.00457	0.00492	0.00369	0.00447	0.07004
HEXANAL	ND	ND	ND	ND	ND	ND	ND
MESITYLOXIDE	ND	ND	ND	ND	ND	ND	ND
1,2-DIBROMOETHANE	ND	ND	ND	ND	ND	ND	ND
BUTYLACETATE	ND	ND	ND	ND	ND	ND	0.00054
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	ND
M/P-XYLENES	ND	ND	ND	ND	ND	ND	0.00068
2-HEPTANONE	ND	ND	ND	ND	ND	ND	ND
CYCLOHEXANONE	ND	ND	ND	ND	ND	ND	ND
HEPTANAL	ND	ND	ND	ND	ND	ND	ND
STYRENE	ND	ND	ND	ND	ND	ND	ND
1,1,2,2-TETRACHLOROETHANE	ND	ND	ND	ND	ND	ND	ND
O-XYLENE	0.00151	0.00181	0.00181	0.00291	0.00186	0.00242	0.00068

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	ND
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	0.00156	0.00156	ND	ND	ND	ND	0.00156
2-METHYL-2-PROPENAL	ND	ND	ND	ND	ND	ND	0.01471
3-BUTEN-2-ONE	ND	ND	ND	ND	ND	ND	ND
2-ETHOXYETHANOL	ND	ND	ND	ND	ND	ND	ND
DIMETHYLDISULFIDE	ND	ND	ND	ND	ND	ND	ND
OCTAMETHYLCYCLOTETRAILOXANE	0.00552	0.00545	0.00547	0.00463	0.00208	0.00471	0.00609

NON-TARGET COMPOUNDS							
OCTAFLUOROPROPANE	0.00051	0.00029	0.00022	0.00034	0.00066	0.00042	0.00001
1,1,1,2-TETRAFLUROETHANE	ND	ND	ND	ND	ND	ND	0.00024
SULFURHEXAFLUORIDE	0.00015	0.00017	0.00012	0.00012	0.00014	0.00020	ND
CARBONYLSULFIDE	ND	ND	ND	ND	ND	ND	0.01485
1-BUTENE	ND	ND	ND	ND	ND	ND	0.00015
2-METHYL-1,3-BUTADIENE(ISOPRENE)	0.02392	0.02883	0.02550	0.02630	0.01733	0.02438	ND
TRIMETHYLSILANOL	0.05214	0.05664	0.06477	0.04644	0.03901	0.05784	0.27504
1,3-DIOXOLANE	0.00069	0.00151	0.00140	0.00069	0.00069	0.00069	0.00694
C7-ALKANE	ND	ND	ND	ND	ND	ND	0.00583
C6-ALKENE	ND	ND	ND	ND	ND	ND	0.00029
C7-ALKANE	ND	ND	ND	ND	ND	ND	0.02105
C7-ALKANE	ND	ND	ND	ND	ND	ND	0.01113
HEXAMETHYLCYCLOTRIILOXANE	0.03942	0.03859	0.04543	0.03386	0.02578	0.03874	0.10635
PINENE	ND	ND	ND	ND	ND	ND	0.00072
LIMONENE	0.00058	0.00063	0.00070	0.00071	0.00044	0.00065	ND
DECAMETHYLCYCLOPENTASILOXANE	0.04115	0.05367	0.05702	0.05474	0.03656	0.05434	0.00806

TARGET COMPOUNDS (GC)							
CARBON MONOXIDE	0.11211	0.11519	0.10843	0.10686	0.09794	0.11279	0.11106
METHANE	0.00327	0.00334	0.00332	0.00419	0.00321	0.00419	0.00000

HYDROGEN	0.00837	0.00866	0.00861	0.01270	0.00988	0.01249	0.00000
CARBON DIOXIDE	0.44675	0.46357	0.50636	0.45805	0.34274	0.45636	0.08677

TOTAL T-VALUE	0.80782	0.86244	0.90576	0.83212	0.64905	0.84735	0.97841
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TOTAL T-VALUE - OFP	0.80731	0.86214	0.90554	0.83177	0.64839	0.84693	0.97839
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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 2C
ANALYTICAL RESULTS OF
SOYUZ 26S RETURN MINI-GRAB SAMPLE CONTAINER AIR SAMPLES

CHEMICAL CONTAMINANT	T-VALUE (180-d SMAC)					
	AA05202 S/N 2074 SM 08/01/11 @ 10:39 GMT	AA05203 S/N 2075 LAB 08/01/11 @ 10:42 GMT	AA05204 S/N 2076 JPM 08/01/11 @ 10:45 GMT	AA05205 S/N 2072 SM 08/24/11 @ 14:38 GMT	AA05206 S/N 2073 COL 08/24/11 @ 14:42 GMT	AA05207 S/N 2071 LAB 08/24/11 @ 14:45 GMT
TARGET COMPOUNDS (TO-14/POLAR)						
FREON12	ND	ND	ND	ND	ND	ND
CHLOROMETHANE	ND	ND	ND	ND	ND	ND
FREON114	ND	ND	ND	ND	ND	ND
METHANOL	0.00614	0.00630	0.00583	0.00493	0.00501	0.00545
ACETALDEHYDE	0.03536	0.04343	0.04010	0.03679	0.03813	0.04906
VINYLCHLORIDE	ND	ND	ND	ND	ND	ND
BROMOMETHANE	ND	ND	ND	ND	ND	ND
ETHANOL	0.00254	0.00178	0.00157	0.00113	0.00130	0.00130
CHLOROETHANE	ND	ND	ND	ND	ND	ND
ACETONITRILE	ND	ND	ND	ND	ND	ND
PROPENAL	ND	ND	ND	ND	ND	ND
ACETONE	0.00597	0.00562	0.00604	0.00479	0.00492	0.00501
PROPANAL	ND	ND	ND	ND	ND	ND
ISOPROPANOL	0.00164	0.00204	0.00211	0.00165	0.00157	0.00128
FREON11	ND	ND	ND	ND	ND	ND
FURAN	ND	ND	ND	ND	ND	ND
ACRYLONITRILE	ND	ND	ND	ND	ND	ND
PENTANE	ND	ND	ND	ND	ND	ND
2-METHYL-2-PROPANOL	ND	ND	ND	ND	ND	ND
METHYLACETATE	0.00021	0.00021	0.00021	0.00021	0.00021	0.00021
1,1-DICHLOROETHENE	ND	ND	ND	ND	ND	ND
DICHLOROMETHANE	ND	ND	ND	ND	ND	ND
3-CHLOROPROPENE	ND	ND	ND	ND	ND	ND
FREON113	ND	ND	ND	ND	ND	ND

N-PROPANOL	0.00026	0.00026	0.00026	0.00026	0.00026	0.00026
1,1-DICHLOROETHANE	ND	ND	ND	ND	ND	ND
BUTANAL	ND	ND	ND	ND	ND	ND
2-BUTANONE	0.00083	0.00083	0.00083	ND	ND	0.00083
CIS-1,2-DICHLOROETHENE	ND	ND	ND	ND	ND	ND
2-METHYLFURAN	ND	ND	ND	ND	ND	ND
ETHYLACETATE	0.00032	0.00014	0.00014	0.00031	0.00014	0.00032
HEXANE	ND	ND	ND	ND	ND	ND
CHLOROFORM	ND	ND	ND	ND	ND	ND
2-BUTENAL	ND	ND	ND	ND	ND	ND
1,2-DICHLOROETHANE	0.01563	0.01563	0.01563	0.01563	0.01563	0.01563
1,1,1-TRICHLOROETHANE	ND	ND	ND	ND	ND	ND
N-BUTANOL	0.00230	0.00214	0.00210	0.00197	0.00203	0.00218
BENZENE	ND	ND	ND	ND	ND	ND
CARBONTETRACHLORIDE	ND	ND	ND	ND	ND	ND
2-PENTANONE	ND	ND	ND	ND	ND	ND
2-METHYLHEXANE	ND	ND	ND	ND	ND	ND
2,3-DIMETHYLPENTANE	ND	ND	ND	ND	ND	ND
PENTANAL	ND	ND	ND	ND	ND	ND
3-METHYLHEXANE	ND	ND	ND	ND	ND	ND
1,2-DICHLOROPROPANE	ND	ND	ND	ND	ND	ND
1,4-DIOXANE	ND	ND	ND	ND	ND	ND
TRICHLOROETHENE	ND	ND	ND	ND	ND	ND
2,5-DIMETHYLFURAN	ND	ND	ND	ND	ND	ND
N-HEPTANE	ND	ND	ND	ND	ND	ND
4-METHYL2-PENTANONE	ND	ND	ND	ND	ND	ND
CIS-1,3-DICHLOROPROPENE	ND	ND	ND	ND	ND	ND
2-PENTENAL	ND	ND	ND	ND	ND	ND
TRANS-1,3-DICHLOROPROPENE	ND	ND	ND	ND	ND	ND
1,1,2-TRICHLOROETHANE	ND	ND	ND	ND	ND	ND
TOLUENE	0.00420	0.00400	0.00398	0.00382	0.00362	0.00401
HEXANAL	ND	ND	ND	ND	ND	ND
MESITYLOXIDE	ND	ND	ND	ND	ND	ND
1,2-DIBROMOETHANE	ND	ND	ND	ND	ND	ND
BUTYLACETATE	ND	ND	ND	ND	ND	ND
OCTANE	ND	ND	ND	ND	ND	ND

TETRACHLOROETHENE	ND	ND	ND	ND	ND	ND
CHLOROBENZENE	ND	ND	ND	ND	ND	ND
ETHYLBENZENE	ND	ND	ND	ND	ND	ND
M/P-XYLENES	ND	ND	ND	ND	ND	ND
2-HEPTANONE	ND	ND	ND	ND	ND	ND
CYCLOHEXANONE	ND	ND	ND	ND	ND	ND
HEPTANAL	ND	ND	ND	ND	ND	ND
STYRENE	ND	ND	ND	ND	ND	ND
1,1,2,2-TETRACHLOROETHANE	ND	ND	ND	ND	ND	ND
O-XYLENE	0.00182	0.00151	0.00151	0.00157	0.00068	0.00159
NONANE	ND	ND	ND	ND	ND	ND
1,3,5-TRIMETHYLBENZENE	ND	ND	ND	ND	ND	ND
1,2,4-TRIMETHYLBENZENE	ND	ND	ND	ND	ND	ND
1,3-DICHLOROBENZENE	ND	ND	ND	ND	ND	ND
1,4-DICHLOROBENZENE	ND	ND	ND	ND	ND	ND
1,2-DICHLOROBENZENE	ND	ND	ND	ND	ND	ND
1,2,4-TRICHLOROBENZENE	ND	ND	ND	ND	ND	ND
HEXACHLORO-1,3-BUTADIENE	ND	ND	ND	ND	ND	ND

TARGET COMPOUNDS (TOXIC)

1,3-BUTADIENE	ND	ND	ND	ND	ND	ND
ETHYLENE OXIDE	0.00139	ND	ND	ND	ND	ND
CARBON DISULFIDE	0.00156	ND	ND	ND	ND	ND
2-METHYL-2-PROPENAL	ND	ND	ND	ND	ND	ND
3-BUTEN-2-ONE	ND	ND	ND	ND	ND	ND
2-ETHOXYETHANOL	ND	ND	ND	ND	ND	ND
DIMETHYLDISULFIDE	ND	ND	ND	ND	ND	ND
OCTAMETHYLCYCLOTETRAISILOXANE	0.00208	0.01446	0.00427	0.00208	0.00444	0.00208

NON-TARGET COMPOUNDS

OCTAFLUOROPROPANE	0.00020	0.00024	0.00020	0.00031	0.00030	0.00018
SULFURHEXAFLUORIDE	0.00009	0.00010	0.00007	0.00008	0.00009	0.00007
PROPENE	ND	ND	ND	ND	ND	ND
CARBONYLSULFIDE	0.00208	ND	ND	ND	ND	ND
1-BUTENE	ND	ND	ND	ND	ND	ND
2-METHYL-1,3-BUTADIENE(ISOPRENE)	0.03049	0.02730	0.02651	0.02789	0.02756	0.02928

TRIMETHYLSILANOL	0.04928	0.06373	0.06459	0.04593	0.05705	0.05356
HEXAMETHYLCYCLOTRISILOXANE	##	##	##	##	##	##
DECAMETHYLCYCLOPENTASILOXANE	0.04085	0.01485	0.03082	0.06529	0.05227	0.05856

TARGET COMPOUNDS (GC)						
CARBON MONOXIDE	0.10691	0.10525	0.09919	0.10945	0.11810	0.10169
METHANE	0.00547	0.00537	0.00544	0.00553	0.00540	0.00534
HYDROGEN	0.01456	0.01466	0.01456	0.01220	0.01181	0.01277
CARBON DIOXIDE	0.56207	0.54358	0.51840	0.48121	0.52534	0.48509

TOTAL T-VALUE	0.89425	0.87344	0.84436	0.82302	0.87583	0.83575
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TOTAL T-VALUE - OFP	0.89405	0.87320	0.84415	0.82271	0.87553	0.83557
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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.