NC DAQ Source Test Observers Checklist - EPA Methods 1-5 & 26A (Hydrogen Halides and Halogens)

Facility Name / Location:

Source Contact / Phone #:

Testing Firm / Contact:

Facility ID / Source Tested:

Tracking Number:

Test Date:

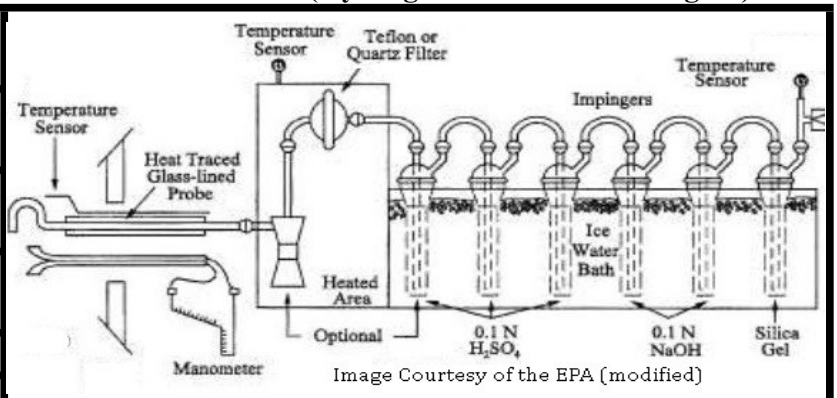

Image Courtesy of the EPA (modified)

Run #	Start Time	End Time	DGM Start	DGM End	Vm	Ave. Δp	Nozzle ø	Filter No.	H_2O Coll.	Post leak

Ask for an explanation to any question answered "No" and attach comments to this form or in your report.

METHOD 1 - Sample and Velocity Traverses for Stationary Sources	**Yes**	**No**
1.1) Method 1 calculated correctly (see reverse side)?		
1.2) Cyclonic flow check completed during test day? (Average of absolute value of all angles <20 degrees?)		
METHOD 2 - Determination of Stack Gas Velocity and Volumetric Flow Rate	**Yes**	**No**
2.1) Pitot tube leak check completed after each run?		
2.2) Visual check of pitot tube heads - good condition?		
2.3) Manometer level and zeroed correctly?		
2.4) Static pressure measured during the test day? Static Pressure: inches H_20		
2.5) Barometric pressure recorded and adjusted for elevation? (see page 3)		
2.6) Pitot tube heads oriented to axis of flue? / Pitot tube perpendicular to axis of stack?		
2.7) Temperature recorded at each sampling point?		
2.8) Minimum sample of 30 dscf collected (or per applicable subpart?)(see Vm above)		
METHOD 3 - Gas analysis for O_2, CO_2, and Dry Molecular Weight	**Yes**	**No**
3.1) Is molecular weight being assumed? (If yes, and allowed, skip rest of Method 3)(see page 3)		
3.2) Multi point integrated sample / Bag evacuated and leak free (if applicable)		
3.3) Electronic Analyzer; or Orsat (performed in triplicate, analysis consistent?) (circle)(see page 3)		
3.4) Calculate F_0 / Within Range?		
METHOD 4 - Determination of Moisture Content in Stack Gases	**Yes**	**No**
4.1) See Page 2 (Method 26A) for impinger requirements		
4.2) Temperature at the exit of impingers / condenser <68 F? (see page 3)		
4.3) Silica gel in good condition? - Blue-new, Pink-spent (unable to absorb more H_2O)		
METHOD 5 - Determination of Particulate Emissions from Stationary Sources	**Yes**	**No**
5.1) Methods 2 - 5, 26A run concurrently? Test team accurately recording meterbox data at each sampling point?		
5.2) Visually inspect sample nozzle for damage / nozzle opening facing direction of flow?		
5.3) Pre run leak check, optional (watch) Leak Rate ≤0.02cfm?		
5.4) Post run leak check, mandatory (watch) Leak Rate ≤0.02cfm? Conducted ≥ highest vacuum during run?		
5.5) Isokinetic rates between 90% and 110%? (see reverse side) K factor:		
5.6) Filter and probe temperatures - see Page 2 (Different Requirements for Method 26A than Method 5)		
5.7a) During a run, was any equipment changed (ie. filter, nozzle, impinger) Why? (Do not explain a "No")		
5.7b) Was a leak check performed prior to the equipment change? (May not be applicable)		
5.8) Meterbox calibration values - ΔH@: Y: Date Calibrated:		
5.9a) Front-half particulate sample clean-up: acetone used? (or water if required by CFR such as MACT MM)?		
5.9b) Inside of nozzle, probe, and glassware (before the filter) rinsed and brushed in triplicate (minimum)?		
5.9c) Is filter holder disassembled on site or transported to lab intact? (circle)		
5.9d) 200 ml acetone blank prepared? Volume of acetone used for cleanup:		

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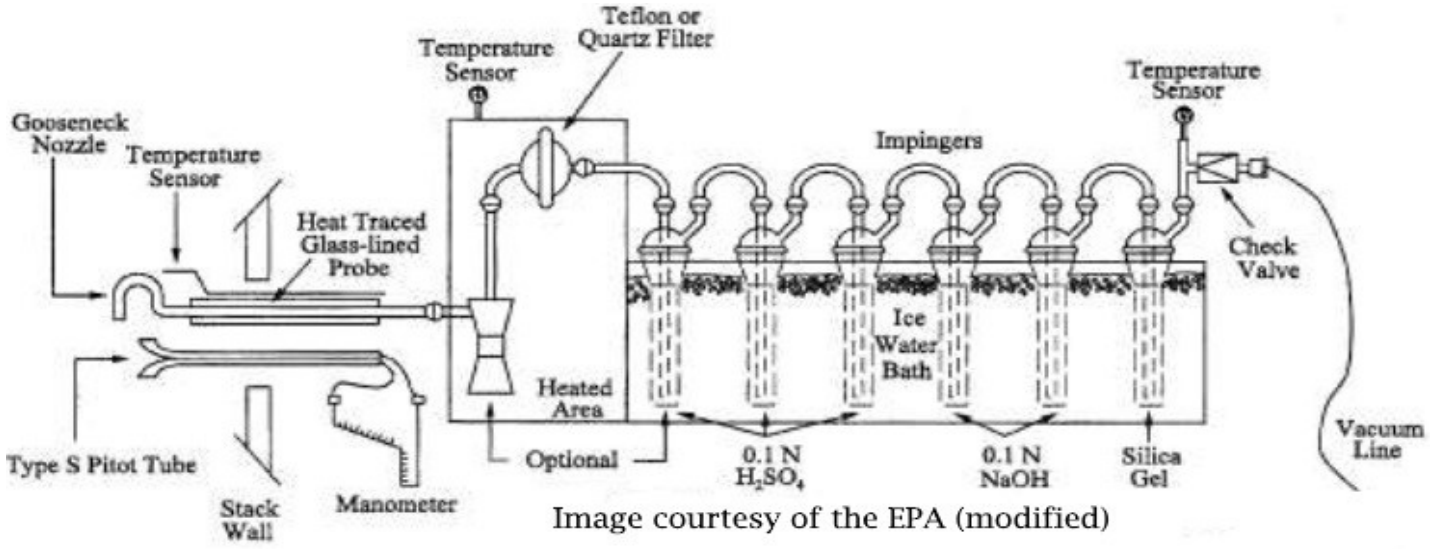

Image courtesy of the EPA (modified)

METHOD 26A - DETERMINATION OF HYDROGEN HALIDES AND HALOGENS		
26A.1) Equipment and Reagents per Method 26A? (Impingers 4 & 5 optional if testing only for HCl & HF)	**Yes**	**No**
26A.1a) Probe nozzle and probe liner borosilicate or quartz glass?		
26A.1b) Cyclone (optional) between probe liner and filter holder?		
26A.1c) Teflon mat filter used?		
26A.1d) Stack temp > 410 Deg F? If so, quartz filter may be used and one-piece glass nozzle/liner mandatory		
26A.1e) Impinger #1 (Optional knockout or condensate impinger; shortened stem) 50 ml of 0.1 N H_2SO_4		
26A.1f) Impinger #2 (Greenburg-Smith Standard Tip & 100 ml of 0.1 N H_2SO_4) (Acid Impinger)		
26A.1g) Impinger #3 (Greenburg-Smith Standard Tip & 100 ml of 0.1 N H_2SO_4) (Acid Impinger)		
26A.1h) Impinger #4 (Modified Greenburg-Smith & 100 ml of 0.1 N NaOH) (Alkaline Impinger)		
26A.1i) Impinger #5 (Modified Greenburg-Smith & 100 ml of 0.1 N NaOH) (Alkaline Impinger)		
26A.1j) Impinger #6 - silica gel (See item 4.3 on page 1)		
26A.1k) Acidic and Alkaline absorbing solutions prepared per Method?		
26A.2) Sampling Train Operation per Method 26A?	**Yes**	**No**
26A.2.a) Probe and filter temperatures between 248 and 273 Deg F?		
26A.3) Post-run Sample Recovery, Cleanup, Blank Preparation, and Optional Moisture Purge	**Yes**	**No**
26A.3.a) 200 ml blanks prepared for each absorbing solution? (250 ml of acidic sol. if optional impinger used)		
26A.3.b) Blanks diluted to same volume of field samples (see d,e below) using blank sample of DI rinse water?		
26A.3.c) Post-test moisture removal (optional and typically not conducted) - required when the optional cyclone is used or when liquid is visible on the filter at the end of the sample run.		
26A.3.d) Acid Impinger Catch - Measure liquids from impingers #'s 1-3; rinse impingers and connecting glassware with DI water; and add all liquids (impinger catch and rinse water) to one storage container.		
26A.3.e) Alkaline Impinger Catch - Measure liquids from impingers #4 & #5; rinse impingers and connecting glassware with DI water; and add all liquids (impinger catch and rinse water) to one container.		
26A.3.f) Sodium thiosulfate added to alkaline impinger catch per Method 26A?		
26A.3.g) DI rinse water blank prepared?		
26A.3.h) Is the rinse water deionized, distilled water that conforms to American Society of Testing and Materials (ASTM) Specification D 1193-77 or 91, Type 3?		
26A.3.i) Record the analytical lab to be used for analysis:		
26A.3.j) Audit sample obtained (if required and commercially available)?		

REMARKS:

**** DO NOT REJECT A TEST WITHOUT CONSULTING WITH THE STATIONARY SOURCE COMPLIANCE BRANCH. IF YOU HAVE TESTING CONCERNS, DISCUSS THEM IMMEDIATELY WITH THE TESTING COMPANY AND SSCB. ****

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RECORD PROCESS DATA: It is imperative for the facility and the observer to record the pertinent data during the test so that the measured emissions can be correlated to a production rate and compared to the permit limit. The test will be unacceptable without production data. Control device operating parameters should also be recorded.

DATA TABLE: DGM stands for "dry gas meter", the volume of dry gas collected typically in cf. The "Vm" is the DGM meter change from the beginning to the end of the run, which is the total dry gas volume collected. "Ave. Δp" is the average pitot tube velocity head for the points sampled (in inches H_2O). "Nozzle ø" is the nozzle diameter, typically in inches. "H_2O Coll." is the water collected by Method 4. "Post leak" is the post leak check amount in cfm (see below).

METHOD 1: If stack is between 4" - 12" then Method 1a must be employed. If duct is <4" then alternative methods must be used.

Stack Diameter:	
How Determined?	
Port Dist. upstream from disturbance (A):	
Upstream Diameters (A):	
Port Dist. downstream from disturbance (B):	
Downstream Diameters (B):	

Draw a line vertically from the "Distance A" axis down to the step chart, and from the "Distance B" axis up to the step chart. The maximum # of points marked on the chart yields the minimum # of points to be sampled.

Minimum number of sampling points:	
Points correctly marked on the pitot tube?	
Port length accounted for in calculations?	

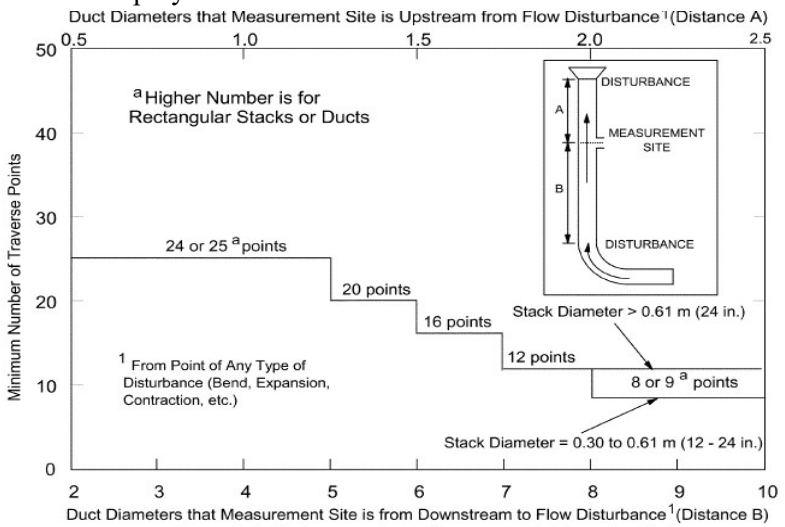

Figure 1-1. Minimum number of traverse points for particulate traverses

Image Courtesy of the EPA

2.5 Barometric Pressure: pressure must be adjusted minus 0.1" Hg per 100ft elevation increase or vice versa for elevation decrease.

2.8 Sample Volume (Vm): SIP Sources require 1hr particulate test runs and a minimum sample of 30 dscf. NSPS regulations may require different sample rates, times, and temperatures. Investigate prior to test. Check "Vm" discussed above.

METHOD 3: The measurement of O_2 & CO_2 is usually performed with an analyzer. Orsats may be used but must meet analysis criteria (see guidance document). Assuming ambient air and a molecular weight may be acceptable for some stacks (asphalt plants).

Calculate: $$F_o = \frac{20.9 - \%O_2}{\%CO_2}$$

Coal:	Anthracite and lignite	1.016 - 1.130	Gas:	Natural	1.600 - 1.836
	Bituminous	1.083 - 1.230		Propane	1.434 - 1.586
Oil:	Distillate	1.260 - 1.413		Butane	1.405 - 1.553
	Residual	1.210 - 1.370	Wood:		1.000 - 1.120

METHOD 4: See Method 26A (page 2) for impinger setup. Impinger Exit Temperature - The temperature of the dry gas leaving the impingers/condenser must be below 68 Deg F. When the ambient temperature is above 68 Deg F it may take approximately 5 minutes for the thermal effects of the ice bath to cool the exit thermometer below 68 Deg F.

METHOD 5:

Leak Check: If the results indicate a leak (>0.02cfm), record the leakage rate. Suggest repeating the run, but it is the discretion of the test team and facility to accept the leak. However, the sample volume will be adversely adjusted due to the leakage rate.

Isokinetics: If the test team indicates that the isokinetic rate of a run is over 110% or under 90%, the run should be voided and repeated.

Particulate Sample Clean-up: If any particulate sample is lost during clean-up, the run should be voided and repeated.

REMARKS: (*Record process data and applicable regulations here and/or in your observation report*)

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