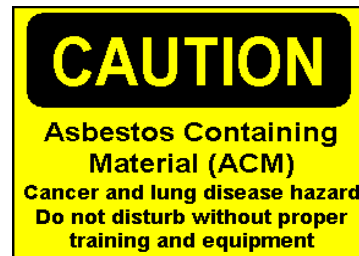


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1.0 Purpose & Scope

Purpose: The purpose of this procedure is to define specific roles, responsibilities, authorities, and accountabilities of the SHSD Industrial Hygiene (IH) group members function in the project oversight of BNL asbestos removal projects.

2.0 Responsibilities

- 2.1 The BNL Asbestos program is implemented through a matrixed organization of several BNL organization units. The SHSD portion of these programs are implemented through personnel assigned by the Industrial Hygiene Manager.
- 2.2 The SHSD person assigned to conduct Asbestos project monitoring is responsible to comply with this SOP, the BNL Subject Area Asbestos and EPA and OSHA regulations applicable to BNL operations.

3.0 Definitions

Asbestos Containing Material (ACM) – a material determined by laboratory analysis to contain greater than 1% asbestos fibers.

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Fiber - a particulate 5 micrometers or longer, with a length-to-diameter ratio (aspect ratio) of at least 3 to 1.

Regulated area - means an area established by the employer to demarcate areas where airborne concentrations of asbestos exceed, or there is a reasonable possibility they may exceed, the permissible exposure limits.

Clearance level standard: air airborne concentrations results for post-abatement samples are to be less than 0.01 asbestos fibers per cubic centimeter of air.

4.0 Prerequisites no

- 4.1 Obtain and maintain required training for OSHA, DOE and EPA requirements.

5.0 Precautions none

6.0 Procedure

- 6.1 Review planned jobs for Hazard Assessment and Exposure Monitoring and document appropriate controls and exposure monitoring requirements in the ARAF (Attachment 9.3) or other appropriate document.
- 6.2 Perform Project Design Reviews for impact on workers: Review documentation such as Experimental Reviews, Work Permits, Project Designs, and SOPs relating to Asbestos to determine if the project is planned to achieve compliance with regulatory drivers and to determine the adequacy of controls measures. Inform the document generating organizations of any needed corrective actions in writing and follow-ups to ensure adequate measures were taken to correct any deficiencies.
- 6.3 Collect bulk samples of suspect material following EPA and OSHA requirements.
- 6.4 Conduct or direct the sampling of personnel airborne exposure monitoring by a qualified sampler. Follow IH75100.
- 6.5 Conduct real time measurement of asbestos fibers when needed using one of the meters listed in the Attachments to this procedure. Follow the guidance on meter

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operation in this procedure or the instrument manufacturer's Instrument/operating Manual.

6.6 Calculations and determination of anticipated exposure levels/re-occupancy criteria:

- 6.6.1 Use fiber count filter samples for determining acceptable levels for personal exposures. That type of sampling is based on laboratory analysis of compliance samples (ACGIH TLV and the OSHA PEL/excursion limit).
- 6.6.2 The direct reading meters can be used to determine re-occupancy criteria based on acceptable levels as determined by the EPA/NYS asbestos project clearance level. The result displays in units of fibers per cubic centimeter of air (f/cc). Criteria level for re-occupancy of a space after asbestos clean-up is **0.01 f/cc**.
- 6.6.3 All results should be reviewed and interpreted by an IH professional trained in asbestos exposure evaluations.
- 6.6.4 All FAM-1 data should be supplemented with a fiber collected sample.
- 6.6.5 Prepare a hazard evaluation report written by a competent person on the survey and ensure a copy is sent to the IH Laboratory and the department ESH coordinator.

6.7 Enter the monitoring data into the BNL exposure database as per IH60500.

7.0 Implementation & training

- 7.1 The IHG qualifies SHSD personal who perform fieldwork (hazard assessment and exposure monitoring) under this program and documents the qualification with the Attachment: Job Performance Measure.

8.0 References

- 8.1 BNL SBMS Subject Area *Asbestos Program*.
- 8.2 29 CFR 1910.1001 OSHA Asbestos Standard for General Industry.
- 8.3 29 CFR 1926.1101 OSHA Asbestos Standard for Construction.
- 8.4 New York State Code Rule 56.

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9.0 Attachments

- 9.1 MIE FAM-1 Meter Operation
- 9.2 Applied Physics 7400D Real-Time Fiber Monitor Meter Operation
- 9.3 ARAF form
- 9.4 Asbestos Monitor JPM Qualification Form

10.0 Documentation

Document Development and Revision Control Tracking		
Prepared By: <i>(signature/date on file)</i> Robert Selvey 10/08/09 Industrial Hygienist	Reviewed By / Date: <i>(signature/date on file)</i> R. Selvey 04/14/05 Industrial Hygienist	Approved By / Date: <i>(signature/date on file)</i> R. Selvey 10/08/09 Industrial Hygienist Group Leader
ESH Coordinator/ Date: <i>none</i>	Work Coordinator/ Date: <i>none</i>	SHSD Manager / Date <i>none</i>
QA Representative / Date: <i>none</i>	Training Coordinator / Date: <i>none</i>	Filing Code: IH52.05
Facility Support Rep. / Date: <i>none</i>	Environ. Compliance Rep. / Date: <i>none</i>	Effective Date: 10/08/09
ISM Review - Hazard Categorization <input type="checkbox"/> High <input type="checkbox"/> Moderate <input checked="" type="checkbox"/> Low/Skill of the craft	Validation: <input type="checkbox"/> Formal Walkthrough <input checked="" type="checkbox"/> Desk Top Review <input type="checkbox"/> SME Review Name / Date:	IMPLEMENTATION: Training Completed: none Procedure posted on Web: 10/08/09 Hard Copy files updated: 10/08/09

Revision Log
Purpose: <input type="checkbox"/> Temporary Change <input type="checkbox"/> Change in Scope <input type="checkbox"/> Periodic review <input type="checkbox"/> Clarify/enhance procedural controls Changed resulting from: <input type="checkbox"/> Environmental impacts <input type="checkbox"/> Federal, State and/or Local requirements <input type="checkbox"/> Corrective/preventive actions to non-conformances <input type="checkbox"/> none of the above Section/page and Description of change: SME Reviewer/Date: (signature/date on file)

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Attachment 9.1

FAM-1 Operation

The unit is typically used to supplement (not replace) regulatory specified sampling methods using filter media and calibrated sampling pumps. The FAM-1 provides an indication of ambient, airborne fiber levels of asbestos containing materials (ACM). The FAM-1 is factory calibrated to report results comparable to NIOSH Method 7400 Phase Contrast Microscopy (PCM) for asbestos fiber monitoring. The FAM-1 is used to give a rapid, quantified indication of airborne fibers present in an area after an unplanned event. The information can be used to plan immediate response actions to be taken in the time interval while laboratory analysis on sampling filters is being processed.



The FAM-1 is not a recognized laboratory method for compliance monitoring. It is not specific to asbestos fibers and should not be used for compliance with any regulatory requirement. The meter should be used with professional guidance and subsequent, laboratory analytical verification by PCM.

This meter is used to

- Count individual fibers in real time and calculate average airborne concentrations.
- Determine, along with professional judgment, immediate re-occupancy criteria in emergency response situations.

The FAM-1 components are inside a carry-case and include:

- The sampling cassette (25 mm MCE with conductive cowl).
- The electrical cord.
- The flow meter.
- The meter body.

Specific Instrument Precautions

- The meter is sensitive and can be misaligned due to physical shock (rough handling or dropping).
- High dust levels and or relative humidity may affect the reported result as well as adversely affect future operation of the instrument.
- If exposed to low temperatures (e.g. in the trunk of a car during winter) allow the unit to return to room temperature prior to turning the unit on. Otherwise water vapor may condense on the interior surfaces causing voltage leakage affecting either temporary or permanent operation.
- The inlet of the FAM should be placed in a central location with respect to the area to be assessed, away from strong localized air currents due to fans, blowers, pumps, ventilation intakes/exhausts, etc.

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The FAM should be placed on a firm support without excessive vibration.

- Tubing may be attached to the inlet end of the FAM to extend sampling positions. However, only Tygon® tubing (not Teflon) should be used and not exceed 6 feet. The tubing inlet should point either horizontally or downward to prevent debris from entering.
- Exposure to water spray or any other liquid must be avoided.
- There are two overload indicator lights. These may come on periodically during sampling but are not a problem unless this condition arises frequently.
- For areas with high dust operations, the unit should not be shut off during sampling. At the end of the sampling and prior to turning the unit off, a filter may be placed on the FAM inlet to clear the instrument before shutting it down.

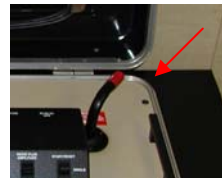
1. **Calibration:** No external calibration is required prior to sampling. The meter can only be factory calibrated. Follow IH51 for calibration frequency.

2. **Set-up:** Open the case and remove the power cord from the top half of the case. Remove the top half of the case and set aside(hinges slide for removal). Most of the optional settings will be set by the IH lab technician.



3. Securely plug the line cord into the back of the raised control panel and into an 110V wall outlet. Use of an extension cord is allowable within SBMS guidelines for their use.

4. Remove the red protective cap from the meter's air inlet.



5. Locate and remove the transparent flow meter which is fastened to the unit.

6. Push this unit snugly down over the receptacle as indicated in the drawings (Attachment 9.1). Ensure the connection is tight.



7. Remove the plugs from the ends of a sample cassette and plug the flow meter tubing into the outlet side of the cassette (small end). Push the inlet end (large end) of the cassette onto the fitting adjacent to the flow meter. Ensure the connections are tight. The sampling cassette is not used for laboratory analysis.

8. Select the Sample Time using the Sample Time switch. Note the longer a sample runs the more precise (significant figures) the sample results. A 10 minute sample will result in two significant figures (0.00).



9. Complete the routine diagnostic checks prior to sampling. Turn the edgewise meter selector switch to *Laser Alignment*.

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10. Switch the Power to **On** and push the Sample Mode switch momentarily to **Start/Reset** (up) and release. This begins a sample in single sample mode.

11. To sample continuously push the switch to the **continuous** position (down). The flow meter will read approximately 2 liters/minute and the digital display should read C 0.00. The numbers may change during sampling as this represents the total number of fibers counted and not the final average air concentration.



12. Recording readings:

12.1 No data logging capability is used with this instrument. Each data point needs to be individually recorded.

12.2 In single sample mode the unit will stop sampling after the selected time period and display the result on the readout. Record this result on the *Direct Reading Sampling Instrument* form, or equivalent.

12.3 When sampling in continuous mode, the result will only appear for approximately 12 seconds. The unit will then start a new sample and delete the previous result. Thus, the meter must be observed carefully near the end of the sampling period and each sample must be recorded on the sampling form within that 12 second time period.

12.4 For the last sample in continuous sample mode, push the **Start/Reset** switch to single sample mode (center position). The instrument will complete the run underway and then stop, displaying the last concentration reading.

13. Ending Sampling: Turn the power off at the switch on the meter.

13.1 Remove the sample cassette from the flow meter and recap both ends. The sample cassette may be used again as long as it does not restrict flow and is in good condition.

13.2 Remove the flow meter and screw down onto the unit from where it was removed.

13.3 Place the red protective end cap back onto the unit's air inlet.

13.4 Remove the power line cord and rewind onto the holder in the top of the case.

13.5 Wipe off the unit to ensure it is in clean condition prior to removing from the site.

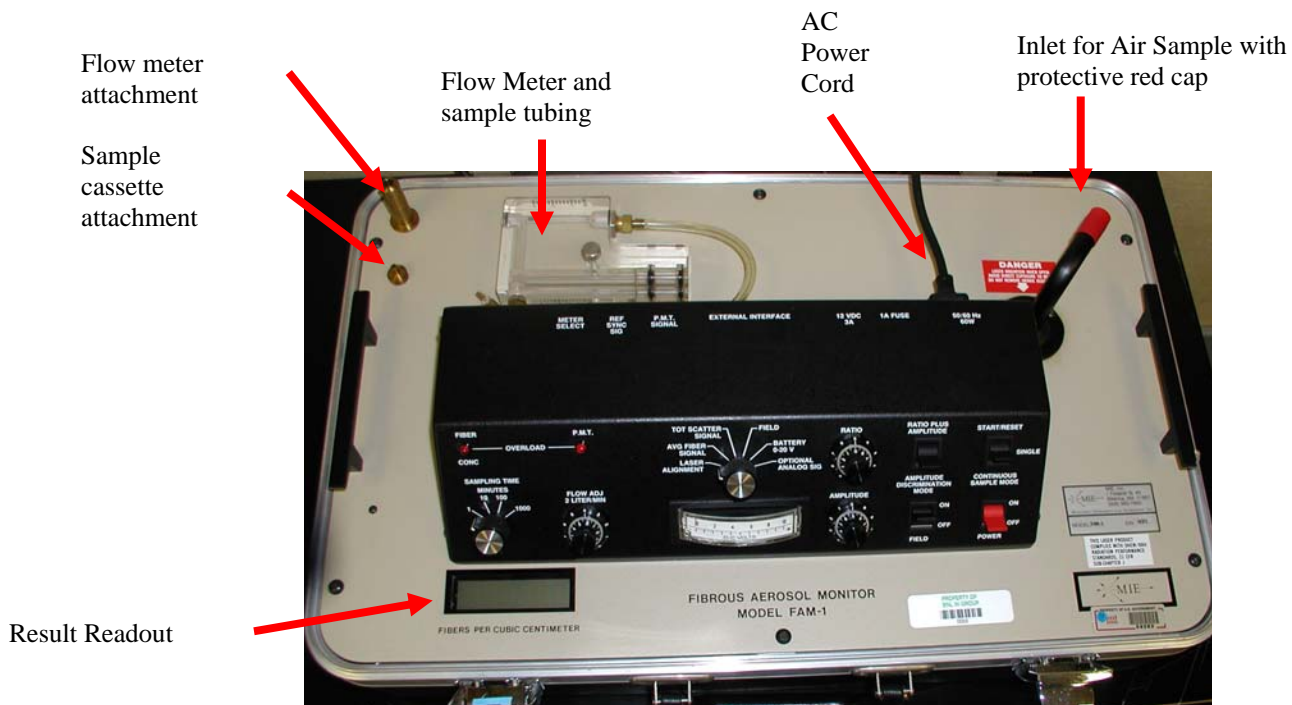
13.6 Attach the top of the case, close and return the unit to the IH lab.

14. Routine Diagnostic Checks (performed by the IH lab, as needed.) The following sequence of checks should be conducted in a clean environment or connecting a low pressure drop, high efficiency filter (e.g. glass fiber) to the FAM-1 inlet. These checks are recommended by the manufacturer prior to each use.

- Set Ratio control is adjusted to 5.0
- Set Amplitude control to 0.50 and locked.

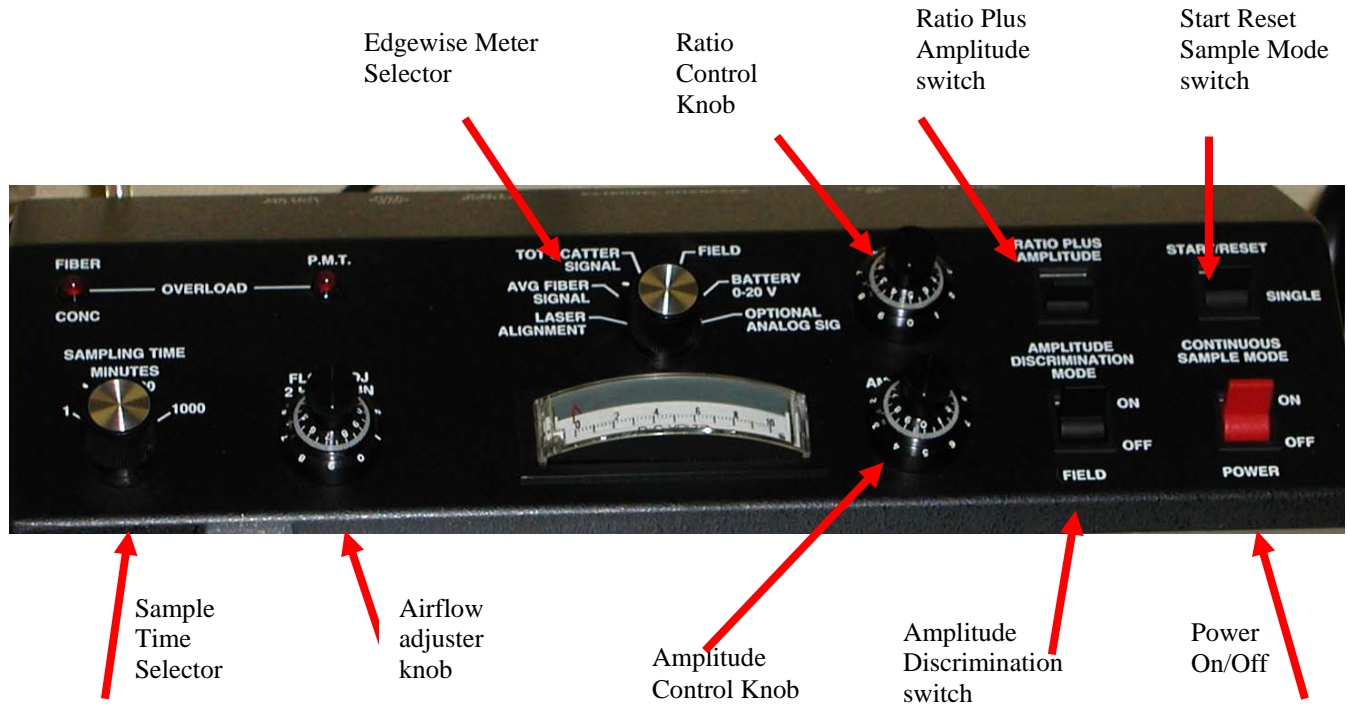
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- Set Discrimination Mode selector switch in *Ratio Plus Amplitude* position (up).
- Set Sample Mode selector switch in *Single* position (middle).
- Plug line cord into AC outlet.
- Switch Power to *On* and select 10 minute Sampling Time.
- Push *Sampling Mode* switch momentarily to *Start/Reset* (up) and release. Then place this switch in *Continuous* position (down).
- Observe the flow meter ball. Center of ball should be at 2 lpm when viewed horizontally. If the flow meter readings differ from 2 lpm unlock the Flow Adjust control (push up small side lever) and adjust control until flow meter indicates 2 lpm. Lock control pushing down small side lever.
- Plug inlet opening with finger and the flow meter should drop below lowest marking (pump may stop running). Unplug inlet and reading should return to 2 lpm.
- Set selector switch to *Laser Alignment* position. Observe meter. Reading should be between 4.5 and 5.5 volts. Typically 5.0 volts.
- Move meter selector to *Avg Fiber Signal* position and reading should be less than 0.2 volts.
- Move selector switch to *Top Scatter* position. Reading should be less than 0.2 volts.
- Move the selector to *Field* position. Reading should be between 4.0-4.5 volts. Typically 4.3 volts.
- Move the selector switch to *Battery* position (this reading indicates the internal battery condition). Reading should be between 10 and 14 volts. Typically 11.0 volts. Note: the scale is 0-20 for this test, which doubles the observed reading.
- Place Sample Mode switch to *Single* and wait until the FAM-1 stops operation at end of 10 minute period. Indicated fiber concentration should not exceed 0.01 f/cc. This will complete the calibration checks and warm up period.



The only official copy is on-line at the SHSD IH Group website.
Before using a printed copy, verify that it is current by checking the document issue date on the website.

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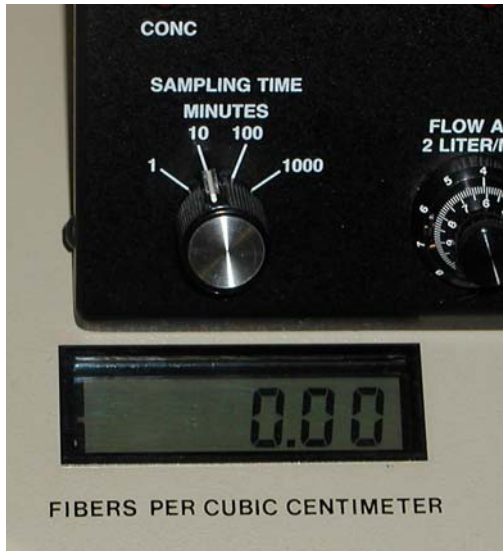


Flow meter and sample cassette attached



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MIE FAM-1 Readout



Readout after 10 minute sample event
NOTE: decimal appears with two significant figures



Readout after 100 minute sample event
NOTE: decimal appears with three significant figures



Readout during sample event
Note: C means counting

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Attachment 9.2

Applied Physics 7400D Real-Time Fiber Monitor

(placeholder)

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Attachment 9.3

Asbestos Removal Assessment Form (ARAF)

For official copy access this link:

http://www.bnl.gov/esh/shsd/SOP/WordDocs/IH_Forms/IH88_ARAF.doc

ASBESTOS REMOVAL ASSESSMENT FORM (ARAF)		IH Job # _____ CC # _____ ARAF # _____ PE # _____
Dept Code: _____ Building#: _____ Room # or Room name or Location: _____ Date Today: ____/____/____ Assessment: _____ sq. ft. In _____		
Job Description: _____		
<input type="checkbox"/> NO <input type="checkbox"/> YES ODE NOTIFICATION IS REQUIRED IN ADVANCE OF REMOVAL		
ARAF PREPARATION _____ _____ Contractor		WORK BY: _____ _____
S&H REP: _____ Other: _____		
TYPE OF ABATEMENT <input type="checkbox"/> Remove ACM <input type="checkbox"/> Encapsulate ACM <input type="checkbox"/> Cover with Protective Metal Cover <input type="checkbox"/> Clean Up Debris	ASBESTOS CONTAINING MATERIAL TYPE <input type="checkbox"/> Equipment or Duct Insulation <input type="checkbox"/> Pipe Insulation <input type="checkbox"/> Ceiling Tiles <input type="checkbox"/> Floor Tiles <input type="checkbox"/> Shingles (Non-transit) <input type="checkbox"/> Transit <input type="checkbox"/> Roofing <input type="checkbox"/> Wall and Ceiling <input type="checkbox"/> Debris <input type="checkbox"/> Other: _____	
LOCATION OF SURVEY <input type="checkbox"/> Attic <input type="checkbox"/> Basement <input type="checkbox"/> Roof <input type="checkbox"/> General (Office/Hall) etc. <input type="checkbox"/> Mechanical Room <input type="checkbox"/> Outdoors <input type="checkbox"/> Other: _____	PRE-JOB CONTROLS <input type="checkbox"/> Bulk Sample <input type="checkbox"/> Warning Signs / Tape <input type="checkbox"/> Secure Doors, Etc. <input type="checkbox"/> Steam off <input type="checkbox"/> Electric off / Grounded <input type="checkbox"/> Local Ventilation off <input type="checkbox"/> Local Ventilation Covered <input type="checkbox"/> Q/Limits- During Abatement <input type="checkbox"/> Q/Limits- Until Post Test <input type="checkbox"/> Film Badge Area <input type="checkbox"/> Contact Rep and Coordinator <input type="checkbox"/> Safety Instructions <input type="checkbox"/> Other: _____	
ACCESSIBILITY <input type="checkbox"/> Worker / Occupant Access <input type="checkbox"/> Public Access <input type="checkbox"/> Inaccessible	PERSONAL PROTECTIVE EQUIPMENT <input type="checkbox"/> Half Face Mask with HEPA <input type="checkbox"/> Full Face Mask with HEPA <input type="checkbox"/> PAPR with HEPA <input type="checkbox"/> Supplied Air <input type="checkbox"/> SCBA <input type="checkbox"/> Tyvek Suit _____ Double Suit <input type="checkbox"/> Boots <input type="checkbox"/> Gloves <input type="checkbox"/> Goggles / Face Shield <input type="checkbox"/> Ear Plugs / Ear Muffs <input type="checkbox"/> Heat Stress Potential <input type="checkbox"/> Other: _____	
ABATEMENT METHOD <input type="checkbox"/> Glove Bag <input type="checkbox"/> Neg. Pres. Glove Bag <input type="checkbox"/> Tent <input type="checkbox"/> Enclosure <input type="checkbox"/> HEPA Vacuum <input type="checkbox"/> Wet Pick-up <input type="checkbox"/> Wrap in Plastic <input type="checkbox"/> Remove Nails / Demolish <input type="checkbox"/> Map Adjacent Floor <input type="checkbox"/> Map Entire Floor <input type="checkbox"/> Wipe Adjacent Surfaces <input type="checkbox"/> Other: _____	AIR SAMPLING <input type="checkbox"/> Pre-Test, Background <input type="checkbox"/> Area Sample _____ High Vol Pump _____ Low Vol Pump <input type="checkbox"/> Post Test _____ Aggressive _____ Nonaggressive <input type="checkbox"/> Personal Monitors: Worn in Breathing Zone <input type="checkbox"/> Excluded _____ Size of Job <input type="checkbox"/> _____ Fugitive Interference <input type="checkbox"/> _____ Negative Exposure Assessment	
ARAF Prep By: _____		
Date: _____		
Surveyor Name: _____		
Date: _____ Job Complete: <input type="checkbox"/> Yes <input type="checkbox"/> No		
File Code: 8488 SHSD Form ARAF Revision 07 (04/15/06)		

Safety and Health Services Division - Industrial Hygiene Group

**Asbestos Project Monitor
Job Performance Measure Qualification Certificate**

Candidate's Name (Print):	BNL#
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Additional Requirements for Program Administrator

		Unsatisfactory	Recover	Satisfactory
Project Monitoring Specification	Demonstrates the proper specification of airborne fiber monitoring requirements via the ARAF form or other suitable mechanisms.			
Air Sampling with Direct Reading Meters	<input type="checkbox"/> Demonstrates proper operation of the MIE FAM-1 meter			
	<input type="checkbox"/> Demonstrates proper operation of the Applied Physics 7400D Real-Time Fiber Monitor			
Air Sampling with Filter Samplers				
Bulk Sampling				
IH Group Program Development	Demonstrates the ability to address gaps or deficiencies in the IH Group SOPs and initiate corrective actions.			

I accept the responsibility for performing the tasks as demonstrated within this JPM and the corresponding SOP.

Candidate Signature:	Date:
----------------------	-------

I certify the candidate has satisfactorily performed each of the above listed steps and is capable of performing the task unsupervised.

Evaluator Signature:	Date:
----------------------	-------