

**EPA Clean Air Act Performance Audit Samples  
Stationary Source Audit Sample (SSAS) Table  
Revision 3, Effective August 27, 2012**

Matrix	NELAC Analyte Code	Analyte <sup>1</sup>	Concentration Range	Acceptance Criteria <sup>2</sup>	ASRL <sup>3</sup>
		<b>Inorganics in Impinger Solution</b>			
		<b>EPA Method 6 and 8<sup>4,5</sup></b>	mg/dscm		mg/dscm
Air & Emissions	4010	Sulfur Dioxide	50-2000	± 15% at < 150 ± 10% ≥ 150 fixed acceptance limit	42
		<b>EPA Method 8<sup>4,5</sup></b>	mg/dscm		mg/dscm
Air & Emissions	4020	Sulfuric Acid mist	5.0-150	± 15% at < 20 ± 10% ≥ 20 fixed acceptance limit	4.2
		<b>EPA Method 7<sup>4,6</sup></b>	mg/dscm		mg/dscm
Air & Emissions	3885	Oxides of Nitrogen	100-2000	± 15% fixed acceptance limit	85
		<b>EPA Method 13A and 13B<sup>4,7</sup></b>	mg/dscm		mg/dscm
Air & Emissions	1730	Fluoride	1.0-50	± 15% fixed acceptance limit	0.85
		<b>EPA Method 26 and 26A<sup>8</sup></b>	mg/L		mg/L
Air & Emissions	1770	Hydrogen Chloride	5.0-500	± 10% fixed acceptance limit	4.5
Air & Emissions	1775	Hydrogen Fluoride	5.0-500	± 10% fixed acceptance limit	4.5
		<b>Metals on Glass/Quartz Fiber Filters<sup>9</sup></b>			
		<b>EPA Method 29</b>	µg/filter		µg/filter
Air & Emissions	1005	Antimony	25-250	± 25% fixed acceptance limit	19
Air & Emissions	1010	Arsenic	20-250	± 25% fixed acceptance limit	15
Air & Emissions	1015	Barium	20-250	± 25% fixed acceptance limit	15
Air & Emissions	1020	Beryllium	10-250	± 25% fixed acceptance limit	7.5
Air & Emissions	1030	Cadmium	10-250	± 20% fixed acceptance limit	8.0
Air & Emissions	1040	Chromium	15-250	± 20% fixed acceptance limit	12
Air & Emissions	1050	Cobalt	10-250	± 25% fixed acceptance limit	7.5
Air & Emissions	1055	Copper	10-250	± 25% fixed acceptance limit	7.5
Air & Emissions	1075	Lead	20-350	± 20% fixed acceptance limit	16
Air & Emissions	1090	Manganese	10-250	± 30% at < 20 ± 20% ≥ 20 fixed acceptance limit	7.0
Air & Emissions	1105	Nickel	20-250	± 30% at < 30 ± 20% ≥ 30 fixed acceptance limit	14
Air & Emissions	1140	Selenium	20-250	± 30% at < 40 ± 25% ≥ 40 fixed acceptance limit	14

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Air & Emissions	1150	Silver	30-250	± 30% fixed acceptance limit	21
Air & Emissions	1165	Thallium	30-250	± 25% fixed acceptance limit	22
Air & Emissions	1190	Zinc	20-250	± 30% at < 40 ± 25% ≥ 40 fixed acceptance limit	14
		<b>EPA Method 29<sup>10</sup></b>	µg/filter		µg/filter
Air & Emissions	1095	Mercury	1.0-75	± 25% fixed acceptance limit	0.75
		<b>EPA Method 12</b>	µg/filter		µg/filter
Air & Emissions	1075	Lead	20-350	± 20% fixed acceptance limit	16
		<b>Metals in Impinger Solution<sup>11</sup></b>			
		<b>EPA Method 29</b>	µg/mL		µg/mL
Air & Emissions	1005	Antimony	0.25-20	± 25% fixed acceptance limit	0.19
Air & Emissions	1010	Arsenic	0.20-20	± 25% fixed acceptance limit	0.15
Air & Emissions	1015	Barium	0.15-25	± 25% fixed acceptance limit	0.11
Air & Emissions	1020	Beryllium	0.050-20	± 30% at < 1.0 ± 25% ≥ 1.0 fixed acceptance limit	0.035
Air & Emissions	1030	Cadmium	0.10-20	± 20% fixed acceptance limit	0.080
Air & Emissions	1040	Chromium	0.20-20	± 20% fixed acceptance limit	0.16
Air & Emissions	1050	Cobalt	0.10-25	± 25% fixed acceptance limit	0.075
Air & Emissions	1055	Copper	0.20-20	± 25% fixed acceptance limit	0.15
Air & Emissions	1075	Lead	0.20-20	± 25% fixed acceptance limit	0.15
Air & Emissions	1090	Manganese	0.10-20	± 25% fixed acceptance limit	0.075
Air & Emissions	1105	Nickel	0.15-30	± 20% fixed acceptance limit	0.12
Air & Emissions	1140	Selenium	0.15-25	± 25% fixed acceptance limit	0.11
Air & Emissions	1150	Silver	0.50-20	± 25% fixed acceptance limit	0.38
Air & Emissions	1165	Thallium	0.15-25	± 25% fixed acceptance limit	0.11
Air & Emissions	1190	Zinc	0.15-25	± 25% fixed acceptance limit	0.11
		<b>EPA Method 29 and 101A</b>	ng/mL		ng/mL
Air & Emissions	1095	Mercury	0.90-200	± 25% fixed acceptance limit	0.68
		<b>EPA Method 12</b>	µg/ml		µg/mL
Air & Emissions	1075	Lead	0.20-120	± 25% fixed acceptance limit	0.15

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		<b>Volatiles in Gas Cylinder</b>			
		<b>EPA Method 25<sup>12</sup></b>	ppmC		ppmC
Air & Emissions	3860	Non-Methane Organic Compounds	150-2500	See Footnote <sup>12</sup>	40
		<b>Organic Extractables on Glass Fiber Filters<sup>13</sup></b>			
		<b>EPA Method 315</b>	mg/sample		mg/sample
Air & Emissions	5123	Methylene Chloride Extractable Material (MCEM)	1.5-50	± 50% fixed acceptance limit	0.75

Matrix	NELAC Analyte Code	Analyte <sup>1</sup>	Concentration Range	Acceptance Criteria <sup>2</sup>	ASRL <sup>3</sup>	TEF <sup>14</sup> (WHO 1998)	TEF <sup>14</sup> (WHO 2005)
		<b>Dioxins and Furans on XAD-2 Cartridge<sup>15</sup></b>					
		<b>EPA Method 23</b>	ng/cartridge		ng/cartridge		
Air & Emissions	9618	2,3,7,8-Tetrachlorodibenzo-p-dioxin	0.050-1.0	± 30% at < 0.10 ± 20% ≥ 0.10 fixed acceptance limit	0.035	1.0	1.0
Air & Emissions	9612	2,3,7,8-Tetrachlorodibenzofuran	0.050-1.0	± 30% at < 0.20 ± 20% ≥ 0.20 fixed acceptance limit	0.035	0.10	0.10
Air & Emissions	9540	1,2,3,7,8-Pentachlorodibenzo-p-dioxin	0.050-1.0	± 30% at < 0.10 ± 20% ≥ 0.10 fixed acceptance limit	0.035	1.0	1.0
Air & Emissions	9543	1,2,3,7,8-Pentachlorodibenzofuran	0.050-1.0	± 20% fixed acceptance limit	0.040	0.050	0.030
Air & Emissions	9549	2,3,4,7,8-Pentachlorodibenzofuran	0.050-1.0	± 30% at < 0.10 ± 20% ≥ 0.10 fixed acceptance limit	0.035	0.50	0.30

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Matrix	NELAC Analyte Code	Analyte <sup>1</sup>	Concentration Range	Acceptance Criteria <sup>2</sup>	ASRL <sup>3</sup>	TEF <sup>14</sup> (WHO 1998)	TEF <sup>14</sup> (WHO 2005)
Air & Emissions	9453	1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	0.050-1.0	± 30% at < 0.10 ± 20% ≥ 0.10 fixed acceptance limit	0.035	0.10	0.10
Air & Emissions	9471	1,2,3,4,7,8-Hexachlorodibenzofuran	0.050-1.0	± 20% fixed acceptance limit	0.040	0.10	0.10
Air & Emissions	9456	1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	0.050-1.0	± 30% at < 0.10 ± 20% ≥ 0.10 fixed acceptance limit	0.035	0.10	0.10
Air & Emissions	9474	1,2,3,6,7,8-Hexachlorodibenzofuran	0.050-1.0	± 25% at < 0.10 ± 20% ≥ 0.10 fixed acceptance limit	0.038	0.10	0.10
Air & Emissions	9459	1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	0.050-1.0	± 30% at < 0.20 ± 20% ≥ 0.20 fixed acceptance limit	0.035	0.10	0.10
Air & Emissions	9477	1,2,3,7,8,9-Hexachlorodibenzofuran	0.10-1.0	± 40% fixed acceptance limit	0.060	0.10	0.10
Air & Emissions	9480	2,3,4,6,7,8-Hexachlorodibenzofuran	0.050-1.0	± 40% at < 0.20 ± 25% ≥ 0.20 fixed acceptance limit	0.030	0.10	0.10
Air & Emissions	9426	1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	0.050-1.0	± 30% at < 0.20 ± 20% ≥ 0.20 fixed acceptance limit	0.035	0.010	0.010
Air & Emissions	9420	1,2,3,4,6,7,8-Heptachlorodibenzofuran	0.050-1.0	± 30% at < 0.20 ± 20% ≥ 0.20 fixed acceptance limit	0.035	0.010	0.010
Air & Emissions	9423	1,2,3,4,7,8,9-Heptachlorodibenzofuran	0.050-1.0	± 40% at < 0.15 ± 20% ≥ 0.15 fixed acceptance limit	0.030	0.010	0.010
Air & Emissions	9519	1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin	0.10-1.5	± 25% at < 0.20 ± 20% ≥ 0.20 fixed acceptance limit	0.075	0.00010	0.00030

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Air & Emissions	9516	1,2,3,4,6,7,8,9-Octachlorodibenzofuran	0.10-1.5	± 30% at < 0.30 ± 20% ≥ 0.30 fixed acceptance limit	0.070	0.00010	0.00030
Air & Emissions	9376	Total Equivalents (TEQ) [WHO 1998]		See Footnote <sup>16</sup>	NA		
Air & Emissions	9377	Total Equivalents (TEQ) [WHO 2005]		See Footnote <sup>16</sup>	NA		
Air & Emissions	9661	Total PCDD/Fs		See Footnote <sup>17</sup>	NA		
Air & Emissions	9660	Total PCDDs		See Footnote <sup>17</sup>	NA		
Air & Emissions	9657	Total PCDFs		See Footnote <sup>17</sup>	NA		

<sup>1</sup> The audit samples presented exist in a liquid and/or solid form at ambient temperature after sample collection. The audit sample design is presented in the collection sample matrix (e.g., impinger solution, filter and/or adsorbent), in accordance with 40 CFR parts 51, 60, 61, and 63. As referenced in the CFR, gaseous matrix samples will be included as they are developed and approved by the TNI SSAS Program.

<sup>2</sup> Acceptance limits are set at the Mean ± 2 SD.

<sup>3</sup> TNI Audit Sample Reporting Limits (ASRLs) are provided as guidance to laboratories analyzing TNI SSAS samples. These levels are the lowest acceptable results that could be obtained from the lowest spike level for each analyte. The laboratory should report any positive result down to the ASRL. The laboratory should use an appropriate method that is sensitive enough to generate results at the ASRL shown. TNI ASRLs are also provided as guidance to SSAS Providers. At a minimum for all analytes with an assigned value of less than ASRL (<ASRL), the SSAS Provider should verify that the sample does not contain the analyte at a concentration greater than or equal to the ASRL.

<sup>4</sup> mg/dscm = milligrams per dry standard cubic meter. Dry gas sample volume for audit sample is equal to 1 dscm

<sup>5</sup> Prepared from Sulfuric Acid in HPLC-grade water.

<sup>6</sup> Prepared from Potassium Nitrate in HPLC-grade water.

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<sup>7</sup> Prepared from Sodium Fluoride in HPLC-grade water.

<sup>8</sup> Prepared from Potassium Chloride and Sodium Fluoride in HPLC-grade water.

<sup>9</sup> Prepared on Glass/Quartz Fiber Filter spiked with analytes diluted in 2% Nitric Acid.

<sup>10</sup> Mercury on Glass/Quartz (as appropriate) Fiber Filters audit sample design, historically, has been supplied in the liquid form to be spiked onto a filter at the laboratory due to the volatility of the analyte. Sample design is at the discretion of the SSAS Provider, but must be approved by the SSAS Provider Accreditor.

<sup>11</sup> Prepared using 2% Nitric Acid.

<sup>12</sup> Prepared with volatile organic compounds that condense at dry-ice temperatures (e.g., ketones) and volatile organic compounds that remain gaseous at dry-ice temperatures (e.g., Propane). Diluent gas is ultra-high purity Nitrogen that should contain 2-8% Carbon Dioxide. Acceptance limits are set at the Mean  $\pm$  2 SD. Mean =  $a \cdot T + b$ , SD =  $c \cdot T + d$ , where  $a=1.0041$ ,  $b=5.7461$ ,  $c=0.0643$ ,  $d=28.8995$ , and T is the assigned value.

<sup>13</sup> Prepared on Glass Fiber Filter spiked with Phenanthrene in Methylene Chloride.

<sup>14</sup> Toxic Equivalency Factor (TEF) is taken from the World Health Organization (WHO) TEFs, 1998 and 2005.

<sup>15</sup> Prepared on XAD-2 cartridge spiked with analytes in nonane. At a minimum each Dioxins and Furans on XAD-2 Cartridge audit standard must contain the following three analytes: 2,3,7,8-Tetrachlorodibenzo-p-dioxin, 1,2,3,7,8-Pentachlorodibenzo-p-dioxin and 2,3,4,7,8-Pentachlorodibenzofuran plus at least five additional dioxin or furans randomly selected from the analyte list.

<sup>16</sup> Total Equivalent (TEQ) acceptance limits are calculated by multiplying each dioxin and/or furan analyte acceptance limit by its individual TEF then totaling all individual acceptance limits. Any analyte not spiked in the audit sample and not found at or above the SSAS ASRL should be treated as a zero concentration when calculating the TEQ.

<sup>17</sup> Total Polychlorinated dibenzo-p-dioxins and Total Polychlorinated dibenzofurans (Total PCDD/Fs, Total PCDDs, and Total PCDFs) acceptance limits are calculated by adding together all individual dioxin and furan acceptance limits.