96-333

DEVELOPMENT OF TOXICS EMISSION FACTORS FROM SOURCE TEST DATA COLLECTED UNDER THE AIR TOXICS HOT SPOTS PROGRAM

Part II
Final Report
Volume II

Prepared for

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ATTACHMENT 1
ACRONYMS

ATTACHMENT 1. ACRONYMS

AB2588	Air Toxics "Hot Spots" Information and Assessment Act of 1987
AB	Afterburner
AF	Air Filter
AI	Ammonia Injection
Al	Aluminum
APC	Air Pollution Control
APS	Air Pollution Control System
ATEDS	Air Toxic Emission Data System
BAAQMD	Bay Area Air Quality Management District
BH	Baghouse
BTX	Benzene, Toluene, and Xylene
C	Cyclone or Carbon
CARB	California Air Resources Board
CB	Chevron Blade
CFS	Chemical Fume Suppressant
COC	Carbon Monoxide Oxidation Catalyst
CVAAS	Cold Vapor Atomic Absorption Spectrometry
CVR	Case Vapors Recovered
Cr	Chromium
DM	Demister
DMNP	Dist Mist NP mist suppressant
dscfm	Dry Standard Cubic Feet per Minute
dscf	Dry Standard Cubic Feet
EER	Energy and Environmental Research Corporation
EF	Emission Factor
EPA	Environmental Protection Agency
ESP	Electrostatic Precipitator
F	Filter of unknown type
F101	Fumetrol 101
F140	Fumetrol 140
FB	Foam Blanket
FBC	Fluidized Bed Combustor
FF	Fabric Filter
FI	Fume Incinerator
FPT	Floating Pinched Polypropylene Tubes
GFAAS	Graphite Furnace Atomic Absorption Spectrometry
H2S	Hydrogen Sulfide
HCHO	Formaldehyde
HCl	Hydrogen Chloride
HEPA	High Efficiency Particulate Arresting
HF	Hydrogen Fluoride
Hl	Hydrogen Chloride
HNO3	Nitric acid
HO	Halogenated Organics
Hp	Horse Power
HS	Hydrogen Sulfide
HVLP	High Volume Low Pressure
ICAP	Inductively Coupled Argon Plasma
ICE	Internal Combustion Engine
IS	Internal Standards
LD	Laboratory Data or Location Data
LI	Lime Injection
lbs/MMcf	Pounds per Million Cubic Feet

lbs/Mgal	Pounds per Thousand Gallons
lbs/drum	Pounds per Drum
lbs/gal paint	Pounds per Gallon Paint
lbs/lbs powder	Pounds per Pounds Powder
lbs/lbs production	Pounds per Pounds Production
lbs/ton	Pounds per Ton
lbs/ton coke	Pounds per Ton Coke
lbs/ton production	Pounds per Ton Production
ME	Mist Eliminator
MMBtu	Million British Thermal Units
MC	Multicyclone
MMcf	Million Cubic Feet
MDL	Method Detection Limit
Mgal	Thousand Gallons
mg/amp-hr	Milligram per Amp-hour
MMT	Multiple Metals Train
MP	Mesh Pad
Ni	Nickel
NIOSH	National Institute of Occupation Safety and Hazard
NOx	Nitrogen oxides
O2	Oxygen
O	Oxygen
PA	Paint Arrestor
PB	Polyballs
PBS	Packed Bed Scrubber
PAH	Polycyclic Aromatic Hydrocarbons
PCB	Polychlorinated Biphenyls
PCDD	Polychlorinated Dibenzo-p-dioxin
PCDF	Polychlorinated Dibenzofuran
PE	Polyurethane
ppbv	Parts per Billion Volume
PQL	Practical Quantitation Limit
QA/QC	Quality Assurance/Quality Control
RFG	Refinery Fuel Gas
ROC	Reactive Organic Compound
RSD	Relative Standard Deviation
S	Scrubber of unknown type
SCAQMD	South Coast Air Quality Management District
SCC	Source Classification Code
SCR	Selective Catalytic Reduction
SD	Spray Dryer
SIC	Standard Industrial Classification
SNCR	Selective Non Catalytic Reduction
SO2	Sulfur Dioxide
SVOC	Semi-Volatile Organic Compounds
THC	Total Hydrocarbons
Ti	Titanium
TO	Thermal Oxidizer
VC	Vinyl Chloride
VOC	Volatile Organic Compound
WC	Water Curtain
WS	Wet Scrubber
WSN	Water Spray Nozzle
WSPA	Western States Petroleum Association
WT	Water Trough

ATTACHMENT 2
TEST REPORT INVENTORY AND REVIEW STATUS

ATTACHMENT 2. TEST REPORT INVENTORY AND REVIEW STATUS.

Report ID	Device ID	Tests	Device Type	Material Used	Fugitive	Collect	Review	Screen	Detail	Comment	Calculation Check
2065A	**	7	?	?	No	Part 1	Part 1	Fail	na	1	**
2080A	**	1	?	?	No	Part 1	Part 1	Fail	na	1	**
2301A	**	1	?	?	No	Part 1	Part 1	Fail	na	1	**
2369A	**	2	?	?	No	Part 1	Part 1	Fail	na	1	**
2435A	**	1	?	?	No	Part 1	Part 1	Fail	na	1	**
2663A	**	1	?	?	Yes	Part 2	Part 2	Fail	na	23	na
2663A	**	1	?	?	Yes	Part 2	Part 2	Fail	na	23	na
2663A	**	1	?	?	Yes	Part 2	Part 2	Fail	na	23	na
2663A	**	1	?	?	Yes	Part 2	Part 2	Fail	na	23	na
2649A	**	1	?	?	Yes	Part 2	Part 2	Fail	na	23	na
2650A	**	1	?	?	Yes	Part 2	Part 2	Fail	na	23	na
2651A	**	1	?	?	Yes	Part 2	Part 2	Fail	na	23	na
2648A	**	1	?	Gas	Yes	Part 2	Part 2	Fail	na	23	na
2656A	**	1	?	Lube oil	Yes	Part 2	Part 2	Fail	na	23	na
2657A	**	1	?	Soil	Yes	Part 2	Part 2	Fail	na	23	na
2658A	**	1	?	Solvent	Yes	Part 2	Part 2	Fail	na	23	na
2660A	**	1	Above graound storage tank	?	Yes	Part 2	Part 2	Fail	na	23	na
2643A	301	1	Abrasive blasting	Dust	Yes	Part 2	Part 2	Pass	Pass		na
2660A	**	1	Acid gas inlet	?	Yes	Part 2	Part 2	Fail	na	23	na
2642A	319	1	Aeration basin	Wastewater	Yes	Part 2	Part 2	Pass	Pass		na
2084A	**	1	Aggregate, bleacher	?	No	Part 1	Part 1	Fail	na	1	**
2089A	**	1	Aggregate, plant	Aggregate	No	Part 1	Part 1	Fail	na	1	**
2091A	**	1	Aggregate, predryer	?	No	Part 1	Part 1	Fail	na	1	**
2092A	**	1	Aggregate, screening plant	Aggregate	No	Part 1	Part 1	Fail	na	1	**
2524A	234	1	Anodizing tank	Aluminum	No	Part 1	Part 2	Pass	Pass		P
2599L	160	2	Asphalt blowing with blow/no blow cycle	Asphalt fumes	No	Part 1	Part 1	Pass	Pass	9	P
2077A	**	1	Asphalt production	Aggregate	No	Part 1	Part 2	Fail	na	10	**
2149A	**	1	Asphalt production	Aggregate	No	Part 1	Part 2	Fail	na	10	**
2169A	**	1	Asphalt production	Aggregate	No	Part 1	Part 2	Fail	na	21	**
2582A	**	1	Asphalt production	Aggregate	No	Part 1	Part 2	Fail	na	26	**
2194A	216	1	Asphalt production	Asphalt	No	Part 1	Part 2	Pass	Pass		NR
2364A	214	1	Asphalt production	Back-up oil/Aggregate/asphalt	No	Part 1	Part 2	Pass	Pass		ND-430
2365A	215	1	Asphalt production	Back-up oil/Rocks/sand/petroleum	No	Part 1	Part 2	Pass	Pass	9	ND-430
2193A	217	1	Asphalt production	Natural gas/Flux	No	Part 1	Part 2	Pass	Pass		NR
2099A		1	Asphalt production, crusher	Aggregate	No	Part 1	Part 2	Pass	Review		
2372A	159	1	Asphalt production, drum dryer	Aggregate, Diesel	No	Part 1	Part 1	Pass	Pass	9	P
2449A	164	1	Asphalt production, drum dryer	Aggregate, Diesel	No	Part 1	Part 1	Pass	Pass		P
2567A	423	1	Asphalt production, drum dryer	Aggregate, Diesel	No	Part 1	Part 1	Pass	Pass	12,13	P
2387A	624	1	Asphalt production, drum dryer	Aggregate, Natural gas	No	Part 1	Part 1	Pass	Pass	9	P
2371A	**	1	Asphalt production, dryer/mixer	Aggregate	No	Part 1	Part 1	Fail	na	1	**
2453A	**	1	Asphalt production, handling	Aggregate	No	Part 1	Part 1	Fail	na	1	**
2371B	**	1	Asphalt production, hot oil heater	Aggregate	No	Part 1	Part 1	Fail	na	1	**
2345A	**	1	Asphalt production, mixer	Aggregate	No	Part 1	Part 1	Fail	na	1	**
2588A	**	1	Asphalt production, mixer	Aggregate	No	Part 1	Part 2	Fail	na	26	**

ATTACHMENT 2. TEST REPORT INVENTORY AND REVIEW STATUS.

Report ID	Device ID	Tests	Device Type	Material Used	Fugitive	Collect	Review	Screen	Detail	Comment	Calculation Check
2592A	**	1	Asphalt production, mixer	Aggregate	No	Part 1	Part 2	Fail	na	26	**
2654A	349	1	Asphalt production, rock pile	Dust	Yes	Part 2	Part 2	Pass	Pass		na
2655A	350	1	Asphalt production, rock pile	Dust	Yes	Part 2	Part 2	Pass	Pass		na
2393A	**	1	Asphalt production, rotary dryer	Aggregate	No	Part 1	Part 1	Pass	Fail	Fail Calc	F-All
2382A	**	1	Asphalt production, rotary dryer	Aggregate	No	Part 1	Part 1	Fail	na	1	**
2008A	105	1	Asphalt production, rotary dryer	Aggregate, Diesel	No	Part 1	Part 1	Pass	Pass		P
2008C	103	1	Asphalt production, rotary dryer	Aggregate, Natural gas	No	Part 1	Part 1	Pass	Pass		P
2008D	104	1	Asphalt production, rotary dryer	Aggregate, Natural gas	No	Part 1	Part 1	Pass	Pass		P
2150A	165	1	Asphalt production, rotary dryer	Aggregate, Natural gas	No	Part 1	Part 1	Pass	Pass	9	ND
2370A	623	1	Asphalt production, rotary dryer	Aggregate, Natural gas	No	Part 1	Part 1	Pass	Pass		P
2391A	158	1	Asphalt production, rotary dryer	Aggregate, Oil	No	Part 1	Part 1	Pass	Pass	9	P
2008B	106	1	Asphalt production, rotary dryer	Aggregate, Process Oil 70	No	Part 1	Part 1	Pass	Pass		P
2644A	296	1	Asphalt production, various	Rock plant mine feed	Yes	Part 2	Part 2	Pass	Pass		na
2644A	297	1	Asphalt production, various	Specialty mine feed	Yes	Part 2	Part 2	Pass	Pass		na
2587A	**	1	Asphalt roofing	Roofing material	No	Part 1	Part 2	Fail	na	26	**
2499A	**	1	Asphalt roofing plant, applicator vac	?	No	Part 1	Part 1	Fail	na	1	**
2499B	**	1	Asphalt roofing plant, control vac	?	No	Part 1	Part 1	Fail	na	1	**
2499D	**	1	Asphalt roofing plant, doorway	?	No	Part 1	Part 1	Fail	na	1	**
2660A	**	1	Balance tank outlet evaporative cooler	?	Yes	Part 2	Part 2	Fail	na	23	na
2163C	**	1	Ball mill	Pc boards	No	Part 1	Part 1	Fail	na	1	**
2307A	**	1	Batch-mixing of polyester resin	Formaldehyde	No	Part 1	Part 1	Fail	na	1	**
2619A	**	1	Batteries	?	No	Part 2	Part 2	Fail	na	10	**
2304F	**	1	Batteries, Baghouse	Lb oxide	No	Part 1	Part 2	Fail	na	1	**
2304I	**	1	Batteries, Ball mill	Lb oxide	No	Part 1	Part 2	Fail	na	1	**
2304D	280	1	Batteries, Cast on strap line	Batteries	No	Part 1	Part 2	Pass	Pass		P
2304G	**	1	Batteries, CVS	Batteries/plates	No	Part 1	Part 2	Fail	na	1	**
2304B	281	1	Batteries, Grid casting	Grids	No	Part 1	Part 2	Pass	Pass		P
2304C	**	1	Batteries, Oven	Plates	No	Part 1	Part 2	Fail	na	1	**
2304H	**	1	Batteries, Pasting line	Plates	No	Part 1	Part 2	Fail	na	1	**
2304A	282	1	Batteries, Post pour	Batteries	No	Part 1	Part 2	Pass	Pass		P
2304E	**	1	Batteries, Remelt	Metal	No	Part 1	Part 2	Fail	na	1	**
2069A	**	1	Battery, crushing system	Batteries	No	Part 1	Part 1	Fail	na	1	**
2170B	**	1	Battery, grid caster	Batteries	No	Part 1	Part 1	Fail	na	1	**
2170A	**	1	Battery, production facility	Metal	No	Part 1	Part 1	Fail	na	1	**
2303A	**	1	Battery, production facility	Metal	No	Part 1	Part 1	Fail	na	1	**
2094B	**	1	Bicarbonate fluid bed	Borax, salt cake	No	Part 1	Part 2	Fail	na	21	**
2094A	**	1	Bicarbonate milling/screening	Borax, salt cake	No	Part 1	Part 2	Fail	na	21	**
2468A	**	1	Bioventing system	Vapor	No	Part 1	Part 1	Fail	na	1	**
2040B	**	1	Boiler	?	No	Part 1	Part 1	Fail	na	1	**
2379A	**	1	Boiler	?	No	Part 1	Part 1	Fail	na	1	**
2505A	**	1	Boiler	?	No	Part 1	Part 1	Fail	na	1	**
2636A	**	1	Boiler	?	No	Part 2	Part 2	Fail	na	1	**
2023A	**	1	Boiler	?	No	Part 1	Part 2	Fail	na	21	**
2623A	279	1	Boiler	Coal/coke	No	Part 2	Part 2	Pass	Pass		P

ATTACHMENT 2. TEST REPORT INVENTORY AND REVIEW STATUS.

Report ID	Device ID	Tests	Device Type	Material Used	Fugitive	Collect	Review	Screen	Detail	Comment	Calculation Check
2095A	218	1	Boiler	Coal/natural gas	No	Part 1	Part 2	Pass	Pass	18	P
2570A	**	1	Boiler	Coke	No	Part 1	Part 1	Fail	na	1	**
2644A	**	1	Boiler	Diesel	Yes	Part 2	Part 2	Fail	na	23	na
2596A	161	1	Boiler	Diesel	No	Part 1	Part 1	Pass	Pass		P
2395B	179	1	Boiler	Diesel	No	Part 1	Part 1	Pass	Pass		P
2395B	180	1	Boiler	Diesel	No	Part 1	Part 1	Pass	Pass		NR
2395B	181	1	Boiler	Diesel	No	Part 1	Part 1	Pass	Pass		NR
2101B	415	1	Boiler	Diesel	No	Part 1	Part 1	Pass	Pass	9,12	ND
2426A	422	1	Boiler	Diesel	No	Part 1	Part 1	Pass	Pass	9	P
2450A	428	1	Boiler	Diesel	No	Part 1	Part 1	Pass	Pass		ND
2051A	**	2	Boiler	Diesel/pitch	No	Part 1	Part 1	Fail	na	1	**
2621A	**	1	Boiler	Dust	No	Part 2	Part 2	Fail	na	1	**
2549B	102	1	Boiler	Fuel oil	No	Part 1	Part 1	Pass	Pass	9	NR
2001B	**	1	Boiler	Fuel oil No.6	No	Part 1	Part 2	Fail	na	1	**
2572A	**	1	Boiler	Fuel oil No.6	No	Part 1	Part 2	Fail	na	22	**
2572B	**	1	Boiler	Fuel oil No.6	No	Part 1	Part 2	Fail	na	22	**
2487A	645	1	Boiler	Fuel oil no.6	No	Part 1	Part 2	Pass	Pass		P
2563A	**	1	Boiler	Landfill gas	No	Part 1	Part 2	Fail	na	13	**
2153A	**	1	Boiler	Landfill gas	No	Part 1	Part 2	Fail	na	21	**
2317B	100	1	Boiler	Landfill gas	No	Part 1	Part 1	Pass	Pass	5,9	P
2570B	**	1	Boiler	Natural gas	No	Part 1	Part 1	Fail	na	1	**
2577A	**	1	Boiler	Natural gas	No	Part 1	Part 2	Fail	na	26	**
2533A	138	1	Boiler	No 6 fuel oil	No	Part 1	Part 1	Pass	Pass	9	
2552A	128	1	Boiler	No. 6 fuel oil	No	Part 1	Part 1	Pass	Pass	9	P
2484A	142	1	Boiler	No. 6 fuel oil	No	Part 1	Part 1	Pass	Pass	3	P
2483A	143	1	Boiler	No. 6 fuel oil	No	Part 1	Part 1	Pass	Pass	9	P
2011A	604	1	Boiler	No. 6 fuel oil	No	Part 1	Part 1	Pass	Pass	9	P
2026A	606	1	Boiler	No. 6 fuel oil	No	Part 1	Part 1	Pass	Pass	9	
2600A	261	1	Boiler	Refinery fuel gas	No	Part 2	Part 2	Pass	Pass		P
2599B	505	1	Boiler	Refinery fuel gas	No	Part 1	Part 2	Pass	Pass	9	P
2599E	508	1	Boiler	Refinery fuel gas	No	Part 1	Part 2	Pass	Pass	9	P
2599G	642	1	Boiler	Refinery fuel gas	No	Part 1	Part 2	Pass	Pass	9	P
2599H	643	1	Boiler	Refinery fuel gas	No	Part 1	Part 2	Pass	Pass	9	P
2599F	646	1	Boiler	Refinery fuel gas	No	Part 1	Part 2	Pass	Pass		P
2396A	434	1	Boiler	Residual fuel	No	Part 1	Part 1	Pass	Pass		P
2579A	**	1	Boiler	Rice hull	No	Part 1	Part 1	Fail	na	1	**
2002A	**	1	Boiler	Waste, municipal	No	Part 1	Part 2	Fail	na	22	**
2535A	**	1	Boiler	Wood	No	Part 1	Part 1	Fail	na	1	**
2622A	**	1	Boiler	Wood	No	Part 2	Part 2	Fail	na	22	**
2571A	**	1	Boiler	Wood	No	Part 1	Part 2	Fail	na	22	**
2493A	137	1	Boiler	Wood	No	Part 1	Part 1	Pass	Pass		F-430
2621B	**	1	Boiler	Wood shavings	No	Part 2	Part 2	Fail	na	1	**
2621C	**	1	Boiler	Wood shavings	No	Part 2	Part 2	Fail	na	1	**
2577B	**	1	Boiler	Wood waste, natural gas	No	Part 1	Part 1	Fail	na	1	**

ATTACHMENT 2. TEST REPORT INVENTORY AND REVIEW STATUS.

Report ID	Device ID	Tests	Device Type	Material Used	Fugitive	Collect	Review	Screen	Detail	Comment	Calculation Check
2576B	**	1	Boiler	Wood waste/natural gas	No	Part 1	Part 1	Fail	na	1	**
2512A	201	1	Boiler	Wood/biomass	No	Part 1	Part 2	Pass	Pass	16	P
2122A	**	1	Boiler, CO	?	No	Part 1	Part 1	Fail	na	1	**
2122B	**	1	Boiler, CO	Coke	No	Part 1	Part 1	Fail	na	1	**
2494A	**	1	Boiler, reboiler	Gas	No	Part 1	Part 1	Fail	na	1	**
2518A	**	4	Boiler, rendering plant	?	No	Part 1	Part 1	Fail	na	1	**
2525A	631	1	Boiler, utility	No. 6 fuel oil	No	Part 1	Part 1	Pass	Pass	9	P
2027A	**	2	Boiler, utility	No. 6 fuel oil/Natural gas	No	Part 1	Part 1	Pass	Fail	15	**
2424A	630	2	Boiler, utility	No. 6 fuel oil/Natural gas	No	Part 1	Part 1	Pass	Pass	9	P
2378A	633	2	Boiler, utility	No. 6 fuel oil/Natural gas	No	Part 1	Part 1	Pass	Pass	9	F-425,430
2419A	634	2	Boiler, utility	No. 6 fuel oil/Natural gas	No	Part 1	Part 1	Pass	Pass	9	P
2093A	**	1	Borax dryer	Borax	No	Part 1	Part 2	Fail	na	21	**
2094C	**	1	Borax dryer	Borax, salt cake	No	Part 1	Part 2	Fail	na	21	**
2177A	**	1	Boric acid reactor	Ore, sulfuric acid & liquor	No	Part 1	Part 2	Fail	na	26	**
2037B	**	1	Bromine liquid ring	?	No	Part 1	Part 1	Fail	na	1	**
2037A	**	1	Bromine storage tank	?	No	Part 1	Part 1	Fail	na	1	**
2447A	**	1	Bulk terminal	Gasoline	No	Part 1	Part 1	Fail	na	1	**
2578A	**	1	Bulk terminal (vapor recovery)	Gasoline	No	Part 1	Part 2	Fail	na	10	**
2175A	**	1	Burn platform	?	No	Part 1	Part 1	Fail	na	1	**
2411A	**	1	Carbon canister	Carbon	No	Part 1	Part 2	Fail	na	21	**
2462A	**	1	Catalytic oxidizer	?	No	Part 1	Part 1	Fail	na	1	**
2408A	**	1	Catalytic reformer	Oil	No	Part 1	Part 1	Fail	na	1	**
2029A	**	1	Chemical process	?	No	Part 1	Part 1	Fail	na	1	**
2078A	**	1	Chemical process	Waste	No	Part 1	Part 1	Fail	na	1	**
2312C	**	2	Chlorinator/clarification tanks	Chlorine	No	Part 1	Part 1	Fail	na	1	**
2660A	**	1	Claus sulfur	?	Yes	Part 2	Part 2	Fail	na	23	na
2618A	**	1	Cleaning line	None	No	Part 2	Part 2	Fail	na	24	**
2637A	**	1	Coating line	Solvent	Yes	Part 2	Part 2	Fail	na	23	na
2197A	211	1	Coating operation	Acrylic enamel systems	No	Part 1	Part 2	Pass	Pass		ND-425,12
2360A	**	1	Coating operation	Aluminum	No	Part 1	Part 1	Fail	na	1	**
2334A	210	1	Coating operation	Barium chromate primer	No	Part 1	Part 2	Pass	Pass		P
2565A	**	1	Coating operation	Magnetic tape	No	Part 1	Part 1	Fail	na	1	**
2529B	252	1	Coating operation	Ni/Al thermal spray powder	No	Part 1	Part 2	Pass	Pass		P
2346A	**	1	Coating operation	Paint	No	Part 1	Part 1	Fail	na	1	**
2615A	**	1	Coating operation	Paint	No	Part 2	Part 2	Fail	na	10,22	**
2160A		1	Coating operation	Paint	No	Part 1	Part 2	Pass	Review		
2333A	209	1	Coating operation	Poly-amide paint	No	Part 1	Part 2	Pass	Pass		P
2610A	273	1	Coating operation	Solvent reducible paint	No	Part 2	Part 2	Pass	Pass		P
2609A	270	1	Coating operation	Water reducible paint	No	Part 2	Part 2	Pass	Pass		P
2620A	278	1	Coating operation	Water reducible paint	No	Part 2	Part 2	Pass	Pass		P
2465A	**	2	Coating operation, dipping lines	Solvents and silicon solids	No	Part 1	Part 1	Fail	na	1	**
2473A	611	1	Coating operation, paint booth	Green primer	No	Part 1	Part 1	Pass	Pass		P
2473A	613	1	Coating operation, paint booth	Green primer	No	Part 1	Part 1	Pass	Pass		NR
2473A	615	1	Coating operation, paint booth	Green primer	No	Part 1	Part 1	Pass	Pass		NR

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Report ID	Device ID	Tests	Device Type	Material Used	Fugitive	Collect	Review	Screen	Detail	Comment	Calculation Check
2473A	612	2	Coating operation, paint booth	Green primer/Green polyurethane	No	Part 1	Part 1	Pass	Pass		NR
2473A	614	2	Coating operation, paint booth	Green primer/Green polyurethane	No	Part 1	Part 1	Pass	Pass		NR
2473A	616	2	Coating operation, paint booth	Green primer/Green polyurethane	No	Part 1	Part 1	Pass	Pass		NR
2473A	617	2	Coating operation, paint booth	Green primer/Green polyurethane	No	Part 1	Part 1	Pass	Pass		NR
2473A	618	2	Coating operation, paint booth	Green primer/Green polyurethane	No	Part 1	Part 1	Pass	Pass		NR
2195A	**	1	Coating operation, paint booth	Paint	No	Part 1	Part 1	Fail	na	1	**
2031A	**	1	Coating operation, paint booth	Paint	No	Part 1	Part 1	Fail	na	1	**
2044A	**	1	Coating operation, paint booth	Paint	No	Part 1	Part 1	Fail	na	1	**
2060A	**	8	Coating operation, paint booth	Paint	No	Part 1	Part 1	Fail	na	1	**
2066A	**	1	Coating operation, paint booth	Paint	No	Part 1	Part 1	Fail	na	1	**
2328A	**	1	Coating operation, paint booth	Paint	No	Part 1	Part 1	Fail	na	1	**
2335A	**	8	Coating operation, paint booth	Paint	No	Part 1	Part 1	Fail	na	1	**
2336A	**	1	Coating operation, paint booth	Paint	No	Part 1	Part 1	Fail	na	1	**
2555A	**	1	Coating operation, paint booth	Paint	No	Part 1	Part 1	Fail	na	1	**
2473A	619	1	Coating operation, paint booth	Yellow polyurethane	No	Part 1	Part 1	Pass	Pass		NR
2572D	**	2	Coating operation, pine	Paint/natural gas	No	Part 1	Part 1	Fail	na	1	**
2397A	607	3	Coating operation, plasma arc	3 difference powder coatings	No	Part 1	Part 1	Pass	Pass		P
2140A	602	4	Coating operation, plasma arc	4 difference powder coatings	No	Part 1	Part 1	Pass	Pass		P
2126A	**	1	Cogeneration	?	No	Part 1	Part 1	Fail	na	1	**
2151A	**	2	Cogeneration	Diesel	No	Part 1	Part 1	Fail	na	1	**
2151B	**	2	Cogeneration	Diesel	No	Part 1	Part 1	Fail	na	1	**
2366A	**	1	Cogeneration	Diesel/natural gas	No	Part 1	Part 1	Fail	na	1	**
2354A	**	1	Cogeneration	Natural gas	No	Part 1	Part 1	Fail	na	1	**
2506A	**	1	Cogeneration	Natural gas	No	Part 1	Part 2	Fail	na	26	**
2581A	**	1	Cogeneration	Natural/digester gas	No	Part 1	Part 1	Fail	na	1	**
2605A	263	1	Cogeneration unit	Natural gas/refinery gas	No	Part 2	Part 2	Pass	Pass		F-430
2607F	272	1	Cogeneration unit	Natural gas/refinery gas	No	Part 2	Part 2	Pass	Pass		ND-ALL
2607E	271	1	Cogeneration unit	Natural gas/refinery gas/butane	No	Part 2	Part 2	Pass	Pass		ND-ALL
2327A	**	1	Coker	Coke	No	Part 1	Part 1	Fail	na	1	**
2180A	**	1	Cooling tower	Polysulfide/polyurethane	No	Part 1	Part 1	Fail	na	1	**
2642A	321	1	Daf tank	Wastewater	Yes	Part 2	Part 2	Pass	Pass		na
2343A	**	1	Degreasing operation	?	No	Part 1	Part 1	Fail	na	1	**
2630A	289	1	Dehydrator	Natural gas/Glycol	No	Part 2	Part 2	Pass	Pass		NONE
2118A	212	1	Dehydrator	Natural gas/Sludge	No	Part 1	Part 2	Pass	Pass		ND-MMT
2584A	**	2	Dehydrator	Vegetable	No	Part 1	Part 1	Fail	na	1	**
2324A	233	1	Delaquering	Aluminum	No	Part 1	Part 2	Pass	Pass		P
2076A	626	4	Devolatizer/Extruder/Mix Tank/Reactor	Styrene monomer	No	Part 1	Part 1	Pass	Pass	11	
2079A	**	1	Dryer	Boric acid	No	Part 1	Part 1	Fail	na	1	**
2353A	249	1	Dryer	Diesel/Specialty sand	No	Part 1	Part 2	Pass	Pass		ND-430
2532A	**	1	Dryer	Dry pet food	No	Part 1	Part 1	Fail	na	1	**
2575A	205	1	Dryer	Fiberboard	No	Part 1	Part 2	Pass	Pass		P
2082A	250	1	Dryer	Pot ash	No	Part 1	Part 2	Pass	Pass		P
2085A	251	1	Dryer	Sulfate of pot ash	No	Part 1	Part 2	Pass	Pass		P
2572C	**	1	Dryer, molded line	Natural gas/steam	No	Part 1	Part 2	Fail	na	21	**

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Report ID	Device ID	Tests	Device Type	Material Used	Fugitive	Collect	Review	Screen	Detail	Comment	Calculation Check
2050A	**	1	Evacuated sterilization chamber	Ethylene oxide	No	Part 1	Part 2	Fail	na	13	**
2483B	**	1	Feed mill cyclone	Grain	No	Part 1	Part 2	Fail	na	26	**
2479A	**	2	Fermentation tanks	Yeast	No	Part 1	Part 1	Fail	na	1	**
2120A	**	1	Fertilizer pelletizing unit	Sludge	No	Part 1	Part 1	Fail	na	1	**
2652A	308	1	Flanges	Crude oil	Yes	Part 2	Part 2	Pass	Pass		na
2638A	298	1	Flanges	Field gas	Yes	Part 2	Part 2	Pass	Pass		na
2646A	314	1	Flanges	Field gas	Yes	Part 2	Part 2	Pass	Pass		na
2154A	**	1	Flare	?	No	Part 1	Part 1	Fail	na	1	**
2316A	**	1	Flare	Landfill gas	No	Part 1	Part 2	Fail	na	26	**
2317A	203	1	Flare	Landfill gas	No	Part 1	Part 2	Pass	Pass		NR
2350A	213	1	Flare	Landfill gas	No	Part 1	Part 2	Pass	Pass	9	P
2624A	284	1	Flare	Landfill gas	No	Part 2	Part 2	Pass	Pass		F-ALL
2068A	**	1	Fluid catalytic cracking unit	Carbon & hydrocarbons	No	Part 1	Part 1	Fail	na	1	**
2122C	**	1	Fluid catalytic cracking unit	Carbon & hydrocarbons	No	Part 1	Part 1	Fail	na	1	**
2125A	**	1	Fluid catalytic cracking unit	Carbon & hydrocarbons	No	Part 1	Part 1	Fail	na	1	**
2320A	**	1	Fluid catalytic cracking unit	Carbon & hydrocarbons	No	Part 1	Part 1	Fail	na	1	**
2326A	**	1	Fluid catalytic cracking unit	Carbon & hydrocarbons	No	Part 1	Part 1	Fail	na	1	**
2613A	**	1	Fluid Catalytic Cracking Unit	Oils	No	Part 2	Part 2	Fail	na	1,21	**
2602A	260	1	Fluid Catalytic Cracking Unit	Refinery fuel gas/Oils	No	Part 2	Part 2	Pass	Pass		F-430
2508A	413	1	Fluidized bed combustion	Wood waste	No	Part 1	Part 1	Pass	Pass		F-430
2537A	139	1	Fluidized bed combustor	Agricultural waste	No	Part 1	Part 1	Pass	Pass	9	P
2549A	101	1	Fluidized bed combustor	Coal	No	Part 1	Part 1	Pass	Pass	9	P
2116A	431	1	Fluidized bed combustor	Coal	No	Part 1	Part 1	Pass	Pass		ND-430
2500A	601	1	Fluidized bed combustor	Coal	No	Part 1	Part 1	Pass	Pass	9	P
2544A	603	1	Fluidized bed combustor	Coal	No	Part 1	Part 1	Pass	Pass	3	P
2550A	605	1	Fluidized bed combustor	Coal	No	Part 1	Part 1	Pass	Pass	3	F-430
2491A	635	1	Fluidized bed combustor	Coal	No	Part 1	Part 1	Pass	Pass		F-430
2547B	**	1	Fluidized bed combustor	Coke	No	Part 1	Part 2	Fail	na	26	**
2425A	640	1	Fluidized bed combustor	Coke	No	Part 1	Part 1	Pass	Pass	9	P
2421A	641	1	Fluidized bed combustor	Coke	No	Part 1	Part 1	Pass	Pass	9	P
2547A	**	1	Fluidized bed combustor	Coke/natural gas	No	Part 1	Part 2	Fail	na	15	**
2660A	**	1	Fuel gas	?	Yes	Part 2	Part 2	Fail	na	23	na
2145A	**	1	Fugitives	Crude oil	No	Part 1	Part 1	Fail	na	1	**
2439A	**	1	Fugitives	Natural gas	No	Part 1	Part 1	Fail	na	1	**
2204A		1	Fugitives, Air analysis at landfill	Landfill gas	No	Part 1	Part 2	Pass	Review		
2206A		1	Fugitives, Air analysis at landfill	Landfill gas	No	Part 1	Part 2	Pass	Review		
2438A	**	1	Fugitives, analysis of produced gas	Produced gas	No	Part 1	Part 2	Fail	na	26	**
2323A	**	1	Fugitives, butadiene process lines	1,3-butadiene	No	Part 1	Part 1	Fail	na	1	**
2466A	**	1	Fugitives, crude oil storage tank vapor	Gas	No	Part 1	Part 1	Fail	na	1	**
2483D	**	1	Fugitives, diesel refuel station	Diesel	No	Part 1	Part 2	Fail	na	26	**
2064A	**	1	Fugitives, gasoline loading operation	Gasoline	No	Part 1	Part 2	Fail	na	10	**
2663A	324	1	Fugitives, misc.	Casing gas/natural gas	Yes	Part 2	Part 2	Pass	Pass		na
2663A	325	1	Fugitives, misc.	Casing gas/natural gas	Yes	Part 2	Part 2	Pass	Pass		na
2663A	327	1	Fugitives, misc.	Crude oil	Yes	Part 2	Part 2	Pass	Pass		na

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2663A	328	1	Fugitives, misc.	Diesel	Yes	Part 2	Part 2	Pass	Pass		na
2663A	329	1	Fugitives, misc.	Lube oil	Yes	Part 2	Part 2	Pass	Pass		na
2663A	330	1	Fugitives, misc.	Lube oil	Yes	Part 2	Part 2	Pass	Pass		na
2665A	340	1	Fugitives, misc.	Lube oil	Yes	Part 2	Part 2	Pass	Pass		na
2661A	332	1	Fugitives, misc.	Sour water	Yes	Part 2	Part 2	Pass	Pass		na
2101D	**	1	Fugitives, natural gas fuel line	Natural gas	No	Part 1	Part 2	Fail	na	21	**
2466B	**	1	Fugitives, oil sample	Oil	No	Part 1	Part 1	Fail	na	1	**
2054A	**	1	Fugitives, well	Petroleum	No	Part 1	Part 1	Fail	na	1	**
2614A	**	1	Furnace	?	No	Part 2	Part 2	Fail	na	1,21,22	**
2517B	**	1	Furnace	Aluminum	No	Part 1	Part 1	Fail	na	1	**
2368B	**	1	Furnace	Aluminum cans	No	Part 1	Part 1	Fail	na	1	**
2368C	**	1	Furnace	Aluminum cans	No	Part 1	Part 1	Fail	na	1	**
2368D	**	1	Furnace	Aluminum dross	No	Part 1	Part 1	Fail	na	1	**
2339A	**	1	Furnace	Brass	No	Part 1	Part 1	Fail	na	1	**
2517A	**	1	Furnace	Cast iron	No	Part 1	Part 1	Fail	na	1	**
2129A	**	1	Furnace	Diesel	No	Part 1	Part 2	Fail	na	21	**
2531A	200	1	Furnace	Fuel oil no.6	No	Part 1	Part 2	Pass	Pass		P
2176A	**	2	Furnace	Gold, silver	No	Part 1	Part 1	Fail	na	1	**
2432A	**	1	Furnace	Light hydrocarbon	No	Part 1	Part 1	Fail	na	1	**
2368A	**	1	Furnace	Magnesium dross	No	Part 1	Part 1	Fail	na	1	**
2309A	**	1	Furnace	Metal	No	Part 1	Part 1	Fail	na	1	**
2164A	**	1	Furnace	Pc boards	No	Part 1	Part 2	Fail	na	21	**
2517C	**	1	Furnace	Steel	No	Part 1	Part 1	Fail	na	1	**
2517D	**	1	Furnace	Steel	No	Part 1	Part 1	Fail	na	1	**
2338A	**	3	Furnace, aluminum ignots	Aluminum	No	Part 1	Part 1	Fail	na	1	**
2381D	**	1	Furnace, annealing	Metal	No	Part 1	Part 1	Fail	na	1	**
2499C	**	1	Furnace, asphalt roofing plant	?	No	Part 1	Part 1	Fail	na	1	**
2310A	**	1	Furnace, brass melting	Brass	No	Part 1	Part 2	Fail	na	21	**
2010A	223	1	Furnace, Carbon	Precarbonized rayon	No	Part 1	Part 2	Pass	Pass	3	F-430
2312B	**	1	Furnace, charcoal	Activated carbon & natural gas	No	Part 1	Part 1	Fail	na	1	**
2025B	155	1	Furnace, chip melter	Aluminum	No	Part 1	Part 1	Pass	Pass		P
2203A	**	1	Furnace, crucible	Steel wool & gold	No	Part 1	Part 1	Fail	na	1	**
2433A	**	1	Furnace, cupola	Grey iron	No	Part 1	Part 1	Fail	na	1	**
2134A	**	1	Furnace, cupola	Iron, coke, limestone	No	Part 1	Part 1	Pass	Fail	14	**
2053B	**	1	Furnace, dross	Aluminum	No	Part 1	Part 1	Fail	na	2	**
2053B	152	1	Furnace, dross	Aluminum	No	Part 1	Part 1	Pass	Pass	6	P
2004A	162	1	Furnace, electric induction air melt	Alloy stock	No	Part 1	Part 1	Pass	Pass		P
2551A	**	1	Furnace, float glass	Silica sand, dolomite, etc.	No	Part 1	Part 1	Fail	na	1	**
2128A	**	4	Furnace, glass	Glass	No	Part 1	Part 1	Fail	na	1	**
2359A	**	1	Furnace, glass	Glass	No	Part 1	Part 1	Fail	na	1	**
2417B	**	1	Furnace, glass	Glass	No	Part 1	Part 1	Fail	na	1	**
2417C	**	2	Furnace, glass	Glass	No	Part 1	Part 1	Fail	na	1	**
2538A	**	2	Furnace, glass	Glass	No	Part 1	Part 1	Fail	na	1	**
2373A	**	1	Furnace, glass	Limestone, soda ash	No	Part 1	Part 1	Fail	na	1	**

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2548A	416	1	Furnace, glass	Sand, limestone, soda	No	Part 1	Part 1	Pass	Pass		P
2340A	129	1	Furnace, glass	Sand, limestone, soda ash	No	Part 1	Part 1	Pass	Pass		P
2340A	130	1	Furnace, glass	Sand, limestone, soda ash	No	Part 1	Part 1	Pass	Pass		P
2041A	163	1	Furnace, glass	Sand, limestone, soda ash	No	Part 1	Part 1	Pass	Pass		P
2385B	**	1	Furnace, kirksite	Kirksite	No	Part 1	Part 1	Fail	na	1	**
2385A	**	1	Furnace, lead	Lead	No	Part 1	Part 1	Fail	na	1	**
2322A	**	2	Furnace, lead and kirksite pots	Lead/kirksite	No	Part 1	Part 1	Fail	na	1	**
2312A	**	1	Furnace, lime recalcing	Sludge	No	Part 1	Part 1	Fail	na	1	**
2514A	430	1	Furnace, melting	Brass, bronze ingot, scrap	No	Part 1	Part 1	Pass	Pass		P
2022A	**	1	Furnace, melting pot	Aluminum	No	Part 1	Part 1	Fail	na	1	**
2053C	153	1	Furnace, melting pot	Aluminum	No	Part 1	Part 1	Pass	Pass	6	P
2308A	**	1	Furnace, melting pot	Metal	No	Part 1	Part 1	Fail	na	1	**
2016A	219	1	Furnace, Melting pot	Natural gas/Lead	No	Part 1	Part 2	Pass	Pass		P
2016A	220	1	Furnace, Melting pot	Natural gas/Lead	No	Part 1	Part 2	Pass	Pass		P
2016A	221	1	Furnace, Melting pot	Natural gas/Lead	No	Part 1	Part 2	Pass	Pass		P
2016A	222	1	Furnace, Melting pot	Natural gas/Lead	No	Part 1	Part 2	Pass	Pass		P
2608B	**	1	Furnace, Metal	Metal	No	Part 2	Part 2	Fail	na	21	**
2161A	433	1	Furnace, metal cleaning	Metal Drums	No	Part 1	Part 1	Pass	Pass		ND-430
2087A	**	1	Furnace, pyrobor/calciner	Potash	No	Part 1	Part 2	Fail	na	21	**
2025A	154	1	Furnace, recoperator	Aluminum	No	Part 1	Part 1	Pass	Pass		P
2136A	**	1	Furnace, reheat	Steel	No	Part 1	Part 1	Fail	na	1	**
2560A	**	1	Furnace, Reverb.	Batteries	No	Part 1	Part 2	Fail	na	1	**
2113A	429	1	Furnace, reverberatory	Alminum scrap	No	Part 1	Part 1	Pass	Pass		P
2053A	**	2	Furnace, reverberatory	Aluminum	No	Part 1	Part 1	Fail	na	2	**
2053A	151	1	Furnace, reverberatory	Aluminum	No	Part 1	Part 1	Pass	Pass	6	P
2049A	166	1	Furnace, reverberatory	Aluminum ingots and scrap	No	Part 1	Part 1	Pass	Pass		P
2070A	**	1	Furnace, reverberatory	UBC, internal scrap, ingots, mlc	No	Part 1	Part 1	Pass	Fail	4	**
2131A	**	1	Furnace, Steel	Steel	No	Part 1	Part 2	Pass	Pass	14	**
2311A	**	1	Furnace, steel melting	Metal	No	Part 1	Part 1	Pass	Fail	4	**
2646A	312	1	Gas plant	Field gas	Yes	Part 2	Part 2	Pass	Pass		na
2661A	331	1	Gas processing	Fuel gas	Yes	Part 2	Part 2	Pass	Pass		na
2656A	334	1	Gas processing	Fuel gas	Yes	Part 2	Part 2	Pass	Pass		na
2665A	339	1	Gas processing	Fuel gas	Yes	Part 2	Part 2	Pass	Pass		na
2664A	343	1	Gas processing	Fuel gas	Yes	Part 2	Part 2	Pass	Pass		na
2664A	348	1	Gas processing	Fuel gas	Yes	Part 2	Part 2	Pass	Pass		na
2666A	370	1	Gas processing	Produced gas	Yes	Part 2	Part 2	Pass	Pass		na
2666A	371	1	Gas processing	Produced gas	Yes	Part 2	Part 2	Pass	Pass		na
2666A	372	1	Gas processing	Produced gas	Yes	Part 2	Part 2	Pass	Pass		na
2666A	373	1	Gas processing	Produced gas	Yes	Part 2	Part 2	Pass	Pass		na
2376A	**	1	Gas separator	Natural gas	No	Part 1	Part 2	Fail	na	26	**
2520A	**	1	Gasifier	Wet alganic acid product	No	Part 1	Part 2	Fail	na	21	**
2329A	**	1	Gas-sterilization	Ethylene oxide	No	Part 1	Part 1	Fail	na	1	**
2412A	**	1	Ground water treatment system	Water	No	Part 1	Part 1	Fail	na	1	**
2628A	**	1	Headworks	Permanganate	No	Part 2	Part 2	Fail	na	1	**

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2642A	317	1	Headworks	Wastewater	Yes	Part 2	Part 2	Pass	Pass		na
2513H	**	1	Heater	Crude oil	No	Part 1	Part 2	Fail	na	10	**
2405A	107	1	Heater	Natural gas	No	Part 1	Part 1	Pass	Pass		P
2488A	224	1	Heater	Natural gas	No	Part 1	Part 2	Pass	Pass		ND-430
2481A	411	1	Heater	Natural gas, Refinery fuel gas	No	Part 1	Part 1	Pass	Pass		P
2541A	146	1	Heater	Pipeline oil	No	Part 1	Part 1	Pass	Pass	3	P
2603A	**	1	Heater	Refinery fuel gas	No	Part 2	Part 2	Fail	na	25	**
2117A	225	1	Heater	Refinery fuel gas	No	Part 1	Part 2	Pass	Pass	4	F-430
2601A	259	1	Heater	Refinery fuel gas	No	Part 2	Part 2	Pass	Pass		F-430
2604A	262	1	Heater	Refinery fuel gas	No	Part 2	Part 2	Pass	Pass		F-430
2605B	264	1	Heater	Refinery fuel gas	No	Part 2	Part 2	Pass	Pass		F-430
2607A	265	1	Heater	Refinery fuel gas	No	Part 2	Part 2	Pass	Pass		ND-ALL
2607B	266	1	Heater	Refinery fuel gas	No	Part 2	Part 2	Pass	Pass		ND-ALL
2607C	267	1	Heater	Refinery fuel gas	No	Part 2	Part 2	Pass	Pass		ND-ALL
2607D	268	1	Heater	Refinery fuel gas	No	Part 2	Part 2	Pass	Pass		ND-ALL
2607G	269	1	Heater	Refinery fuel gas	No	Part 2	Part 2	Pass	Pass		ND-ALL
2598A	436	1	Heater	Refinery fuel gas	No	Part 1	Part 2	Pass	Pass	9	P
2599A	437	1	Heater	Refinery fuel gas	No	Part 1	Part 2	Pass	Pass	9	P
2599N	438	1	Heater	Refinery fuel gas	No	Part 1	Part 2	Pass	Pass	9	P
2300A	439	1	Heater	Refinery fuel gas	No	Part 1	Part 2	Pass	Pass		P
2300A	440	1	Heater	Refinery fuel gas	No	Part 1	Part 2	Pass	Pass		P
2300A	441	1	Heater	Refinery fuel gas	No	Part 1	Part 2	Pass	Pass		P
2300A	442	1	Heater	Refinery fuel gas	No	Part 1	Part 2	Pass	Pass		P
2300A	443	1	Heater	Refinery fuel gas	No	Part 1	Part 2	Pass	Pass		P
2599A	444	2	Heater	Refinery fuel gas	No	Part 1	Part 2	Pass	Pass	9	P
2124A	445	3	Heater	Refinery fuel gas	No	Part 1	Part 2	Pass	Pass		P
2599C	506	1	Heater	Refinery fuel gas	No	Part 1	Part 2	Pass	Pass	9	P
2599D	507	1	Heater	Refinery fuel gas	No	Part 1	Part 2	Pass	Pass	9	P
2599B	509	1	Heater	Refinery fuel gas	No	Part 1	Part 2	Pass	Pass	9	P
2402A	**	1	Heater	Refinery fuel gas/oil	No	Part 1	Part 2	Fail	na	15	**
2660A	**	1	High pressure gas inlet to teg dehyrator	?	Yes	Part 2	Part 2	Fail	na	23	na
2660A	**	1	High pressure sour gas	?	Yes	Part 2	Part 2	Fail	na	23	na
2646A	**	1	Hobson lact tank	?	Yes	Part 2	Part 2	Fail	na	23	na
2646A	**	1	Hobson wash tank	?	Yes	Part 2	Part 2	Fail	na	23	na
2105A	**	1	Hydraulic press	Resin	No	Part 1	Part 1	Fail	na	1	**
2034A	**	2	Impregnating treater	Resin	No	Part 1	Part 2	Fail	na	10	**
2035A	**	1	Impregnating treater	Resin	No	Part 1	Part 2	Fail	na	10	**
2442A	**	1	Incinerator	Biomedical waste	No	Part 1	Part 2	Fail	na	22	**
2158A	**	1	Incinerator	Biomedical waste	No	Part 1	Part 2	Fail	na	23	**
2121A	**	1	Incinerator	Cocaine	No	Part 1	Part 1	Fail	na	1	**
2103A	244	1	Incinerator	Natural gas/Infectious waste	No	Part 1	Part 2	Pass	Pass	19	P
2573A	**	1	Incinerator	Non-hazardous waste	No	Part 1	Part 1	Fail	na	1	**
2510A	**	1	Incinerator	Paper	No	Part 1	Part 2	Fail	na	22	**
2595A	**	1	Incinerator	Resin facility byproducts	No	Part 1	Part 1	Fail	na	1	**

ATTACHMENT 2. TEST REPORT INVENTORY AND REVIEW STATUS.

Report ID	Device ID	Tests	Device Type	Material Used	Fugitive	Collect	Review	Screen	Detail	Comment	Calculation Check
2423A	**	1	Incinerator	Rocket propellant	No	Part 1	Part 2	Fail	na	13	**
2192A	**	1	Incinerator	Sewer sludge	No	Part 1	Part 2	Fail	na	22	**
2569A	**	1	Incinerator	Trash & refuse	No	Part 1	Part 1	Fail	na	1	**
2171A	**	1	Incinerator	Waste, hospital	No	Part 1	Part 2	Fail	na	23	**
2314A	**	3	Incinerator	Waste, municipal	No	Part 1	Part 2	Fail	na	26	**
2098A	**	1	Incinerator	Sewer sludge	No	Part 1	Part 1	Fail	na	1	**
2047A	**	1	Incinerator, afterburner	?	No	Part 1	Part 1	Fail	na	1	**
2052A	**	1	Incinerator, afterburner	?	No	Part 1	Part 1	Fail	na	1	**
2141A	**	1	Incinerator, afterburner	Coating paint	No	Part 1	Part 2	Fail	na	10	**
2146A	**	1	Incinerator, afterburner	Coating paint	No	Part 1	Part 2	Fail	na	10	**
2061A	**	1	Incinerator, afterburner	Coating process emissions	No	Part 1	Part 1	Fail	na	1	**
2485A	**	1	Incinerator, afterburner	Ink vapors	No	Part 1	Part 2	Fail	na	26	**
2057A	**	1	Incinerator, afterburner	Ink/light oil	No	Part 1	Part 1	Fail	na	1	**
2341A	**	1	Incinerator, afterburner	Parts coating	No	Part 1	Part 1	Fail	na	1	**
2163A	**	1	Incinerator, afterburner	Pc boards	No	Part 1	Part 1	Fail	na	1	**
2107A	**	2	Incinerator, afterburner	Pyrolysis oven emissions	No	Part 1	Part 1	Fail	na	1	**
2108A	**	1	Incinerator, afterburner	Stripping waste gas	No	Part 1	Part 1	Fail	na	1	**
2155A	**	1	Incinerator, catalytic	Resin off gases	No	Part 1	Part 1	Fail	na	1	**
2422A	226	1	Incinerator, Onsite	Animal bedding	No	Part 1	Part 2	Pass	Pass		P
2543A	229	1	Incinerator, Onsite	Coffee beans	No	Part 1	Part 2	Pass	Pass		NR
2542A	230	1	Incinerator, Onsite	Diesel/Waste explosives	No	Part 1	Part 2	Pass	Pass		P
2199A	283	1	Incinerator, Onsite	Natural gas	No	Part 1	Part 2	Pass	Pass	12	NR
2398B	246	1	Incinerator, Onsite	Natural gas/Animal carcasses	No	Part 1	Part 2	Pass	Pass		F-430
2398A	245	1	Incinerator, Onsite	Natural gas/Human carcasses	No	Part 1	Part 2	Pass	Pass		F-430
2103A	227	1	Incinerator, Onsite	Natural gas/Infectious waste	No	Part 1	Part 2	Pass	Pass	19,9	P
2558A	208	1	Incinerator, Onsite	Pathological waste	No	Part 1	Part 2	Pass	Pass		P
2152A	247	1	Incinerator, Onsite	Propane/Bodies	No	Part 1	Part 2	Pass	Pass		P
2152A	248	1	Incinerator, Onsite	Propane/Bodies	No	Part 1	Part 2	Pass	Pass		P
2410A	228	1	Incinerator, Onsite	Waste gas	No	Part 1	Part 2	Pass	Pass		NR
2174A	**	1	Internal Combustion Engine	?	No	Part 1	Part 2	Fail	na	1	**
2207A	**	2	Internal combustion engine	Diesel	No	Part 1	Part 1	Fail	na	1	**
2302A	**	6	Internal combustion engine	Diesel	No	Part 1	Part 1	Fail	na	1	**
2472B	**	1	Internal combustion engine	Diesel	No	Part 1	Part 2	Fail	na	10	**
2472C	**	2	Internal combustion engine	Diesel	No	Part 1	Part 2	Fail	na	10	**
2513K	**	1	Internal combustion engine	Diesel	No	Part 1	Part 2	Fail	na	10	**
2562A	**	1	Internal combustion engine	Diesel	No	Part 1	Part 2	Fail	na	26	**
2143A	**	3	Internal Combustion Engine	Diesel	No	Part 1	Part 2	Fail	na	13	**
2589B	**	1	Internal Combustion Engine	Diesel	No	Part 1	Part 2	Pass	Pass	23	**
2375C	112	1	Internal combustion engine	Diesel	No	Part 1	Part 1	Pass	Pass	8,9	NR
2375C	113	1	Internal combustion engine	Diesel	No	Part 1	Part 1	Pass	Pass	8,9	NR
2436A	231	1	Internal Combustion Engine	Diesel	No	Part 1	Part 2	Pass	Pass	9	ND-429,430
2629A	288	1	Internal Combustion Engine	Diesel	No	Part 2	Part 2	Pass	Pass		NONE
2638A	300	1	Internal combustion engine	Diesel	Yes	Part 2	Part 2	Pass	Pass		na
2509A	410	1	Internal combustion engine	Diesel	No	Part 1	Part 1	Pass	Pass		P

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2540A	412	1	Internal combustion engine	Diesel	No	Part 1	Part 1	Pass	Pass		P
2101A	414	1	Internal combustion engine	Diesel	No	Part 1	Part 1	Pass	Pass		P
2530A	417	1	Internal combustion engine	Diesel	No	Part 1	Part 1	Pass	Pass	9	F-429,ND-430
2386A	636	1	Internal combustion engine	Diesel	No	Part 1	Part 1	Pass	Pass	9	
2513C	637	1	Internal combustion engine	Diesel	No	Part 1	Part 1	Pass	Pass	9	P
2331A	**	1	Internal combustion engine	Digester gas	No	Part 1	Part 1	Fail	na	1	**
2580A	**	1	Internal combustion engine	Digester gas	No	Part 1	Part 1	Fail	na	1	**
2590A	**	1	Internal combustion engine	Digester gas	No	Part 1	Part 1	Fail	na	1	**
2611A	**	1	Internal Combustion Engine	Digester gas	No	Part 2	Part 2	Fail	na	1,10	**
2611C	**	1	Internal Combustion Engine	Digester gas	No	Part 2	Part 2	Fail	na	1,10	**
2612C	**	1	Internal Combustion Engine	Digester gas	No	Part 2	Part 2	Fail	na	1,10	**
2055A	**	1	Internal combustion engine	Distillate No.2	No	Part 1	Part 2	Fail	na	23	**
2513D	**	1	Internal combustion engine	Field gas	No	Part 1	Part 2	Fail	na	10	**
2409A	114	1	Internal combustion engine	Field gas	No	Part 1	Part 1	Pass	Pass	7	P
2409A	115	1	Internal combustion engine	Field gas	No	Part 1	Part 1	Pass	Pass	7	NR
2409A	118	1	Internal combustion engine	Field gas	No	Part 1	Part 1	Pass	Pass	7	NR
2409A	119	1	Internal combustion engine	Field gas	No	Part 1	Part 1	Pass	Pass	7	NR
2409A	120	1	Internal combustion engine	Field gas	No	Part 1	Part 1	Pass	Pass	7	NR
2409A	127	1	Internal combustion engine	Field gas	No	Part 1	Part 1	Pass	Pass	7	NR
2142A	**	3	Internal combustion engine	Fuel oil No.2/natural gas	No	Part 1	Part 1	Fail	na	1	**
2445A	**	1	Internal combustion engine	Gas	No	Part 1	Part 1	Fail	na	1	**
2460A	**	1	Internal combustion engine	Gas	No	Part 1	Part 1	Fail	na	1	**
2463A	**	19	Internal combustion engine	Gas	No	Part 1	Part 1	Fail	na	1	**
2110A	**	1	Internal combustion engine	Landfill gas	No	Part 1	Part 1	Fail	na	1	**
2042A	132	1	Internal combustion engine	Landfill gas	No	Part 1	Part 1	Pass	Pass		P
2043A	133	1	Internal combustion engine	Landfill gas	No	Part 1	Part 1	Pass	Pass	9	F-430,429
2404A		5	Internal Combustion Engine	Landfill gas	No	Part 1	Part 2	Pass	Review		
2662A	355	1	Internal combustion engine	Lube oil/diesel	Yes	Part 2	Part 2	Pass	Pass		na
2351A	**	1	Internal combustion engine	Natural gas	No	Part 1	Part 1	Fail	na	1	**
2594A	**	1	Internal combustion engine	Natural gas	No	Part 1	Part 1	Fail	na	1	**
2400A	**	3	Internal combustion engine	Natural gas	No	Part 1	Part 1	Fail	na	2	**
2352A	**	4	Internal combustion engine	Natural gas	No	Part 1	Part 1	Fail	na	10	**
2464A	**	24	Internal combustion engine	Natural gas	No	Part 1	Part 2	Fail	na	10	**
2513G	**	1	Internal combustion engine	Natural gas	No	Part 1	Part 2	Fail	na	10	**
2589A	**	1	Internal combustion engine	Natural gas	No	Part 1	Part 2	Fail	na	22	**
2441A	**	1	Internal combustion engine	Natural gas	No	Part 1	Part 2	Fail	na	23	**
2591A	**	1	Internal Combustion Engine	Natural gas	No	Part 1	Part 2	Fail	na	1	**
2409A	116	1	Internal combustion engine	Natural gas	No	Part 1	Part 1	Pass	Pass	7	NR
2409A	117	1	Internal combustion engine	Natural gas	No	Part 1	Part 1	Pass	Pass	7	NR
2409A	121	1	Internal combustion engine	Natural gas	No	Part 1	Part 1	Pass	Pass	7	NR
2409A	122	1	Internal combustion engine	Natural gas	No	Part 1	Part 1	Pass	Pass	7	NR
2409A	123	1	Internal combustion engine	Natural gas	No	Part 1	Part 1	Pass	Pass	7	NR
2409A	124	1	Internal combustion engine	Natural gas	No	Part 1	Part 1	Pass	Pass	7	NR
2409A	125	1	Internal combustion engine	Natural gas	No	Part 1	Part 1	Pass	Pass	7	NR

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2409A	126	1	Internal combustion engine	Natural gas	No	Part 1	Part 1	Pass	Pass	7	NR
2021A	134	1	Internal combustion engine	Natural gas	No	Part 1	Part 1	Pass	Pass		ND
2021A	135	1	Internal combustion engine	Natural gas	No	Part 1	Part 1	Pass	Pass		ND
2102A	147	1	Internal combustion engine	Natural gas	No	Part 1	Part 1	Pass	Pass		P
2102A	148	1	Internal combustion engine	Natural gas	No	Part 1	Part 1	Pass	Pass		P
2102C	149	1	Internal combustion engine	Natural gas	No	Part 1	Part 1	Pass	Pass		P
2496A	156	1	Internal combustion engine	Natural gas	No	Part 1	Part 1	Pass	Pass		F-430
2460B	168	1	Internal combustion engine	Natural gas	No	Part 1	Part 1	Pass	Pass		F-430
2460B	168	1	Internal Combustion Engine	Natural gas	No	Part 1	Part 2	Pass	Pass		F-430
2460B	169	1	Internal combustion engine	Natural gas	No	Part 1	Part 1	Pass	Pass		F-430
2460B	169	1	Internal Combustion Engine	Natural gas	No	Part 1	Part 2	Pass	Pass		F-430
2460B	170	1	Internal combustion engine	Natural gas	No	Part 1	Part 1	Pass	Pass		F-430
2460B	170	1	Internal Combustion Engine	Natural gas	No	Part 1	Part 2	Pass	Pass		F-430
2460B	171	1	Internal combustion engine	Natural gas	No	Part 1	Part 1	Pass	Pass		F-430
2460B	171	1	Internal Combustion Engine	Natural gas	No	Part 1	Part 2	Pass	Pass		F-430
2400A	173	1	Internal combustion engine	Natural gas	No	Part 1	Part 1	Pass	Pass		F-430
2498A	174	1	Internal combustion engine	Natural gas	No	Part 1	Part 1	Pass	Pass		P
2497A	175	1	Internal combustion engine	Natural gas	No	Part 1	Part 1	Pass	Pass		F-430
2616A	274	1	Internal Combustion Engine	Natural gas	No	Part 2	Part 2	Pass	Pass		F-430
2616B	275	1	Internal Combustion Engine	Natural gas	No	Part 2	Part 2	Pass	Pass		F-430
2355A	448	1	Internal Combustion Engine	Natural gas	No	Part 1	Part 2	Pass	Pass		ND-430
2611B	**	1	Internal Combustion Engine	Natural gas/digester gas	No	Part 2	Part 2	Fail	na	1	**
2612B	**	1	Internal Combustion Engine	Natural gas/digester gas	No	Part 2	Part 2	Fail	na	1	**
2611A	**	1	Internal Combustion Engine	Natural gas/digester gas	No	Part 2	Part 2	Fail	na	1,10	**
2612A	**	1	Internal Combustion Engine	Natural gas/digester gas	No	Part 2	Part 2	Fail	na	1,10	**
2612D	**	1	Internal Combustion Engine	Natural gas/digester gas	No	Part 2	Part 2	Fail	na	1,10	**
2612E	**	1	Internal Combustion Engine	Natural gas/digester gas	No	Part 2	Part 2	Fail	na	1,10	**
2557A	**	3	Ion implant/chemical etching/tube clean	Chemical	No	Part 1	Part 1	Fail	na	1	**
2185A	232	1	Kiln	60% blue shale 40% petroleum hydro	No	Part 1	Part 2	Pass	Pass		NR
2007A	425	1	Kiln, calcining coke to petro products	Coke, Natural gas	No	Part 1	Part 1	Pass	Pass		F-430
2106A	424	1	Kiln, cement	Limestone, Coal	No	Part 1	Part 1	Pass	Pass		ND
2205A	**	1	Kiln, cement	Limestone, silica sand, clay	No	Part 1	Part 1	Fail	na	1	**
2109A	**	1	Kiln, cement	Raw material	No	Part 1	Part 1	Fail	na	1	**
2114A	426	1	Kiln, cement	Raw material, Coal	No	Part 1	Part 1	Pass	Pass	3	P
2429A	427	1	Kiln, cement	Raw material, coal, coke	No	Part 1	Part 1	Pass	Pass		P
2196A	**	1	Kiln, lime	Coke	No	Part 1	Part 2	Fail	na	26	**
2374A	**	1	Kiln, lime	Coke	No	Part 1	Part 2	Fail	na	26	**
2380A	**	1	Kiln, lime	Coke	No	Part 1	Part 2	Fail	na	26	**
2437A	**	1	Kiln, rotary	Diesel	No	Part 1	Part 1	Fail	na	1	**
2203B	**	1	Kiln, used to regenerate carbon	Carbon/natural gas	No	Part 1	Part 1	Fail	na	1	**
2572E	**	2	Kiln,tempering for molded line	?	No	Part 1	Part 1	Fail	na	1	**
2583A	**	1	Kiln/raw mill sys	Coal	No	Part 1	Part 1	Fail	na	1	**
2646A	**	1	Lact tank	?	Yes	Part 2	Part 2	Fail	na	23	na
2137A	**	1	Landfill gas collection system	Landfill gas	No	Part 1	Part 1	Fail	na	1	**

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2559A	**	4	Lead melting pots,battery production	Metal	No	Part 1	Part 1	Fail	na	1	**
2515A	**	2	Linter system & seed cleaner	?	No	Part 1	Part 1	Fail	na	1	**
2093B	**	1	Llx	Borax	No	Part 1	Part 2	Fail	na	21	**
2556E	**	1	Loadout	Grain	No	Part 1	Part 2	Fail	na	26	**
2381C	**	1	Lpcvd reactor	Film coating	No	Part 1	Part 1	Fail	na	1	**
2639A	307	1	Main trap	Produced gas	Yes	Part 2	Part 2	Pass	Pass		na
2399D	**	2	Maintenance/mixing & production area	Chemical	No	Part 1	Part 2	Fail	na	21	**
2556D	**	1	Mash/load out	Grain	No	Part 1	Part 2	Fail	na	26	**
2399B	**	1	Material mixing line-mezzanine scrubber	Metallic & non-metallic compou	No	Part 1	Part 2	Fail	na	21	**
2399A	**	1	Material mixing/preparation	Screen coating material	No	Part 1	Part 2	Fail	na	21	**
2090A	**	1	Mea off gas	?	No	Part 1	Part 1	Fail	na	1	**
2556G	**	1	Mill loadout	Grain	No	Part 1	Part 2	Fail	na	26	**
2389A	**	1	Misc metals, alodine processing tank	Metal	No	Part 1	Part 1	Fail	na	1	**
2167A	**	1	Misc metals, anodizing process tank	Metal-steel panels	No	Part 1	Part 2	Fail	na	26	**
2495A	**	1	Misc metals, auto shredder	Metal	No	Part 1	Part 1	Fail	na	1	**
2526A	**	1	Misc metals, c-72 salt bath tank	Aluminum	No	Part 1	Part 1	Fail	na	1	**
2385C	**	1	Misc metals, cadmium ion vapor	?	No	Part 1	Part 1	Fail	na	1	**
2394A	**	2	Misc metals, chemical milling facility	Metal	No	Part 1	Part 2	Fail	na	26	**
2434A	**	1	Misc metals, chromate conversion dip tank	Metal	No	Part 1	Part 1	Fail	na	1	**
2360C	**	1	Misc metals, conformal coating	Lead	No	Part 1	Part 1	Fail	na	1	**
2390A	**	1	Misc metals, deposition operation	Metal	No	Part 1	Part 1	Fail	na	1	**
2203C	**	1	Misc metals, electrowinning	Steel wool	No	Part 1	Part 1	Fail	na	1	**
2522A	**	1	Misc metals, finishing shop	Metal	No	Part 1	Part 1	Fail	na	1	**
2454A	**	1	Misc metals, gold stripping tank	Chemical solution-cyanide	No	Part 1	Part 2	Fail	na	21	**
2388B	**	1	Misc metals, heloblade anodizing	Metal	No	Part 1	Part 2	Fail	na	26	**
2529A	**	1	Misc metals, hf pickling tank	Metal	No	Part 1	Part 2	Fail	na	26	**
2168A	**	1	Misc metals, hydrotelmill	Beryllium	No	Part 1	Part 1	Fail	na	1	**
2036A	**	1	Misc metals, metal cleaning unit	Metal	No	Part 1	Part 2	Fail	na	21	**
2555B	**	1	Misc metals, processing	Metal	No	Part 1	Part 1	Fail	na	1	**
2360B	**	1	Misc metals, soldering	Lead	No	Part 1	Part 1	Fail	na	1	**
2517E	**	1	Misc metals, soldering	Lead	No	Part 1	Part 1	Fail	na	1	**
2527A	**	4	Misc metals, treatment tank	Metal	No	Part 1	Part 2	Fail	na	26	**
2083A	**	1	Monohydrate crystallizer	?	No	Part 1	Part 1	Fail	na	1	**
2086A	**	1	Monohydrate crystallizer	?	No	Part 1	Part 1	Fail	na	1	**
2367A	**	1	Neutralization tank	Acid	No	Part 1	Part 2	Fail	na	21	**
2660A	**	1	Old pump oil	?	Yes	Part 2	Part 2	Fail	na	23	na
2395A	238	1	Oven	Coating of electric motor wires	No	Part 1	Part 2	Pass	Pass		F-430
2191A		1	Oven, Convection air	Bread	No	Part 1	Part 2	Pass	Review		
2187A		1	Oven, Convection air	Bread	No	Part 1	Part 2	Pass	Review		
2417A	**	2	Oven, curing	Glass	No	Part 1	Part 1	Fail	na	1	**
2097A	237	1	Oven, Curing	Natural gas/Abrasive cutting tools	No	Part 1	Part 2	Pass	Pass		P
2017A	**	1	Oven, curing	Rubber & elastomers	No	Part 1	Part 1	Fail	na	1	**
2020A	**	1	Oven, drying	Rubber	No	Part 1	Part 1	Fail	na	1	**
2020B	**	1	Oven, drying	Rubber	No	Part 1	Part 1	Fail	na	1	**

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2516A	**	1	Oven, metal cleaning	Gas & grease on metals	No	Part 1	Part 2	Fail	na	21	**
2036B	**	1	Oven, metal cleaning	Metal	No	Part 1	Part 2	Fail	na	21	**
2313A	**	6	Oxide & kettle sanitary stack	?	No	Part 1	Part 1	Fail	na	1	**
2451A	**	1	Oxidizer	Metal	No	Part 1	Part 1	Fail	na	1	**
2556B	**	1	Pellet cooler & loadout	Grain	No	Part 1	Part 2	Fail	na	26	**
2399C	**	1	Phosphar blow off, fabrication	Phosphor	No	Part 1	Part 2	Fail	na	21	**
2608A	**	1	Plasma cutting table	Metal	No	Part 2	Part 2	Fail	na	21	**
2356A	**	1	Plating and etching operation	Metal	No	Part 1	Part 1	Fail	na	1	**
2822A	**	1	Plating operation	Chromic acid	No	Part 2	Part 2	Fail	na	10	**
2827A	**	1	Plating operation	Chromic acid	No	Part 2	Part 2	Fail	na	10	**
2829A	**	1	Plating operation	Chromic acid	No	Part 2	Part 2	Fail	na	10	**
2851A	**	1	Plating operation	Chromic acid	No	Part 2	Part 2	Fail	na	10	**
2854A	**	1	Plating operation	Chromic acid	No	Part 2	Part 2	Fail	na	10	**
2803A	**	1	Plating operation	Chromic acid	No	Part 2	Part 2	Fail	na	13	**
2804A	**	1	Plating operation	Chromic acid	No	Part 2	Part 2	Fail	na	13	**
2806A	**	1	Plating operation	Chromic acid	No	Part 2	Part 2	Fail	na	13	**
2807A	**	1	Plating operation	Chromic acid	No	Part 2	Part 2	Fail	na	13	**
2808A	**	1	Plating operation	Chromic acid	No	Part 2	Part 2	Fail	na	13	**
2809A	**	1	Plating operation	Chromic acid	No	Part 2	Part 2	Fail	na	13	**
2811A	**	1	Plating operation	Chromic acid	No	Part 2	Part 2	Fail	na	13	**
2817A	**	1	Plating operation	Chromic acid	No	Part 2	Part 2	Fail	na	13	**
2824A	**	1	Plating operation	Chromic acid	No	Part 2	Part 2	Fail	na	13	**
2842A	**	1	Plating operation	Chromic acid	No	Part 2	Part 2	Fail	na	13	**
2843A	**	1	Plating operation	Chromic acid	No	Part 2	Part 2	Fail	na	13	**
2844A	**	1	Plating operation	Chromic acid	No	Part 2	Part 2	Fail	na	13	**
2845A	**	1	Plating operation	Chromic acid	No	Part 2	Part 2	Fail	na	13	**
2846A	**	1	Plating operation	Chromic acid	No	Part 2	Part 2	Fail	na	13	**
2855A	**	1	Plating operation	Chromic acid	No	Part 2	Part 2	Fail	na	13	**
2857A	**	1	Plating operation	Chromic acid	No	Part 2	Part 2	Fail	na	13	**
2858A	**	1	Plating operation	Chromic acid	No	Part 2	Part 2	Fail	na	13	**
2860A	**	1	Plating operation	Chromic acid	No	Part 2	Part 2	Fail	na	13	**
2861A	**	1	Plating operation	Chromic acid	No	Part 2	Part 2	Fail	na	13	**
2864A	**	1	Plating operation	Chromic acid	No	Part 2	Part 2	Fail	na	13	**
2871A	**	1	Plating operation	Chromic acid	No	Part 2	Part 2	Fail	na	13	**
2880A	**	1	Plating operation	Chromic acid	No	Part 2	Part 2	Fail	na	13	**
2881A	**	1	Plating operation	Chromic acid	No	Part 2	Part 2	Fail	na	13	**
2013A	**	1	Plating operation	Chromic acid	No	Part 1	Part 2	Fail	na	13	**
2015A	**	1	Plating operation	Chromic acid	No	Part 1	Part 2	Fail	na	13	**
2024A	**	1	Plating operation	Chromic acid	No	Part 1	Part 2	Fail	na	13	**
2332A	**	1	Plating operation	Chromic acid	No	Part 1	Part 2	Fail	na	13	**
2349A	**	1	Plating operation	Chromic acid	No	Part 1	Part 2	Fail	na	13	**
2873A	**	1	Plating operation	Chromic acid	No	Part 2	Part 2	Fail	na	22	**
2882A	**	1	Plating operation	Chromic acid	No	Part 2	Part 2	Fail	na	22	**
2884A	**	1	Plating operation	Chromic acid	No	Part 2	Part 2	Fail	na	22	**

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Report ID	Device ID	Tests	Device Type	Material Used	Fugitive	Collect	Review	Screen	Detail	Comment	Calculation Check
2810A	**	1	Plating operation	Chromic acid	No	Part 2	Part 2	Fail	na	27	**
2833A	**	1	Plating operation	Chromic acid	No	Part 2	Part 2	Fail	na	27	**
2836A	**	1	Plating operation	Chromic acid	No	Part 2	Part 2	Fail	na	27	**
2853A	**	1	Plating operation	Chromic acid	No	Part 2	Part 2	Fail	na	27	**
2856A	**	1	Plating operation	Chromic acid	No	Part 2	Part 2	Fail	na	27	**
2869A	**	1	Plating operation	Chromic acid	No	Part 2	Part 2	Fail	na	27	**
2887A	**	1	Plating operation	Chromic acid	No	Part 2	Part 2	Fail	na	27	**
2812A	**	1	Plating operation	Chromic acid	No	Part 2	Part 2	Fail	na	28	**
2818A	**	1	Plating operation	Chromic acid	No	Part 2	Part 2	Fail	na	28	**
2820A	**	1	Plating operation	Chromic acid	No	Part 2	Part 2	Fail	na	28	**
2821A	**	1	Plating operation	Chromic acid	No	Part 2	Part 2	Fail	na	28	**
2825A	**	1	Plating operation	Chromic acid	No	Part 2	Part 2	Fail	na	28	**
2826A	**	1	Plating operation	Chromic acid	No	Part 2	Part 2	Fail	na	28	**
2828A	**	1	Plating operation	Chromic acid	No	Part 2	Part 2	Fail	na	28	**
2830A	**	1	Plating operation	Chromic acid	No	Part 2	Part 2	Fail	na	28	**
2831A	**	1	Plating operation	Chromic acid	No	Part 2	Part 2	Fail	na	28	**
2834A	**	1	Plating operation	Chromic acid	No	Part 2	Part 2	Fail	na	28	**
2835A	**	1	Plating operation	Chromic acid	No	Part 2	Part 2	Fail	na	28	**
2838A	**	1	Plating operation	Chromic acid	No	Part 2	Part 2	Fail	na	28	**
2839A	**	1	Plating operation	Chromic acid	No	Part 2	Part 2	Fail	na	28	**
2840A	**	1	Plating operation	Chromic acid	No	Part 2	Part 2	Fail	na	28	**
2859A	**	1	Plating operation	Chromic acid	No	Part 2	Part 2	Fail	na	28	**
2863A	**	1	Plating operation	Chromic acid	No	Part 2	Part 2	Fail	na	28	**
2872A	**	1	Plating operation	Chromic acid	No	Part 2	Part 2	Fail	na	28	**
2877A	**	1	Plating operation	Chromic acid	No	Part 2	Part 2	Fail	na	28	**
2886A	**	1	Plating operation	Chromic acid	No	Part 2	Part 2	Fail	na	28	**
2456A	239	1	Plating operation	Chromic acid	No	Part 1	Part 2	Pass	Pass		ND
2430A	240	1	Plating operation	Chromic acid	No	Part 1	Part 2	Pass	Pass		ND
2431A	241	1	Plating operation	Chromic acid	No	Part 1	Part 2	Pass	Pass		P
2431A	242	1	Plating operation	Chromic acid	No	Part 1	Part 2	Pass	Pass		P
2431A	243	1	Plating operation	Chromic acid	No	Part 1	Part 2	Pass	Pass		P
2626A	286	1	Plating operation	Chromic acid	No	Part 2	Part 2	Pass	Pass		P
2847A,2878A	286	1	Plating operation	Chromic acid	No	Part 2	Part 2	Pass	Pass		P
2866A,2802A	455	1	Plating operation	Chromic acid	No	Part 2	Part 2	Pass	Pass		P
2819A	456	1	Plating operation	Chromic acid	No	Part 2	Part 2	Pass	Pass		P
2816A	457	1	Plating operation	Chromic acid	No	Part 2	Part 2	Pass	Pass		P
2832A	458	1	Plating operation	Chromic acid	No	Part 2	Part 2	Pass	Pass		P
2874A	459	1	Plating operation	Chromic acid	No	Part 2	Part 2	Pass	Pass		P
2841A	460	1	Plating operation	Chromic acid	No	Part 2	Part 2	Pass	Pass		P
2870A,2849A	461	1	Plating operation	Chromic acid	No	Part 2	Part 2	Pass	Pass		P
2837A	462	1	Plating operation	Chromic acid	No	Part 2	Part 2	Pass	Pass		P
2868A	463	1	Plating operation	Chromic acid	No	Part 2	Part 2	Pass	Pass		P
2883A	464	1	Plating operation	Chromic acid	No	Part 2	Part 2	Pass	Pass		P
2875A	465	1	Plating operation	Chromic acid	No	Part 2	Part 2	Pass	Pass		P

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2852A	466	1	Plating operation	Chromic acid	No	Part 2	Part 2	Pass	Pass		P
2850A	467	1	Plating operation	Chromic acid	No	Part 2	Part 2	Pass	Pass		P
2850A	468	1	Plating operation	Chromic acid	No	Part 2	Part 2	Pass	Pass		P
2848A	469	1	Plating operation	Chromic acid	No	Part 2	Part 2	Pass	Pass		P
2815A	470	1	Plating operation	Chromic acid	No	Part 2	Part 2	Pass	Pass		P
2814A	471	1	Plating operation	Chromic acid	No	Part 2	Part 2	Pass	Pass		P
?	472	1	Plating operation	Chromic acid	No	Part 2	Part 2	Pass	Pass		P
?	473	1	Plating operation	Chromic acid	No	Part 2	Part 2	Pass	Pass		P
2865A	474	1	Plating operation	Chromic acid	No	Part 2	Part 2	Pass	Pass		P
2800A	475	1	Plating operation	Chromic acid	No	Part 2	Part 2	Pass	Pass		P
2867A	476	1	Plating operation	Chromic acid	No	Part 2	Part 2	Pass	Pass		P
2823A	477	1	Plating operation	Chromic acid	No	Part 2	Part 2	Pass	Pass		P
2813A,2879A	478	1	Plating operation	Chromic acid	No	Part 2	Part 2	Pass	Pass		P
2805A	479	1	Plating operation	Chromic acid	No	Part 2	Part 2	Pass	Fail	29	P
2156A	**	1	Plating operation	Metal	No	Part 1	Part 1	Fail	na	1	**
2330A	**	5	Plating operation	Metal	No	Part 1	Part 1	Fail	na	1	**
2381A	**	1	Plating operation	Metal	No	Part 1	Part 1	Fail	na	1	**
2428A	**	1	Plating operation	Metal	No	Part 1	Part 1	Fail	na	1	**
2523A	**	3	Plating operation	Metal	No	Part 1	Part 1	Fail	na	1	**
2388A	420	1	Plating operation, anodizing	Chromic acid	No	Part 1	Part 1	Pass	Pass		P
2388A	421	1	Plating operation, anodizing	Chromic acid	No	Part 1	Part 1	Pass	Pass		P
2418A	620	1	Plating operation, anodizing	Chromic acid	No	Part 1	Part 1	Pass	Pass		P
2337A	**	1	Plating operation, chrome	Chromic acid	No	Part 1	Part 2	Fail	na	22	**
2420A	**	1	Plating operation, chrome	Chromic acid	No	Part 1	Part 2	Fail	na	22	**
2585A	**	1	Plating operation, chrome	Chromic acid	No	Part 1	Part 2	Fail	na	22	**
2344A	**	1	Plating operation, chrome	Metal	No	Part 1	Part 1	Fail	na	1	**
2132A	**	1	Plating operation, chrome tank	Chromic acid	No	Part 1	Part 1	Pass	Fail	Fail Calc	F-All
2133A	**	1	Plating operation, chrome tank	Chromic acid	No	Part 1	Part 1	Pass	Fail	Fail Calc	F-All
2186A	**	1	Plating operation, chrome tank	Chromic acid	No	Part 1	Part 1	Pass	Fail	Fail Calc	F-All
2019A	**	2	Plating operation, chrome tank	Metal	No	Part 1	Part 1	Fail	na	1	**
2056A	**	1	Plating operation, chrome tank	Metal	No	Part 1	Part 1	Fail	na	1	**
2063A	**	1	Plating operation, chrome tank	Metal	No	Part 1	Part 1	Fail	na	1	**
2181A	**	1	Plating operation, chrome tank	Metal	No	Part 1	Part 1	Fail	na	1	**
2189A	**	1	Plating operation, chrome tank	Metal	No	Part 1	Part 1	Fail	na	1	**
2190A	**	1	Plating operation, chrome tank	Metal	No	Part 1	Part 1	Fail	na	1	**
2112A	**	1	Plating operation, chrome tank	Metal	No	Part 1	Part 2	Fail	na	26	**
2067A	**	3	Plating operation, hard	Chromic acid	No	Part 1	Part 1	Fail	na	2	**
2474A	432	1	Plating operation, hard	Chromic acid	No	Part 1	Part 1	Pass	Pass		P
2357A	610	1	Plating operation, hard	Chromic acid	No	Part 1	Part 1	Pass	Pass		P
2418A	621	1	Plating operation, hard	Chromic acid	No	Part 1	Part 1	Pass	Pass		P
2418A	622	1	Plating operation, hard	Chromic acid	No	Part 1	Part 1	Pass	Pass		P
2067A	609	2	Plating operation, hard high/typical amps	Chromic acid	No	Part 1	Part 1	Pass	Pass		ND
2062A	608	2	Plating operation, hard with/without polyballs	Chromic acid	No	Part 1	Part 1	Pass	Pass		P
2104A	157	1	Preheater kiln	Coal, limestone	No	Part 1	Part 1	Pass	Pass	3	P

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2575B	206	1	Pressor	Fiberboard	No	Part 1	Part 2	Pass	Pass	17	P
2315A	**	1	Pretreatment of aluminum parts	Aluminum	No	Part 1	Part 1	Fail	na	1	**
2642A	318	1	Primary sedimentation tank	Wastewater	Yes	Part 2	Part 2	Pass	Pass		na
2038A	**	1	Printing press	Ink and coatings	No	Part 1	Part 2	Fail	na	10	**
2177B	**	1	Pump	Boric acid	No	Part 1	Part 2	Fail	na	21	**
2660A	**	1	Pump oil storage	?	Yes	Part 2	Part 2	Fail	na	23	na
2088A	**	1	Pyrobar milling and screening	?	No	Part 1	Part 1	Fail	na	1	**
2076A	627	1	Reactor	Styrene monomer	No	Part 1	Part 1	Pass	Pass	11	
2037C	**	1	Reactor 2 scrubber	?	No	Part 1	Part 1	Fail	na	1	**
2492B	447	1	Reboiler	Ethylene Glycol	No	Part 1	Part 2	Pass	Pass		ND-430
2492A	446	1	Reboiler	Triethylene Glycol	No	Part 1	Part 2	Pass	Pass		ND-430
2556A	**	1	Receiving	Grain	No	Part 1	Part 2	Fail	na	26	**
2556C	**	1	Receiving	Grain	No	Part 1	Part 2	Fail	na	26	**
2556F	**	1	Receiving	Grain	No	Part 1	Part 2	Fail	na	26	**
2059A	**	1	Resin mix tank	Resin	No	Part 1	Part 2	Fail	na	10	**
2361A	**	12	Rocket engines	Liquid propellant	No	Part 1	Part 2	Fail	na	22	**
2645A	**	1	Rocket plumes	Kerosene	Yes	Part 2	Part 2	Fail	na	22	na
2645A	**	1	Rocket plumes	Kerosene	Yes	Part 2	Part 2	Fail	na	22	na
2631A	290	1	Rotary kiln	Natural gas	No	Part 2	Part 2	Pass	Pass		P
2096A	**	1	Secondary crusher	Limestone rock	No	Part 1	Part 2	Fail	na	26	**
2381B	**	2	Secondary process tanks	Metal solution	No	Part 1	Part 1	Fail	na	1	**
2646A	**	1	Shipping tank	?	Yes	Part 2	Part 2	Fail	na	23	na
2163B	**	1	Shredder	Pc boards	No	Part 1	Part 1	Fail	na	1	**
2005A	235	1	Shredding and delaquering	Aluminum	No	Part 1	Part 2	Pass	Pass		P
2072A	236	1	Shredding and delaquering	Aluminum	No	Part 1	Part 2	Pass	Pass		P
2058A	**	1	Sludge dryer	?	No	Part 1	Part 1	Fail	na	1	**
2660A	**	1	Slug catcher outlet	?	Yes	Part 2	Part 2	Fail	na	23	na
2660A	**	1	Slug outlet	?	Yes	Part 2	Part 2	Fail	na	23	na
2568A	**	1	So2 roaster	?	No	Part 1	Part 1	Fail	na	1	**
2642A	320	1	Solids odor processing	Sludge	Yes	Part 2	Part 2	Pass	Pass		na
2443A	**	2	Solvent tanks	?	No	Part 1	Part 1	Fail	na	1	**
2660A	**	1	Sour water stripper inlet	?	Yes	Part 2	Part 2	Fail	na	23	na
2660A	**	1	Sour water stripper outlet	?	Yes	Part 2	Part 2	Fail	na	23	na
2081A	**	1	Spent carbon regenerator	?	No	Part 1	Part 1	Fail	na	1	**
2198A	**	1	Spray dryer	Zinc sulfate monohydrate	No	Part 1	Part 2	Fail	na	26	**
2660A	**	1	Stabilizer ngl outlet	?	Yes	Part 2	Part 2	Fail	na	23	na
2513E	**	1	Steam generator	Crude oil	No	Part 1	Part 2	Fail	na	10	**
2513F	**	1	Steam generator	Crude oil	No	Part 1	Part 2	Fail	na	10	**
2513L	**	1	Steam generator	Crude oil	No	Part 1	Part 2	Fail	na	10	**
2375B	111	1	Steam generator	Crude oil	No	Part 1	Part 1	Pass	Pass	8,9	P
2536A	435	1	Steam generator	Crude Oil	No	Part 1	Part 1	Pass	Pass		ND-430
2513A	638	1	Steam generator	Crude oil	No	Part 1	Part 1	Pass	Pass	9	P
2513B	**	1	Steam generator	Natural gas	No	Part 1	Part 2	Fail	na	10	**
2375A	110	1	Steam generator	Natural gas	No	Part 1	Part 1	Pass	Pass		NR

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2405B	108	1	Steam generator	Natural, CVR gas	No	Part 1	Part 1	Pass	Pass		NR
2444A	178	1	Steam generator	Natural, CVR gas	No	Part 1	Part 1	Pass	Pass		P
2407A	511	2	Steam generator	Natural/CVR gas	No	Part 1	Part 2	Pass	Pass		P
2407A	512	1	Steam generator	Natural/CVR gas	No	Part 1	Part 2	Pass	Pass		P
2407A	513	1	Steam generator	Natural/CVR gas	No	Part 1	Part 2	Pass	Pass		P
2188A	**	1	Sterilizer	Ethylene oxide	No	Part 1	Part 1	Fail	na	1	**
2076A	629	1	Storage Silo	Styrene monomer	No	Part 1	Part 1	Pass	Pass	11	
2076A	628	2	Storage Silos	Styrene monomer	No	Part 1	Part 1	Pass	Pass	11	
2635A	**	1	Strap cutting	Polyester	No	Part 2	Part 2	Fail	na	21	**
2661A	**	1	Stretford outlet	?	Yes	Part 2	Part 2	Fail	na	23	na
2599M	**	1	Sulfur recovery unit	?	No	Part 1	Part 2	Fail	na	1	**
2653A	**	1	Tank	?	Yes	Part 2	Part 2	Fail	na	23	na
2659A	**	1	Tank headspace	?	Yes	Part 2	Part 2	Fail	na	23	na
2640A	293	1	Tank headspace	Crude oil	Yes	Part 2	Part 2	Pass	Pass		na
2640A	295	1	Tank headspace	Crude oil	Yes	Part 2	Part 2	Pass	Pass		na
2641A	305	1	Tank headspace	Crude oil	Yes	Part 2	Part 2	Pass	Pass		na
2639A	306	1	Tank headspace	Crude oil	Yes	Part 2	Part 2	Pass	Pass		na
2648A	313	1	Tank headspace	Crude oil	Yes	Part 2	Part 2	Pass	Pass		na
2646A	315	1	Tank headspace	Crude oil	Yes	Part 2	Part 2	Pass	Pass		na
2646A	316	1	Tank headspace	Crude oil	Yes	Part 2	Part 2	Pass	Pass		na
2664A	341	1	Tank headspace	Crude oil	Yes	Part 2	Part 2	Pass	Pass		na
2664A	344	1	Tank headspace	Crude oil	Yes	Part 2	Part 2	Pass	Pass		na
2664A	345	1	Tank headspace	Crude oil	Yes	Part 2	Part 2	Pass	Pass		na
2666A	356	1	Tank headspace	Crude oil	Yes	Part 2	Part 2	Pass	Pass		na
2666A	358	1	Tank headspace	Crude oil	Yes	Part 2	Part 2	Pass	Pass		na
2666A	360	1	Tank headspace	Crude oil	Yes	Part 2	Part 2	Pass	Pass		na
2666A	362	1	Tank headspace	Crude oil	Yes	Part 2	Part 2	Pass	Pass		na
2666A	364	1	Tank headspace	Crude oil	Yes	Part 2	Part 2	Pass	Pass		na
2666A	366	1	Tank headspace	Crude oil	Yes	Part 2	Part 2	Pass	Pass		na
2666A	368	1	Tank headspace	Crude oil	Yes	Part 2	Part 2	Pass	Pass		na
2666A	374	1	Tank headspace	Crude oil	Yes	Part 2	Part 2	Pass	Pass		na
2656A	335	1	Tank headspace	Diluent	Yes	Part 2	Part 2	Pass	Pass		na
2664A	346	1	Tank headspace	Distillate oil	Yes	Part 2	Part 2	Pass	Pass		na
2640A	292	1	Tank headspace	Produced water	Yes	Part 2	Part 2	Pass	Pass		na
2640A	294	1	Tank headspace	Produced water	Yes	Part 2	Part 2	Pass	Pass		na
2638A	299	1	Tank headspace	Produced water	Yes	Part 2	Part 2	Pass	Pass		na
2646A	309	1	Tank headspace	Produced water	Yes	Part 2	Part 2	Pass	Pass		na
2646A	310	1	Tank headspace	Produced water	Yes	Part 2	Part 2	Pass	Pass		na
2646A	311	1	Tank headspace	Produced water	Yes	Part 2	Part 2	Pass	Pass		na
2663A	326	1	Tank headspace	Produced water	Yes	Part 2	Part 2	Pass	Pass		na
2666A	365	1	Tank headspace	Produced water	Yes	Part 2	Part 2	Pass	Pass		na
2666A	367	1	Tank headspace	Produced water	Yes	Part 2	Part 2	Pass	Pass		na
2665A	337	1	Tank headspace	Wastewater	Yes	Part 2	Part 2	Pass	Pass		na
2665A	338	1	Tank headspace	Wastewater	Yes	Part 2	Part 2	Pass	Pass		na

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2664A	342	1	Tank headspace	Wastewater	Yes	Part 2	Part 2	Pass	Pass		na
2664A	347	1	Tank headspace	Wastewater	Yes	Part 2	Part 2	Pass	Pass		na
2666A	357	1	Tank liquid	Produced water	Yes	Part 2	Part 2	Pass	Pass		na
2666A	359	1	Tank liquid	Produced water	Yes	Part 2	Part 2	Pass	Pass		na
2666A	361	1	Tank liquid	Produced water	Yes	Part 2	Part 2	Pass	Pass		na
2666A	363	1	Tank liquid	Produced water	Yes	Part 2	Part 2	Pass	Pass		na
2666A	369	1	Tank liquid	Produced water	Yes	Part 2	Part 2	Pass	Pass		na
2666A	375	1	Tank liquid	Produced water	Yes	Part 2	Part 2	Pass	Pass		na
2503A	**	1	Thermal oxidizer	Gas	No	Part 1	Part 1	Fail	na	1	**
2502A	253	1	Thermal oxidizer	Natural gas	No	Part 1	Part 2	Pass	Pass		ND-430
2446A	**	1	Thermal oxidizer	Soil	No	Part 1	Part 2	Fail	na	26	**
2471A	**	1	Thermal oxidizer, vapor extraction sys.	Soil	No	Part 1	Part 1	Fail	na	1	**
2661A	333	1	Truck loading	Sulfur	Yes	Part 2	Part 2	Pass	Pass		na
2040A	**	1	Turbine	?	No	Part 1	Part 1	Fail	na	1	**
2511A	**	1	Turbine	?	No	Part 1	Part 2	Fail	na	1	**
2525B	632	1	Turbine	Diesel	No	Part 1	Part 1	Pass	Pass	9	NR
2403A	144	1	Turbine	Field gas	No	Part 1	Part 1	Pass	Pass		P
2048A	**	1	Turbine	Gas	No	Part 1	Part 1	Fail	na	1	**
2643A	302	1	Turbine	Jp-4	Yes	Part 2	Part 2	Pass	Pass		na
2643A	303	1	Turbine	Jp-5	Yes	Part 2	Part 2	Pass	Pass		na
2586A	176	1	Turbine	Landfill gas	No	Part 1	Part 1	Pass	Pass		P
2032A	**	1	Turbine	Natural gas	No	Part 1	Part 1	Fail	na	1	**
2033A	**	1	Turbine	Natural gas	No	Part 1	Part 1	Fail	na	1	**
2142B	**	1	Turbine	Natural gas	No	Part 1	Part 1	Fail	na	1	**
2415A	**	2	Turbine	Natural gas	No	Part 1	Part 2	Fail	na	10	**
2416A	**	1	Turbine	Natural gas	No	Part 1	Part 2	Fail	na	10	**
2461A	**	1	Turbine	Natural gas	No	Part 1	Part 2	Fail	na	10	**
2472A	**	4	Turbine	Natural gas	No	Part 1	Part 2	Fail	na	10	**
2519A	**	1	Turbine	Natural gas	No	Part 1	Part 2	Fail	na	10	**
2617A	**	1	Turbine	Natural gas	No	Part 2	Part 2	Pass	Pass	28	**
2617B	**	1	Turbine	Natural gas	No	Part 2	Part 2	Pass	Pass	28	**
2405C	109	1	Turbine	Natural gas	No	Part 1	Part 1	Pass	Pass		NR
2554B	141	1	Turbine	Natural gas	No	Part 1	Part 1	Pass	Pass		NR
2486A	145	1	Turbine	Natural gas	No	Part 1	Part 1	Pass	Pass		P
2102D	150	1	Turbine	Natural gas	No	Part 1	Part 1	Pass	Pass		P
2480A	167	1	Turbine	Natural gas	No	Part 1	Part 1	Pass	Pass		P
2593A	172	1	Turbine	Natural gas	No	Part 1	Part 1	Pass	Pass	9	F-430
2444B	177	1	Turbine	Natural gas	No	Part 1	Part 1	Pass	Pass		P
2009A	254	1	Turbine	Natural gas	No	Part 1	Part 2	Pass	Pass		P
2009A	255	1	Turbine	Natural gas	No	Part 1	Part 2	Pass	Pass		P
2102B	256	1	Turbine	Natural gas	No	Part 1	Part 2	Pass	Pass		P
2102B	257	1	Turbine	Natural gas	No	Part 1	Part 2	Pass	Pass		P
2130A	258	1	Turbine	Natural gas	No	Part 1	Part 2	Pass	Pass		P
2627A	287	1	Turbine	Natural gas	No	Part 2	Part 2	Pass	Pass		P

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2507A	418	1	Turbine	Natural gas	No	Part 1	Part 1	Pass	Pass		F-430
2459A	449	1	Turbine	Natural gas	No	Part 1	Part 2	Pass	Pass		ND-430
2477A		2	Turbine	Natural gas	No	Part 1	Part 2	Pass	Review		
2383A	**	1	Turbine	Natural gas/distillate	No	Part 1	Part 2	Fail	na	26	**
2599J	510	2	Turbine	NG/LPG/RFG	No	Part 1	Part 2	Pass	Pass	9	P
2554A	140	1	Turbine	No 2 distillate oil	No	Part 1	Part 1	Pass	Pass	9	
2028A	639	2	Turbine	No 2 distillate oil/Natural gas	No	Part 1	Part 1	Pass	Pass	9	P
2553A	131	1	Turbine	No. 2 distillate oil	No	Part 1	Part 1	Pass	Pass		P
2478A	136	1	Turbine	No. 2 distillate oil	No	Part 1	Part 1	Pass	Pass	3	F-425
2599I	644	1	Turbine	Refinery fuel gas	No	Part 1	Part 2	Pass	Pass	9	P
2599K	451	1	Turbine	RFG/NG	No	Part 1	Part 2	Pass	Pass		P
2599K	452	1	Turbine	RFG/NG	No	Part 1	Part 2	Pass	Pass		P
2643A	304	1	Turbine/rice	Diesel	Yes	Part 2	Part 2	Pass	Pass		na
2575B	207	1	Unloader	Fiberboard	No	Part 1	Part 2	Pass	Pass	17	P
2466C	**	1	Waste water	H2o	No	Part 1	Part 1	Fail	na	1	**
2662A	351	1	Wastewater treatment	Wastewater	Yes	Part 2	Part 2	Pass	Pass		na
2662A	352	1	Wastewater treatment	Wastewater	Yes	Part 2	Part 2	Pass	Pass		na
2662A	353	1	Wastewater treatment	Wastewater	Yes	Part 2	Part 2	Pass	Pass		na
2662A	354	1	Wastewater treatment	Wastewater	Yes	Part 2	Part 2	Pass	Pass		na
2101C	**	6	Water treatment facility	Sewer water	No	Part 1	Part 2	Fail	na	26	**

**Data not extracted for this device.
F - Failed calculation check.
P - Passed calculation check.
NR - Calculation check not required because calculations checked for another device in report.
ND - Not enough data to check calculations.

1. Emission factor cannot be calculated (Data not validated or extracted).
2. Original estimate of devices incorrect (Data not validated or extracted).
3. Dioxin/PAH sampled using a single train (Data extracted and noted in the database).
4. Separate front/backhalf analysis conducted for CARB 436 (Results not extracted).
5. Used outdated method without CARB approval.
6. Method 421 sampling was not isokinetic and stack temp < 250F (Data not extracted).
7. Naphthalene analyzed by method 410 (Data not extracted).
8. Nonisokinetic sampling method 429.
9. Full set of internal standards not used for method 429.
10. No air toxics (Data not extracted).
11. Sampling by method 422 only. No calculation checks required for this method.
12. Limited supporting documentation.
13. Single run only (Data not validated or extracted).
14. All sampling done non-isokinetically.
15. Two different types of fuel fired (gas and solid or gas and liquid) during testing (Data not validated or extracted).
16. Mercury not tested by CVAAS (Data not extracted).
17. 2 stacks tested.
18. Use method 12 for trace metals.
19. Did not use correct impingers for metals train (Data not extracted).
20. Used method 422 to test for benzene.
21. SCC cound not be assigned (Data not extracted).
22. No sample/laboratory data (Data not extracted).
23. Key parameters information not provided (Data not extracted).
24. Used incorrect method (Data not extracted).
25. Two different process emitting to single stack (Data not extracted).
26. Process rate unit and SCC unit don't match (Data not extracted).
27. Test protocol only.
28. Duplicate report.
29. Failed swirl check (Data not extracted)

ATTACHMENT 3
METHOD VALIDATION FORMS AND CALCULATION SPREADSHEETS

Description of Forms

Each method validation procedure includes a description of the method, quality assurance/control checks, blank correction procedure if applicable, and other comments. The method description is used to check the procedures followed in the source test report. The quality assurance/control checks are provided in a table. This table includes a series of questions. If the answer to a question is yes, then the user circles the code which includes the character "a". For example, if a swirl check was not conducted for Method 12, the code sc1a would be circled. If the test report does not provide enough information to answer the question, then the user circles the code which includes the character "b". For example, if the test report did not indicate the variation in probe diameter for Method 12, the code nz2b is circled. For some checks, more than one "a" code is provided. In these instances, each code refers to a different run. For example, if the Method 12 leak check was greater than 0.02 cfm for the second run, the second lc3a code is circled. It should be noted that all questions are phrased to indicate failures of key method criteria. Therefore, any mark on the table indicates either the information in the report was missing or a key parameter was not satisfied. If the table contains no marks, the test was conducted within guidelines of the method. All of the circled codes are transferred to a database. In addition to verifying key method parameters, calculation checks are conducted for each isokinetic method using the spreadsheets provided in this attachment. One calculation check is conducted per report per method per substance. For example, if a report presented results from methods 428 and 426, two calculation checks are conducted.

SOURCE TEST METHOD DETAILED VALIDATION CHECKLIST

Test Method: CARB 11 - June, 1983
Substance: Hydrogen Sulfide

Report ID Number: _____
Reviewer: _____
Review Date: _____

Method Description and Applicability

This method is applicable to the determination of hydrogen sulfide content of fuel gas streams at petroleum refineries. Hydrogen sulfide (H_2S) is collected from a source in a series of midget impingers and absorbed in pH 3.0 cadmium sulfate ($CdSO_4$) solution to form cadmium sulfide (CdS). The latter compound is then measured iodometrically.

Quality Assurance/Quality Control Checks

Please complete the detailed checklist provided in the attached Table. If the statements are true, circle "a"s or the corresponding run numbers; and if they are not reported, circle "b"s.

Other Comments

_____
_____
_____
_____

Device ID:

SAMPLING EQUIPMENT				
** Field Dry Gas Meter*				
1.) Not checked pre- and post-test?	gm1a		gm1b	M
2.) Pre- and post-test Y not within (+/-) 5%?	gm2a		gm2b	M
SAMPLING PROCEDURES				
**Sample Time*				
NR 1.) Runs < 10 minutes	sd1a	sd1a	sd1a	R
**Leak Check*				
1.) Not conducted?	lc1a		lc1b	M
2.) Indication of leaks?	ic2a		lc2b	M
**Reagent Blank*				
1.) Not conducted daily?	fb1a		fb1b	M
**Impinger Solution*				
1.) Hydrogen peroxide (H2O2) not used?	im1a		im1b	M
2.) Cadmium sulfate (CdS) not used?	im2a		im2b	M
ANALYSIS				
**Method*				
1.) 0.01N Sodium thiosulfate solution not used for titration?	mt1a		mt1b	M
2.) Iodine solution not used?	mt2a		mt2b	M

M-Method a-True
R-Run b-Not reported
S-Substance

SOURCE TEST METHOD DETAILED VALIDATION CHECKLIST

Test Method: CARB 12 - March, 1986
Substance: Inorganic Lead

Report ID Number: _____
Reviewer: _____
Review Date: _____

Method Description and Applicability

This method is applicable to the determination of inorganic lead emissions from stationary sources. Particulate and gaseous Pb emissions are withdrawn isokinetically and collected on a filter and/or in dilute nitric acid. The samples are then digested and analyzed by atomic absorption spectrometry using an air acetylene flame.

Quality Assurance/Quality Control Checks

Please complete the detailed checklist provided in attached Table. If the statements are true, circle "a"s or the corresponding run numbers; and if they are not reported, circle "b"s. In addition to completing the checklist please answer the following questions:

1.) What digestion method was used? _____
2.) Enter the digestion date(s). _____
3.) Number of Impingers: 0.1 HNO_3 (2) __ Empty (1)__ Silica Gel (1) __

Blank Procedure

Please be sure that the blank data was applied and considered correctly. For this particular method, the absorbance reading from the sample needs to be corrected for the absorbance readings from the filter and nitric blanks. There is no criteria for the blank levels, they just need to be performed and corrected for in the sample values.

Other Comments

_____

_____

Device ID:

SAMPLE LOCATION			
* *Swirl Check*			
1.) Not conducted?	sc1a	sc1b	M
2.) Average absolute value of angles > 10%?	sc2a	sc2b	M
* *Stack Size*			
1.) Enter stack diameter (inches).			M
2.) Stack diameter < 12 inch ? or	st2a	st2b	M
3.) Area <113 inch squared?	st3a	st3b	M
* *Number of Sample Points*			
1.) Enter total number of points.			M
2.) Method 1 not used?	ns2a	ns2b	M
SAMPLING EQUIPMENT			
* *Nozzle Size Check*			
1.) Not conducted prior to test?	nz1a	nz1b	M
2.) Variation in diameter > 0.004 inch?	nz2a	nz2b	M
* *Field Gas Dry Meter*			
1.) Not checked pre- and post-test?	gm1a	gm1b	M
2.) Pre- and post-test Y not within (+/-) 5%?	gm2a	gm2b	M
* *Pitot Tube*			
1.) Semi-annual calibration sheet not included?	pt1a	pt1b	M
SAMPLING PROCEDURES			
* *Leak Check*			
1.) Not conducted?	lc1a	lc1b	M
2.) Values not reported?	lc2a		M
3.) Pretest >0.02 cfm or 4% of average?	lc3a lc3a	lc3a	R
4.) Post-test >0.02 cfm or 4% of average?	lc4a lc4a	lc4a	R
* *Isokinetic Variation*			
1.) Sample not taken isokinetically?	is1a	is1b	M
2.) Isokinetic variation not reported?	is2a		M
3.) Isokinetic <90 or >110%?	is3a is3a	is3a	R
* *Field Reagent Blank*			
1.) Not conducted for two filters and 0.1N HNO3?	rb1a	rb1b	M
2.) Not used to correct samples?	rb2a	rb2b	M
ANALYSIS			
* *Method*			
1.) Atomic absorption spectrometry (AAS) not used?	mt1a	mt1b	M
2.) Not conducted in triplicate?	mt2a	mt2b	M

M-Method a-True
R-Run b-Not reported
S-Substance

CALCULATION CHECK FOR CARB METHOD 12

Device ID:

DATA ENTRY-SAMPLING	SYMBOL	UNITS	DATA
RUN NUMBER	-	-	
ROUND STACK, DIAMETER	ds	inches	
RECTANGULAR STACK, LENGTH	L	inches	
WIDTH	W	inches	
NOZZLE DIAMETER	dn	inches	
AVERAGE STACK TEMPERATURE	Fs	degrees F	
AVERAGE METER TEMPERATURE	Fm	degrees F	
BAROMETRIC PRESSURE	Pbar	in. Hg	
STACK STATIC PRESSURE	Pg	in. H20	
AVG. DELTA H	dH	in. H20	
AVG. RMS VELOCITY HEAD	dP	in. H20	
PITOT COEFFICIENT	Cp	-	
GAS SAMPLE VOLUME	Vm	cubic ft.	
METER CALIBRATION FACTOR	Y	-	
TOTAL SAMPLING TIME	min	minutes	
STACK GAS OXYGEN CONTENT	Co2,m	%	
STACK GAS CARBON DIOXIDE CONTENT	Cco2,m	%	
TOTAL IMPINGER GAIN (WATER & PARTICULATE)	Ww	grams	
CALCULATED DATA-SAMPLING			
RUN NUMBER	-	-	0
NOZZLE AREA, An = 3.14(dn)**2/4	An	sq. in.	0.000
STACK AREA, As = 3.14*(ds)**2/576 (ROUND) = L * W/144 (RECTANGULAR)	As	sq. feet	0.000
AVG. STACK TEMPERATURE, Ts = Fs + 460	Ts	degrees R	460.0
AVG. METER TEMPERATURE, Tm = Fm + 460	Tm	degrees R	460.0
GAS SAMPLE VOLUME AT STANDARD CONDITIONS, VmStd = 17.64*Y*(Vm/Tm)*(Pbar + dH/13.6)	VmStd	dscf	0.0
VOLUME OF WATER VAPOR, VwStd = 0.04707*Ww	VwStd	scf	0.0
MOISTURE FRACTION, Bws = VwStd/(VmStd + VwStd)	Bws	-	#DIV/0!
DRY STACK GAS MOL. WEIGHT, Md = 0.32(Co2,m)+ 0.44(Cco2,m)+0.28{100-(Co2,m)-(Cco2,m)}	Md	g/g-mole	28.00
WET STACK GAS MOLECULAR WEIGHT, Mw = Md(1-Bws)+18.0(Bws)	Mw	g/g-mole	#DIV/0!
ABSOLUTE STACK PRESSURE, Ps = Pbar + Pg/13.6	Ps	in. Hg	0.00
STACK GAS VELOCITY vs = 85.49 Cp { sqrt[(dP*Ts) /(Ps*Mw)] }	vs	ft/s	#DIV/0!
ACTUAL STACK GAS FLOW RATE, Q = 60*vs*As	Q	acf/min	#DIV/0!
DRY GAS STACK FLOW RATE (DRY,STP) Qsd = 17.64*Q*(1-Bws)*(Ps/Ts)	Qsd	dscf/min	#DIV/0!
ISOKINETIC RATE, I = 13.61*Ts*VmStd/[Ps*vs*An*min*(1-Bws)]	I	%	#DIV/0!
DATA ENTRY-ANALYTICAL			
TOTAL MASS OF LEAD IS SAMPLE TRAIN	Mpb	mg	
CALCULATED DATA-OVERALL			
CONCENTRATION OF LEAD MCpb = (35.31*Mpb)/Vmstd	MCpb	mg/dscm	#DIV/0!

SOURCE TEST METHOD DETAILED VALIDATION CHECKLIST

Test Method: CARB 15 - June, 1983
Substance: Hydrogen Sulfide

Report ID Number: _____
Reviewer: _____
Review Date: _____

Method Description and Applicability

This method is applicable to the measurement of hydrogen sulfide, carbonyl sulfide, and carbon disulfide from tail gas control units of sulfur recovery plants. A gas sample is extracted from the emission source and diluted with clean dry air. An aliquot of the sample is then analyzed by gas chromatographic separation and flame photometric detection (GC/FPD).

Quality Assurance/Quality Control Checks

Due to the difficulty in performing on-site GC testing, CARB has often allowed contractors to collect sample in Tedlar Bags and submit the bags to the laboratory for analysis. If this was done on the source test, prior approval from CARB must be obtained. Along with approval, CARB adds additional quality assurance checks and samples to ensure accurate measurements. Determine if samples were collected with a bag sample or if on-site GC analysis was performed. If the sample was collected using a bag, please answer the following questions.

1) Was this modification discussed in the text? YES NO
2) Did the discussion include prior approval and additional requirements by CARB?YES NO
3) Were the additional requirements completed and did they pass criteria? YES NO

If the bag collection technique was used, some of the parameters listed in Table 1 might not be applicable. **The Table 1 applies strictly to the method, which specifies on-site GC analysis.** Please complete the detailed checklist provided in the attached Table . Please complete the detailed checklist provided in attached Table. If the statements are true, circle "a"s or the corresponding run numbers; and if they are not reported, circle "b"s.

Other Comments

Device ID:

This table applies only to on-site GC analysis.

SAMPLING PROCEDURES			
** Leak Check*			
1.) Not conducted?	lc1a	lc1b	M
2.) Indication of leaks?	lc2a	lc2b	M
**Sample line loss*			
1.) Not conducted for post-test?	sl1a	sl1b	M
2.) Sample not corrrected for <20% loss?	sl2a	sl2b	M
3.) Sample corrected for >20% loss?	sl3a	sl3b	M
ANALYSIS			
** Method*			
1.) GC/FPD not used?	mt1a	mt1b	M

M-Method a-True
R-Run b-Not reported
S-Substance

SOURCE TEST METHOD DETAILED VALIDATION CHECKLIST

Test Method: CARB 101A - March, 1986
Substance: Mercury

Report ID Number: _____
Reviewer: _____
Review Date: _____

Method Description and Applicability

This method is applicable to the determination of mercury emissions from stationary sources. Particulate and gaseous mercury emissions are withdrawn isokinetically from the source and collected in acidic potassium permanganate ($KMnO_4$) solution. The Hg collected (in the mercuric form) is reduced to elemental Hg which is then aerated from the solution into an optical cell and measured by atomic absorption spectrometry.

Quality Assurance/Quality Control Checks

Please complete the detailed checklist provided in the attached Table. If the statements are true, please circle "a"s or the corresponding run numbers; and if they are not reported, circle "a"s. In addition to completing the checklist please answer the following questions:

1.) What digestion method was used? _____

2.) Enter the digestion date(s). _____

3.) Number of Impingers: 50 ml 4% $KMnO_4$ (1) __ 100 ml 4% $KMnO_4$ (1)__
Empty (1 optional) __Silica Gel (1) __

Blank Procedure

Please be sure that the blank data was applied and considered correctly. For this particular method, the average peak height (or peak area) of the blank should have been subtracted from the average peak height of the aliquot standards.

Other Comments

Device ID:

SAMPLE LOCATION				
* *Swirl Check*				
1.) Not conducted?	sc1a		sc1b	M
2.) Average absolute value of angles > 10%?	sc2a		sc2b	M
* *Stack Size*				
1.) Enter stack diameter (inches).				M
2.) Stack diameter < 12 inch ? or	st2a		st2b	M
3.) Area <113 inch squared?	st3a		st3b	M
* *Number of Sample Points*				
1.) Enter total number of points.				M
2.) Method 1 not used?	ns2a		ns2b	M
SAMPLING EQUIPMENT				
* *Nozzle Size Check*				
1.) Not conducted prior to test?	nz1a		nz1b	M
2.) Variation in diameter > 0.004 inch?	nz2a		nz2b	M
* *Field Gas Dry Meter*				
1.) Not checked pre- and post-test?	gm1a		gm1b	M
2.) Pre- and post-test Y not within (+/-) 5%?	gm2a		gm2b	M
* *Pitot Tube*				
1.) Semi-annual calibration sheet not included?	pt1a		pt1b	M
SAMPLING PROCEDURES				
* *Leak Check*				
1.) Not conducted?	lc1a		lc1b	M
2.) Values not reported?	lc2a			M
3.) Pretest >0.02 cfm or 4% of average?	lc3a	lc3a	lc3a	R
4.) Post-test >0.02 cfm or 4% of average?	lc4a	lc4a	lc4a	R
* *Isokinetic Variation*				
1.) Sample not taken isokinetically?	is1a		is1b	M
2.) Isokinetic variation not reported?	is2a			M
3.) Isokinetic <90 or >110%?	is3a	is3a	is3a	R
* *Field Reagent Blank*				
1.) Not conducted once per test?	rb1a		rb1b	M
2.) Not used to correct sample?	rb2a		rb2b	M
* *Temperature*				
1.) Filter temperature not between 106 and 134 degrees?	tm1a		tm1b	M
* *Flow Rate*				
1.) Flow rate not reported?	fr1a			M
2.) Flow rate > 28 liter per minute (1 cfm)?	fr2a	fr2a	fr2a	R
ANALYSIS				
* *Method*				
1.) Atomic absorption spectrometry (AAS) not used?	mt1a		mt1b	M
2.) Combined analysis used ?	mt2a		mt2b	M

M-Method
R-Run
S-Substance

a-True
b-Not reported

CALCULATION CHECK FOR CARB METHOD 101A

Device ID:

DATA ENTRY-SAMPLING	SYMBOL	UNITS	DATA
RUN NUMBER	-	-	
ROUND STACK, DIAMETER	ds	inches	
RECTANGULAR STACK, LENGTH	L	inches	
WIDTH	W	inches	
NOZZLE DIAMETER	dn	inches	
AVERAGE STACK TEMPERATURE	Fs	degrees F	
AVERAGE METER TEMPERATURE	Fm	degrees F	
BAROMETRIC PRESSURE	Pbar	in. Hg	
STACK STATIC PRESSURE	Pg	in. H20	
AVG. DELTA H	dH	in. H20	
AVG. RMS VELOCITY HEAD	dP	in. H20	
PITOT COEFFICIENT	Cp	-	
GAS SAMPLE VOLUME	Vm	cubic ft.	
METER CALIBRATION FACTOR	Y	-	
TOTAL SAMPLING TIME	min	minutes	
STACK GAS OXYGEN CONTENT	Co2,m	%	
STACK GAS CARBON DIOXIDE CONTENT	Cco2,m	%	
TOTAL IMPINGER GAIN (WATER & PARTICULATE)	Ww	grams	
CALCULATED DATA-SAMPLING			
RUN NUMBER	-	-	0
NOZZLE AREA, An = 3.14(dn)**2/4	An	sq. in.	0.000
STACK AREA, As = 3.14*(ds)**2/576 (ROUND) = L * W/144 (RECTANGULAR)	As	sq. feet	0.000
AVG. STACK TEMPERATURE, Ts = Fs + 460	Ts	degrees R	460.0
AVG. METER TEMPERATURE, Tm = Fm + 460	Tm	degrees R	460.0
GAS SAMPLE VOLUME AT STANDARD CONDITIONS, VmStd = 17.64*Y*(Vm/Tm)*(Pbar + dH/13.6)	VmStd	cubic ft.	0.0
VOLUME OF WATER VAPOR, VwStd = 0.04707*Ww	VwStd	cubic ft.	0.0
MOISTURE FRACTION, Bws = VwStd/(VmStd + VwStd)	Bws	-	#DIV/0!
DRY STACK GAS MOL. WEIGHT, Md = 0.32(Co2,m)+ 0.44(Cco2,m)+0.28{100-(Co2,m)-(Cco2,m)]	Md	g/g-mole	28.00
WET STACK GAS MOLECULAR WEIGHT, Mw = Md(1-Bws)+18.0(Bws)	Mw	g/g-mole	#DIV/0!
ABSOLUTE STACK PRESSURE, Ps = Pbar + Pg/13.6	Ps	in. Hg	0.00
STACK GAS VELOCITY vs = 85.49 Cp { sqrt[(dP*Ts) /(Ps*Mw)] }	vs	ft/s	#DIV/0!
ACTUAL STACK GAS FLOW RATE, Q = 60*vs*As	Q	acf/min	#DIV/0!
DRY GAS STACK FLOW RATE (DRY,STP) Qsd = 17.64*Q*(1-Bws)*(Ps/Ts)	Qsd	dscf/min	#DIV/0!
ISOKINETIC RATE, I = 13.61*Ts*VmStd/[Ps*vs*An*min*(1-Bws)]	I	%	#DIV/0!
DATA ENTRY-ANALYTICAL			
TOTAL MASS OF MERCURY IN SAMPLE TRAIN	Mhg	mg	
CALCULATED DATA-OVERALL			
CONCENTRATION OF MERCURY MChg = (35.31*Mhg)/Vmstd	MChg	mg/dscm	#DIV/0!
ARSENIC MASS EMISSION RATE Ehg = ((Qsd*Mhg)/Vmstd)*1.32e-4	Ehg	lb/hr	#DIV/0!

SOURCE TEST METHOD DETAILED VALIDATION CHECKLIST

Test Method: CARB 104 - March, 1986
Substance: Beryllium

Report ID Number: _____
Reviewer: _____
Review Date: _____

Method Description and Applicability

This method is applicable to the determination of beryllium emissions from stationary sources. Beryllium emissions are withdrawn isokinetically and the collected sample is digested in and acid solution and analyzed by atomic absorption spectrometry.

Quality Assurance/Quality Control Checks

Please complete the detailed checklist provided in the attached Table. If the statements are true, please circle "a"s or the corresponding run numbers; and if they are not reported, circle "a"s. In addition to completing the checklist please answer the following questions:

1.) What digestion method was used? _____
2.) Enter the digestion date(s). _____
3.) Number of Impingers: H_2O (2) __ Empty (1)__ Silica Gel (1) __

Blank Procedure

Please be sure that the blank data was applied and considered correctly. For this particular method, the total amount of beryllium detected in the sample is corrected for the total amount of beryllium detected in the acetone and water blanks. There is no criteria for the blank levels, they just need to be performed and corrected for the sample values.

Other Comments

_____

_____

Device ID:

SAMPLE LOCATION				
** Swirl Check*				
1.) Not conducted?	sc1a		sc1b	M
2.) Average absolute value of angles > 10%?	sc2a		sc2b	M
** Stack Size*				
1.) Enter stack diameter (inches).				M
2.) Stack diameter < 12 inch ? or	st2a		st2b	M
3.) Area <113 inch squared?	st3a		st3b	M
** Number of Sample Points*				
1.) Enter total number of points.				M
2.) Method 1 not used?	ns2a		ns2b	M
SAMPLING EQUIPMENT				
** Nozzle Size Check*				
1.) Not conducted prior to test?	nz1a		nz1b	M
2.) Variation in diameter > 0.004 inch?	nz2a		nz2b	M
** Field Gas Dry Meter*				
1.) Not checked pre- and post-test?	gm1a		gm1b	M
2.) Pre- and post-test Y not within (+/-) 5%?	gm2a		gm2b	M
** Pitot Tube*				
1.) Semi-annual calibration sheet not included?	pt1a		pt1b	M
SAMPLING PROCEDURES				
** Leak Check*				
1.) Not conducted?	lc1a		lc1b	M
2.) Values not reported?	lc2a			M
3.) Pretest >0.02 cfm or 4% of average?	lc3a	lc3a	lc3a	R
4.) Post-test >0.02 cfm or 4% of average?	lc4a	lc4a	lc4a	R
** Isokinetic Variation*				
1.) Sample not taken isokinetically?	is1a		is1b	M
2.) Isokinetic variation not reported?	is2a			M
3.) Isokinetic <90 or >110%?	is3a	is3a	is3a	R
** Field Reagent Blank*				
1.) Not conducted for acetone?	rb1a		rb1b	M
2.) Not used to correct sample ?	rb2a		rb2b	M
** Flow Rate*				
1.) Flow rate not reported?	fr1a			M
2.) Flow rate < 0.5 or > 1 cfm?	fr2a	fr2a	fr2a	R
ANALYSIS				
** Method*				
1.) Atomic absorption spectrometry (AAS) not used?	mt1a		mt1b	M

M-Method
R-Run
S-Substance

a-True
b-Not reported

CALCULATION CHECK FOR CARB METHOD 104

Device ID:

DATA ENTRY-SAMPLING	SYMBOL	UNITS	DATA
RUN NUMBER	-	-	
ROUND STACK, DIAMETER	ds	inches	
RECTANGULAR STACK, LENGTH	L	inches	
WIDTH	W	inches	
NOZZLE DIAMETER	dn	inches	
AVERAGE STACK TEMPERATURE	Fs	degrees F	
AVERAGE METER TEMPERATURE	Fm	degrees F	
BAROMETRIC PRESSURE	Pbar	in. Hg	
STACK STATIC PRESSURE	Pg	in. H20	
AVG. DELTA H	dH	in. H20	
AVG. RMS VELOCITY HEAD	dP	in. H20	
PITOT COEFFICIENT	Cp	-	
GAS SAMPLE VOLUME	Vm	cubic ft.	
METER CALIBRATION FACTOR	Y	-	
TOTAL SAMPLING TIME	min	minutes	
STACK GAS OXYGEN CONTENT	Co2,m	%	
STACK GAS CARBON DIOXIDE CONTENT	Cco2,m	%	
TOTAL IMPINGER GAIN (WATER & PARTICULATE)	Ww	grams	
CALCULATED DATA-SAMPLING			
RUN NUMBER	-	-	0
NOZZLE AREA, An = 3.14(dn)**2/4	An	sq. in.	0.000
STACK AREA, As = 3.14*(ds)**2/576 (ROUND) = L * W/144 (RECTANGULAR)	As	sq. feet	0.000
AVG. STACK TEMPERATURE, Ts = Fs + 460	Ts	degrees R	460.0
AVG. METER TEMPERATURE, Tm = Fm + 460	Tm	degrees R	460.0
GAS SAMPLE VOLUME AT STANDARD CONDITIONS, VmStd = 17.64*Y*(Vm/Tm)*(Pbar + dH/13.6)	VmStd	cubic ft.	0.0
VOLUME OF WATER VAPOR, VwStd = 0.04707*Ww	VwStd	cubic ft.	0.0
MOISTURE FRACTION, Bws = VwStd/(VmStd + VwStd)	Bws	-	#DIV/0!
DRY STACK GAS MOL. WEIGHT, Md = 0.32(Co2,m)+ 0.44(Cco2,m)+0.28{100-(Co2,m)-(Cco2,m)]	Md	g/g-mole	28.00
WET STACK GAS MOLECULAR WEIGHT, Mw = Md(1-Bws)+18.0(Bws)	Mw	g/g-mole	#DIV/0!
ABSOLUTE STACK PRESSURE, Ps = Pbar + Pg/13.6	Ps	in. Hg	0.00
STACK GAS VELOCITY vs = 85.49 Cp { sqrt[(dP*Ts) /(Ps*Mw)] }	vs	ft/s	#DIV/0!
ACTUAL STACK GAS FLOW RATE, Q = 60*vs*As	Q	acf/min	#DIV/0!
DRY GAS STACK FLOW RATE (DRY,STP) Qsd = 17.64*Q*(1-Bws)*(Ps/Ts)	Qsd	dscf/min	#DIV/0!
ISOKINETIC RATE, I = 13.61*Ts*VmStd/[Ps*vs*An*min*(1-Bws)]	I	%	#DIV/0!
DATA ENTRY-ANALYTICAL			
TOTAL MASS OF BERYLLIUM IN SAMPLE TRAIN	Mass	mg	
TOTAL MASS OF BERYLLIUM IN ACETONE REAGENT BLAN	Mbeac	mg	
TOTAL MASS OF BERYLLIUM IN WATER REAGENT BLANK	Mbeh2o	mg	
CALCULATED DATA-OVERALL			
CORRECTED TOTAL AMOUNT OF BERYLLIUM Mbe = Mass - Mbeac - Mbeh2o	Mbe	mg	0.000
CONCENTRATION OF BERYLLIUM MCbe = (35.31*Mbe)/Vmstd	MCbe	mg/dscm	#DIV/0!
ARSENIC MASS EMISSION RATE Ebe = ((Qsd*Mbe)/Vmstd)*1.32e-4	Ebe	lb/hr	#DIV/0!

SOURCE TEST METHOD DETAILED VALIDATION CHECKLIST

Test Method: CARB 106 - June, 1983
Substance: Vinyl Chloride

Report ID Number: _____
Reviewer: _____
Review Date: _____

Method Description and Applicability

This method is applicable to the measurement of vinyl chloride in stack gases. An integrated bag sample of stack gas is subjected to chromatographic analysis, using a flame ionization detector.

Quality Assurance/Quality Control Checks

Please complete the detailed checklist provided in the attached Table . If the statements are true, please circle "a"s or the corresponding run numbers; and if they are not reported, circle "b"s.

Other Comments

_____
_____
_____
_____

Device ID:

ANALYSIS			
** Method*			
1.) GC/FID not used?	mt1a	mt1b	M
**Analysis Date*			
1.) Not within 72 hours from collection, all samples?	ad1a	ad1b	M
** 3-Point Calibration Curve*			
1.) Not conducted daily or before and after test?	pc1a	pc1b	M
2.) Percent difference not reported?	pc2a		M
3.) Percent difference > 5%?	pc3a	pc3b	M

M-Method a-True
R-Run b-Not reported
S-Substance

SOURCE TEST METHOD DETAILED VALIDATION CHECKLIST

Test Method: CARB 410A/B - March, 1986
Substance: Benzene

Report ID Number: _____
Reviewer: _____
Review Date: _____

Method Description and Applicability

This method is designed to provide sampling and analysis techniques for measurement of benzene emissions from stationary sources. CARB Method 410A is used for low concentrations (1.0 to 1000 ppb) and CARB Method 410B is used for high concentrations (60 ppb to 1 %). A Tedlar bag is used to collect a sample and the sample is subjected to gas chromatographic with a photo ionization detector for low concentrations and a flame ionization detector for high concentrations.

Quality Assurance/Quality Control Checks

Please complete the detailed checklist provided in the attached Table . If the statements are true, please circle "a"s or the corresponding run numbers; and if they are not reported, circle "b"s.

Other Comments

_____
_____
_____
_____

Device ID:

SAMPLING EQUIPMENT			
** Tedlar Bag Contamination Checks*			
1.) Not conducted for all bags?	tb1a	tb1b	M
SAMPLE COLLECTION			
** Leak Check*			
1.) Not conducted before and after each test?	lc1a	lc1b	M
ANALYSIS			
** Method*			
1.) FID not used for high concentrations (60ppb to .01) used?	mt1a	mt1b	M
2.) PID not used for low concentratons (1.0 to 1000 ppb)?	mt2a	mt2b	M
** Analysis Date*			
1.) Not within 96 hours from collection, each sample?	ad1a	ad1b	M

M-Method a-True
R-Run b-Not reported
S-Substance

SOURCE TEST METHOD DETAILED VALIDATION CHECKLIST

Test Method: CARB 421 - January, 1987
Substance: Hydrochloric Acid

Report ID Number: _____
Reviewer: _____
Review Date: _____

Method Description and Applicability

This method is applicable to the determination of hydrochloric acid emissions from stationary sources. Particulate and gaseous chloride emissions are withdrawn isokinetically from the source through a impinger-filter train where the gaseous chloride is absorbed and ionized in a basic buffer solution. Hydrochloric acid is assumed to be the principle compounds detected when testing combustion sources. ARB Method 421 calls for isokinetic sampling, absorption of HCL in impingers filled with ion chormatographic eluent solution, and analysis of samples by ion chormatography using that same eluent solution.

Quality Assurance/Quality Control Checks

Before completing the detailed QA checklist, please answer the following questions:

1) Is stack temperature above 250F? Yes No (answer Q #2)
2) If No, Is the sampling isokinetic? Yes No
3) If No, **STOP** evaluating this method.
4) Number of Impingers: NaHCO3/Na2CO3 (2)___ Empty (1)___Silica Gel (1)__

Please complete the detailed checklist provided in the attached Table . If the statements are true, please circle "a"s or the corresponding run numbers; and if they are not reported, circle "b"s.

Blank Procedure

Please be sure that the blank data is considered correctly. For this particular method, the peak resulting from the reagent blank **should have been subtracted** off of the sample peaks on the chromatograph.

Other Comments

Device ID:

SAMPLE LOCATION				
** Swirl Check*				
1.) Not conducted?		sc1a	sc1b	M
2.) Average absolute value of angles > 10%?		sc2a	sc2b	M
** Stack Size*				
1.) Enter stack diameter (inches).				M
2.) Stack diameter < 12 inch ? or		st2a	st2b	M
3.) Area <113 inch squared?		st3a	st3b	M
** Number of Sample Points*				
1.) Enter total number of points.				M
2.) Method 1 not used?		ns2a	ns2b	M
SAMPLING EQUIPMENT				
** Nozzle Size Check*				
1.) Not conducted prior to test?		nz1a	nz1b	M
2.) Variation in diameter > 0.004 inch?		nz2a	nz2b	M
** Field Gas Dry Meter*				
1.) Not checked pre- and post-test?		gm1a	gm1b	M
2.) Pre- and post-test Y not within (+/-) 5%?		gm2a	gm2b	M
** Pitot Tube*				
1.) Semi-annual calibration sheet not included?		pt1a	pt1b	M
SAMPLING PROCEDURES				
** Leak Check*				
1.) Not conducted?		lc1a	lc1b	M
2.) Values not reported?		lc2a		M
3.) Pretest >0.02 cfm or 4% of average?		lc3a	lc3a lc3a	R
4.) Post-test >0.02 cfm or 4% of average?		lc4a	lc4a lc4a	R
** Isokinetic Variation*				
1.) Sample not taken isokinetically?		is1a	is1b	M
2.) Isokinetic variation not reported?		is2a		M
3.) Isokinetic <90 or >110%?		is3a	is3a is3a	R
** Field Reagent Blank*				
1.) Not conducted once per test?		fb1a	fb1b	M
2.) Not used to correct sample peaks on the chromatograph?		fb2a	fb2b	M
** Impinger Solution*				
1.) Biocarbonate (NaHCO3) not used ?		im1a	im1b	M
2.) Sodium carbonate (Na2CO3) not used ?		im2a	im2b	M
3.) Water not used ?		im3a	im3b	M
ANALYSIS				
** Method*				
1.) Ion chromatography not used?		mt1a	mt1b	M
** Lab Spike*				
1) Not conducted 10% of all samples?		ls1a	ls1b	M
** Duplicate*				
1.) Not conducted for each sample?		du1a	du1b	M
2.) Percent difference not reported?		du2a		M
3.) Percent difference > 5%?				
	NR Hydrogen Chloride (HCl)	du3a	du3a du3a	S

M-Method
R-Run
S-Substance

a-True
b-Not reported

SOURCE TEST METHOD DETAILED VALIDATION CHECKLIST

Test Method: CARB 421 - December, 1991
Substance: Hydrogen Chloride

Report ID Number: _____
Reviewer: _____
Review Date: _____

Method Description and Applicability

This method is applicable to the determination of gaseous chloride emissions from stationary sources. Gaseous chloride is absorbed and ionized in a basic buffer solution and volatile chloride aerosol mist are also detected. Hydrochloric acid is assumed to be the principle compounds detected when testing combustion sources. ARB Method 421 calls for isokinetic sampling, absorption of HCL in impingers filled with ion chormatographic eluent solution, and analysis of samples by ion chormatography using that same eluent solution.

Quality Assurance/Quality Control Checks

Before completing the detailed QA checklist, please answer the following questions:

1) Is stack temperature above 250F? Yes No (answer Q #2)
2) If No, Is the sampling isokinetic? Yes No
3) If No, **STOP** evaluating this method.
4) Number of Impingers: NaHCO3/Na2CO3 (2)___ Empty (1)___Silica Gel (1)__

Please complete the detailed checklist provided in the attached Table. If the statements are true, please circle "a"s or the corresponding run numbers; and if they are not reported, circle "b"s.

Blank Procedure

Please be sure that the blank data is considered correctly. For this particular method, the sample value is not corrected with any of the blank values, although there is a blank level criteria. Make sure the measured blank levels satisfy the method criteria.

Other Comments

Device ID:

SAMPLE LOCATION					
* *Swirl Check*					
1.) Not conducted?		sc1a		sc1b	M
2.) Average absolute value of angles > 10%?		sc2a		sc2b	M
* *Stack Size*					
1.) Enter stack diameter (inches).					M
2.) Stack diameter < 12 inch ? or		st2a		st2b	M
3.) Area <113 inch squared?		st3a		st3b	M
* *Number of Sample Points*					
1.) Enter total number of points.					M
2.) Method 1 not used?		ns2a		ns2b	M
SAMPLING EQUIPMENT					
* *Nozzle Size Check*					
1.) Not conducted prior to test?		nz1a		nz1b	M
2.) Variation in diameter > 0.004 inch?		nz2a		nz2b	M
* *Field Gas Dry Meter*					
1.) Not checked pre- and post-test?		gm1a		gm1b	M
2.) Pre- and post-test Y not within (+/-) 5%?		gm2a		gm2b	M
* *Pitot Tube*					
1.) Semi-annual calibration sheet not included?		pt1a		pt1b	M
SAMPLING PROCEDURES					
* *Sample Runs*					
1.) Runs<3?		sr1a		sr1b	M
* *Sample Time*					
1.) Not conducted per run?		sd1a		sd1a	M
NR	2.) Runs <60 minutes?	sd2a	sd2a	sd2a	R
* *Leak Check*					
1.) Not conducted?		lc1a		lc1b	M
2.) Values not reported?		lc2a		lc2b	M
3.) Pre-test >0.02 cfm or 4% of average?		lc3a	lc3a	lc3a	R
4.) Post-test >0.02 cfm or 4% of average?		lc4a	lc4a	lc4a	R
* *Isokinetic Variation*					
1.) Sample not taken isokinetically?		is1a		is1b	M
2.) Isokinetic variation not reported?		is2a			M
3.) Isokinetic <90 or >110%?		is3a	is3a	is3a	R
* *Field Blank*					
1.) Not conducted once per test?		fb1a		fb1b	M
2.) Used to correct sample peaks on the chromatograph?		fb2a		fb2b	M
3.) Contamination >20% of any run ?					
NR	HCl	fb3a	fb3a	fb3a	S
* *Implnger Solution*					
1.) Biocarbonate (NaHCO3) not used ?		im1a		im1b	M
2.) Sodium carbonate (Na2CO3) not used ?		im2a		im2b	M
3.) Water not used ?		im3a		im3b	M
ANALYSIS					
* *Method*					
1.) Ion chromatography not used?		mt1a		mt1b	M
* *Lab Spike*					
1.) Not conducted prior, daily, and after every 40 samples?		ls1a		ls1b	M
2.) Percent recovery not reported?		ls2a			M
3.) Percent recovery <95% or > 105%					
Hydrogen Chloride (HCl)		ls3a	ls3a	ls3a	S
* *Duplicate*					
1.) Not conducted for 10% of all samples?		du1a		du1b	M
2.) Percent difference not reported?		du2a			M
3.) Percent difference > 5% STD?					
Hydrogen Chloride (HCl)		du3a	du3a	du3a	R

M-Method a-True
R-Run b-not reported
S-Substance

SOURCE TEST METHOD DETAILED VALIDATION CHECKLIST

Test Method: CARB 422-January, 1987
Substance: Volatile Halogenated Organic Compounds

Report ID Number: _____
Reviewer: _____
Review Date: _____

Method Description and Applicability

This method is designed to provide sampling and analysis techniques for measurement of halogenated organics in emissions from stationary sources. A Tedlar bag is used to collect a sample and the sample is subjected to gas chromatographic analysis for quantitation.

Quality Assurance/Quality Control Checks

Please complete the detailed checklist provided in the attached Table. If the statements are true, please circle "a
"s or the corresponding run numbers; and if they are not reported, circle "b"s.

Other Comments

_____
_____
_____
_____

Device ID:

SAMPLING EQUIPMENT			
** Tedlar Bag Contamination Checks*			
1.) Not conducted for all bags?	tb1a	tb1b	M
2.) Levels not reported ?	tb2a	tb2b	M
SAMPLE Collection			
** Leak Check*			
1.) Not conducted before and after each test?	lc1a	lc1b	M
2.) Leaks > 5% of sample rate ?	lc2a	lc2b	M
ANALYSIS			
** Method*			
1.) GC not used ?	mt1a	mt1b	M
**Analysis Date*			
1.) Not within 24 hours from collection, each sample?	ad1a	ad1b	M

M-Method a-True
R-Run b-Not reported
S-Substance

SOURCE TEST METHOD DETAILED VALIDATION CHECKLIST

Test Method: CARB 422 - December, 1991
Substance: Volatile Halogenated Organic Compounds

Report ID Number: _____
Reviewer: _____
Review Date: _____

Method Description and Applicability

This method is designed to provide sampling and analysis techniques for measurement of volatile organic compounds in emissions from stationary sources. This method cannot be used to determine compounds that (1) are polymetric (high molecular weight) (2) can polymerize before analysis, or (3) have very low vapor pressures at stack or instrument conditions. A Tedlar bag is used to collect a sample and the sample is subjected to gas chromatographic analysis for quantitation.

Quality Assurance/Quality Control Checks

Some preliminary determinations and options are available to the source tester based on the stack conditions. The following questions indicate those options.

1) Was the sample diluted to avoid condensation? Yes No
2) Were impingers used? Yes No
3) Was an on-site GC used for 1,3-Butadiene? Yes No

Please complete the detailed checklist provided in the attached Table. If the statements are true, please circle "a"s or the corresponding run numbers; and if they are not reported, circle "a"s.

Other Comments

_____
_____
_____
_____

Device ID: 422DEC91.XLS

SAMPLING EQUIPMENT						
** Tedlar Bag Contamination Checks*						
1.) Not conducted for all bags?			tb1a		tb1b	M
2.) Levels not reported ?			tb2a		tb2b	M
SAMPLE COLLECTION						
** Field Blank*						
1.) Not conducted once per test?			fb1a		fb1b	M
2.) Used to correct sample?			fb2a		fb2b	M
3.) Blank > 20% of the stack samples?						
NA	NR	Dichloromethane	fb3a	fb3a	fb3a	S
NA	NR	Chloroform	fb3a	fb3a	fb3a	S
NA	NR	1,1,1-trichloroethane	fb3a	fb3a	fb3a	S
NA	NR	Carbon tetrachloride	fb3a	fb3a	fb3a	S
NA	NR	1,2-dichloroethane	fb3a	fb3a	fb3a	S
NA	NR	Trichloroethene	fb3a	fb3a	fb3a	S
NA	NR	1,2-dibromoethane	fb3a	fb3a	fb3a	S
NA	NR	Tetrachloroethene	fb3a	fb3a	fb3a	S
NA	NR	1,3-butadiene	fb3a	fb3a	fb3a	S
** Leak Check*						
1.) Not conducted before and after each test?			lc1a		lc1b	M
2.) Leaks > 5% of sample rate ?			lc2a		lc2b	M
** Field Spike*						
1.) Not collected once per source?			fs1a		fs1b	M
ANALYSIS						
** Method*						
1.) GC not used ?			mt1a		mt1b	M
**Analysis Date*						
1) Not within 72 hours from collection, each sample?			ad1a		ad1b	M
** Duplicates*						
1.) Not conducted once per sample?			du1a		du1b	M
2.) Values not reported?			du2a			M
3.) Values > 3 X RSD ?						
	NA	Dichloromethane	du3a		du3b	S
	NA	Chloroform	du3a		du3b	S
	NA	1,1,1-trichloroethane	du3a		du3b	S
	NA	Carbon tetrachloride	du3a		du3b	S
	NA	1,2-dichloroethane	du3a		du3b	S
	NA	Trichloroethene	du3a		du3b	S
	NA	1,2-dibromoethane	du3a		du3b	S
	NA	Tetrachloroethene	du3a		du3b	S
	NA	1,3-butadiene	du3a		du3b	S

M-Method
R-Run
S-Substance

a-True
b-Not reported

SOURCE TEST METHOD DETAILED VALIDATION CHECKLIST

Test Method: CARB 423 - January, 1987
Substance: Inorganic Arsenic

Report ID Number: _____
Reviewer: _____
Review Date: _____

Method Description and Applicability

This method is applicable to the determination of inorganic arsenic emissions from stationary sources. Particulate and gaseous arsenic emissions are withdrawn isokinetically and collected on a filter and in water. The samples are then analyzed by atomic absorption spectrometry.

Quality Assurance/Quality Control Checks

Please complete the detailed checklist provided in the attached Table. If the statements are true, please circle "a"s or the corresponding run numbers; and if they are not reported, circle "a"s. In addition to completing the checklist please answer the following questions:

1.) What digestion method was used? _____
2.) Enter the digestion date(s). _____
3.) Number of Impingers: H_2O (2) __ Empty (1)__ Silica Gel (1) __

Blank Procedure

Please be sure that the blank data was applied and considered correctly. For this particular method, the total amount of arsenic detected in the sample is corrected for the total amount of arsenic detected in the filter, NaOH, and water blanks. There is no criteria for the blank levels, they just need to be performed and corrected for the sample values.

Other Comments

_____

_____

Device ID:

SAMPLE LOCATION			
* *Swirl Check*			
1.) Not conducted?	sc1a	sc1b	M
2.) Average absolute value of angles > 10%?	sc2a	sc2b	M
* *Stack Size*			
1.) Enter stack diameter (inches).			M
2.) Stack diameter < 12 inch ? or	st2a	st2b	M
3.) Area <113 inch squared?	st3a	st3b	M
* *Number of Sample Points*			
1.) Enter total number of points.			M
2.) Method 1 not used?	ns2a	ns2b	M
SAMPLING EQUIPMENT			
* *Nozzle Size Check*			
1.) Not conducted prior to test?	nz1a	nz1b	M
2.) Variation in diameter > 0.004 inch?	nz2a	nz2b	M
* *Field Gas Dry Meter*			
1.) Not checked pre- and post-test?	gm1a	gm1b	M
2.) Pre- and post-test Y not within (+/-) 5%?	gm2a	gm2b	M
* *Pitot Tube*			
1.) Semi-annual calibration sheet not included?	pt1a	pt1b	M
SAMPLING PROCEDURES			
* *Leak Check*			
1.) Not conducted?	lc1a	lc1b	M
2.) Values not reported?	lc2a		M
3.) Pretest >0.02 cfm or 4% of average?	lc3a lc3a	lc3a	R
4.) Post-test >0.02 cfm or 4% of average?	lc4a lc4a	lc4a	R
* *Isokinetic Variation*			
1.) Sample not taken isokinetically?	is1a	is1b	M
2.) Isokinetic variation not reported?	is2a		M
3.) Isokinetic <90 or >110%?	is3a is3a	is3a	R
* *Field Reagent Blank*			
1.) Not conducted for two filters and 0.1N NaOH?	rb1a	rb1b	M
2.) Not used to correct sample ?	rb2a	rb2b	M
* *Temperature*			
1.) Filter temperature not between 107 and 135 degrees?	tm1a	tm1b	M
* *Flow Rate*			
1.) Flow rate not reported?	fr1a		M
2.) Flow rate > 28 liter per minute (1 cfm)?	fr2a fr2a	fr2a	R
ANALYSIS			
* Method			
1.) Atomic absorption spectrometry (AAS) not used?	mt1a	mt1b	M
2.) Combined analysis used ?	mt2a	mt2b	M

M-Method a-True
R-Run b-Not reported
S-Substance

CALCULATION CHECK FOR CARB METHOD 423

Device ID:

DATA ENTRY-SAMPLING	SYMBOL	UNITS	DATA
RUN NUMBER	-	-	
ROUND STACK, DIAMETER	ds	inches	
RECTANGULAR STACK, LENGTH	L	inches	
WIDTH	W	inches	
NOZZLE DIAMETER	dn	inches	
AVERAGE STACK TEMPERATURE	Fs	degrees F	
AVERAGE METER TEMPERATURE	Fm	degrees F	
BAROMETRIC PRESSURE	Pbar	in. Hg	
STACK STATIC PRESSURE	Pg	in. H20	
AVG. DELTA H	dH	in. H20	
AVG. RMS VELOCITY HEAD	dP	in. H20	
PITOT COEFFICIENT	Cp	-	
GAS SAMPLE VOLUME	Vm	cubic ft.	
METER CALIBRATION FACTOR	Y	-	
TOTAL SAMPLING TIME	min	minutes	
STACK GAS OXYGEN CONTENT	Co2,m	%	
STACK GAS CARBON DIOXIDE CONTENT	Cco2,m	%	
TOTAL IMPINGER GAIN (WATER & PARTICULATE)	Ww	grams	
CALCULATED DATA-SAMPLING			
RUN NUMBER	-	-	0
NOZZLE AREA, An = 3.14(dn)**2/4	An	sq. in.	0.000
STACK AREA, As = 3.14*(ds)**2/576 (ROUND) = L * W/144 (RECTANGULAR)	As	sq. feet	0.000
AVG. STACK TEMPERATURE, Ts = Fs + 460	Ts	degrees R	460.0
AVG. METER TEMPERATURE, Tm = Fm + 460	Tm	degrees R	460.0
GAS SAMPLE VOLUME AT STANDARD CONDITIONS, VmStd = 17.64*Y*(Vm/Tm)*(Pbar + dH/13.6)	VmStd	cubic ft.	0.0
VOLUME OF WATER VAPOR, VwStd = 0.04707*Ww	VwStd	cubic ft.	0.0
MOISTURE FRACTION, Bws = VwStd/(VmStd + VwStd)	Bws	-	#DIV/0!
DRY STACK GAS MOL. WEIGHT, Md = 0.32(Co2,m)+ 0.44(Cco2,m)+0.28{100-(Co2,m)-(Cco2,m)]	Md	g/g-mole	28.00
WET STACK GAS MOLECULAR WEIGHT, Mw = Md(1-Bws)+18.0(Bws)	Mw	g/g-mole	#DIV/0!
ABSOLUTE STACK PRESSURE, Ps = Pbar + Pg/13.6	Ps	in. Hg	0.00
STACK GAS VELOCITY vs = 85.49 Cp { sqrt[(dP*Ts) /(Ps*Mw)] }	vs	ft/s	#DIV/0!
ACTUAL STACK GAS FLOW RATE, Q = 60*vs*As	Q	acf/min	#DIV/0!
DRY GAS STACK FLOW RATE (DRY,STP) Qsd = 17.64*Q*(1-Bws)*(Ps/Ts)	Qsd	dscf/min	#DIV/0!
ISOKINETIC RATE, I = 13.61*Ts*VmStd/[Ps*vs*An*min*(1-Bws)]	I	%	#DIV/0!
DATA ENTRY-ANALYTICAL			
TOTAL MASS OF ARSENIC IN SAMPLE TRAIN	Mass	mg	
TOTAL MASS OF ARSENIC IN FILTER REAGENT BLANKS	Masf	mg	
TOTAL MASS OF ARSENIC IN 0.1N NaOH REAGENT BLANK	Masoh	mg	
TOTAL MASS OF ARSENIC IN WATER REAGENT BLANK	Mash2o	mg	
CALCULATED DATA-OVERALL			
CORRECTED TOTAL AMOUNT OF ARSENIC Mas = Mass - Masf - Masoh - Mash2o	Mas	mg	0.000
CONCENTRATION OF ARSENIC MCas = (35.31*Mas)/Vmstd	MCas	mg/dscm	#DIV/0!
ARSENIC MASS EMISSION RATE Eas = ((Qsd*Mas)/Vmstd)*1.32e-4	Eas	lb/hr	#DIV/0!

SOURCE TEST METHOD DETAILED VALIDATION CHECKLIST

Test Method: CARB 424 - January, 1987
Substance: Inorganic Cadmium

Report ID Number: _____
Reviewer: _____
Review Date: _____

Method Description and Applicability

This method is applicable to the determination of inorganic cadmium emissions from stationary sources. Particulate and gaseous cadmium emissions are withdrawn isokinetically and collected on a filter and in a solution of nitric acid. The samples are then analyzed by atomic absorption spectrometry (direct aspiration method).

Quality Assurance/Quality Control Checks

Please complete the detailed checklist provided in the attached Table. If the statements are true, please circle "a"s or the corresponding run numbers; and if they are not reported, circle "a"s. In addition to completing the checklist please answer the following questions:

1.) What digestion method was used? _____
2.) Enter the digestion date(s). _____
3.) Number of Impingers: 0.1N HNO_3 (2) __ Empty (1)__ Silica Gel (1) __

Blank Procedure

Please be sure that the blank data was applied and considered correctly. For this particular method, the absorbance reading from the sample needs to be corrected for the absorbance readings of the filter and nitric blanks. There is no criteria for the blank levels, they just need to be performed and corrected for the sample values.

Other Comments

_____

_____

Device ID:

SAMPLE LOCATION				
** Swirl Check*				
1.) Not conducted?	sc1a		sc1b	M
2.) Average absolute value of angles > 10%?	sc2a		sc2b	M
** Stack Size*				
1.) Enter stack diameter (inches).				M
2.) Stack diameter < 12 inch ? or	st2a		st2b	M
3.) Area <113 inch squared?	st3a		st3b	M
** Number of Sample Points*				
1.) Enter total number of points.				M
2.) Method 1 not used?	ns2a		ns2b	M
SAMPLING EQUIPMENT				
** Nozzle Size Check*				
1.) Not conducted prior to test?	nz1a		nz1b	M
2.) Variation in diameter > 0.004 inch?	nz2a		nz2b	M
** Field Gas Dry Meter*				
1.) Not checked pre- and post-test?	gm1a		gm1b	M
2.) Pre- and post-test Y not within (+/-) 5%?	gm2a		gm2b	M
** Pitot Tube*				
1.) Semi-annual calibration sheet not included?	pt1a		pt1b	M
SAMPLING PROCEDURES				
** Leak Check*				
1.) Not conducted?	lc1a		lc1b	M
2.) Values not reported?	lc2a			M
3.) Pretest >0.02 cfm or 4% of average?	lc3a	lc3a	lc3a	R
4.) Post-test >0.02 cfm or 4% of average?	lc4a	lc4a	lc4a	R
** Isokinetic Variation*				
1.) Sample not taken isokinetically?	is1a		is1b	M
2.) Isokinetic variation not reported?	is2a			M
3.) Isokinetic <90 or >110%?	is3a	is3a	is3a	R
** Field Reagent Blank*				
1.) Not conducted for two filters and 0.1N HNO3?	rb1a		rb1b	M
2.) Not used to correct sample ?	rb2a		rb2b	M
ANALYSIS				
** Method*				
1.) Atomic absorption spectrometry (AAS) not used?	mt1a		mt1b	M
2.) Not conducted in triplicate ?	mt2a		mt2b	M

M-Method
R-Run
S-Substance

a-True
b-Not reported

CALCULATION CHECK FOR CARB METHOD 424

Device ID:

DATA ENTRY-SAMPLING	SYMBOL	UNITS	DATA
RUN NUMBER	-	-	
ROUND STACK, DIAMETER	ds	inches	
RECTANGULAR STACK, LENGTH	L	inches	
WIDTH	W	inches	
NOZZLE DIAMETER	dn	inches	
AVERAGE STACK TEMPERATURE	Fs	degrees F	
AVERAGE METER TEMPERATURE	Fm	degrees F	
BAROMETRIC PRESSURE	Pbar	in. Hg	
STACK STATIC PRESSURE	Pg	in. H20	
AVG. DELTA H	dH	in. H20	
AVG. RMS VELOCITY HEAD	dP	in. H20	
PITOT COEFFICIENT	Cp	-	
GAS SAMPLE VOLUME	Vm	cubic ft.	
METER CALIBRATION FACTOR	Y	-	
TOTAL SAMPLING TIME	min	minutes	
STACK GAS OXYGEN CONTENT	Co2,m	%	
STACK GAS CARBON DIOXIDE CONTENT	Cco2,m	%	
TOTAL IMPINGER GAIN (WATER & PARTICULATE)	Ww	grams	
CALCULATED DATA-SAMPLING			
RUN NUMBER	-	-	0
NOZZLE AREA, An = 3.14(dn)**2/4	An	sq. in.	0.000
STACK AREA, As = 3.14*(ds)**2/576 (ROUND) = L * W/144 (RECTANGULAR)	As	sq. feet	0.000
AVG. STACK TEMPERATURE, Ts = Fs + 460	Ts	degrees R	460.0
AVG. METER TEMPERATURE, Tm = Fm + 460	Tm	degrees R	460.0
GAS SAMPLE VOLUME AT STANDARD CONDITIONS, VmStd = 17.64*Y*(Vm/Tm)*(Pbar + dH/13.6)	VmStd	cubic ft.	0.0
VOLUME OF WATER VAPOR, VwStd = 0.04707*Ww	VwStd	cubic ft.	0.0
MOISTURE FRACTION, Bws = VwStd/(VmStd + VwStd)	Bws	-	#DIV/0!
DRY STACK GAS MOL. WEIGHT, Md = 0.32(Co2,m)+ 0.44(Cco2,m)+0.28{100-(Co2,m)-(Cco2,m)]	Md	g/g-mole	28.00
WET STACK GAS MOLECULAR WEIGHT, Mw = Md(1-Bws)+18.0(Bws)	Mw	g/g-mole	#DIV/0!
ABSOLUTE STACK PRESSURE, Ps = Pbar + Pg/13.6	Ps	in. Hg	0.00
STACK GAS VELOCITY vs = 85.49 Cp { sqrt[(dP*Ts) /(Ps*Mw)] }	vs	ft/s	#DIV/0!
ACTUAL STACK GAS FLOW RATE, Q = 60*vs*As	Q	acf/min	#DIV/0!
DRY GAS STACK FLOW RATE (DRY,STP) Qsd = 17.64*Q*(1-Bws)*(Ps/Ts)	Qsd	dscf/min	#DIV/0!
ISOKINETIC RATE, I = 13.61*Ts*VmStd/[Ps*vs*An*min*(1-Bws)]	I	%	#DIV/0!
DATA ENTRY-ANALYTICAL			
TOTAL MASS OF CADMIUM IN SAMPLE TRAIN	Mcd	mg	
CALCULATED DATA-OVERALL			
CONCENTRATION OF CADMIUM MCcd = (35.31*Mcd)/Vmstd	MCcd	mg/dscm	#DIV/0!
CADMIUM MASS EMISSION RATE Ecd = ((Qsd*Mcd)/Vmstd)*1.32e-4	Ecd	lb/hr	#DIV/0!

SOURCE TEST METHOD DETAILED VALIDATION CHECKLIST

Test Method: CARB 425 - January, 1987
Substance: Total and Hexavalent Chromium

Report ID Number: _____
Reviewer: _____
Review Date: _____

Method Description and Applicability

This method is applicable to the determination of total chromium and hexavalent chromium emissions from stationary sources. Particulate emissions are withdrawn isokinetically and collected on a filter and in DI water. The components of the collected sample are then split and analyzed. Analysis for hexavalent chromium is performed by a diphenylcarbazide colorimetric method after alkaline extraction. Total chromium is analyzed by a graphite furnace technique after acid digestion and dissolution.

Quality Assurance/Quality Control Checks

Please complete the detailed checklist provided in the attached Table. If the statements are true, please circle "a"s or the corresponding run numbers; and if they are not reported, circle "a"s.

Other Comments

_____
_____
_____
_____

Device ID:

SAMPLE LOCATION				
** Swirl Check*				
1.) Not conducted?	sc1a		sc1b	M
2.) Average absolute value of angles > 10%?	sc2a		sc2b	M
** Stack Size*				
1.) Enter stack diameter (inches).				
2.) Stack diameter < 12 inch ? or	st2a		st2b	M
3.) Area <113 inch squared?	st3a		st3b	M
** Number of Sample Points*				
1.) Enter total number of points.				
2.) Method 1 not used?	ns2a		ns2b	M
SAMPLING EQUIPMENT				
** Nozzle Size Check*				
1.) Not conducted prior to test?	nz1a		nz1b	M
2.) Variation in diameter > 0.004 inch?	nz2a		nz2b	M
** Field Gas Dry Meter*				
1.) Not checked pre- and post-test?	gm1a		gm1b	M
2.) Pre- and post-test Y not within (+/-) 5%?	gm2a		gm2b	M
** Pitot Tube*				
1.) Semi-annual calibration sheet not included?	pt1a		pt1b	M
SAMPLING PROCEDURES				
** Leak Check*				
1.) Not conducted?	lc1a		lc1b	M
2.) Values not reported?	lc2a			M
3.) Pretest >0.02 cfm or 4% of average?	lc3a	lc3a	lc3a	R
4.) Post-test >0.02 cfm or 4% of average?	lc4a	lc4a	lc4a	R
** Isokinetic Variation*				
1.) Sample not taken isokinetically?	is1a		is1b	M
2.) Isokinetic variation not reported?	is2a			M
3.) Isokinetic <90 or >110%?	is3a	is3a	is3a	R
** Reagent Blank*				
1.) Not conducted once per sample batch?	rb1a		rb1b	M
2.) Used to correct sample?	rb2a		rb2b	M
ANALYSIS (Hexavalent Chromium)				
** Matrix Spike*				
1.) Not conducted per test?	ms1a		ms1b	M
2.) Percent recovery not reported?	ms2a			M
3.) Was percent recovery > 10%?				
Hexavalent Chromium	ms3a	ms3a	ms3a	S
ANALYSIS (Total Chromium)				
** Duplicates*				
1.) Not conducted for every 10 samples?	du1a		du1b	M
** Matrix Spike*				
1.) Not conducted daily?	ms4a		ms4b	M

M-Method
R-Run
S-Substance

a-True
b-Not reported

CALCULATION CHECK FOR CARB METHOD 425-Jan 87

Device ID:

DATA ENTRY-SAMPLING	SYMBOL	UNITS	DATA
RUN NUMBER	-	-	
ROUND STACK, DIAMETER RECTANGULAR STACK, LENGTH WIDTH	ds L W	inches inches inches	
NOZZLE DIAMETER	dn	inches	
AVERAGE STACK TEMPERATURE	Fs	degrees F	
AVERAGE METER TEMPERATURE	Fm	degrees F	
BAROMETRIC PRESSURE	Pbar	in. Hg	
STACK STATIC PRESSURE	Pg	in. H20	
AVG. DELTA H	dH	in. H20	
AVG. RMS VELOCITY HEAD	dP	in. H20	
PITOT COEFFICIENT	Cp	-	
GAS SAMPLE VOLUME	Vm	cubic ft.	
METER CALIBRATION FACTOR	Y	-	
TOTAL SAMPLING TIME	min	minutes	
STACK GAS OXYGEN CONTENT	Co2,m	%	
STACK GAS CARBON DIOXIDE CONTENT	Cco2,m	%	
TOTAL IMPINGER GAIN (WATER & PARTICULATE)	Ww	grams	
CALCULATED DATA-SAMPLING			
RUN NUMBER	-	-	0
NOZZLE AREA, An = 3.14(dn)**2/4	An	sq. in.	0.000
STACK AREA, As = 3.14*(ds)**2/576 (ROUND) = L * W/144 (RECTANGULAR)	As	sq. feet	0.000
AVG. STACK TEMPERATURE, Ts = Fs + 460	Ts	degrees R	460.0
AVG. METER TEMPERATURE, Tm = Fm + 460	Tm	degrees R	460.0
GAS SAMPLE VOLUME AT STANDARD CONDITIONS, VmStd = 17.64*Y*(Vm/Tm)*(Pbar + dH/13.6)	VmStd	cubic ft.	0.0
VOLUME OF WATER VAPOR, VwStd = 0.04707*Ww	VwStd	cubic ft.	0.0
MOISTURE FRACTION, Bws = VwStd/(VmStd + VwStd)	Bws	-	#DIV/0!
DRY STACK GAS MOL. WEIGHT, Md = 0.32(Co2,m)+ 0.44(Cco2,m)+0.28{100-(Co2,m)-(Cco2,m)}	Md	g/g-mole	28.00
WET STACK GAS MOLECULAR WEIGHT, Mw = Md(1-Bws)+18.0(Bws)	Mw	g/g-mole	#DIV/0!
ABSOLUTE STACK PRESSURE, Ps = Pbar + Pg/13.6	Ps	in. Hg	0.00
STACK GAS VELOCITY vs = 85.49 Cp { sqrt[(dP*Ts) /(Ps*Mw)] }	vs	ft/s	#DIV/0!
ACTUAL STACK GAS FLOW RATE, Q = 60*vs*As	Q	acf/min	#DIV/0!
DRY GAS STACK FLOW RATE (DRY,STP) Qsd = 17.64*Q*(1-Bws)*(Ps/Ts)	Qsd	dscf/min	#DIV/0!
ISOKINETIC RATE, I = 13.61*Ts*VmStd/[Ps*vs*An*min*(1-Bws)]	I	%	#DIV/0!
DATA ENTRY-ANALYTICAL			
TOTAL HEXAVELENT CHROMIUM IN PROBE	Mpcr6	ug	
TOTAL HEXAVELENT CHROMIUM IN FILTER	Mfcr6	ug	
TOTAL HEXAVELENT CHROMIUM IN IMPINGERS	Micr6	ug	
TOTAL CHROMIUM IN PROBE	Mpcr	ug	
TOTAL CHROMIUM IN FILTER	Mfcr	ug	
TOTAL CHROMIUM IN IMPINGERS	Micr	ug	
CALCULATED DATA-OVERALL			
TOTAL HEXAVALENT CHROMIUM Mcr6 = Mpcr6 + Mfcr6 + Micr6	Mcr6	ug	0.000
TOTAL CHROMIUM Mcr = Mpcr + Mfcr + Micr	Mcr	ug	0.000
CONCENTRATION OF HEXAVELENT CHROMIUM Ccr6 = (35.31*Mcr6)/Vmstd	Ccr6	ug/dscm	#DIV/0!
CONCENTRATION OF TOTAL CHROMIUM Ccr = (35.31*Mcr)/Vmstd	Ccr	ug/dscm	#DIV/0!
HEXAVALENT CHROMIUM MASS EMISSION RATE Ecr6 = ((Qsd*Mcr6)/Vmstd)*1.32e-7	Ecr6	lb/hr	#DIV/0!
TOTAL CHROMIUM MASS EMISSION RATE Ecr = ((Qsd*Mcr)/Vmstd)*1.32e-7	Ecr	lb/hr	#DIV/0!

SOURCE TEST METHOD DETAILED VALIDATION CHECKLIST

Test Method: CARB 425 - September, 1990
Substance: Total and Hexavalent Chromium

Report ID Number: _____
Reviewer: _____
Review Date: _____

Method Description and Applicability

This method is applicable to the determination of total chromium and hexavalent chromium emissions from stationary sources. Particulate emissions are withdrawn isokinetically and collected in an alkaline medium. The components of the collected sample are then split and analyzed. Analysis for hexavalent chromium is performed by a diphenylcarbazide colorimetric method after alkaline extraction. Total chromium is analyzed by a graphite furnace technique after acid digestion and dissolution.

Quality Assurance/Quality Control Checks

Before preceding with the validation checklist, the method allows alternative procedures and analysis to be performed. The following questions will indicate which alternatives the contractor chose in order to perform the source test (circle correct answers).

1) Was total chromium quantified with this method? Yes No (if no, disregard all questions involving total chrome)
2) How was the hexavalent chromium analyzed? Colorimetric Ion Chromatography
3) How was the total chromium analyzed? Graphite Furnace Flame AAS
4) Were impinger catches analyzed combined or separate? Combined Separate
5) Which impinger catch was used to extract filter? Imp #1 Imp #2

Please complete the detailed checklist provided in the attached Tabl. If the statements are true, please circle "a"s or the corresponding run numbers; and if they are not reported, circle "b"s.

Blank Procedure

Please be sure that the blank data was applied and considered correctly. The absorbance reading from the reagent blank should be subtracted from the absorbance reading obtained from the field sample.

Other Comments

Device ID:

SAMPLE LOCATION				
** Swirl Check*				
1.) Not conducted?	sc1a		sc1b	M
2.) Average absolute value of angles > 10%?	sc2a		sc2b	M
** Stack Size*				
1.) Enter stack diameter (inches).				
2.) Stack diameter < 12 inch ? or	st2a		st2b	M
3.) Area <113 inch squared?	st3a		st3b	M
** Number of Sample Points*				
1.) Enter total number of points.				
2.) Method 1 not used?	ns2a		ns2b	M
SAMPLING EQUIPMENT				
** Nozzle Size Check*				
1.) Not conducted prior to test?	nz1a		nz1b	M
2.) Variation in diameter > 0.004 inch?	nz2a		nz2b	M
** Field Gas Dry Meter*				
1.) Not checked pre- and post-test?	gm1a		gm1b	M
2.) Pre- and post-test Y not within (+/-) 5%?	gm2a		gm2b	M
** Pitot Tube*				
1.) Semi-annual calibration sheet not included?	pt1a		pt1b	M
SAMPLING PROCEDURES				
** Leak Check*				
1.) Not conducted?	lc1a		lc1b	M
2.) Values not reported?	lc2a			M
3.) Pretest >0.02 cfm or 4% of average?	lc3a	lc3a	lc3a	R
4.) Post-test >0.02 cfm or 4% of average?	lc4a	lc4a	lc4a	R
** Isokinetic Variation*				
1.) Sample not taken isokinetically?	is1a		is1b	M
2.) Isokinetic variation not reported?	is2a			M
3.) Isokinetic <90 or >110%?	is3a	is3a	is3a	R
** Probe Proof*				
1.) Not conducted per prob?	pp1a		pp1b	M
2.) Value not reported ?	pp2a			M
3.) Total chrome > DL ?	pp3a	pp3a	pp3a	S
** Reagent Blank*				
1.) Not conducted one per sample batch?	rb1a		rb1b	M
2.) Not used to correct sample?	rb2a		rb2b	M
ANALYSIS (Hexavalent Chromium)				
** Matrix Spike*				
1.) Not conducted per test?	ms1a		ms1b	M
2.) Percent recovery not reported?	ms2a			M
3.) Percent recovery > 10%?				
Hexavalent Chromium	ms3a	ms3a	ms3a	S
ANALYSIS (Total Chromium)				
** Duplicates*				
1.) Not conducted for every 10 samples?	du1a		du1b	M
** Spikes*				
1.) Not conducted daily?	ms4a		ms4b	M

M-Method
R-Run
S-Substance

a-True
b-Not reported

Device ID:

DATA ENTRY-SAMPLING	SYMBOL	UNITS	DATA
RUN NUMBER	-	-	
ROUND STACK, DIAMETER	ds	inches	
RECTANGULAR STACK, LENGTH	L	inches	
WIDTH	W	inches	
NOZZLE DIAMETER	dn	inches	
AVERAGE STACK TEMPERATURE	Fs	degrees F	
AVERAGE METER TEMPERATURE	Fm	degrees F	
BAROMETRIC PRESSURE	Pbar	in. Hg	
STACK STATIC PRESSURE	Pg	in. H20	
AVG. DELTA H	dH	in. H20	
AVG. RMS VELOCITY HEAD	dP	in. H20	
PITOT COEFFICIENT	Cp	-	
GAS SAMPLE VOLUME	Vm	cubic ft.	
METER CALIBRATION FACTOR	Y	-	
TOTAL SAMPLING TIME	min	minutes	
STACK GAS OXYGEN CONTENT	Co2,m	%	
STACK GAS CARBON DIOXIDE CONTENT	Cco2,m	%	
TOTAL IMPINGER GAIN (WATER & PARTICULATE)	Ww	grams	
CALCULATED DATA-SAMPLING			
RUN NUMBER	-	-	0
NOZZLE AREA, An = 3.14(dn)**2/4	An	sq. in.	0.000
STACK AREA, As = 3.14*(ds)**2/576 (ROUND) = L * W/144 (RECTANGULAR)	As	sq. feet	0.000
AVG. STACK TEMPERATURE, Ts = Fs + 460	Ts	degrees R	460.0
AVG. METER TEMPERATURE, Tm = Fm + 460	Tm	degrees R	460.0
GAS SAMPLE VOLUME AT STANDARD CONDITIONS, VmStd = 17.64*Y*(Vm/Tm)*(Pbar + dH/13.6)	VmStd	cubic ft.	0.0
VOLUME OF WATER VAPOR, VwStd = 0.04707*Ww	VwStd	cubic ft.	0.0
MOISTURE FRACTION, Bws = VwStd/(VmStd + VwStd)	Bws	-	#DIV/0!
DRY STACK GAS MOL. WEIGHT, Md = 0.32(Co2,m)+ 0.44(Cco2,m)+0.28{100-(Co2,m)-(Cco2,m)]	Md	g/g-mole	28.00
WET STACK GAS MOLECULAR WEIGHT, Mw = Md(1-Bws)+18.0(Bws)	Mw	g/g-mole	#DIV/0!
ABSOLUTE STACK PRESSURE, Ps = Pbar + Pg/13.6	Ps	in. Hg	0.00
STACK GAS VELOCITY vs = 85.49 Cp { sqrt[(dP*Ts) /(Ps*Mw)] }	vs	ft/s	#DIV/0!
ACTUAL STACK GAS FLOW RATE, Q = 60*vs*As	Q	acf/min	#DIV/0!
DRY GAS STACK FLOW RATE (DRY,STP) Qsd = 17.64*Q*(1-Bws)*(Ps/Ts)	Qsd	dscf/min	#DIV/0!
ISOKINETIC RATE, I = 13.61*Ts*VmStd/[Ps*vs*An*min*(1-Bws)]	I	%	#DIV/0!
DATA ENTRY-ANALYTICAL			
TOTAL MASS OF HEXAVELENT CHROMIUM IN SAMPLE TRAIN	Mcr6	ug	
TOTAL MASS OF TOTAL CHROMIUM IN SAMPLE TRAIN	Mcr	ug	
CALCULATED DATA-OVERALL			
CONCENTRATION OF HEXAVELENT CHROMIUM Ccr6 = (35.31*Mcr6)/Vmstd	Ccr6	ug/dscm	#DIV/0!
CONCENTRATION OF TOTAL CHROMIUM Ccr = (35.31*Mcr)/Vmstd	Ccr	ug/dscm	#DIV/0!
HEXAVALENT CHROMIUM MASS EMISSION RATE Ecr6 = ((Qsd*Mcr6)/Vmstd)*1.32e-7	Ecr6	lb/hr	#DIV/0!
TOTAL CHROMIUM MASS EMISSION RATE Ecr = ((Qsd*Mcr)/Vmstd)*1.32e-7	Ecr	lb/hr	#DIV/0!

SOURCE TEST METHOD DETAILED VALIDATION CHECKLIST

Test Method: CARB 428-March, 1988
Substance: PCDD/PCDF

Report ID Number: _____
Reviewer: _____
Review Date: _____

Method Description and Applicability

This method is applicable to the determination of Polychlorinated Dibenzo-p-dioxin (PCDD) and Polychlorinated Dibenzofuran (PCDF) emissions from stationary sources. Particulate and gaseous phase PCDD, and PCDF are withdrawn isokinetically from the stack and collected on a filter, XAD-2 resin, or in impingers. The contents of the sample train are then extracted. Internal standards are added and the extracts are separated by high resolution gas chromatography (HRGS) and quantified by low resolution mass spectrometry (LRMS) or high resolution mass spectrometry (HRMS). Only total amounts of the analytes can be determined, partitioning of the analytes cannot be determined.

Quality Assurance/Quality Control Checks

Before completing the detailed QA checklist, please answer the following questions:

1) Sampling run IDs ---------- (428) Laboratory sample IDs ---------- (428)
---------- (429) ---------- (429)

2) Was the sample run ID the same for the Method 428 and 429 tests? Yes No

3) Was the Laboratory sample ID the same for Method 428 and 429 samples? Yes No

If the answer to either 2 or 3 is "Yes", check the source test report for further confirmation that Method 428 and 429 were modified for analysis of single sample.

4) Was a single sampling train used for both methods? Yes No

5) If the answer to #4 is "Yes"; **STOP**, do not evaluate these method.

Please complete the detailed checklist provided in the attached Table. If the statements are true, circle "a"s or the corresponding run numbers; and if they are not reported, circle "b"s.

Other Comments

Device ID:

SAMPLE LOCATION					
* *Swirl Check*					
1.) Not conducted?	sc1a		sc1b	M	
2.) Average absolute value of angles > 10%?	sc2a		sc2b	M	
* *Stack Size*					
1.) Enter stack diameter (inches).					
2.) Stack diameter < 12 inch ? or	st2a		st2b	M	
3.) Area <113 inch squared?	st3a		st3b	M	
* *Number of Sample Points*					
1.) Enter total number of points.				M	
2.) Method 1 not used?	ns2a		ns2b	M	
SAMPLING EQUIPMENT					
* *Nozzle Size Check*					
1.) Not conducted prior to test?	nz1a		nz1b	M	
2.) Variation in diameter > 0.004 inch?	nz2a		nz2b	M	
* *Field Gas Dry Meter*					
1.) Not checked pre- and post-test?	gm1a		gm1b	M	
2.) Pre- and post-test Y not within (+/-) 5%?	gm2a		gm2b	M	
* *Pitot Tube*					
1.) Semi-annual calibration sheet not included?	pt1a		pt1b	M	
SAMPLING PROCEDURES					
* *Leak Check*					
1.) Not conducted?	lc1a		lc1b	M	
2.) Values not reported?	lc2a			M	
3.) Pretest >0.02 cfm or 4% of average?	lc3a	lc3a	lc3a	R	
4.) Post-test >0.02 cfm or 4% of average?	lc4a	lc4a	lc4a	R	
* *Sample Runs*					
1) Runs<3?	sr1a		sr1b	M	
* *Sample Time*					
NR 1.) Runs < 3 hours?	sd1a	sd1a	sd1a	R	
* *Isokinetic Variation*					
1.) Sample not taken isokinetically?	is1a		is1b	M	
2.) Isokinetic variation not reported?	is2a			M	
3.) Isokinetic <90 or >110%?	is3a	is3a	is3a	R	
* *Field Blank*					
1.) Not conducted once per test?	fb1a		fb1b	M	
2.) Used to correct sample?	fb2a		fb2b	M	
**Surrogate Standard*					
1.) Not conducted once per test?	ss1a		ss1b	M	
2.) Spiked <1 run?	ss2a		ss2b	M	
3.) Percent recovery <60 or >140%?					
NA NR 37Cl-2,3,7,8-TCDD	ss3a	ss3a	ss3a	R	
NA NR 13C-1,2,3,4,6,7,8-HpCDF	ss4a	ss4a	ss4a	R	

M-Method
R-Run
S-Substance

a-True
b-Not reported

ANALYSIS						
**Laboratory Control Spike*						
1.) Not conducted every 20 samples or per site?				lq1a	lq1b	M
2.) Percent accuracy <60 or >140%?						
NA	**PCDDs**					
NA	2,3,7,8-TCDD			lq2a	lq2b	S
NA	Total TCDD			lq2a	lq2b	S
NA	1,2,3,7,8-PeCDD			lq2a	lq2b	S
NA	Total PeCDD			lq2a	lq2b	S
NA	1,2,3,4,7,8-HxCDD			lq2a	lq2b	S
NA	1,2,3,6,7,8-HxCDD			lq2a	lq2b	S
NA	1,2,3,7,8,9-HxCDD			lq2a	lq2b	S
NA	Total HxCDD			lq2a	lq2b	S
NA	1,2,3,4,6,7,8-HpCDD			lq2a	lq2b	S
NA	Total HpCDD			lq2a	lq2b	S
NA	Total OCDD			lq2a	lq2b	S
	PCBs					
NA	Monochlorobiphenyls			lq2a	lq2b	S
NA	Dichlorobiphenyls			lq2a	lq2b	S
NA	Trichlorobiphenyls			lq2a	lq2b	S
NA	Tetrachlorobiphenyls			lq2a	lq2b	S
NA	Pentachlorobiphenyls			lq2a	lq2b	S
NA	Hexachlorobiphenyls			lq2a	lq2b	S
NA	Heptachlorobiphenyls			lq2a	lq2b	S
NA	Octachlorobiphenyls			lq2a	lq2b	S
NA	Nonachlorobiphenyls			lq2a	lq2b	S
	Decachlorobiphenyl			lq2a	lq2b	S
	PCDFs					
NA	2,3,7,8-TCDF			lq2a	lq2b	S
NA	Total TCDF			lq2a	lq2b	S
NA	1,2,3,7,8-PeCDF			lq2a	lq2b	S
NA	2,3,4,7,8-PeCDF			lq2a	lq2b	S
NA	Total PeCDF			lq2a	lq2b	S
NA	1,2,3,4,7,8-HxCDF			lq2a	lq2b	S
NA	1,2,3,6,7,8-HxCDF			lq2a	lq2b	S
NA	1,2,3,7,8,9-HxCDF			lq2a	lq2b	S
NA	2,3,4,6,7,8-HxCDF			lq2a	lq2b	S
NA	Total HxCDF			lq2a	lq2b	S
NA	1,2,3,4,6,7,8-HpCDF			lq2a	lq2b	S
NA	1,2,3,4,7,8,9-HpCDF			lq2a	lq2b	S
NA	Total HpCDF			lq2a	lq2b	S
NA	Total OCDF			lq2a	lq2b	S
**Internal Standards*						
1.) Not conducted once per sample?				qs1a	qs1b	M
2.) Percent recovery <60 or >120%?						
NA NR 13C-2,3,7,8-TCDD				qs2a	qs2a	qs2a S
NA NR 13C-1,2,3,7,8-PeCDD				qs2a	qs2a	qs2a S
NA NR 13C-1,2,3,6,7,8-HxCDD				qs2a	qs2a	qs2a S
NA NR 13C-1,2,3,4,6,7,8-HpCDD				qs2a	qs2a	qs2a S
NA NR 13C-OCDD				qs2a	qs2a	qs2a S
NA NR 13C-2,3,7,8-TCDF				qs2a	qs2a	qs2a S

CALCULATION CHECK FOR CARB METHOD 428-March 88

Device ID:
Substance:

DATA ENTRY-SAMPLING	SYMBOL	UNITS	DATA
RUN NUMBER	-	-	
ROUND STACK, DIAMETER	ds	inches	
RECTANGULAR STACK, LENGTH	L	inches	
WIDTH	W	inches	
NOZZLE DIAMETER	dn	inches	
AVERAGE STACK TEMPERATURE	Fs	degrees F	
AVERAGE METER TEMPERATURE	Fm	degrees F	
BAROMETRIC PRESSURE	Pbar	in. Hg	
STACK STATIC PRESSURE	Pg	in. H20	
AVG. DELTA H	dH	in. H20	
AVG. RMS VELOCITY HEAD	dP	in. H20	
PITOT COEFFICIENT	Cp	-	
GAS SAMPLE VOLUME	Vm	cubic ft.	
METER CALIBRATION FACTOR	Y	-	
TOTAL SAMPLING TIME	min	minutes	
STACK GAS OXYGEN CONTENT	Co2,m	%	
STACK GAS CARBON DIOXIDE CONTENT	Cco2,m	%	
TOTAL IMPINGER GAIN (WATER & PARTICULATE)	Ww	grams	
CALCULATED DATA-SAMPLING			
RUN NUMBER	-	-	0
NOZZLE AREA, An = 3.14(dn)**2/4	An	sq. in.	0.000
STACK AREA, As = 3.14*(ds)**2/576 (ROUND) = L * W/144 (RECTANGULAR)	As	sq. feet	0.000
AVG. STACK TEMPERATURE, Ts = Fs + 460	Ts	degrees R	460.0
AVG. METER TEMPERATURE, Tm = Fm + 460	Tm	degrees R	460.0
GAS SAMPLE VOLUME AT STANDARD CONDITIONS, VmStd = 17.64*Y*(Vm/Tm)*(Pbar + dH/13.6)	VmStd	cubic ft.	0.0
VOLUME OF WATER VAPOR, VwStd = 0.04707*Ww	VwStd	cubic ft.	0.0
MOISTURE FRACTION, Bws = VwStd/(VmStd + VwStd)	Bws	-	#DIV/0!
DRY STACK GAS MOL. WEIGHT, Md = 0.32(Co2,m)+ 0.44(Cco2,m)+0.28{100-(Co2,m)-(Cco2,m)]	Md	g/g-mole	28.00
WET STACK GAS MOLECULAR WEIGHT, Mw = Md(1-Bws)+18.0(Bws)	Mw	g/g-mole	#DIV/0!
ABSOLUTE STACK PRESSURE, Ps = Pbar + Pg/13.6	Ps	in. Hg	0.00
STACK GAS VELOCITY vs = 85.49 Cp { sqrt[(dP*Ts) /(Ps*Mw)] }	vs	ft/s	#DIV/0!
ACTUAL STACK GAS FLOW RATE, Q = 60*vs*As	Q	acf/min	#DIV/0!
DRY GAS STACK FLOW RATE (DRY,STP) Qsd = 17.64*Q*(1-Bws)*(Ps/Ts)	Qsd	dscf/min	#DIV/0!
ISOKINETIC RATE, I = 13.61*Ts*VmStd/[Ps*vs*An*min*(1-Bws)]	I	%	#DIV/0!
DATA ENTRY-ANALYTICAL			
TOTAL MASS OF ONE ANALYTE IN SAMPLE TRAIN	Ma	ng	
CALCULATED DATA-OVERALL			
CONCENTRATION OF ANALYTE Mc = (35.31*Ma)/Vmstd	Mc	ng/dscm	#DIV/0!
ANALYTE MASS EMISSION RATE Em = ((Qsd*Ma)/Vmstd)*1.32e-10	Em	lb/hr	#DIV/0!

SOURCE TEST METHOD DETAILED VALIDATION CHECKLIST

Test Method: CARB 428 - September, 1990
Substance: PCDD/PCDF and PCB's

Report ID Number: _____
Reviewer: _____
Review Date: _____

Method Description and Applicability

This method is applicable to the determination of Polychlorinated Dibenzo-p-dioxin (PCDD), Polychlorinated Dibenzofuran (PCDF) and Polychlorinated Biphenyl (PCB) emissions from stationary sources. Particulate and gaseous phase PCDD, PCDF, and PCB are withdrawn isokinetically from the stack and collected on a filter, XAD-2 resin, and in impingers. The contents of the sample train are then extracted and split, if both PCDD/PCDF and PCB are of interest. Internal standards are added and the extracts are separated by high resolution gas chromatography (HRGS) and quantified by low resolution mass spectrometry (LRMS). High resolution mass spectrometry (HRMS) is sometimes used to quantify PCDD/PCDF. Only total amounts of the analytes can be determined, partitioning of the analytes cannot be determined.

Quality Assurance/Quality Control Checks

Before completing the detailed QA checklist, please answer the following questions:

1) Sampling run IDs ---------- (428) Laboratory sample IDs ---------- (428)
---------- (429) ---------- (429)

2) Was the sample run ID the same for the Method 428 and 429 tests? Yes No

3) was the Laboratory sample ID the same for Method 428 and 429 samples? Yes No

If the answer to either 2 or 3 is "Yes", check the source test report for further confirmation that Method 428 and 429 were modified for analysis of single sample.

4) Was a single sampling train used for both method? Yes No

5) If the answer to #4 is "Yes"; **STOP**, do not evaluate these method.

Please complete the detailed checklist provided in the attached Table. If the statements are true, circle "a"s or the corresponding run numbers; and if they are not reported, circle "b"s.

Other Comments

Device ID:

SAMPLE LOCATION				
* *Swirl Check*				
1.) Not conducted?	sc1a		sc1b	M
2.) Average absolute value of angles > 10%?	sc2a		sc2b	M
* *Stack Size*				
1.) Enter stack diameter (inches).				M
2.) Stack diameter < 12 inch ? or	st2a		st2b	M
3.) Area <113 inch squared?	st3a		st3b	M
* *Number of Sample Points*				
1.) Enter total number of points.				M
2.) Method 1 not used?	ns2a		ns2b	M
SAMPLING EQUIPMENT				
* *Nozzle Size Check*				
1.) Not conducted prior to test?	nz1a		nz1b	M
2.) Variation in diameter > 0.004 inch?	nz2a		nz2b	M
* *Field Gas Dry Meter*				
1.) Not checked pre- and post-test?	qm1a		qm1b	M
2.) Pre- and post-test Y not within (+/-) 5%?	qm2a		qm2b	M
* *Pitot Tube*				
1.) Semi-annual calibration sheet not included?	pt1a		pt1b	M
SAMPLING PROCEDURES				
* *Leak Check*				
1.) Not conducted?	lc1a		lc1b	M
2.) Values not reported?	lc2a			M
3.) Pretest >0.02 cfm or 4% of average?	lc3a	lc3a	lc3a	R
4.) Post-test >0.02 cfm or 4% of average?	lc4a	lc4a	lc4a	R
* *Sample Runs*				
1) Runs<3?	sr1a		sr1b	M
* *Sample Time*				
1.) Runs < 3 hours	sd1a	sd1a	sd1a	R
* *Isokinetic*				
1.) Sample not taken isokinetically?	is1a		is1b	M
2.) Isokinetic variation not reported?	is2a			M
3.) Isokinetic <90 or >110%?	is3a	is3a	is3a	R
* *Field Blank*				
1.) Not conducted once per test?	fb1a		fb1b	M
2.) Used to correct sample?	fb2a		fb2b	M
Surrogate Standard				
1.) Not conducted once per run?	ss1a	ss1a	ss1a	R
2.) Not reported?	ss2a			M
3a.) Percent recovery <60 or >140% (for LRMS)?				
NA NR 37Cl-2,3,7,8-TCDD	ss3a	ss3a	ss3a	S
NA NR 13C-1,2,3,7,8,9-HxCDD	ss3a	ss3a	ss3a	S
NA NR 13C-1,2,3,4,6,7,8-HpCDF	ss3a	ss3a	ss3a	S
3b.) Percent recovery <60 or >140% (for HRMS)?				
NA NR 37Cl-2,3,7,8-TCDD	ss4a	ss4a	ss4a	S
NA NR 13C-2,3,4,7,8-PeCDF	ss4a	ss4a	ss4a	S
NA NR 13C-1,2,3,7,8,9-HxCDD	ss4a	ss4a	ss4a	S
NA NR 13C-1,2,3,4,7,8-HxCDF	ss4a	ss4a	ss4a	S
NA NR 13C-1,2,3,4,6,7,8-HpCDF	ss4a	ss4a	ss4a	S

M-Method a-True
R-Run b-Not reported
S-Substance

ANALYSIS				
Laboratory Control Spike				
1.) Not conducted every 20 samples or per site?	lq1a		lq1b	M
2.) Was percent accuracy <60 or >140%?				
PCDDs				
NA 2,3,7,8-TCDD	lq2a		lq2b	S
NA Total TCDD	lq2a		lq2b	S
NA 1,2,3,7,8-PeCDD	lq2a		lq2b	S
NA Total PeCDD	lq2a		lq2b	S
NA 1,2,3,4,7,8-HxCDD	lq2a		lq2b	S
NA 1,2,3,6,7,8-HxCDD	lq2a		lq2b	S
NA 1,2,3,7,8,9-HxCDD	lq2a		lq2b	S
NA Total HxCDD	lq2a		lq2b	S
NA 1,2,3,4,6,7,8-HpCDD	lq2a		lq2b	S
NA Total HpCDD	lq2a		lq2b	S
NA Total OCDD	lq2a		lq2b	S
PCBs				
NA Monochlorobiphenyls	lq2a		lq2b	S
NA Dichlorobiphenyls	lq2a		lq2b	S
NA Trichlorobiphenyls	lq2a		lq2b	S
NA Tetrachlorobiphenyls	lq2a		lq2b	S
NA Pentachlorobiphenyls	lq2a		lq2b	S
NA Hexachlorobiphenyls	lq2a		lq2b	S
NA Heptachlorobiphenyls	lq2a		lq2b	S
NA Octachlorobiphenyls	lq2a		lq2b	S
NA Nonachlorobiphenyls	lq2a		lq2b	S
NA Decachlorobiphenyl	lq2a		lq2b	S
PCDFs				
NA 2,3,7,8-TCDF	lq2a		lq2b	S
NA Total TCDF	lq2a		lq2b	S
NA 1,2,3,7,8-PeCDF	lq2a		lq2b	S
NA 2,3,4,7,8-PeCDF	lq2a		lq2b	S
NA Total PeCDF	lq2a		lq2b	S
NA 1,2,3,4,7,8-HxCDF	lq2a		lq2b	S
NA 1,2,3,6,7,8-HxCDF	lq2a		lq2b	S
NA 1,2,3,7,8,9-HxCDF	lq2a		lq2b	S
NA 2,3,4,6,7,8-HxCDF	lq2a		lq2b	S
NA Total HxCDF	lq2a		lq2b	S
NA 1,2,3,4,6,7,8-HpCDF	lq2a		lq2b	S
NA 1,2,3,4,7,8,9-HpCDF	lq2a		lq2b	S
NA Total HpCDF	lq2a		lq2b	S
NA Total OCDF	lq2a		lq2b	S
Internal Standards (LRMS)				
NA 1.) Not conducted once per sample?	qs1a		qs1b	M
NA 2.) Values not reported?	qs2a			M
3.) Was percent accuracy <40 or >120%?				
NA NR 13C-2,3,7,8-TCDD	qs4a	qs4a	qs4a	S
NA NR 13C-1,2,3,7,8-PeCDD	qs4a	qs4a	qs4a	S
NA NR 13C-1,2,3,6,7,8-HxCDD	qs4a	qs4a	qs4a	S
NA NR 13C-1,2,3,4,6,7,8-HpCDD	qs4a	qs4a	qs4a	S
NA NR 13C-OCDD	qs4a	qs4a	qs4a	S
NA NR 13C-2,3,7,8-TCDF	qs4a	qs4a	qs4a	S
Internal Standards (HRMS)				
NA 1.) Not conducted once per sample?	qs1a		qs1b	M
NA 2.) Values not reported?	qs2a			M
3.) Was percent accuracy <40 or >120%?				
NA NR 13C-2,3,7,8-TCDD	qs3a	qs3a	qs3a	S
NA NR 13C-1,2,3,7,8-PeCDD	qs3a	qs3a	qs3a	S
NA NR 13C-1,2,3,6,7,8-HxCDD	qs3a	qs3a	qs3a	S
NA NR 13C-1,2,3,4,6,7,8-HpCDD	qs3a	qs3a	qs3a	S
NA NR 13C-OCDD	qs3a	qs3a	qs3a	S
NA NR 13C-2,3,7,8-TCDF	qs3a	qs3a	qs3a	S
NA NR 13C-1,2,3,7,8-PeCDF	qs3a	qs3a	qs3a	S
NA NR 13C-1,2,3,6,7,8-HxCDF	qs3a	qs3a	qs3a	S
NA NR 13C-1,2,3,4,7,8,9-HpCDF	qs3a	qs3a	qs3a	S

CALCULATION CHECK FOR CARB METHOD 428-Sep 90

Device ID:
Substance:

DATA ENTRY-SAMPLING	SYMBOL	UNITS	DATA
RUN NUMBER	-	-	
ROUND STACK, DIAMETER	ds	inches	
RECTANGULAR STACK, LENGTH	L	inches	
WIDTH	W	inches	
NOZZLE DIAMETER	dn	inches	
AVERAGE STACK TEMPERATURE	Fs	degrees F	
AVERAGE METER TEMPERATURE	Fm	degrees F	
BAROMETRIC PRESSURE	Pbar	in. Hg	
STACK STATIC PRESSURE	Pg	in. H20	
AVG. DELTA H	dH	in. H20	
AVG. RMS VELOCITY HEAD	dP	in. H20	
PITOT COEFFICIENT	Cp	-	
GAS SAMPLE VOLUME	Vm	cubic ft.	
METER CALIBRATION FACTOR	Y	-	
TOTAL SAMPLING TIME	min	minutes	
STACK GAS OXYGEN CONTENT	Co2,m	%	
STACK GAS CARBON DIOXIDE CONTENT	Cco2,m	%	
TOTAL IMPINGER GAIN (WATER & PARTICULATE)	Ww	grams	
CALCULATED DATA-SAMPLING			
RUN NUMBER	-	-	0
NOZZLE AREA, An = 3.14(dn)**2/4	An	sq. in.	0.000
STACK AREA, As = 3.14*(ds)**2/576 (ROUND) = L * W/144 (RECTANGULAR)	As	sq. feet	0.000
AVG. STACK TEMPERATURE, Ts = Fs + 460	Ts	degrees R	460.0
AVG. METER TEMPERATURE, Tm = Fm + 460	Tm	degrees R	460.0
GAS SAMPLE VOLUME AT STANDARD CONDITIONS, VmStd = 17.64*Y*(Vm/Tm)*(Pbar + dH/13.6)	VmStd	cubic ft.	0.0
VOLUME OF WATER VAPOR, VwStd = 0.04707*Ww	VwStd	cubic ft.	0.0
MOISTURE FRACTION, Bws = VwStd/(VmStd + VwStd)	Bws	-	#DIV/0!
DRY STACK GAS MOL. WEIGHT, Md = 0.32(Co2,m)+ 0.44(Cco2,m)+0.28{100-(Co2,m)-(Cco2,m)]	Md	g/g-mole	28.00
WET STACK GAS MOLECULAR WEIGHT, Mw = Md(1-Bws)+18.0(Bws)	Mw	g/g-mole	#DIV/0!
ABSOLUTE STACK PRESSURE, Ps = Pbar + Pg/13.6	Ps	in. Hg	0.00
STACK GAS VELOCITY vs = 85.49 Cp { sqrt[(dP*Ts) /(Ps*Mw)] }	vs	ft/s	#DIV/0!
ACTUAL STACK GAS FLOW RATE, Q = 60*vs*As	Q	acf/min	#DIV/0!
DRY GAS STACK FLOW RATE (DRY,STP) Qsd = 17.64*Q*(1-Bws)*(Ps/Ts)	Qsd	dscf/min	#DIV/0!
ISOKINETIC RATE, I = 13.61*Ts*VmStd/[Ps*vs*An*min*(1-Bws)]	I	%	#DIV/0!
DATA ENTRY-ANALYTICAL			
TOTAL MASS OF ONE ANALYTE IN SAMPLE TRAIN	Ma	ng	
CALCULATED DATA-OVERALL			
CONCENTRATION OF ANALYTE Mc = (35.31*Ma)/Vmstd	Mc	ng/dscm	#DIV/0!
ANALYTE MASS EMISSION RATE Em = ((Qsd*Ma)/Vmstd)*1.32e-10	Em	lb/hr	#DIV/0!

SOURCE TEST METHOD DETAILED VALIDATION CHECKLIST

Test Method: CARB 429 - September, 1989
Substance: PAH

Report ID Number: _____
Reviewer: _____
Review Date: _____

Method Description and Applicability

This method is applicable to the determination of Polycyclic Aromatic Hydrocarbons (PAH) emissions from stationary sources. Particulate and gaseous phase PAH are withdrawn isokinetically from the stack and collected on a filter, XAD-2 resin, and in impingers. The contents of the sample train are then extracted. Internal standards are added and the extracts are separated by high resolution gas chromatography (HRGS) and quantified by low resolution mass spectrometry (LRMS) or high resolution mass spectrometry (HRMS). Only total amounts of the analytes can be determined, partitioning of the analytes cannot be determined.

Quality Assurance/Quality Control Checks

Before completing the detailed QA checklist, please answer the following questions:

1) Sampling run IDs ---------- (428) Laboratory sample IDs ---------- (428)
---------- (429) ---------- (429)

2) Was the sample run ID the same for the Method 428 and 429 tests? Yes No

3) was the Laboratory sample ID the same for Method 428 and 429 samples? Yes No

If the answer to either 2 or 3 is "Yes", check the source test report for further confirmation that Method 428 and 429 were modified for analysis of single sample.

4) Was a single sampling train used for both method? Yes No

5) If the answer to #4 is "Yes"; **STOP**, do not evaluate these method.

6) Was a Teflon coated glass fiber or Teflon membrane filter used? Yes No

7) If the answer to #6 is "No"; **STOP**, do not evaluate these method.

Please complete the detailed checklist provided in the attached Table. If the statements are true, circle "a"s or the corresponding run numbers; and if they are not reported, circle "b"s.

Other Comments

Device ID:

SAMPLE LOCATION				
* Swirl Check				
1.) Not conducted?	sc1a		sc1b	M
2.) Average absolute value of angles > 10%?	sc2a		sc2b	M
* Stack Size				
1.) Enter stack diameter (inches).				M
2.) Stack diameter < 12 inch ? or	st2a		st2b	M
3.) Area <113 inch squared?	st3a		st3b	M
* Number of Sample Points				
1.) Enter total number of points.				M
2.) Method 1 not used?	ns2a		ns2b	M
SAMPLING EQUIPMENT				
* Nozzle Size Check				
1.) Not conducted prior to test?	nz1a		nz1b	M
2.) Variation in diameter > 0.004 inch?	nz2a		nz2b	M
* Field Gas Dry Meter				
1.) Not checked pre- and post-test?	gm1a		gm1b	M
2.) Pre- and post-test Y not within (+/-) 5%?	gm2a		gm2b	M
* Pitot Tube				
1.) Semi-annual calibration sheet not included?	pt1a		pt1b	M
SAMPLING PROCEDURES				
* Leak Check				
1.) Not conducted?	lc1a		lc1b	M
2.) Values not reported?	lc2a			M
3.) Pretest >0.02 cfm or 4% of average?	lc3a	lc3a	lc3a	R
4.) Post-test >0.02 cfm or 4% of average?	lc4a	lc4a	lc4a	R
* Sample Runs				
1) Runs < 3?	sr1a		sr1b	M
* Isokinetic Variation				
1.) Sample not taken isokinetically?	ls1a		is1b	M
2.) Isokinetic variation not reported?	ls2a			M
3.) Isokinetic <90 or >110%?	ls3a	ls3a	is3a	R
* Field Blank				
1.) Not conducted once per test?	fb1a		fb1b	M
2.) Used to correct sample?	fb2a		fb2b	M
* Surrogate Standard				
1.) Not conducted once per run?	ss1a		ss1b	M
2.) Values not reported?	ss2a			M
3.) Percent recovery <50 or >150% ?				
NA NR d10-methylnaphthalene	ss3a	ss3a	ss3a	R

M-Method a-True
R-Run b-Not reported
S-Substance

ANALYSIS						
* Analysis Date						
1.) Not within 40 days of extraction?			ad1a		ad1b	M
* Extraction Date						
1.) Not within 7 days of collection			ed1a		ed1b	M
*Laboratory Control						
1.) Not conducted every 20 samples?			lq1a		lq1b	M
2.) Percent accuracy <50 or >150%?						
NA		acenaphthene	lq2a		lq2b	S
NA		acenaphtheylene	lq2a		lq2b	S
NA		anthracene	lq2a		lq2b	S
NA		benz[a]anthracene	lq2a		lq2b	S
NA		benzo[b]fluoranthene	lq2a		lq2b	S
NA		benzo[a]pyrene	lq2a		lq2b	S
NA		benzo[g,h,i]pyrene	lq2a		lq2b	S
NA		chrysene	lq2a		lq2b	S
NA		dibenz[a,h]anthracene	lq2a		lq2b	S
NA		fluoranthene	lq2a		lq2b	S
NA		fluorene	lq2a		lq2b	S
NA		indeno[1,2,3-c,d]pyrene	lq2a		lq2b	S
NA		naphthalene	lq2a		lq2b	S
NA		phenantherene	lq2a		lq2b	S
NA		pyrene	lq2a		lq2b	S
NA		benzo[k]fluoranthene	lq2a		lq2b	S
NA		benzo[b+k]fluoranthene	lq2a		lq2b	S
*Internal Standards						
1.) Not conducted once per sample?			qs1a		qs1b	M
2.) Values not reported?			qs2a			M
3.) Percent accuracy <50 or >150%?						
NA	NR	d8-acenaphtheylene	qs3a	qs3a	qs3a	S
NA	NR	d8-naphthalene	qs3a	qs3a	qs3a	S
NA	NR	d10-acenaphthene	qs3a	qs3a	qs3a	S
NA	NR	d10-anthracene	qs3a	qs3a	qs3a	S
NA	NR	d10-fluoranthene	qs3a	qs3a	qs3a	S
NA	NR	d10-fluorene	qs3a	qs3a	qs3a	S
NA	NR	d10-phenantherene	qs3a	qs3a	qs3a	S
NA	NR	d10-pyrene	qs3a	qs3a	qs3a	S
NA	NR	d12-benz[a]anthracene	qs3a	qs3a	qs3a	S
NA	NR	d12-benzo[a]pyrene	qs3a	qs3a	qs3a	S
NA	NR	d12-benzo[b]fluoranthene	qs3a	qs3a	qs3a	S
NA	NR	d12-benzo[g,h,i]pyrene	qs3a	qs3a	qs3a	S
NA	NR	d12-benzo[k]fluoranthene	qs3a	qs3a	qs3a	S
NA	NR	d12-chrysene	qs3a	qs3a	qs3a	S

CALCULATION CHECK FOR CARB METHOD 429

Device ID:

Substance:

DATA ENTRY-SAMPLING	SYMBOL	UNITS	DATA
RUN NUMBER	-	-	
ROUND STACK, DIAMETER	ds	inches	
RECTANGULAR STACK, LENGTH	L	inches	
WIDTH	W	inches	
NOZZLE DIAMETER	dn	inches	
AVERAGE STACK TEMPERATURE	Fs	degrees F	
AVERAGE METER TEMPERATURE	Fm	degrees F	
BAROMETRIC PRESSURE	Pbar	in. Hg	
STACK STATIC PRESSURE	Pg	in. H20	
AVG. DELTA H	dH	in. H20	
AVG. RMS VELOCITY HEAD	dP	in. H20	
PITOT COEFFICIENT	Cp	-	
GAS SAMPLE VOLUME	Vm	cubic ft.	
METER CALIBRATION FACTOR	Y	-	
TOTAL SAMPLING TIME	min	minutes	
STACK GAS OXYGEN CONTENT	Co2,m	%	
STACK GAS CARBON DIOXIDE CONTENT	Cco2,m	%	
TOTAL IMPINGER GAIN (WATER & PARTICULATE)	Ww	grams	
CALCULATED DATA-SAMPLING			
RUN NUMBER	-	-	0
NOZZLE AREA, An = 3.14(dn)**2/4	An	sq. in.	0.000
STACK AREA, As = 3.14*(ds)**2/576 (ROUND) = L * W/144 (RECTANGULAR)	As	sq. feet	0.000
AVG. STACK TEMPERATURE, Ts = Fs + 460	Ts	degrees R	460.0
AVG. METER TEMPERATURE, Tm = Fm + 460	Tm	degrees R	460.0
GAS SAMPLE VOLUME AT STANDARD CONDITIONS, VmStd = 17.64*Y*(Vm/Tm)*(Pbar + dH/13.6)	VmStd	cubic ft.	0.0
VOLUME OF WATER VAPOR, VwStd = 0.04707*Ww	VwStd	cubic ft.	0.0
MOISTURE FRACTION, Bws = VwStd/(VmStd + VwStd)	Bws	-	#DIV/0!
DRY STACK GAS MOL. WEIGHT, Md = 0.32(Co2,m)+ 0.44(Cco2,m)+0.28{100-(Co2,m)-(Cco2,m)]	Md	g/g-mole	28.00
WET STACK GAS MOLECULAR WEIGHT, Mw = Md(1-Bws)+18.0(Bws)	Mw	g/g-mole	#DIV/0!
ABSOLUTE STACK PRESSURE, Ps = Pbar + Pg/13.6	Ps	in. Hg	0.00
STACK GAS VELOCITY vs = 85.49 Cp { sqrt[(dP*Ts) /(Ps*Mw)] }	vs	ft/s	#DIV/0!
ACTUAL STACK GAS FLOW RATE, Q = 60*vs*As	Q	acf/min	#DIV/0!
DRY GAS STACK FLOW RATE (DRY,STP) Qsd = 17.64*Q*(1-Bws)*(Ps/Ts)	Qsd	dscf/min	#DIV/0!
ISOKINETIC RATE, I = 13.61*Ts*VmStd/[Ps*vs*An*min*(1-Bws)]	I	%	#DIV/0!
DATA ENTRY-ANALYTICAL			
TOTAL MASS OF ONE ANALYTE IN SAMPLE TRAIN	Ma	ng	
CALCULATED DATA-OVERALL			
CONCENTRATION OF ANALYTE Mc = (35.31*Ma)/Vmstd	Mc	ng/dscm	#DIV/0!
ANALYTE MASS EMISSION RATE Em = ((Qsd*Ma)/Vmstd)*1.32e-10	Em	lb/hr	#DIV/0!

SOURCE TEST METHOD DETAILED VALIDATION CHECKLIST

Test Method: CARB 430-September, 1989
Substance: Formaldehyde

Report ID Number: _____
Reviewer: _____
Review Date: _____

Method Description and Applicability

This method is applicable to the determination of formaldehyde emissions from stationary sources. Gaseous emissions are drawn through a Teflon sample line and two impingers in series, each impinger containing an aqueous acidic solution of 2,4-dinitrophenyl-hydrazine (DNPH). An aldehyde reacts with DNPH by nucleophilic addition on the carbonyl followed by 1,2-elimination of water and the formation of a 2,4-dinitrophenylhydrazone. The sample is then extracted and analyzed using reverse phase HPLC with an ultraviolet absorption detector.

Quality Assurance/Quality Control Checks

Please complete the detailed checklist provided in the attached Table. If the statements are true, circle "a"s or the corresponding run numbers; and if they are not reported, circle "b"s.

Other Comments

_____
_____
_____
_____

Device ID:

SAMPLING EQUIPMENT				
** Field Gas Dry Meter*				
1.) Not checked pre- and post-test?	gm1a		gm1b	M
2.) Pre- and post-test Y not within (+/-) 5%?	gm2a		gm2b	M
SAMPLING PROCEDURES				
** Flow Rate*				
1.) Not conducted per run?	fr1a		fr1b	M
2.) Values not reported?	fr2a			M
3.) Runs > 1.0 L / min?	fr3a	fr3a	fr3a	R
4.) Pre-test and post-test not within 15% per run?	fr4a	fr4a	fr4a	R
** Leak Checks*				
1.) Not conducted per test?	lc1a		lc1b	M
2.) Indication of flow?	lc2a		lc2b	M
** Sample Runs*				
NR 1.) Runs < 3?	sr1a	sr1a	sr1a	R
** Field Blank*				
1.) Not conducted once per test?	fb1a		fb1b	M
2.) Not conducted on 2 impingers?	fb2a		fb2b	M
3.) Used to correct sample?	fb3a		fb3b	M
**Field Spike*				
NR 1.) Not conducted once per run?	fs1a	fs1a	fs1a	R
ANALYSIS				
** Extraction Date*				
1.) Not within 7 days of collection, each sample?	ed1a		ed1b	M
** Analysis Date*				
1.) Not within 30 days of extraction, each sample?	ad1a		ad1b	M
**Sampling Method*				
1.) Reverse phase HPLC not used?	mt1a		mt1b	M
** Matrix Spike*				
1.) Not conducted per test?	ms1a		ms1b	M
2.) Not reported?	ms2a			M

M-Method
R-Run
S-Substance

a-True
b-Not reported

CALCULATION CHECK FOR CARB 430-Sept 89

DATA ENTRY	SYMBOL	UNITS	DATA
RUN NUMBER	-	-	
AVERAGE METER TEMPERATURE	Fm	degree F	
BAROMETRIC PRESSURE	Pbar	in. Hg	
AVG. DELTA H	dH	in. H20	
GAS SAMPLE VOLUME	Vm	cubic ft.	
METER CALIBRATION FACTOR	Y	-	
TOTAL SAMPLING TIME	min	minutes	
SAMPLE WEIGHTS (1ST IMPINGER)			
Formaldehyde	Swt,1	µg	
SAMPLE WEIGHTS (2ND IMPINGER)			
Formaldehyde	Swt,2	µg	

CALCULATED DATA	SYMBOL	UNITS	DATA
RUN NUMBER	-	-	0
AVG. METER TEMPERATURE, Tm = Fm + 460	Tm	degrees R	460.00
GAS SAMPLE VOLUME AT STANDARD CONDITIONS, VmStd = 17.64Y (Vm/Tm) (Pbar + dH/13.6)	VmStd	dscm	0.000

SAMPLE CONCENTRATIONS Cc,1 = (Swt,1 + Swt,2) / Vmstd

RUN NUMBER	-	-	0
Formaldehyde	Cc,1	mg/dscm	#DIV/0!

SAMPLE CONCENTRATIONS Cc,2 = Cc,1 * 24.05/30

RUN NUMBER	-	-	0
Formaldehyde	Cc,2	ppbv	#DIV/0!

SOURCE TEST METHOD DETAILED VALIDATION CHECKLIST

Test Method: CARB 430 - December, 1991
Substance: Formaldehyde and Acetaldehyde

Report ID Number: _____
Reviewer: _____
Review Date: _____

Method Description and Applicability

This method is applicable to the determination of formaldehyde and acetaldehyde emissions from stationary sources. Gaseous emissions are drawn through a Teflon sample line and two impingers in series , each impinger containing an aqueous acidic solution of 2,4-dinitrophenyl-hydrazine (DNPH). The sample line is rinsed with another aliquot of the same solution. An aldehyde reacts with DNPH by nucleophilic addition on the carbonyl followed by 1,2-elimination of water and the formation of a 2,4-dinitrophenylhydrazone. The sample is then extracted and analyzed using reverse phase HPLC with an ultraviolet absorption detector.

Quality Assurance/Quality Control Checks

Please complete the detailed checklist provided in the attached Table. If the statements are true, circle "a"s or the corresponding run numbers; and if they are not reported, circle "b"s.

Blank Procedure

The average of the three field blanks should be used to calculate the sample/blank ratios. **If the ratios are greater than five, the field blank is subtracted off of the field samples. If the ratios are equal to or less than five, the reporting limit should be reported. The reporting limit is equal to the average field blank times 5.**

Other Comments

_____
_____
_____
_____

Device ID:

SAMPLING EQUIPMENT						
** Calibration Check*						
1.) Not conducted for each rotometer?				cc1a	cc1b	M
2.) Calibration sheet not included?				cc2a	cc2b	M
SAMPLING PROCEDURES						
** Sample flow*						
1.) Not conducted per run?				fr1a	fr1b	M
2.) Values not reported?				fr2a		M
3.) Runs > 1.0 L / min?				fr3a	fr3a fr3a	R
4.) Pre-test and post-test not within 15% per run?				fr4a	fr4a fr4a	R
** Leak Checks*						
1.) Not conducted per test?				lc1a	lc1b	M
2.) Indication of flow?				lc2a	lc2b	M
** Sample Runs*						
1.) Runs < 3?				sr1a	sr1b	M
** Sampling Date*						
1.) Not within 2 days of reagent blank contaminatin check?				sd1a	sd1b	M
** Field Blank*						
1.) Not conducted three per test?				fb1a	fb1b	M
2a.) Reporting limit not given?(Sample / Field Blank <5)						
NA	NR	formaldehyde		fb2a	fb2a fb2a	S
NA	NR	acetaldehyde		fb2a	fb2a fb2a	S
NA	NR	acrolein		fb2a	fb2a fb2a	S
2b.) Sample not corrected?(Sample / Field Blank >5)						
NA	NR	formaldehyde		fb3a	fb3a fb3a	S
NA	NR	acetaldehyde		fb3a	fb3a fb3a	S
NA	NR	acrolein		fb3a	fb3a fb3a	S
ANALYSIS						
** Extraction Date*						
1.) Not within 7 days of collection, each sample?				ed1a	ed1b	M
** Analysis Date*						
1.) Not within 30 days of extraction, each sample?				ad1a	ad1b	M
**Sampling Method*						
1.) Reverse phase HPLC not used?				mt1a	mt1b	M
** Impinger Analysis*						
1.) Not analyzed seperately?				im1a	im1b	M
** Matrix Spike*						
1.) Not conducted per test?				ms1a	ms1b	M
2.) Not reported ?				ms2a	ms2b	M

M-Method
R-Run
S-Substance

a-True
b-Not reported

Device ID:

DATA ENTRY	SYMBOL	UNITS		DATA		DATA		DATA			
RUN NUMBER	-	-		R1		R2		R3		AVE	RSD
AVERAGE METER TEMPERATURE	Fm	degree F								#DIV/0!	#DIV/0!
BAROMETRIC PRESSURE	Pbar	in. Hg								#DIV/0!	#DIV/0!
AVG. DELTA H	dH	in. H20								#DIV/0!	#DIV/0!
GAS SAMPLE VOLUME	Vm	cubic ft.								#DIV/0!	#DIV/0!
METER CALIBRATION FACTOR	Y	-								#DIV/0!	#DIV/0!
TOTAL SAMPLING TIME	min	minutes								#DIV/0!	#DIV/0!
SAMPLE 1ST IMPINGER VOLUME	Siwt,1	ml								#DIV/0!	#DIV/0!
SAMPLE 2ND IMPINGER VOLUME	Siwt,2	ml								#DIV/0!	#DIV/0!
BLANK 1ST IMPINGER VOLUME	Biwt,1	ml								#DIV/0!	#DIV/0!
BLANK 2ND IMPINGER VOLUME	Biwt,2	ml								#DIV/0!	#DIV/0!
SAMPLE WEIGHTS (1ST IMPINGER)											
Formaldehyde	Swt,1	µg								#DIV/0!	#DIV/0!
SAMPLE WEIGHTS (2ND IMPINGER)											
Formaldehyde	Swt,2	µg								#DIV/0!	#DIV/0!
BLANK WEIGHTS (1ST IMPINGER)											
Formaldehyde	Bwt,1	µg								#DIV/0!	#DIV/0!
BLANK WEIGHTS (2ND IMPINGER)											
Formaldehyde	Bwt,2	µg								#DIV/0!	#DIV/0!

CALCULATED DATA	SYMBOL	UNITS		DATA		DATA		DATA			
RUN NUMBER	-	-		R1		R2		R3		AVE	RSD
AVG. METER TEMPERATURE, Tm = Fm + 460	Tm	degrees R		460.00		460.00		460.00		460.00	0.00
GAS SAMPLE VOLUME AT STANDARD CONDITIONS, VmStd = 17.64Y (Vm/Tm) (Pbar + dH/13.6)	VmStd	dscm		0.000		0.000		0.000		0.000	#DIV/0!

SAMPLE IMPINGER CONCENTRATION (ng/ml), S or Bic= 1000*(S or Bwt,1+S or Bwt,2)/(S or Biwt,1+S or Biwt,2)

RUN NUMBER	-	-		R1		R2		R3		AVE	RSD
SAMPLE											
Formaldehyde	Sic	ng/ml		#DIV/0!		#DIV/0!		#DIV/0!		#DIV/0!	#DIV/0!
BLANK											
Formaldehyde	Bic	ng/ml		#DIV/0!		#DIV/0!		#DIV/0!		#DIV/0!	#DIV/0!

BLANK TO SAMPLE RATIO, Br=Sic/Average(Bic)

RUN NUMBER	-	-		R1		R2		R3		AVE	RSD
RATIO											
Formaldehyde	Br		###	#DIV/0!	###	#DIV/0!	###	#DIV/0!		#DIV/0!	#DIV/0!

CORRECTED SAMPLE CONCENTRATION (ng/ml) Br>5 Cic=Sic-Average(Bic); Br<5 Cic=5*Average(Bic)

RUN NUMBER	-	-		R1		R2		R3		AVE	RSD
SAMPLE											
Formaldehyde	Cic	ng/ml	### ###	#DIV/0!	### ###	#DIV/0!	### ###	#DIV/0!	### ###	#DIV/0!	#DIV/0!

CORRECTED SAMPLE CONCENTRATION 1 (mg/dscm), Cc,1=Cic*(Swt,1+Swt,2)/VmStd/1e06

RUN NUMBER	-	-		R1		R2		R3		AVE	RSD
SAMPLE											
Formaldehyde	Cc,1	mg/dscm	### ###	#DIV/0!	### ###	#DIV/0!	### ###	#DIV/0!	### ###	#DIV/0!	#DIV/0!

CORRECTED SAMPLE CONCENTRATION 2 (ppbv), Cc,2=1000*24.05/Mw

RUN NUMBER	-	-		R1		R2		R3		AVE	RSD
SAMPLE											
Formaldehyde	Cc,2	ppbv	### ###	#DIV/0!	### ###	#DIV/0!	### ###	#DIV/0!	### ###	#DIV/0!	#DIV/0!

ND - Sample value below detection limit

< - Some sample values below detection limit

C - Blank Corrected

RL - Reporting Limit

NA - Not Available

SOURCE TEST METHOD DETAILED VALIDATION CHECKLIST

Test Method: CARB 433 - September, 1989
Substance: Nickel

Report ID Number: _____
Reviewer: _____
Review Date: _____

Method Description and Applicability

This method is applicable to the determination of nickel emissions from stationary sources. Particulate and gaseous nickelß emissions are withdrawn isokinetically and collected on a filter and in a solution of nitric acid. The samples are then analyzed by atomic absorption spectrometry using the direct aspiration flame method (flame AA).

Quality Assurance/Quality Control Checks

Please complete the detailed checklist provided in the attached Table. If the statements are true, please circle "a"s or the corresponding run numbers; and if they are not reported, circle "a"s. In addition to completing the checklist please answer the following questions:

1.) What digestion method was used? _____
2.) Enter the digestion date(s). _____
3.) Number of Impingers: 0.1N HNO_3 (2) __ Empty (1)__ Silica Gel (1) __

Blank Procedure

Please be sure that the blank data was applied and considered correctly. For this particular method, the absorbance reading from the sample needs to be corrected for the absorbance readings of the filter and nitric blanks. There is no criteria for the blank levels, they just need to be performed and corrected for the sample values.

Other Comments

_____

_____

Device ID:

SAMPLE LOCATION			
** Swirl Check*			
1.) Not conducted?	sc1a	sc1b	M
2.) Average absolute value of angles > 10%?	sc2a	sc2b	M
** Stack Size*			
1.) Enter stack diameter (inches).			M
2.) Stack diameter < 12 inch ? or	st2a	st2b	M
3.) Area <113 inch squared?	st3a	st3b	M
** Number of Sample Points*			
1.) Enter total number of points.			M
2.) Method 1 not used?	ns2a	ns2b	M
SAMPLING EQUIPMENT			
** Nozzle Size Check*			
1.) Not conducted prior to test?	nz1a	nz1b	M
2.) Variation in diameter > 0.004 inch?	nz2a	nz2b	M
** Field Gas Dry Meter*			
1.) Not checked pre- and post-test?	gm1a	gm1b	M
2.) Pre- and post-test Y not within (+/-) 5%?	gm2a	gm2b	M
** Pitot Tube*			
1.) Semi-annual calibration sheet not included?	pt1a	pt1b	M
SAMPLING PROCEDURES			
** Leak Check*			
1.) Not conducted?	lc1a	lc1b	M
2.) Values not reported?	lc2a		M
3.) Pretest >0.02 cfm or 4% of average?	lc3a lc3a	lc3a	R
4.) Post-test >0.02 cfm or 4% of average?	lc4a lc4a	lc4a	R
** Isokinetic Variation*			
1.) Sample not taken isokinetically?	is1a	is1b	M
2.) Isokinetic variation not reported?	is2a		M
3.) Isokinetic <90 or >110%?	is3a is3a	is3a	R
** Field Reagent Blank*			
1.) Not conducted for two filters and 0.1N HNO3?	rb1a	rb1b	M
2.) Not used to correct sample ?	rb2a	rb2b	M
ANALYSIS			
** Method*			
1.) Atomic absorption spectrometry (AAS) not used?	mt1a	mt1b	M
2.) Not conducted in triplicate ?	mt2a	mt2b	M

M-Method
R-Run
S-Substance

a-True
b-Not reported

CALCULATION CHECK FOR CARB METHOD 433

Device ID:

DATA ENTRY-SAMPLING	SYMBOL	UNITS	DATA
RUN NUMBER	-	-	
ROUND STACK, DIAMETER	ds	inches	
RECTANGULAR STACK, LENGTH	L	inches	
WIDTH	W	inches	
NOZZLE DIAMETER	dn	inches	
AVERAGE STACK TEMPERATURE	Fs	degrees F	
AVERAGE METER TEMPERATURE	Fm	degrees F	
BAROMETRIC PRESSURE	Pbar	in. Hg	
STACK STATIC PRESSURE	Pg	in. H20	
AVG. DELTA H	dH	in. H20	
AVG. RMS VELOCITY HEAD	dP	in. H20	
PITOT COEFFICIENT	Cp	-	
GAS SAMPLE VOLUME	Vm	cubic ft.	
METER CALIBRATION FACTOR	Y	-	
TOTAL SAMPLING TIME	min	minutes	
STACK GAS OXYGEN CONTENT	Co2,m	%	
STACK GAS CARBON DIOXIDE CONTENT	Cco2,m	%	
TOTAL IMPINGER GAIN (WATER & PARTICULATE)	Ww	grams	
CALCULATED DATA-SAMPLING			
RUN NUMBER	-	-	0
NOZZLE AREA, An = 3.14(dn)**2/4	An	sq. in.	0.000
STACK AREA, As = 3.14*(ds)**2/576 (ROUND) = L * W/144 (RECTANGULAR)	As	sq. feet	0.000
AVG. STACK TEMPERATURE, Ts = Fs + 460	Ts	degrees R	460.0
AVG. METER TEMPERATURE, Tm = Fm + 460	Tm	degrees R	460.0
GAS SAMPLE VOLUME AT STANDARD CONDITIONS, VmStd = 17.64*Y*(Vm/Tm)*(Pbar + dH/13.6)	VmStd	cubic ft.	0.0
VOLUME OF WATER VAPOR, VwStd = 0.04707*Ww	VwStd	cubic ft.	0.0
MOISTURE FRACTION, Bws = VwStd/(VmStd + VwStd)	Bws	-	#DIV/0!
DRY STACK GAS MOL. WEIGHT, Md = 0.32(Co2,m)+ 0.44(Cco2,m)+0.28{100-(Co2,m)-(Cco2,m)]	Md	g/g-mole	28.00
WET STACK GAS MOLECULAR WEIGHT, Mw = Md(1-Bws)+18.0(Bws)	Mw	g/g-mole	#DIV/0!
ABSOLUTE STACK PRESSURE, Ps = Pbar + Pg/13.6	Ps	in. Hg	0.00
STACK GAS VELOCITY vs = 85.49 Cp { sqrt[(dP*Ts) /(Ps*Mw)] }	vs	ft/s	#DIV/0!
ACTUAL STACK GAS FLOW RATE, Q = 60*vs*As	Q	acf/min	#DIV/0!
DRY GAS STACK FLOW RATE (DRY,STP) Qsd = 17.64*Q*(1-Bws)*(Ps/Ts)	Qsd	dscf/min	#DIV/0!
ISOKINETIC RATE, I = 13.61*Ts*VmStd/[Ps*vs*An*min*(1-Bws)]	I	%	#DIV/0!
DATA ENTRY-ANALYTICAL			
TOTAL MASS OF NICKEL IN SAMPLE TRAIN	Mni	mg	
CALCULATED DATA-OVERALL			
CONCENTRATION OF NICKEL MCni = (35.31*Mni)/Vmstd	MCni	mg/dscm	#DIV/0!
NICKEL MASS EMISSION RATE Eni = ((Qsd*Mni)/Vmstd)*1.32e-4	Eni	lb/hr	#DIV/0!

SOURCE TEST METHOD DETAILED VALIDATION CHECKLIST

Test Method: MMT - Pre 436
Substance: Trace Metals

Report ID Number: _____
Reviewer: _____
Review Date: _____

Method Description and Applicability

This method is applicable to the determination of trace metal emissions from stationary sources. Particulate and gaseous metal emissions are withdrawn isokinetically and collected on a filter and in a nitric acid solution and a potassium permanganate solution. The samples are then analyzed in separate front and back half portions by either ICAP, GVAAS, AAS and Hg is analyzed by CVAAS.

Quality Assurance/Quality Control Checks

Before completing the detailed QA checklist, please answer the following questions.

1) Was ARB approval granted for use of this method (This method was to be used prior to February 1991)? Yes No

2) Equipment check - Non-metallic prob, nozzle, prob brush, and non-wood prob brush.
Yes No

3) If the answer to #2 is "No" **STOP** evaluating.

4) Number of impingers with Mercury:
5%HNO_3/10%H_2O_2 (2)____ 4%$KMnO_4$/10%H_2SO_2 (1 or 2 depending on Hg levels)___
Silica Gel (1)___ Empty(0 if moisture <150ml ; otherwise 1) ___
Number of impingers without Mercury:
5%HNO_3/10%H_2O_2 (2)___ Silica Gel (1)___
Empty (0 if moisture <150ml ; otherwise 1) ___

5) If answer to #4 is different than the default **STOP** evaluating this method (see manager).

6) Combined or separate (front and back half) analysis? Combined Separate

7) If the answer to #6 is "Combined" **STOP** evaluating this method (see manager).

8.) What digestion method was used? _____

9.) Enter the digestion date(s). _____

Please complete the detailed checklist provided in the attached Table. If the statements are true, circle "a"s or the corresponding run numbers; and if they are not reported, circle "b"s.

Blank Procedure

Please be sure that the blank data was applied and considered correctly. The blank data should be handled as follows:

If the measured blank value for the front half is in the range of 0.0 to A [where A equals the value determined by multiplying 1.4 ug per square inch (1.4 ug/in2) times the actual area in square inches (in2) of the filter used in the emission sample], the measured blank value can be used to correct the front half field sample results. If the measured blank level is greater than A, the greater of these two value should be used:

I. A ug, or
II. The lesser of (1) the measured front half blank value or (2) 5 percent of the front half sample value

If the measured blank value for the back half is in the range of 0.0 to 1 ug, the measured back half blank value can be used to correct the back half field sample results. If the measured back half blank value exceeds 1 ug, the greater of the two following values may be used:

I. 1 ug, or
II. 5 percent of the measured back half field sample

Other Comments

_____

_____

_____

_____

Device ID:

SAMPLE LOCATION			
* *Swirl Check*			
1.) Not conducted?	sc1a	sc1b	M
2.) Average absolute value of angles > 10%?	sc2a	sc2b	M
* *Stack Size*			
1.) Enter stack diameter (inches).			
2.) Stack diameter < 12 inch ? or	st2a	st2b	M
3.) Area <113 inch squared?	st3a	st3b	M
* *Number of Sample Points*			
1.) Enter total number of points.			M
2.) Method 1 not used?	ns2a	ns2b	M
SAMPLING EQUIPMENT			
* *Nozzle Size Check*			
1.) Not conducted prior to test?	nz1a	nz1b	M
2.) Variation in diameter > 0.004 inch?	nz2a	nz2b	M
* *Field Gas Dry Meter*			
1.) Not checked pre- and post-test?	gm1a	gm1b	M
2.) Pre- and post-test Y not within (+/-) 5%?	gm2a	gm2b	M
* *Pitot Tube*			
1.) Semi-annual calibration sheet not included?	pt1a	pt1b	M
SAMPLING PROCEDURES			
* *Leak Check*			
1.) Not conducted?	lc1a	lc1b	M
2.) Values not reported?	lc2a		M
3.) Pretest >0.02 cfm or 4% of average?	lc3a lc3a	lc3a	R
4.) Post-test >0.02 cfm or 4% of average?	lc4a lc4a	lc4a	R
* *Isokinetic Variation*			
1.) Sample not taken Isokinetically?	is1a	is1b	M
2.) Isokinetic variation not reported?	is2a		M
3.) Isokinetic <90 or >110%?	is3a is3a	is3a	R
* *Field Reagent Blank*			
1.) Not conducted once per test?	rb1a	rb1b	M
2.) Not used to correct samples?	rb2a	rb2b	M

M-Method a-True
R-Run b-Not reported
S-Substance

ANALYSIS ICAP (all metals ,except mercury)						
* *Duplicate*						
NA	1.) Not conducted once per test?	du1a		du1b		M
NA	2.) Percent difference not reported?	du2a				M
	3.) Was percent difference > 5%?					
NA	NR Antimony (Sb)	du3a	du3a	du3a		S
NA	NR Arsenic (As)	du3a	du3a	du3a		S
NA	NR Barium (Ba)	du3a	du3a	du3a		S
NA	NR Beryllium (Be)	du3a	du3a	du3a		S
NA	NR Cadmium (Cd)	du3a	du3a	du3a		S
NA	NR Chromium (Cr)	du3a	du3a	du3a		S
NA	NR Copper (Cu)	du3a	du3a	du3a		S
NA	NR Lead (Pb)	du3a	du3a	du3a		S
NA	NR Manganese (Mn)	du3a	du3a	du3a		S
NA	NR Nickel (Ni)	du3a	du3a	du3a		S
NA	NR Phosphorus (P)	du3a	du3a	du3a		S
NA	NR Selenium (Se)	du3a	du3a	du3a		S
NA	NR Silver (Ag)	du3a	du3a	du3a		S
NA	NR Thallium (Tl)	du3a	du3a	du3a		S
NA	NR Zinc (Zn)	du3a	du3a	du3a		S
ANALYSIS GFAAS (listed metals)						
* *Duplicate*						
NA	1.) Not conducted per run?	du4a		du4b		M
NA	2.) Runs not reported?	du5a	du5a	du5a		R
* *Matrix Spike*						
NA	1.) Spike include Front- and Back-Half?	ms1a		ms1b		M
NA	2.) Percent recovery not reported?	ms3a				
	3.) Was percent recovery <75 or >125%?					
NA	NR Antimony (Sb)	ms4a	ms4a	ms4a		S
NA	NR Arsenic (As)	ms4a	ms4a	ms4a		S
NA	NR Cadmium (Cd)	ms4a	ms4a	ms4a		S
NA	NR Lead (Pb)	ms4a	ms4a	ms4a		S
NA	NR Selenium (Se)	ms4a	ms4a	ms4a		S
NA	NR Thallium (Tl)	ms4a	ms4a	ms4a		S
ANALYSIS CVAAS (mercury)						
* *Duplicate*						
NA	1.) Not conducted per run?	du6a		du6b		M
NA	2.) Runs not reported?	du7a	du7a	du7a		R
* *Matrix Spike*						
NA	1.) Not conducted on one nitric impinger?	ms5a		ms5b		M
NA	2.) Percent recovery not reported?	ms6a				M
	3.) Was percent recovery <75 or >125%?					
NA	NR 1.) Mercury (Hg)	ms7a	ms7a	ms7a		S

CALCULATION CHECK FOR METHOD MMT - Pre 436

Device ID:
Substance:

DATA ENTRY-SAMPLING	SYMBOL	UNITS	DATA
RUN NUMBER	-	-	
ROUND STACK, DIAMETER	ds	inches	
RECTANGULAR STACK, LENGTH	L	inches	
WIDTH	W	inches	
NOZZLE DIAMETER	dn	inches	
AVERAGE STACK TEMPERATURE	Fs	degrees F	
AVERAGE METER TEMPERATURE	Fm	degrees F	
BAROMETRIC PRESSURE	Pbar	in. Hg	
STACK STATIC PRESSURE	Pg	in. H20	
AVG. DELTA H	dH	in. H20	
AVG. RMS VELOCITY HEAD	dP	in. H20	
PITOT COEFFICIENT	Cp	-	
GAS SAMPLE VOLUME	Vm	cubic ft.	
METER CALIBRATION FACTOR	Y	-	
TOTAL SAMPLING TIME	min	minutes	
STACK GAS OXYGEN CONTENT	Co2,m	%	
STACK GAS CARBON DIOXIDE CONTENT	Cco2,m	%	
TOTAL IMPINGER GAIN (WATER & PARTICULATE)	Ww	grams	
CALCULATED DATA-SAMPLING			
RUN NUMBER	-	-	0
NOZZLE AREA, An = 3.14(dn)**2/4	An	sq. in.	0.000
STACK AREA, As = 3.14*(ds)**2/576 (ROUND) = L * W/144 (RECTANGULAR)	As	sq. feet	0.000
AVG. STACK TEMPERATURE, Ts = Fs + 460	Ts	degrees R	460.0
AVG. METER TEMPERATURE, Tm = Fm + 460	Tm	degrees R	460.0
GAS SAMPLE VOLUME AT STANDARD CONDITIONS, VmStd = 17.64*Y*(Vm/Tm)*(Pbar + dH/13.6)	VmStd	cubic ft.	0.0
VOLUME OF WATER VAPOR, VwStd = 0.04707*Ww	VwStd	cubic ft.	0.0
MOISTURE FRACTION, Bws = VwStd/(VmStd + VwStd)	Bws	-	#DIV/0!
DRY STACK GAS MOL. WEIGHT, Md = 0.32(Co2,m)+ 0.44(Cco2,m)+0.28{100-(Co2,m)-(Cco2,m)]	Md	g/g-mole	28.00
WET STACK GAS MOLECULAR WEIGHT, Mw = Md(1-Bws)+18.0(Bws)	Mw	g/g-mole	#DIV/0!
ABSOLUTE STACK PRESSURE, Ps = Pbar + Pg/13.6	Ps	in. Hg	0.00
STACK GAS VELOCITY vs = 85.49 Cp { sqrt[(dP*Ts) /(Ps*Mw)] }	vs	ft/s	#DIV/0!
ACTUAL STACK GAS FLOW RATE, Q = 60*vs*As	Q	acf/min	#DIV/0!
DRY GAS STACK FLOW RATE (DRY,STP) Qsd = 17.64*Q*(1-Bws)*(Ps/Ts)	Qsd	dscf/min	#DIV/0!
ISOKINETIC RATE, I = 13.61*Ts*VmStd/[Ps*vs*An*min*(1-Bws)]	I	%	#DIV/0!
DATA ENTRY-ANALYTICAL			
TOTAL MASS OF ONE TRACE METAL IN FRONT HALF OF SAMPLE TRAIN	Mfh	mg	
TOTAL MASS OF TRACE METAL IN FRONT HALF REAGENT BLANK	Mfhb	mg	
TOTAL MASS OF TRACE METAL IN BACK HALF OF SAMPLE TRAIN	Mbh	mg	
TOTAL MASS OF TRACE METAL IN BACK HALF REAGENT BLANK	Mbhb	mg	
CALCULATED DATA-OVERALL			
CORRECTED TOTAL AMOUNT OF TRACE METAL Mmt = (Mfh - Mfhb) + (Mbh - Mbhb)	Mmt	mg	0.000
CONCENTRATION OF TRACE METAL Mmc = (35.31*Mmt)/Vmstd	Mmc	mg/dscm	#DIV/0!
TRACE METAL MASS EMISSION RATE Emt = ((Qsd*Mmt)/Vmstd)*1.32e-4	Emt	lb/hr	#DIV/0!

SOURCE TEST METHOD DETAILED VALIDATION CHECKLIST

Test Method: CARB 436-March, 1991 or March 1992
Substance: Trace Metals

Report ID Number: _____
Reviewer: _____
Review Date: _____

Method Description and Applicability

This method is applicable to the determination of trace metal emissions from stationary sources. Particulate and gaseous arsenic emissions are withdrawn isokinetically and collected on a filter and in a nitric acid solution and a potassium permanganate solution. The samples are then analyzed in separate front and back half portions by either ICAP, GVAAS, AAS and Hg is analyzed by CVAAS.

Quality Assurance/Quality Control Checks

Before completing the detailed QA checklist, please answer the following questions.

1) Was ARB approval granted for use of this method? Yes No
2) If the answer to question 1 is "No" check with manager.
3) Indicate the specific version of CARB 436 used. March 1991 or March 1992
4) Have results of parallel source test or audit provided? Yes No
5) Equipment check - Non-metallic prob, nozzle, prob brush, and non-wood prob brush.
   Yes No
6) If the answer to #5 is "No" **STOP** evaluating.
7) Number of impingers with Mercury:
   $5\%HNO_3/10\%H_2O_2$ (2)___ $4\%KMnO_4/10\%H_2SO_2$ (2)___ Silica Gel (1)___
   Empty(1 if moisture <100ml 92 version or <150ml 91 version ; otherwise 2) ___
   Number of impingers without Mercury:
   $5\%HNO_3/10\%H_2O_2$ (2)___ Silica Gel (1)___
   Empty(0 if moisture <100ml 92 version or <150ml 91 version ; otherwise 1) ___

8) If answer to #7 is different than the default **STOP** evaluating this method (see manager).

9) For all metals except mercury was combined or separate (front and back half) analysis conducted? Combined Separate

10) If the answer to #9 is "Separate" and prior approval from ARB not obtained **STOP** evaluating this method (see manager).

11.) What digestion method was used? _____

12.) Enter the digestion date(s). _____

Please complete the detailed checklist provided in the attached Table. If the statements are true, circle "a"s or the corresponding run numbers; and if they are not reported, circle "b"s.

Blank Procedure

Please be sure that the blank data was applied and considered correctly. The blank data should be handled as follows:

The field reagent blanks should be used to correct field sample data. If the amount of metal detected in the field reagent blank is greater than 20% of the field sample. The field sample needs to be flagged as such. The field blank is not used to correct the field data, instead a field sample/field blank ratio needs to be calculated for all of the samples. If the ratio is less than 5, the field data needs to be flagged as such.

Other Comments

_____

_____

_____

_____

Device ID:

SAMPLE LOCATION					
* *Swirl Check*					
1.) Not conducted?	sc1a		sc1b	M	
2.) Average absolute value of angles > 10%?	sc2a		sc2b	M	
* *Stack Size*					
1.) Enter stack diameter (inches).					
2.) Stack diameter < 12 inch ? or	st2a		st2b	M	
3.) Area <113 inch squared?	st3a		st3b	M	
* *Number of Sample Points*					
1.) Enter total number of points.					
2.) Method 1 not used?	ns2a		ns2b	M	
SAMPLING EQUIPMENT					
* *Nozzle Size Check*					
1.) Not conducted prior to test?	nz1a		nz1b	M	
2.) Variation in diameter > 0.004 inch?	nz2a		nz2b	M	
* *Field Gas Dry Meter*					
1.) Not checked pre- and post-test?	gm1a		gm1b	M	
2.) Pre- and post-test Y not within (+/-) 5%?	gm2a		gm2b	M	
* *Pitot Tube*					
1.) Semi-annual calibration sheet not included?	pt1a		pt1b	M	
SAMPLING PROCEDURES					
* *Leak Check*					
1.) Not conducted?	lc1a		lc1b	M	
2.) Values not reported?	lc2a			M	
3.) Pretest >0.02 cfm or 4% of average?	lc3a	lc3a	lc3a	R	
4.) Post-test >0.02 cfm or 4% of average?	lc4a	lc4a	lc4a	R	
**Sample runs*					
1) Runs<3?	sr1a		sr1b	M	
* *Isokinetic*					
1.) Sample not taken isokinetically?	is1a		is1b	M	
2.) Isokinetic variation not reported?	is2a			M	
3.) Isokinetic <90 or >110%?	is3a	is3a	is3a	R	
* *Field Blank*					
1.) Not conducted once per test?	fb1a		fb1b	M	
2.) Used to correct samples?	fb2a		fb2b	M	
3) Sample/field blank<5?					
NA NR Antimony	fb3a	fb3a	fb3a	S	
NA NR Arsenic	fb3a	fb3a	fb3a	S	
NA NR Barium	fb3a	fb3a	fb3a	S	
NA NR Beryllium	fb3a	fb3a	fb3a	S	
NA NR Cadmium	fb3a	fb3a	fb3a	S	
NA NR Chromium	fb3a	fb3a	fb3a	S	
NA NR Copper	fb3a	fb3a	fb3a	S	
NA NR Lead	fb3a	fb3a	fb3a	S	
NA NR Manganese	fb3a	fb3a	fb3a	S	
NA NR Nickel	fb3a	fb3a	fb3a	S	
NA NR Phosphorus	fb3a	fb3a	fb3a	S	
NA NR Selenium	fb3a	fb3a	fb3a	S	
NA NR Silver	fb3a	fb3a	fb3a	S	
NA NR Titanium	fb3a	fb3a	fb3a	S	
NA NR Zinc	fb3a	fb3a	fb3a	S	
* *Field Reagent Blank*					
1.) Not conducted once per test?	rb1a		rb1b	M	
2.) Not used to correct samples?	rb2a		rb2b	M	

ANALYSIS ICAP (all metals ,except mercury)					
* *Analysis Date*					
NA 1.) Not within 2 months, for all samples?	ad1a		ad1b	M	
* *Duplicate*					
NA 1.) Not conducted once per test?	du1a		du1b	M	
NA 2.) Percent difference not reported?	du2a			M	
3.) Was percent difference > 10%?					
NA NR Antimony (Sb)	du3a	du3a	du3a	S	
NA NR Arsenic (As)	du3a	du3a	du3a	S	
NA NR Barium (Ba)	du3a	du3a	du3a	S	
NA NR Beryllium (Be)	du3a	du3a	du3a	S	
NA NR Cadmium (Cd)	du3a	du3a	du3a	S	
NA NR Chromium (Cr)	du3a	du3a	du3a	S	
NA NR Copper (Cu)	du3a	du3a	du3a	S	
NA NR Lead (Pb)	du3a	du3a	du3a	S	
NA NR Manganese (Mn)	du3a	du3a	du3a	S	
NA NR Nickel (Ni)	du3a	du3a	du3a	S	
NA NR Phosphorus (P)	du3a	du3a	du3a	S	
NA NR Selenium (Se)	du3a	du3a	du3a	S	
NA NR Silver (Ag)	du3a	du3a	du3a	S	
NA NR Thallium (Tl)	du3a	du3a	du3a	S	
NA NR Zinc (Zn)	du3a	du3a	du3a	S	
ANALYSIS GFAAS (listed metals)					
* *Analysis Date*					
NA 1.) Not within 2 months, for all samples?	ad2a		ad2b	M	
* *Duplicate*					
NA 1.) Not conducted per run?	du4a		du4b	M	
NA 2.) Runs not reported?	du5a	du5a	du5a	R	
* *Matrix Spike*					
NA 1.) Not conducted on combined?	ms1a		ms1b	M	
NA 2.) Percent recovery not reported?	ms2a			M	
3.) Was percent recovery <75 or >125%?					
NA NR Antimony (Sb)	ms3a	ms3a	ms3a	S	
NA NR Arsenic (As)	ms3a	ms3a	ms3a	S	
NA NR Cadmium (Cd)	ms3a	ms3a	ms3a	S	
NA NR Lead (Pb)	ms3a	ms3a	ms3a	S	
NA NR Selenium (Se)	ms3a	ms3a	ms3a	S	
NA NR Thallium (Tl)	ms3a	ms3a	ms3a	S	
ANALYSIS CVAAS (mercury)					
* *Analysis Date*					
NA 1.) Not within 28 days, for all samples?	ad3a		ad3b	M	
* *Duplicate*					
NA 1) Not conducted per run?	du6a		du6b	M	
NA 2.) Runs not reported?	du7a	du7a	du7a	R	
* *Matrix Spike*					
NA 1.) Not conducted on one nitric impinger?	ms4a		ms4b	M	
NA 2.) Percent recovery not reported?	ms5a			M	
3.) Percent recovery <75 or >125%?					
NA NR 1.)Mercury (Hg)	ms6a	ms6a	ms6a	S	

M-Method a-True
R-Run b-Not reported
S-Substance

CALCULATION CHECK FOR CARB METHOD 436-MARCH 91 and 92

Device ID:
Substance:

DATA ENTRY-SAMPLING	SYMBOL	UNITS	DATA
RUN NUMBER	-	-	
ROUND STACK, DIAMETER RECTANGULAR STACK, LENGTH WIDTH	ds L W	inches inches inches	
NOZZLE DIAMETER	dn	inches	
AVERAGE STACK TEMPERATURE	Fs	degrees F	
AVERAGE METER TEMPERATURE	Fm	degrees F	
BAROMETRIC PRESSURE	Pbar	in. Hg	
STACK STATIC PRESSURE	Pg	in. H20	
AVG. DELTA H	dH	in. H20	
AVG. RMS VELOCITY HEAD	dP	in. H20	
PITOT COEFFICIENT	Cp	-	
GAS SAMPLE VOLUME	Vm	cubic ft.	
METER CALIBRATION FACTOR	Y	-	
TOTAL SAMPLING TIME	min	minutes	
STACK GAS OXYGEN CONTENT	Co2,m	%	
STACK GAS CARBON DIOXIDE CONTENT	Cco2,m	%	
TOTAL IMPINGER GAIN (WATER & PARTICULATE)	Ww	grams	
CALCULATED DATA-SAMPLING			
RUN NUMBER	-	-	0
NOZZLE AREA, An = 3.14(dn)**2/4	An	sq. in.	0.000
STACK AREA, As = 3.14*(ds)**2/576 (ROUND) = L * W/144 (RECTANGULAR)	As	sq. feet	0.000
AVG. STACK TEMPERATURE, Ts = Fs + 460	Ts	degrees R	460.0
AVG. METER TEMPERATURE, Tm = Fm + 460	Tm	degrees R	460.0
GAS SAMPLE VOLUME AT STANDARD CONDITIONS, VmStd = 17.64*Y*(Vm/Tm)*(Pbar + dH/13.6)	VmStd	cubic ft.	0.0
VOLUME OF WATER VAPOR, VwStd = 0.04707*Ww	VwStd	cubic ft.	0.0
MOISTURE FRACTION, Bws = VwStd/(VmStd + VwStd)	Bws	-	#DIV/0!
DRY STACK GAS MOL. WEIGHT, Md = 0.32(Co2,m)+ 0.44(Cco2,m)+0.28[100-(Co2,m)-(Cco2,m)]	Md	g/g-mole	28.00
WET STACK GAS MOLECULAR WEIGHT, Mw = Md(1-Bws)+18.0(Bws)	Mw	g/g-mole	#DIV/0!
ABSOLUTE STACK PRESSURE, Ps = Pbar + Pg/13.6	Ps	in. Hg	0.00
STACK GAS VELOCITY vs = 85.49 Cp { sqrt[(dP*Ts) /(Ps*Mw)] }	vs	ft/s	#DIV/0!
ACTUAL STACK GAS FLOW RATE, Q = 60*vs*As	Q	acf/min	#DIV/0!
DRY GAS STACK FLOW RATE (DRY,STP) Qsd = 17.64*Q*(1-Bws)*(Ps/Ts)	Qsd	dscf/min	#DIV/0!
ISOKINETIC RATE, I = 13.61*Ts*VmStd/[Ps*vs*An*min*(1-Bws)]	I	%	#DIV/0!
DATA ENTRY-ANALYTICAL			
TOTAL MASS OF ONE TRACE METAL IN SAMPLE TRAIN	Mf	mg	
TOTAL MASS OF TRACE METAL IN FIELD REAGENT BLANK	Mb	mg	
CALCULATED DATA-OVERALL			
CORRECTED TOTAL AMOUNT OF TRACE METAL Mmt = (Mf - Mb)	Mmt	mg	0.000
CONCENTRATION OF TRACE METAL Mmc = (35.31*Mmt)/Vmstd	Mmc	mg/dscm	#DIV/0!
TRACE METAL MASS EMISSION RATE Emt = ((Qsd*Mmt)/Vmstd)*1.32e-4	Emt	lb/hr	#DIV/0!