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June 1992



Asbestos Hazard Emergency Response Act (AHERA)

Inspection Guidance Manual and Checklist



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**ASBESTOS HAZARD EMERGENCY
RESPONSE ACT**

INSPECTION GUIDANCE MANUAL

June 1992

**U.S. Environmental Protection Agency
Office of Compliance Monitoring
401 M Street, SW
Washington, D.C. 20460**

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Any EPA inspector who currently uses a checklist other than the one included in this manual (e.g., a checklist developed by the Region in which the inspector operates) should compare such checklist with the attached checklist. If such a comparison shows that the other checklist is as comprehensive in scope as the attached one, the inspector is requested to provide a copy of the other checklist to EPA Headquarters for informational purposes. If the Region's checklist is less comprehensive than the attached, EPA recommends that the Region use the attached checklist and also send a copy of the other checklist to Headquarters.

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ACRONYMS

AHERA - Asbestos Hazard Emergency Response Act (Title II of TSCA)

ACBM - Asbestos Containing Building Material(s)

ACM - Asbestos Containing Material(s)

ACTS - Asbestos Contractor Tracking System

ASHAA - Asbestos School Hazard Abatement Act

ASHARA - Asbestos School Hazard Abatement Reauthorization Act of 1990

CC - Civil Complaint

CAA - Clean Air Act

CFR - Code of Federal Regulations

CDO - Case Development Officer

CMS - Compliance Monitoring Strategy

EPA - U.S. Environmental Protection Agency

ERP - Enforcement Response Policy

F - Friable

FIFRA - Federal Insecticide, Fungicide and Rodenticide Act

FTTS - FIFRA and TSCA Tracking System

FOIA - Freedom of Information Act

LEA - Local Education Agency

NAC - NESHAP Asbestos Coordinator

NAIS - Neutral Administrative Inspection Scheme

NARS - National Asbestos Registry System

NCSC - National Council of Senior Citizens

NDAAC - National Directory of AHERA Accreditation Courses

NESHAP - National Emission Standards for Hazardous Air Pollutants

ACRONYMS (Continued)

NF - Nonfriable

NON - Notice of Noncompliance

O&M - Operations and Maintenance

OCM - Office of Compliance Monitoring (EPA)

QED - Quality Education Directory

RAC - Regional Asbestos Coordinator

RACM - Regulated Asbestos-Containing Material

TSCA - Toxic Substances Control Act

USC - United States Code

WPR - Worker Protection Rule

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CHAPTER I. INTRODUCTION

This manual has been developed to assist compliance inspectors from the States and U.S. Environmental Protection Agency (EPA), including the National Council of Senior Citizens (NCSC), under contract with EPA, to conduct inspections under the Asbestos Hazard Emergency Response Act (AHERA) of 1986 (15 U.S.C. 2601) and the Asbestos-Containing Materials in Schools Rule, promulgated pursuant to AHERA. (Throughout the remainder of this manual, this rule is referred to as the AHERA Schools Rule.) The manual is composed of two major sections: general guidance information in Chapters I through IX; and appendices, including the Comprehensive AHERA Inspection Checklist (the Checklist) from which the guidance provided in the manual stems. The Checklist contains four sections pertaining to the Local Education Agency (LEA), the schools within the LEA (including a walk-through inspection of the schools), response actions, and exclusions (where claimed by the LEA). (See Appendix D for the Checklist.) The manual also contains tips on conducting inspection activities. The tips cover such topics as the opening conference, steps to be taken upon arrival at the school, conducting the walk-through, inspecting for compliance with response action requirements and the closing conference. (See Appendix E for Tips.) The combination of general guidance, tips, and the Checklist should be used by the inspector when conducting AHERA compliance inspections. (The inspector is urged to take the Checklist [as well as appropriate tips and guidance procedures] along with her/him on the inspection.)

The general guidance component of this manual contains eight chapters, following this introduction, pertaining to AHERA inspections:

- Chapter II - an overview of the AHERA Schools Rule;
- Chapter III - compliance and enforcement information;
- Chapter IV - identification of other types of asbestos-related inspections conducted by EPA;
- Chapter V - authority to conduct inspections and entry requirements;
- Chapter VI - purpose and summary of the contents of the Comprehensive AHERA Inspection Checklist;
- Chapter VII - preparing for the AHERA inspection;
- Chapter VIII - direction on how to use the Checklist during the inspection, including conducting the "walk-through" inspection of school buildings selected for an inspection; and

- Chapter IX - discussion of post-inspection activities, including writing the inspection report and performing necessary follow-up.

This manual was developed as a user-friendly aid to the inspector while conducting AHERA compliance inspections. Some of the helpful features of the manual are its three-ring binder format (which allows the Checklist to be taken to the inspection site and used during the inspection) and the fact that the manual may be easily updated, as necessary. If and when new or revised pages are developed, copies will be provided to inspectors for inclusion in the binder.

We do expect an expanded section on abatement inspections to be inserted into the manual prior to October 1, 1992. As part of the proposed FY 93 Memorandum of Agreements (MOAs) between Headquarters and the Regions, we expect FY 93 AHERA inspection priorities to focus on response to tips and complaints for in-progress abatement activities greater than the National Emission Standards for Hazardous Air Pollutants (NESHAP) 160\260, threshold with emphasis on large school districts. A section providing more detailed explanation of this priority and inspection guidance on these activities will be provided for this manual by the end of FY 92.

Because this manual contains frequent references to specific provisions of the AHERA Schools Rule, in both the general guidance component (i.e., Chapters I through IX) and the Checklist, the relevant regulatory citation has been provided in each instance. To assist the inspector in obtaining the precise language from the AHERA Schools Rule, a copy of the rule is included as an appendix to the manual (see Appendix F). Any regulatory citations contained in this manual are to the AHERA Schools Rule, unless otherwise noted.

The inspector should keep in mind that this manual is not intended as a training manual for AHERA inspectors. It was developed as a guidance manual for carrying out inspections.

An inspector may choose to conduct an inspection using the Checklist or may instead decide to conduct a more focused inspection (for example, an inspection of response actions only), utilizing only relevant components of the Checklist, as described in Chapter IV, A, 3. Whichever choice is made, the EPA inspector is encouraged to use the Checklist provided in this manual when conducting AHERA compliance inspections to ensure consistency from Region to Region.

CHAPTER II. AHERA: AN OVERVIEW

On October 22, 1986, President Reagan signed into law the Asbestos Hazard Emergency Response Act (AHERA), which became Title II of the Toxic Substances Control Act (TSCA). AHERA required EPA to develop regulations that established a comprehensive framework for addressing asbestos problems in public and nonprofit private elementary and secondary school buildings. On October 30, 1987, EPA published the *Asbestos-Containing Materials in Schools Rule* (the "AHERA Schools Rule," 40 CFR Part 763, Subpart E), which became effective on December 14, 1987.

In general, the AHERA Schools Rule requires that Local Education Agencies (LEAs) fulfill many responsibilities, including designating a person (Designated Person) to ensure that the requirements of the AHERA Schools Rule are properly implemented [§763.84(g)]; conducting inspections for friable and nonfriable asbestos in each school building that the LEA leases, owns, or otherwise uses as a school building [§763.85(a)]; developing management plans for each school and submitting all the plans to the governor of the State in which the LEA is located [§763.93]; and selecting and implementing response actions in a timely manner [§763.90]. The LEA must ensure that such activities are carried out in accordance with the provisions of the AHERA Schools Rule [§763.84(a)]. The LEA also must ensure that any person who performs inspections, develops management plans, or designs or conducts response actions must be accredited [§763.84].

Accreditation is the training required to perform any of the above-described activities under AHERA. The EPA Model Contractor Accreditation Plan (40 CFR 763, Appendix C to Subpart E), published in the *Federal Register* on April 30, 1987, developed pursuant to AHERA, specifies the training requirements for each activity for which an individual must be accredited. To become accredited in a particular discipline (i.e., inspector, management planner, contractor/supervisor, project designer, worker), an individual must take a course and pass an examination, offered by either an EPA-approved training provider or by a State that has adopted a contractor accreditation plan at least as stringent as the Model Plan, or a course approved by such a State.

The LEA has other duties, including:

- Ensuring that the activities of any person who inspects, reinspects, conducts periodic surveillance, develops and updates management plans, and/or develops and implements response actions are conducted in accordance with the AHERA Schools Rule [§763.84(a)].
- Ensuring that short-term workers (e.g., telephone repair workers, utility workers, or exterminators) who may come in contact with asbestos in a school are provided with information regarding the location of known and suspected asbestos containing building material (ACBM) assumed to be asbestos containing material (ACM) [§763.84(d)].
- Conducting reinspections, at least once every 3 years after the management plan is in effect, in each school building that contains known or assumed friable or nonfriable ACBM [§763.85(b)].
- Providing required training to maintenance and custodial staff (i.e., 2 hours of training for those staff members who may work in a building that contains ACBM and an additional 14 hours of training for those who conduct activities that will result in the disturbance of ACBM) [§763.92(a)].
- Conducting periodic surveillance, at least once every 6 months after a management plan is in effect, in each school building that contains ACBM or is assumed to contain ACBM [§763.92(b)].
- Updating the management plan to keep it current with ongoing operations and maintenance, periodic surveillance, inspection, reinspections, and response actions [§763.93(d)].
- Keeping a copy of the complete and updated management plan in the LEA administrative office, upon submission of such plan to the governor; ensuring that such plan is available for inspection, without cost or restriction, by EPA, the State, and the public, including parents, teachers, other school personnel, and their representatives [§763.93(g)(1)]. The individual schools within the LEA should likewise maintain a copy of the complete, updated management plan for that school in their administrative office [§763.93(g)(3)].
- Notifying, in writing, parent, teacher, and employee organizations of the availability of the management plan upon submission of the management plan to the governor and at least once per school year thereafter. The management plan must include a description of steps taken to provide such notification, as well as a dated copy of the notification [§763.93(g)(4)].
- Maintaining proper records on specified activities such as preventive measures and response actions, training of maintenance and custodial staff, periodic surveillance, cleaning, operations and maintenance, major asbestos activities, and fiber release episodes [§763.94] (these records must be maintained in a centralized location of the administrative offices of both the schools and the LEA).
- Ensuring that workers, building occupants, or their legal guardians are informed at least once per school year of inspections, response actions, and post-response action activities, including periodic surveillance and reinspections, that are planned or in progress [§763.84(c)] and that a

description of steps taken to provide such notification are included in the management plan [§763.93(e)(10)].

Provisions of the AHERA Schools Rule apply to individuals other than the LEA (called "other persons" for compliance and enforcement purposes). These "other persons" include contractors who perform inspections and/or reinspections, prepare management plans, and design and/or conduct response actions, agencies that collect bulk and/or air samples, and laboratories that analyze the samples. For example, §763.85(a)(4)(iv) requires the person who inspects for asbestos to collect and submit for analysis bulk samples for all homogeneous areas of ACBM not assumed to contain ACM.

For information on which provision(s) of the AHERA Schools Rules is enforceable criminally or civilly against the LEA, "other persons," or both, how civil penalty amounts are determined, and what factors are weighed in making penalty determinations, see Chapter III, Compliance and Enforcement. Refer to the Enforcement Response Policy (ERP) (January 31, 1989), listed in Appendix J, No. 5, for additional information.

CHAPTER III. COMPLIANCE AND ENFORCEMENT

The Toxic Substances Control Act (TSCA) §207(a) and §16 are the enforcement and penalty provisions that apply to LEAs and "other persons," respectively. TSCA §16 states that it is unlawful for a person to violate the provisions of AHERA or the AHERA Schools Rule. TSCA §207(a) states that it is unlawful for a LEA to engage in or fail to engage in certain actions specified in this section of AHERA (see discussion below on LEAs). Generally, fines of up to \$5,000 per day per violation can be assessed against LEAs and up to \$25,000 per day per violation against other persons. However, under the Asbestos School Hazard Abatement Reauthorization Act of 1990 (ASHARA), AHERA was amended to authorize penalties of \$5,000 per day per violation for certain acts involving the failure of a contractor and his/her employees to obtain proper accreditation. It is the responsibility of the AHERA compliance inspector to document potential violations of AHERA and/or the AHERA Schools Rule during inspections. Such documentation of potential violations by the inspector is the basis on which subsequent enforcement decisions are made.

The violations of AHERA for which LEAs and other persons may be assessed civil penalties are substantially different. Therefore, the remainder of this chapter will separately address LEA and other person compliance requirements. Each section contains a discussion of the requirements and identifies the pertinent regulatory provisions.

A. LOCAL EDUCATION AGENCIES

A LEA is whatever is defined as such by Section 198 of the Elementary and Secondary Education Act of 1965 (i.e., the definition of a public school is essentially determined by State law); the owner of any nonpublic, nonprofit elementary or secondary school building; and the governing authority of schools operated under the Defense Department's education system provided under the Defense Dependent's Education Act of 1978. Under TSCA §207(a), LEAs may be assessed civil penalties for any and/or all of the following violations:

- ***Failure to Conduct an Inspection*** [§207(a)(1)]

Failure to conduct an inspection in compliance with provisions of AHERA. This encompasses those activities necessary to identify the condition of ACBM in the school building. Inspection requirements include using accredited personnel and laboratories and following assessment and bulk sampling analysis requirements.

- ***Submission of False Inspection Information*** [§207(a)(2)]

Submitting false information to the governor of the State is a violation of AHERA. This may include falsified laboratory reports and false representation of inspector or laboratory accreditation.

- ***Failure to Develop or Submit a Valid Management Plan*** [§207(a)(3)]

Violations of AHERA regarding the development of management plans for submission to the State governor include using an unaccredited person to prepare the management plan, developing a management plan that omits any of the required elements, failing to submit the management plan to the State, failing to notify the public of the availability of the management plan, and failing to make the management plan available to the public without cost or restriction. (Note: AHERA requires that the management plan be submitted to the State governor for review, and that the governor, if s/he intends to disapprove of the management plan, has 90 days to do so. However, LEAs may still be liable for failure to develop or submit the management plan even if the LEA's management plan was not disapproved by the State.)

- ***Performance of Any Activity Prohibited by Section 215 of AHERA as Amended*** [§207(a)(4)]

The amendment prohibits renovations or removal of any building material, with the exception of emergency repairs, in any school whose MP has not completed the AHERA State review process unless (1) the school is working under a grant from EPA's Asbestos School Hazard Abatement Act (ASHAA) program, or (2) an inspection in compliance with LEA response actions and AHERA requirements has been completed. Additionally, the amendment prohibits the performance of operations and maintenance activity(ies) unless conducted pursuant to AHERA Sections 40 CFR §§763.91 and 92(a)(2). These provisions concern operations and maintenance requirements and the required 2 and 14 hour training of maintenance and custodial workers (40 CFR 763.91 (a)(1) and (2), respectively) who conduct activities that will result in the disturbance of ACBM.

- ***Submission of False Information Regarding the Deferral Request*** [§207(a)(5)]

False statements knowingly submitted to the State with a deferral request include:

(1) Submission of a false statement that the LEA has notified the parent, teacher, and employee organizations of the LEA's intent to request the deferral; and

(2) Submission of a false statement concerning the holding of the required public meeting of the public school board to discuss the deferral request.

B. OTHER PERSONS

"Other Persons" include persons who inspect LEAs for ACBM, prepare management plans, and design and/or conduct response actions at LEAs; laboratories that analyze samples collected under AHERA; and those who contract with a LEA to perform any other AHERA-related function.

Under TSCA §16 it is unlawful for any person to "fail or refuse to comply with any requirement of Title II [AHERA] or any rule promulgated or order issued under Title II." Persons who violate this provision are liable for penalties of up to \$25,000 per day per violation and, under ASHARA, \$5,000 per day per violation for certain acts concerning failure of a contractor to be accredited or to use accredited employees. TSCA §16 states that any person who knowingly or willfully violates any part or order issued under Title II of TSCA may "in addition to or in lieu of any civil penalty which may be imposed ... be subject, upon conviction, to a fine of not more than \$25,000 for each day of violation, or to imprisonment for not more than one year, or both."

Major areas of potential violation(s) by other persons include, but are not limited to, the following:

- Inspections and reinspections [§763.85]
- Bulk Sampling [§763.86]
- Analysis [§763.87]
- Assessment [§763.88]
- Response Actions [§763.90]
- Air Sampling [§763.90]
- Management Plans [§763.93]
- Recordkeeping [§763.94]
- Exclusions [§763.99]

The above potential violations may be determined by the inspector's ascertaining whether or not the regulatory requirements of each section have been met. Guidance on making such a determination is provided in Chapter VIII (Conducting the AHERA Inspection).

C. ENFORCEMENT

AHERA provides several enforcement mechanisms that may be used against LEAs and other person(s) for violations of the AHERA Schools Rule. With respect to LEAs, EPA may use such mechanisms as

civil and criminal penalties, injunctions (under TSCA §208), and actions to compel compliance (TSCA §17). EPA may also use Notices of Noncompliance (NONs) and press releases to encourage compliance.

Notices of Noncompliance are issued to LEAs for all violations of the AHERA Schools Rule that are not responded to by other enforcement mechanisms. NONs are most often used against LEAs, rather than against other persons. Press releases are used to notify the public of a LEA or other person violation of the AHERA Schools Rule. Inspectors should consult the Enforcement Response Policy (ERP) for AHERA for a detailed discussion of the enforcement mechanisms (see Appendix J, No. 5).

CHAPTER IV. COORDINATION OF ASBESTOS RELATED INSPECTIONS

Inspections are the method by which EPA determines compliance with statutes administered by the Agency, and the regulations promulgated pursuant to such statutes. EPA conducts four types of asbestos-related inspections: AHERA inspections and inspections conducted pursuant to the Asbestos School Hazard Abatement Act (ASHAA [20 U.S.C. 4011]), the EPA Worker Protection Rule (WPR [40 CFR 763, Subpart G]), and the National Emission Standards for Hazardous Air Pollutants (NESHAPs [40 CFR Part 61, Subpart M]) for asbestos (i.e., asbestos NESHAP).

In an effort to implement coordinated asbestos programs under TSCA and the Clean Air Act (CAA) (under which NESHAPs was promulgated), EPA and State AHERA inspectors should evaluate compliance with certain requirements under NESHAP and the WPR, in addition to AHERA. To support the integration of these programs, this manual includes abbreviated referral forms for AHERA and NESHAP inspectors so that each of these two inspectors may refer general information pertaining to compliance with the laws administered by the other to the relevant program offices for follow-up (see Appendices G and H).

Each of the aforementioned inspections is discussed below. The AHERA inspection is addressed first and includes guidance on how EPA determines which LEAs and school buildings to inspect, as well as information pertaining to the scope of the inspection. Following this is a summary of the requirements of the Worker Protection Rule, ASHAA, and NESHAP, under which the other asbestos-related inspections are conducted.

A. AHERA

In general, EPA Regions use two methods in selecting which LEAs to inspect under AHERA. They are "for cause" and the "Neutral Administrative Inspection Scheme" (NAIS), each of which is discussed below.

1. "For Cause" Inspections

"For Cause" inspections are initiated as a result of a potential problem with a LEA or another person that has been brought to the attention of EPA (Region or Headquarters) or a LEA. Such problems may be in the form of tips or complaints (for example, about a response action at a particular school). Tips and

complaints, or referrals, may be raised by LEAs, school employees, parent/teacher groups, the general public, a State official, or others.

2. Neutral Administrative Inspection Scheme

NAIS-based inspections are initiated by EPA and States to determine compliance with AHERA by LEAs and other persons. Such inspections are not based on the "for cause" determinant. Rather, Regions and States conduct NAIS inspections based on neutral determination factors, such as the size of a LEA, whether the LEA is public or private, NONs issued to LEAs for violations discovered during previous inspections, etc. Regions and States typically choose from a geographic mixture of small, medium, and large public and private LEAs. They should inspect at least one LEA that has had other persons perform AHERA-related activities, one that has received a NON for a violation(s) previously discovered, and others as resources allow. Inspectors may refer to the Compliance Monitoring Strategy (CMS), Appendix J, No. 3.

3. Scope of AHERA Inspection

The AHERA Schools Rule is a complex regulation that imposes many requirements on LEAs (and other persons). To facilitate the job of the AHERA inspector in conducting an inspection under this Rule, EPA developed the Comprehensive AHERA Inspection Checklist (see Chapters VI and VIII for discussions on the content and use of the Checklist, respectively). The Checklist may be used to conduct either an inspection using all sections of the Checklist, or a "focused" inspection (using one or more sections of the Checklist: for example, the response action section). This flexibility allows Regions and States more latitude in determining how best to conduct an inspection, taking into consideration such factors as time and resources.

Each Region determines which LEAs to inspect, the scope of the inspections, and how many schools to inspect within a LEA. Generally, if the inspector intends to use the entire Checklist, s/he should inspect at least three schools within a LEA, with the total number of schools inspected not to exceed 10 percent of the total within the LEA (i.e., in a LEA with 84 schools, no more than 8 schools would be inspected). For a "focused" inspection, in which one or more sections of the checklist are used, the inspector should conduct an inspection of at least one school in a LEA (for example, the one that is the subject of a tip or complaint), but may inspect more. Circumstances that may influence how many schools to inspect include whether the LEA or other persons who have performed work in the LEA have a history of

violations, the receipt of a tip or complaint about a school or LEA, and whether a LEA has an exemplary record of compliance.

B. ASBESTOS SCHOOL HAZARD ABATEMENT ACT

Under the ASHAA program, EPA provides financial assistance to public and nonprofit private LEAs for use in performing asbestos abatement activities under AHERA. The ASHAA loan and grant program administered by EPA provides financial assistance only to school buildings with serious asbestos problems and with demonstrated financial need.

ASHAA awards may be made only to LEAs that have used accredited asbestos professionals to perform the activities required under AHERA. Therefore, to qualify for an ASHAA award, the LEA must use accredited asbestos inspectors, management planners, project designers, abatement contractors/supervisors, and workers. This requirement applies to planned projects, as well as to any completed projects, for which a LEA may seek reimbursement from EPA. To determine compliance, EPA plans to inspect ASHAA-funded abatement sites.

C. EPA WORKER PROTECTION RULE

The EPA Worker Protection Rule (WPR) was published in the July 12, 1985, *Federal Register* (revised in the February 25, 1987, *Federal Register*). The WPR extended the provisions of the Occupational Health and Safety Administration's (OSHA) asbestos workplace standards to State and local government employees engaged in asbestos abatement work who are not specifically covered by OSHA. The WPR essentially duplicates the OSHA requirements with two additions: a notification requirement for emergency projects and projects involving more than 3 linear or square feet of friable Asbestos Containing Material (ACM), and retention of EPA's definition of asbestos to include nonasbestiform fibers. (See Appendix J, No. 8, for the WPR.) EPA conducts inspections pursuant to this rule. Such inspections are not covered in this manual.

D. ASBESTOS NESHAP

EPA promulgated the asbestos NESHAP (40 CFR 61, Subpart M) under Section 112 of the CAA, which requires EPA to promulgate regulations establishing emissions standards for hazardous air pollutants. The asbestos NESHAP is intended to protect the public from exposure to asbestos in ambient air. The asbestos NESHAP applies to all demolition operations regardless of the amount of regulated asbestos-

containing materials (RACM) at the facility. The asbestos NESHAP also applies to renovation activities where greater than 260 linear, 160 square, or 35 cubic feet of RACM is to be stripped or removed from the facility. In such situations, under the asbestos NESHAP, the contractor or building owner must provide written notice to EPA of intent to renovate or demolish such a building. While NESHAP and AHERA inspections are performed by separate program offices, both NESHAP and AHERA inspectors should be cognizant of the requirements of both laws and should share information gathered during inspections. Therefore, during an AHERA inspection, the AHERA inspector should complete the Abbreviated NESHAP Compliance Referral Form (Appendix G) and likewise, during a NESHAP inspection, the NESHAP inspector should complete the Abbreviated AHERA Compliance Referral Form (Appendix H).

CHAPTER V. AUTHORITY TO CONDUCT INSPECTIONS AND ENTRY REQUIREMENTS

This chapter provides information on EPA's statutory authority, under TSCA Section 11, to conduct AHERA inspections. The chapter includes discussion of legal requirements (e.g., credentials, notice of inspection) and guidance on entry procedures for the inspector upon arrival at the LEA.

A. INSPECTION AUTHORITY: TSCA SECTION 11

To conduct an AHERA inspection, the inspector must ensure that the requirements of TSCA Section 11, which govern inspection authority (and subpoenas), are met. After such statutory requirements have been satisfied, the inspector and his/her supervisor may use their discretion to schedule the inspection date and time, based upon factors pertaining to the particular LEA selected for inspection, such as the availability of the Designated Person and other LEA personnel, as well as the human and monetary resources of the Region. The requirements of Section 11, which include the presentation of credentials authorizing an individual to conduct an inspection, and presentation of a written notice of inspection, are discussed below.

1. TSCA Section 11: Inspections and Subpoenas

To enter a LEA to conduct an inspection, the person intending to conduct the inspection must have statutory authority to inspect such a facility. Statutory authority stems from Section 11 of TSCA, which specifies:

- Who may conduct an inspection ("the Administrator, and any duly designated representative of the Administrator...").
- Which facilities may be inspected ("any establishment, facility, or other premises in which chemical substances or mixtures are manufactured, processed, stored, or held before or after their distribution in commerce..."). The inspector may also inspect "any conveyance being used to transport chemical substances, mixtures, or such articles in connection with distribution in commerce."

An inspection under TSCA may be conducted only after the inspector has presented to the owner, operator, or agent-in-charge:

- The appropriate credentials (discussed below),

- A written notice (of inspection) (discussed below).

A separate inspection notice must be presented for each inspection, but separate notice is not required for each entry made during the period covered by the inspection.

Under Section 11, an inspection must be:

- Commenced and completed with reasonable promptness
- Conducted at reasonable times, within reasonable limits and in a reasonable manner.

EPA recommends that if the AHERA compliance inspector cannot complete an inspection before the LEA's normal close of business, the inspection should be continued on the following business day, unless LEA officials do not object to the inspector working past normal working hours.

The scope of an inspection may include "records, files, papers, processes, controls, and facilities...." Some of the records that the inspector may want to review are discussed in Chapter VII, B, 5, pertaining to notifying the LEA in advance of an inspection about such topics as the purpose of the inspection and records that the LEA must make accessible for review. However, unless described with reasonable specificity in the required written notice of the inspection (see 4, below, on Written Notice of Inspection), Section 11 prohibits the inspection of:

- Financial data
- Sales data (other than shipment data)
- Pricing data
- Personnel data
- Research data (other than data required under TSCA or a rule promulgated under TSCA).

2. Subpoenas

EPA may require the attendance and testimony of witnesses, and/or the production of documents relating to AHERA enforcement, when necessary. The AHERA inspector should consult with his/her supervisor and regional counsel for guidance pertaining to subpoenas (i.e., when to obtain one and how).

3. Credentials

Section 11 of TSCA requires that the EPA Administrator or any "duly designated representative of the Administrator..." who intends to inspect a facility subject to TSCA present "appropriate credentials" to the owner, operator, or agent-in-charge. Therefore, the inspector should, upon arrival at the LEA to be inspected, introduce him/herself as an EPA (or State) inspector and present the credentials before initiating the inspection. Typically, the credentials will be presented to either the Designated Person or the District Superintendent. A State inspector inspecting under a cooperative agreement should state that he/she is an official representative of the EPA and present the required credentials.

Credentials must be presented whether or not identification is requested by facility officials. Appropriate credentials indicate that the holder is a lawful representative of the EPA Administrator and is authorized to conduct inspections under TSCA. The inspector should allow time for the LEA official to examine the credentials to verify that the inspector is a representative of the EPA and has the authority to perform the inspection under AHERA. Credentials should be available at all times and may not be photocopied. The inspector should make a note in his/her field logbook and/or checklist of the fact that credentials were presented, the date and time of presentation, and the name of the LEA representative to whom they were presented.

4. Written Notice of Inspection

Section 11 requires that the inspector present a written notice of inspection (see Appendix A, Notice of Inspection) to the owner, operator, or agent-in-charge (e.g., the Designated Person). The notice must be dated and include the time of inspection, as proof that the inspection was scheduled to occur at a reasonable time, as required by Section 11 of TSCA. Generally, the notice is presented during the opening conference (discussed below, Chapter VIII, A), typically held at the LEA administrative office. However, the inspector may choose to present the notice prior to the opening conference. The inspector should present the notice at the LEA site, not at the individual school buildings within the LEA. However, the inspector may also present the notice to the person(s) in charge of the school building (e.g., the principal or assistance principal). The notice must be signed and dated by the inspector (this should be done in the presence of a LEA official, such as the Designated Person).

If records ordinarily exempted from inspection under TSCA Section 11 (e.g., financial, sales, pricing, personnel, or research data) are to be inspected, they must be specifically listed on the notice. The

inspector should also verbally inform the LEA Designated Person (or other person in charge) that such records will be inspected.

The inspector should request the LEA representative to whom the notice is presented to sign and date the notice as proof of receipt. Also, the inspector should make copies of the signed notice for the LEA and for him/herself for the EPA files. The inspector should keep the original.

Finally, the inspector should keep in mind that this requirement for a written notice (under Section 11 of TSCA) is separate from the requirement that schools be given 5 days advance notification in order to provide access to the management plans, required under Section 763.93(g)(3) of the AHERA Schools Rule (see Chapter VII). It is also recommended that the compliance inspector should generally provide 5 days notice of the intent to conduct a compliance inspection but that the inspector should refer to her/his particular Region's operating procedures for specific guidance on how much notice to provide.

B. ENTRY

It is EPA's policy that inspections may occur only with the consent of a representative (e.g., the Designated Person) of the facility (e.g., LEA) to be inspected. Consent must be given voluntarily (i.e., it may not be coerced or obtained through threats by the inspector of potential punitive measures for failing to grant consent). The fact that the inspector is allowed to enter the LEA generally constitutes consent. Express consent is not necessary. If entry is denied, the inspector may tactfully attempt to determine the reasons for denial. If entry is still denied, the inspector should depart from the LEA premises and consult with his/her supervisor and Region counsel concerning the advisability and procedures for obtaining a warrant for inspecting the LEA. Whenever entry is denied, the inspector should make note of the denial and circumstances surrounding the denial in the field logbook, if any is maintained.

If the inspector is allowed to enter the LEA, and/or the school buildings within the LEA, to conduct the inspection but is then asked to leave, or is not allowed to enter any part of the school building, consent no longer exists. The inspector should leave the premises under such circumstances and consult with his/her supervisor.

Uncredentialed Persons Accompanying an Inspector

The consent of the LEA representative must be obtained for the entry of persons accompanying an inspector to an inspection site, if such persons do not have EPA credentials. If consent is not given voluntarily, these persons may not enter the premises.

TIPS GOVERNING INSPECTOR'S ARRIVAL AT LEA

The following is a list of tips concerning the inspector's arrival at the LEA to conduct an inspection:

- The inspector should inspect the facility during normal working hours, unless the LEA agrees to off-business hour inspections or an emergency situation requires an inspection at such other hours;
- The inspector should arrive at the facility at the scheduled time;
- The inspector should keep in mind that it is EPA's policy that the inspection be conducted only with the consent of the LEA, or by procuring a warrant (see above, on Entry);
- The inspector should enter the facility through the main entrance, unless the LEA has designated a different entrance;
- The inspector may, if requested, sign a visitor's log or register. However, the inspector must not sign any such sheet or other document if it contains restrictive language limiting the scope of the inspection or the manner in which the inspection may be conducted (for example, a waiver, releases of liability, or restrictions on the use of photographic or other recording devices);
- The inspector should present his/her credentials, upon arrival, to the "owner, operator, or agent in charge" of the LEA. It is likely that such an individual may be the Designated Person or the District Superintendent; and
- Inspector credentials should be kept available at all times throughout the inspection. The inspector should keep in mind that business cards do not constitute credentials (but may be used for introductory purposes).

CHAPTER VI. COMPREHENSIVE AHERA INSPECTION CHECKLIST

A. WHAT IS IT?

The Comprehensive AHERA Inspection Checklist (which contains four sections, described in section C below) asks for data pertaining to all aspects of the AHERA inspection, including the Designated Person interview (during the opening conference) concerning the LEA (e.g., number of school buildings, students, and employees in the LEA); the detailed review of a representative management plan at the LEA administrative office (and the review of the other management plans to verify that required data have been included); examination of management plans at school buildings selected for inspection; inspection (i.e., walk-through) of such school buildings, using the AHERA Walk-Through Inspection Form (see Appendix D); inspection of school (and "other persons") compliance with the response action provision of the AHERA Schools Rule; determination of compliance with AHERA exclusion provisions; and the closing conference.

Appended to this manual, to be used along with the comprehensive Checklist, are two forms: the National Emission Standards for Hazardous Air Pollutants (NESHAP) Abbreviated Compliance Referral Form and the AHERA Abbreviated Compliance Referral Form (see Appendices G and H, respectively). The first form is for use by AHERA inspectors; the second for use by NESHAP inspectors (see section D below for details on the purpose and use of these forms).

The following discussion describes the purpose of the comprehensive Checklist and then summarizes each of its sections. For guidance on how to use the Checklist, the inspector should refer to Chapter VIII, which contains details on completing each section of the Checklist.

B. PURPOSE

The purpose of the Comprehensive AHERA Inspection Checklist is to guide the AHERA inspector through the often lengthy and complex inspection process in order to ensure that all information necessary to determine compliance with the enforceable provisions of the AHERA Schools Rule is obtained during the inspection, rather than during follow-up. An AHERA inspection requires that an inspector ensure compliance with the AHERA Schools Rule by the LEA and many "other persons," such as the inspector, management planner, project designer, agencies that collect bulk and air samples, and laboratory(ies) that analyze such samples. Conducting an AHERA compliance inspection is complicated not only because

of the number of individuals who must comply with various provisions of the AHERA Schools Rule, but also because of the number of requirements that must be met, including those pertaining to inspections and the inspection report, development of the management plan, response actions, and recordkeeping.

Without a comprehensive Checklist, it is more likely that important questions relating to LEA (and "other person") compliance with AHERA may be overlooked, resulting in, at best, the inspector having to spend more time following the inspection collecting necessary information. Therefore, the Checklist was developed to assist the inspector in addressing all the components of the AHERA Schools Rule. Of course, there will likely be some unavoidable follow-up activities to complete the inspection process (see Chapter IX, A, Follow-up).

C. SUMMARY OF CHECKLIST SECTIONS

The Comprehensive AHERA Inspection Checklist provides detailed guidance to the AHERA inspector on what to look for (and ask for) during an AHERA inspection. All key enforceable provisions of the AHERA Schools Rules are covered by the Checklist. The Checklist contains four sections pertaining to:

- Inspecting the management plan at the LEA administrative office;
- Inspecting school management plans at school buildings (this management plan review takes place in the school administrative office). This section of the Checklist will also require a walk-through inspection of selected schools within the LEA;
- Determining compliance with AHERA response action provisions; and
- Determining compliance with AHERA exclusion provisions.

The contents of each of the four sections of the Checklist are summarized below.

1. Inspecting Management Plan at the LEA Administrative Office

This summary pertains to the LEA section of the Checklist (Appendix D, pages 1-5), which asks for information that may be obtained from a detailed review of a representative management plan at the LEA administrative office (as well as a review of the other management plans at the LEA), examination of Region files, and the opening conference. (See Chapter VIII, B, for guidance on using this section of the Checklist.) After obtaining background data from regional files (e.g., whether there were any

citations previously issued to the LEA), and completing the relevant portion of this section of the Checklist, the inspector will complete the remainder of the LEA portion of the Checklist at the LEA administrative office. The inspector should keep in mind that, on occasion, a LEA may hire more than one management planner. In such cases, the inspector should conduct a detailed review of a representative management plan from each management planner. Also, the inspector should review the other management plans from each management planner to verify that data required to be included in the plan are included. Therefore, the inspector must make a sufficient number of copies of this section of the Checklist so that s/he can complete one copy for each management planner.

The following information should be obtained at the LEA and be used to complete the LEA section of the Checklist:

- Data on the LEA generally, as obtained from the Designated Person during the opening conference conducted at the LEA administrative office. Such information will include the number of school buildings, students, and employees within the LEA, and more (see Chapter VII, B, Entry and Opening Conference);
- Date and docket number of inspection, compliance inspector's identification number and signature, schools selected for inspection, reason for inspection (for cause or random/neutral selection: see Chapter IV, Section B), opening and closing conference participants;
- Whether general LEA responsibilities under AHERA have been met;
- Information on the management planner, including name, address, and accreditation number, and the date the management plan was prepared;
- Whether the AHERA-required components are included within the management plans for the particular LEA. The inspector should keep in mind that, for the most part, management plans are generic in format. Therefore, the inspector may review a single management plan at the LEA administrative office to determine whether the management planner adequately documented the information required by §763.93 of the AHERA Schools Rule to be included in management plans; and
- Data concerning the closing conference (since both the opening and closing conferences typically take place at the LEA office, both conferences are included in the LEA section of the Checklist).

2. Inspecting School Management Plans at School Buildings

This summary pertains to the school section of the Checklist (Appendix D, pages 6-12) which is intended for completion at the school(s) selected for inspection at the LEA. (See Chapter VIII, C, for guidance

on using this section of the Checklist.) The inspector will need to complete *one* copy of the school section of the Checklist for *each* school inspected. (For example, if three schools are selected for inspection, three copies of the school section of the Checklist must be completed, one for each school). Therefore, the inspector should make a sufficient number of copies of this section before the inspection.

Completing the school section of the Checklist is much like completing the LEA section. The inspector must review the individual management plan (i.e., the one pertaining to the school being inspected) at the school administrative office and ask questions of knowledgeable LEA and/or school staff. The school section of the Checklist contains one unique element: the requirement for a walk-through inspection of each school selected for inspection in the LEA. To complete this section, the inspector should conduct a walk-through inspection of each selected school using the "AHERA Walk-Through Inspection Form," which is part of the Checklist (see Appendix D, page 12). For a commentary on the purpose of the walk-through inspection and guidance on how to conduct this inspection, see Chapter VIII, C, 3.

In sum, the school section of the Checklist requires, for its completion, a combination of activities: a review of the relevant management plan, interview(s), and a walk-through inspection. This section of the Checklist contains general information on the particular school to be inspected, including the buildings within the school, the grade levels at the school, and construction dates of school building(s). Other data asked for in the school section include the following:

- Names and titles of LEA/school representatives who accompany the EPA inspector on the inspection;
- Name, accreditation number and State, and course provider for the person who conducted the LEA AHERA inspection (or reinspection, if this is the case) of the school, and the name and address of the inspector's employer;
- Whether the LEA AHERA inspector met the requirements under AHERA pertaining to the contents of the inspection (or reinspection) report, and the requirements concerning bulk sampling and assessment;
- Whether the laboratory that conducted bulk sample analysis in the school(s) met the accreditation requirements of the AHERA Schools Rule; and
- Whether regulatory requirements (required of the LEA) were met at the particular school being inspected: notification; training; periodic surveillance; warning labels; operations and maintenance; and recordkeeping.

3. Determining Compliance with AHERA Response Action Provisions

This summary pertains to the response action section of the Checklist (Appendix D, pages 13-15). This section of the Checklist may be completed by reviewing the management plan and associated records at the school where the response action is being or has been conducted and obtaining necessary documentation from contractors engaged by the LEA to design and conduct the response actions. (See Chapter VIII, D, for guidance on using this section of the Checklist.) The section need not be completed unless a response action has been conducted at the school being inspected. For the most part, this section of the Checklist entails determining compliance with provisions of §763.90 (response actions, including accreditation, visual inspection, and aggressive sampling requirements) and §763.91(c) (initial cleaning). The section should be completed once for each response action in each school inspected. (For example, if there are three school buildings in the school, with two response actions in each, the inspector should complete six copies of the response action section of the Checklist.) Therefore, the inspector should make as many copies of the response action section of the Checklist as are necessary, in advance of the inspection.

The response action section of the Checklist contains information pertaining to:

- The particular response action conducted within the school being inspected, including:
 - type of response action (e.g., encapsulation, enclosure, removal, O&M, repair);
 - location of response action in school;
 - type and amount of ACBM involved (e.g., surfacing/TSI/miscellaneous and square/linear feet);
 - start and completion dates of response action;
 - name of contractor conducting response action; and

The inspector should keep in mind that if school employees, as opposed to contractors, are conducting the response action, the inspector should determine compliance with the EPA WPR (40 CFR 763.120; see Chapter 4, C). The WPR inspection is conducted pursuant to separate EPA guidance and checklists. The inspector should speak to appropriate supervisors and program offices concerning WPR inspections.

- Whether LEA/school responsibilities concerning response actions have been met, including those pertaining to accreditation, initial cleaning, visual inspections, and more;

- Whether "other person" requirements have been met, including those pertaining to the abatement contractor, air monitoring contractor, and laboratory.

**4. Determining Compliance with AHERA Exclusion Provisions
(need only be completed if the LEA has claimed an exemption)**

This summary pertains to the exclusion section of the Checklist (Appendix D, pages 16-18). This section of the Checklist only needs to be completed when the LEA claims it meets exclusion requirements under §763.99 and may be completed by reviewing the management plan at the school being inspected. (See Chapter VIII, E, for guidance on how to use this section of the Checklist.) The inspector should complete *one* copy of the exclusion section of the checklist for *each* school inspected. (For example, if the inspector conducts three inspections, three copies of the exclusion section should be completed.) Therefore, the inspector should make a sufficient number of copies of this section before conducting the inspection.

The exclusion section of the Checklist asks for information concerning:

- The identification of friable ACM before December 14, 1987;
- The identification of nonfriable ACM before December 14, 1987;
- Whether a determination was made that no ACM was present prior to December 14, 1987;
- Whether a determination was made by a State lead agency, under a waiver, that no ACBM is present;
- Whether a determination made before December 14, 1987, that suspected ACBM is assumed ACM; _____
- The absence of ACBM in areas where asbestos removal operations were conducted prior to December 14, 1987; and
- The existence of a certification that no ACBM was specified as a building material for building constructed after October 12, 1988 [§763.99].

D. NESHAP AND AHERA REFERRAL FORMS

Two forms are appended to this manual: the Abbreviated NESHAP Compliance Referral Form and the Abbreviated AHERA Compliance Referral Form (see Appendices G and H). The NESHAP referral form is intended to be used by the AHERA inspector while conducting an AHERA inspection. The AHERA

inspector should make note on the form of any potential NESHAP violations (as determined by the questions on the form) and submit the form to his/her supervisor for referral to NESHAP enforcement staff. Likewise, the AHERA referral form is to be used by the NESHAP inspector while conducting a NESHAP inspection. If the NESHAP inspector discovers potential violations of AHERA during the course of the NESHAP inspection, the inspector should complete the form and submit a copy of the completed form to his/her supervisor for referral to appropriate AHERA enforcement personnel.

CHAPTER VII. PREPARING FOR THE AHERA INSPECTION

Prior to conducting an AHERA inspection, the inspector should ensure that s/he is well-prepared to visit the inspection site and is familiar with the compliance background and other details concerning the LEA, and school buildings within the LEA, to be inspected. The discussion that follows should assist the inspector in preparing for the inspection, as well as in actually conducting the AHERA inspection (and utilizing the Checklist).

This chapter addresses the following topics: the purpose of various pre-inspection activities that should be undertaken and guidance on performing those activities.

A. PURPOSE

The purpose of preparing for the AHERA inspection is to ensure that the AHERA inspector is able to conduct an efficient and thorough inspection and collects enough information to verify compliance with AHERA, including enough evidence of potential AHERA violations to assist Case Development Officers (CDOs) at EPA, or in the State, in the development of necessary enforcement actions. Preparation can be accomplished through the procedures discussed below.

The objectives of pre-inspection preparation are to:

- Become knowledgeable about the LEA to be inspected, including its AHERA compliance history and the characteristics of the LEA itself, such as size, physical layout, numbers and ages of school buildings, and numbers of employees and students, etc.
- Determine what documentation or other evidence should be collected during the inspection.
- Decide what the scope of the inspection will be (i.e., will it require the use of all sections of the Checklist, or will it encompass only one section of the Checklist, such as response actions), which should be decided by the inspector and his/her supervisor before the inspection begins. The scope may however, change, during the inspection. (For example, the inspector may decide, after consulting with regional management, to conduct an inspection using all sections of the checklist, rather than to conduct an inspection using one or two sections, based on the particular circumstances of the inspection).
- Decide how many school buildings will be inspected (see Chapter IV).

B. PRE-INSPECTION ACTIVITIES

Before traveling to the inspection site, the inspector should prepare for the inspection by taking the time to review records and other data already contained in the Region files pertaining to the LEA selected for inspection. The inspector should also take other preparatory steps prior to conducting the inspection, including meeting with the Regional AHERA Coordinator (RAC), coordinating inspection activities with other EPA program offices, and notifying the LEA. Each of these steps is discussed below.

1. Review EPA Records on LEA

Before reviewing EPA records on a particular LEA for compliance information and other data, the inspector should obtain general information on the LEA to be inspected for background purposes. A good source of these data is the Quality Education Data (QED) School Guide, copies of which should be available in EPA Region offices. The QED contains statistical information on public and private, non-profit LEAs by State, including LEA address, enrollment, number of school buildings, and names of personnel. (It should be noted that there may be additional buildings covered by AHERA that are not identified in the QED. Therefore, the inspector should ask the Designated Person for a list of all school buildings within the LEA. The inspector may want to attach this list to the Checklist.)

The inspector should also check the local telephone book for the area in which the LEA is located to obtain addresses of other buildings leased, owned, or otherwise used by the LEA as school buildings, including sports stadiums, outreach program centers, alternative education buildings, and churches.

After obtaining background information on the LEA, the inspector should conduct a thorough review of EPA files pertaining to the LEA. EPA records may contain information that is helpful to the inspector and Region management in making decisions regarding the scope of the inspection, what documentation should be collected at the LEA and school administrative offices, and which provisions of the AHERA Schools Rule may be problematic, from a compliance perspective, for the particular LEA. In addition to reviewing records at the Region (or State) office, the inspector may want to discuss the LEA to be inspected with other EPA (or State) personnel who have knowledge about the particular LEA, to obtain information that may not be available in EPA files. The inspector should review Region files for the following information on the LEA to be inspected:

- Data on 1982 Asbestos in Schools Rule compliance: the 1982 rule (40 CFR 763.100) required LEAs to identify friable ACM in school buildings, sample and analyze ACM, post notice of

results of inspection and analysis, provide warnings on associated health effects and instructions on avoiding exposure, and notify parent-teacher associations of inspection results.

- **Previous inspections and enforcement actions:** the inspector should make note of the dates of any previous AHERA and/or NESHAP inspections, whether any NONs or civil complaints were issued to the LEA and/or contractors engaged by the LEA to perform AHERA-related activities, whether any tips or complaints were received by EPA concerning the LEA or its contractors, and settlement conditions relating to the LEA and its AHERA activities.
- **Technical assistance:** examine any correspondence that may have been exchanged between EPA and the LEA, paying attention to potential AHERA compliance problems raised in the correspondence.
- **ASHAA:** check the records to see if the LEA is the recipient of ASHAA grants or loans, which would indicate that response actions have been or are being conducted at the LEA.
- **Asbestos notification, including NESHAP and WPR:** NESHAP requires the owner or operator of a facility that contains RACM (e.g., the LEA) to notify EPA prior to disturbing the ACM through demolition or renovation activities.
- **Referrals:** these may be from other Federal or State agencies and may concern AHERA, worker protection under either EPA's Worker Protection Rule [§763.120] or the Occupational Safety and Health Administration's (OSHA) construction industry asbestos standard (29 CFR 1926.58), or NESHAP. Such referrals may contain information helpful to the inspector in making decisions concerning the upcoming AHERA inspection of the particular LEA.
- **ACTS:** the Asbestos Contractor Tracking System (ACTS) maintains and tracks information concerning asbestos demolition and renovation contractors, notifications, and landfills receiving asbestos wastes under NESHAP. It is designed for use by State and local air pollution agencies and EPA Region officials.
- **FTTS:** the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) and TSCA Tracking System (FTTS) tracks enforcement cases and administrative actions under FIFRA and TSCA, including TSCA Title II-(AHERA), for all inspections and violations under these laws.
- **NARS:** the National Asbestos Registry System (NARS) stores compliance history pertaining to the owners and operators of demolition and/or renovation operations under the asbestos NESHAP (see Chapter IV, D, on NESHAP).

2. Meet with Regional Asbestos Coordinator

The inspector should meet with the RAC in the Region to discuss information obtained from the EPA files concerning the LEA to be inspected and to make decisions concerning the scope of the inspection. The RAC and the inspector should determine, in advance of the inspection, the scope of the inspection

(i.e., comprehensive or focused). Basically, it is left to the discretion of each Region to make this determination (see Chapter IV for more information).

3. Coordinate Activities with Other EPA/State Offices

To increase the efficacy of the AHERA inspection and to encourage the sharing of compliance and enforcement information among offices at EPA (and within the State where a particular LEA is located), the inspector should try to contact such offices in advance of each intended AHERA inspection so that various asbestos-related activities and inspections may be coordinated (e.g., NESHAP and AHERA). Therefore, prior to conducting the AHERA inspection, the inspector should notify such other offices (e.g., NESHAP) of the intended inspection, including the schedule for the inspection. When contacting NESHAP staff, the inspector should mention that any potential NESHAP violations discovered during the AHERA inspection will be referred to NESHAP, using the Abbreviated NESHAP Compliance Referral Form (see Appendix G). Conversely, when NESHAP inspectors conduct inspections under NESHAP, they should complete the Abbreviated AHERA Compliance Referral Form (see Appendix H).

4. Gather Necessary Equipment and Materials for Inspection

The inspector should gather any equipment necessary for the inspection. Some equipment, such as ladders, are probably available for use at the LEA. Therefore, the LEA representative should be requested in advance to have such equipment available (see below, 6, on Notifying the LEA in Advance of Inspection). Equipment that typically is taken by the inspector to the inspection site includes the following:

- Tape measures
- Flashlight
- Camera and film with flash attachment
- Video camera with light
- Clipboard
- Chalk board (to be used to note the location of suspected ACM identified during walk-through; see Chapter VIII, C, 5, on "Walk-Through") and
- Screwdrivers (standard and phillips).

The inspector may also take the following materials along during the inspection of the LEA:

- Photocopy of applicable pages of current QED;
- Photocopy of technical assistance file pertaining to the LEA to be inspected (see discussion above on EPA records review);
- Copy of NESHAP notification (if any submitted);
- Copy of consent agreement and inspection report pertaining to 1982 Schools Rule (see discussion above on EPA records review);
- Literature for LEA (e.g., copy of AHERA, NESHAP, EPA, and OSHA asbestos-related worker protection rules, other public information publications) (see Appendix J, Reference List for suggested literature); and
- Current list of accredited contractors and course providers.

5. Fill In LEA Background Data on Comprehensive Checklist

As background information is obtained from the QED, other program offices, and files, the inspector should begin filling in data on the LEA portion of the Checklist, pertaining to general background of the LEA. That is, information obtained during records review at the Region office, and data relating to the reason for the inspection, should be reflected in the appropriate places on the LEA section of the Checklist (e.g., pages 1 and 2, asking for LEA name and address, Superintendent's name, schools to be inspected within the LEA, telephone appointment data, and reason for inspection).

6. Notify the LEA in Advance of the Inspection

It is recommended that the compliance inspector notify the LEA of a planned inspection at least 5 working days prior to the date of inspection, requesting access to the LEA, schools within the LEA, management plans at the LEA (and school) administrative offices, and records pertaining to asbestos activities. However, the inspector should refer to regional procedures on standard operating procedures concerning how much notice is typically provided in the Region. With respect to requesting access to a school's management plans, the inspector is **required**, under the AHERA Schools Rule [§763.93(g)(3)], to provide 5 days advance notice to allow the school to make the management plan available for inspection.

If the compliance inspector decides, in accordance with the particular Region's policy, to provide advance notice of the inspection generally, the subject matter of this notice should include the items listed below. The notice may be made by telephone or in writing. If the initial notice is by telephone, the inspector should send the LEA a follow-up letter confirming the subject matter of the call, including the date and time of the scheduled inspection. The notice and the follow-up letter should address the following items:

- **The purpose of the inspection.**
- **The equipment needed during the inspection.**
- **Access to a copying machine and ladders.**
- **Confirmation of the availability of the Designated Person throughout the inspection. This is particularly critical since under the AHERA Schools Rule [§763.84] the Designated Person is the person who must ensure that all requirements of the rule are being met by the LEA. If the Designated Person cannot be available during the scheduled inspection, the AHERA inspector should consider rescheduling for a time when the Designated Person will be available; the LEA should be so notified of this fact.**
- **Discussion of the fact that the LEA must allow access to all parts of all school buildings and to all management plans and related records (including those identified below).**
- **A request for a list of all school buildings under the LEA's authority (the QED may not always be up to date).**
- **A request that a room or area of the administrative building or offices be set aside for the purposes of reviewing the management plans and for the opening and closing conference.**
- **A request that the school(s) selected within the LEA for inspection allow a member of the maintenance staff to accompany the inspector during the inspection. This request should make clear that the school is not *required* by AHERA to provide such a guide but that it could help to make the inspection process more efficient.**

Some of the records the inspector may want to review relating to AHERA, and which the advance notification should request be made available (if the LEA has any), include:

- **Correspondence among LEA, schools, States, abatement contractors, and EPA**
- **Building specifications**
- **Contractual statement(s) of work**
- **Management plans**

- Laboratory reports
- Logbooks pertaining to the 2 and 14 hour training requirements
- All notifications required under AHERA Schools Rule
- Accreditation certificates
- exclusion statements under Section 763.99 (if appropriate).
- Time sheets.

The inspector should keep in mind that the advance notice discussed above and required under Section 763.93(g)(3) is separate from, and in addition to, the requirement for written notice of inspection under Section 11 of TSCA (see Chapter V, A, 3).

CHAPTER VIII. CONDUCTING THE AHERA INSPECTION

This chapter provides guidance on conducting the AHERA inspection, from the opening conference (including the interview with the Designated Person and the detailed review of a representative management plan at the LEA [as well as the review of the other plans]), to reviewing management plans at selected school buildings, inspecting the school buildings themselves (i.e., conducting the walk-through), and the closing conference. (See Chapter IX for guidance on follow-up activities and writing the inspection report.)

Throughout this chapter, guidance is provided to the inspector on completing relevant portions of the Checklist (Appendix D). The inspector should refer, as necessary, to the Checklist while reading this chapter. In addition, the inspector should review Chapter VI, which summarizes the contents of the four basic sections of the Checklist (LEA, School, Response Action, and Exclusions sections).

A. OPENING CONFERENCE

Immediately upon arrival at the LEA Administrative Office, the inspector should conduct the opening conference. During the conference, the inspector should accomplish the following:

- Present credentials and the Notice of Inspection;
- State the reason for the inspection (this should be stated in general terms, avoiding any mention of potential violations, or penalties);
- Summarize the AHERA inspection process and schedule;
- Inform the participants that the inspector will need access to all management plans and records;
- Remind participants of the need for access to a copying machine and a room or area within the LEA administrative office (and school buildings) where the inspector can review management plans (see Chapter VII, on advance notification letter to LEA);
- Invite participants, and any other interested persons, to attend the closing conference (see Section F below), and provide the date and time of the conference;
- Briefly mention the purpose of the Receipt for Samples and Documents and the Summary of Observation forms and that the LEA will receive a copy of such forms (see discussion on closing conference for details on these forms; this chapter, F);
- Identify the school(s) to be inspected, and provide tentative date(s) and time(s) of inspection;

- Answer questions from, and present information to, participants concerning AHERA and the inspection (these schools may change once the inspector is at the LEA site; for example, if a response action has recently occurred, the inspector may wish to inspect that building); and
- Obtain general background information on the LEA by interviewing the Designated Person (see below). Make sure to add the data obtained from the Designated Person on the LEA section of the Checklist (pages 1-5) (see discussion below on interviewing the Designated Person).

TIPS FOR CONDUCTING OPENING CONFERENCE

The inspector should do the following during the opening conference:

- Try to establish a good rapport with LEA officials, especially the Designated Person.
- Be prepared to answer questions concerning AHERA, the AHERA Schools Rule, and inspection procedures, and to provide copies of the rule and other EPA guidance materials relating to AHERA upon request.
- Acknowledge, up front, that the inspection may cause some disruption to the daily routine at the LEA and its school buildings and that every attempt will be made to keep any disruptions to a minimum.
- Listen carefully to questions and concerns from LEA representatives about the inspection, and try to address them.
- Bear in mind that schools originally selected for inspection may change based upon information discovered at the LEA or the school within the LEA.
- Be aware that s/he may need to complete all four sections of the Checklist, which are:
 - inspecting the management plan at the LEA administrative office;
 - inspecting school management plans and school buildings (e.g., conducting the walk-through inspection of selected schools within the LEA);
 - determining compliance with AHERA response action provisions; and
 - determining compliance with AHERA exclusion provisions.

The inspector should explain to attendees that copies of documents (e.g., management plans [§763.93] and associated records [§763.94]) may need to be made during the inspection for use in the compliance inspection report. The inspector should inform attendees that s/he may take photographs during the course of the inspection.

The inspector should answer any questions that the conference attendees have and provide names and telephone numbers of other appropriate EPA personnel who can be contacted for additional information. The inspector should record the names and titles of all participants at the opening conference on the LEA section of the Checklist pertaining to the opening conference (Appendix D, pages 1-2).

Interviewing the Designated Person

During the opening conference, the inspector should obtain background information from the Designated Person concerning the LEA and its school buildings. The knowledge that the Designated Person has concerning AHERA-related activities in the school buildings may provide critical information on what records, management plans, and areas of school buildings should be inspected.

The inspector should ask the Designated Person for the information necessary to complete the LEA section of the Checklist preceding the opening conference questions (i.e., Appendix D, pages 1-2). These general background questions concern the number of schools within the LEA, number of students and employees, and more. The inspector should also continue to page 3 of the Checklist and ask the Designated Person the questions pertaining to general LEA regulatory requirements (e.g., whether the Designated Person received training pursuant to §763.84(g)(2), etc.).

B. INSPECTING MANAGEMENT PLAN AT LEA ADMINISTRATIVE OFFICE

After obtaining basic information on the LEA from the Designated Person, the inspector should review one management plan while at the LEA administrative office. Ensure that all records required to be kept by the LEA (i.e., those required under §763.93 and related records required under §763.94) are made available for review while the inspector is at the LEA office (some records may not actually be kept with the management plan). Request that the LEA representative obtain these records from the secretary or other appropriate person. School management plans are, for the most part, fairly generic in format. Therefore, it is recommended that the inspector review one plan in detail from those maintained at the LEA administrative office to determine whether the management planner for that LEA adequately

documented the information required to be included in a management plan by §763.93. The inspector should review the other plans, too, to verify presence of the required data. Inspectors should note that sometimes a LEA uses more than one management planner. If this is the case, the inspector should review, in detail, one plan prepared by each management planner to determine the adequacy of the plans prepared by each planner. In addition to the detailed review, the inspector should examine the other management plans from the different management planners to verify the presence of required data.

During the review, the inspector should complete all questions in the LEA section of the Checklist pertaining to the contents of the management plan. The inspector should begin the review by identifying on the Checklist the name, accreditation number, etc., of the management planner. The inspector should proceed item-by-item to locate the required contents of the management plan as listed on the Checklist. (However, the inspector should leave the closing conference questions unanswered until that conference is held.)

C. INSPECTING SCHOOL MANAGEMENT PLANS AND SCHOOL BUILDINGS

After reviewing the management plans at the LEA administrative office to determine whether the management planner included in the management plans the "quantitative" requirements of §763.93 (management plans), the inspector should review the management plan at each school selected for inspection and conduct a "walk-through" inspection of each school whose management plan is reviewed. (The management plan review and walk-through inspection are treated separately in this chapter.)

The inspector should inspect such management plans and school buildings, one building at a time. Throughout the management plan review and school walk-through inspection process, the inspector should, of course, be completing the school section of the comprehensive Checklist. Therefore, all references to the Checklist in this part of Chapter VIII refer only to the school section of the Checklist, (pages 6 to 12) unless otherwise noted. Finally, the inspector should complete one copy of the school section for *each* school inspected in the LEA.

This part of the inspection (i.e., of management plans at schools within the LEA and of the selected school buildings [which are part of the schools] themselves) is the "qualitative" part of the inspection process (whereas the review of the LEA management plan is "quantitative"). During this stage, the inspector should determine such things as whether the LEA inspector properly identified all homogeneous areas of suspect friable and non-friable ACBM; whether proper sampling was conducted, in terms of

numbers of samples and locations; and whether response actions, if any were conducted, were completed in accordance with the AHERA Schools Rule. The inspector should make these determinations, completing relevant portions of the Checklist, by conducting the "walk-through," reviewing school management plans, and interviewing school staff and employees, as necessary.

TIPS FOR INSPECTOR UPON ARRIVAL AT SCHOOL

Upon arrival at a school selected for inspection, the inspector should do the following:

- Enter the facility through main entrance unless the LEA designates a different entrance.
- Present credentials to school representative(s) (although presentation is only *required* to be made at the LEA site; see Chapter VI, A, 3).
- Request that the school representative(s) be the liaison between the school inspector and the employees (e.g., teachers, custodians) as necessary during the inspection.
- Establish a rapport with the secretary at the school, as this person will likely be of the most assistance to the inspector concerning the location of the management plan and associated records.
- Request a quiet room or area in the school to use to review the management plan.
- Ensure that all required management plan records (i.e., records required under §763.94: "living documents") are available for review as they are sometimes stored separately from the management plan.
- Request that a member of the school's maintenance (or custodial) staff accompany the inspector on the inspection.
- Request a copy of the floor plan of the school for use during the walk-through.
- Ensure that all necessary equipment for conducting the inspection is on hand (e.g., a ladder for looking above drop ceilings, etc.) (see Chapter V, for suggested equipment list).

Details concerning these tips follow.

Upon arrival at the school to be inspected, the inspector should speak to the school representative (e.g., the principal or assistant principal) concerning the intended management plan review and "walk-through" inspection. Credentials may be presented at this time (or at any time, if requested) to the school representative. The inspector should request the use of a quiet room or area in the school to review the management plan. The inspector should also ensure that all records pertaining to the management plan (i.e., those required under §763.94, which pertain to such things as preventive measures and response actions, training, and periodic surveillance) are available at the school for review (see discussion below, 1, on "living documents") as these records are sometimes stored separately from the management plan. The secretary at the school is likely to be a good source of information pertaining to the location of such plans and records, and the inspector should request that the school representative obtain these records from the secretary or other appropriate person.

In addition to requesting access to needed records, the inspector should request the accompaniment of one of the school's maintenance staff (or custodial staff, if a maintenance person is not available) during the "walk-through" inspection of the school (which will take place after the inspector reviews the school's management plan). A maintenance staff member is preferable to a custodial staff member because the duties of the maintenance person require knowledge of and ability to maintain in good condition the mechanical systems in the school building. Such knowledge can be very useful to the inspector, who should inspect areas such as boiler rooms, mechanical areas, and more during the "walk-through" inspection.

The inspector must keep in mind that neither the LEA nor the school is *required* by AHERA or the AHERA Schools Rule to provide a guide to the inspector. However, the inspector should inform the school official or representative that such a guide may make the inspection process run more efficiently, since the guide will likely be more knowledgeable about the school than the inspector. (See Chapter V on notifying LEA in advance of the inspection or request for guide.) The inspector should also request from the school official a copy of the school floor plan for use by the inspector during the walk-through inspection (see 2, below).

1. Reviewing Management Plans at School(s)

The inspector will need to review each individual school's management plan and associated records (i.e., those required under §763.94) while completing the relevant data on the Checklist. The inspector should begin by obtaining background information on the school (see page 6 of Appendix D, addressing the

number of buildings within the school, grade levels taught at the school, construction dates of school buildings, etc.), some of which can be obtained from the school secretary, and filling in the pertinent data on the Checklist. Next, the inspector should complete the Checklist questions under the heading "LEA Requirements" (i.e., notification, training, and periodic surveillance). (These questions are on page 7, and page 10 of Appendix D.) The data necessary to complete these questions can be obtained by reviewing the school management plan and asking questions of appropriate staff (for example, ask custodial and maintenance staff about whether they have received required training under §763.92).

The inspector should also answer the recordkeeping questions on the Checklist (page 10 of Appendix D). These pertain to records that must be retained under §763.94 and are referred to as "living documents." The inspector should be aware that such records must be part of the school management plan and that the AHERA Schools Rule requires that management plans and associated records that are part of such plans be maintained in *both* locations, that is, the LEA administrative office and the school. Therefore, the inspector should check the school management plan for such records, or ask the school representative for the records (since there is no requirement that the records actually be attached to the management plan).

These living documents are those that must be constantly updated by the school, as necessary, and that represent an ongoing responsibility of the school. For example, under training requirements [§763.92], maintenance and custodial employees must have the requisite number of hours of training. Section 763.94 requires that records on such training be maintained (e.g., name and title, date and location of training, and number of hours of training). The inspector should verify that these requirements have been met. The inspector should check not only to ensure that the recordkeeping requirement was met, but also that the employees were actually trained (for example, the inspector may ask employees whether they have, in fact, received required training).

The inspector should keep in mind that verifying some of the data may require follow-up activities after completion of the inspection. For example, §763.94 requires records to be maintained each time a "major asbestos activity" (i.e., one other than small-scale, short-duration) is performed, including documentation of accreditation number of each person performing the activity. Therefore, the inspector may want to contact the consultant who performed the activity and request employee accreditation records (See Chapter IX, A, for discussion on follow-up activities).

The remainder of the school section of the Checklist will be completed after the inspector conducts a "walk-through" inspection of the school (see 2, below, on conducting a walk-through inspection). These remaining questions in the school section pertain to inspections and reinspections (see Appendix D, pages 7-9). The requirements governing the scope of inspections [§763.85(a)] are different from those applying to reinspections [§763.85(b)]. However, the contents of the management plan are the same for both inspections and reinspections [§763.93(e)(3)]. Such items include the date of inspection/reinspection and descriptions of sampling method(s) and location(s). (See below for a discussion on the general differences between a reinspection and an inspection, and how the inspector will determine compliance with each.)

Inspection Versus Reinspection Under the AHERA Schools Rule

Under §763.85(a), the LEA must conduct an inspection of each school building it leases, owns, or otherwise uses as a school building. The LEA inspector must also take other actions, including visually inspecting each area of such buildings; touching all suspect ACBM to determine friability; identifying homogeneous areas; etc.

In order to conduct an inspection to determine compliance with the requirements discussed above, the EPA (or State) inspector should review the management plan for the particular school where the inspection was conducted and conduct a walk-through inspection of the school (see this chapter, 2). That management plan must contain the LEA inspection report required under §763.93(e)(3). The inspector should compare the contents of this report with the Checklist to determine compliance.

Reinspections

Under §763.85(b), the LEA must, at least once every 3 years after a management plan is in effect, conduct a reinspection of all friable and nonfriable known or assumed ACBM in each school building that it leases, owns, or otherwise uses as a school building. Since July 9, 1989, was the latest date by which a LEA could implement its management plans [§763.93(c)], the first round of reinspections would need be completed on or before July 9, 1992. If a management plan was implemented prior to July 9, 1989, the first reinspection would have to be conducted within 3 years of that earlier date. (For example, if a management plan was implemented on January 30, 1989, the reinspection would need to be completed by January 30, 1992).

The person who conducts the reinspection for the LEA must be accredited [§763.85(b)(2)]. During the reinspection, the LEA's inspector is required to take such actions as visually inspecting and touching ACBM previously considered nonfriable to determine whether it has become friable, and identifying homogeneous areas with material that has become friable since the last inspection or reinspection.

Under §763.85(b)(3)(vii), the LEA's reinspector must include the following information in the management plan:

- Date of the reinspection, name/signature of reinspector, State and number of accreditation, changes in the condition of known or assumed ACBM.
- Locations where samples were collected during the reinspection, description of the manner used to determine such locations, name/signature of each accredited inspector who collected samples, State and number of accreditation.
- Assessments or reassessments of friable material, name/signature of the accredited inspector making the assessment, and the State and accreditation number.

Section 763.85(b) requires, generally, that the scope of the LEA's reinspection encompass all known or assumed ACBM identified during the original inspection (or subsequent reinspection). However, even though there is no explicit requirement beyond reinspecting the materials discovered in the original inspection, EPA strongly recommends that the EPA (or State) compliance inspector also attempt to identify any ACBM that may have been overlooked during the original LEA inspection and subsequent reinspections.

The EPA (and State) compliance inspector should review not only information pertaining to the original inspection, but data concerning all subsequent reinspections, when conducting a compliance inspection. The compliance inspector will need to review the original inspection and reinspection data to determine compliance with AHERA. For example, since all ACBM discovered during a reinspection that has become friable since the original inspection must be identified in the reinspection component of the management plan, the compliance inspector will have to ensure that subsequent reinspectors inspect such materials too.

The compliance inspector should obtain copies of all reinspection reports and append them to the Checklist, which will become part of the compliance inspection report for use by Case Development

Officers (CDOs) in making enforcement decisions pertaining to the LEA. (See Chapter IX, B and C, for details concerning the compliance inspection report).

For information concerning reinspections under AHERA, refer to Appendix K, Reference List, Item 6, "A Guide to Performing Reinspections under the Asbestos Hazard Emergency Response Act," February 1992.

2. Conducting the Walk-Through Inspection

Upon review of the management plan (at the school administrative office) and completion of the relevant portions of the Checklist, the inspector should conduct a walk-through inspection of the school itself. The purposes of conducting the walk-through inspection are as follows:

- To verify correctness of management plan information, such as appropriateness of sampling and location description;
- To ascertain whether response actions were properly completed (e.g., whether there is any remaining debris, residue, or dust);
- To identify all homogeneous areas of suspect friable and non-friable ACBM;
- To identify (based on information obtained during the above activity) which of the areas of such suspect homogeneous ACBM were not included in the management plan by the LEA inspector who conducted the AHERA inspection pursuant to §763.85;
- To ascertain whether warning labels have been appropriately placed [§763.95]; and
- To perform random interviews with school staff to verify that the 2- and 14-hour training requirements of §763.92 were met.

The inspector should use the AHERA Walk-Through Inspection Form (page 12 of Appendix D) during the walk-through inspection, completing the items on the form as the inspection progresses (see description of form below, 4). The inspector should also take the copy of the school section of the Checklist (Appendix D, pages 6-12), the school floor plan provided by the school, as well as the field logbook for note taking purposes. Basically, the inspector will be conducting a walk-through inspection of the entire school (i.e., all buildings composing the school and all rooms) to identify all homogeneous areas (discussed below) in each room to ascertain whether the LEA inspector (i.e., the inspector

TIPS ON CONDUCTING THE WALK-THROUGH

The following is a list of tips on conducting an efficient walk-through:

- Take along the Checklist (at least the school section, including the walk-through form, pages 6-12, of Appendix D); a copy of the school floor plan (to ensure that all rooms and areas in the school are inspected); and a field logbook to take notes as necessary.
- Request to be accompanied by a member of the maintenance staff.
- Bring all necessary equipment (e.g., ladder, camera) (see Chapter 7, B, 4).
- Identify and record on the walk-through form all homogeneous areas (whether suspect or not) including square or linear feet of such areas.
- Take any necessary photographs that may be helpful to EPA (and State) CDOs in subsequent case development and enforcement efforts.

Details concerning these tips follow.

hired to perform the inspection under §763.85) failed to identify and/or to sample and assess as required by the AHERA Schools Rule.

Prior to beginning the walk-through, the inspector should indicate on the Checklist the name and title of each person who will accompany the inspector on the walk-through (for example, the maintenance supervisor). The inspector should also complete the information pertaining to the LEA inspector (including accreditation number, course provider, etc.). If a response action has occurred at the school building, the inspector should determine whether there is visible ACM debris in the area where the response action occurred (§763.90(i) requires a visual inspection to be conducted by a person designated by the LEA).

3. Homogeneous Areas

Under §763.85, the LEA inspector must "...for each area of a school building...identify all homogeneous areas of friable suspected ACBM and...of nonfriable suspected ACBM." A homogenous area is defined under §763.83 as "...an area of surfacing material, thermal system insulation material, or miscellaneous

material that is uniform in color and texture." The AHERA Walk-Through Inspection Form was developed with this definition in mind and is organized so that the inspector can use the form during the inspection to identify each homogenous area, room by room.

4. AHERA Walk-Through Inspection Form

The form contains space for identification by the inspector of the following:

- The particular room or area (e.g., hallway, room) being inspected;
- The type of material (e.g., acoustical drop ceilings, 12" x 12" vinyl tile) of which each of the homogeneous areas (i.e., ceiling, walls, floors, and thermal system insulation) within each room or area is made;
- Whether the LEA inspector failed to identify each homogeneous area in the management plan, whether such identification was "not applicable" (i.e., the material is not considered "suspect" under AHERA), or whether the material is "new" (i.e., constructed or added after the inspection by the LEA inspector); and
- The estimated square or linear footage of suspect ACBM in each homogeneous area missed by the LEA inspector (for a list of "suspect" materials, see EPA's "Guidance for Controlling Asbestos-Containing Materials in Buildings," and EPA's "100 Commonly Asked Questions About the New AHERA Asbestos In Schools Rule," both listed as references in Appendix J).

The space designated on the walk-through form for the inspector to estimate the square or linear footage of each homogeneous area (e.g., ceiling, walls) of suspect ACBM overlooked by the LEA inspector is necessary because the amount of ACBM generally determines the extent of the violation, as described in the ERP (see Appendix J, No. 5). Also, with respect to each homogeneous area of friable surfacing ACBM not assumed to be ACM, the amount of such ACBM determines the number of bulk samples that must be taken. For example, for each homogeneous area of suspect ACBM of surfacing material less than 1,000 square feet, three bulk samples must be taken. The inspector should review the sampling provision of the AHERA Schools Rule (§763.85) for information on sampling requirements (e.g., the number of samples to take).

5. Using the AHERA Walk-Through Inspection Form During the Inspection

Before beginning the inspection, the inspector should examine the floor plan and decide which part of the school to examine first, and in which order the rooms will be examined. The inspector should keep in mind that the floor plan may not always match the description of the school contained in the

management plan. Section 763.93(e)(3)(ii) requires that the management plan contain a blueprint, diagram, or written description of all homogeneous areas. The inspector should clearly identify each room on the floor plan or make such an identification in the field logbook (e.g., nurse's office). In this way, the rooms and areas inspected can be compared with those identified in the management plan.

As the inspector examines a particular room or area in the school, all the data pertaining to that room or area should be listed on the form. The inspector should repeat this process for every room and area within the school. Therefore, the inspector should make enough copies of the walk-through form to allow information on all rooms to be recorded.

Once the inspector has planned out the course of the inspection, a good starting point for conducting the actual inspection is to refer to the maintenance (or custodial) staff member, if one has been provided by the school. The inspector may ask to be guided around the school, starting with the boiler rooms and other mechanical systems areas. The maintenance person will likely be the most knowledgeable person in the school about how the heating and air conditioning system operates, including the location and operation of return air ducts, and the location of pipes (water and others). Such information is germane to the possible existence of thermal system insulation, which will need to be identified during the walk-through.

While inspecting each room and area of the school, the inspector should identify *all* homogeneous areas, whether suspect or not (even though the LEA inspector is only required under §763.85 to identify such areas containing suspect ACBM), to ensure that the walk-through is complete. For example, the inspector should determine whether a certain homogeneous area is not identified because it was simply overlooked by the LEA's inspector, or because the area did not contain suspect material. Therefore, the inspector should identify all homogeneous areas in the beginning and designate in the appropriate box on the walk-through form "not applicable" where such materials are not suspect.

As the inspector checks each room, s/he should take notes on whether the school has met other requirements under the AHERA Schools Rule, such as placing required warning labels [§763.95] in routine maintenance areas. The inspector should write down such observations in the field logbook, and/or directly on the Checklist, where appropriate.

Throughout the inspection, photographs should be taken as necessary to document the location of homogeneous areas of ACBM that the LEA inspector may have overlooked in the management plan. The inspector should use a small chalk board to write down the number and name of the room in which such homogeneous areas are identified; the inspector may then photograph the board next to the identified area. (See Chapter VII, B, 4, on suggested equipment to bring to the inspection site.) The inspector may also want to take note of whether any suspect material is friable. S/he should write this observation in her/his field logbook.

6. Completing the School Section of the Checklist After Walk-Through

The main purpose of conducting the walk-through inspection is to ensure that homogeneous areas of suspect ACBM are properly identified in the management plan. Therefore, the next step after inspecting the school is to return to the management plan for that school (referring to the walk-through form as necessary) and determine whether the LEA inspector identified all homogenous areas of *suspect* friable or nonfriable ACBM (as required under §763.85) and included them in the management plan pursuant to §763.93(e)(3)(ii).

As the inspector re-examines the management plan, noting whether the LEA inspector properly identified each such homogeneous area of suspect ACBM, the appropriate data should be recorded on the Checklist. This means that the inspector should answer the questions on the Checklist pertaining to the contents of LEA inspection (Appendix D, page 7) or reinspection (Appendix D, page 9) reports, sampling, and assessment. (See discussion above on inspections versus reinspections.)

The inspector should also complete the data pertaining to warning labels, O&M, and recordkeeping (see Appendix D, page 10). The inspector should keep in mind that the questions concerning O&M only need to be addressed if O&M activities occurred (e.g., small-scale, short-duration activities or minor fiber release episodes). Also, questions pertaining to recordkeeping as it concerns preventive measures and response actions need only be answered if such measures or actions were taken. If the inspector answers "no" to this initial question, the remainder of the questions pertaining to such measures and actions need not be addressed.

D. DETERMINING COMPLIANCE WITH RESPONSE ACTION PROVISIONS OF AHERA SCHOOLS RULE

If an inspection is conducted at a school that has conducted response actions, the inspector should ensure compliance with AHERA Schools Rule §763.90(g) (accreditation of response actions supervisor, project designers, and workers), §763.91(c) (initial cleaning), and 763.90(i) (activities at completion of response action, such as visual inspection and aggressive sampling). To do this, the inspector should complete the response action section of the Checklist (see Appendix D, pages 13-15).

TIPS FOR COMPLETING THE RESPONSE ACTION SECTION OF THE CHECKLIST

- Because this section of the Checklist needs to be completed only if a response action occurred at the school to be inspected, the inspector should determine first whether such a response action occurred. Therefore, s/he should review the management plan for that school which, in accordance with §763.94(b)(1), must contain descriptions of any response actions taken. Once it is determined that a response action occurred, the inspector should follow the steps below, to complete the response action section of the checklist.
 - Provide accreditation information pertaining to workers (see page 13, Part A of Appendix D) by obtaining a list of the workers from the project designer, LEA, or the abatement contractor during follow-up (see Chapter IX, B).
 - Obtain the name and accreditation number of project designer from records required to be kept under §763.94(b)(1).
 - Ascertain whether proper number of air clearance samples was collected (see page 15, C, of Appendix D) by obtaining copies of drawings or diagrams of functional spaces from the air sampling agency during follow-up.
 - Obtain disposal records from LEA project designer or abatement contractor.
 - Obtain answers to questions on the Checklist pertaining to laboratory contractor responsibilities (page 15, D, of Appendix D) by reviewing management plan records required under §763.94.

Details concerning these tips follow.

Pursuant to §763.93(e)(6), the school's management plan must contain a detailed description of preventive measures and response actions to be taken in the school, including locations where such measures will be taken, scheduling information, etc. According to §763.94(b)(1), the management plan must also contain a description of response actions that were taken. The inspector should review the records to determine what response actions were taken. The inspector should also obtain the documentation (described below) from contractors who employed the workers, to assess compliance and complete the response action section of the Checklist.

As to the general questions on response actions (e.g., location of response action, type and amount of ACBM) in this section of the Checklist, the inspector should review the response action descriptions in the management plan for the particular school in which the response actions were conducted. The inspector should keep in mind that if response actions were conducted by school employees, a WPR inspection (see Chapter IV, C) should be conducted, because the WPR extends the provisions of the OSHA asbestos construction standards to State and local government employees engaged in asbestos abatement work who are not specifically covered by OSHA. (See Chapter IV, C, above.)

The inspector should answer the questions in the response action section of the Checklist that pertain to accreditation of persons who design and conduct response actions. The inspector should record the names of the individuals on the worksheet (page 14 of Appendix D). (See Chapter IX, A, for tips on obtaining follow-up information). Under §763.94(g), the LEA is required to keep a list of persons who conducted response actions.

The LEA is required, pursuant to §763.94(b)(1), to maintain as part of its management plan a description of response actions and preventive measures taken, including methods used, location of such actions and/or measures, and the names and accreditation numbers of all contractors involved. Therefore, the inspector should be able to obtain the name and accreditation number of the project designer from such records.

The questions on the Checklist pertaining to air monitoring contractor responsibilities (page 15 of the Checklist), which refer to the person designated by LEA under §763.90(i)(2)(i) to collect air samples, can be answered by reviewing several sources of information. They include management plan records required under §763.94(b)(2) and drawings obtained from the project designer or air clearance laboratory during follow-up (see Chapter IX, A). During follow-up, the inspector should obtain copies of drawings

and/or diagrams of functional spaces to ascertain whether the proper number of air samples was taken. For assistance in answering both the questions pertaining to air clearance monitoring contractor *and* laboratory contractor responsibilities, the drawings should tell the inspector how many air samples should have been taken (for example, for analysis by phase contrast microscopy (PCM), a minimum of 5 samples should be collected for each functional space).

For additional assistance in answering questions concerning laboratory contractor responsibilities, the inspector should also review the management plan records pertaining to air sampling. These records include data on the laboratory that analyzed the samples. These records are required under §763.94(b)(2) to be made part of the management plan.

Finally, as discussed in Chapter VI, C, 3 the inspector should complete one copy of the response action section for *each* response action within *each* school inspected. (Also see Appendix E, Inspector Tips.)

E. DETERMINING COMPLIANCE WITH EXCLUSION PROVISIONS OF AHERA SCHOOLS RULE

The final section of the Checklist to be completed is the exclusion section. Exclusions are covered in §763.99, which exempts LEAs from having to inspect a certain sampling area (as defined by §763.103 of the rule) or a homogeneous area of a school building where an accredited inspector has made any of several determinations (e.g., that based on sampling records, friable ACBM was identified during an inspection conducted before December 14, 1987). For every determination that excludes a LEA from inspection requirements, there must be a statement to that effect included in the management plan. Therefore, the exclusion section of the Checklist may be completed by reviewing the management plan for the school. The inspector should complete one copy of this section for each school inspected within a LEA that claims it qualifies for an exclusion. For a summary of the specific exclusions, see Chapter VI, C, 4.

F. CLOSING CONFERENCE

The inspector should, at the conclusion of the inspection, conduct the closing conference. The closing conference is the stage during which the inspector will take several important steps to formally end the inspection process (excluding the follow-up activities and the inspection report, covered in Chapter IX).

Prior to conducting the conference, the inspector should refer back to the LEA section of the Checklist and supply the requested data concerning the closing conference, typically held at the LEA administrative office. (The questions regarding LEA receipt of copies of the required closing documents [discussed below] may be answered during the closing conference, when such documents are provided to the LEA.) The inspector should also complete as much of the closing documents (i.e., the Receipt for Samples and Documents and the Summary of Observations forms) as possible (see discussion of these forms below). At the end of the closing conference, these documents will be presented to the LEA representative as described below.

TIPS ON CONDUCTING CLOSING CONFERENCE

- **Provide LEA with copy of Receipt for Samples and Documents.**
- **Provide LEA with a copy of Summary of Observations.**
- **Discuss Summary of Observations.**
- **Obtain copies of management plans components or other records needed by the inspector as attachments to the inspection report (see Chapter IX).**
- **Supply the Designated Person with a dated list of outstanding documents or records that are not immediately available to the inspector—the inspector and Designated Person should agree on a specific date for submission of outstanding documents, and such a date should be identified in the list.**
- **Answer questions from the Designated Person and other attendees concerning the inspection and/or AHERA.**
- **Discuss actions that the LEA may take to correct potential violations of AHERA and explain how to document such actions.**
- **Provide public outreach information to such attendees if requested.**

Details concerning these tips follow.

Before beginning the conference, the inspector should ensure that all persons the LEA invited to attend are present. Such individuals may include the Designated Person, the Superintendent, Principal(s), business officer, school board representatives, maintenance engineers, etc. Once the preconference

preparation has taken place (see above), the inspector may begin the conference. Besides providing time to answer any questions conference participants may have, the closing conference should include two major actions/topics. Each is discussed in succeeding subsections.

1. Receipt for Samples and Documents

During the closing conference, the inspector must present a completed copy of the Receipt for Samples and Documents form (see Appendix B), which when completed serves as an inventory of all documents obtained during the inspection. (Neither bulk nor air samples are generally taken by AHERA inspectors.) The list of documents obtained by the inspector should be prepared a few minutes prior to the conference, in order to save time for the inspector and the attendees. The inspector should describe each document (by title, total number of pages, and date, if applicable) on the form.

During the closing conference, the inspector should summarize the purpose of the form and its contents, and obtain the signature of the Designated Person or other LEA official. The inspector should sign and date the form in the presence of the conference attendees. The inspector should then provide the Designated Person or other official with a copy of the form (the form contains carbons for this purpose). The inspector should retain the original and other copies for Region files.

2. Presentation of Summary of Observations Form

The Summary of Observations form (see Appendix C) is intended to be used by the inspector to describe potential "deviations" from AHERA provisions by the LEA, other persons, or both. As is stated on the form, the intent is to bring to attention potential areas of concern regarding AHERA at the earliest possible time. To save time, the inspector should complete the form (except for signature and the date) prior to the conference.

3. Discussion of Summary of Observations Form

The inspector should explain the purpose of the summary form to conference attendees. It should be made clear that the form is not intended to be a comprehensive list of potential deviations of AHERA, and that other items may be added or deleted at a later date. The inspector should also make clear that the final determination as to whether such potential deviations of AHERA are, in fact, deviations, will be made by EPA (or State) CDOs during the AHERA case review process. The inspector should be very careful not to suggest that a civil penalty or other penalty will or will not ensue because of the inspection

or items listed on the summary form. It is the responsibility of the CDO, not the inspector, to make determinations of whether violations actually exist and to assess or seek penalties.

A separate form may be completed for each school within a LEA or the inspector may use just one summary form, as long as it is clear which potential deviations pertain to which school buildings. Some of the potential deviations that the inspector may identify are listed on the summary form. They include the following:

- LEA failed to conduct an AHERA inspection pursuant to the AHERA Schools Rule;
- LEA failed to develop a management plan pursuant to the AHERA Schools Rule;
- LEA knowingly submitted false information to the Governor regarding an inspection report;
- LEA carried out removal/renovation activities while operating under a deferral;
- LEA knowingly submitted false information to the Governor regarding the deferral request;
- LEA failed to use accredited persons;
- LEA failed to provide initial or annual notifications to parent/teacher/employee organizations;
- LEA failed to notify short-term workers;
- LEA failed to conduct periodic surveillance;
- LEA failed to maintain required records;
- LEA failed to ensure proper completion of response action(s);
- LEA failed to provide training for Designated Person and/or for custodial or maintenance staff;
- LEA failed to post required warning labels;
- LEA failed to qualify for an AHERA exclusion; and
- Other potential violations.

Once the inspector has provided an explanation of the purpose and contents of the summary form, the inspector should sign and date the form in front of the attendees. Finally, the inspector must provide a copy of the form to the Designated Person, who also signs and dates the form as proof of having received it. The inspector should note that the school or LEA representative (e.g., the Designated Person) is not

required by the AHERA Schools Rule to sign the summary form, since the form is **not** an official EPA form approved by the Office of Management and Budget.

The form is prepared in triplicate, with the original and the pink copies to be retained by the inspector (one for the regional files and one for the inspector's own file). The second copy (yellow) should be given to the Designated Person for the LEA's file. The inspector should inform the attendees that any records taken from the premises by the inspector are subject to requests pursuant to the Freedom of Information Act (FOIA). In addition, the summary form is also able to be obtained by the public pursuant to a FOIA request. The inspector should then invite questions by the conference attendees. After answering any such questions, or indicating that an answer will be provided later, the inspector should thank the LEA's representatives for their participation and cooperation.

4. Request for Outstanding Documents

The inspector should prepare and provide to the LEA representative (e.g., Designated Person) a list of all outstanding documents that the inspector wants to review. The list should be dated, and the inspector and LEA representative should agree on a date by which such documents will be submitted to the inspector.

CHAPTER IX. POST-INSPECTION ACTIVITIES

There are several important steps that should be taken by the inspector following the inspection itself. These steps are intended to finalize the entire inspection process and include conducting necessary follow-up activities, which include obtaining any outstanding documentation that is needed to assist CDOs in making compliance determinations and that should be included in the inspection report (discussed below); and preparing the inspection report.

A. FOLLOW-UP

The inspector will often have to undertake a number of follow-up activities after completion of the inspection to obtain outstanding documents and other information pertaining to the inspection. Such missing data may be essential to subsequent enforcement efforts that may be taken against the LEA or "other person." Therefore, conducting a thorough follow-up after the closing conference is a critical component of the inspector's job. In addition, the AHERA inspector should refer any potential violations of NESHAP to the NESHAP Asbestos Coordinator (NAC) in the Region in which the inspection was conducted, by submitting to the NAC the NESHAP Abbreviated Compliance Referral Form (see Chapter VI, Referral Forms, and Appendix G) and a copy of the applicable AHERA provisions and any related AHERA documents (e.g., the relevant portions of the Checklist pertaining to the response actions).

One of the main reasons for conducting follow-up after the inspection is to obtain information needed to verify data asked for on the comprehensive Checklist. For example, the response action section of the Checklist asks for information pertaining to the accreditation of persons who design and conduct response actions (i.e., contractors and workers). In order to verify that such individuals were properly accredited, the inspector should obtain additional information concerning accreditation from the abatement contractor, during follow-up. The inspector should visit or write to the contractor and request a list of workers who performed response actions, their accreditation numbers, and course provider identities.

The following is a list of suggested follow-up tips that the inspector may take after completing the inspections:

FOLLOW-UP TIPS

- Obtain laboratory analytical reports on bulk sampling to determine whether homogeneous areas of suspect ACM were sampled in accordance with §763.86.
- Obtain laboratory analytical reports on air clearance sampling to determine whether response actions were properly completed in accordance with §763.90.

[Note: The above two types of data are required to be maintained by the laboratories in question; the data that follows are not required to be maintained by the specified contractors.]

- Obtain time sheets, payroll records, daily sign in sheets, etc., and AHERA accreditation certificates for workers on the job during response action activities (such documentation would be available, if at all, from the project designer, abatement contractor, and/or air sampling contractors). This information will enable the inspector to identify which workers performed the response actions and whether they were accredited. The inspector should keep in mind that AHERA does not require that contractors retain this information, so if the contractor informs the inspector that such data are not available, the inspector may have no further recourse, other than using the subpoena process. To do this, the inspector should consult with her/his supervisor and the Region counsel.
- Contact the course providers identified on the certificates of accreditation, if any can be obtained by the inspector from the LEA or the abatement contractor. The inspector may then be able to verify whether the particular workers were accredited by the provider at the time of the response action (the inspector should remember that all persons accredited pursuant to AHERA must take annual refresher courses, so the inspector should be careful to determine whether the accreditation had expired prior to the response actions being conducted).
- Check the National Directory of AHERA Accredited Courses (NDAAC), which lists all EPA and State approved course providers. This document is available from the NDAAC hotline referenced in Appendix K, No. 13.
- Obtain copies of drawings/diagrams of functional spaces from the project designer (or air clearance monitoring contractor) for the purpose of determining whether air sampling requirements were met, as asked for in the response action section of the Checklist.

B. PREPARATION OF INSPECTION REPORT

For a compliance inspection to be of use to compliance and enforcement personnel, the results of the inspection must be expressed in a concise written format. Therefore, the AHERA inspector, upon completion of all components of the inspection process, from opening to closing conferences and follow-up, should prepare an inspection report. The inspection report is EPA's, or the State's, official documentation of the inspection, including a detailed account of the inspector's observations and activities

during the inspection, arranged chronologically. The inspector may rely on the checklist and on the field logbook, if one was kept, to aid in developing this report.

The inspector should prepare the inspection report as soon as possible after completing the closing conference, so that important details of the inspection are not forgotten and so that as much time as feasible can be allowed for the development of necessary enforcement actions. A final report should be included in the inspector's file (and in the main file within the Region or the appropriate State office) within a month of the date on which the inspection was completed.

The inspector should ensure that the report is concise, accurate, factual, and based on the inspector's first-hand knowledge. If the inspector relies on other individuals for details included within the report, the report should describe in detail who these individuals are, their role with respect to the LEA, and why the information obtained from the individuals is important.

The inspector should not, under any circumstances, include within the inspection report any conclusions about whether the LEA or an "other person" (e.g., contractor) violated a provision of AHERA or the regulations promulgated pursuant to AHERA. The report should, instead, only include facts known to the inspector that may assist EPA CDOs, or State equivalents, in making such a determination. Therefore, the inspector should avoid using the term "violation," which indicates that a conclusion has been drawn.

Proper documentation of the inspection is a critical element of the inspector's job. Many individuals other than the inspector may need to rely on the documentation to make decisions regarding the subject of the inspection (e.g., the LEA and contractors who performed AHERA activities for the LEA). These may include government attorneys, other compliance and enforcement personnel, and other inspectors who may conduct additional inspections of the same subject at a later date and who may want to refer to the details of previous inspection(s).

C. INSPECTION REPORT: BASIC ELEMENTS

In general, the inspector should ensure that the final inspection report contains the following basic documents. These elements constitute a comprehensive inspection report that will assist EPA (or State) CDOs in their subsequent efforts to develop necessary enforcement actions. The basic inspection documents are the following:

- Notice of Inspection (see Chapter V, A, 4);
- Receipt for Samples and Documents (see Chapter VIII, F, 1)

All documents obtained during the inspection as evidence of potential violations of AHERA should be listed on the Receipt for Samples and Documents form and included in the Inspection Summary.

- Summary of Observations Form (see Chapter VIII, F, 2);
- Completed AHERA Inspection Checklist (see Chapter VIII on guidance for completing the Checklist);
- Photographs (if any were taken); and
- Inspection Summary (see below).

Inspection Summary

While there is no uniform or required format for the development of an Inspection Summary, certain facts that should be kept in mind when developing such a report. The report should address, at a minimum, the following:

- Description of and background information on the LEA and the schools that were inspected (size, organization, floor plans, identities of Designated Person and of all participants in conferences or walk-through, etc.);
- The reason for the inspection (neutral or for cause);
- Scope of the inspection (comprehensive or focused);
- Who conducted the inspection, including individuals who may have accompanied the inspector on the inspection;
- Beginning and ending dates of the inspection conducted by LEA inspectors for each school selected for a compliance inspection;
- Dates and location(s) of response action(s), if any were conducted;
- All forms, notices, or other documents that were completed and/or presented and signed;
- Actions taken by the inspector before, during, and following the inspection and the chronology and dates of those actions;
- Observations made during the inspection and references to any specific documents/evidence pertaining to observations; and

- Records or other documents taken as evidence of compliance or of potential violations during the inspection, such as inspection and reinspection reports.
- Dated list of any follow-up records requested by the inspector from the LEA at the closing conference.

APPENDIX A

NOTICE OF INSPECTION FORM



United States Environmental Protection Agency
 Washington, D.C. 20460
 Toxic Substances Control Act
 NOTICE OF INSPECTION

Form Approved
 OMB No. 2070-0007
 Approval Expires 10-31-92

The public reporting burden for this collection of information is estimated to average 5 minutes per response. This estimate includes time for reviewing instructions, searching existing data sources, gathering and maintaining the needed data, and completing and reviewing the collection of information. Send comments regarding the burden estimate or any other aspect of this collection of information to the Chief, Information Policy Branch (PM-223), US Environmental Protection Agency, 401 M Street, SW, Washington, DC 20460, and to the Office of Information and Regulatory Affairs, Office of Management and Budget, Washington, DC 20503, marked ATTENTION: Desk Officer for EPA.

1. Investigation Identification			2. Time	3. Firm Name
Date	Inspector No.	Daily Seq. No.		
4. Inspector Address				5. Firm Address

REASON FOR INSPECTION

Under the authority of Section 11 of the Toxic Substances Control Act:

For the purpose of inspecting (including taking samples, photographs, statements, and other inspection activities) an establishment, facility, or other premises in which chemical substances or mixtures or articles containing same are manufactured, processed or stored, or held before or after their distribution in commerce (including records, files, papers, processes, controls, and facilities) and any conveyance being used to transport chemical substances, mixtures, or articles containing same in connection with their distribution in commerce (including records, files, papers, processes, controls, and facilities) bearing on whether the requirements of the Act applicable to the chemical substances, mixtures, or articles within or associated with such premises or conveyance have been complied with.

In addition, this inspection extends to (Check appropriate blocks):

- | | |
|--|--|
| <input type="checkbox"/> A. Financial data | <input type="checkbox"/> D. Personnel data |
| <input type="checkbox"/> B. Sales data | <input type="checkbox"/> E. Research data |
| <input type="checkbox"/> C. Pricing data | |

The nature and extent of inspection of such data specified in A through E above is as follows:

Certification

I certify that the statements I have made on this form and all attachments thereto are true, accurate, and complete. I acknowledge that any knowingly false or misleading statement may be punishable by fine or imprisonment or both under applicable law.

Inspector Signature		Recipient Signature	
Name		Name	
Title	Date Signed	Title	Date Signed

APPENDIX B
RECEIPT FOR SAMPLES AND DOCUMENTS

APPENDIX C
SUMMARY OF OBSERVATIONS
(OPTIONAL FORM: NON-OFFICIAL)

**U.S. ENVIRONMENTAL PROTECTION AGENCY
TSCA INSPECTION
SUMMARY OF OBSERVATIONS**

Name and Address of Inspector(s)	Name and Address of Facility
	Chief Executive Officer of Firm
Name of Individual to Whom Notice is Given	Title
Title	Date
Address	

The following potential deviations from the requirements of the Toxic Substances Control Act and regulations promulgated thereto were observed during this inspection:

- LEA APPEARS to be in compliance with AHERA.
- LEA failed to conduct an AHERA inspection pursuant to 40 CFR Part 763.
- LEA failed to develop a management plan pursuant to 40 CFR Part 763.
- LEA knowingly submitted false information to Governor regarding the inspection report.
- LEA carried out removal/renovation activities while operating under a deferral.
- LEA knowingly submitted false information to the Governor regarding the deferral request.

- LEA failed to use accredited persons.
- LEA failed to provide initial or annual notifications to parent/teacher/employee organizations.
- LEA failed to notify short term workers.
- LEA failed to to conduct periodic surveillance.
- LEA failed to maintain required records.
- LEA failed to ensure proper completion of response action.
- LEA failed to provide training for designated person, custodial or maintenance staff.
- LEA failed to to post warnings.
- LEA failed to qualify for an AHERA exclusion; and
- Other: _____

This Summary of Observations is provided to bring to your attention those areas of concern at the earliest possible time. It is not intended to be a complete list of potential deviations from the requirements of the Toxic Substances Control Act and regulations thereto, but rather a list of those conditions of immediate concern and/or those readily apparent.

The undersigned acknowledges having received and read a copy of this TSCA Summary of Observations.

Signature	Title	Date
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Signature of Inspector

Title of Inspector

Date

APPENDIX D

**COMPREHENSIVE AHERA INSPECTION CHECKLIST
(INCLUDING AHERA WALK-THROUGH INSPECTION FORM)**

INSPECTION STRATEGY FOR AHERA

AHERA inspections involve ensuring compliance with the AHERA Schools Rule (40 CFR 763, Subpart E) by the regulated community made up public and private non-profit schools and contractors who perform AHERA-related activities in the schools (i.e., inspectors, management planners, project designers, supervisors, workers, and analytical laboratories). Requirements under the rule pertain to many areas, including preparation of inspection reports, development of management plans, operations and maintenance activities, the designing and conducting of response actions, and recordkeeping. The manual is intended to benefit both EPA and State inspectors.

During a compliance inspection, the inspector must determine if each member of the regulated community has met the applicable requirements of the rule, and its appendices, on two levels. The first level is "quantitative"; for example, does the management plan present information required pursuant to Section 763.93? Was sampling appropriate in numbers and locations? Most of these items will likely be determined by reviewing records at the LEA and/or the Regional (or State) office.

The second level is "qualitative"; for example, did the LEA inspector properly identify all homogeneous areas of suspect ACBM in each school building? Have the response actions been conducted as required by the management plan? Were response actions properly completed (e.g., visual inspection conducted, aggressive sampling performed)? These questions may be answered by conducting a walk-through inspection of selected schools within the LEA, as well as by reviewing the relevant management plans and interviewing school staff.

The attached Comprehensive AHERA Inspection Checklist (the Checklist) has been developed to assist the EPA (and State) inspector in mapping out the strategy to be followed during an AHERA inspection and to help the inspector focus her/his efforts.

It has been found that LEAs' management plans are, for the most part, generic in format for each school. Therefore, the inspector should examine, in detail, one representative management plan at the LEA (unless prepared by more than one management planner), and also review the others, to become familiar with the overall format of the LEA's management plan and to determine whether the management planner has adequately documented the information required by Section 763.93. The inspector should pay particular attention to any inadequacies discovered in the representative management plan reviewed at the LEA, carefully reviewing the other plans to determine if such errors repeat themselves. After reviewing the management plans at the LEA, the inspector should examine the management plan at the selected schools within the LEA for specific information needed while s/he conducts the school inspections (e.g., walk-through) and interviews.

The Checklist contains four components pertaining to: 1) LEA; 2) school management plans and walk-through inspections of school buildings that are part of the school selected for inspection; 3) compliance with response action provisions of rule; and 4) compliance with exclusion provisions of rule for an LEA that has claimed that it qualifies for an exclusion. It is recommended that the inspector duplicate each component of the Checklist onto a different colored paper so as to distinguish easily each section of the Checklist during the inspection process.

- Report Elements Attached:
 School Inspection
 Walk Through
 Response Action
 Exclusion

**UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
 AHERA COMPLIANCE INSPECTION CHECKLIST**

PART I. LEA INSPECTION

LEA NAME: _____	DATE: _____
ADDRESS: _____	DOCKET NO: _____
	INSP. NO. _____

CITY: _____ STATE: _____ ZIP: _____

PHONE NO. _____ SUPERINTENDENT/HEADMASTER: _____

DESIGNATED PERSON: _____

NUMBER OF LEA: SCHOOLS: _____ STUDENTS: _____ EMPLOYEES: _____

LEA is PUBLIC or PRIVATE (Nonprofit) NUMBER OF SCHOOLS INSPECTED: _____

If private School, list owner's name and address: _____

SCHOOLS AND/OR FACILITIES INSPECTED: (List names only)

PREINSPECTION REVIEW: (Obtained from Regional Office Files)

Date(s) of Previous
 EPA Inspection(s): _____ NON(s): _____ CC(s): _____

Previous Citations, if any related to inadequate:

- | | |
|-------------------------------------|---|
| <input type="checkbox"/> inspection | <input type="checkbox"/> warnings and notifications |
| <input type="checkbox"/> sampling | <input type="checkbox"/> record keeping |
| <input type="checkbox"/> analysis | <input type="checkbox"/> other: _____ |

O&M Plan agreed to as part of civil complaint settlement? Yes No

LEA: _____

TELEPHONE APPOINTMENT(S):

Date telephone appointment made: _____ Telephone No: _____

Appointment made with whom? _____ Title: _____

Appointment rescheduled? Yes No Reason: _____

Purpose of compliance inspection explained when appointment made? Yes No

REASON FOR INSPECTION OF LEA: The purpose of this inspection is to determine if the LEA is in compliance with the requirements of AHERA, codified in 40 CFR Part 763, Subpart E.

AHERA INSPECTION:

- Randomly Selected Neutral Inspection
- Selected for Cause
 - Complaint (Employee, Parent, Other)
 - Referral from other Federal or State Agency
 - Other: (Specify)
- ASHAA INSPECTION (Separate Report)
- WORKER PROTECTION INSPECTION: If Response Action performed by public school employees (Separate Report)

OPENING CONFERENCE

PRELIMINARY INFORMATION:

1. LEA personnel present and interviewed:

Name: _____ Title: _____

Name: _____ Title: _____

Name: _____ Title: _____

Name: _____ Title: _____

Name: _____ Title: _____

2. EPA inspector accompanied by other State or Federal employee(s)? Yes No

Name: _____ Agency: _____

Name: _____ Agency: _____

3. Credentials presented to: _____

4. "Notice of Inspection" signed by LEA official and copy provided to official? Yes No

LEA: _____

GENERAL INSTRUCTIONS/INFORMATION:

1. For items marked with a star (*), obtain copies of documentation for follow-up actions.
2. For any "No" answers, provide explanation given by school official.
3. Line through any item missing. For example, "...name/signature..."
4. "F" means Friable and "NF" means Nonfriable.

PART II - LEA - REGULATORY REQUIREMENTS - GENERAL	YES	NO	N/A	REMARKS
Designate a person to ensure that requirements of regulation are implemented [763.84(g)(1)]				
Provide designated person adequate training [763.84(g)(2)]				
Inform workers, bldg. occupants, or legal guardians at least once each school year about inspections, response action, post-response action activities that are planned or are in progress [763.84(c)]				

(Select schools to be inspected and proceed to Part III.)

PART III - MANAGEMENT PLANS - Use to Verify Accreditation

If more than one Management Planner was used by the LEA, complete the remainder of this LEA section for each planner.

Developed by: _____

Firm Name/Address: _____

State/Accreditation No.: _____

Initial Course Provider: _____

Date Submitted to State: _____ Date State Response: _____

CONTENTS [(40 CFR 763.93(e)...]	YES	NO	N/A	REMARKS
(1) Name/address of each school building, whether it has FACBM, NFACBM, suspected or assumed F/NFACBM *				
(2) If inspected before 12/14/87:				(Complete only if information from previous inspections was used to form basis for AHERA inspection)
- <u>date of inspection</u>				
- <u>blueprint/description w/approximate sq/ft footage homogeneous/sampling area sampled, sample locations, sample dates</u>				
- <u>bulk sample analyses, dates of analyses</u>				
- <u>description of response/preventive measures, names of all contractors, start/completion dates, air clearance sample results</u>				
- <u>description of assessments of material identified prior to 12/14/87, name/signature/State and number of accreditation of person making statement</u>				

LEA: _____

MANAGEMENT PLANS (Continued)	YES	NO	N/A	REMARKS
<p>(3) For inspection/reinspection under AHERA:</p> <ul style="list-style-type: none"> - <u>date of inspection, name/signature, State and number of accreditation of person(s) making inspection</u> * - <u>blueprint/description that identifies location and approximate sq/ln footage of homogeneous areas sampled, location of samples, date; homogeneous area of F and NF assumed ACBM in each school building</u> * - <u>description of manner used to determine sampling locations, name/signature of person collecting samples, State and number of accreditation</u> - <u>bulk sample analyses, name/address of laboratory, statement lab meets requirements, name/signature of analyst</u> - <u>description of assessments, name/signature, State and accreditation number of person making assessments</u> - <u>list whether homogeneous areas are surfacing, thermal, or miscellaneous material [40 CFR 763.85(a)(4)]</u> 				
<p>(4) Name/address/telephone number of LEA-designated person, course name, dates, hours of training</p>				
<p>(5) Recommendations of response actions, name/signature, State and accreditation number of person making recommendations (management planner)</p>				
<p>(6) Description of preventive measures/response actions/methods to be used for FACBM, locations, reasons, and schedule for beginning and completing</p>				
<p>(7) For person who inspected for ACBM and who will design and carry out response actions (except O&M),</p> <ul style="list-style-type: none"> - <u>statement that person is accredited under State contractor accreditation program, or by an EPA-approved course, OR</u> - <u>that LEA will use accredited persons</u> 				
<p>(8) Description/blueprint of ACBM/assumed ACBM remaining in school after response actions completed</p>				
<p>(9) Plan for reinspection, plan for O&M, plan for periodic surveillance, recommendation of additional cleaning, response of LEA to recommendation, if any.</p> <ul style="list-style-type: none"> - <u>for each person who performed periodic surveillance, is a record of date of surveillance, name of person conducting surveillance, and any changes in the condition of the material(s) included [763.94(d)]?</u> 				
<p>(10) Description of steps taken to inform workers, building occupants, regarding inspections, reinspections, response actions, post-response actions, post-response actions planned or in progress *</p>				
<p>(11) Evaluation of resources needed to complete response actions, carry out reinspection, O&M, training</p>				
<p>(12) For each consultant who contributed to management plan, statement that person is:</p> <ul style="list-style-type: none"> - <u>accredited under State accreditation plan, OR</u> - <u>accredited by another State or EPA-approved course</u> 				

LEA: _____

LEA RESPONSIBILITIES	YES	NO	N/A	REMARKS
LOCATION OF PLAN [40 CFR 763.93(g)(2)] LEA administrative office				
NOTIFICATION OF PLAN AVAILABILITY [40 CFR 763.93(g)(4)] Annual notification to parent, teacher, employee organization(s); <u>description</u> of steps taken to notify such organization(s); dated copy of notification as part of management plan *				
DESIGNATED PERSON STATEMENT [40 CFR 763.93(i)] Plan contains statement signed by designated person that general LEA responsibilities have been or will be met				

CLOSING CONFERENCE (to be completed at conclusion of inspections of all schools)

A. Date: _____ Time: _____ Where conducted: _____

LEA Representative(s) Present:

Name: _____ Title: _____

Name: _____ Title: _____

Name: _____ Title: _____

C. Were LEA officials provided copies of:

___ Receipt for samples and documents

___ Summary of observations

___ Updated regulations/guidances

D. Was explanation provided to LEA officials that possible Rule deviations listed on Summary of Observations are not all-inclusive and other rule deviations may be found by EPA during review of the file? _____ Yes _____ No _____ N/A

E. Were LEA officials encouraged to submit proof of rule compliance as soon as possible to the inspector's address? _____ Yes _____ No _____ N/A

F. Were LEA officials informed that documents collected and generated as a result of this inspection are available to parents, the news media, general public, etc., through Freedom of Information Act requests? _____ Yes _____ No _____ N/A

Inspector's Signature: _____ Date of Signature: _____

Inspector's Signature: _____ Date of Signature: _____

SCHOOL: _____ LEA: _____

PART IV - SCHOOL INSPECTION - General Information: Complete for each School Inspected

F or NF ACBM or Assumed ACBM is present in this School's buildings: Yes No

GENERAL

School Name: _____ Date: _____

Address: _____ Time: _____

City, State, Zip: _____ Telephone: _____

TOTAL NUMBER OF:

_____ Buildings _____ Grades (i.e., K, K-12)

BUILDING	CONSTRUCTION DATE(S)	INCL. IN MP?		IF NO, DATE FIRST USED AS A SCHOOL
		Y	N	

Management Plan in Administration Office: Yes No

Content of Management Plan is as described on LEA report: Yes No
(If NO, explain)

ACCOMPANIED ON INSPECTION BY LEA/SCHOOL REPRESENTATIVES:

Name: _____ Title: _____

Name: _____ Title: _____

PART V - LEA INSPECTOR INFORMATION

Inspection
 Re-inspection

LEA Inspection Date: _____

Firm Name and Address: _____

LEA Inspector's Name: _____

Accreditation State/Number: _____

Course Provider: _____

If more than one Inspector/Firm, use back of sheet to record information for each.

SCHOOL: _____

LEA: _____

A. CONTENTS OF INSPECTION REPORT	YES	NO	N/A	REMARKS
<p style="text-align: center;">INSPECTIONS</p> <p>For inspections: Did inspector: [40 CFR 763.85(a)(4)]</p> <ul style="list-style-type: none"> - identify all homogeneous areas of F and NF suspected ACBM for each area of the school building? - collect bulk samples for all homogeneous areas NOT assumed to contain ACM and submit for bulk analysis? - assess F ACM where samples are collected, F material in areas assumed to be ACM, and F ACM identified during previous inspection? - record and submit to LEA designated person within 30 days [40 CFR 763.85(a)(4)(vi)] of the inspection report 				
<p>B. SAMPLING [40 CFR 763.86]</p>				
<p>Did inspector collect appropriate number of samples in each homogeneous area?</p>				(Use Worksheet next page)
<p>C. ASSESSMENT [40 CFR 763.88]</p>				
<p>Written assessment provided for all F known or assumed ACBM in the school building Signature of person making assessment, date, State and number of accreditation (inspector) Copy of assessment provided to LEA DP within 30 days? Assessment rationale? Recommendation of Response Action?</p>				If adequacy of assessments or recommendations is questionable, comment on reverse side and attach questionable portion.
<p>PART VI - LABORATORY RESPONSIBILITIES BULK SAMPLE ANALYSIS (40 CFR 763.87)</p>				
<p>Name of lab: _____</p>				
<p>Address: _____</p>				
<p>Accreditation for PLM analysis NIST _____ Interim _____</p>				
<p>Date of Analysis: _____</p>				
<p>Name of Analyst: _____</p>				
<p>Signature of Analyst: _____</p>				
<p>PART VII - LEA REQUIREMENTS - SCHOOL</p>				
<p>A. NOTIFICATIONS</p> <ul style="list-style-type: none"> - Provide short-term workers information regarding locations of ACBM and assumed ACBM [40 CFR 763.84(d)] - Initial/annual notification to parent/teacher/employee organizations re plan availability [40 CFR 763.93(g)] - Dated copy of notification as part of Management Plan 				(If "NO," describe specific instance of non-notification)

SAMPLING WORKSHEET [40 CFR 763.86]

In the remarks section on this page, the inspector should write down the exact number of samples taken for each of the specified categories of ACBM (e.g., surfacing materials, TSI), the amount of ACBM in each homogeneous area, and for (c) and (d) below (i.e., miscellaneous material and non-friable suspected ACBM), the type of material involved.

	YES	NO	N/A	REMARKS
Did inspector collect appropriate number of samples in each homogeneous area (HA), from				
(a) Surfacing material				
- 3 from each HA 1,000 sq. ft. or less				
- 5 from each HA > 1,000 sq. ft. but < 5,000 sq. ft.				
- 7 from each HA > 5,000 sq. ft.				
(b) Thermal System Insulation (TSI)				
- 3 from each HA of TSI that is NOT assumed to be ACBM				
- 1 from each HA of PATCHED TSI NOT assumed to be ACBM				
- samples from each insulated mechanical system NOT assumed to be ACM where cement plaster is used on fittings IN A MANNER SUFFICIENT TO DETERMINE whether or not material is ACM				
(c) Miscellaneous Material				
- samples from each HA of FRIABLE miscellaneous material NOT assumed to be ACM IN A MANNER SUFFICIENT TO DETERMINE whether or not material is ACM				
(d) Nonfriable suspected ACBM				
- If HA of NF suspected ACBM is NOT assumed to be ACM, collect bulk samples from HA of NF suspected ACM NOT assumed, IN A MANNER SUFFICIENT TO DETERMINE whether or not material is ACM				

Comments on Sampling:

SCHOOL: _____ LEA: _____

PART V - LEA REINSPECTOR INFORMATION

Reinspection Date: _____

Firm Name and Address: _____

Reinspector's Name: _____

Accreditation State/Number: _____

Course Provider: _____

If more than one Reinspector/Firm, use back of sheet to record information for each.

A. CONTENTS OF REINSPECTION REPORT	YES	NO	N/A	REMARKS
<p style="text-align: center;">REINSPECTIONS</p> <p>For reinspections: Did reinspector: [40 CFR 763.85(b)(i-vii)]</p> <ul style="list-style-type: none"> - For each school building in the LEA, reinspect all F and NF suspect ACBM at least once every 3 years after the management plan was in effect? - state accreditation/number of reinspector - for each area of each school, did the reinspector: <ul style="list-style-type: none"> - visually reinspect and reassess the condition of all F known or assumed ACBM? - visually reinspect all previously considered NF ACBM and touch the material to determine if it had become friable since the last inspection? - identify any homogeneous area with material that had become friable since the last inspection? - for each homogeneous area of newly friable material already assumed to be ACBM, were bulk samples collected? (Samples are <u>not required</u> to be collected.) Copies of laboratory accreditation, sampler accreditation, name and address of sampler and laboratory included in reinspection report? - was an assessment made of the condition of the newly friable material in areas where samples were collected, and of newly friable materials in areas assumed to be ACBM? - Within 30 days of the reinspection, was the following information submitted to the LEA: <ul style="list-style-type: none"> - date, name/signature of reinspector, State and accreditation number, and changes in the condition of known or assumed ACBM? - exact locations where samples were collected, description of the manner used to determine sampling locations, name/signature and State/accreditation number of each person who collected samples - any assessments or reassessments made of friable material, name/signature and State/accreditation number of person making assessments 				<p>Date of last inspection:</p>

SCHOOL: _____

LEA: _____

B. TRAINING [40 CFR 763.92(a)...]	YES	NO	N/A	REMARKS
(1) all members of maintenance/custodial staff who may work in building that contains ACBM have received 2-hour awareness training; new employees trained within 60 days of employment (2) maintenance/custodial staff who disturb ACBM have received additional 14-hour training				
C. PERIODIC SURVEILLANCE [40 CFR 763.92(b)]				
- Periodic surveillance conducted at least once every 6 months after plan is in effect				Date of last periodic surveillance
D. WARNING LABELS [40 CFR 763.95...]				
(a) warning labels attached immediately adjacent to F and NF ACBM and assumed ACBM in all routine maintenance areas (b) Labels prominently displayed in readily visible locations (c) Labels read "CAUTION: ASBESTOS. HAZARDOUS. DO NOT DISTURB WITHOUT PROPER TRAINING AND EQUIPMENT."				(If "NO," was F or NF ACBM present in such areas?) Specify: routine maintenance areas and type of ACBM
E. OPERATIONS AND MAINTENANCE [40 CFR 763.91...]				Complete only if O&M activities have occurred. Otherwise "N/A"
(a) program implemented whenever F ACBM is known or assumed				
(b) complied with WP Rule (Public Employees only) or complied with Appendix B.				
(c)(2) complied with additional cleaning recommendation, if any				
(d) when O&M activities disturb F ACBM, (Small Scale, Short Duration) (Appendix B)				
- restrict access to maintenance project				
- post signs to prevent entry				
- shut off/modify air handling system(s)				
- use work practices: wet methods, protective clothing, HEPA-vac, mini-enclosures, glove bags [circle practice(s) used as necessary]				
- clean all fixtures in work area				
- place asbestos debris in sealed, leak-tight container				
(f)(1) Minor Fiber Release Episode (< 3 sq/ln feet)				
- thoroughly saturate debris-wet asbestos				
- cleaning as described in initial cleaning				
- place asbestos debris in sealed, leak-tight containers				
- repair, or implement appropriate response action				
(f)(2) Major Fiber Release Episode (> 3 sq/ln feet)				Complete "Response Action"
- restrict entry				
- shut off/modify air handling system				
- have response action designed and conducted by accredited persons				
F. RECORD KEEPING [40 CFR 763.94...]				
- records kept in administrative office of school				For questions (b)(1) & (2), if no Response Action or preventive measure occurred, no records are required.
(b)(1) for preventive measures & response action				
- written description of action taken				
- methods used				
- location of action				
- reasons for selecting action				

SCHOOL: _____

LEA: _____

F. RECORD KEEPING (Continued)	YES	NO	N/A	REMARKS
(b)(1): - start and completion dates - names and addresses of all contractors used, their state of accreditation and accreditation numbers * - if ACBM is removed, name and location of storage or disposal site				
(b)(2) name/signature of person collecting air sample, if applicable * - locations where air samples collected * - date of collection * - name/address of lab analyzing samples * - date of analysis * - results of analysis * - method of analysis * - name/signature of analyst * - statement that lab meets requirements *				
(c) for each custodial/maintenance person required to receive training: - person's name/job title - date and location of training - number of training hours completed				
(d) for each periodic surveillance: - person's name conducting surveillance * - date of surveillance - any change in condition of ACBM				Collect most recent periodic surveillance records
(e) for each initial cleaning under [40 CFR 763.91(c)] - person's name doing cleaning - locations cleaned - cleaning methods used				
(f) for each O&M activity (small-scale, short duration) - person's name doing O&M - start and completion dates - locations of activity - description of activity/preventative measures - if ACBM is removed, name/location of storage or disposal site				Obtain copy of representative O&M activity
(g) for each major asbestos activity performed: - name, signature, State of accreditation, accreditation number (if applicable) of each person performing activity - start and completion date - locations of activity - description of activity/preventative measures - if ACBM is removed, name/location of storage or disposal site				
(h) for each fiber release episode under [40 CFR 763.91(f)] - date and location of episode * - method of repair - preventative measure or response taken * - name of person performing work - if ACBM is removed, name/location of storage or disposal site				Obtain copy of representative activity

AHERA WALK THROUGH INSPECTION FORM
(List material for each of the following)

LEA: _____

SCHOOL: _____

BUILDING: _____

Suspect
ACBM Identified in
the Management Plan

Room(s):	Photo	YES	NO	NEW	N/A	3YR
Ceiling:						
Walls:						
Floors:						
Thermal:						

Room(s):	Photo	YES	NO	NEW	N/A	3YR
Ceiling:						
Walls:						
Floors:						
Thermal:						

Room(s):	Photo	YES	NO	NEW	N/A	3YR
Ceiling:						
Walls:						
Floors:						
Thermal:						

Room(s):	Photo	YES	NO	NEW	N/A	3YR
Ceiling:						
Walls:						
Floors:						
Thermal:						

Inspector No. _____

Date: / /

Page of

SCHOOL: _____ LEA: _____

PART VIII. RESPONSE ACTIONS: Complete separate form for each Response Action documented.

1. Response Action Type:

Encapsulation Removal O&M other than small-scale, short duration
 Enclosure Repair Major Fiber Release

2. Location of Response Action in School (Be Specific)

Building: _____ Location in building: _____

3. Type of ACBM: Surfacing Thermal Miscellaneous

4. Size (square/linear feet) of project: _____

5. Start/Completion dates of project: _____

6. Response Action completed by:

School Employees (if so, at a Public School, conduct a separate Worker Protection Inspection)

Contractor

Name: _____

Address: _____

Telephone: _____

A. LEA/SCHOOL RESPONSIBILITIES	YES	NO	N/A	REMARKS
Designed by accredited persons [763.90(g)]				(See Worksheet Next Page)
Conducted by accredited persons [763.90(g)]				(See Worksheet Next Page)
Initial cleaning accomplished [763.91(c)] (except for O&M and/or repair)				Name: () Employee () Contractor
- HEPA-vac/steam clean all carpets				
- HEPA-vac/wet-clean all other floors and all other horizontal surfaces				
- dispose of debris, filters, mopheads, cloths, in sealed, leak-tight containers				
Person (LEA or Contractor) designated to visually inspect (i.e., following a response action) [763.90(i)(1)]				() LEA or () Contractor
Visual inspection conducted [763.90(i)(1)]				
Is an updated and detailed or descriptive blueprint, diagram, etc., included in the MP, indicating where (if any) ACBM or suspected ACBM assumed to be ACM remains in the school once response action completed [763.93(e)(8)]?				

WORKSHEET - ACCREDITED PERSONS

(To be used in conjunction with page 12)

	EMPLOYER/ NAME: ADDRESS	STATE/ACCREDITATION NO. (and name of course provider if no State Accreditation #)
PROJECT DESIGNER		
CONTRACTOR/ SUPERVISOR		
LIST NAMES OF WORKERS		

This information may not be available at the school, and may have to be obtained through a visit to the contractor, or through written correspondence or subpoena.

Inspector should review sign-in sheets and/or personnel daily air monitoring records, to verify number of workers and supervisors and their accreditation numbers.

OTHER PERSON RESPONSIBILITIES

B. ABATEMENT CONTRACTOR	YES	NO	N/A	REMARKS
Conducted by accredited workers (Use worksheet previous page)				Obtain time sheets of workers on job; workers' AHERA certificates. (LEA is not required to have this, may need to request of contractor)
C. AIR MONITORING CONTRACTOR				
For PCM and TEM - Air samples collected using <u>aggressive sampling</u> where TEM is to be used (per Appendix A) (not required for small-scale, short duration) - If PCM is applicable, minimum of 5 samples collected from each functional space - If TEM is applicable, minimum of 13 samples collected for each functional space				Air monitoring contractor: Name/Address: Obtain copies of drawings/diagrams establishing functional spaces
D. LABORATORY CONTRACTOR				
Air samples analyzed by: [763.90(i)(2)(ii)] - NIST-accredited lab (TEM) - Lab used protocol in Appendix A (TEM) - Lab enrolled in American Industrial Hygiene Association Proficiency Analytical Testing Program (PCM) - Lab used NIOSH method 7400 (PCM)				
E. TEM REPORTING (must provide to client) Appendix A, Unit II.H				
Concentration in s/mm ² and s/cc ³				Obtain copy of all final clearance documents
Analytical sensitivity used				
Number of asbestos structures				
Area analyzed				
Volume of air sampled				
Copy of count sheet				
Signature of lab official that laboratory met all specifications of method				
Official lab identification (letterhead)				
Type of asbestos				

SCHOOL: _____ LEA: _____

EXCLUSIONS: Complete for each School building claiming exclusion from inspection.

REFERENCE: 40 CFR Section 763.99

Exclusion(s) claimed for sampling area(s) as follows:

A. For friable ACM identified before 12/14/87

Location _____

Per accredited inspector (name) _____

State and accreditation number _____

Review statement. Comments: _____

Has material been assessed? _____ Yes _____ No

Note documentation of assessment record _____

B. For nonfriable ACM identified before 12/14/87

Location _____

Per accredited inspector (name) _____

State and accreditation number _____

Review statement. Comments: _____

Has material become friable? _____ Yes _____ No

Note documentation for friability _____

Has material been assessed? _____ Yes _____ No

Note documentation of assessment record _____

C. No ACM present determined before 12/14/87

Location _____

Per accredited inspector (name) _____

State and accreditation number _____

Review statement. Comments: _____

Was air sampling done? _____ Yes _____ No

Review record of sampling and analysis. Comments: _____

Sampling done in compliance with regulations? _____ Yes _____ No

Notice received by regional office of EPA? _____ Yes _____ No

SCHOOL: _____ LEA: _____

D. No ACBM present, as determined by State lead agency, under waiver

Location _____

Review statement. Date. _____

Comments: _____

Copy of statement in management plan? _____ Yes _____ No

E. Suspected ACBM is assumed ACM, determined before 12/14/87

Location _____

Per accredited inspector (name) _____

State and accreditation number _____

Review statement. Comments: _____

Has material become friable? _____ Yes _____ No

Note documentation for friability _____

Has material been assessed? _____ Yes _____ No

Note documentation of assessment record _____

F. Asbestos removed before 12/14/87; no asbestos present

Location _____

Per accredited inspector (name) _____

State and accreditation number _____

Per contractor (name) _____

State and accreditation number _____

Review statements. Review air clearance record.

Comments: _____

Notice received in regional EPA office? _____ Yes _____ No

Copy of statement in management plan? _____ Yes _____ No

COMMENTS:

APPENDIX E

**ASBESTOS-CONTAINING MATERIALS IN SCHOOLS; FINAL RULE AND NOTICE;
FEDERAL REGISTER, OCTOBER 30, 1987**

Federal Register

Friday
October 30, 1987

Part III

**Environmental
Protection Agency**

40 CFR Part 763

Asbestos-Containing Materials in Schools;
Final Rule and Notice



Printed on Recycled Paper

**ENVIRONMENTAL PROTECTION
AGENCY**
40 CFR Part 763
CFR PARTS 62048E; FRL-3269-81
**Asbestos-Containing Materials in
Schools**
AGENCY: Environmental Protection Agency (EPA).

ACTION: Final rule.

SUMMARY: EPA is issuing a final rule under section 203 of Title II of the Toxic Substances Control Act (TSCA), 15 U.S.C. 2643, to require all local education agencies (LEAs) to identify asbestos-containing materials (ACM) in their school buildings and take appropriate actions to control release of asbestos fibers. The LEAs are required to describe their activities in management plans, which must be made available to all concerned persons and submitted to State Governors. This final rule requires LEAs to use specially-trained persons to conduct inspections for asbestos, develop the management plans, and design or conduct major actions to control asbestos. Exclusions are provided for LEAs which have previously conducted inspections and for LEAs subject to any state requirement at least as stringent as the comparable requirement in this final rule.

DATES: In accordance with 40 CFR 23.5, this rule shall be promulgated for purposes of judicial review at 1 p.m. Eastern Standard Time on November 13, 1987. This rule shall be effective on December 14, 1987. The incorporation by reference in the rule is approved by the Director of the Federal Register as of December 14, 1987.

FOR FURTHER INFORMATION CONTACT: Edward A. Klein, Director, TSCA Assistance Office (TS-799), Office of Toxic Substances, Environmental Protection Agency, Rm. E-543, 401 M St., SW., Washington, DC 20460, Telephone: (202-554-1404).

SUPPLEMENTARY INFORMATION:
I. Background
**A. Description of the Enabling
Legislation**

On October 22, 1986, President Reagan signed into law the Asbestos Hazard Emergency Response Act (AHERA) which enacted, among other provisions, Title II of the Toxic Substances Control Act (TSCA) 15 U.S.C. sections 2641 through 2654.

Section 203 of Title II, 15 U.S.C. 2643, requires EPA to propose rules by April 20, 1987 (180 days after enactment), and

to promulgate final rules by October 17, 1987 (360 days after enactment), regarding: (1) The inspection of all public and private school buildings for ACM; (2) the identification of circumstances requiring response actions; (3) description of the appropriate response actions; (4) the implementation of response actions; (5) the establishment of a reinspection and periodic surveillance program for ACM; (6) the establishment of an operations and maintenance program for friable ACM; (7) the preparation and implementation of asbestos management plans by LEAs and the submission of the management plans to State Governors, who may review the plans and approve or disapprove them; and (8) the transportation and disposal of waste ACM from schools. This final rule implements the Title II requirements to issue the section 203 rules (except for transportation and disposal, as discussed further below).

Section 206 of TSCA Title II, 15 U.S.C. 2646, also requires EPA to issue by April 20, 1987, a final model accreditation plan for persons who inspect for asbestos, develop management plans, and design or conduct response actions. States are required to adopt an accreditation program at least as stringent as the EPA model within 180 days after the beginning of their next legislative session. Accreditation of laboratories which analyze asbestos bulk samples and asbestos air samples is also required by TSCA Title II. The National Bureau of Standards (NBS), U.S. Department of Commerce, is required to establish the bulk sampling accreditation program by October 17, 1987, and the air sampling accreditation program by October 12, 1988.

States were required to notify LEAs by October 17, 1987, regarding where to submit management plans. LEAs must submit those plans to their State no later than October 12, 1988. The plans must include the results of school building inspections and a description of all response actions planned, completed, or in progress. After receiving a management plan, States are allowed 90 days to disapprove the plan. If the plan is disapproved, the State must provide a written explanation of the disapproval and the LEA must revise the plan within 30 days to conform with the State's suggested changes. The 30-day period can be extended to 90 days by the State. LEAs are required to begin implementation of their management plans by July 9, 1989, and to complete implementation in a timely fashion.

Transport and disposal rules under TSCA section 203(h) have not yet been proposed. In accordance with TSCA

section 204(f), therefore, LEAs shall provide for transportation and disposal of asbestos in accordance with the most recent version of EPA's "Asbestos Waste Management Guidance." Applicable provisions of that document are included as Appendix D of this rule. Regulations governing transport of asbestos-containing waste, including school waste already regulated by the National Emission Standard for Hazardous Air Pollutants (NESHAP) (40 CFR Part 61, Subpart M) under the Clean Air Act (42 U.S.C. section 7401, et seq.), were promulgated by the Department of Transportation (DOT) (49 CFR Part, 173 Subpart J). The NESHAP and DOT rules must be followed, according to the "Asbestos Waste Management Guidance." These rules will be sufficient to ensure the proper loading and unloading of vehicles and to ensure the physical integrity of containers.

Section 203(1) requires Department of Defense schools to carry out asbestos identification, inspection and management activities in a manner comparable to the manner in which an LEA is required to carry out such activities. EPA interprets the language of this section which states that such activities shall be carried out "to the extent feasible and consistent with the national security" as recognition that existing agreements with foreign governments may make it difficult to carry out certain provisions of this regulation.

Since this rule has been signed by the EPA Administrator by October 17, 1987, the rule has been promulgated within the statutory time frame required by section 203 of TSCA Title II. In accordance with 40 CFR 23.5, however, solely for purposes of judicial review deadlines under section 19 of TSCA Title I, the rule is considered to be promulgated at 1 p.m. eastern time, 14 days after publication in the Federal Register. Thus, the period in which petitions for review of this rule may be filed under section 19 commences 14 days after publication.

B. Previous EPA Asbestos Activities

EPA has undertaken a variety of technical assistance and regulatory activities designed to control ACMs in buildings and minimize inhalation of asbestos fibers.

1. Technical Assistance Program. Since 1979, EPA staff have assisted schools and other building owners in identifying and controlling ACM in their buildings. Through a cooperative agreement with the American Association of Retired Persons (AARP), EPA has hired architects, engineers, and

other professionals to provide on-site assistance to school officials and other building owners. With AARP assistance, many school officials and building owners have effectively and safely dealt with ACM in ways that are appropriate for the particular situation in their building.

In addition, EPA has published state-of-the-art guidance to help identify and control asbestos in buildings. EPA's principal asbestos guidance document, "Guidance for Controlling Asbestos-Containing Materials in Buildings," (EPA 560/5-85-024, also known as the "Purple Book") was expanded and updated in June 1985, based on recommendations from recognized national experts. The document provides criteria for building owners to use in deciding which abatement method is most appropriate for each particular situation.

An important EPA goal has been to provide training for people involved in all aspects of the identification and control of asbestos. EPA has established five Asbestos Information and Training Centers to provide information concerning the identification and abatement of asbestos hazards and to train people in proper asbestos abatement techniques. The five centers are located at the Georgia Institute of Technology in Atlanta, the University of Kansas in Kansas City, Tufts University in Medford, Massachusetts, the University of Illinois in Chicago, and the University of California at Berkeley. Courses attended by more than 8,000 building owners and managers, maintenance personnel, school officials, architects, consultants, and abatement contractors have been taught at the centers since December 1984.

Finally, because of the large number of asbestos abatement projects and the short-term nature of many of them, EPA believes that contractors should be State-certified and that States should oversee projects to ensure that they are properly performed. EPA has provided models for State certification legislation and start-up funding for the initiation of 38 State oversight programs.

2. *EPA's regulatory program.* In the Federal Register of May 27, 1982 (47 FR 23360), EPA issued a school identification and notification rule (hereinafter called the 1982 Asbestos-in-Schools Rule). This rule required school officials by June 28, 1983, to inspect all school buildings for friable materials, take a minimum of three samples of each of friable material found, analyze samples using polarized light microscopy (PLM) to determine if asbestos is present, and keep records of

the findings. (40 CFR Part 763, Subpart F)

School district officials who found friable ACM were required to notify employees of the location of the materials, post a notification form in the primary administrative and custodial offices and faculty common rooms, provide maintenance and custodial employees with a guide for reducing asbestos exposure, and notify parent-teacher associations or parents directly of the inspection results.

EPA also issued a rule to protect public employees who perform asbestos abatement work in those States not covered by the current asbestos standard issued by the Occupational Safety and Health Administration (OSHA), U.S. Department of Labor. This rule (40 CFR Part 763, Subpart G) complements the OSHA asbestos regulations that protect private sector workers, and public employees in States with OSHA-approved State plans, from exposure to asbestos in occupational settings. The rule requires specific work practices, personal protective equipment, environmental monitoring, medical exams, and other provisions. The EPA rule also includes a provision not in the OSHA rule, i.e., notification to EPA generally 10 days before an asbestos abatement project is begun when public employees are doing the work. OSHA issued revised regulations regarding occupational asbestos exposure published in the Federal Register of June 20, 1986 (51 FR 22812). EPA issued in the Federal Register of February 25, 1987 (52 FR 5618), a revision of its worker protection rule to make it consistent with the new OSHA regulations.

3. *Recent developments.* EPA issued an Advance Notice of Proposed Rulemaking (ANPR) on August 12, 1986 (51 FR 28914), entitled "Asbestos-Containing Materials in Schools: Inspection, Notification, Management Plans and Technical Assistance." The purpose of this ANPR was to solicit comments on the future direction of EPA's program to reduce risks from asbestos in schools and to solicit information about a variety of technical and policy issues.

Prior to enactment of TSCA Title II, EPA had also initiated development of two new guidance documents on asbestos control. One document was being developed to provide more detailed guidance about assessing ACM in buildings and selecting abatement actions. A second document was being developed to provide more detailed guidance about practices and procedures which should be included in

an operations and maintenance program. Both documents had been developed with the assistance of panels of national experts who convened in Washington, DC to discuss technical and operational issues associated with these subjects. The work done in these two guidance documents has been valuable in developing provisions of this rule.

Also, in 1986, EPA, in cooperation with the National Institute for Occupational Safety and Health (NIOSH), U.S. Department of Health and Human Services, published "A Guide to Respiratory Protection for the Asbestos Abatement Industry" to provide practical guidance in the selection and use of respiratory protection to persons who work in asbestos abatement. The "Guide" also provides information relevant to other work activities, such as maintenance or repair, where the exposure to asbestos or the potential for exposure exists. The "Guide" was updated in September 1986 to include the text of the OSHA June 1986 revision of its asbestos standard.

C. *Development of the Rule*

The April 1987 proposed rule was developed through the process of regulatory negotiation, an alternative process for developing regulations in which individuals and groups with negotiable interests directly affected by the rulemaking work together with EPA in a cooperative venture to develop a proposed rule by committee agreement. The negotiation group was established as a Federal Advisory Committee and consisted of representatives of national educational organizations, labor unions, asbestos product manufacturers, the environmental community, asbestos abatement contractors, professional associations of architects, consulting engineers, industrial hygienists, States, and EPA.

After an organizational meeting in Washington, DC on January 23, 1987 (announced in the Federal Register of January 13, 1987, 52 FR 1377), the committee was established with 23 interests represented. Meetings were scheduled on February 5 and 6, February 17 and 18, March 9 and 10, March 26 and 27, and April 1 thru 3. During the March 10, 1987, meeting, the plenary session of the Committee accepted two more parties on the committee, one taking a seat representing State attorneys general, the other (representing big city schools) sharing a seat with a previously seated member representing big city schools.

Members of Negotiating Committee

The members of the negotiating committee and their interest represented are as follows:

1. Allen Abend, Council of Chief State School Officers.
 2. Bill Borwegen, Service Employees International Union/Jordan Barab, American Federation of State, County, and Municipal Employees (school service employees).
 3. Dr. William Brown, Baltimore City Schools/Michael Young, New York City Law Department (big city schools).
 4. Brian Christopher, Committee on Occupational Safety and Health.
 5. Donald Elisburg, Laborers' International Union and Laborers-AGC Education and Training Fund.
 6. Kellen Flannery, Council for American Private Education.
 7. Steve Hays, asbestos abatement engineer.
 8. Jesse Hill, manufacturers of asbestos pipe and block insulation products.
 9. Edward Kealy, National School Boards Association.
 10. Lloyd A. Kelley, Jr., Superintendent of Schools Rutland S.W. Vermont, Supervisory Union (rural schools).
 11. William Lewis, Manufacturers of asbestos surfacing products.
 12. Lynn MacDonald, Sheet Metal Workers International Association.
 13. Claudia Mansfield, American Association of School Administrators.
 14. Roger Morse, American Institute of Architects.
 15. David Ouimette, Colorado Department of Health (States with developing asbestos programs).
 16. Joel Packer, National Education Association.
 17. Robert Percival, Environmental Defense Fund.
 18. Miriam Rosenberg, National PTA.
 19. Paul Schur, Connecticut Department of Health/Dr. Donald Anderson, Illinois Department of Public Health (States with implemented asbestos programs).
 20. Robert Sheriff, American Industrial Hygienists Association.
 21. David Spinazzolo, Association of Wall and Ceiling Industries (asbestos abatement contractors).
 22. Susan Vogt, U.S. E.P.A.
 23. John Welch, Safe Buildings Alliance (former manufacturers of asbestos products).
 24. Margaret Zaleski, National Association of State Attorneys General.
- Facilitation Team and Executive Secretary
- Owen Olpin, Consultant to EPA
Eileen B. Hoffman, Federal Mediation & Conciliation Services

Kathy Tyson, U.S. E.P.A. (Executive Secretary)

Leah Haygood, The Conservation Foundation

Dan Dozier, Federal Mediation & Conciliation Services

John Wagner, Federal Mediation & Conciliation Services

The committee met in plenary sessions as well as in four work groups. Each work group focused on a cluster of related issues and reported to the plenary on options and recommendations. The plenary retained all decision-making power of the committee and often gave guidance to work groups. Generally, for each day of a plenary session, work groups convened the day before to prepare reports for the plenary. Neutral facilitators were present at all work group and plenary meetings to assist the negotiations in moving forward.

At the end of the 2-month negotiating process on April 3, 1987, and after extensive efforts, the committee was in general agreement on the vast majority of issues before it for the purposes of the proposal. Agreement to solicit further comment about alternatives was often important in developing provisions to be included as proposals. At the close of the negotiations, some items remained at issue and were not subject to universal agreement. These consisted of the following: definitions and response actions for damaged and significantly damaged thermal system insulation ACM (relates to being deemed nonfriable in the inspection section) and damaged and significantly damaged friable surfacing and miscellaneous ACM. Also, the definition of asbestos debris and the nature of cleaning practices (initial and routine) for friable ACBM or damaged or significantly damaged thermal insulation under the operations and maintenance section were still at issue. While extending negotiations beyond April 3, 1987, may well have enabled the committee to resolve these issues, the Congressional April 20, 1987, deadline for issuing a proposed rule precluded this possibility. Although Federal Register practices precluded the Agency from highlighting these issues in the text of the proposed rule, the public docket contains a copy of the proposed rule which clearly identifies the sections which contain these unresolved issues.

On April 3, 1987, the facilitators prepared, for members' signatures, statements supporting the use of the agreed-on portions of the regulatory language as a basis for a Notice of Proposed Rulemaking. Members representing 20 of the 24 interests seated

on the committee signed these statements. Members representing 4 of the interests seated on the committee did not sign the statements, due to the status of the unresolved issues described above. Mr. Paul Schur, a corepresentative of states with an implemented asbestos program (an interest that did not sign), signed in an individual capacity. All committee members, signatories and non-signatories alike, retained for themselves and for their constituencies all rights which bear on the rulemaking, including the right to comment fully during the public comment period.

Notably, signatories supporting the agreed-on regulatory language as a basis for a Notice of Proposed Rulemaking did so in considering that language as a whole. The proposed rule's agreed-on language was not necessarily ideal from any one party's perspective.

On April 17, 1987, the EPA Administrator signed the proposed rule developed through the negotiated rulemaking process. The proposed rule and the final Model Accreditation Plan were published in the Federal Register of April 30, 1987. EPA's decision to use the results of the negotiated rulemaking process as a basis for a proposed rule was explained in the April 30 document (52 FR 15833).

The 60-day public comment period ended on June 29. During this time period, EPA staff conducted 10 Regional briefings on the proposed rule for State officials and a number of additional briefings for interested parties. These parties included school administrators, school board officials and building owners. At the conclusion of the public comment period, the Agency had received over 170 comments on the proposed rule.

Several comments received by EPA requested the Agency to hold a public hearing on the proposed rule. As a result of these comments, EPA conducted public hearings on August 25 and 26. Over 25 individuals representing a variety of groups testified before EPA. The testimony and transcript from the public hearing were included in the rulemaking's docket.

D. Basis for EPA's Decision

After consideration of the proposed rule and all the evidence in the rulemaking record, including public comments on the proposed rule, EPA has decided to promulgate a final rule which is like the proposal in most respects. A relatively small number of changes have been made from the proposal to reflect public comments. In a number of cases EPA decided not to

make changes suggested by public comments. The Agency discusses its response either in this preamble or elsewhere in the rulemaking docket. EPA has determined that the regulations being announced in this edition of the Federal Register use the least burdensome methods which protect human health and the environment. This determination is supported by the discussion in this preamble and the entire rulemaking record. EPA adopts as the reasoning supporting its final rule the same basic reasoning in the preamble to the proposed rule (52 FR 15833). The provisions of this rule represent a reasonable way to carry out the statutory responsibilities of TSCA Title II.

EPA's analysis of risk placed in the rulemaking record when the proposed rule was issued shows that asbestos in schools could present a risk of concern and that the measures required by this rule are necessary to protect public health and the environment. EPA, as discussed later in this preamble, continues to rely on that risk analysis for support of the final rule. While there may be a wide divergence of opinion as to the actual health effects from asbestos exposure in schools, EPA believes there is little doubt that the decisionmaking process established by this rule needs to be implemented. This process is based on the responsibility of local officials, with input from the local community and with assistance from specially-trained experts, to develop management plans to implement appropriate measures that will abate the risk of asbestos in particular schools depending upon local circumstances.

This decisionmaking process ensures that the costs associated with this rule will be reasonable while protecting health and the environment. EPA has revised its costs somewhat from the analysis in its proposal, but has not changed its decision that these costs are reasonable. The detailed revisions to the Agency's costs analysis are discussed later in this preamble and in the rulemaking record. All public and private schools will experience the cost of a building walkthrough and visual inspecting, which EPA has determined will not exceed a few hundred dollars per school. Many schools, finding no asbestos, will experience no further costs. Most of the remaining schools that find ACM are expected to implement operations and maintenance programs along with training, periodic surveillance and reinspection. EPA has in fact revised downward the cost of the typical school asbestos program. It is

expected that this cost will be about \$5,530 per school year, a cost that is clearly minimal if there is a possibility that adverse health effects may be avoided. EPA also notes that some portion of the cost of the typical school program will not involve expenditures by the schools but are so-called "opportunity costs." These are costs assigned to the time spent by school employees in carrying out the activities required by the regulation. While these are real costs of the program, EPA expects that many schools will be able to conduct the typical school program through use of existing employees. Thus, the costs of the program will appear to the individual school officials and local communities to be somewhat less than EPA's economic analysis shows.

The decisionmaking process, summarized above and discussed in detail elsewhere in the preamble and rulemaking record, will ensure the reasonableness of other more extensive response actions for particular schools.

II. Provisions of the Final Rule

A. Introduction

This unit describes the various provisions of the final rule. The changes to the proposed rule made by the Agency based on comments received during the comment period are noted. Following a discussion of applicable regulatory definitions in Unit B and general responsibilities in Unit C, inspections and reinspections, sampling and analysis, and assessment of materials are discussed in Units D, E, and F, respectively. In Unit G, the major elements of the management plan, availability of the plan, and review of the plan by Governors are discussed.

Unit H describes requirements for response actions to be taken by LEAs under circumstances described in that section. Unit I explains requirements for training and periodic surveillance, and Unit J explains air sampling requirements for determining when a response action has been completed.

Unit K discusses requirements to use accredited persons to inspect buildings for asbestos, develop management plans, and design or conduct response actions. Requirements to protect abatement workers, custodial and maintenance staff and building occupants are explained in Unit L.

Waivers for all or part of a State asbestos program are described in Unit M, including information required in the waiver request and the process for granting or denying such waivers. Requirements for recordkeeping and enforcement provisions are described in Units N and O, respectively.

B. Definitions

Several important definitions (§ 763.83) are discussed below.

"Asbestos-containing building material (ACBM)" encompasses surfacing ACM, thermal system insulation ACM, and miscellaneous ACM in or on interior parts of the school building. These include specified exterior portions of school buildings that, for the purposes of this rule, may fairly be considered interior parts. EPA focused upon interior building materials because, in the Agency's experience, such materials represent a very large percentage of ACM in schools and appear to pose the greatest hazards to occupants.

The definition of "school building," in the rule however, makes it clear that exterior hallways connecting buildings, porticos, and mechanical system insulation are considered to be in a building and are subject to jurisdiction under TSCA Title II. The Agency believes that these exterior areas, by virtue of the accessibility of the ACM found there, warrant inclusion under the rule. Often, these exterior areas are connected to interior areas and could be considered to be a single homogeneous area in terms of a removal project design.

"Asbestos debris" is defined as pieces of ACBM that can be identified by color, texture, or composition. The definition also includes dust, if the dust is determined by the accredited inspector to be asbestos-containing. The Agency included dust in the definition based on public comments.

"Damaged or significantly damaged thermal system insulation ACM" is defined as ACM on pipes, boilers, and other similar components and equipment where the insulation has lost its structural integrity or its covering in whole or in part, is crushed, water-stained, gouged, punctured, missing or not intact such that it is not able to contain fibers. Damage may further be illustrated by occasional punctures, gouges, or other signs of physical injury to ACM; occasional water damage on the protective coverings/jackets; or exposed ACM ends or joints. Asbestos debris originating from adjacent ACBM may also indicate damage. This definition allows that, even though the insulation is marred, scratched or otherwise marked, it may not be, in the judgment of the accredited expert, damaged so as to release fibers. This definition varies from the proposed rule's language by providing more specific guidance on the physical characteristics that may constitute

damage. An accredited inspector shall classify this material based upon a determination of damage or significant damage (§§ 763.85 and 763.88) and an accredited management planner shall recommend in writing appropriate response actions (§ 763.93).

"Damaged friable surfacing ACM" is defined as ACM which has deteriorated or sustained physical injury such that the cohesion of the material or its adhesion to the substrate is inadequate, or which, for any other reason, lacks fiber cohesion or adhesion qualities. Such damage or deterioration may be illustrated by the separation of ACM into layers; separating of ACM from the substrate; flaking, blistering, or crumbling of the ACM surface; water damage; or significant or repeated water stains, scrapes, gouges, mars, or other signs of physical injury on the ACM. Asbestos debris originating from adjacent ACBM may also indicate damage. The definition allows that such surfacing material may show signs of water damage or physical injury without, in the judgment of the accredited expert, always demonstrating a lack of fiber cohesion or adhesion. This definition varies from the proposed rule's language by providing more specific guidance on the physical characteristics that may constitute damage. Accredited experts will classify material based upon a determination of damage and recommend appropriate response actions (§§ 763.85, 763.88, and 763.93).

"Miscellaneous ACM" includes a wide variety of materials in buildings, such as vinyl flooring, fire-resistant gaskets and seals, and asbestos cement. Damage to these materials is defined by the same cohesion and adhesion (if appropriate) properties as surfacing materials. The Agency believes this definition is sufficiently general to provide a reasonable approach to assessing damage to so wide a range of materials.

"Significantly damaged friable surfacing ACM" is defined as material in a functional space where the damage is extensive and severe. (The definition of significantly damaged friable miscellaneous ACM closely parallels the definition for significantly damaged surfacing ACM.) Again, this determination of significant damage will be made by accredited experts (§§ 763.85, 763.88, and 763.93).

This definition is a function of two major factors. The first factor deals with extent, or scope, of damage across a functional space. The Agency, in draft guidance, suggested that damage evenly distributed across one-tenth of a functional space or localized over one-

quarter represented significant damage (See Seventh Draft Report, "Guidance for Assessing and Managing Exposure to Asbestos in Buildings," November 7, 1986, p. 9). This represents a level of damage which a panel of experts, convened by the Agency, believed was generally, although perhaps not always, unreasonable to repair or restore.

The second factor involves the degree or severity of the damage itself. A major delamination of asbestos material, for instance, constitutes damage which is more severe than slight marks or mars. ACM, in the accredited expert's judgment, may be so severely damaged that there is no feasible means of restoring it to an undamaged condition.

Material has potential for significant damage as opposed to only potential for damage if it is subject to major or continuing disturbance, due to factors such as accessibility (i.e., subject to disturbance by school building occupants or workers in the course of the normal activities), or, under certain circumstances, vibration or air erosion. For example, material within reach of students above an entrance is clearly accessible. Thermal system insulation running along the base of a wall in a boiler room is also accessible. Material on the ceiling of a school auditorium, beyond the reach of students, is not. ACM on a high school gymnasium ceiling, which might be reached with basketballs or other objects, is subject to either classification, although an LEA might be well advised in this instance to implement a preventive measure to avoid disturbance.

EPA believes a wide range of "preventive measures" exist. One example is the installation of a stop to prevent a door from striking (and damaging) thermal system insulation ACM behind it. Another might involve restricting access of a corridor with surfacing ACM on a low ceiling, where students continually marred and vandalized the material. The problem of high school students hitting the gym ceiling with basketballs may be eliminated by a policy prohibiting such activities, if it can be effectively implemented. LEAs, in consultation with maintenance staff and, if desired, accredited experts, will identify a variety of creative and effective means of eliminating potential damage or significant damage to ACM.

If, however, such preventive measures cannot be effectively implemented, other response actions, including removal, will be required. The Act is clear that EPA, as part of its rulemaking, direct LEAs to mitigate those circumstances which involve potential for significant damage.

Based on public comments, the Agency added the terms "air erosion" and "vibration" to increase the specificity of the "potential significant damage" definition in the rule.

The "enclosure" definition requiring an airtight, impermeable, permanent barrier around ACBM to prevent the release of asbestos fibers into the air does not contemplate a vacuum-sealed area which is impossible to access. Instead, this definition, based on the National Institute of Building Sciences' (NIBS') "Model Guide Specifications, Asbestos Abatement in Buildings," July 18, 1986, is associated with precise engineering specifications, found in section 09251 and elsewhere in the NIBS' Model Guide, to construct enclosures sufficient to prevent fiber release. Also, this term, from the standpoint of permanence, is not intended to apply to mini-enclosures described in the EPA worker protection rule or Appendix B of the regulation, as these enclosures are used temporarily for repair or abatement activities.

"Functional space" is a term of art used by the accredited expert to appropriately characterize an area as containing "significantly damaged friable surfacing ACM" or "significantly damaged friable miscellaneous ACM." The "functional space" may be a room, group of rooms, or a homogeneous area, as determined appropriate by the accredited expert. Note that the functional space includes the area above a dropped ceiling as well as crawl spaces.

C. LEA General Responsibilities

The final rule requires LEAs to designate a person to carry out certain duties and ensure that such person receives training adequate to perform the duties.

Section 763.84 requires LEAs to ensure that: (1) inspections, reinspections, periodic surveillance and response action activities are carried out in accordance with the final rule; (2) custodial and maintenance employees are properly trained as required by this final rule; (3) workers and building occupants are informed annually about inspections, response actions, and post-response action activities including reinspections and periodic surveillance; (4) short-term workers (e.g., telephone repair workers) who may come in contact with asbestos in a school are provided information about locations of asbestos-containing building material (ACBM); (5) warning labels are posted as required by this final rule; and (6) management plans are available for review and that parent, teacher, and

employee organizations are notified of the availability of the plan.

Lastly, LEAs shall consider whether a conflict of interest may arise from the interrelationship among accredited personnel (e.g., the management planner and abatement contractor) used by the LEAs and whether that should influence the LEA's selection of accredited personnel. EPA added this provision after reviewing public comments.

D. Inspections and Reinspections

1. Inspections. Section 763.85 requires LEAs to have an accredited inspector visually inspect all areas of each school building to identify locations of all friable and nonfriable suspected ACM, determine friability by touching, and either sample the suspected ACM or assume that suspected materials contain asbestos. The inspector must then develop an inventory of areas where samples are taken or material is assumed to contain asbestos. Finally, the accredited inspector is required to assess the physical condition of friable known or assumed ACM as required under § 763.88.

2. Exclusions. Section 763.99 defines conditions that would exclude an LEA from all or part of the initial inspection. The accredited inspector is a key element in the exclusion process. For all inspection exclusions, areas previously identified as having friable ACM or nonfriable ACM that has become friable have to be assessed as required under § 763.88. All information regarding inspection exclusions shall be placed in the management plan.

Five types of exclusions for LEAs are provided in the final rule. First, LEAs do not need to have an initial inspection conducted in specific areas of a school where ACM has already been identified. Second, if previous sampling of a specific area of the school indicated that no ACM was present, and the sampling was done in substantial compliance with the final rule, the LEA does not have to perform an initial inspection of that area. Third, LEAs do not have to inspect specific areas of schools where records indicate that all ACM was removed. Fourth, LEAs can receive an inspection exclusion for schools built after October 12, 1988 (the date when management plans are to be submitted to Governors), if no ACM was specified for use in the school. Fifth, States that receive a waiver from the inspection requirements of the rule can grant exclusions to schools that had performed inspections in substantial compliance with the rule.

3. Reinspections. Section 763.85(b) requires LEAs to have accredited inspectors conduct reinspections at least

once every 3 years. The inspector must reinspect all known or assumed ACM and shall determine by touching whether nonfriable material has become friable since the last inspection. The inspector may sample any newly friable materials or continue to assume the material to be ACM. The inspector shall record changes in the material's conditions, sample locations, and the inspection date for inclusion in the management plan. In addition, the inspector must assess newly friable known or assumed ACM, reassess the condition of friable known or assumed ACM, and include assessment and reassessment information in the management plan.

Section 763.85(c) states that thermal system insulation that has retained its structural integrity and that has an undamaged protective jacket or wrap is treated as nonfriable. Based on public comments, EPA changed the wording in this section from "deemed" nonfriable to "treated as" nonfriable.

E. Sampling and Analysis

1. Sampling. Section 763.86 permits the LEA to assume that suspected ACM is ACM. If the LEA does not assume suspected ACM to be ACM, the LEA shall use an accredited inspector to collect bulk samples for analysis.

EPA expects that a school is likely to sample only friable suspected ACM. For nonfriable suspected ACM, EPA anticipates most schools will assume this material contains asbestos. However, the final rule does not preclude a school from sampling all of its suspected ACM, both friable and nonfriable. Sampling of friable surfacing materials should follow the guidance provided in the EPA publication "Simplified Sampling Scheme for Friable Surfacing Materials" (EPA 560/5-85-030a). To determine whether an area of surfacing material contains asbestos, sufficient samples shall be taken in a statistically random manner to provide data representative of each homogeneous area being sampled.

In most cases, sampling of thermal system insulation requires an accredited inspector to take at least three randomly distributed samples per homogeneous area. The final rule includes three exceptions to this requirement for sampling of thermal system insulation. First, an accredited inspector can determine through visual inspection that the material is non-ACM (e.g., fiberglass). Second, only one sample is required for patched homogeneous areas of thermal system insulation. Third, an accredited inspector needs to collect an appropriate number of samples to

determine whether cement or plaster tiles are ACM.

For friable miscellaneous material or nonfriable suspected ACM, an accredited inspector must collect bulk samples in an appropriate manner.

2. Analysis. Section 763.87 requires analysis of bulk samples by laboratories accredited by NBS. In the period before NBS has developed its accreditation program, laboratories which have received interim accreditation from EPA may be used to analyze samples. The interim program is explained in a notice in the Federal Register (52 FR 33470, September 3, 1987). After receiving the sample results, the LEA must consider an area to contain asbestos if asbestos is present in any sample in a concentration greater than 1 percent. Compositing of samples (mixing several samples together) is prohibited.

The 1982 EPA rule "Asbestos in Schools: Identification and Notification", 40 CFR 763, Subpart F, required analysis of bulk asbestos samples by PLM and provides a protocol for analysis in its Appendix A to Subpart F. EPA requires use of the same PLM method for this final rule. As it develops the accreditation process for laboratories performing analysis of bulk samples, NBS will consider whether to change the PLM protocol. If NBS recommends changes, EPA will amend this rule accordingly.

F. Assessment

Section 763.88 outlines a general assessment procedure to be conducted by an accredited inspector during each inspection or reinspection. The accredited inspector is required to classify ACM and suspected ACM assumed to be ACM in the school building into broad categories appropriate for response actions. In addition, after reviewing public comments, the Agency decided to require the inspector to give reasons in the written assessment supporting his classification decisions. Assessment may include a variety of considerations, including the location and amount of material, its condition, accessibility, potential for disturbance, known or suspected causes of damage, or preventive measures which might eliminate the reasonable likelihood of damage. The LEA is directed to select an accredited management plan developer who, after a review of the results of the inspection and the assessment, shall recommend in writing appropriate response actions.

G. Management Plans

Section 763.93 requires LEAs to develop an asbestos management plan for each school under its administrative control or direction. The plan must be developed by an accredited asbestos management planner. Some of the major components required in the plan include: A description of inspections and response actions; an assurance that accredited persons were used to conduct inspections, develop management plans, and design or conduct response actions; and a plan for reinspection, periodic surveillance, and operations and maintenance.

Each LEA is required to maintain a copy of the management plan in its administrative office, and each school is required to maintain a copy of the school's management plan in the school's administrative office. These plans are to be made available for inspection by the public without cost or restriction. LEAs must notify in writing, parent, teacher, and employee organizations of the availability of management plans upon submission of the plan to the State and at least once each school year. The requirement for written notification was added after the Agency reviewed comments from the public. In addition, based on public comments received on the proposed rule, the Agency has included in the final rule a requirement that in the absence of any such organizations, the LEA shall provide written notice to that group (e.g., parents) of the availability of the management plan.

Section 763.93 requires LEAs to submit their management plans to their States on or before October 12, 1988. Each LEA must begin implementation of its management plan on or before July 9, 1989, and complete implementation of the plan in a timely fashion.

H. Response Actions

The final rule identifies five major response actions—in § 763.91 operations and maintenance (O&M) and in § 763.90, repair, encapsulation, enclosure and removal—and describes appropriate conditions under which they may be selected by the LEA. The final rule also identifies the steps which shall be taken to properly conduct and complete the response actions.

The LEA is required to select and implement in a timely manner the appropriate response action. The response action selected shall be sufficient to protect human health and the environment. From among the response actions that protect human health and the environment, the LEA

may select the response action that is least burdensome.

LEAs are required to use accredited persons to design or conduct response actions. Section 763.90 specifically provides that nothing in the rule shall be construed to prohibit the removal of ACM from a school building at any time, should removal be the preferred response action of the LEA.

Different response actions are required for each of the five major categories of damaged or potentially damaged ACM. These categories are:

1. Damaged or significantly damaged thermal system insulation ACM.
2. Damaged friable surfacing or miscellaneous ACM.
3. Significantly damaged friable surfacing or miscellaneous ACM.
4. Friable surfacing or miscellaneous ACM, and thermal system insulation ACM which has potential for significant damage; and
5. Friable surfacing or miscellaneous ACM, thermal system insulation ACM which has potential for damage.

In each of the categories above, procedures for appropriately controlling or abating the hazards posed by the ACM are set forth. For damaged or significantly damaged thermal system insulation, the LEA must at least repair the damaged area. If it is not feasible, due to technological factors, to repair the damaged material, it must be removed. Further, the LEA must maintain all thermal system insulation in an intact state and undamaged condition. If damaged friable surfacing or miscellaneous ACM is present, the LEA shall encapsulate, enclose, remove, or repair the damaged area. After selecting the appropriate response actions that protect human health and the environment, the LEA may consider local circumstances, including occupancy and use patterns within the school building, and economic concerns, such as short- and long-term costs. When friable surfacing or miscellaneous ACM is significantly damaged, the LEA must immediately isolate the functional space and then must remove the material in the functional space, unless enclosure or encapsulation would be sufficient to contain fibers.

Response actions for ACM with potential for damage and potential for significant damage emphasize O&M and preventive measures to eliminate the reasonable likelihood that damage will occur. When potential damage is possible, the LEA must at least implement an O&M program. If there is potential for significant damage and preventive measures cannot be effectively implemented, response

actions other than O&M or area isolation may be required.

Section 763.91 requires the LEA to implement an operations, maintenance and repair (O&M) program for any school building in which friable ACM is present or assumed to be present in the building. Any material identified as nonfriable ACM or nonfriable assumed ACM which is rendered or is about to be rendered friable as a result of activities performed in the school building shall be treated as friable. For example, if nonfriable ACM wallboard was about to be sanded, operations and maintenance procedures would be required. The O&M program, which must be documented in the LEA management plan, consists of worker protection (summarized in Unit II.K.), cleaning, operations and maintenance activities (also in Unit II.K.), and fiber release episodes.

An initial cleaning is required, which employs wet methods and is conducted at least once after completion of the inspection and before the initiation of a response action other than an O&M activity. In addition, the rule also requires that an accredited management planner make a written recommendation to the LEA regarding whether additional cleaning is needed. The recommendation on additional cleaning was added to the rule based on public comments.

The final rule requires that O&M activities (other than small-scale, short-duration activities) which disturb asbestos shall be designed and conducted by persons accredited to do such work. (A discussion of what constitutes small-scale, short-duration projects is given in Appendix B to Subpart E.) Finally, procedures are provided for responding to fiber release episodes—the uncontrolled or unintentional disturbance of ACM. For minor episodes (i.e., those involving 3 square or linear feet or less of ACM), basic cleaning and containment practices for O&M staff are listed. For larger amounts, accredited personnel are required to respond.

I. Training and Periodic Surveillance

The LEA shall ensure that all members of its maintenance and custodial staff receive at least 2 hours of awareness training. The LEA must also ensure that staff who conduct any activities which will disturb ACM receive an additional 14 hours of training. Specific topics to be covered in the 2-hour and 14-hour training courses are listed in § 763.92(a).

Section 763.92(b) requires periodic surveillance to be performed at least

once every 6 months. The LEA may use unaccredited personnel such as custodians or maintenance workers to conduct surveillance activities. Periodic surveillance requires checking known or assumed ACBM to determine if the ACBM's physical condition has changed since the last inspection or surveillance. The date of the surveillance and any changes in the condition of the ACBM must be added to the management plan.

J. Completion of Response Actions

After performing a thorough visual inspection, air testing is used to determine if a response action has been completed (§ 763.90(i)). Clearance air monitoring will not be required for small-scale, short-duration projects. Phase Contrast Microscopy (PCM) is allowed for response actions involving 260 linear or 160 square feet or less, the amounts used to trigger removal requirements under EPA's NESHAP (40 CFR Part 61, Subpart M).

Section 763.90 requires the use of transmission electron microscopy (TEM) for most removal, enclosure, and encapsulation response actions. Laboratories are to be accredited by the National Bureau of Standards (NBS). Until NBS develops its program, LEAs shall use laboratories that use the inter-laboratory protocol described in Appendix A to Subpart E. EPA continues to believe that TEM is the method of choice for air sample analysis because, unlike PCM, TEM analysis can distinguish asbestos from other fibers and detect the small thin fibers found at abatement sites. Therefore the use of TEM will significantly improve the adequacy of cleanup and is recommended over PCM when available. However, due to limited availability of microscopes for air sample analysis and the cost and time associated with TEM analysis, the final rule allows a phase-in period for the TEM requirement. For 2 years after the rule becomes effective, LEAs may choose to use PCM for response actions comprising 3,000 square or 1,000 linear feet or less. For 1 year after this, LEAs may use PCM for clearance of projects of 1,500 square or 500 linear feet or less. LEAs retain full discretion to require use of TEM at any time for any project.

The criterion for determining whether a response action is complete when using PCM will require multiple samples (minimum of five) with clearance allowed only if all of the individual samples are below the limit of reliable quantitation of the PCM method (0.01 fibers/cm³). The rule requires persons to use the NIOSH 7400 method for PCM clearance.

The rule has a three-step process for using TEM to determine successful completion of a removal response action. The first step is a careful visual inspection, as mentioned above. The two steps that follow involve a sequential evaluation of the five samples taken inside the worksite and five samples taken outside the worksite. Both sets of samples must be taken at the same time to ensure that atmospheric conditions are the same and that the comparisons are valid. The inside samples are analyzed first. If the average concentration of the inside samples does not exceed the filter background contamination level (discussed in detail in Appendix A to Subpart E), then the removal is considered complete.

Step three is taken if the average concentration of the samples taken inside the worksite are greater than the filter background contamination level. In this case, an encapsulation, enclosure, or removal response action is considered complete when the average of five samples taken inside the worksite is not significantly larger than the average of five samples taken outside the worksite. A statistical comparison using the Z-Test must be used to determine whether the two averages are significantly different. (A discussion on how to compare measured levels of airborne asbestos with the Z-Test is given in Appendix A to Subpart E.) If the concentrations are not significantly different, then the response action is considered complete. If the inside average concentration is significantly higher, recleaning is required and new air samples must be collected and evaluated after the worksite has been cleaned and reinspected.

K. Use of Accredited Persons

Section 206 of Title II of TSCA requires accreditation of persons who:

1. Inspect for ACM in school buildings.
2. Prepare management plans for such schools.
3. Design or conduct response actions with respect to friable ACM in such schools (other than O&M activities).

Section 206 of Title II of TSCA required EPA to develop a Model Contractor Accreditation Plan by April 20, 1987. The Agency met this deadline and the model plan was published in the Federal Register of April 30, 1987 (52 FR 15875). The plan appears as Appendix C to Subpart E. A notice listing EPA approved courses appears elsewhere in this issue of the Federal Register.

Persons can receive accreditation from a State that has instituted an

accreditation program at least as stringent as the requirements of the Model Plan. In addition, persons in States that have not yet developed programs at least as stringent as the Model Plan can receive accreditation by passing an EPA-approved training course and exam that are consistent with the Model Plan. The Model Plan requires persons seeking accreditation to take an initial course, pass an examination, and participate in continuing education.

L. Worker and Occupant Protection

Worker protection requirements for removal, encapsulation and/or enclosure response actions are already in effect under the EPA worker protection rule (40 CFR Part 763, Subpart G); and the OSHA construction standard (29 CFR 1926.58). EPA's NESHAP standard, although designed to protect outdoor air, also provides incidental protection to workers.

Essentially, under § 763.91, the regulation extends coverage of EPA's worker protection rule at 40 CFR 763.121 to maintenance and custodial personnel in schools who perform O&M activities but are not covered by OSHA's construction standard or an asbestos regulation under an OSHA approved State plan. The EPA worker protection rule itself extended the same protections as the OSHA construction standard to asbestos abatement workers who are employees of State and local governments and who are not otherwise covered by OSHA regulation or OSHA approved State plans. This final rule further extends these standards to O&M workers who are LEA employees. These regulations basically establish a Permissible Exposure Limit (PEL) of 0.2 fibers per cubic centimeter (f/cm³) over an 8-hour period for abatement project workers exposed to airborne asbestos and an action level of 0.1 f/cm³ which triggers a variety of worker protection practices. These practices include air monitoring, regulated work areas, engineering and work practice controls, respiratory protection and protective clothing, hygiene facilities and practices, worker training, medical surveillance, and recordkeeping requirements.

As an alternative, however, OSHA's standard allows employers to institute the provisions of its Appendix G in the case of small-scale, short-duration projects rather than comply with the full worker protection standard. Appendix B to Subpart E is an adaptation of OSHA's Appendix G and, thus, allows more flexibility in dealing with minor (small-scale, short-duration) projects.

None of the requirements of the OSHA standard or the EPA worker protection rule would apply if asbestos concentrations are below the action level (0.1 f/cm^3). There are, however, fairly stringent requirements established by OSHA and adopted by EPA for purposes of this rule to show that levels are below this action level for any activity, including small-scale, short-duration projects. These requirements are discussed in the following paragraphs.

Employers who have a workplace or work operation covered by the EPA worker protection rule must perform initial monitoring to determine the airborne concentrations of asbestos to which employees may be exposed. If employers can demonstrate that employee exposures are below the action level (0.1 f/cm^3) by means of objective data, then initial monitoring is not required. If initial monitoring indicates that employee exposures are below the PEL, then periodic monitoring is not required.

The exemption from monitoring in § 763.121(f)(2)(iii) of the worker protection rule for employers who have historical monitoring data is included in recognition of the fact that many employers have conducted or are currently conducting exposure monitoring. This exemption would prevent these employers from having to repeat monitoring activity for O&M activities that are substantially similar to previous jobs for which monitoring was conducted.

However, for purposes of this rule, EPA requires that such monitoring data must have been obtained from projects conducted by the employer that meet the following conditions:

1. The data upon which judgments are based are scientifically sound and collected using methods that are sufficiently accurate and precise.

2. The processes and work practices in use when the historical data were obtained are essentially the same as those to be used during the job for which initial monitoring will not be performed.

3. The characteristics of the ACM being handled when the historical data were obtained are the same as those on the job for which initial monitoring will not be performed.

4. Environmental conditions prevailing when the historical data were obtained are the same as for the job for which initial monitoring will not be performed.

When OSHA issued the final asbestos standard on June 20, 1986 (51 FR 22664), it published data from routine facility maintenance which "demonstrates a potential for exposure of maintenance personnel to concentrations exceeding

0.5 f/cm^3 (fibers per cubic centimeter)." OSHA further stated:

With the exception of wet handling, which is feasible in only very limited situations due to problems such as electrical wiring, and the use of HEPA vacuums for the clean-up of any debris generated during maintenance activities, OSHA believes that there do not appear to be any feasible engineering controls or work practices available to reduce these potential exposure to levels below the 0.2 f/cm^3 PEL and that respirators will be required to comply with the 0.2 f/cm^3 PEL.

LEAs are required, under the provisions of § 763.91 of this rule, to ascertain, through monitoring procedures or historic monitoring data, and to document that these levels have not been reached.

Under § 763.91, basic occupant protection requirements are established (regardless of air level) for any O&M activity in a school building which disturbs ACBM. Primarily, access must be restricted, signs posted, and air movement outside the area modified. Necessary work practices shall be implemented to contain fibers, the area shall be properly cleaned after the activity is completed, and asbestos debris must be disposed of in a proper manner.

Section 763.95 requires the LEA to attach warning labels immediately adjacent to any friable and nonfriable ACBM or suspected ACBM in routine maintenance areas, such as boiler rooms, until the material is removed. They shall read, in large size or bright colors, as follows: CAUTION: ASBESTOS. HAZARDOUS. DO NOT DISTURB WITHOUT PROPER TRAINING AND EQUIPMENT.

M. Waiver for State Programs

Section 763.98 provides a procedure to implement the statutory provision that a State can receive a waiver from some or all of the requirements of the final rule if the State has established and is implementing or intends to implement a program of asbestos inspection and management at least as stringent as the requirements of the final rule. The rule requests specific information to be included in the waiver request submitted to EPA, establishes a process for reviewing waiver requests, and sets forth procedures for oversight and rescission of waivers granted to States.

The final rule requires States seeking waivers to submit requests to the Regional Administrator for the EPA Region in which the State is located. Within 30 days of receiving a waiver request, EPA must determine whether the request is complete. Within 30 days after determining that a request is

complete, EPA will issue in the Federal Register a notice that announces receipt of the request and solicit written comments from the public. Comments must be submitted within 60 days. If, during the comment period, EPA receives a written objection to the State's request or a written request for a public hearing, EPA will schedule a public hearing (as is required by TSCA Title II) to be held in the affected State after the close of the comment period. EPA will issue a notice in the Federal Register announcing its decision to grant or deny, in whole or in part, a request for waiver within 30 days after the close of the comment period or within 30 days following a public hearing.

N. Recordkeeping

Section 763.94 requires that LEAs collect and retain various records which are not part of the information submitted to the Governor in the management plan. Records required by the rule include those pertaining to certain events which occur after the submission of the management plan, including: Response actions and preventive measures; fiber release episodes; periodic surveillance; and various operations and maintenance activities. Records required must be maintained in a centralized location in the administrative office of the school and the local education agency.

For each homogeneous area where all ACBM has been removed, the LEA shall retain such records for 3 years after the next reinspection.

O. Enforcement

TSCA Title II, section 207(a) provides civil penalties of up to \$5,000 per day for violations of Title II of TSCA when an LEA fails to conduct inspections in a manner consistent with the final rule, knowingly submits false information to the Governor, or fails to develop a management plan in a manner consistent with the final rule, knowingly submits false information to the Governor, or fails to develop a management plan in a manner consistent with this rule. TSCA Title II, section 16 provides civil penalties of up to \$25,000 per day for violations of Title I of TSCA when a person other than an LEA violates the final rule. Criminal penalties may be assessed if any violation committed by any person (including a LEA) is knowing or willful.

The rule provides a process for filing complaints by citizens and requires that such complaints be investigated and responded to within a reasonable period

of time consistent with the nature of the violation alleged.

P. Transport and Disposal

Section 203(h) of TSCA Title II requires EPA to promulgate regulations which prescribe standards for transportation and disposal of asbestos-containing waste material. The final rule on transport and disposal was to be issued by October 17, 1987, as part of the final regulations under TSCA Title II. EPA had planned to use revised NESHAP regulations on disposal of asbestos waste to satisfy the requirements of section 203(h) of Title II. However, completion of the NESHAP revision has been delayed.

Accordingly, under section 204(a) of Title II, LEAs shall carry out the requirements described in section 204(f). Section 204(f) states that "the local education agency shall provide for the transportation and disposal of asbestos in accordance with the most recent version of the Environmental Protection Agency's "Asbestos Waste Management Guidance" (or any successor to such document)." Under TSCA Title I, section 15(1)(D), as amended by AHERA section 3, EPA may enforce the provisions of section 204(f). The chapters of the waste management guidance document which pertain to transport and disposal have been included in this Federal Register notice's Appendix D to Subpart E.

EPA intends to issue the revised asbestos NESHAP as a proposed rule under section 203(h) of TSCA Title II to govern transport and disposal of asbestos waste from schools. Section 204(f) will be in effect until a final rule under section 203(h) is promulgated. Further, EPA also intends that the NESHAP waste disposal rules will ultimately regulate asbestos emissions from waste disposal when they are promulgated.

III. Response to Public Comments

This unit discusses EPA's responses to the most significant issues raised in the comments received from the public. A more comprehensive version of EPA's response to comments received has been placed in the public record.

Comments and responses are organized in this unit according to the relevant section of the regulation.

A. Scope and Purpose

Comments were received regarding three aspects of the Scope and Purpose section (§ 763.80). Comments from a group of technical practitioners, which included architects, engineers, and consultants involved in asbestos control, suggested that preschool nurseries, colleges, and universities should be

included in the schools covered by the regulation. A second issue raised in the comments recommended that nonfriable materials not be subject to the inspection and management plan requirements of the regulation. Third, many commenters expressed concerns that the October 12, 1988, deadline for submitting management plans to States could not be met.

On all three of these issues, the statutory language of Title II is clear and the regulation reflects the statute. Title II only gives EPA authority to regulate "local education agencies." The definition of "local education agency" in section 202(7) refers only to public and private elementary and secondary schools. Section 203 of Title II requires inspection for "asbestos-containing materials" which includes both friable and nonfriable asbestos (see section 202). Management plan provisions of Title II also refer to "asbestos-containing material." Finally, section 205(a) of Title II specifies that "720 days after enactment" of this title (i.e., October 12, 1988) local education agencies must submit management plans to the Governors of their States. Based on the comments received, EPA is concerned about the ability of LEAs to complete and submit management plans by October 12, 1988. The deadline, however, is prescribed in the statute.

B. Definitions

1. *Asbestos containing building material.* In general, union groups and education groups urged the incorporation into the rule of all exterior ACM and other asbestos material such as asbestos gloves. Conversely, several school administration groups argued to limit the rule to interior areas only and not to include asbestos gloves and other such materials within the scope of the rule.

TSCA Title II was designed to provide school children and school employees with a safe environment while attending classes or working inside school buildings. The statute in several places specifically authorizes EPA to regulate asbestos "in" school buildings. Furthermore, an extension to all exterior areas would result in only small health benefits since most exterior ACM is enclosed in solid matrices such as cement, is nonfriable, and is not generally disturbed. Dealing with exterior materials would constitute an expensive undertaking for schools in terms of inspection and management plan development for such small health benefits. The Agency believes the proposed rule's coverage of all interior areas and a few specified exterior areas that function similar to interior areas

protects the health of building occupants.

EPA also interprets TSCA Title II as not including nonbuilding asbestos products within the scope of the rule. The definition of friable ACM in the statute (section 202(6)) refers to ACM applied on ceilings, walls, structural members, piping, duct work, or any other part of a building. At no point does the statute cite as examples nonbuilding materials such as asbestos gloves. If certain schools such as vocational schools have other types of asbestos products in their buildings (e.g. automobile brake linings) they may want to voluntarily address these issues in a fashion similar to the AHERA requirements.

2. *Asbestos debris.* A number of commenters have sought to have dust included in the definition of asbestos debris. Some other commenters favor expanding the definition of asbestos debris to include dust in the immediate vicinity of friable ACM. Other commenters representing former asbestos manufacturers and schools argued that dust should not be included as part of the definitions of asbestos debris or as evidence of damage.

The Agency believes that an accredited expert be allowed to exercise judgment in determining whether asbestos fibers or dust constitute damage. EPA believes that accredited experts can determine whether dust has originated from adjacent ACBM. The Agency maintains, however, that not all dust in schools is ACM. An accredited person on-the-scene in a school building can make the determination of damage due to the presence of dust based on training and experience. As a result, EPA has included in the final rule's definitions of asbestos debris the flexibility for the accredited inspectors to determine dust to be asbestos containing.

3. *Significantly damaged friable surfacing and miscellaneous ACM.* Many commenters thought that significantly damaged asbestos should be defined to be damage that is either extensive "or" severe, rather than extensive "and" severe as in the proposal. These commenters included education groups and unions. They believe that either condition can pose a significant health threat.

The Agency disagrees with the comments. Significantly damaged friable surfacing and miscellaneous ACM must refer to the most severely damaged areas where the damage is also widespread. Damage that is widespread or only severe is of concern, but should not necessarily require a response

action of the same magnitude as those situations where both are present.

4. *Operations and maintenance.* Many commenters recommended that O&M apply to all ACBM, not just friable ACBM. Some of these commenters were primarily concerned with the need for periodic surveillance of all ACBM, not just friable ACBM as suggested by the proposed rule's definition.

The Agency disagrees with the recommendation to extend O&M to nonfriable ACBM. Section 203(f) states that O&M is for friable ACBM. Periodic surveillance (see section 203(g) and training requirements (see generally section 206), however, apply to all ACM. The final rule makes clear these statutory distinctions. Section 763.91 dealing with O&M refers to friable asbestos and § 763.92 dealing with periodic surveillance and training apply to all ACM (including friable and nonfriable materials).

5. *Potential damage and potential significant damage.* Many groups commented on these definitions. A group representing former asbestos manufacturers argue that the best indicator of potential damage is evidence of past damage. Some union groups and State attorneys general commented that in addition to accessibility, potential significant damage ought to include air erosion and vibration as disturbance factors.

The Agency believes adding the terms air erosion and vibration increases the specificity of the rule and clarifies the original intent of the proposed regulation. As a result, the Agency accepts the comments regarding air erosion and vibration and has added definitions for each of these terms. EPA believes that whether past damage is the best indicator of potential damage is irrelevant to defining potential damage. As asbestos material ages, it may become more susceptible to damage. The Agency, accordingly, believes that all circumstances must be considered in assessing potential damage.

6. *Repair and enclosure.* A sizable number of commenters suggested that EPA change the wording of both of these definitions to require the preventing of fiber release. In the proposed rule, repair "contained" fiber release and enclosure "controlled" fiber release. In addition, another commenter suggested adding the requirements of inaccessibility and permanence for enclosed ACM. One commenter wanted to expand the enclosure definition to account for spray applied enclosures.

EPA agrees with the recommendation regarding fiber release. Preventing fiber release clarifies the intent of the repair definition. An enclosure is an airtight,

impermeable, permanent barrier and as such must by definition prevent the release of fibers.

7. *Vibration and air erosion.* Several commenters suggested these terms be defined in the rule.

EPA agrees with the commenters and has added definitions for both terms.

C. LEA Responsibilities

Several issues in this section were commented upon by LEAs, education associations, school administrators and school board groups and state government officials.

Comments were received on the requirement in the proposed rule for the LEA to designate a person to ensure that the requirements of this section are properly implemented. Some commenters felt that this requirement was unnecessary while other commenters felt that the requirement of the proposed rule was sufficiently flexible to allow for differences in size and capabilities of LEAs. Some commenters favored appointment of an asbestos program manager with more stringent training or qualification requirements for that person. EPA has retained for the final rule the requirement for a designee to ensure proper implementation of LEA responsibilities. This approach provides the benefits of having a single overseer for the asbestos program without the added burden of more stringent training or qualification requirements.

Many parties commented on the requirement that LEAs ensure that short-term workers (telephone repair workers, administrators, etc.) who may come in contact with asbestos are "instructed in safe work practices" regarding ACM. Commenters felt that this placed an undue burden on LEAs and that the responsibility for this kind of instruction for short-term workers rests with their employer. EPA agrees with these comments and has eliminated this requirement while retaining the provision that LEAs ensure that short-term workers are provided information about the locations of ACBM.

The potential for conflicts of interest between accredited inspectors, management planners, and persons who design or conduct abatement actions also was discussed by a variety of commenters. Some commenters suggested that EPA should require the accredited persons to sign a conflict of interest statement certifying no party has a financial relationship with other parties involved in the inspection, development of the management plan, or performance of the response action. The Agency recommends that LEAs consider requesting a full financial disclosure

from all potential accredited professions. It may be more efficient for LEAs to use the same firm to conduct the inspections and develop the management plans to promote continuity in the process. However, LEAs should be wary of employing one firm to develop both the management plan and conduct response actions, since the management planner's recommendations about response actions could be influenced by the potential profitability of the recommendation. A similar conflict of interest problem could exist when an abatement firm and an air monitoring firm are directly or indirectly connected. The air monitoring firm could conceivably provide false results that indicate a building is safe for reoccupancy and the abatement contractor has successfully completed the job. EPA has modified the LEA responsibilities section of the rule to specifically state that LEAs must consider conflict of interest issues. However, any resolution of such issues is solely at the discretion of the LEA.

D. Inspections and Reinspections

Comments received on this section dealt with three subjects: the scope of the inspection; the standardization of the inspection; and the inspection process itself.

Regarding the scope of the inspection comments were received on whether dormitories should be included in the inspection requirement. EPA concurs with the comments supporting the proposed rule's language including dormitories in the inspection. The Agency believes this is a reasonable extension of the definition of school building since the intent of AHERA is to protect children while attending school. Comments were also received regarding incorporation into the rule of all exterior ACM and other asbestos-containing products. As described in the "Definitions" part of this Unit, EPA believes these additions are unwarranted.

Comments were received regarding the use of a standardized inspection form, and commenters also urged EPA to issue a guidance document for inspectors and management planners. EPA disagrees with comments supporting a mandatory inspection form. The Agency believes LEAs, accredited inspectors, and States should be allowed the flexibility to develop inspection forms to suit their needs. However, EPA is developing a guidance document for LEAs which explains the requirements of this rule, and that document will contain, among other

things. A suggested format for inspection and management plans. In addition, EPA has developed a model course for accreditation of inspectors and management planners which will provide uniform guidance to inspectors and management planners regarding their responsibilities. Further, before any course is offered to accredit inspectors and management planners, it must be reviewed and approved by EPA in accordance with the provisions of the Model Accreditation Plan. This review process will help ensure that inspectors and management planners receive uniform guidance.

The Agency received comments about the requirement for reinspection every 3 years by an accredited inspector. Some commenters supported this requirement, others thought the reinspection should be more frequent, still others felt that the reinspection should be less frequent and that use of an accredited inspector was unnecessary. EPA believes a 3-year reinspection requirement to be conducted by an accredited inspector is necessary. The Agency is concerned that an annual reinspection as suggested by some commenters would prove unduly burdensome to LEAs while providing limited information. The rule provides for periodic surveillance activities at least twice a year to keep track of changes in the ACBM's condition. On the other hand, the Agency believes a reinspection every 5 years is too long a period of time for a school's ACBM not to be checked by an accredited inspector. ACBM could deteriorate substantially over a 5-year period of time. The Agency disagrees with comments suggesting that unaccredited persons should be permitted to perform reinspections. Accredited inspectors will have special training to determine changes in the physical condition of ACBM. The purpose of periodic surveillance, which may be conducted by unaccredited personnel, is to note observable changes in the condition of ACBM. For example, a periodic surveillance check would notice a water leak through an ACBM ceiling. The Agency believes the combination of the semiannual periodic surveillance check and the 3-year reinspection by an accredited inspector provides for adequate scrutiny of ACBM present in schools.

Industry commenters commended the proposed rule for allowing thermal system insulation "that has retained its structural integrity and that has an undamaged protective jacket or wrap that prevents fiber release" to be "deemed" nonfriable for the purposes of this regulation. Others commenters

believed this is a misrepresentation of the true nature of the material, which is still friable under its covering.

The Agency agreed with comments that state friable thermal system insulation cannot properly be "deemed" nonfriable. This constitutes an inaccurate depiction of the true nature of this material. An undamaged jacket on thermal system insulation may be properly seen as an enclosure, which prevents fiber release and reduces hazard, but does not change the characteristics of material friability behind or under the enclosure.

However, while the Agency considers it inappropriate to "deem" or characterize friable thermal system insulation as nonfriable, it is appropriate to "treat" this material as nonfriable. EPA, in its guidance and technical assistance activities, has traditionally treated undamaged friable thermal system insulation as nonfriable, for the purposes of cleaning and other O&M activities.

Accordingly, the regulation at § 763.85(c) has been modified to state that thermal system insulation that has retained its structural integrity and that has an undamaged protective jacket or wrap that prevents fiber release shall be treated as nonfriable.

Ultimately, however, the change in wording does not change the intent of the regulation that thermal insulation that has both an intact protective jacket and has retained structural integrity should be subject to periodic surveillance and preventive measures, and that custodial and maintenance workers must be trained to deal with such material. Furthermore, if the thermal insulation is disturbed or is about to be disturbed such that it would be rendered friable, all applicable O&M and response action provisions will apply. EPA believes that this is consistent with NESHAP, which considers such material to be friable when disturbed or removed.

E. Bulk Asbestos Sample Measurement

Comments suggested that EPA allow use of electron microscopy and X-ray diffraction (XRD) for the analysis of bulk samples.

For purposes of this rule, PLM will be used for analyzing bulk samples for asbestos. The analytical method to be employed is the EPA "Interim Method for the Determination of Asbestos in Bulk Insulation Samples" (40 CFR 763, Appendix A to Subpart F). EPA feels that the existing EPA PLM protocol is technically sufficient for determining asbestos fiber identity and quantity. Currently, allowance is made in the EPA PLM protocol for additional

determination of a fiber's quantity by XRD. Additionally, validated methods for the use of electron microscopy in bulk asbestos analysis do not exist at this time. New developments in electron microscopy or XRD technology may lead EPA to reconsider the use of these tools for primary analysis at a future time.

A number of comments sought clarification on the laboratory accreditation program. Two laboratory accreditation programs are currently being developed by the NBS for laboratories which analyze bulk and air samples for asbestos. The bulk accreditation program is expected to be operational in early FY89. The air accreditation program is expected to be complete in late FY89.

Until the NBS bulk accreditation program is complete, EPA will establish an interim accreditation program for laboratories which analyze bulk samples by PLM. EPA will provide interim accreditation to laboratories which correctly identify four samples as either asbestos-containing or nonasbestos-containing. EPA announced the availability of this program in the Federal Register of September 3, 1987 (52 FR 33470). The deadline for laboratory participation in the first round was September 30, 1987. A formal listing of the first round of accredited labs will be available in January 1988. Individual laboratories will be informed of their performance by letter in December 1987. Laboratories which did not participate in the first round of accreditation will be considered in the second round of accreditation, which is scheduled for April 1988.

F. Assessment

One comment regarding assessment of the physical condition of the material by accredited inspectors was that EPA should require accredited inspectors to give reasons for their assessment conclusions. EPA agrees with the comment. This requirement would provide reviewers of management plans at the State level with additional, useful information in judging whether the management plan accurately reflects the condition of the school building. The Agency believes the increase in the recordkeeping burden is small. As a result, § 763.86(b) has been changed to require the accredited inspector to give written reasons for the decision to classify ACBM.

Some commenters suggested that management planners should be required to use one assessment method in developing recommendations for LEAs about response actions. These commenters suggested a variety of

algorithms and "decision tree" methods for consideration. Other commenters supported the proposed rule's language to allow various assessment methods. The Agency believes it is not possible to point to one assessment method as most capable of producing an appropriate response action recommendation: there are a number of suitable assessment methods available for use by accredited management planners. EPA's management planner accreditation course will provide instruction about a variety of such methods.

G. Response Actions

1. *Protection of human health and the environment in response action selection.* Several commenters, particularly several State attorneys general and unions, expressed concern that the structure of the response action subsection allowed costs and other considerations to be granted equal consideration with protecting human health and the environment.

EPA has clarified language in the response action subsection (§ 763.90) to underscore its original intent in the proposed rule that protecting human health and the environment is the prime consideration in selecting an appropriate response action. Comments from the Service Employees International Union were particularly useful in this regard.

The Agency believes its response action approach is consistent with congressional direction to apply the prior and inviolable standard of protecting human health and the environment, and allows the consideration and selection of the least burdensome method only after the overriding health determination is made.

2. *Air monitoring for determining response actions.* Several commenters, primarily from industry, encouraged the establishment of air monitoring standards as the primary basis for hazard assessment. Most commenters, however, supported EPA's position in the proposed rule.

Traditionally, EPA has recommended assessment of asbestos in schools by visual evaluation of qualitative factors such as the material's condition, physical characteristics, and location. A careful examination of physical characteristics of the material, conducted by a trained expert, provides a direct method for determining both the relative degree of hazard and the likelihood of future fiber release.

EPA continues to discourage the use of air monitoring as the primary technique for assessing asbestos hazards, since that method only measures current conditions and

provides no information about potential and future levels of fiber release. Further, when the costs and technical requirements necessary for acquiring truly meaningful air monitoring data are considered, the Agency maintains that assessment of qualitative factors continues to be the appropriate method for assessment of hazards and selection of response actions which protect human health and the environment. However, air monitoring may provide useful supplemental information, when conducted in conjunction with a comprehensive visual inspection.

Several industry commenters proposed that EPA adopt air monitoring standards for damaged and significantly damaged ACM. The levels most often proposed were 0.01 fibers per cubic centimeter (f/cm^3) for damaged friable ACM; 0.1 f/cm^3 for significantly damaged friable ACM, with fibers longer than 5 μm as measured by transmission electron microscopy (TEM) in each case. No commenters, however, provided any substantive rationale for choosing such levels. The Agency believes that such standards used for purposes of assessing asbestos hazards could not ensure protection of human health and the environment as intended by TSCA Title II. As factors to be used in determining whether response actions are necessary, these numerical values provide a false sense of precision regarding the presence and severity of asbestos hazards and the appropriateness of a given response action. For the same reasons cited in the above discussion of the use of air monitoring, the Agency disagrees with the suggestion that a numerical standard is appropriate as the primary criterion for selection of response actions.

3. *Specificity in definitions related to response actions.* Many commenters felt that more objective and definite response action descriptions should be provided by EPA with regard to damage-related definitions and response actions. Some believed that too much discretion was vested in accredited experts, who would be making technical judgments to advise LEA decisions. One comment cited EPA's economic impact analysis of the rule as an illustration of the lack of objectivity of the response action descriptions. In this analysis, EPA's own regional asbestos coordinators varied greatly in their estimates of what percentages of materials in schools in their regions fell into the various damage conditions described in TSCA Title II.

In response to comments, the Agency has added much more illustrative detail to three important definitions—damaged and significantly damaged friable

thermal system insulation ACM; damaged friable miscellaneous ACM; and damaged friable surfacing ACM—which will help accredited experts better identify asbestos hazards in schools. EPA agrees that this language, taken from the preamble of the proposed rule, adds necessary clarification to conditions which may constitute ACM damage and warrant appropriate response actions. These descriptions were not available to Agency regional asbestos coordinators when they gave their estimates of damage in schools. In addition, the extensive training program developed in the rule should achieve much greater consistency in evaluating and assessing asbestos in schools, although perfect consistency will never be achieved.

However, a rigid response action decision structure is not appropriate for this rule, primarily because many asbestos hazard situations are too circumstantial and appropriate response actions are too "hazard specific" to fit neatly into a discrete set of prescriptive categories.

There appears, then, no substitute for the judgment of the accredited management planner, who must recommend appropriate response actions within the general requirements established in § 763.90. That section provides a process by which a range of available choices may be considered by the accredited expert and selected by the LEA to best protect human health and the environment from each particular asbestos hazard in the school.

Under the provisions of the regulation, LEAs may take into account a variety of particular considerations, such as local circumstances, technological feasibility of appropriate response actions, economic considerations, and other relevant factors in selecting the least burdensome method. Such factors, however, may be considered only after the response action has been determined to protect human health and the environment.

Finally, accreditation alone does not imply "expertness." It only assures a suitable and common level of competence and awareness which is necessary for inspection, assessment and response action recommendation. School officials are well-advised to consider a variety of factors, including quality of training, experience, and prior performance of accredited personnel in selecting inspectors, management plan developers, abatement project designers, and contractors for school asbestos projects.

4. *Removal as the "only" appropriate response action for significantly*

damaged ACM. Several State attorneys general, among several other commenters, contended that "[i]n cases of significant damage, the only appropriate response is to remove the material, as this is the only action which adequately protects human health and the environment."

EPA disagrees that removal is the only appropriate response in all cases of significantly damaged ACM, particularly thermal system insulation. There may indeed be particular circumstances of significant damage in which removal is both inappropriate and undesirable.

EPA agrees that, particularly with regard to significantly damaged friable miscellaneous and surfacing ACM, isolation of the functional space and removal is often the most appropriate (and possibly, only acceptable) response. Encapsulation, for example, would be an acceptable response action for friable surfacing ACM only under very limited circumstances, given current technology. However, the Agency will not categorically preclude response actions of repair, encapsulation, or enclosure which, under certain circumstances, may also protect human health and the environment.

5. Implementation of response actions in a timely fashion. Several commenters asked the Agency to clarify the requirement that appropriate response actions be selected and implemented by LEAs "in a timely fashion," perhaps by establishing time limits for particular actions.

Many of the response action provisions themselves imply timeliness in response. Damaged or significantly damaged thermal system insulation ACM or its covering, for example, must be constantly maintained in an intact state and undamaged condition. In addition, the rule specifies, in the case of significantly damaged friable surfacing or miscellaneous ACM, that LEAs must *immediately* isolate the functional space and restrict access, unless isolation is not necessary to protect human health and the environment.

The Agency does not believe it is able to set the "timely fashion" or specify time limits or deadlines in applying such requirements in all cases any better than it is able to prescribe a single response action for every particular damage category. LEAs, in the context of particular asbestos hazards, in consultation with accredited experts and in full view of school-community groups, are responsible for determining appropriate schedules for their asbestos response actions.

However, LEAs should be advised that in providing "a schedule for beginning and completing each preventive measure and response action" as required in § 763.93(e)(6), the LEA is specifying what constitutes implementation of preventive measures and response actions in a timely fashion for that LEA. EPA and State enforcement officials will be monitoring LEA adherence to these schedules to determine whether enforcement actions are warranted against those schools which fail to meet their own deadlines for completing preventive measures and response actions.

6. Repair for significantly damaged friable thermal system insulation ACM. Several commenters, State attorneys general and the unions in particular, questioned the efficacy of repair for significantly damaged friable thermal system insulation ACM.

Repair is often successful in preventing fiber release from damaged thermal system insulation and, after assurance that it will protect human health and the environment, an LEA may find repair the least burdensome method of response. Techniques for thermal system insulation ACM repair are well-developed and easily accomplished. Furthermore, the nature of the material makes it especially susceptible to quick remediation with simple techniques.

EPA recognizes that severely damaged friable thermal system ACM may warrant removal to protect human health and the environment, but this is not always the case. If feasible, as determined by the accredited expert, and protective of human health and the environment, repair may be an appropriate response action for this level of damage under particular circumstances. Further, new and emerging repair technologies may offer LEAs new ways to prevent fiber release, protect human health and the environment, and postpone the major disruption often associated with asbestos removal projects until a more appropriate time.

Finally, "feasibility" does *not* imply, as one commenter feared, "repair first and only if repair is impossible, then remove." There is no predisposition toward repair, but rather a prior consideration of repair feasibility as a check to avoid a major disruption to the material, through removal, if it is not necessary or desirable.

7. Airborne asbestos fiber measurement for clearance of abatement sites. EPA has received comments on the use of transmission electron microscopy (TEM), scanning electron microscopy, and phase contrast

microscopy for the analysis of air samples taken for clearance air monitoring. Comments dealt with issues that included the possible uses of each of these analytical methods for clearance air monitoring, as well as issues specific to the use of TEM.

The final rule sets forth TEM as the analytical method to be used for analysis of samples taken for clearance air monitoring although the TEM requirement will be phased-in gradually. EPA convened a committee of leading microscopists from private and Federal laboratories to produce an analytical protocol specific for post-abatement clearance monitoring. Each microscopist had extensive experience in TEM, scanning electron microscopy (SEM), and airborne asbestos analysis. The unanimous conclusion of the microscopists was that, for purposes of clearance air monitoring, TEM was the technique of choice. Consequently, an interim TEM protocol has been formulated for clearance air monitoring of asbestos abatement sites in schools.

EPA chose to require analysis by TEM for four reasons: (1) TEM is capable of measuring the smallest diameter fibers; (2) based on existing, validated methods, a formal protocol has been developed; (3) TEM has been validated by intra- and inter-laboratory comparisons conducted by NBS; and (4) a formal laboratory accreditation program for TEM laboratories is currently under development by the NBS.

Phase Contrast Microscopy (PCM) will be allowed for clearance of small projects (removal of less than 160 ft² or 280 linear feet of asbestos) and during a phase-in of the TEM requirement, for clearance of some larger projects. This phase-in period will give laboratories a period of time to acquire and install TEM instruments, and will permit economical clearance of small projects where clearance analysis costs are a significant portion of total abatement costs.

PCM analysis must be made using the latest version of the NIOSH 7400 method. Two other methods of PCM analysis were considered: the OSHA/EPA Reference Method (ORM) and P&CAM 239. The ORM cannot be used for area clearance because it is intended for personal sampling of abatement workers during abatement work clearance following an abatement action. P&CAM 239 will not be allowed since both NIOSH and OSHA have determined that the NIOSH 7400 method is more accurate and reliable.

The PCM method is nonspecific for asbestos and it cannot detect the small

thin fibers found at abatement sites. EPA research data has shown that PCM is often inadequate for post-abatement monitoring of airborne asbestos. These data indicate that sites which were shown to be clean with PCM data were found by TEM data to be still contaminated. Therefore, reoccupancy of sites initially cleared by PCM, and thus, assumed to have been adequately cleaned, may in fact result in exposures to asbestos.

SEM, for purposes of this rulemaking, was determined to be inadequate for building clearance for the following reasons: (1) Currently available methodologies are not validated for the analysis of asbestos fibers; (2) SEM is limited in its ability to identify the crystalline structure of a particular fiber. (SEM analysis is therefore confined to identification of structures by elemental composition and morphology); (3) recent studies conducted by NBS have evaluated several types of scanning electron microscopes and the variability between these instruments. (NBS has found the image contrast of the microscopes is difficult to standardize between individual scanning electron microscopes); and (4) currently no laboratory accreditation program exists for accrediting SEM laboratories. EPA is aware of two methodologies for SEM: a draft method currently in its initial review by the American Society for Testing and Materials (ASTM) and an Asbestos International Association (AIA) protocol. Neither method has been validated. Additionally, NBS has determined that the AIA method has inherent difficulty when examining certain types of asbestos.

Currently, a laboratory accreditation program is in development for TEM by NBS. Additionally, the AIHA PAT Program evaluates laboratories conducting PCM analyses. The NBS has unconditionally stated that it will not formulate a laboratory accreditation program for SEM based on existing methodologies. Until suitable methodologies are developed, EPA will continue to monitor and investigate the progress of SEM methodologies and research for asbestos analysis. New developments in SEM technology may allow SEM to be considered as an acceptable asbestos measurement tool in the future.

Regarding the use of TEM, several commenters suggested that the aspect ratio (length to width) should be extended to 10:1. For the purpose of TEM measurement by the methods in Appendix A, any elongated particle having a minimum length of 0.5 μm , parallel sides, and an aspect ratio

(length to width) of 5:1 or larger is defined as a fiber. This represents a change in the previous EPA proposed TEM methodologies which examine fibers with aspect ratios of 3:1 and above; it follows the direction set by NIOSH in proposing modified counting rules in the 7400 method. It is consistent with the panel of microscopists' observations that asbestos structures have aspect ratios equal to and greater than 5:1 whereas the majority of nonasbestos structures, minerals and particles, for example, gypsum, have aspect ratios of less than 5:1. Analysis of these nonasbestos structures tends to comprise a large portion of the time required for sample analysis. EPA believes that further research is needed to justify the extension of aspect ratio to 10:1. Consequently, for the purpose of TEM building clearance, fibers must have an aspect ratio of at least 5:1.

8. *Phase-in period for TEM.* Several commenters asked that the phase-in period for requiring TEM analysis be lengthened, abbreviated, or eliminated altogether. EPA believes the 3-year phase-in period for requiring TEM for all but the smallest abatement jobs allows commercial laboratories the necessary time to purchase and set up additional TEM instruments. In December 1987, estimates developed by EPA's Office of Research and Development (ORD) indicated that there were approximately 62 commercial laboratories in the country which advertised the ability to perform TEM analysis on airborne asbestos samples. Testimony received during the August 25 and 26 public hearings for this rulemaking as well as information gathered by EPA staff, indicate that many laboratories intended to purchase additional TEM equipment. In addition, several laboratories own more than one transmission electron microscope.

EPA believes that an increased demand for TEM instruments will drive the supply of instruments, and has stipulated the 3-year phase-in to allow commercial laboratories time to react to the increased demand. The Agency believes a shorter phase-in period, or requiring the immediate use of TEM for all jobs would create a substantial burden on schools and laboratories. The delay to clear abatement jobs and the high cost associated with TEM analysis for relatively small jobs would be burdensome. EPA has consequently decided to retain the length and type of phase-in described in the proposed rule.

H. Operations and Maintenance and Worker Protection

1. *Worker protection and "small-scale-short-duration" activities.* Several

commenters, particularly union groups, advised the Agency to increase worker protection standards and alter the definition and requirements for small-scale, short-duration projects (as defined by Appendix B to Subpart E) prescribed by the Occupational Safety and Health Administration's (OSHA's) and EPA's relevant worker protection regulations. In particular, comments focused on permissible exposure limits (PEL), the allowance of historical air monitoring data, respiratory protection, and the practice of glove bag removal. Other commenters recommended no change, citing OSHA's primacy in this area.

This final regulation, through the provisions of the EPA worker protection rule, extends coverage already in place for O&M workers in private schools under the OSHA construction standard to public sector O&M workers now unprotected in schools. This OSHA standard also includes Appendix B of this rule. LEAs may implement the provisions of Appendix B of the rule instead of the full scope of the EPA/OSHA worker protection regulation when they conduct small-scale, short-duration activities (all of which are presumed to exceed the action level of 0.1 f/cm³).

The Agency maintains that OSHA is the most appropriate Federal agency for determining worker protection policy. As noted in the preamble to the proposed rule, EPA believes that OSHA's recently completed worker protection rulemaking, a lengthy and detailed process focused specifically on such issues, is as appropriate to school O&M workers via the EPA worker protection rule as it is to other private sector O&M workers. EPA continues in this belief and no commenters have indicated substantive reasons why the OSHA protections should not be followed.

Therefore, the Agency does not intend to reassess the OSHA determination with respect to issues such as PEL, the use of historical air monitoring data, respiratory protection, and the allowance of glove bag removal. EPA will, however, change the provisions of its worker protection rule (and hence, this regulation) to conform with any modifications subsequently adopted by OSHA.

Finally, with regard to the definition of "small-scale, short-duration" activities, the Agency provides further clarification of the OSHA definition in Appendix B to Subpart E by adding five additional points which may be used to define such projects. EPA believes these additional considerations are instructive

and useful, but will not require their consideration in defining "small-scale, short-duration" activities.

2. *Respiratory protection.* Many organizations, in their comments, advocated the mandatory use of respiratory protection for all operations and maintenance O&M work which might affect asbestos-containing materials ACM.

Once again, the Agency maintains that OSHA is the most appropriate Federal agency for determining worker protection regulations policy, including appropriate respiratory protection, and EPA finds that OSHA's respiratory protection regulations which govern O&M workers in the private sector are equally relevant in schools. EPA does not intend to reassess the OSHA determination in this regard.

However, the regulation does require specific respiratory protection training for all O&M workers who conduct any activities which will result in the disturbance of ACM. Such training must include: (1) Notification of information on the use of respiratory protection as contained in the EPA/National Institute for Occupational Safety and Health (NIOSH) "Guide to Respiratory Protection for the Asbestos Abatement Industry," September 1986 (EPA-560/CTTS-86-001); and (2) hands-on training on the use of respiratory protection.

EPA believes the effect of these training requirements will be to ensure that LEAs determine the appropriate level of protection for its O&M workers and that workers are adequately informed of protection levels and properly trained in respiratory protection practices.

Comments expressed concern that O&M workers could be at risk in situations where peak exposures occur and, thus, may need additional respiratory protection. The comments claim these exposures may exceed OSHA standards and are unpredictable. EPA, however, believes its regulations cover these situations since the regulations provide that respirators shall be supplied in areas where airborne concentrations "can reasonably be expected to exceed permissible limits" 40 CFR 763.121(e) (1) and (4). Since this regulation requires warning labels for asbestos materials (§ 763.95), workers and LEAs should be aware of situations in which asbestos materials will be disturbed to such an extent that respirators may be appropriate.

3. *Right to refuse work.* Several unions provided comments which advanced a proposal to include a right to refuse unsafe or illegal work in the regulation. EPA believes that the issue of right to refuse work, which is protected under

other labor legislation and worker protection regulations, is more properly addressed by the Department of Labor. This is a general worker protection issue, outside the scope of EPA's expertise. Comments noted that OSHA has promulgated a general regulation affecting an employee's right to refuse work (29 CFR 1977.12(b)(2)) and argue that EPA should extend this safeguard to school workers in the same way the Agency extended other OSHA safeguards to school workers. This point, however, is misplaced. EPA does not believe it should extend general OSHA safeguards to school workers. EPA is not charged with general worker protection, although it is appropriate to extend specific asbestos related standards to school workers.

AHERA section 211(a) does prohibit State or LEA discrimination in any way against someone because that person has provided information relating to a potential violation of the Act or regulation, including a school directive that workers perform unsafe or illegal activities. The Act allows for any employee or representative of employees who believes they have been fired or otherwise discriminated against to apply for review at the Department of Labor under section 11(c) of the Occupational Safety and Health Act.

4. *Routine cleaning.* Several commenters, particularly the State attorneys general and the unions, recommended that the Agency require routine or periodic cleaning in areas with friable ACM, as outlined in the EPA Purple Book.

The Agency has traditionally recommended, as a prudent measure, routine cleaning by wet methods in school areas with asbestos-containing materials, particularly when they are friable. Monthly wet cleaning has been recommended in previous EPA guidance for areas where friable surfacing ACM is present and semiannual wet cleaning is suggested in areas with damaged thermal system insulation ACM.

Other commenters stated the belief that improper cleaning on a regular basis might disturb the material and could actually increase fiber levels in the air. Further, periodic cleaning in limited-access areas, such as pipe tunnels, would not appreciably reduce exposure to school occupants and might actually increase hazard to custodial workers who conduct the cleaning.

EPA is persuaded by the comments that a decision on routine cleaning by the accredited management planner in the context of the particular asbestos hazard is appropriate. The final rule now requires that the accredited management planner shall make a

written recommendation to the LEA regarding the appropriateness and frequency of additional cleaning, which must be included in the management plan.

I. Management Plans

The contents of the management plan were the subject of numerous comments from various parties. In general, commenters urged that the contents of the plan not exceed the items required in the statutory language of Title II. EPA believes that the language of Title II regarding management plans was made very prescriptive to enhance accountability, aid review by States, and improve enforcement of the regulation. The Agency has determined that the additional requirements in the regulation are consistent with the intent of the Act and that the additional information will be useful to parents, employees, accredited persons, State reviewers, and EPA enforcement officials.

The manner in which parents and employees should receive notification about the availability of asbestos management plans was the subject of many comments. In general, LEAs and school administrative groups favored the flexibility provided under the proposed rule, which allowed LEAs to notify parent and employee organizations without specifying the exact form of notification. Other commenters such as educational associations and environmental groups preferred written notification to individual parents and employees as a way of ensuring full awareness of the availability of the plan. EPA has modified this provision of the final rule to require written notification to parent and employee organizations, or, in the absence of such organizations, written public notice regarding plan availability. (Notification in the absence of the organizations could be in the form of a newspaper ad, an article in an LEA newsletter or various other forms.) The change provides a means of notification that should increase awareness of the plan, retain flexibility of LEAs regarding the exact form of the notification, and aid efforts to enforce the notification provisions.

Some commenters suggested that there is no need to notify parents of the availability of the plan. Title II, section 203(i)(5), states that the LEA "shall notify parent, teacher, and employee organizations of the availability of such plan."

Comments were also received regarding the need for an annual notification requirement even though the

plan has not changed since the previous notification. The purpose for the annual notification is to ensure that parents and employees new to the LEA each year have an opportunity to be informed about the availability of the plan. Other commenters suggested that annual notification about the plan should include any asbestos abatement planned for that year, and that the notification requirement be expanded to inform parents whenever actions are taken under the management plans. EPA believes that these ends are achieved in a less burdensome fashion through § 763.84(c), which requires that the LEA inform workers and building occupants, or their legal guardians, at least once each school year about inspections, response actions, and post-response action activities, including periodic surveillance activities that are planned or in progress.

Regarding access to the plan, commenters suggested the plan required to be maintained at the individual school should not be the plan for the entire LEA, but only the plan for that school. The final rule has been clarified to specify that a school needs to have available only that part of the LEA's plan which pertains to that school. Another comment regarding access to the plan came from private school groups interested in limiting access to parents, students, and employees, thereby excluding the general public. EPA believes that this is contrary to Title II, section 203(i)(5), which states that the plan shall be available "for inspection by the public, including teachers, or other school personnel, and parents." Since persons involved with the school are only among those "included" in the public, EPA interprets the statute to preclude limiting access to all other members of the public.

J. State Waivers

Commenters suggested that the opportunity for a public hearing regarding a State's request for waiver should be granted upon request, rather than in response to a written request which details specific objections, as required in the proposal. EPA believes that by requiring a written statement, it is ensuring that hearings have been requested for a valid reason, thereby discouraging individuals from arbitrarily or capriciously requesting a hearing.

Comments were also received which suggested that documents submitted by States seeking waivers should be made public. State waiver requests will be made available as part of the public record required when EPA issues a notice in the Federal Register

announcing receipt of the request and opportunity for public comment.

Commenters suggested that waiver requests from local governments should be permitted. Section 203(m) of Title II is clear in limiting waiver requests to States which have established and are implementing a program of asbestos inspection and management.

Commenters suggested that waivers should be granted to programs which are "substantially equivalent" to the regulation, rather than "at least as stringent." Section 203(m) of Title II clearly states that waivers are to be granted to programs "at least as stringent."

Commenters suggested that States with programs requiring only inspection of friable materials be allowed to seek waivers. The Agency believes that section 203(m) of Title II, which states that EPA "may waive some or all" of the regulatory requirements of Title II allows States which require inspection of friable materials in a manner at least as stringent as section 203 of Title II to be granted a waiver. The LEAs of that State would still be required to comply with the Title II requirements for inspection of nonfriable materials as well as all other Title II requirements for which the State did not have a program at least as stringent.

Other comments on the State waiver provisions will be considered as they are raised in proceedings affecting individual States.

K. Exclusions

Comments on the proposed exclusion criteria ranged from general support to opposing any exclusions. Some commenters indicated EPA's 1982 rule was frequently not complied with, dealt only with friable ACM, and the inspectors were not required to have accreditation. As a result, these commenters believe few if any exclusions could be granted based on the 1982 rule. Several commenters believe the term "substantial compliance" is vague and unenforceable. In addition, other commenters agreed that the requirement in the proposed rule to assess friable ACM would require inspectors to visually inspect all areas anyway. Lastly, some commenters suggested that requiring an accredited inspector to determine whether the LEA qualifies for an exclusion is too stringent and thus, unreasonable.

TCSA Title II directs the Agency to promulgate regulations which will provide for the exclusion of any area of a school building from the inspection requirements. If LEAs were required to repeat actions conducted properly in the

past, the Agency would place an unnecessary burden on those LEAs and penalize LEAs which made a good faith effort to address asbestos hazards in their building. EPA believes a number of States and localities have developed inspection programs in recent years that are similar to Title II. In addition, LEAs that complied with EPA's 1982 rule could receive an exclusion from part of the final rule's requirements. For example, friable material sampled and found to contain asbestos on the ceiling of the cafeteria would not have to be re-sampled. Although friable ACBM must be assessed even if previously identified, the above example illustrates a savings to the LEA.

"Substantial compliance" allows previous sampling that was done in a random manner with sufficient samples to be adequate to determine no ACBM is present. EPA believes previous adequate inspection and sampling efforts conducted by LEAs should not prove worthless. For example, if a LEA had records that it took three random samples in a 1,500 square foot classroom to comply with EPA's 1982 rule or a State law, and all samples were analyzed negative for asbestos, an accredited inspector may determine that this is sufficient to indicate no asbestos is present even though the current rule would require five samples for the same classroom.

EPA believes only an accredited inspector has the training necessary to determine whether previous inspections and sampling were adequate. EPA has evidence to suggest that many inspections performed under the 1982 rule were conducted by persons with little or no inspection training. If these same individuals were responsible for determining the validity of previous inspections, large areas of schools may not be examined by accredited inspectors. In many respects, this would defeat the purpose of TSCA Title II.

L. Enforcement

Some commenters stated that the "Compliance and Enforcement" section of the proposed rule (§ 763.97) incorrectly describes the provisions of TSCA Title II and that the final rule should explicitly state the following points. First, LEAs that violate the regulations under Title II are not liable under any enforcement provision of Title I. Second, Title II does not allow EPA to assess penalties against individuals. Third, criminal penalties are not permitted for violation of Title II.

EPA disagrees. The provisions of the "Compliance and Enforcement" section

are in accordance with applicable law, as discussed below.

Section 3 of AHERA, "Technical and Conforming Amendments," amends section 15(1) of TSCA Title I to provide that it is unlawful for any person to fail or refuse to comply with any requirement of TSCA Title II or any rule promulgated or order issued under Title II. Therefore, violations of Title II regulations, published in this document are generally subject to the civil and criminal penalties under section 16 of Title I and to civil injunctive actions under section 17 of Title I. This liability is qualified, however, by section 207 of Title II which describes LEA civil liabilities for violation of regulations and provides that LEAs are not liable for any civil penalty under Title I. Section 207, however, does not alter the criminal liabilities of Title I or the injunctive provisions of section 17 of Title I. Nor does section 207 provide any exemption from Title I provisions for inspectors, management planners or any other person other than an LEA that has responsibilities under TSCA Title II. Finally, regardless of the provisions of TSCA, applicable case law provides that liability for actions of organizations may extend to responsible officials.

Thus the three points noted in the comments are wrong. First, LEAs that violate Title II rules are liable for criminal penalties under section 16 of Title I and are subject to injunctive relief in Federal District Courts under section 17 of Title I. Second, individuals may be liable for violating TSCA Title II regulations. Individuals other than LEAs that violate Title II regulations are subject to any of the penalties under Title I, and responsible LEA officials may be liable for any LEA violation of Title II. Third, the effect of the conforming amendments to TSCA Title I is that criminal penalties may be assessed for violation of Title II.

M. Other Issues

1. Cost estimates for inspection. Several commenters, ranging from school districts to independent consultants, expressed concern that the economic impact analysis of the proposed rule underestimated the cost of inspecting for ACM. Comments claimed that labor rates and time required to conduct inspections were too low.

EPA agreed with these comments. As a result the Agency's estimates for the final rule increased due to an update of unit labor costs and a small increase in the estimated to perform several inspection activities. As a result the estimated total cost for all inspection activities increased from the proposal to

the final rule from approximately \$58.2 million to approximately \$78.5 million.

The cost for the building walkthrough visual inspection, assessment, and mapping and reporting activities increased, while the cost estimates for bulk sampling and analysis remained the same. The total inspection costs are now estimated to be \$1,144 for public primary schools, \$1,627 for public secondary schools and \$1,587 for private schools.

2. Cost estimates for management plans. A number of commenters expressed concern that the proposed rule underestimated the cost of developing management plans due to low assumptions for labor rates and time needed to prepare the plan. EPA also received comments that training and recordkeeping costs were too low. These costs are considered by EPA as part of the cost of the management plan implementation. Several commenters also expressed concern that EPA underestimated the burden associated with the state review of management plans.

EPA agrees that labor costs and time needed to prepare plans were too low in the proposal and has increased these estimates. EPA has also increased the cost for training by raising labor rate estimates and including travel expenses in the cost of training. As a result, the average costs for first year development and implementation of a management plan for a typical school is estimated to be \$3,270 for a public primary school, \$4,521 for a public secondary school and \$4,460 for a private school. The total cost for development and implementation of management plans increased from \$970.8 million in the proposed rule to \$1,272 million in the final rule.

With respect to the cost to States of reviewing management plans, EPA has not substantially changed its estimates. While the proposed rule stated a range of \$63 to \$85 for a State to review a plan, the final rule estimates this cost at approximately \$77. The plan review burden will vary with the different number of schools found in each State. For example, California, with an estimated 10,832 schools, would incur a review cost of roughly \$842,000. Delaware, with an estimated 288 schools, would incur a cost of about \$23,000. States will incur this burden within the 90-day review period specified in the law. The burden for each State, if it must review many plans, may be substantial. However, this burden is imposed by statute.

3. Costs for operations and maintenance (O&M) programs. EPA received a comment that it should not

have included a cost for levels of overhead and contingency costs for school O&M programs because schools are not run like a business and would not charge themselves overhead. In addition, the comment argued that EPA's assumed rate of three minor fiber release episodes per school per year was too high. It was also argued that EPA should not have included an opportunity cost associated with O&M work, since schools would not actually spend money on many O&M activities but would redirect their employees' activities. Finally, the commenter identified a mistake in the calculations of the cost of consumable supplies used in O&M programs.

EPA agrees that schools would not incur overhead and contingency costs for O&M work. EPA used these indirect costs to calculate the expenses associated with the incremental utility, payroll, and other expenses attributable to an O&M program. EPA believes that these estimates of indirect rates are reasonable.

EPA slightly modified its assumptions with respect to fiber release episodes. However, this change did not have a significant impact on the total cost of O&M programs.

With respect to using an opportunity cost approach in the calculation of O&M costs, EPA believes that these costs are, indeed, a real cost of conducting O&M. However, the Agency acknowledges that some portion of the O&M cost may not result in actual expenditures by a school if the school chooses to give up some other activity to absorb the additional O&M activity. Regardless of how the school chooses to react, these are costs imposed by the rule. Accordingly, the Agency has included the opportunity costs analysis in the final rule estimates.

EPA acknowledges its mistake in the cost of consumables and has adjusted the O&M costs accordingly. This yields a fairly substantial drop in per school annual expenses for O&M programs. The reason for the decrease in O&M costs noted below is almost entirely due to this decrease in cost of consumables.

The final rule's costs of O&M programs per school on a yearly basis (excluding the cost of special equipment acquisition) are now estimated to be \$3,800 for a public primary school, \$5,100 for a public secondary school and \$3,800 for a private school. The total O&M costs have decreased from \$525.4 million in the proposal to \$292.7 million for the final rule.

4. Costs for removal, enclosure and encapsulation projects. Commenters argued that cost estimates in the

proposal for removal projects were incorrect because they assumed replacement costs and post-abatement air monitoring for asbestos materials removed during building demolition. These errors have been corrected in the final cost estimates.

In addition, EPA assumed in the proposal that all post-response action air samples would be analyzed using TEM. Since the rule allows limited PCM, the costs of response actions have decreased accordingly. This cost decrease is approximately \$4,000 in direct expenses per project for those projects using PCM.

Total costs for removal, enclosure and encapsulation projects have decreased from \$1,587.8 million in the proposal to \$1,431 million in the final rule.

5. *Risk related to asbestos in buildings.* Comments argued that EPA did not adequately assess the evidence relating to the harm caused by asbestos in schools. Specifically, they claim that EPA's assessment of risk for this rule (1) did not consider estimates of the toxicological potency of asbestos developed by a number of scientists who disagree with the potency estimates accepted by the Agency; (2) ignored studies showing that prevailing exposure to asbestos in schools has often been measured at levels far below those assumed by the Agency in its assessment (70 to 500 ng/m³); and (3) did not consider documentation that asbestos exposures after major abatement, especially removal, may not be reduced at all and may even be elevated. Had such evidence been considered, according to one of these comments (Safe Buildings Alliance), EPA would have come to the conclusion that operations and maintenance programs are, in almost all schools, the appropriate response action to protect health and the environment. This evidence is cited to support the position that protection of health and the environment requires specification of an airborne exposure level of protection.

EPA disagrees that the evidence cited in these comments supports the need for an airborne asbestos standard in buildings. Rather, EPA believes that the data cited by these comments, even if assumed to be correctly interpreted by the commenters, supports the rule as promulgated.

The Agency has noted elsewhere in this preamble the problems with air monitoring as the primary assessment tool for asbestos in schools. Furthermore, no comments have provided any substantive health based justification for choosing any airborne level as an appropriate level to protect public health from asbestos in schools.

Nevertheless, EPA believes that the rule accomplishes the goals of these commenters to ensure that unnecessary removal activities do not occur. Indeed, one of these commenters (Safe Buildings Alliance) specifically stated that it believes removals could typically be the response action if the rules were *incorrectly* applied. The rules, however, are not designated to prefer one response action over another, but to allow schools the flexibility to deal with their particular situations. Certainly, asbestos in many schools may not present significant risks in its current condition, but could cause considerable harm if not dealt with properly. Also, there are plainly schools in which serious measures would be needed immediately. In this context the evidence cited by the comments is supportive of EPA's rule, as discussed below.

With respect to the potency of asbestos, EPA has decided that for purposes of this rule there is no need to resolve the divergence of opinion. See preamble to Proposed Rule, 52 FR 15833. In any event, EPA has considered differing views on asbestos health effects in other proceedings (see, e.g., 51 FR 3728 *et seq.*, January 29, 1986) and commenters have not presented new evidence. The important point for purposes of this rule, is that varying local circumstances will drive the decision on the appropriate response action.

With respect to asbestos exposure, EPA acknowledges that many building air measurements show low prevailing levels. However, peak levels during serious disturbances can be extremely high and may cause very serious risks to individuals involved. Regardless of the actual average measurements in all schools, regardless of whether one accepts the levels used by EPA in its assessment or the levels presented by the commenters, the basic structure of the rule should not be changed. Assessment of all the evidence leads to the conclusion that local educational agencies should at least adopt operations and maintenance programs and institute more serious response actions if local conditions warrant. The levels EPA used in its risk assessment are actual measurements (see, e.g. "Measuring Airborne Asbestos Levels in Buildings," EPA 560/13-80-028; "Airborne Asbestos Levels in Schools," EPA 560/5-83-003) and are reasonable for purposes of decisionmaking in the context of this rule. In any event, the lower airborne asbestos levels cited by the commenters do not make the case for an airborne regulatory level.

Finally, EPA interprets data on airborne levels of asbestos before and after removal actions differently from the commenters. The information available on airborne concentrations before and after asbestos removal is actually limited, dealing with a very small number of abatement actions. Nevertheless, EPA believes that this information indicates that, in the past, some abatement actions were not done properly and led to increased airborne levels. The rule, therefore, was designed to prevent shoddy abatement work. A draft report prepared by Batelle (March 1987) shows significant reduction in airborne asbestos concentrations in the enclosed abatement area in schools immediately after removal operations. Airborne levels measured in the Batelle study did increase back to approximately the same as pre-removal levels after school resumed (based on a statistical analysis of pre- and post-removal levels). However, these levels could only have been the result of reentrainment of asbestos from outside the immediate removal area. Removals, thus, were successful at the removal site but could not guarantee no fiber release from asbestos-containing materials remaining in the building. The Batelle draft, therefore, does not show an increase in exposure from the removal activities as suggested by the comments. At the very least, removal reduced some danger of peak exposures. The data in the Batelle draft may indicate a need for continuing O&M programs following abatement, particularly where all asbestos is not removed.

6. *Model accreditation plan.* EPA received comments about the provisions of the Model Accreditation Plan required under section 206 of TSCA Title II. Under Title II, the Agency was required to submit a final Model Accreditation Plan by April 20, 1987. The final plan was issued by EPA in accordance with that deadline. The final plan appeared in the Federal Register of April 30, 1987, entitled "Asbestos-Containing Material in Schools: Model Accreditation Plan."

IV. Economic Impact

The economic impact analysis estimates the incremental costs attributable to the proposed regulation, including costs of inspection, sampling, development, and implementation of management plans, training of school employees, periodic surveillance, and the implementation of abatement actions. Estimates of the number of schools affected and square footage of asbestos were developed based on the 1984 EPA survey of asbestos in schools

and data compiled from the Asbestos School Hazard Abatement Act (ASHAA) loan and grant program. Estimates of the percentage of asbestos which falls into each of the hazard categories were based on the results of a survey of the EPA's Regional Asbestos Coordinators (RACs).

Using a model school/model project approach, costs of inspection, sampling, and appropriate response actions were developed for schools with ACM in each of the different hazard categories. For schools with only nonfriable ACM, the only costs estimated were for management plan implementation, nominal plan implementation activities, training of the asbestos program manager, custodial training for proper repair and maintenance of ACM, and the periodic surveillance and reinspection of ACM. For purposes of the economic analysis, EPA assumed that all schools with only nonfriable ACM would choose to forego sampling and instead just treat suspect material as asbestos-containing.

Asbestos abatement-related costs expected to be incurred regardless of the existence of these regulations were subtracted from the total costs to calculate only the incremental cost of the final regulations. For example, data from the ASHAA loan and grant application data base were used to project an average annual rate of removal of asbestos that is assumed would have occurred even if TSCA Title II legislation and these regulations were not promulgated. That average annual rate was estimated to be approximately 3.4 percent for primary schools, 3.3 percent for secondary schools, and 1.8 percent for private schools. The costs associated with this underlying rate of removal were subtracted from the total costs. Also, the costs of removal of friable ACM prior to demolition that is required by the NESHAPs regulations were also netted out of the total costs.

The estimated present value of the costs of these final regulations is approximately \$3.145 billion (using a 10 percent discount rate) over 30 years. This includes the cost of initial inspection and sampling—\$78.5 million; development and implementation of management plans—\$1.272 million; periodic surveillance—\$47.7 million; reinspection—\$23.2 million; special operations and maintenance programs—\$292.7 million; and abatement response actions—\$1.431 million.

The total number of primary and secondary schools potentially affected by these regulations is estimated to be 108,900. Approximately 44,800 are estimated to have about 213 million square feet of surfacing or thermal

systems insulation ACM. Of these, an estimated 10,700 have surfacing ACM only. It is likely that every school contains some amount of nonfriable ACM such as floor tile, transite board, and fire doors.

The cost of an asbestos inspection is estimated to range from \$1,144 to \$1,627 per school for schools with both surfacing and thermal systems insulation ACM. This cost varies depending upon the size of the school, the amount and type of ACM contained in the school, and the type of professional doing the work. The costs of sampling and analysis if friable materials are found will depend upon the number of samples taken and analyzed. Costs of analysis are estimated to range from \$25 to \$47 per sample. Assuming the average school has to analyze 20 samples, the cost of analysis will be \$500 to \$940 per school. The cost of mapping ACM is estimated to range from \$110 to over \$270 per school.

The cost of developing a management plan if asbestos-containing surfacing ACM or thermal systems insulation ACM is present is estimated to range from \$1,025 for an average-size public primary school to \$1,420 for an average-size public secondary school. These estimates are weighted averages of the costs of plans developed by trained school personnel and by outside consultants. A less extensive management plan would be required for schools containing only nonfriable materials. The average development cost for a management plan where only nonfriable materials are present is estimated to be about \$500 for both public primary and private schools, and about \$715 for public secondary schools.

The cost of training for school employees involves a variety of factors ranging from course and accreditation exam fees to the possible expenses for any out of town travel required for the training. The estimated course fee for a 2-hour awareness session required of all school maintenance employees in schools with ACM is approximately \$50 per person. The additional 14 hours of training for school maintenance workers who may come in contact with asbestos in doing minor repair and maintenance work that disturbs asbestos is estimated to cost \$250. A fee of \$420 is estimated for the 24 hours of training required for the certification of asbestos abatement workers doing more than just minor repair and small glove-bag removal jobs. The fee for the 40-hour training course and certification required for asbestos abatement contractors is estimated to be \$640.

Response action costs depend primarily on the condition of the asbestos in a school and to a lesser extent on many other factors. In general, for surfacing ACM in all but the significantly damaged category, it is likely that the primary response action undertaken by a school will be special O&M activities. Use of O&M activities would likely continue until or unless the ACM deteriorates to a "significantly damaged" condition. The annual cost of a special O&M program (excluding acquisition of special equipment) is estimated to range from \$3,800 for a typical public primary school to \$5,100 for a typical public secondary school. Initial cleaning costs are expected to range from \$950 to \$1,400.

The cost of removal depends upon many factors including size of the project. The estimated cost of removal for a 4,000 ft² project in which surfacing material is removed would be approximately \$51,300. The cost of removal for a 900 ft² boiler wrap project is estimated to be approximately \$30,900. The total discounted costs of response actions were estimated assuming schools undertake a combination of response actions that depend on the condition of the ACM.

V. Rulemaking Record

EPA has established a record for this rulemaking (docket control number OPTS-62048E). The record is available in the Office of Toxic Substances Public Information Office, from 8 a.m. to 4 p.m., Monday through Friday, except legal holidays. The Public Information Office is located in Rm. NE-G004, 401 M St., SW., Washington, DC.

The record includes information considered by EPA in developing the proposed and final rules. The record now includes the following categories of information:

1. Federal Register notices.
2. Support documents.
3. Reports.
4. Memoranda and letters.
5. Records of the negotiating committee.
6. Public comments received on the proposed rule.
7. Response to comments document.
8. Transcript of the August 25 and 26 Public Meeting.

EPA requests that any person who commented on this rule submit to the Agency in writing any information which such person believes shows there are errors or omissions in the record. EPA will evaluate such submissions and supplement the record as appropriate.

VI. References

1. USEPA. "Guidance for Controlling Asbestos-Containing Materials in Buildings," EPA 560/5-85-024, June 1985.
2. USEPA. "A Guide to Respiratory Protection for the Asbestos Abatement Industry," EPA 560/OPTS-86-001, September 1986.
3. USEPA. "Asbestos in Buildings: Simplified Sampling Scheme for Friable Surfacing Materials," EPA 560/5-85-030a, October 1985.
4. USEPA. Friable Asbestos-Containing Materials in Schools, 40 CFR Part 763, Subpart F.
5. USEPA. National Emission Standards for Hazardous Air Pollutants, 40 CFR Part 61, Subpart M.
6. USDOL. OSHA. Occupational Exposure to Asbestos, 29 CFR 1926.58.
7. USEPA. Toxic Substances; Asbestos Abatement Projects, 40 CFR Part 763, Subpart G.

VII. Regulatory Assessment Requirements

A. Executive Order 12291

Under Executive Order 12291, EPA has determined that this rule is a "major" rule and has developed a Regulatory Impact Analysis. EPA has prepared an economic impact analysis of the TSCA Title II regulations.

B. Regulatory Flexibility Act

EPA has analyzed the economic impact of this rule on small businesses. EPA's analysis of the economic consequences of this rule appears in Unit IV.

C. Paperwork Reduction Act

The reporting and recordkeeping provisions in this rule have been approved by the Office of Management and Budget (OMB) under the Paperwork Reduction Act, and has been assigned OMB control number 2070-0091.

List of Subjects in 40 CFR Part 763

Asbestos, Environmental protection, Hazardous substances, Incorporation by reference, Occupational health and safety, Recordkeeping, Schools.

Dated: October 17, 1987.

Lee M. Thomas,
Administrator.

Therefore, 40 CFR Part 763 is amended as follows:

PART 763—[AMENDED]

1. The authority citation for Part 763 continues to read as follows:

Authority: 15 U.S.C. 2605 and 2607(c). Subpart E also issued under 15 U.S.C. 2641, 2643, 2646, and 2647.

2. By adding §§ 763.80 through 763.99 and Appendices A, B, and D to Subpart E to read as follows:

Subpart E—Asbestos-Containing Materials in Schools

Sec.	
763.80	Scope and purpose.
763.83	Definitions.
763.84	General local education agency responsibilities.
763.85	Inspection and reinspections.
763.86	Sampling.
763.87	Analysis.
763.88	Assessment.
763.90	Response actions.
763.91	Operations and maintenance.
763.92	Training and periodic surveillance.
763.93	Management plans.
763.94	Recordkeeping.
763.95	Warning labels.
763.97	Compliance and enforcement.
763.98	Waiver; delegation to State.
763.99	Exclusions.
Appendix A to Subpart E—Interim Transmission Electron Microscopy Analytical Methods—Mandatory and Nonmandatory—and Mandatory Section to Determine Completion of Response Actions	
Appendix B to Subpart E—Work Practices and Engineering Controls for Small-Scale, Short-Duration Operations Maintenance and Repair (O&M) Activities Involving ACM	

Appendix D to Subpart E—Transport and Disposal of Asbestos Waste

§ 763.80 Scope and purpose.

(a) This rule requires local education agencies to identify friable and nonfriable asbestos-containing material (ACM) in public and private elementary and secondary schools by visually inspecting school buildings for such materials, sampling such materials if they are not assumed to be ACM, and having samples analyzed by appropriate techniques referred to in this rule. The rule requires local education agencies to submit management plans to the Governor of their State by October 12, 1988, begin to implement the plans by July 9, 1989, and complete implementation of the plans in a timely fashion. In addition, local education agencies are required to use persons who have been accredited to conduct inspections, reinspections, develop management plans, or perform response actions. The rule also includes recordkeeping requirements. Local education agencies may contractually delegate their duties under this rule, but they remain responsible for the proper performance of those duties. Local education agencies are encouraged to consult with EPA Regional Asbestos Coordinators, or if applicable, a State's lead agency designated by the State

Governor, for assistance in complying with this rule.

(b) Local education agencies must provide for the transportation and disposal of asbestos in accordance with EPA's "Asbestos Waste Management Guidance." For convenience, applicable sections of this guidance are reprinted as Appendix D of this subpart. There are regulations in place, however, that affect transportation and disposal of asbestos waste generated by this rule. The transportation of asbestos waste is covered by the Department of Transportation (49 CFR Part 173, Subpart J) and disposal is covered by the National Emissions Standards for Hazardous Air Pollutants (NESHAP) (40 CFR Part 61, Subpart M).

§ 763.83 Definitions.

For purposes of this subpart:

"Act" means the Toxic Substances Control Act (TSCA), 15 U.S.C. 2601, *et seq.*

"Accessible" when referring to ACM means that the material is subject to disturbance by school building occupants or custodial or maintenance personnel in the course of their normal activities.

"Accredited" or "accreditation" when referring to a person or laboratory means that such person or laboratory is accredited in accordance with section 206 of Title II of the Act.

"Air erosion" means the passage of air over friable ACBM which may result in the release of asbestos fibers.

"Asbestos" means the asbestiform varieties of: Chrysotile (serpentine); crocidolite (riebeckite); amosite (cummingtonite/grunerite); anthophyllite; tremolite; and actinolite.

"Asbestos-containing material" (ACM) when referring to school buildings means any material or product which contains more than 1 percent asbestos.

"Asbestos-containing building material" (ACBM) means surfacing ACM, thermal system insulation ACM, or miscellaneous ACM that is found in or on interior structural members or other parts of a school building.

"Asbestos debris" means pieces of ACBM that can be identified by color, texture, or composition, or means dust, if the dust is determined by an accredited inspector to be ACM.

"Damaged friable miscellaneous ACM" means friable miscellaneous ACM which has deteriorated or sustained physical injury such that the internal structure (cohesion) of the material is inadequate or, if applicable, which has delaminated such that its bond to the substrate (adhesion) is

inadequate or which for any other reason lacks fiber cohesion or adhesion qualities. Such damage or deterioration may be illustrated by the separation of ACM into layers; separation of ACM from the substrate; flaking, blistering, or crumbling of the ACM surface; water damage; significant or repeated water stains, scrapes, gouges, mars or other signs of physical injury on the ACM. Asbestos debris originating from the ACBM in question may also indicate damage.

"Damaged friable surfacing ACM" means friable surfacing ACM which has deteriorated or sustained physical injury such that the internal structure (cohesion) of the material is inadequate or which has delaminated such that its bond to the substrate (adhesion) is inadequate, or which, for any other reason, lacks fiber cohesion or adhesion qualities. Such damage or deterioration may be illustrated by the separation of ACM into layers; separation of ACM from the substrate; flaking, blistering, or crumbling of the ACM surface; water damage; significant or repeated water stains, scrapes, gouges, mars or other signs of physical injury on the ACM. Asbestos debris originating from the ACBM in question may also indicate damage.

"Crushed or significantly damaged thermal system insulation ACM" means thermal system insulation ACM on pipes, boilers, tanks, ducts, and other thermal system insulation equipment where the insulation has lost its structural integrity, or its covering, in whole or in part, is crushed, water-stained, gouged, punctured, missing, or not intact such that it is not able to contain fibers. Damage may be further illustrated by occasional punctures, gouges or other signs of physical injury to ACM; occasional water damage on the protective coverings/jackets; or exposed ACM ends or joints. Asbestos debris originating from the ACBM in question may also indicate damage.

"Encapsulation" means the treatment of ACBM with a material that surrounds or embeds asbestos fibers in an adhesive matrix to prevent the release of fibers, as the encapsulant creates a membrane over the surface (bridging encapsulant) or penetrates the material and binds its components together (penetrating encapsulant).

"Enclosure" means an airtight, impermeable, permanent barrier around ACBM to prevent the release of asbestos fibers into the air.

"Fiber release episode" means any uncontrolled or unintentional disturbance of ACBM resulting in visible emission

"Friable" when referring to material in a school building means that the material, when dry, may be crumbled, pulverized, or reduced to powder by hand pressure, and includes previously nonfriable material after such previously nonfriable material becomes damaged to the extent that when dry it may be crumbled, pulverized, or reduced to powder by hand pressure.

"Functional space" means a room, group of rooms, or homogeneous area (including crawl spaces or the space between a dropped ceiling and the floor or roof deck above), such as classroom(s), a cafeteria, gymnasium, hallway(s), designated by a person accredited to prepare management plans, design abatement projects, or conduct response actions.

"High-efficiency particulate air" (HEPA) refers to a filtering system capable of trapping and retaining at least 99.97 percent of all monodispersed particles 0.3 μm in diameter or larger.

"Homogeneous area" means an area of surfacing material, thermal system insulation material, or miscellaneous material that is uniform in color and texture.

"Local education agency" means:

(1) Any local educational agency as defined in section 198 of the Elementary and Secondary Education Act of 1965 (20 U.S.C. 3381).

(2) The owner of any nonpublic, nonprofit elementary, or secondary school building.

(3) The governing authority of any school operated under the defense dependents' education system provided for under the Defense Dependents' Education Act of 1978 (20 U.S.C. 921, et seq.).

"Miscellaneous ACM" means miscellaneous material that is ACM in a school building.

"Miscellaneous material" means interior building material on structural components, structural members or fixtures, such as floor and ceiling tiles, and does not include surfacing material or thermal system insulation.

"Nonfriable" means material in a school building which when dry may not be crumbled, pulverized, or reduced to powder by hand pressure.

"Operations and maintenance program" means a program of work practices to maintain friable ACBM in good condition, ensure clean up of asbestos fibers previously released, and prevent further release by minimizing and controlling friable ACBM disturbance or damage.

"Potential damage" means circumstances in which:

(1) Friable ACBM is in an area regularly used by building occupants,

including maintenance personnel, in the course of their normal activities.

(2) There are indications that there is a reasonable likelihood that the material or its covering will become damaged, deteriorated, or delaminated due to factors such as changes in building use, changes in operations and maintenance practices, changes in occupancy, or recurrent damage.

"Potential significant damage" means circumstances in which:

(1) Friable ACBM is in an area regularly used by building occupants, including maintenance personnel, in the course of their normal activities.

(2) There are indications that there is a reasonable likelihood that the material or its covering will become significantly damaged, deteriorated, or delaminated due to factors such as changes in building use, changes in operations and maintenance practices, changes in occupancy, or recurrent damage.

(3) The material is subject to major or continuing disturbance, due to factors including, but not limited to, accessibility or, under certain circumstances, vibration or air erosion.

"Preventive measures" means actions taken to reduce disturbance of ACBM or otherwise eliminate the reasonable likelihood of the material's becoming damaged or significantly damaged.

"Removal" means the taking out or the stripping of substantially all ACBM from a damaged area, a functional space, or a homogeneous area in a school building.

"Repair" means returning damaged ACBM to an undamaged condition or to an intact state so as to prevent fiber release.

"Response action" means a method, including removal, encapsulation, enclosure, repair, operations and maintenance, that protects human health and the environment from friable ACBM.

"Routine maintenance area" means an area, such as a boiler room or mechanical room, that is not normally frequented by students and in which maintenance employees or contract workers regularly conduct maintenance activities.

"School" means any elementary or secondary school as defined in section 198 of the Elementary and Secondary Education Act of 1965 (20 U.S.C. 2854).

"School building" means:

(1) Any structure suitable for use as a classroom, including a school facility such as a laboratory, library, school eating facility, or facility used for the preparation of food.

(2) Any gymnasium or other facility which is specially designed for athletic

or recreational activities for an academic course in physical education.

(3) Any other facility used for the instruction or housing of students or for the administration of educational or research programs.

(4) Any maintenance, storage, or utility facility, including any hallway, essential to the operation of any facility described in this definition of "school building" under paragraphs (1), (2), or (3).

(5) Any portico or covered exterior hallway or walkway.

(6) Any exterior portion of a mechanical system used to condition interior space.

"Significantly damaged friable miscellaneous ACM" means damaged friable miscellaneous ACM where the damage is extensive and severe.

"Significantly damaged friable surfacing ACM" means damaged friable surfacing ACM in a functional space where the damage is extensive and severe.

"State" means a State, the District of Columbia, the Commonwealth of Puerto Rico, Guam, American Samoa, the Northern Marianas, the Trust Territory of the Pacific Islands, and the Virgin Islands.

"Surfacing ACM" means surfacing material that is ACM.

"Surfacing material" means material in a school building that is sprayed-on, troweled-on, or otherwise applied to surfaces, such as acoustical plaster on ceilings and fireproofing materials on structural members, or other materials on surfaces for acoustical, fireproofing, or other purposes.

"Thermal system insulation" means material in a school building applied to pipes, fittings, boilers, breeching, tanks, ducts, or other interior structural components to prevent heat loss or gain, or water condensation, or for other purposes.

"Thermal system insulation ACM" means thermal system insulation that is ACM.

"Vibration" means the periodic motion of friable ACBM which may result in the release of asbestos fibers.

§ 763.84 General local education agency responsibilities.

Each local education agency shall:

(a) Ensure that the activities of any persons who perform inspections, reinspections, and periodic surveillance, develop and update management plans, and develop and implement response actions, including operations and maintenance, are carried out in accordance with Subpart E of this part.

(b) Ensure that all custodial and maintenance employees are properly

trained as required by this Subpart E and other applicable Federal and/or State regulations (e.g., the Occupational Safety and Health Administration asbestos standard for construction, the EPA worker protection rule, or applicable State regulations).

(c) Ensure that workers and building occupants, or their legal guardians, are informed at least once each school year about inspections, response actions, and post-response action activities, including periodic reinspection and surveillance activities that are planned or in progress.

(d) Ensure that short-term workers (e.g., telephone repair workers, utility workers, or exterminators) who may come in contact with asbestos in a school are provided information regarding the locations of ACBM and suspected ACBM assumed to be ACM.

(e) Ensure that warning labels are posted in accordance with § 763.95.

(f) Ensure that management plans are available for inspection and notification of such availability has been provided as specified in the management plan under § 763.93(g).

(g)(1) Designate a person to ensure that requirements under this section are properly implemented.

(2) Ensure that the designated person receives adequate training to perform duties assigned under this section. Such training shall provide, as necessary, basic knowledge of:

(i) Health effects of asbestos.

(ii) Detection, identification, and assessment of ACM.

(iii) Options for controlling ACBM.

(iv) Asbestos management programs.

(v) Relevant Federal and State regulations concerning asbestos, including those in this Subpart E and those of the Occupational Safety and Health Administration, U.S. Department of Labor, the U.S. Department of Transportation and the U.S. Environmental Protection Agency.

(h) Consider whether any conflict of interest may arise from the interrelationship among accredited personnel and whether that should influence the selection of accredited personnel to perform activities under this subpart.

§ 763.85 Inspection and reinspections.

(a) *Inspection.* (1) Except as provided in paragraph (a)(2) of this section, before October 12, 1988, local education agencies shall inspect each school building that they lease, own, or otherwise use as a school building to identify all locations of friable and nonfriable ACBM.

(2) Any building leased or acquired on or after October 12, 1988, that is to be

used as a school building shall be inspected as described under paragraphs (a) (3) and (4) of this section prior to use as a school building. In the event that emergency use of an uninspected building as a school building is necessitated, such buildings shall be inspected within 30 days after commencement of such use.

(3) Each inspection shall be made by an accredited inspector.

(4) For each area of a school building, except as excluded under § 763.99, each person performing an inspection shall:

(i) Visually inspect the area to identify the locations of all suspected ACBM.

(ii) Touch all suspected ACBM to determine whether they are friable.

(iii) Identify all homogeneous areas of friable suspected ACBM and all homogeneous areas of nonfriable suspected ACBM.

(iv) Assume that some or all of the homogeneous areas are ACM, and, for each homogeneous area that is not assumed to be ACM, collect and submit for analysis bulk samples under §§ 763.86 and 763.87.

(v) Assess, under § 763.88, friable material in areas where samples are collected, friable material in areas that are assumed to be ACBM, and friable ACBM identified during a previous inspection.

(vi) Record the following and submit to the person designated under § 763.84 a copy of such record for inclusion in the management plan within 30 days of the inspection:

(A) An inspection report with the date of the inspection signed by each accredited person making the inspection, State of accreditation, and if applicable, his or her accreditation number.

(B) An inventory of the locations of the homogeneous areas where samples are collected, exact location where each bulk sample is collected, dates that samples are collected, homogeneous areas where friable suspected ACBM is assumed to be ACM, and homogeneous areas where nonfriable suspected ACBM is assumed to be ACM.

(C) A description of the manner used to determine sampling locations, the name and signature of each accredited inspector who collected the samples, State of accreditation, and, if applicable, his or her accreditation number.

(D) A list of whether the homogeneous areas identified under paragraph (a)(4)(vi)(B) of this section are surfacing material, thermal system insulation, or miscellaneous material.

(E) Assessments made of friable material, the name and signature of each accredited inspector making the

assessment, State of accreditation, and if applicable, his or her accreditation number.

(b) *Reinspection.* (1) At least once every two years after a management plan takes effect, each local education agency shall conduct a reinspection of all friable and nonfriable known or assumed ACMB in each school building that they lease, own, or otherwise use as a school building.

(2) Each inspection shall be made by an accredited inspector.

(3) For each area of a school building, each person performing a reinspection shall:

(i) Visually reinspect, and reassess, under § 763.88, the condition of all friable known or assumed ACMB.

(ii) Visually inspect material that was previously considered nonfriable ACMB and touch the material to determine whether it has become friable since the last inspection or reinspection.

(iii) Identify any homogeneous areas with material that has become friable since the last inspection or reinspection.

(iv) For each homogeneous area of newly friable material that is already assumed to be ACMB, bulk samples may be collected and submitted for analysis in accordance with §§ 763.86 and 763.87.

(v) Assess, under § 763.88, the condition of the newly friable material in areas where samples are collected, and newly friable materials in areas that are assumed to be ACMB.

(vi) Reassess, under § 763.88, the condition of friable known or assumed ACMB previously identified.

(vii) Record the following and submit to the person designated under § 763.84 a copy of such record for inclusion in the management plan within 30 days of the reinspection:

(A) The date of the reinspection, the name and signature of the person making the reinspection, State of accreditation, and if applicable, his or her accreditation number, and any changes in the condition of known or assumed ACMB.

(B) The exact locations where samples are collected during the reinspection, a description of the manner used to determine sampling locations, the name and signature of each accredited inspector who collected the samples, State of accreditation, and, if applicable, his or her accreditation number.

(C) Any assessments or reassessments made of friable material, the name and signature of the accredited inspector making the assessments, State of accreditation, and if applicable, his or her accreditation number.

(c) *General.* Thermal system insulation that has retained its structural

integrity and that has an undamaged protective jacket or wrap that prevents fiber release shall be treated as nonfriable and therefore is subject only to periodic surveillance and preventive measures as necessary.

§ 763.86 Sampling.

(a) *Surfacing material.* An accredited inspector shall collect, in a statistically random manner that is representative of the homogeneous area, bulk samples from each homogeneous area of friable surfacing material that is not assumed to be ACM, and shall collect the samples as follows:

(1) At least three bulk samples shall be collected from each homogeneous area that is 1,000 ft² or less, except as provided in § 763.87(c)(2).

(2) At least five bulk samples shall be collected from each homogeneous area that is greater than 1,000 ft² but less than or equal to 5,000 ft², except as provided in § 763.87(c)(2).

(3) At least seven bulk samples shall be collected from each homogeneous area that is greater than 5,000 ft², except as provided in § 763.87(c)(2).

(b) *Thermal system insulation.* (1) Except as provided in paragraphs (b) (2) through (4) of this section and § 763.87(c), an accredited inspector shall collect, in a randomly distributed manner, at least three bulk samples from each homogeneous area of thermal system insulation that is not assumed to be ACM.

(2) Collect at least one bulk sample from each homogeneous area of patched thermal system insulation that is not assumed to be ACM if the patched section is less than 6 linear or square feet.

(3) In a manner sufficient to determine whether the material is ACM or not ACM, collect bulk samples from each insulated mechanical system that is not assumed to be ACM where cement or plaster is used on fittings such as tees, elbows, or valves, except as provided under § 763.87(c)(2).

(4) Bulk samples are not required to be collected from any homogeneous area where the accredited inspector has determined that the thermal system insulation is fiberglass, foam glass, rubber, or other non-ACBM.

(c) *Miscellaneous material.* In a manner sufficient to determine whether material is ACM or not ACM, an accredited inspector shall collect bulk samples from each homogeneous area of friable miscellaneous material that is not assumed to be ACM.

(d) *Nonfriable suspected ACMB.* If any homogeneous area of nonfriable suspected ACMB is not assumed to be ACM, then an accredited inspector shall

collect, in a manner sufficient to determine whether the material is ACM or not ACM, bulk samples from the homogeneous area of nonfriable suspected ACMB that is not assumed to be ACM.

§ 763.87 Analysis.

(a) Local education agencies shall have bulk samples, collected under § 763.86 and submitted for analysis, analyzed for asbestos using laboratories accredited by the National Bureau of Standards (NBS). Local education agencies shall use laboratories which have received interim accreditation for polarized light microscopy (PLM) analysis under the EPA Interim Asbestos Bulk Sample Analysis Quality Assurance Program until the NBS PLM laboratory accreditation program for PLM is operational.

(b) Bulk samples shall not be composited for analysis and shall be analyzed for asbestos content by PLM, using the "Interim Method for the Determination of Asbestos in Bulk Insulation Samples" found at Appendix A to Subpart F in 40 CFR Part 763.

(c)(1) A homogeneous area is considered not to contain ACM only if the results of all samples required to be collected from the area show asbestos in amounts of 1 percent or less.

(2) A homogeneous area shall be determined to contain ACM based on a finding that the results of at least one sample collected from that area shows that asbestos is present in an amount greater than 1 percent.

(d) The name and address of each laboratory performing an analysis, the date of analysis, and the name and signature of the person performing the analysis shall be submitted to the person designated under § 763.84 for inclusion into the management plan within 30 days of the analysis.

§ 763.88 Assessment.

(a)(1) For each inspection and reinspection conducted under § 763.85 (a) and (c) and previous inspections specified under § 763.99, the local education agency shall have an accredited inspector provide a written assessment of all friable known or assumed ACMB in the school building.

(2) Each accredited inspector providing a written assessment shall sign and date the assessment, provide his or her State of accreditation, and if applicable, accreditation number, and submit a copy of the assessment to the person designated under § 763.84 for inclusion in the management plan within 30 days of the assessment.

(b) The inspector shall classify and give reasons in the written assessment for classifying the ACBM and suspected ACBM assumed to be ACM in the school building into one of the following categories:

- (1) Damaged or significantly damaged thermal system insulation ACM.
- (2) Damaged friable surfacing ACM.
- (3) Significantly damaged friable surfacing ACM.
- (4) Damaged or significantly damaged friable miscellaneous ACM.
- (5) ACBM with potential for damage.
- (6) ACBM with potential for significant damage.
- (7) Any remaining friable ACBM or friable suspected ACBM.

(c) Assessment may include the following considerations:

(1) Location and the amount of the material, both in total quantity and as a percentage of the functional space.

(2) Condition of the material, specifying:

(i) Type of damage or significant damage (e.g., flaking, blistering, water damage, or other signs of physical damage).

(ii) Severity of damage (e.g., major flaking, severely torn jackets, as opposed to occasional flaking, minor tears to jackets).

(iii) Extent or spread of damage over large areas or large percentages of the homogeneous area.

(3) Whether the material is accessible.

(4) The material's potential for disturbance.

(5) Known or suspected causes of damage or significant damage (e.g., air erosion, vandalism, vibration, water).

(6) Preventive measures which might eliminate the reasonable likelihood of undamaged ACM from becoming significantly damaged.

(d) The local education agency shall select a person accredited to develop management plans to review the results of each inspection, reinspection, and assessment for the school building and to conduct any other necessary activities in order to recommend in writing to the local education agency appropriate response actions. The accredited person shall sign and date the recommendation, provide his or her State of accreditation, and, if applicable, provide his or her accreditation number, and submit a copy of the recommendation to the person designated under § 763.84 for inclusion in the management plan.

§ 763.90 Response actions.

(a) The local education agency shall select and implement in a timely manner the appropriate response actions in this section consistent with the assessment

conducted in § 763.88. The response actions selected shall be sufficient to protect human health and the environment. The local education agency may then select, from the response actions which protect human health and the environment, that action which is the least burdensome method. Nothing in this section shall be construed to prohibit removal of ACBM from a school building at any time, should removal be the preferred response action of the local education agency.

(b) If damaged or significantly damaged thermal system insulation ACM is present in a building, the local education agency shall:

(1) At least repair the damaged area.

(2) Remove the damaged material if it is not feasible, due to technological factors, to repair the damage.

(3) Maintain all thermal system insulation ACM and its covering in an intact state and undamaged condition.

(c)(1) If damaged friable surfacing ACM or damaged friable miscellaneous ACM is present in a building, the local education agency shall select from among the following response actions: encapsulation, enclosure, removal, or repair of the damaged material.

(2) In selecting the response action from among those which meet the definitional standards in § 763.83, the local education agency shall determine which of these response actions protects human health and the environment. For purposes of determining which of these response actions are the least burdensome, the local education agency may then consider local circumstances, including occupancy and use patterns within the school building, and its economic concerns, including short- and long-term costs.

(d) If significantly damaged friable surfacing ACM or significantly damaged friable miscellaneous ACM is present in a building the local education agency shall:

(1) Immediately isolate the functional space and restrict access, unless isolation is not necessary to protect human health and the environment.

(2) Remove the material in the functional space or, depending upon whether enclosure or encapsulation would be sufficient to protect human health and the environment, enclose or encapsulate.

(e) If any friable surfacing ACM, thermal system insulation ACM, or friable miscellaneous ACM that has potential for damage is present in a building, the local education agency shall at least implement an operations and maintenance (O&M) program, as described under § 763.91.

(f) If any friable surfacing ACM, thermal system insulation ACM, or friable miscellaneous ACM that has potential for significant damage is present in a building, the local education agency shall:

(1) Implement an O&M program, as described under § 763.91.

(2) Institute preventive measures appropriate to eliminate the reasonable likelihood that the ACM or its covering will become significantly damaged, deteriorated, or delaminated.

(3) Remove the material as soon as possible if appropriate preventive measures cannot be effectively implemented, or unless other response actions are determined to protect human health and the environment. Immediately isolate the area and restrict access if necessary to avoid an imminent and substantial endangerment to human health or the environment.

(g) Response actions including removal, encapsulation, enclosure, or repair, other than small-scale, short-duration repairs, shall be designed and conducted by persons accredited to design and conduct response actions.

(h) The requirements of this Subpart E in no way supersede the worker protection and work practice requirements under 29 CFR 1926.58 (Occupational Safety and Health Administration (OSHA) asbestos worker protection standards for construction), 40 CFR Part 763, Subpart G (EPA asbestos worker protection standards for public employees), and 40 CFR Part 61, Subpart M (National Emission Standards for Hazardous Air Pollutants—Asbestos).

(i) Completion of response actions. (1) At the conclusion of any action to remove, encapsulate, or enclose ACBM or material assumed to be ACBM, a person designated by the local education agency shall visually inspect each functional space where such action was conducted to determine whether the action has been properly completed.

(2)(i) A person designated by the local education agency shall collect air samples using aggressive sampling as described in Appendix A to this Subpart E to monitor air for clearance after each removal, encapsulation, and enclosure project involving ACBM, except for projects that are of small-scale, short-duration.

(ii) Local education agencies shall have air samples collected under this section analyzed for asbestos using laboratories accredited by the National Bureau of Standards to conduct such analysis using transmission electron microscopy (TEM) or, under circumstances permitted in this section,

laboratories enrolled in the American Industrial Hygiene Association Proficiency Analytical Testing Program for phase contrast microscopy (PCM).

(3) Until the National Bureau of Standards TEM laboratory accreditation program is operational, local educational agencies shall use laboratories that use the protocol described in Appendix A to Subpart E of this part.

(3) Except as provided in paragraphs (i) (4), (5), (6), or (7) of this section, an action to remove, encapsulate, or enclose ACBM shall be considered complete when the average concentration of asbestos of five air samples collected within the affected functional space and analyzed by the TEM method in Appendix A of this Subpart E, is not statistically significantly different, as determined by the Z-test calculation found in Appendix A of this Subpart E, from the average asbestos concentration of five air samples collected at the same time outside the affected functional space and analyzed in the same manner, and the average asbestos concentration of the three field blanks described in Appendix A of this Subpart E is below the filter background level, as defined in Appendix A of this Subpart E, of 70 structures per square millimeter (70 s/mm²).

(4) An action may also be considered complete if the volume of air drawn for each of the five samples collected within the affected functional space is equal to or greater than 1,199 L of air for a 25 mm filter or equal to or greater than 2,799 L of air for a 37 mm filter, and the average concentration of asbestos as analyzed by the TEM method in Appendix A of this Subpart E, for the five air samples does not exceed the filter background level, as defined in Appendix A, of 70 structures per square millimeter (70 s/mm²). If the average concentration of asbestos of the five air samples within the affected functional space exceeds 70 s/mm², or if the volume of air in each of the samples is less than 1,199 L of air for a 25 mm filter or less than 2,799 L of air for a 37 mm filter, the action shall be considered complete only when the requirements of paragraph (i) (3), (5), (6), or (7) of this section are met.

(5) At any time, a local education agency may analyze air monitoring samples collected for clearance purposes by phase contrast microscopy (PCM) to confirm completion of removal, encapsulation, or enclosure of ACBM that is greater than small-scale, short-duration and less than or equal to 160 square feet or 260 linear feet. The action shall be considered complete when the results of samples collected in the

affected functional space and analyzed by phase contrast microscopy using the National Institute for Occupational Safety and Health (NIOSH) Method 7400 entitled "Fibers" published in the NIOSH Manual of Analytical Methods, 3rd Edition, Second Supplement, August 1987, show that the concentration of fibers for each of the five samples is less than or equal to a limit of quantitation for PCM (0.01 fibers per cubic centimeter (0.01 f/cm³) of air). The method is available at the Office of the Federal Register Information Center, 11th and L St., NW., Room 8401, Washington, DC, 20408, and the EPA OPTS Reading Room, Rm. G004 Northeast Mall, 401 M St., SW., Washington, DC 20460. This incorporation by reference was approved by the Director of the Federal Register in accordance with 5 U.S.C. 552(a) and 1 CFR Part 51. The method is incorporated as it exists on the effective date of this rule, and a notice of any change to the method will be published in the Federal Register.

(6) Until October 7, 1989, a local education agency may analyze air monitoring samples collected for clearance purposes by PCM to confirm completion of removal, encapsulation, or enclosure of ACBM that is less than or equal to 3,000 square feet or 1,000 linear feet. The action shall be considered complete when the results of samples collected in the affected functional space and analyzed by PCM using the NIOSH Method 7400 entitled "Fibers" published in the NIOSH Manual of Analytical Methods, 3rd Edition, Second Supplement, August 1987, show that the concentration of fibers for each of the five samples is less than or equal to a limit of quantitation for PCM (0.01 fibers per cubic centimeter, 0.01 f/cm³). The method is available at the Office of the Federal Register, 11th and L St., NW., Room 8301, Washington, DC, 20408, and in the EPA OPTS Reading Room, Rm. G004 Northeast Mall, 401 M St., SW., Washington, DC 20460. This incorporation by reference was approved by the Director of the Federal Register in accordance with 5 U.S.C. 552(a) and 1 CFR Part 51. The method is incorporated as it exists on the effective date of this rule and a notice of any change to the method will be published in the Federal Register.

(7) From October 8, 1989, to October 7, 1990, a local education agency may analyze air monitoring samples collected for clearance purposes by PCM to confirm completion of removal, encapsulation, or enclosure of ACBM that is less than or equal to 1,500 square feet or 500 linear feet. The action shall be considered complete when the results of samples collected in the affected

functional space and analyzed by PCM using the NIOSH Method 7400 entitled "Fibers" published in the NIOSH Manual of Analytical Methods, 3rd Edition, Second Supplement, August 1987, show that the concentration of fibers for each of the five samples is less than or equal to a limit of quantitation for PCM (0.01 fibers per cubic centimeter, 0.01 f/cm³). The method is available at the Office of the Federal Register, 11th and L St., NW., Room 8301, Washington, DC, 20408, and in the EPA OPTS Reading Room, Rm. G004 Northeast Mall, 401 M St., SW., Washington, DC 20460. This incorporation by reference was approved by the Director of the Federal Register in accordance with 5 U.S.C. 552(a) and 1 CFR Part 51. The method is incorporated as it exists on the effective date of this rule and a notice of any change to the method will be published in the Federal Register.

(8) To determine the amount of ACBM affected under paragraphs (i) (5), (6), and (7) of this section, the local education agency shall add the total square or linear footage of ACBM within the containment barriers used to isolate the functional space for the action to remove, encapsulate, or enclose the ACBM. Contiguous portions of material subject to such action conducted concurrently or at approximately the same time within the same school building shall not be separated to qualify under paragraphs (i) (5), (6), or (7) of this section.

§ 763.91 Operations and maintenance.

(a) *Applicability.* The local education agency shall implement an operations, maintenance, and repair (O&M) program under this section whenever any friable ACBM is present or assumed to be present in a building that it leases, owns, or otherwise uses as a school building. Any material identified as nonfriable ACBM or nonfriable assumed ACBM must be treated as friable ACBM for purposes of this section when the material is about to become friable as a result of activities performed in the school building.

(b) *Worker protection.* The protection provided by EPA at 40 CFR 763.121 for worker protection during asbestos abatement projects is extended to employees of local education agencies who perform operations, maintenance, and repair (O&M) activities involving ACBM and who are not covered by the OSHA asbestos construction standard at 29 CFR 1926.58 or an asbestos worker approved by OSHA under section 19 of the Occupational Safety and Health Act. Local education agencies may consult

Appendix B of this Subpart if their employees are performing operations, maintenance, and repair activities that are of small-scale, short-duration.

(c) *Cleaning*—(1) *Initial cleaning*. Unless the building has been cleaned using equivalent methods within the previous 6 months, all areas of a school building where friable ACBM, damaged or significantly damaged thermal system insulation ACM, or friable suspected ACBM assumed to be ACM are present shall be cleaned at least once after the completion of the inspection required by § 763.85(a) and before the initiation of any response action, other than O&M activities or repair, according to the following procedures:

(i) HEPA-vacuum or steam-clean all carpets.

(ii) HEPA-vacuum or wet-clean all other floors and all other horizontal surfaces.

(iii) Dispose of all debris, filters, mopheads, and cloths in sealed, leak-tight containers.

(2) *Additional cleaning*. The accredited management planner shall make a written recommendation to the local education agency whether additional cleaning is needed, and if so, the methods and frequency of such cleaning.

(d) *Operations and maintenance activities*. The local education agency shall ensure that the procedures described below to protect building occupants shall be followed for any operations and maintenance activities disturbing friable ACBM:

(1) Restrict entry into the area by persons other than those necessary to perform the maintenance project, either by physically isolating the area or by scheduling.

(2) Post signs to prevent entry by unauthorized persons.

(3) Shut off or temporarily modify the air-handling system and restrict other sources of air movement.

(4) Use work practices or other controls, such as, wet methods, protective clothing, HEPA-vacuums, mini-enclosures, glove bags, as necessary to inhibit the spread of any released fibers.

(5) Clean all fixtures or other components in the immediate work area.

(6) Place the asbestos debris and other cleaning materials in a sealed, leak-tight container.

(e) *Maintenance activities other than small-scale, short-duration*. The response action for any maintenance activities disturbing friable ACBM, other than small-scale, short-duration maintenance activities, shall be designed by persons accredited to design response actions and conducted

by persons accredited to conduct response actions.

(f) *Fiber release episodes*—(1) *Minor fiber release episode*. The local education agency shall ensure that the procedures described below are followed in the event of a minor fiber release episode (i.e., the falling or dislodging of 3 square or linear feet or less of friable ACBM):

(i) Thoroughly saturate the debris using wet methods.

(ii) Clean the area, as described in paragraph (e) of this section.

(iii) Place the asbestos debris in a sealed, leak-tight container.

(iv) Repair the area of damaged ACM with materials such as asbestos-free spackling, plaster, cement, or insulation, or seal with latex paint or an encapsulant, or immediately have the appropriate response action implemented as required by § 763.90.

(2) *Major fiber release episode*. The local education agency shall ensure that the procedures described below are followed in the event of a major fiber release episode (i.e., the falling or dislodging of more than 3 square or linear feet of friable ACBM):

(i) Restrict entry into the area and post signs to prevent entry into the area by persons other than those necessary to perform the response action.

(ii) Shut off or temporarily modify the air-handling system to prevent the distribution of fibers to other areas in the building.

(iii) The response action for any major fiber release episode must be designed by persons accredited to design response actions and conducted by persons accredited to conduct response actions.

§ 763.92 Training and periodic surveillance.

(a) *Training*. (1) The local education agency shall ensure, prior to the implementation of the O&M provisions of the management plan, that all members of its maintenance and custodial staff (custodians, electricians, heating/air conditioning engineers, plumbers, etc.) who may work in a building that contains ACBM receive awareness training of at least 2 hours, whether or not they are required to work with ACBM. New custodial and maintenance employees shall be trained within 60 days after commencement of employment. Training shall include, but not be limited to:

(i) Information regarding asbestos and its various uses and forms.

(ii) Information on the health effects associated with asbestos exposure.

(iii) Locations of ACBM identified throughout each school building in which they work.

(iv) Recognition of damage, deterioration, and delamination of ACBM.

(v) Name and telephone number of the person designated to carry out general local education agency responsibilities under § 763.84 and the availability and location of the management plan.

(2) The local education agency shall ensure that all members of its maintenance and custodial staff who conduct any activities that will result in the disturbance of ACBM shall receive training described in paragraph (a)(1) of this section and 14 hours of additional training. Additional training shall include, but not be limited to:

(i) Descriptions of the proper methods of handling ACBM.

(ii) Information on the use of respiratory protection as contained in the EPA/NIOSH *Guide to Respiratory Protection for the Asbestos Abatement Industry*, September 1988 (EPA 560/OPTS-88-001), available from TSCA Assistance Office (TS-799), Office of Toxic Substances, Environmental Protection Agency, Rm. E-543, 401 M St. SW., Washington, DC 20460, and other personal protection measures.

(iii) The provisions of this section and § 763.91, Appendices A, B, C, D of this Subpart E of this part, EPA regulations contained in 40 CFR Part 763, Subpart G, and in 40 CFR Part 61, Subpart M, and OSHA regulations contained in 29 CFR 1926.58.

(iv) Hands-on training in the use of respiratory protection, other personal protection measures, and good work practices.

(3) Local education agency maintenance and custodial staff who have attended EPA-approved asbestos training or received equivalent training for O&M and periodic surveillance activities involving asbestos shall be considered trained for the purposes of this section.

(b) *Periodic surveillance*. (1) At least once every 6 months after a management plan is in effect, each local education agency shall conduct periodic surveillance in each building that it leases, owns, or otherwise uses as a school building that contains ACBM or is assumed to contain ACBM.

(2) Each person performing periodic surveillance shall:

(i) Visually inspect all areas that are identified in the management plan as ACBM or assumed ACBM.

(ii) Record the date of the surveillance, his or her name, and any

changes in the condition of the materials.

(iii) Submit to the person designated to carry out general local education agency responsibilities under § 763.84 a copy of such record for inclusion in the management plan.

§ 763.93 Management plans.

(a)(1) On or before October 12, 1988, each local education agency shall develop an asbestos management plan for each school, including all buildings that they lease, own, or otherwise use as school buildings, and submit the plan to an Agency designated by the Governor of the State in which the local education agency is located. The plan may be submitted in stages that cover a portion of the school buildings under the authority of the local education agency.

(2) If a building to be used as part of a school is leased or otherwise acquired after October 12, 1988, the local education agency shall include the new building in the management plan for the school prior to its use as a school building. The revised portions of the management plan shall be submitted to the Agency designated by the Governor.

(3) If a local education agency begins to use a building as a school after October 12, 1988, the local education agency shall submit a management plan for the school to the Agency designated by the Governor prior to its use as a school.

(b) On or before October 17, 1987, the Governor of each State shall notify local education agencies in the State regarding where to submit their management plans. States may establish administrative procedures for reviewing management plans. If the Governor does not disapprove a management plan within 90 days after receipt of the plan, the local education agency shall implement the plan.

(c) Each local education agency must begin implementation of its management plan on or before July 9, 1989, and complete implementation in a timely fashion.

(d) Each local education agency shall maintain and update its management plan to keep it current with ongoing operations and maintenance, periodic surveillance, inspection, reinspection, and response action activities. All provisions required to be included in the management plan under this section shall be retained as part of the management plan, as well as any information that has been revised to bring the plan up-to-date.

(e) The management plan shall be developed by an accredited management planner and shall include:

(1) A list of the name and address of each school building and whether the school building contains friable ACBM, nonfriable ACBM, and friable and nonfriable suspected ACBM assumed to be ACM.

(2) For each inspection conducted before the December 14, 1987:

(i) The date of the inspection.
(ii) A blueprint, diagram, or written description of each school building that identifies clearly each location and approximate square or linear footage of any homogeneous or sampling area where material was sampled for ACM, and, if possible, the exact locations where bulk samples were collected, and the dates of collection.

(iii) A copy of the analyses of any bulk samples, dates of analyses, and a copy of any other laboratory reports pertaining to the analyses.

(iv) A description of any response actions or preventive measures taken to reduce asbestos exposure, including if possible, the names and addresses of all contractors involved, start and completion dates of the work, and results of any air samples analyzed during and upon completion of the work.

(v) A description of assessments, required to be made under § 763.88, of material that was identified before December 14, 1987, as friable ACBM or friable suspected ACBM assumed to be ACM, and the name and signature, State of accreditation, and if applicable, accreditation number of each accredited person making the assessments.

(3) For each inspection and reinspection conducted under § 763.85:

(i) The date of the inspection or reinspection and the name and signature, State of accreditation and, if applicable, the accreditation number of each accredited inspector performing the inspection or reinspection.

(ii) A blueprint, diagram, or written description of each school building that identifies clearly each location and approximate square or linear footage of homogeneous areas where material was sampled for ACM, the exact location where each bulk sample was collected, date of collection, homogeneous areas where friable suspected ACBM is assumed to be ACM, and where nonfriable suspected ACBM is assumed to be ACM.

(iii) A description of the manner used to determine sampling locations, and the name and signature of each accredited inspector collecting samples, the State of accreditation, and if applicable, his or her accreditation number.

(iv) A copy of the analyses of any bulk samples collected and analyzed, the name and address of any laboratory that analyzed bulk samples, a statement

that the laboratory meets the applicable requirements of § 763.87(a) the date of analysis, and the name and signature of the person performing the analysis.

(v) A description of assessments, required to be made under § 763.88, of all ACBM and suspected ACBM assumed to be ACM, and the name, signature, State of accreditation, and if applicable, accreditation number of each accredited person making the assessments.

(4) The name, address, and telephone number of the person designated under § 763.84 to ensure that the duties of the local education agency are carried out, and the course name, and dates and hours of training taken by that person to carry out the duties.

(5) The recommendations made to the local education agency regarding response actions, under § 763.88(d), the name, signature, State of accreditation of each person making the recommendations, and if applicable, his or her accreditation number.

(6) A detailed description of preventive measures and response actions to be taken, including methods to be used, for any friable ACBM, the locations where such measures and action will be taken, reasons for selecting the response action or preventive measure, and a schedule for beginning and completing each preventive measure and response action.

(7) With respect to the person or persons who inspected for ACBM and who will design or carry out response actions, except for operations and maintenance, with respect to the ACBM, one of the following statements:

(i) If the State has adopted a contractor accreditation program under section 206(b) of Title II of the Act, a statement that the person(s) is accredited under such plan.

(ii) A statement that the local education agency used (or will use) persons who have been accredited by another State which has adopted a contractor accreditation plan under section 206(b) of Title II of the Act or is accredited by an EPA-approved course under section 206(c) of Title II of the Act.

(8) A detailed description in the form of a blueprint, diagram, or in writing of any ACBM or suspected ACBM assumed to be ACM which remains in the school once response actions are undertaken pursuant to § 763.90. This description shall be updated as response actions are completed.

(9) A plan for reinspection under § 763.85, a plan for operations and maintenance activities under § 763.91,

and a plan for periodic surveillance under § 763.92, a description of the recommendation made by the management planner regarding additional cleaning under § 763.91(c)(2) as part of an operations and maintenance program, and the response of the local education agency to that recommendation.

(10) A description of steps taken to inform workers and building occupants, or their legal guardians, about inspections, reinspections, response actions, and post-response action activities, including periodic reinspection and surveillance activities that are planned or in progress.

(11) An evaluation of the resources needed to complete response actions successfully and carry out reinspection, operations and maintenance activities, periodic surveillance and training.

(12) With respect to each consultant who contributed to the management plan, the name of the consultant and one of the following statements:

(i) If the State has adopted a contractor accreditation plan under section 206(b) of Title II of the Act, a statement that the consultant is accredited under such plan.

(ii) A statement that the contractor is accredited by another State which has adopted a contractor accreditation plan under section 206(b) of Title II of the Act, or is accredited by an EPA-approved course developed under section 206(c) of Title II of the Act.

(f) A local education agency may require each management plan to contain a statement signed by an accredited management plan developer that such person has prepared or assisted in the preparation of such plan or has reviewed such plan, and that such plan is in compliance with this Subpart E. Such statement may not be signed by a person who, in addition to preparing or assisting in preparing the management plan, also implements (or will implement) the management plan.

(g)(1) Upon submission of a management plan to the Governor for review, a local education agency shall keep a copy of the plan in its administrative office. The management plans shall be available, without cost or restriction, for inspection by representatives of EPA and the State, the public, including teachers, other school personnel and their representatives, and parents. The local education agency may charge a reasonable cost to make copies of management plans.

(2) Each local education agency shall maintain in its administrative office a complete, updated copy of a management plan for each school under

its administrative control or direction. The management plans shall be available, during normal business hours, without cost or restriction, for inspection by representatives of EPA and the State, the public, including teachers, other school personnel and their representatives, and parents. The local education agency may charge a reasonable cost to make copies of management plans.

(3) Each school shall maintain in its administrative office a complete, updated copy of the management plan for that school. Management plans shall be available for inspection, without cost or restriction, to workers before work begins in any area of a school building. The school shall make management plans available for inspection to representatives of EPA and the State, the public, including parents, teachers, and other school personnel and their representatives within 5 working days after receiving a request for inspection. The school may charge a reasonable cost to make copies of the management plan.

(4) Upon submission of its management plan to the Governor and at least once each school year, the local education agency shall notify in writing parent, teacher, and employee organizations of the availability of management plans and shall include in the management plan a description of the steps taken to notify such organizations, and a dated copy of the notification. In the absence of any such organizations for parents, teachers, or employees, the local education agency shall provide written notice to that relevant group of the availability of management plans and shall include in the management plan a description of the steps taken to notify such groups, and a dated copy of the notification.

(h) Records required under § 763.94 shall be made by local education agencies and maintained as part of the management plan.

(i) Each management plan must contain a true and correct statement, signed by the individual designated by the local education agency under § 763.84, which certifies that the general, local education agency responsibilities, as stipulated by § 763.84, have been met or will be met.

§ 763.94 Recordkeeping.

(a) Records required under this section shall be maintained in a centralized location in the administrative office of both the school and the local education agency as part of the management plan. For each homogeneous area where all ACBM has been removed, the local education

agency shall ensure that such records are retained for 3 years after the next reinspection required under § 763.85(b)(1), or for an equivalent period.

(b) For each preventive measure and response action taken for friable and nonfriable ACBM and friable and nonfriable suspected ACBM assumed to be ACM, the local education agency shall provide:

(1) A detailed written description of the measure or action, including methods used, the location where the measure or action was taken, reasons for selecting the measure or action, start and completion dates of the work, names and addresses of all contractors involved, and if applicable, their State of accreditation, and accreditation numbers, and if ACBM is removed, the name and location of storage or disposal site of the ACM.

(2) The name and signature of any person collecting any air sample required to be collected at the completion of certain response actions specified by § 763.90(i), the locations where samples were collected, date of collection, the name and address of the laboratory analyzing the samples, the date of analysis, the results of the analysis, the method of analysis, the name and signature of the person performing the analysis, and a statement that the laboratory meets the applicable requirements of § 763.90(i)(2)(ii).

(c) For each person required to be trained under § 763.92(a) (1) and (2), the local education agency shall provide the person's name and job title, the date that training was completed by that person, the location of the training, and the number of hours completed in such training.

(d) For each time that periodic surveillance under § 763.92(b) is performed, the local education agency shall record the name of each person performing the surveillance, the date of the surveillance, and any changes in the conditions of the materials.

(e) For each time that cleaning under § 763.91(c) is performed, the local education agency shall record the name of each person performing the cleaning, the date of such cleaning, the locations cleaned, and the methods used to perform such cleaning.

(f) For each time that operations and maintenance activities under § 763.81(d) are performed, the local education agency shall record the name of each person performing the activity, the start and completion dates of the activity, the locations where such activity occurred, a description of the activity including preventive measures used, and if ACBM

is removed, the name and location of storage or disposal site of the ACM.

(g) For each time that major asbestos activity under § 763.91(e) is performed, the local education agency shall provide the name and signature, State of accreditation, and if applicable, the accreditation number of each person performing the activity, the start and completion dates of the activity, the locations where such activity occurred, a description of the activity including preventive measures used, and if ACBM is removed, the name and location of storage or disposal site of the ACM.

(h) For each fiber release episode under § 763.91(f), the local education agency shall provide the date and location of the episode, the method of repair, preventive measures or response action taken, the name of each person performing the work, and if ACBM is removed, the name and location of storage or disposal site of the ACM.

(Approved by the Office of Management and Budget under control number 2070-0091)

§ 763.95 Warning labels.

(a) The local education agency shall attach a warning label immediately adjacent to any friable and nonfriable ACBM and suspected ACBM assumed to be ACM located in routine maintenance areas (such as boiler room) at each school building. This shall include:

(1) Friable ACBM that was responded to by a means other than removal.

(2) ACBM for which no response action was carried out.

(b) All labels shall be prominently displayed in readily visible locations and shall remain posted until the ACBM that is labeled is removed.

(c) The warning label shall read, in print which is readily visible because of large size or bright color, as follows: CAUTION: ASBESTOS. HAZARDOUS. DO NOT DISTURB WITHOUT PROPER TRAINING AND EQUIPMENT.

§ 763.97 Compliance and enforcement.

(a) *Compliance with Title II of the Act.* (1) Section 207(a) of Title II of the Act (15 U.S.C. 2647) makes it unlawful for any local education agency to:

(i) Fail to conduct inspections pursuant to section 203(b) of Title II of the Act, including failure to follow procedures and failure to use accredited personnel and laboratories.

(ii) Knowingly submit false information to the Governor regarding any inspection pursuant to regulations under section 203(i) of Title II of the Act.

(iii) Fail to develop a management plan pursuant to regulations under section 203(i) of Title II of the Act.

(2) Section 207(a) of Title II of the Act (15 U.S.C. 2647) also provides that any local education agency which violates any provision of section 207 shall be liable for a civil penalty of not more than \$5,000 for each day during which the violation continues. For the purposes of this subpart, a "violation" means a failure to comply with respect to a single school building.

(b) *Compliance with Title I of the Act.*

(1) Section 15(1)(D) of Title I of the Act (15 U.S.C. 2614) makes it unlawful for any person to fail or refuse to comply with any requirement of Title II or any rule promulgated or order issued under Title II. Therefore, any person who violates any requirement of this Subpart is in violation of section 15 of Title I of the Act.

(2) Section 15(3) of Title I of the Act (15 U.S.C. 2614) makes it unlawful for any person to fail or refuse to establish or maintain records, submit reports, notices or other information, or permit access to or copying of records, as required by this Act or a rule thereunder.

(3) Section 15(4) (15 U.S.C. 2614) of Title I of the Act makes it unlawful for any person to fail or refuse to permit entry or inspection as required by section 11 of Title I of the Act.

(4) Section 16(a) of Title I of the Act (15 U.S.C. 2615) provides that any person who violates any provision of section 15 of Title I of the Act shall be liable to the United States for a civil penalty in an amount not to exceed \$25,000 for each such violation. Each day such a violation continues shall, for purposes of this paragraph, constitute a separate violation of section 15. A local education agency is not liable for any civil penalty under Title I of the Act for failing or refusing to comply with any rule promulgated or order issued under Title II of the Act.

(c) *Criminal penalties.* If any violation committed by any person (including a local education agency) is knowing or willful, criminal penalties may be assessed under section 16(b) of Title I of the Act.

(d) *Injunctive relief.* The Agency may obtain injunctive relief under section 208(b) of Title II of the Act to respond to a hazard which poses an imminent and substantial endangerment to human health or the environment or section 17 (15 U.S.C. 2616) of Title I of the Act to restrain any violation of section 15 of Title I of the Act or to compel the taking of any action required by or under Title I of the Act.

(e) *Citizen complaints.* Any citizen who wishes to file a complaint pursuant to section 207(d) of Title II of the Act should direct the complaint to the

Governor of the State or the EPA Asbestos Ombudsman, 401 M Street, SW., Washington, DC 20460. The citizen complaint should be in writing and identified as a citizen complaint pursuant to section 207(d) of Title II of TSCA. The EPA Asbestos Ombudsman or the Governor shall investigate and respond to the complaint within a reasonable period of time if the allegations provide a reasonable basis to believe that a violation of the Act has occurred.

(f) *Inspections.* EPA may conduct inspections and review management plans under section 11 of Title I of the Act (15 U.S.C. 2610) to ensure compliance.

§ 763.98 Waiver, delegation to State.

(a) *General.* (1) Upon request from a State Governor and after notice and comment and an opportunity for a public hearing in accordance with paragraphs (b) and (c) of this section, EPA may waive some or all of the requirements of this Subpart E if the State has established and is implementing or intends to implement a program of asbestos inspection and management that contains requirements that are at least as stringent as the requirements of this Subpart E.

(2) A waiver from any requirement of this Subpart E shall apply only to the specific provision for which a waiver has been granted under this section. All requirements of this Subpart E shall apply until a waiver is granted under this section.

(b) *Request.* Each request by a Governor to waive any requirement of this Subpart E shall be sent with three complete copies of the request to the Regional Administrator for the EPA Region in which the State is located and shall include:

(1) A copy of the State provisions or proposed provisions relating to its program of asbestos inspection and management in schools for which the request is made.

(2)(i) The name of the State agency that is or will be responsible for administering and enforcing the requirements for which a waiver is requested, the names and job titles of responsible officials in that agency, and phone numbers where the officials can be contacted.

(ii) In the event that more than one agency is or will be responsible for administering and enforcing the requirements for which a waiver is requested, a description of the functions to be performed by each agency, how the program will be coordinated by the lead agency to ensure consistency and

effective administration in the asbestos inspection and management program within the State, the names and job titles of responsible officials in the agencies, and phone numbers where the officials can be contacted. The lead agency will serve as the central contact point for the EPA.

(3) Detailed reasons, supporting papers, and the rationale for concluding that the State's asbestos inspection and management program provisions for which the request is made are at least as stringent as the requirements of this Subpart E.

(4) A discussion of any special situations, problems, and needs pertaining to the waiver request accompanied by an explanation of how the State intends to handle them.

(5) A statement of the resources that the State intends to devote to the administration and enforcement of the provisions relating to the waiver request.

(6) Copies of any specific or enabling State laws (enacted and pending enactment) and regulations (promulgated and pending promulgation) relating to the request, including provisions for assessing criminal and/or civil penalties.

(7) Assurance from the Governor, the Attorney General, or the legal counsel of the lead agency that the lead agency or other cooperating agencies have the legal authority necessary to carry out the requirements relating to the request.

(c) *General notice—hearing.* (1) Within 30 days after receipt of a request for a waiver, EPA will determine the completeness of the request. If EPA does not request further information within the 30-day period, the request will be deemed complete.

(2) Within 30 days after EPA determines that a request is complete, EPA will issue for publication in the Federal Register a notice that announces receipt of the request, describes the information submitted under paragraph (b) of this section, and solicits written comment from interested members of the public. Comments must be submitted within 60 days.

(3) If, during the comment period, EPA receives a written objection to a Governor's request and a request for a public hearing detailing specific objections to the granting of a waiver, EPA will schedule a public hearing to be held in the affected State after the close of the comment period and will announce the public hearing date in the Federal Register before the date of the hearing. Each comment shall include the name and address of the person submitting the comment.

(d) *Criteria.* EPA may waive some or all of the requirements of Subpart E of this part if:

(1) The State's lead agency and other cooperating agencies have the legal authority necessary to carry out the provisions of asbestos inspection and management in schools relating to the waiver request.

(2) The State's program of asbestos inspection and management in schools relating to the waiver request and implementation of the program are or will be at least as stringent as the requirements of this Subpart E.

(3) The State has an enforcement mechanism to allow it to implement the program described in the waiver request.

(4) The lead agency and any cooperating agencies have or will have qualified personnel to carry out the provisions relating to the waiver request.

(5) The State will devote adequate resources to the administration and enforcement of the asbestos inspection and management provisions relating to the waiver request.

(6) When specified by EPA, the State gives satisfactory assurances that necessary steps, including specific actions it proposes to take and a time schedule for their accomplishment, will be taken within a reasonable time to conform with applicable criteria under paragraph (d) (2) through (4) of this section.

(e) *Decision.* EPA will issue for publication in the Federal Register a notice announcing its decision to grant or deny, in whole or in part, a Governor's request for a waiver from some or all of the requirements of this Subpart E within 30 days after the close of the comment period or within 30 days following a public hearing, whichever is applicable. The notice will include the Agency's reasons and rationale for granting or denying the Governor's request. The 30-day period may be extended if mutually agreed upon by EPA and the State.

(f) *Modifications.* When any substantial change is made in the administration or enforcement of a State program for which a waiver was granted under this section, a responsible official in the lead agency shall submit such changes to EPA.

(g) *Reports.* The lead agency in each State that has been granted a waiver by EPA from any requirement of Subpart E of this part shall submit a report to the Regional Administrator for the Region in which the State is located at least once every 12 months to include the following information:

(1) A summary of the State's implementation and enforcement activities during the last reporting period relating to provisions waived under this section, including enforcement actions taken.

(2) Any changes in the administration or enforcement of the State program implemented during the last reporting period.

(3) Other reports as may be required by EPA to carry out effective oversight of any requirement of this Subpart E that was waived under this section.

(h) *Oversight.* EPA may periodically evaluate the adequacy of a State's implementation and enforcement of and resources devoted to carrying out requirements relating to the waiver. This evaluation may include, but is not limited to, site visits to local education agencies without prior notice to the State.

(i) *Informal conference.* (1) EPA may request that an informal conference be held between appropriate State and EPA officials when EPA has reason to believe that a State has failed to:

(i) Substantially comply with the terms of any provision that was waived under this section.

(ii) Meet the criteria under paragraph (d) of this section, including the failure to carry out enforcement activities or act on violations of the State program.

(2) EPA will:

(i) Specify to the State those aspects of the State's program believed to be inadequate.

(ii) Specify to the State the facts that underlie the belief of inadequacy.

(3) If EPA finds, on the basis of information submitted by the State at the conference, that deficiencies did not exist or were corrected by the State, no further action is required.

(4) Where EPA finds that deficiencies in the State program exist, a plan to correct the deficiencies shall be negotiated between the State and EPA. The plan shall detail the deficiencies found in the State program, specify the steps the State has taken or will take to remedy the deficiencies, and establish a schedule for each remedial action to be initiated.

(j) *Rescission.* (1) If the State fails to meet with EPA or fails to correct deficiencies raised at the informal conference, EPA will deliver to the Governor of the State and a responsible official in the lead agency a written notice of its intent to rescind, in whole or part, the waiver.

(2) EPA will issue for publication in the Federal Register a notice that announces the rescission of the waiver, describes those aspects of the State's

program determined to be inadequate, and specifies the facts that underlie the findings of inadequacy.

§ 763.99 Exclusions.

A local education agency shall not be required to perform an inspection under § 763.85(a) in any sampling area as defined in 40 CFR 763.103 or homogeneous area of a school building where:

(1) An accredited inspector has determined that, based on sampling records, friable ACM was identified in that homogeneous or sampling area during an inspection conducted before December 14, 1987. The inspector shall sign and date a statement to that effect with his or her State of accreditation and if applicable, accreditation number and, within 30 days after such determination, submit a copy of the statement to the person designated under § 763.84 for inclusion in the management plan. However, an accredited inspector shall assess the friable ACM under § 763.88.

(2) An accredited inspector has determined that, based on sampling records, nonfriable ACM was identified in that homogeneous or sampling area during an inspection conducted before December 14, 1987. The inspector shall sign and date a statement to that effect with his or her State of accreditation and if applicable, accreditation number and, within 30 days after such determination, submit a copy of the statement to the person designated under § 763.84 for inclusion in the management plan. However, an accredited inspector shall identify whether material that was nonfriable has become friable since that previous inspection and shall assess the newly-friable ACM under § 763.88.

(3) Based on sampling records and inspection records, an accredited inspector has determined that no ACM is present in the homogeneous or sampling area and the records show that the area was sampled, before December 14, 1987 in substantial compliance with § 763.85(a), which for purposes of this section means in a random manner and with a sufficient number of samples to reasonably ensure that the area is not ACM.

(i) The accredited inspector shall sign and date a statement, with his or her State of accreditation and if applicable, accreditation number that the homogeneous or sampling area determined not to be ACM was sampled in substantial compliance with § 763.85(a).

(ii) Within 30 days after the inspector's determination, the local education agency shall submit a copy of

the inspector's statement to the EPA Regional Office and shall include the statement in the management plan for that school.

(4) The lead agency responsible for asbestos inspection in a State that has been granted a waiver from § 763.85(a) has determined that, based on sampling records and inspection records, no ACM is present in the homogeneous or sampling area and the records show that the area was sampled before December 14, 1987, in substantial compliance with § 763.85(a). Such determination shall be included in the management plan for that school.

(5) An accredited inspector has determined that, based on records of an inspection conducted before December 14, 1987, suspected ACM identified in that homogeneous or sampling area is assumed to be ACM. The inspector shall sign and date a statement to that effect, with his or her State of accreditation and if applicable, accreditation number and, within 30 days of such determination, submit a copy of the statement to the person designated under § 763.84 for inclusion in the management plan. However, an accredited inspector shall identify whether material that was nonfriable suspected ACM assumed to be ACM has become friable since the previous inspection and shall assess the newly-friable material and previously identified friable suspected ACM assumed to be ACM under § 763.88.

(6) Based on inspection records and contractor and clearance records, an accredited inspector has determined that no ACM is present in the homogeneous or sampling area where asbestos removal operations have been conducted before December 14, 1987, and shall sign and date a statement to that effect and include his or her State of accreditation and, if applicable, accreditation number. The local education agency shall submit a copy of the statement to the EPA Regional Office and shall include the statement in the management plan for that school.

(7) An architect or project engineer responsible for the construction of a new school building built after October 12, 1988, or an accredited inspector signs a statement that no ACM was specified as a building material in any construction document for the building, or, to the best of his or her knowledge, no ACM was used as a building material in the building. The local education agency shall submit a copy of the signed statement of the architect, project engineer, or accredited inspector to the EPA Regional Office and shall include the statement in the management plan for that school.

(b) The exclusion, under paragraph (a) (1) through (4) of this section, from conducting the inspection under § 763.85(a) shall apply only to homogeneous or sampling areas of a school building that were inspected and sampled before October 17, 1987. The local education agency shall conduct an inspection under § 763.85(a) of all areas inspected before October 17, 1987, that were not sampled or were not assumed to be ACM.

(c) If ACM is subsequently found in a homogeneous or sampling area of a local education agency that had been identified as receiving an exclusion by an accredited inspector under paragraphs (a) (3), (4), (5) of this section, or an architect, project engineer or accredited inspector under paragraph (a)(7) of this section, the local education agency shall have 180 days following the date of identification of ACM to comply with this Subpart E.

Appendix A to Subpart E—Interim Transmission Electron Microscopy Analytical Methods—Mandatory and Nonmandatory—and Mandatory Section to Determine Completion of Response Actions

I. Introduction

The following appendix contains three units. The first unit is the mandatory transmission electron microscopy (TEM) method which all laboratories must follow; it is the minimum requirement for analysis of air samples for asbestos by TEM. The mandatory method contains the essential elements of the TEM method. The second unit contains the complete non-mandatory method. The non-mandatory method supplements the mandatory method by including additional steps to improve the analysis. EPA recommends that the non-mandatory method be employed for analyzing air filters; however, the laboratory may choose to employ the mandatory method. The non-mandatory method contains the same minimum requirements as are outlined in the mandatory method. Hence, laboratories may choose either of the two methods for analyzing air samples by TEM.

The final unit of this Appendix A to Subpart E defines the steps which must be taken to determine completion of response actions. This unit is mandatory.

II. Mandatory Transmission Electron Microscopy Method

A. Definitions of Terms

1. "Analytical sensitivity"—Airborne asbestos concentration represented by each fiber counted under the electron

microscope. It is determined by the air volume collected and the proportion of the filter examined. This method requires that the analytical sensitivity be no greater than 0.005 structures/cm³.

2. "Asbestiform"—A specific type of mineral fibrosity in which the fibers and fibrils possess high tensile strength and flexibility.

3. "Aspect ratio"—A ratio of the length to the width of a particle. Minimum aspect ratio as defined by this method is equal to or greater than 5:1.

4. "Bundle"—A structure composed of three or more fibers in a parallel arrangement with each fiber closer than one fiber diameter.

5. "Clean area"—A controlled environment which is maintained and monitored to assure a low probability of asbestos contamination to materials in that space. Clean areas used in this method have HEPA filtered air under positive pressure and are capable of sustained operation with an open laboratory blank which on subsequent analysis has an average of less than 18 structures/mm² in an area of 0.057 mm² (nominally 10 200-mesh grid openings) and a maximum of 53 structures/mm² for any single preparation for that same area.

6. "Cluster"—A structure with fibers in a random arrangement such that all fibers are intermixed and no single fiber is isolated from the group. Groupings must have more than two intersections.

7. "ED"—Electron diffraction.

8. "EDXA"—Energy dispersive X-ray analysis.

9. "Fiber"—A structure greater than or equal to 0.5 μm in length with an aspect

ratio (length to width) of 5:1 or greater and having substantially parallel sides.

10. "Grid"—An open structure for mounting on the sample to aid in its examination in the TEM. The term is used here to denote a 200-mesh copper lattice approximately 3 mm in diameter.

11. "Intersection"—Nonparallel touching or crossing of fibers, with the projection having an aspect ratio of 5:1 or greater.

12. "Laboratory sample coordinator"—That person responsible for the conduct of sample handling and the certification of the testing procedures.

13. "Filter background level"—The concentration of structures per square millimeter of filter that is considered indistinguishable from the concentration measured on a blank (filters through which no air has been drawn). For this method the filter background level is defined as 70 structures/mm².

14. "Matrix"—Fiber or fibers with one end free and the other end embedded in or hidden by a particulate. The exposed fiber must meet the fiber definition.

15. "NSD"—No structure detected.

16. "Operator"—A person responsible for the TEM instrumental analysis of the sample.

17. "PCM"—Phase contrast microscopy.

18. "SAED"—Selected area electron diffraction.

19. "SEM"—Scanning electron microscope.

20. "STEM"—Scanning transmission electron microscope.

21. "Structure"—a microscopic bundle, cluster, fiber, or matrix which may contain asbestos.

22. "S/cm³"—Structures per cubic centimeter.

23. "S/mm²"—Structures per square millimeter.

24. "TEM"—Transmission electron microscope.

B. Sampling

1. The sampling agency must have written quality control procedures and documents which verify compliance.

2. Sampling operations must be performed by qualified individuals completely independent of the abatement contractor to avoid possible conflict of interest (References 1, 2, 3, and 5 of Unit II.J.).

3. Sampling for airborne asbestos following an abatement action must use commercially available cassettes.

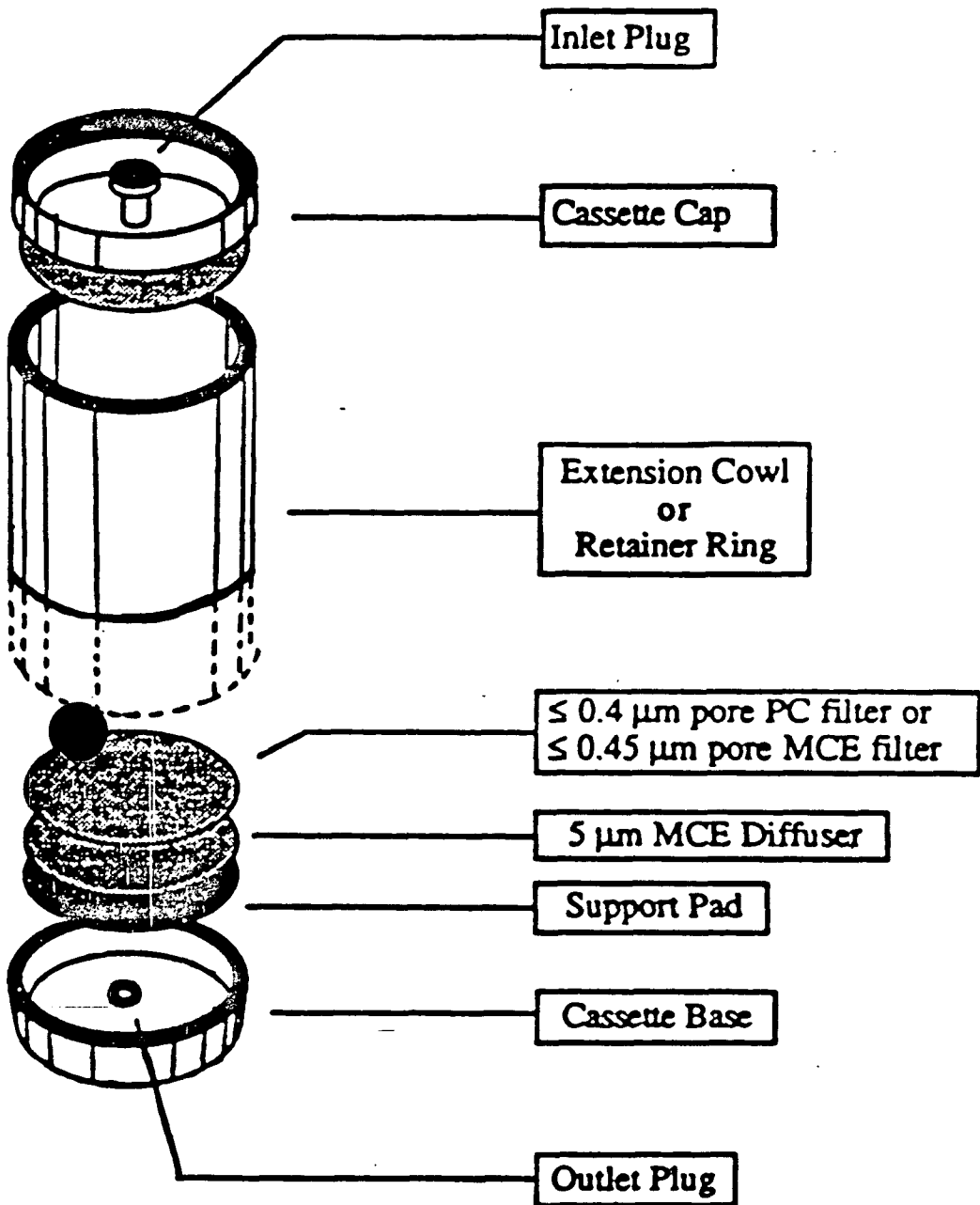
4. Prescreen the loaded cassette collection filters to assure that they do not contain concentrations of asbestos which may interfere with the analysis of the sample. A filter blank average of less than 18 s/mm² in an area of 0.057 mm² (nominally 10 200-mesh grid openings) and a single preparation with a maximum of 53 s/mm² for that same area is acceptable for this method.

5. Use sample collection filters which are either polycarbonate having a pore size less than or equal to 0.4 μm or mixed cellulose ester having a pore size less than or equal to 0.45 μm.

6. Place these filters in series with a 5.0 μm backup filter (to serve as a diffuser) and a support pad. See the following Figure 1:

BILLING CODE 6480-60-01

FIGURE I--SAMPLING CASSETTE CONFIGURATION



BILLING CODE 6880-09-C

7. Reloading of used cassettes is not permitted.

8. Orient the cassette downward at approximately 45 degrees from the horizontal.

9. Maintain a log of all pertinent sampling information.

10. Calibrate sampling pumps and their flow indicators over the range of their intended use with a recognized standard. Assemble the sampling system with a representative filter (not the filter which will be used in sampling) before and after the sampling operation.

11. Record all calibration information.

12. Ensure that the mechanical vibrations from the pump will be minimized to prevent transferral of vibration to the cassette.

13. Ensure that a continuous smooth flow of negative pressure is delivered by the pump by damping out any pump action fluctuations if necessary.

14. The final plastic barrier around the abatement area remains in place for the sampling period.

15. After the area has passed a thorough visual inspection, use aggressive sampling conditions to dislodge any remaining dust. (See suggested protocol in Unit III.B.7.d.)

16. Select an appropriate flow rate equal to or greater than 1 liter per minute (L/min) or less than 10 L/min for 25 mm cassettes. Larger filters may be operated at proportionally higher flow rates.

17. A minimum of 13 samples are to be collected for each testing site consisting of the following:

a. A minimum of five samples per abatement area.

b. A minimum of five samples per ambient area positioned at locations representative of the air entering the abatement site.

c. Two field blanks are to be taken by removing the cap for not more than 30 seconds and replacing it at the time of sampling before sampling is initiated at the following places:

i. Near the entrance to each abatement area.

ii. At one of the ambient sites. (DO NOT leave the field blanks open during the sampling period.)

d. A sealed blank is to be carried with each sample set. This representative cassette is not to be opened in the field.

18. Perform a leak check of the sampling system at each indoor and outdoor sampling site by activating the pump with the closed sampling cassette in line. Any flow indicates a leak which must be eliminated before initiating the sampling operation.

19. The following Table I specifies volume ranges to be used:

BILLING CODE 6540-50-M

TABLE 1--NUMBER OF 200 MESH EM GRID OPENINGS (0.0057 MM²) THAT NEED TO BE ANALYZED TO MAINTAIN SENSITIVITY OF 0.005 STRUCTURES/CC BASED ON VOLUME AND EFFECTIVE FILTER AREA

Effective Filter Area 385 sq mm		Effective Filter Area 855 sq mm	
Volume (liters)	# of grid openings	Volume (liters)	# of grid openings
560	24	1,250	24
600	23	1,300	23
700	19	1,400	21
800	17	1,600	19
900	15	1,800	17
1,000	14	2,000	15
1,100	12	2,200	14
1,200	11	2,400	13
1,300	10	2,600	12
1,400	10	2,800	11
1,500	9	3,000	10
1,600	8	3,200	9
1,700	8	3,400	9
1,800	8	3,600	8
1,900	7	3,800	8
2,000	7	4,000	8
2,100	6	4,200	7
2,200	6	4,400	7
2,300	6	4,600	7
2,400	6	4,800	6
2,500	5	5,000	6
2,600	5	5,200	6
2,700	5	5,400	6
2,800	5	5,600	5
2,900	5	5,800	5
3,000	5	6,000	5
3,100	4	6,200	5
3,200	4	6,400	5
3,300	4	6,600	5
3,400	4	6,800	4
3,500	4	7,000	4
3,600	4	7,200	4
3,700	4	7,400	4
3,800	4	7,600	4

Recommended
Volume
Range

Recommended
Volume
Range

Note minimum volumes required:
25 mm : 560 liters
37 mm : 1250 liters

Filter diameter of 25 mm = effective area of 385 sq mm
Filter diameter of 37 mm = effective area of 855 sq mm

20. Ensure that the sampler is turned upright before interrupting the pump flow.

21. Check that all samples are clearly labeled and that all pertinent information has been enclosed before transfer of the samples to the laboratory.

22. Ensure that the samples are stored in a secure and representative location.

23. Do not change containers if portions of these filters are taken for other purposes.

24. A summary of Sample Data Quality Objectives is shown in the following Table II:

BILLING CODE 6590-60-M

TABLE II--SUMMARY OF SAMPLING AGENCY DATA QUALITY OBJECTIVES

This table summarizes the data quality objectives from the performance of this method in terms of precision, accuracy, completeness, representativeness, and comparability. These objectives are assured by the periodic control checks and reference checks listed here and described in the text of the method.

<u>Unit Operation</u>	<u>QC Check</u>	<u>Frequency</u>	<u>Conformance Expectation</u>
Sampling materials	Scaled blank	1 per I/O site	95%
Sample procedures	Field blanks	2 per I/O site	95%
	Pump calibration	Before and after each field series	90%
Sample custody	Review of chain-of-custody record	Each sample	95% complete
Sample shipment	Review of sending report	Each sample	95% complete

BILLING CODE 6699-99-C

C. Sample Shipment

Ship bulk samples to the analytical laboratory in a separate container from air samples.

D. Sample Receiving

1. Designate one individual as sample coordinator at the laboratory. While that individual will normally be available to receive samples, the coordinator may train and supervise others in receiving procedures for those times when he/she is not available.

2. Bulk samples and air samples delivered to the analytical laboratory in the same container shall be rejected.

E. Sample Preparation

1. All sample preparation and analysis shall be performed by a laboratory independent of the abatement contractor.

2. Wet-wipe the exterior of the cassettes to minimize contamination possibilities before taking them into the clean room facility.

3. Perform sample preparation in a well-equipped clean facility.

Note: The clean area is required to have the following minimum characteristics. The area or hood must be capable of maintaining a positive pressure with make-up air being HEPA-filtered. The cumulative analytical blank concentration must average less than 18 $\mu\text{g}/\text{mm}^2$ in an area of 0.057 mm^2 (nominally 10 200-mesh grid openings) and a single preparation with a maximum of 53 $\mu\text{g}/\text{mm}^2$ for that same area.

4. Preparation areas for air samples must not only be separated from preparation areas for bulk samples, but they must be prepared in separate rooms.

5. Direct preparation techniques are required. The object is to produce an intact film containing the particulates of the filter surface which is sufficiently clear for TEM analysis.

a. TEM Grid Opening Area measurement must be done as follows:

i. The filter portion being used for sample preparation must have the surface collapsed using an acetone vapor technique.

ii. Measure 20 grid openings on each of 20 random 200-mesh copper grids by placing a grid on a glass and examining it under the PCM. Use a calibrated graticule to measure the average field diameters. From the data, calculate the field area for an average grid opening.

iii. Measurements can also be made on the TEM at a properly calibrated low magnification or on an optical microscope at a magnification of approximately 400X by using an eyepiece fitted with a scale that has been calibrated against a stage micrometer. Optical microscopy utilizing

manual or automated procedures may be used providing instrument calibration can be verified.

b. TEM specimen preparation from polycarbonate (PC) filters. Procedures as described in Unit III.G. or other equivalent methods may be used.

c. TEM specimen preparation from mixed cellulose ester (MCE) filters.

i. Filter portion being used for sample preparation must have the surface collapsed using an acetone vapor technique or the Burdette procedure (Ref. 7 of Unit II.J.)

ii. Plasma etching of the collapsed filter is required. The microscope slide to which the collapsed filter pieces are attached is placed in a plasma asher. Because plasma ashers vary greatly in their performance, both from unit to unit and between different positions in the asher chamber, it is difficult to specify the conditions that should be used. Insufficient etching will result in a failure to expose embedded filters, and too much etching may result in loss of particulate from the surface. As an interim measure, it is recommended that the time for ashing of a known weight of a collapsed filter be established and that the etching rate be calculated in terms of micrometers per second. The actual etching time used for the particulate asher and operating conditions will then be set such that a 1-2 μm (10 percent) layer of collapsed surface will be removed.

iii. Procedures as described in Unit III. or other equivalent methods may be used to prepare samples.

F. TEM Method

1. An 80-120 kV TEM capable of performing electron diffraction with a fluorescent screen inscribed with calibrated gradations is required. If the TEM is equipped with EDXA it must either have a STEM attachment or be capable of producing a spot less than 250 nm in diameter at crossover. The microscope shall be calibrated routinely for magnification and camera constant.

2. Determination of Camera Constant and ED Pattern Analysis. The camera length of the TEM in ED operating mode must be calibrated before ED patterns on unknown samples are observed. This can be achieved by using a carbon-coated grid on which a thin film of gold has been sputtered or evaporated. A thin film of gold is evaporated on the specimen TEM grid to obtain zone-axis ED patterns superimposed with a ring pattern from the polycrystalline gold film. In practice, it is desirable to optimize the thickness of the gold film so that only one or two sharp rings are obtained on the superimposed ED pattern. Thicker gold film would

normally give multiple gold rings, but it will tend to mask weaker diffraction spots from the unknown fibrous particulate. Since the unknown d-spacings of most interest in asbestos analysis are those which lie closest to the transmitted beam, multiple gold rings are unnecessary on zone-axis ED patterns. An average camera constant using multiple gold rings can be determined. The camera constant is one-half the diameter of the rings times the interplanar spacing of the ring being measured.

3. Magnification Calibration. The magnification calibration must be done at the fluorescent screen. The TEM must be calibrated at the grid opening magnification (if used) and also at the magnification used for fiber counting. This is performed with a cross grating replica (e.g., one containing 2,160 lines/mm). Define a field of view on the fluorescent screen either by markings or physical boundaries. The field of view must be measurable or previously inscribed with a scale or concentric circles (all scales should be metric). A logbook must be maintained, and the dates of calibration and the values obtained must be recorded. The frequency of calibration depends on the past history of the particular microscope. After any maintenance of the microscope that involved adjustment of the power supplied to the lenses or the high-voltage system or the mechanical disassembly of the electron optical column apart from filament exchange, the magnification must be recalibrated. Before the TEM calibration is performed, the analyst must ensure that the cross grating replica is placed at the same distance from the objective lens as the specimens are. For instruments that incorporate an eucentric tilting specimen stage, all specimens and the cross grating replica must be placed at the eucentric position.

4. While not required on every microscope in the laboratory, the laboratory must have either one microscope equipped with energy dispersive X-ray analysis or access to an equivalent system on a TEM in another laboratory.

5. Microscope settings: 80-120 kV, grid assessment 250-1,000X, then 15,000-20,000X screen magnification for analysis.

6. Approximately one-half (0.5) of the predetermined sample area to be analyzed shall be performed on one sample grid preparation and the remaining half on a second sample grid preparation.

7. Individual grid openings with greater than 5 percent openings (holes)

or covered with greater than 25 percent particulate matter or obviously having nonuniform loading must not be analyzed.

8. Reject the grid if:

- a. Less than 50 percent of the grid openings covered by the replica are intact.
- b. The replica is doubled or folded.
- c. The replica is too dark because of

incomplete dissolution of the filter.

9. Recording Rules.

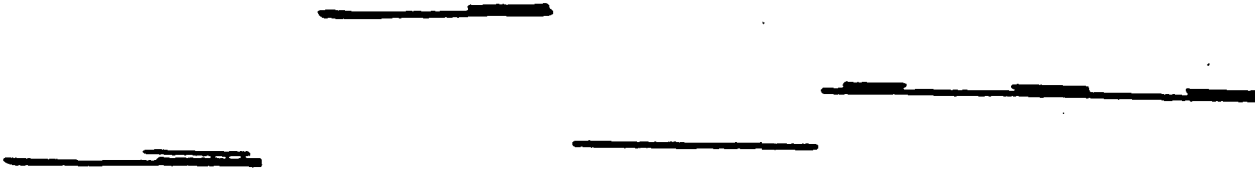
- a. Any continuous grouping of particles in which an asbestos fiber with an aspect ratio greater than or equal to 5:1 and a length greater than or equal to 0.5 μm is detected shall be recorded on the count sheet. These will be designated asbestos structures and will be classified as fibers, bundles, clusters,

or matrices. Record as individual fibers any contiguous grouping having 0, 1, or 2 definable intersections. Groupings having more than 2 intersections are to be described as cluster or matrix. An intersection is a nonparallel touching or crossing of fibers, with the projection having an aspect ratio of 5:1 or greater. See the following Figure 2:

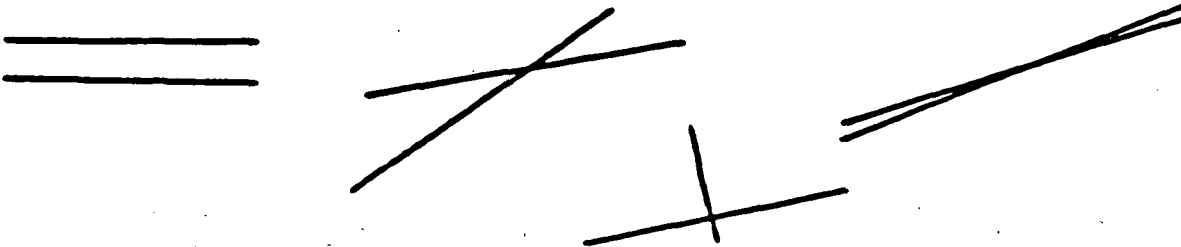
BILLING CODE 6540-60-M

**FIGURE 2--COUNTING GUIDELINES USED IN
DETERMINING ASBESTOS STRUCTURES**

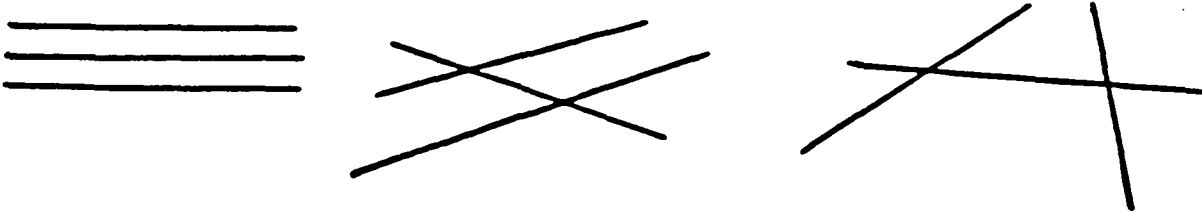
Count as 1 fiber; 1 Structure; no intersections.



Count as 2 fibers if space between fibers is greater than width of 1 fiber diameter or number of intersections is equal to or less than 1.



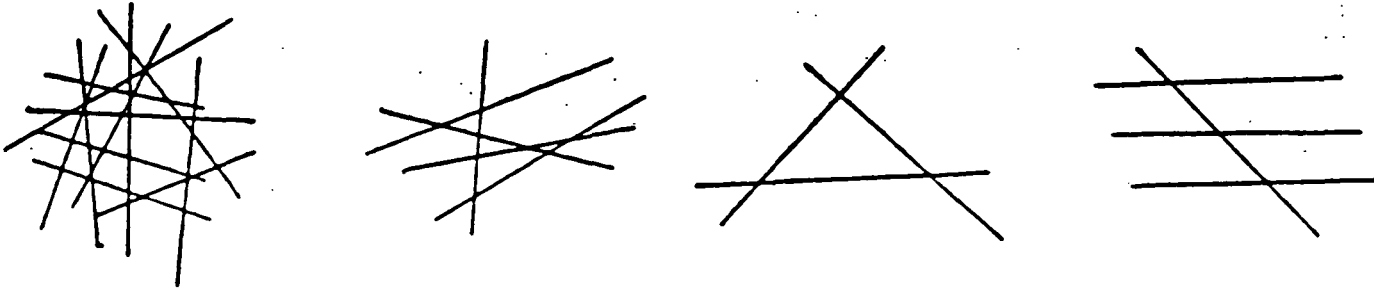
Count as 3 structures if space between fibers is greater than width of 1 fiber diameter or if the number of intersections is equal to or less than 2.



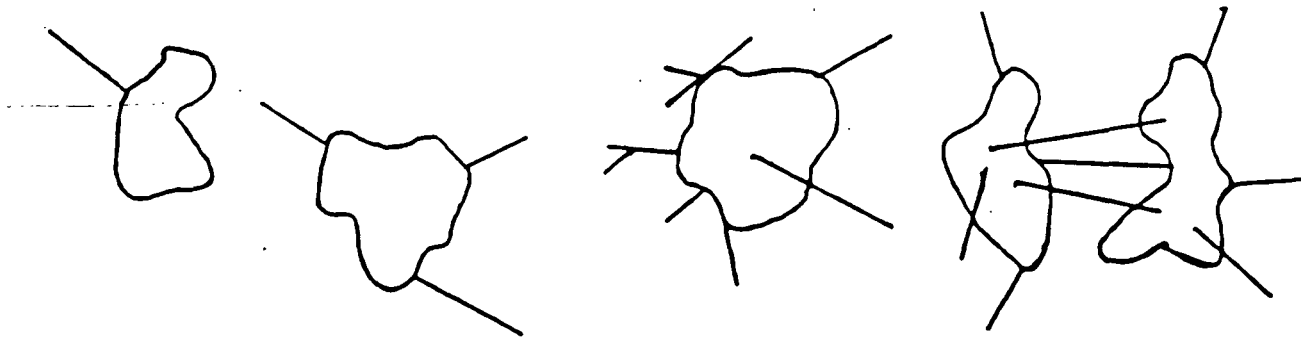
Count bundles as 1 structure; 3 or more parallel fibrils less than 1 fiber diameter separation.



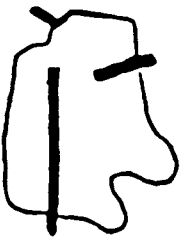
Count clusters as 1 structure; fibers having greater than or equal to 3 intersections.



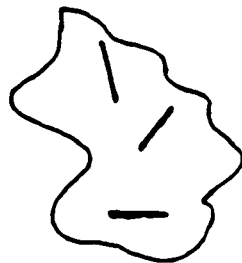
Count matrix as 1 structure.



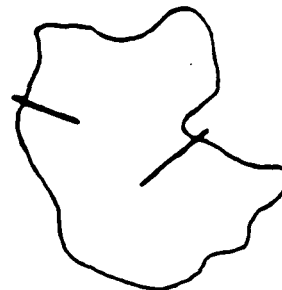
NOT COUNT AS STRUCTURES:



Fiber protrusion
<5:1 Aspect Ratio



No fiber protrusion



Fiber protrusion
<0.5 micrometer

— <0.5 micrometer in length
 — <5:1 Aspect Ratio

Fiber. A structure having a minimum length greater than or equal to 0.5 μm and an aspect ratio (length to width) of 5:1 or greater and substantially parallel sides. Note the appearance of the end of the fiber, i.e., whether it is flat, rounded or dovetailed.

ii. **Bundle.** A structure composed of three or more fibers in a parallel arrangement with each fiber closer than one fiber diameter.

iii. **Cluster.** A structure with fibers in a random arrangement such that all fibers are intermixed and no single fiber is isolated from the group. Groupings must have more than two intersections.

iv. **Matrix.** Fiber or fibers with one end free and the other end embedded in or hidden by a particulate. The exposed fiber must meet the fiber definition.

b. Separate categories will be maintained for fibers less than 5 μm and for fibers equal to or greater than 5 μm in length.

c. Record NSD when no structures are detected in the field.

d. Visual identification of electron diffraction (ED) patterns is required for each asbestos structure counted which would cause the analysis to exceed the 70 s/mm^2 concentration. (Generally this means the first four fibers identified as asbestos must exhibit an identifiable diffraction pattern for chrysotile or amphibole.)

e. The micrograph number of the recorded diffraction patterns must be reported to the client and maintained in the laboratory's quality assurance records. In the event that examination of the pattern by a qualified individual indicates that the pattern has been misidentified visually, the client shall be contacted.

f. Energy Dispersive X-ray Analysis (EDXA) is required of all amphiboles which would cause the analysis results to exceed the 70 s/mm^2 concentration. (Generally speaking, the first 4 amphiboles would require EDXA.)

g. If the number of fibers in the nonasbestos class would cause the analysis to exceed the 70 s/mm^2 concentration, the fact that they are not asbestos must be confirmed by EDXA or measurement of a zone axis diffraction pattern.

h. Fibers classified as chrysotile must be identified by diffraction or X-ray analysis and recorded on a count sheet. X-ray analysis alone can be used only

after 70 s/mm^2 have been exceeded for a particular sample.

i. Fibers classified as amphiboles must be identified by X-ray analysis and electron diffraction and recorded on the count sheet. (X-ray analysis alone can be used only after 70 s/mm^2 have been exceeded for a particular sample.)

j. If a diffraction pattern was recorded on film, record the micrograph number on the count sheet.

k. If an electron diffraction was attempted but no pattern was observed, record N on the count sheet.

l. If an EDXA spectrum was attempted but not observed, record N on the count sheet.

m. If an X-ray analysis spectrum is stored, record the file and disk number on the count sheet.

10. Classification Rules.

a. **Fiber.** A structure having a minimum length greater than or equal to 0.5 μm and an aspect ratio (length to width) of 5:1 or greater and substantially parallel sides. Note the appearance of the end of the fiber, i.e., whether it is flat, rounded or dovetailed.

b. **Bundle.** A structure composed of three or more fibers in a parallel arrangement with each fiber closer than one fiber diameter.

c. **Cluster.** A structure with fibers in a random arrangement such that all fibers are intermixed and no single fiber is isolated from the group. Groupings must have more than two intersections.

d. **Matrix.** Fiber or fibers with one end free and the other end embedded in or hidden by a particulate. The exposed fiber must meet the fiber definition.

11. After finishing with a grid, remove it from the microscope, and replace it in the appropriate grid holder. Sample grids must be stored for a minimum of 1 year from the date of the analysis; the sample cassette must be retained for a minimum of 30 days by the laboratory or returned at the client's request.

G. Sample Analytical Sequence

1. Under the present sampling requirements a minimum of 13 samples is to be collected for the clearance testing of an abatement site. These include five abatement area samples, five ambient samples, two field blanks, and one sealed blank.

2. Carry out visual inspection of work site prior to air monitoring.

3. Collect a minimum of 5 air samples inside the work site and 5 samples

outside the work site. The indoor and outdoor samples shall be taken during the same time period.

4. Remaining steps in the analytical sequence are contained in Unit IV of this Appendix.

H. Reporting

1. The following information must be reported to the client for each sample analyzed:

a. Concentration in structures per square millimeter and structures per cubic centimeter.

b. Analytical sensitivity used for the analysis.

c. Number of asbestos structures.

d. Area analyzed.

e. Volume of air sampled (which must be initially supplied to lab by client).

f. Copy of the count sheet must be included with the report.

g. Signature of laboratory official to indicate that the laboratory met specifications of the method.

h. Report form must contain official laboratory identification (e.g., letterhead).

i. Type of asbestos.

I. Quality Control/Quality Assurance Procedures (Data Quality Indicators)

Monitoring the environment for airborne asbestos requires the use of sensitive sampling and analysis procedures. Because the test is sensitive, it may be influenced by a variety of factors. These include the supplies used in the sampling operation, the performance of the sampling, the preparation of the grid from the filter and the actual examination of this grid in the microscope. Each of these unit operations must produce a product of defined quality if the analytical result is to be a reliable and meaningful test result. Accordingly, a series of control checks and reference standards are to be performed along with the sample analysis as indicators that the materials used are adequate and the operations are within acceptable limits. In this way, the quality of the data is defined and the results are of known value. These checks and tests also provide timely and specific warning of any problems which might develop within the sampling and analysis operations. A description of these quality control/quality assurance procedures is summarized in the following Table III:

TABLE III

TABLE III--SUMMARY OF LABORATORY DATA QUALITY OBJECTIVES

<u>Unit Operation</u>	<u>QC Check</u>	<u>Frequency</u>	<u>Conformance Expectation</u>
Sample receiving	Review of receiving report	Each sample	95% complete
Sample custody	Review of chain-of-custody record	Each sample	95% complete
Sample preparation	Supplies and reagents	On receipt	Meet specs. or reject
	Grid opening size	20 openings/20 grids/lot of 1000 or 1 opening/sample	100%
	Special clean area monitoring	After cleaning or service	Meet specs or reclean
	Laboratory blank	1 per prep series or 10%	Meet specs. or reanalyze series
	Plasma etch blank	1 per 20 samples	75%
Sample analysis	Multiple preps (3 per sample)	Each sample	One with cover of 15 complete grid sqs.
	System check	Each day	Each day
	Alignment check	Each day	Each day
	Magnification calibration with low and high standards	Each month or after service	95%
	ED calibration by gold standard	Weekly	95%
	EDS calibration by copper line	Daily	95%
Performance check	Laboratory blank (measure of cleanliness)	Prep 1 per series or 10% read 1 per 25 samples	Meet specs or reanalyze series
	Replicate counting (measure of precision)	1 per 100 samples	1.5 x Poisson Std. Dev.
	Duplicate analysis (measure of reproducibility)	1 per 100 samples	2 x Poisson Std. Dev.
	Known samples of typical materials (working standards)	Training and for comparison with unknowns	100%
	Analysis of NBS SRM 1876 and/or RM 8410 (measure of accuracy and comparability)	1 per analyst per year	1.5 x Poisson Std. Dev.
	Data entry review (data validation and measure of completeness)	Each sample	95%
	Record and verify ID electron diffraction pattern of structure	1 per 5 samples	80% accuracy
Calculations and data reduction	Hand calculation of automated data reduction procedure or independent recalculation of hand-calculated data	1 per 100 samples	85%

1. When the samples arrive at the laboratory, check the samples and documentation for completeness and requirements before initiating the analysis.
2. Check all laboratory reagents and supplies for acceptable asbestos background levels.
3. Conduct all sample preparation in a clean room environment monitored by laboratory blanks. Testing with blanks must also be done after cleaning or servicing the room.
4. Prepare multiple grids of each sample.
5. Provide laboratory blanks with each sample batch. Maintain a cumulative average of these results. If there are more than 53 fibers/mm² per 10 200-mesh grid openings, the system must be checked for possible sources of contamination.
6. Perform a system check on the transmission electron microscope daily.
7. Make periodic performance checks of magnification, electron diffraction and energy dispersive X-ray systems as set forth in Table III under Unit II.L
8. Ensure qualified operator performance by evaluation of replicate analysis and standard sample comparisons as set forth in Table III under Unit II.L
9. Validate all data entries.
10. Recalculate a percentage of all computations and automatic data reduction steps as specified in Table III under Unit II.L
11. Record an electron diffraction pattern of one asbestos structure from every five samples that contain asbestos. Verify the identification of the pattern by measurement or comparison of the pattern with patterns collected from standards under the same conditions. The records must also demonstrate that the identification of the pattern has been verified by a qualified individual and that the operator who made the identification is maintaining at least an 80 percent correct visual identification based on his measured patterns.
12. Appropriate logs or records must be maintained by the analytical laboratory verifying that it is in compliance with the mandatory quality assurance procedures.

J. References

For additional background information on this method, the following references should be consulted.

1. "Guidance for Controlling Asbestos-Containing Materials in Buildings." EPA 560/5-85-024, June 1985.
2. "Measuring Airborne Asbestos Following an Abatement Action,"

USEPA, Office of Toxic Substances, EPA 600/4-85-049, 1985.

3. Small, John and E. Steel. Asbestos Standards: Materials and Analytical Methods. N.B.S. Special Publication 619, 1982.

4. Campbell, W.J., R.L. Blake, L.L. Brown, E.E. Cather, and J.J. Sjöberg. Selected Silicate Minerals and Their Asbestiform Varieties. Information Circular 8751, U.S. Bureau of Mines, 1977.

5. Quality Assurance Handbook for Air Pollution Measurement System. Ambient Air Methods, EPA 600/4-77-027a, USEPA, Office of Research and Development, 1977.

6. Method 2A: Direct Measurement of Gas Volume through Pipes and Small Ducts. 40 CFR Part 60 Appendix A.

7. Burdette, G.J., Health & Safety Exec. Research & Lab. Services Div., London.

"Proposed Analytical Method for Determination of Asbestos in Air."

8. Chatfield, E.J., Chatfield Tech. Cons., Ltd., Clark, T., PEI Assoc., "Standard Operating Procedure for Determination of Airborne Asbestos Fibers by Transmission Electron Microscopy Using Polycarbonate Membrane Filters," WERL SOP 87-1, March 5, 1987.

9. NIOSH Method 7402 for Asbestos Fibers. 12-11-86 Draft.

10. Yamate, G., Agarwall, S.C., Gibbons, R.D., IIT Research Institute, "Methodology for the Measurement of Airborne Asbestos by Electron Microscopy," Draft report, USEPA Contract 68-02-3268, July 1984.

11. "Guidance to the Preparation of Quality Assurance Project Plans," USEPA, Office of Toxic Substances, 1984.

III. Nonmandatory Transmission Electron Microscopy Method

A. Definitions of Terms

1. "Analytical sensitivity"—Airborne asbestos concentration represented by each fiber counted under the electron microscope. It is determined by the air volume collected and the proportion of the filter examined. This method requires that the analytical sensitivity be no greater than 0.005 s/cm².

2. "Asbestiform"—A specific type of mineral fibrosity in which the fibers and fibrils possess high tensile strength and flexibility.

3. "Aspect ratio"—A ratio of the length to the width of a particle. Minimum aspect ratio as defined by this method is equal to or greater than 5:1.

4. "Bundle"—A structure composed of three or more fibers in a parallel arrangement with each fiber closer than one fiber diameter.

5. "Clean area"—A controlled environment which is maintained and monitored to assure a low probability of asbestos contamination to materials in that space. Clean areas used in this method have HEPA filtered air under positive pressure and are capable of sustained operation with an open laboratory blank which on subsequent analysis has an average of less than 18 structures/mm² in an area of 0.057 mm² (nominally 10 200 mesh grid openings) and a maximum of 53 structures/mm² for no more than one single preparation for that same area.

6. "Cluster"—A structure with fibers in a random arrangement such that all fibers are intermixed and no single fiber is isolated from the group. Groupings must have more than two intersections.

7. "ED"—Electron diffraction.

8. "EDXA"—Energy dispersive X-ray analysis.

9. "Fiber"—A structure greater than or equal to 0.5 μm in length with an aspect ratio (length to width) of 5:1 or greater and having substantially parallel sides.

10. "Grid"—An open structure for mounting on the sample to aid in its examination in the TEM. The term is used here to denote a 200-mesh copper lattice approximately 3 mm in diameter.

11. "Intersection"—Nonparallel touching or crossing of fibers, with the projection having an aspect ratio of 5:1 or greater.

12. "Laboratory sample coordinator"—That person responsible for the conduct of sample handling and the certification of the testing procedures.

13. "Filter background level"—The concentration of structures per square millimeter of filter that is considered indistinguishable from the concentration measured on blanks (filters through which no air has been drawn). For this method the filter background level is defined as 70 structures/mm².

14. "Matrix"—Fiber or fibers with one end free and the other end embedded in or hidden by a particulate. The exposed fiber must meet the fiber definition.

15. "NSD"—No structure detected.

16. "Operator"—A person responsible for the TEM instrumental analysis of the sample.

17. "PCM"—Phase contrast microscopy.

18. "SAED"—Selected area electron diffraction.

19. "SEM"—Scanning electron microscope.

20. "STEM"—Scanning transmission electron microscope.

21. "Structure"—a microscopic bundle, cluster, fiber, or matrix which may contain asbestos.

22. "S/cm³"—Structures per cubic centimeter.

23. "S/mm²"—Structures per square millimeter.

24. "TEM"—Transmission electron microscope.

B. Sampling

1. Sampling operations must be performed by qualified individuals completely independent of the abatement contractor to avoid possible conflict of interest (See References 1, 2, and 5 of Unit III.L.) Special precautions should be taken to avoid contamination of the sample. For example, materials that have not been prescreened for their asbestos background content should not be used; also, sample handling procedures which do not take cross contamination possibilities into account should not be used.

2. Material and supply checks for asbestos contamination should be made on all critical supplies, reagents, and procedures before their use in a monitoring study.

3. Quality control and quality assurance steps are needed to identify problem areas and isolate the cause of the contamination (see Reference 5 of Unit III.L.). Control checks shall be permanently recorded to document the quality of the information produced. The sampling firm must have written quality control procedures and documents which verify compliance. Independent audits by a qualified consultant or firm should be performed once a year. All documentation of compliance should be retained indefinitely to provide a guarantee of quality. A summary of Sample Data Quality Objectives is shown in Table II of Unit II.B.

4. Sampling materials.

a. Sample for airborne asbestos following an abatement action using commercially available cassettes.

b. Use either a cowl or a filter-retaining middle piece. Conductive material may reduce the potential for particulates to adhere to the walls of the cowl.

c. Cassettes must be verified as "clean" prior to use in the field. If packaged filters are used for loading or preloaded cassettes are purchased from the manufacturer or a distributor, the manufacturer's name and lot number should be entered on all field data sheets provided to the laboratory, and are required to be listed on all reports from the laboratory.

d. Assemble the cassettes in a clean facility (See definition of clean area under Unit III.A.).

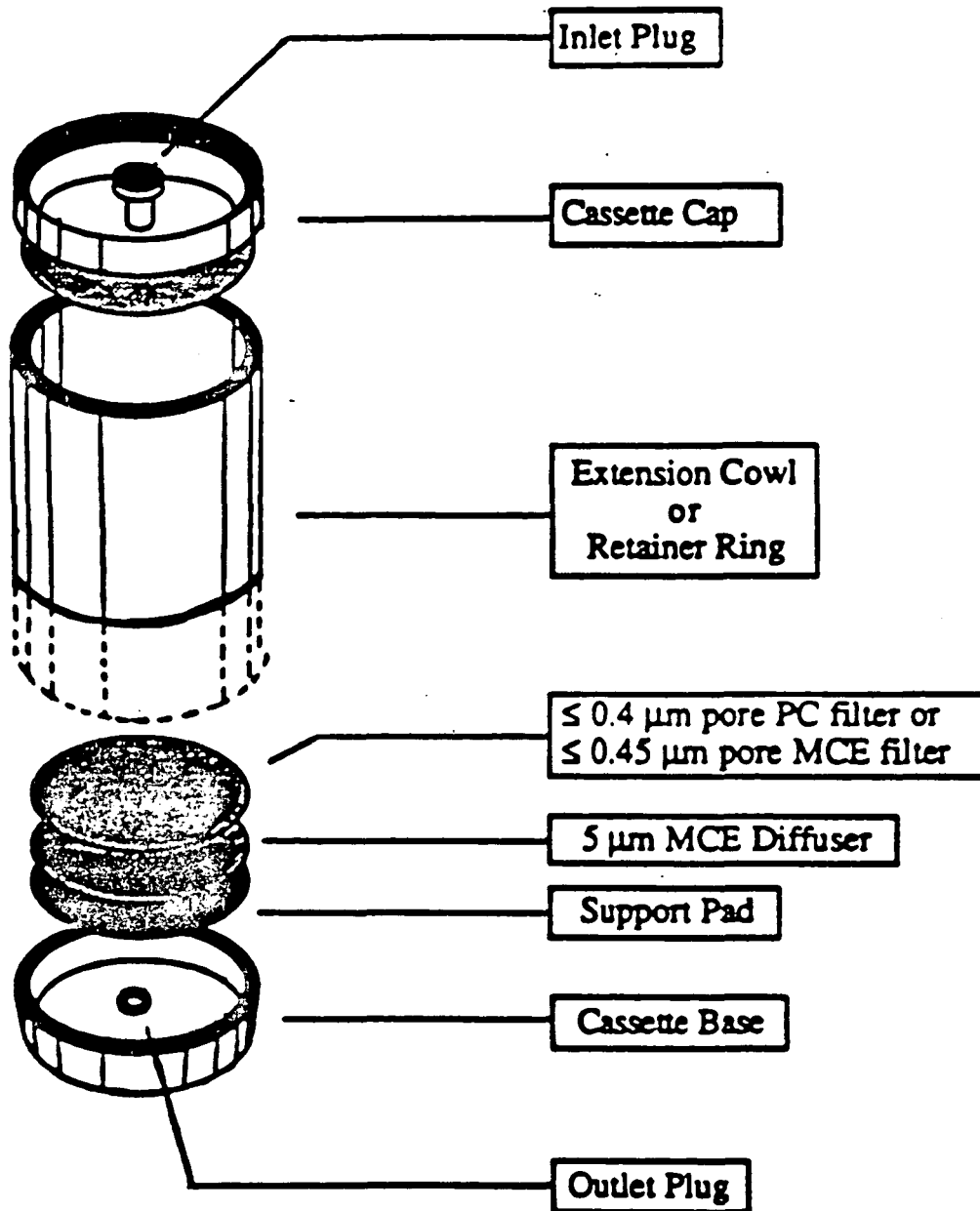
e. Reloading of used cassettes is not permitted.

f. Use sample collection filters which are either polycarbonate having a pore size of less than or equal to 0.4 μm or mixed cellulose ester having a pore size of less than or equal to 0.45 μm .

g. Place these filters in series with a backup filter with a pore size of 5.0 μm (to serve as a diffuser) and a support pad. See the following Figure 1:

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FIGURE I--SAMPLING CASSETTE CONFIGURATION



h. When polycarbonate filters are used, position the highly reflective face that the incoming particulate is viewed on this surface.

i. Seal the cassettes to prevent leakage around the filter edges or between cassette part joints. A mechanical press may be useful to achieve a reproducible leak-free seal. Shrink fit gel-bands may be used for this purpose and are available from filter manufacturers and their authorized distributors.

j. Use wrinkle-free loaded cassettes in the sampling operation.

5. Pump setup.

a. Calibrate the sampling pump over the range of flow rates and loads anticipated for the monitoring period with this flow measuring device in

series. Perform this calibration using guidance from EPA Method 2A each time the unit is sent to the field (See Reference 6 of Unit III.L).

b. Configure the sampling system to preclude pump vibrations from being transmitted to the cassette by using a sampling stand separate from the pump station and making connections with flexible tubing.

c. Maintain continuous smooth flow conditions by damping out any pump action fluctuations if necessary.

d. Check the sampling system for leaks with the end cap still in place and the pump operating before initiating sample collection. Trace and stop the source of any flow indicated by the flowmeter under these conditions.

e. Select an appropriate flow rate equal to or greater than 1 L/min or less than 10 L/min for 25 mm cassettes. Larger filters may be operated at proportionally higher flow rates.

f. Orient the cassette downward at approximately 45 degrees from the horizontal.

g. Maintain a log of all pertinent sampling information, such as pump identification number, calibration data, sample location, date, sample identification number, flow rates at the beginning, middle, and end, start and stop times, and other useful information or comments. Use of a sampling log form is recommended. See the following Figure 2:

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h. Initiate a chain of custody procedure at the start of each sampling, if this is requested by the client.

i. Maintain a close check of all aspects of the sampling operation on a regular basis.

j. Continue sampling until at least the minimum volume is collected, as specified in the following Table I:

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TABLE 1--NUMBER OF 200 MESH EM GRID OPENINGS
(0.0057 MM²) THAT NEED TO BE ANALYZED TO
MAINTAIN SENSITIVITY OF 0.005 STRUCTURES/CC
BASED ON VOLUME AND EFFECTIVE FILTER AREA

Effective Filter Area 385 sq mm		Effective Filter Area 855 sq mm	
Volume (liters)	# of grid openings	Volume (liters)	# of grid openings
560	24	1,250	24
600	23	1,300	23
700	19	1,400	21
800	17	1,600	19
900	15	1,800	17
1,000	14	2,000	15
1,100	12	2,200	14
1,200	11	2,400	13
1,300	10	2,600	12
1,400	10	2,800	11
1,500	9	3,000	10
1,600	8	3,200	9
1,700	8	3,400	9
1,800	8	3,600	8
1,900	7	3,800	8
2,000	7	4,000	8
2,100	6	4,200	7
2,200	6	4,400	7
2,300	6	4,600	7
2,400	6	4,800	6
2,500	5	5,000	6
2,600	5	5,200	6
2,700	5	5,400	6
2,800	5	5,600	5
2,900	5	5,800	5
3,000	5	6,000	5
3,100	4	6,200	5
3,200	4	6,400	5
3,300	4	6,600	5
3,400	4	6,800	4
3,500	4	7,000	4
3,600	4	7,200	4
3,700	4	7,400	4
3,800	4	7,600	4

Note minimum volumes required:
25 mm : 560 liters
37 mm : 1250 liters

Filter diameter of 25 mm = effective area of 385 sq mm
Filter diameter of 37 mm = effective area of 855 sq mm

k. At the conclusion of sampling, turn the cassette upward before stopping the flow to minimize possible particle loss. When sampling is resumed, restart the flow before reorienting the cassette downward. Note the condition of the filter at the conclusion of sampling.

l. Double check to see that all information has been recorded on the data collection forms and that the cassette is securely closed and appropriately identified using a waterproof label. Protect cassettes in individual clean resealed polyethylene bags. Bags are to be used for storing cassette caps when they are removed for sampling purposes. Caps and plugs should only be removed or replaced using clean hands or clean disposable plastic gloves.

m. Do not change containers if portions of these filters are taken for other purposes.

6. Minimum sample number per site. A minimum of 13 samples are to be collected for each testing consisting of the following:

a. A minimum of five samples per abatement area.

b. A minimum of five samples per ambient area positioned at locations representative of the air entering the abatement site.

Two field blanks are to be taken by removing the cap for not more than 30 sec and replacing it at the time of sampling before sampling is initiated at the following places:

i. Near the entrance to each ambient area.

ii. At one of the ambient sites.

(Note: Do not leave the blank open during the sampling period.)

d. A sealed blank is to be carried with each sample set. This representative cassette is not to be opened in the field.

7. Abatement area sampling.

a. Conduct final clearance sampling only after the primary containment barriers have been removed; the abatement area has been thoroughly dried and, it has passed visual inspection tests by qualified personnel. (See Reference 1 of Unit III.L.)

b. Containment barriers over windows, doors, and air passageways must remain in place until the TEM clearance sampling and analysis is completed and results meet clearance test criteria. The final plastic barrier remains in place for the sampling period.

c. Select sampling sites in the abatement area on a random basis to provide unbiased and representative samples.

d. After the area has passed a thorough visual inspection, use

aggressive cleaning conditions to dislodge any remaining dust.

i. Equipment used in aggressive sampling such as a leaf blower and/or fan should be properly cleaned and decontaminated before use.

ii. Air filtration units shall remain on during the air monitoring period.

iii. Prior to air monitoring, floors, ceiling and walls shall be swept with the exhaust of a minimum one (1) horsepower leaf blower.

iv. Stationary fans are placed in locations which will not interfere with air monitoring equipment. Fan air is directed toward the ceiling. One fan shall be used for each 10,000 ft² of worksite.

v. Monitoring of an abatement work area with high-volume pumps and the use of circulating fans will require electrical power. Electrical outlets in the abatement area may be used if available. If no such outlets are available, the equipment must be supplied with electricity by the use of extension cords and strip plug units. All electrical power supply equipment of this type must be approved Underwriter Laboratory equipment that has not been modified. All wiring must be grounded. Ground fault interrupters should be used. Extreme care must be taken to clean up any residual water and ensure that electrical equipment does not become wet while operational.

vi. Low volume pumps may be carefully wrapped in 6-mil polyethylene to insulate the pump from the air. High volume pumps cannot be sealed in this manner since the heat of the motor may melt the plastic. The pump exhausts should be kept free.

vii. If recleaning is necessary, removal of this equipment from the work area must be handled with care. It is not possible to completely decontaminate the pump motor and parts since these areas cannot be wetted. To minimize any problems in this area, all equipment such as fans and pumps should be carefully wet wiped prior to removal from the abatement area. Wrapping and sealing low volume pumps in 6-mil polyethylene will provide easier decontamination of this equipment. Use of clean water and disposable wipes should be available for this purpose.

e. Pump flow rate equal to or greater than 1 L/min or less than 10 L/min may be used for 25 mm cassettes. The larger cassette diameters may have comparably increased flow.

f. Sample a volume of air sufficient to ensure the minimum quantitation limits. (See Table I of Unit III.B.5.)

8. Ambient sampling.

a. Position ambient samplers at locations representative of the air

entering the abatement site. If makeup air entering the abatement site is drawn from another area of the building which is outside of the abatement area, place the pumps in the building, pumps should be placed out of doors located near the building and away from any obstructions that may influence wind patterns. If construction is in progress immediately outside the enclosure, it may be necessary to select another ambient site. Samples should be representative of any air entering the work site.

b. Locate the ambient samplers at least 3 ft apart and protect them from adverse weather conditions.

c. Sample same volume of air as samples taken inside the abatement site.

C. Sample Shipment

1. Ship bulk samples in a separate container from air samples. Bulk samples and air samples delivered to the analytical laboratory in the same container shall be rejected.

2. Select a rigid shipping container and pack the cassettes upright in a noncontaminating nonfibrous medium such as a bubble pack. The use of resealable polyethylene bags may help to prevent jostling of individual cassettes.

3. Avoid using expanded polystyrene because of its static charge potential. Also avoid using particle-based packaging materials because of possible contamination.

4. Include a shipping bill and a detailed listing of samples shipped, their descriptions and all identifying numbers or marks, sampling data, shipper's name, and contact information. For each sample set, designate which are the ambient samples, which are the abatement area samples, which are the field blanks, and which is the sealed blank if sequential analysis is to be performed.

5. Hand-carry samples to the laboratory in an upright position if possible; otherwise choose that mode of transportation least likely to jar the samples in transit.

6. Address the package to the laboratory sample coordinator by name when known and alert him or her of the package description, shipment mode, and anticipated arrival as part of the chain of custody and sample tracking procedures. This will also help the laboratory schedule timely analysis for the samples when they are received.

D. Quality Control/Quality Assurance Procedures (Data Quality Indicators)

Monitoring the environment for airborne asbestos requires the use of

sensitive sampling and analysis procedures. Because the test is sensitive, it may be influenced by a variety of factors. These include the supplies used in the sampling operation, the performance of the sampling, the preparation of the grid from the filter and the actual examination of this grid in the microscope. Each of these unit operations must produce a product of defined quality if the analytical result is to be a reliable and meaningful test result. Accordingly, a series of control checks and reference standards is performed along with the sample analysis as indicators that the materials used are adequate and the operations are within acceptable limits. In this way, the quality of the data is defined, and the results are of known value. These checks and tests also provide timely and specific warning of any problems which might develop within the sampling and analysis operations. A description of these quality control/quality assurance procedures is summarized in the text below.

1. Prescreen the loaded cassette collection filters to assure that they do not contain concentrations of asbestos which may interfere with the analysis of the sample. A filter blank average of less than 18 s/mm² in an area of 0.057 mm² (nominally 10 200-mesh grid openings) and a maximum of 53 s/mm² for that same area for any single preparation is acceptable for this method.

2. Calibrate sampling pumps and their flow indicators over the range of their intended use with a recognized standard. Assemble the sampling system with a representative filter—not the filter which will be used in

sampling—before and after the sampling operation.

3. Record all calibration information with the data to be used on a standard sampling form.

4. Ensure that the samples are stored in a secure and representative location.

5. Ensure that mechanical calibrations from the pump will be minimized to prevent transferral of vibration to the cassette.

6. Ensure that a continuous smooth flow of negative pressure is delivered by the pump by installing a damping chamber if necessary.

7. Open a loaded cassette momentarily at one of the indoor sampling sites when sampling is initiated. This sample will serve as an indoor field blank.

8. Open a loaded cassette momentarily at one of the outdoor sampling sites when sampling is initiated. This sample will serve as an outdoor field blank.

9. Carry a sealed blank into the field with each sample series. Do not open this cassette in the field.

10. Perform a leak check of the sampling system at each indoor and outdoor sampling site by activating the pump with the closed sampling cassette in line. Any flow indicates a leak which must be eliminated before initiating the sampling operation.

11. Ensure that the sampler is turned upright before interrupting the pump flow.

12. Check that all samples are clearly labeled and that all pertinent information has been enclosed before transfer of the samples to the laboratory.

E. Sample Receiving

1. Designate one individual as sample coordinator at the laboratory. While that individual will normally be available to receive samples, the coordinator may train and supervise others in receiving procedures for those times when he/she is not available.

2. Adhere to the following procedures to ensure both the continued chain-of-custody and the accountability of all samples passing through the laboratory:

a. Note the condition of the shipping package and data written on it upon receipt.

b. Retain all bills of lading or shipping slips to document the shipper and delivery time.

c. Examine the chain-of-custody seal, if any, and the package for its integrity.

d. If there has been a break in the seal or substantive damage to the package, the sample coordinator shall immediately notify the shipper and a responsible laboratory manager before any action is taken to unpack the shipment.

e. Packages with significant damage shall be accepted only by the responsible laboratory manager after discussions with the client.

3. Unwrap the shipment in a clean, uncluttered facility. The sample coordinator or his or her designee will record the contents, including a description of each item and all identifying numbers or marks. A Sample Receiving Form to document this information is attached for use when necessary. (See the following Figure 3.)

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FIGURE 3--SAMPLE RECEIVING FORM

Date of package delivery _____ Package shipped from _____

Carrier _____ Shipping bill retained _____

*Condition of package on receipt _____

*Condition of custody seal _____

Number of samples received _____ Shipping manifest attached _____

Purchase Order No. _____ Project I.D. _____

Comments _____

No.	Description	Sampling Medium		Sampled Volume Liters	Receiving ID #	Assigned #
		PC	MCE			
1	_____	_____	_____	_____	_____	_____
2	_____	_____	_____	_____	_____	_____
3	_____	_____	_____	_____	_____	_____
4	_____	_____	_____	_____	_____	_____
5	_____	_____	_____	_____	_____	_____
6	_____	_____	_____	_____	_____	_____
7	_____	_____	_____	_____	_____	_____
8	_____	_____	_____	_____	_____	_____
9	_____	_____	_____	_____	_____	_____
10	_____	_____	_____	_____	_____	_____
11	_____	_____	_____	_____	_____	_____
12	_____	_____	_____	_____	_____	_____
13	_____	_____	_____	_____	_____	_____

(Use as many additional sheets as needed.)

Comments _____

Date of acceptance into sample bank _____

Signature of chain-of-custody recipient _____

Disposition of samples _____

* If the package has sustained substantial damage or the custody seal is broken, stop and contact the project manager and the shipper.

Note.—The person breaking the chain-of-custody seal and itemizing the contents assumes responsibility for the shipment and signs documents accordingly.

4. Assign a laboratory number and schedule an analysis sequence.

5. Manage all chain-of-custody samples within the laboratory such that their integrity can be ensured and documented.

F. Sample Preparation

1. Personnel not affiliated with the Abatement Contractor shall be used to prepare samples and conduct TEM analysis. Wet-wipe the exterior of the cassettes to minimize contamination possibilities before taking them to the clean sample preparation facility.

2. Perform sample preparation in a well-equipped clean facility.

Note.—The clean area is required to have the following minimum characteristics. The area or hood must be capable of maintaining a positive pressure with make-up air being HEPA filtered. The cumulative analytical blank concentration must average less than 18 s/mm² in an area of 0.057 s/mm² (nominally 10 200-mesh grid openings) with no more than one single preparation to exceed 53 s/mm² for that same area.

3. Preparation areas for air samples must be separated from preparation areas for bulk samples. Personnel must not prepare air samples if they have previously been preparing bulk samples without performing appropriate personal hygiene procedures, i.e., clothing change, showering, etc.

4. Preparation. Direct preparation techniques are required. The objective is to produce an intact carbon film containing the particulates from the filter surface which is sufficiently clear for TEM analysis. Currently recommended direct preparation procedures for polycarbonate (PC) and mixed cellulose ester (MCE) filters are described in Unit III.F.7. and 8. Sample preparation is a subject requiring additional research. Variation on those steps which do not substantively change the procedure, which improve filter clearing or which reduce contamination problems in a laboratory are permitted.

a. Use only TEM grids that have had grid opening areas measured according to directions in Unit III.J.

b. Remove the inlet and outlet plugs prior to opening the cassette to minimize any pressure differential that may be present.

c. Examples of techniques used to prepare polycarbonate filters are described in Unit III.F.7.

d. Examples of techniques used to prepare mixed cellulose ester filters are described in Unit III.F.8.

e. Prepare multiple grids for each sample.

f. Store the three grids to be measured in appropriately labeled grid holders or polyethylene capsules.

5. Equipment.

a. Clean area.

b. Tweezers. Fine-point tweezers for handling of filters and TEM grids.

c. Scalpel Holder and Curved No. 10 Surgical Blades.

d. Microscope slides.

e. Double-coated adhesive tape.

f. Gummed page reinforcements.

g. Micro-pipet with disposal tips 10 to 100 μ L variable volume.

h. Vacuum coating unit with facilities for evaporation of carbon. Use of a liquid nitrogen cold trap above the diffusion pump will minimize the possibility of contamination of the filter surface by oil from the pumping system. The vacuum-coating unit can also be used for deposition of a thin film of gold.

i. Carbon rod electrodes.

Spectrochemically pure carbon rods are required for use in the vacuum evaporator for carbon coating of filters.

j. Carbon rod sharpener. This is used to sharpen carbon rods to a neck. The use of necked carbon rods (or equivalent) allows the carbon to be applied to the filters with a minimum of heating.

k. Low-temperature plasma asher. This is used to etch the surface of collapsed mixed cellulose ester (MCE) filters. The asher should be supplied with oxygen, and should be modified as necessary to provide a throttle or bleed valve to control the speed of the vacuum to minimize disturbance of the filter. Some early models of ashers admit air too rapidly, which may disturb particulates on the surface of the filter during the etching step.

l. Glass petri dishes, 10 cm in diameter, 1 cm high. For prevention of excessive evaporation of solvent when these are in use, a good seal must be provided between the base and the lid. The seal can be improved by grinding the base and lid together with an abrasive grinding material.

m. Stainless steel mesh.

n. Lens tissue.

o. Copper 200-mesh TEM grids, 3 mm in diameter, or equivalent.

p. Gold 200-mesh TEM grids, 3 mm in diameter, or equivalent.

q. Condensation washer.

r. Carbon-coated, 200-mesh TEM grids, or equivalent.

s. Analytical balance, 0.1 mg sensitivity.

t. Filter paper, 9 cm in diameter.

u. Oven or slide warmer. Must be capable of maintaining a temperature of 65–70 °C.

v. Polyurethane foam, 8 mm thickness.

w. Gold wire for evaporation.

6. Reagents.

a. General. A supply of ultra-clean, fiber-free water must be available for washing of all components used in the analysis. Water that has been distilled in glass or filtered or deionized water is satisfactory for this purpose. Reagents must be fiber-free.

b. Polycarbonate preparation method—chloroform.

c. Mixed Cellulose Ester (MCE) preparation method—acetone or the Burdette procedure (Ref. 7 of Unit III.L.).

7. TEM specimen preparation from polycarbonate filters.

a. Specimen preparation laboratory. It is most important to ensure that contamination of TEM specimens by extraneous asbestos fibers is minimized during preparation.

b. Cleaning of sample cassettes. Upon receipt at the analytical laboratory and before they are taken into the clean facility or laminar flow hood, the sample cassettes must be cleaned of any contamination adhering to the outside surfaces.

c. Preparation of the carbon evaporator. If the polycarbonate filter has already been carbon-coated prior to receipt, the carbon coating step will be omitted, unless the analyst believes the carbon film is too thin. If there is a need to apply more carbon, the filter will be treated in the same way as an uncoated filter. Carbon coating must be performed with a high-vacuum coating unit. Units that are based on evaporation of carbon filaments in a vacuum generated only by an oil rotary pump have not been evaluated for this application, and must not be used. The carbon rods should be sharpened by a carbon rod sharpener to necks of about 4 mm long and 1 mm in diameter. The rods are installed in the evaporator in such a manner that the points are approximately 10 to 12 cm from the surface of a microscope slide held in the rotating and tilting device.

d. Selection of filter area for carbon coating. Before preparation of the filters, a 75 mm x 50 mm microscope slide is washed and dried. This slide is used to support strips of filter during the carbon evaporation. Two parallel strips of double-sided adhesive tape are applied along the length of the slide.

Polycarbonate filters are easily stretched during handling, and cutting of areas for further preparation must be performed with great care. The filter and the MCE backing filter are removed together from the cassette and placed on a cleaned glass microscope slide. The filter can be cut with a curved scalpel blade by rocking the blade from the

point placed in contact with the filter. The process can be repeated to cut a strip approximately 3 mm wide across the diameter of the filter. The strip of polycarbonate filter is separated from the corresponding strip of backing filter and carefully placed so that it bridges the gap between the adhesive tape strips on the microscope slide. The filter strip can be held with fine-point tweezers and supported underneath by the scalpel blade during placement on the microscope slide. The analyst can place several such strips on the same microscope slide, taking care to rinse and wet-wipe the scalpel blade and tweezers before handling a new sample. The filter strips should be identified by etching the glass slide or marking the slide using a marker insoluble in water and solvents. After the filter strip has been cut from each filter, the residual parts of the filter must be returned to the cassette and held in position by reassembly of the cassette. The cassette will then be archived for a period of 30 days or returned to the client upon request.

e. Carbon coating of filter strips. The glass slide holding the filter strips is placed on the rotation-tilting device, and the evaporator chamber is evacuated. The evaporation must be performed in short bursts, separated by some seconds to allow the electrodes to cool. If evaporation is too rapid, the strips of polycarbonate filter will begin to curl, which will lead to cross-linking of the surface material and make it relatively insoluble in chloroform. An experienced analyst can judge the thickness of carbon film to be applied, and some test should be made first on unused filters. If the film is too thin, large particles will be lost from the TEM specimen, and there will be few complete and undamaged grid openings on the specimen. If the coating is too thick, the filter will tend to curl when exposed to chloroform vapor and the carbon film may not adhere to the support mesh. Too thick a carbon film will also lead to a TEM image that is lacking in contrast, and the ability to obtain ED patterns will be compromised. The carbon film should be as thin as possible and remain intact on most of the grid openings of the TEM specimen intact.

f. Preparation of the Jaffe washer. The precise design of the Jaffe washer is not considered important, so any one of the published designs may be used. A washer consisting of a simple stainless steel bridge is recommended. Several pieces of lens tissue approximately 1.0 cm x 5 cm are placed on the stainless steel bridge, and the washer is filled with chloroform to a level where the

meniscus contacts the underside of the mesh, which results in saturation of the lens tissue. See References 8 and 10 of Unit III.L.

g. Placing of specimens into the Jaffe washer. The TEM grids are first placed on a piece of lens tissue so that individual grids can be picked up with tweezers. Using a curved scalpel blade, the analyst excises three 3 mm square pieces of the carbon-coated polycarbonate filter from the filter strip. The three squares are selected from the center of the strip and from two points between the outer periphery of the active surface and the center. The piece of filter is placed on a TEM specimen grid with the shiny side of the TEM grid facing upwards, and the whole assembly is placed boldly onto the saturated lens tissue in the Jaffe washer. If carbon-coated grids are used, the filter should be placed carbon-coated side down. The three excised squares of filters are placed on the same piece of lens tissue. Any number of separate pieces of lens tissue may be placed in the same Jaffe washer. The lid is then placed on the Jaffe washer, and the system is allowed to stand for several hours, preferably overnight.

h. Condensation washing. It has been found that many polycarbonate filters will not dissolve completely in the Jaffe washer, even after being exposed to chloroform for as long as 3 days. This problem becomes more serious if the surface of the filter was overheated during the carbon evaporation. The presence of undissolved filter medium on the TEM preparation leads to partial or complete obscuration of areas of the sample, and fibers that may be present in these areas of the specimen will be overlooked; this will lead to a low result. Undissolved filter medium also compromises the ability to obtain ED patterns. Before they are counted, TEM grids must be examined critically to determine whether they are adequately cleared of residual filter medium. It has been found that condensation washing of the grids after the initial Jaffe washer treatment, with chloroform as the solvent, clears all residual filter medium in a period of approximately 1 hour. In practice, the piece of lens tissue supporting the specimen grids is transferred to the cold finger of the condensation washer, and the washer is operated for about 1 hour. If the specimens are cleared satisfactorily by the Jaffe washer alone, the condensation washer step may be unnecessary.

8. TEM specimen preparation from MCE filters.

a. This method of preparing TEM specimens from MCE filters is similar to

that specified in NIOSH Method 7402. See References 7, 8, and 9 of Unit III.L.

b. Upon receipt at the analytical laboratory, the sample cassettes must be cleaned of any contamination adhering to the outside surfaces before entering the clean sample preparation area.

c. Remove a section from any quadrant of the sample and blank filters.

d. Place the section on a clean microscope slide. Affix the filter section to the slide with a gummed paged reinforcement or other suitable means. Label the slide with a water and solvent-proof marking pen.

e. Place the slide in a petri dish which contains several paper filters soaked with 2 to 3 mL acetone. Cover the dish. Wait 2 to 4 minutes for the sample filter to fuse and clear.

f. Plasma etching of the collapsed filter is required.

i. The microscope slide to which the collapsed filter pieces are attached is placed in a plasma asher. Because plasma ashers vary greatly in their performance, both from unit to unit and between different positions in the asher chamber, it is difficult to specify the conditions that should be used. This is one area of the method that requires further evaluation. Insufficient etching will result in a failure to expose embedded filters, and too much etching may result in loss of particulate from the surface. As an interim measure, it is recommended that the time for ashing of a known weight of a collapsed filter be established and that the etching rate be calculated in terms of micrometers per second. The actual etching time used for a particular asher and operating conditions will then be set such that a 1-2 μm (10 percent) layer of collapsed surface will be removed.

ii. Place the slide containing the collapsed filters into a low-temperature plasma asher, and etch the filter.

g. Transfer the slide to a rotating stage inside the bell jar of a vacuum evaporator. Evaporate a 1 mm x 5 mm section of graphite rod onto the cleared filter. Remove the slide to a clean, dry, covered petri dish.

h. Prepare a second petri dish as a Jaffe washer with the wicking substrate prepared from filter or lens paper placed on top of a 6 mm thick disk of clean spongy polyurethane foam. Cut a V-notch on the edge of the foam and filter paper. Use the V-notch as a reservoir for adding solvent. The wicking substrate should be thin enough to fit into the petri dish without touching the lid.

i. Place carbon-coated TEM grids face up on the filter or lens paper. Label the grids by marking with a pencil on the filter paper or by putting registration

marks on the petri dish lid and marking with a waterproof marker on the dish lid. In a fume hood, fill the dish with acetone until the wicking substrate is saturated. The level of acetone should be just high enough to saturate the filter paper without creating puddles.

j. Remove about a quarter section of the carbon-coated filter samples from the glass slides using a surgical knife and tweezers. Carefully place the section of the filter, carbon side down, on the appropriately labeled grid in the acetone-saturated petri dish. When all filter sections have been transferred, slowly add more solvent to the wedge-shaped trough to bring the acetone level up to the highest possible level without disturbing the sample preparations. Cover the petri dish. Elevate one side of the petri dish by placing a slide under it. This allows drops of condensed solvent vapors to form near the edge rather than

in the center where they would drip onto the grid preparation.

G. TEM Method

1. Instrumentation.

a. Use an 80-120 kV TEM capable of performing electron diffraction with a fluorescent screen inscribed with calibrated gradations. If the TEM is equipped with EDXA it must either have a STEM attachment or be capable of producing a spot less than 250 nm in diameter at crossover. The microscope shall be calibrated routinely (see Unit III.J.) for magnification and camera constant.

b. While not required on every microscope in the laboratory, the laboratory must have either one microscope equipped with energy dispersive X-ray analysis or access to an equivalent system on a TEM in another laboratory. This must be an Energy Dispersive X-ray Detector mounted on TEM column and associated

hardware/software to collect, save, and read out spectral information.

Calibration of Multi-Channel Analyzer shall be checked regularly for Al at 1.48 KeV and Cu at 8.04 KeV, as well as the manufacturer's procedures.

i. Standard replica grating may be used to determine magnification (e.g., 2160 lines/mm).

ii. Gold standard may be used to determine camera constant.

c. Use a specimen holder with single tilt and/or double tilt capabilities.

2. Procedure.

a. Start a new Count Sheet for each sample to be analyzed. Record on count sheet: analyst's initials and date; lab sample number; client sample number; microscope identification; magnification for analysis; number of predetermined grid openings to be analyzed; and grid identification. See the following Figure 4:

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b. Check that the microscope is properly aligned and calibrated according to the manufacturer's specifications and instructions.

c. Microscope settings: 80–120 kV, grid assessment 250–1000X, then 15,000–20,000X screen magnification for analysis.

d. Approximately one-half (0.5) of the predetermined sample area to be analyzed shall be performed on one sample grid preparation and the remaining half on a second sample grid preparation.

e. Determine the suitability of the grid.

i. Individual grid openings with greater than 5 percent openings (holes) or covered with greater than 25 percent particulate matter or obviously having nonuniform loading shall not be analyzed.

ii. Examine the grid at low magnification (<1000X) to determine its suitability for detailed study at higher magnifications.

iii. Reject the grid if:

(1) Less than 50 percent of the grid openings covered by the replica are intact.

(2) It is doubled or folded.

(3) It is too dark because of incomplete dissolution of the filter.

iv. If the grid is rejected, load the next sample grid.

v. If the grid is acceptable, continue on to Step 6 if mapping is to be used; otherwise proceed to Step 7.

f. Grid Map (Optional).

i. Set the TEM to the low magnification mode.

ii. Use flat edge or finder grids for mapping.

iii. Index the grid openings (fields) to be counted by marking the acceptable fields for one-half (0.5) of the area needed for analysis on each of the two grids to be analyzed. These may be marked just before examining each grid opening (field), if desired.

iv. Draw in any details which will allow the grid to be properly oriented if it is reloaded into the microscope and a particular field is to be reliably identified.

g. Scan the grid.

i. Select a field to start the examination.

ii. Choose the appropriate magnification (15,000 to 20,000X screen magnification).

iii. Scan the grid as follows.

(1) At the selected magnification, make a series of parallel traverses across the field. On reaching the end of one traverse, move the image one window and reverse the traverse.

Note.—A slight overlap should be used so as not to miss any part of the grid opening (field).

(2) Make parallel traverses until the entire grid opening (field) has been scanned.

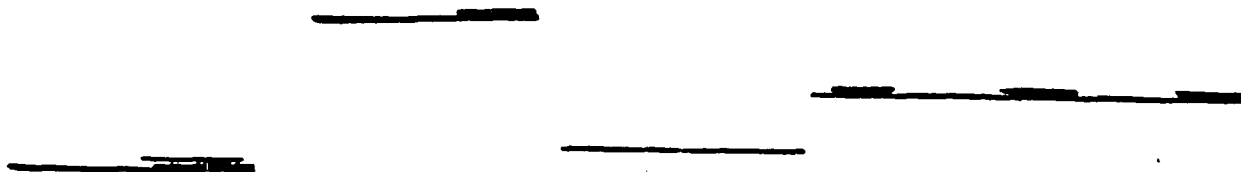
h. Identify each structure for appearance and size.

i. Appearance and size: Any continuous grouping of particles in which an asbestos fiber within aspect ratio greater than or equal to 5:1 and a length greater than or equal to 0.5 μm is detected shall be recorded on the count sheet. These will be designated asbestos structures and will be classified as fibers, bundles, clusters, or matrices. Record as individual fibers any contiguous grouping having 0, 1, or 2 definable intersections. Groupings having more than 2 intersections are to be described as cluster or matrix. See the following Figure 5:

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**FIGURE 5--COUNTING GUIDELINES USED IN
DETERMINING ASBESTOS STRUCTURES**

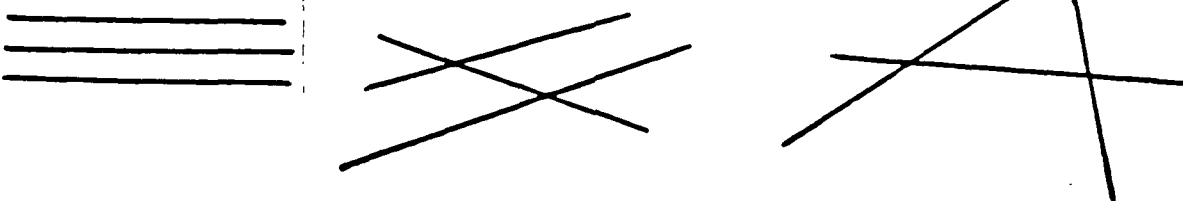
Count as 1 fiber; 1 Structure; no intersections.



Count as 2 fibers if space between fibers is greater than width of 1 fiber diameter or number of intersections is equal to or less than 1.



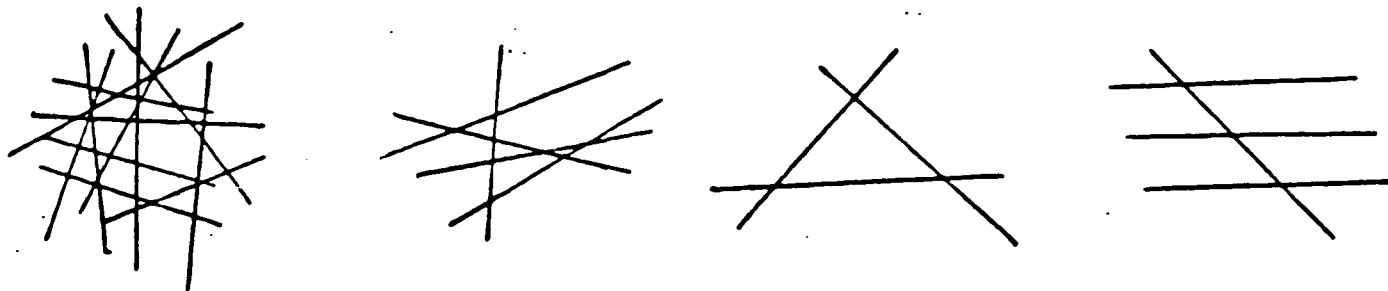
Count as 3 structures if space between fibers is greater than width of 1 fiber diameter or if the number of intersections is equal to or less than 2.



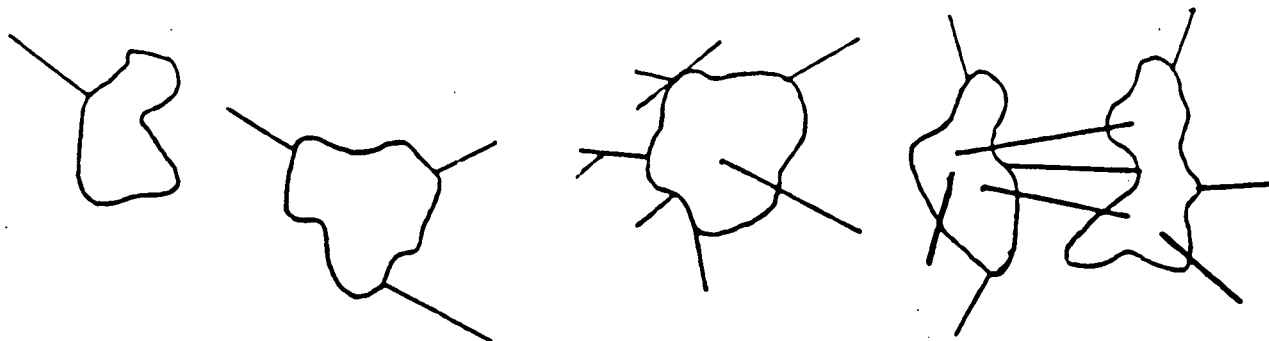
Count bundles as 1 structure; 3 or more parallel fibrils less than 1 fiber diameter separation.



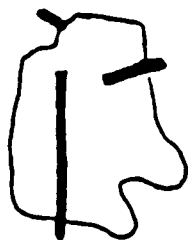
Count clusters as 1 structure; fibers having greater than or equal to 3 intersections.



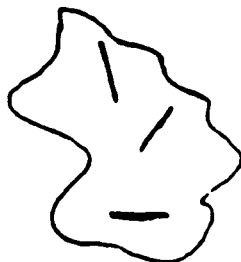
Count matrix as 1 structure.



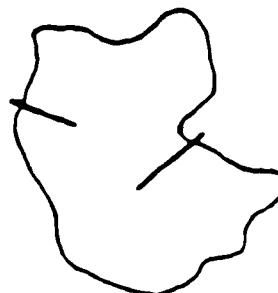
DO NOT COUNT AS STRUCTURES:



Fiber protrusion
<5:1 Aspect Ratio



No fiber protrusion



Fiber protrusion
<0.5 micrometer

— <0.5 micrometer in length
 — <5:1 Aspect Ratio

An intersection is a non-parallel touching or crossing of fibers, with the projection having an aspect ratio of 5:1 or greater. Combinations such as a matrix and cluster, matrix and bundle, or bundle and cluster are categorized by the dominant fiber quality—cluster, bundle, and matrix, respectively. Separate categories will be maintained for fibers less than 5 μm and for fibers greater than or equal to 5 μm in length. Not required, but useful, may be to record the fiber length in 1 μm intervals. (Identify each structure morphologically and analyze it as it enters the "window".)

(1) **Fiber.** A structure having a minimum length greater than 0.5 μm and an aspect ratio (length to width) of 5:1 or greater and substantially parallel sides. Note the appearance of the end of the fiber, i.e., whether it is flat, rounded or dovetailed, no intersections.

(2) **Bundle.** A structure composed of 3 or more fibers in a parallel arrangement with each fiber closer than one fiber diameter.

(3) **Cluster.** A structure with fibers in a random arrangement such that all fibers are intermixed and no single fiber is isolated from the group; groupings must have more than 2 intersections.

(4) **Matrix.** Fiber or fibers with one end free and the other end embedded in a matrix. The exposed end must meet the fiber definition.

(5) **NSD.** Record NSD when no structures are detected in the field.

(6) **Intersection.** Non-parallel touching or crossing of fibers, with the projection having an aspect ratio 5:1 or greater.

ii. Structure Measurement.

(1) Recognize the structure that is to be sized.

(2) Memorize its location in the "window" relative to the sides, inscribed square and to other particulates in the field so this exact location can be found again when scanning is resumed.

(3) Measure the structure using the scale on the screen.

(4) Record the length category and structure type classification on the count sheet after the field number and fiber number.

(5) Return the fiber to its original location in the window and scan the rest of the field for other fibers; if the direction of travel is not remembered, return to the right side of the field and begin scanning in the opposite direction.

i. Identification of Electron Diffraction (ED) patterns is required for each structure counted which would cause the analysis to exceed the 70 s/mm² concentration. (Generally this is the first four fibers identified as asbestos must exhibit an identifiable

diffraction pattern for chrysotile or amphibole.)

i. Center the structure, focus, and obtain an ED pattern. (See Microscope Instruction Manual for more detailed instructions.)

ii. From a visual examination of the ED pattern, obtained with a short camera length, classify the observed structure as belonging to one of the following classifications: chrysotile, amphibole, or nonasbestos.

(1) **Chrysotile:** The chrysotile asbestos pattern has characteristic streaks on the layer lines other than the central line and some streaking also on the central line. There will be spots of normal sharpness on the central layer line and on alternate lines (2nd, 4th, etc.). The repeat distance between layer lines is 0.53 nm and the center doublet is at 0.73 nm. The pattern should display (002), (110), (130) diffraction maxima; distances and geometry should match a chrysotile pattern and be measured semiquantitatively.

(2) **Amphibole Group** [includes grunerite (amosite), crocidolite, anthophyllite, tremolite, and actinolite]: Amphibole asbestos fiber patterns show layer lines formed by very closely spaced dots, and the repeat distance between layer lines is also about 0.53 nm. Streaking in layer lines is occasionally present due to crystal structure defects.

(3) **Nonasbestos:** Incomplete or unobtainable ED patterns, a nonasbestos EDXA, or a nonasbestos morphology.

iii. The micrograph number of the recorded diffraction patterns must be reported to the client and maintained in the laboratory's quality assurance records. The records must also demonstrate that the identification of the pattern has been verified by a qualified individual and that the operator who made the identification is maintaining at least an 80 percent correct visual identification based on his measured patterns. In the event that examination of the pattern by the qualified individual indicates that the pattern had been misidentified visually, the client shall be contacted. If the pattern is a suspected chrysotile, take a photograph of the diffraction pattern at 0 degrees tilt. If the structure is suspected to be amphibole, the sample may have to be tilted to obtain a simple geometric array of spots.

j. Energy Dispersive X-Ray Analysis (EDXA).

i. Required of all amphiboles which would cause the analysis results to exceed the 70 s/mm² concentration. (Generally speaking, the first 4 amphiboles would require EDXA.)

ii. Can be used alone to confirm chrysotile after the 70 s/mm² concentration has been exceeded.

iii. Can be used alone to confirm all nonasbestos.

iv. Compare spectrum profiles with profiles obtained from asbestos standards. The closest match identifies and categorizes the structure.

v. If the EDXA is used for confirmation, record the properly labeled spectrum on a computer disk, or if a hard copy, file with analysis data.

vi. If the number of fibers in the nonasbestos class would cause the analysis to exceed the 70 s/mm² concentration, their identities must be confirmed by EDXA or measurement of a zone axis diffraction pattern to establish that the particles are nonasbestos.

k. Stopping Rules.

i. If more than 50 asbestiform structures are counted in a particular grid opening, the analysis may be terminated.

ii. After having counted 50 asbestiform structures in a minimum of 4 grid openings, the analysis may be terminated. The grid opening in which the 50th fiber was counted must be completed.

iii. For blank samples, the analysis is always continued until 10 grid openings have been analyzed.

iv. In all other samples the analysis shall be continued until an analytical sensitivity of 0.005 s/cm³ is reached.

l. Recording Rules. The count sheet should contain the following information:

i. Field (grid opening): List field number.

ii. Record "NSD" if no structures are detected.

iii. Structure information.

(1) If fibers, bundles, clusters, and/or matrices are found, list them in consecutive numerical order, starting over with each field.

(2) Length. Record length category of asbestos fibers examined. Indicate if less than 5 μm or greater than or equal to 5 μm .

(3) Structure Type. Positive identification of asbestos fibers is required by the method. At least one diffraction pattern of each fiber type from every five samples must be recorded and compared with a standard diffraction pattern. For each asbestos fiber reported, both a morphological descriptor and an identification descriptor shall be specified on the count sheet.

(4) Fibers classified as chrysotile must be identified by diffraction and/or X-ray analysis and recorded on the count

sheet. X-ray analysis alone can be used as sole identification only after 70s/mm² have been exceeded for a particular sample.

(5) Fibers classified as amphiboles must be identified by X-ray analysis and electron diffraction and recorded on the count sheet. (X-ray analysis alone can be used as sole identification only after 70s/mm² have been exceeded for a particular sample.)

(6) If a diffraction pattern was recorded on film, the micrograph number must be indicated on the count sheet.

(7) If an electron diffraction was attempted and an appropriate spectra is not observed, N should be recorded on the count sheet.

(8) If an X-ray analysis is attempted but not observed, N should be recorded on the count sheet.

(9) If an X-ray analysis spectrum is stored, the file and disk number must be recorded on the count sheet.

m. Classification Rules.

i. *Fiber*. A structure having a minimum length greater than or equal to 0.5 μm and an aspect ratio (length to width) of 5:1 or greater and substantially parallel sides. Note the appearance of the end of

the fiber, i.e., whether it is flat, rounded or dovetailed.

ii. *Bundle*. A structure composed of three or more fibers in a parallel arrangement with each fiber closer than one fiber diameter.

iii. *Cluster*. A structure with fibers in a random arrangement such that all fibers are intermixed and no single fiber is isolated from the group. Groupings must have more than two intersections.

iv. *Matrix*. Fiber or fibers with one end free and the other end embedded in or hidden by a particulate. The exposed fiber must meet the fiber definition.

v. *NSD*. Record NSD when no structures are detected in the field.

n. After all necessary analyses of a particle structure have been completed, return the goniometer stage to 0 degrees and return the structure to its original location by recall of the original location.

o. Continue scanning until all the structures are identified, classified and sized in the field.

p. Select additional fields (grid openings) at low magnification; scan at a chosen magnification (15,000 to 20,000X screen magnification); and analyze until the stopping rule becomes applicable.

q. Carefully record all data as they are being collected, and check for accuracy.

r. After finishing with a grid, remove it from the microscope, and replace it in the appropriate grid hold. Sample grids must be stored for a minimum of 1 year from the date of the analysis; the sample cassette must be retained for a minimum of 30 days by the laboratory or returned at the client's request.

H. Sample Analytical Sequence

1. Carry out visual inspection of work site prior to air monitoring.

2. Collect a minimum of five air samples inside the work site and five samples outside the work site. The indoor and outdoor samples shall be taken during the same time period.

3. Analyze the abatement area samples according to this protocol. The analysis must meet the 0.005 s/cm² analytical sensitivity.

4. Remaining steps in the analytical sequence are contained in Unit IV. of this Appendix.

I. Reporting

The following information must be reported to the client. See the following Table II:

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1. Concentration in structures per square millimeter and structures per cubic centimeter.
2. Analytical sensitivity used for the analysis.
3. Number of asbestos structures.
4. Area analyzed.
5. Volume of air samples (which was initially provided by client).
6. Average grid size opening.
7. Number of grids analyzed.
8. Copy of the count sheet must be included with the report.
9. Signature of laboratory official to indicate that the laboratory met specifications of the AHERA method.
10. Report form must contain official laboratory identification (e.g. letterhead).
11. Type of asbestos.

J. Calibration Methodology

Note: Appropriate implementation of the method requires a person knowledgeable in electron diffraction and mineral identification by ED and EDXA. Those inexperienced laboratories wishing to develop capabilities may acquire necessary knowledge through analysis of appropriate standards and by following detailed methods as described in References 8 and 10 of Unit III.L.

1. Equipment Calibration. In this method, calibration is required for the air-sampling equipment and the transmission electron microscope (TEM).

a. TEM Magnification. The magnification at the fluorescent screen of the TEM must be calibrated at the grid opening magnification (if used) and also at the magnification used for fiber counting. This is performed with a cross grating replica. A logbook must be maintained, and the dates of calibration depend on the past history of the particular microscope; no frequency is specified. After any maintenance of the microscope that involved adjustment of the power supplied to the lenses or the high-voltage system or the mechanical disassembly of the electron optical column apart from filament exchange, the magnification must be recalibrated. Before the TEM calibration is performed, the analyst must ensure that the cross grating replica is placed at the same distance from the objective lens as the specimens are. For instruments that incorporate an eucentric tilting specimen stage, all specimens and the cross grating replica must be placed at the eucentric position.

b. Determination of the TEM magnification on the fluorescent screen.

i. Define a field of view on the fluorescent screen either by markings or physical boundaries. The field of view

must be measurable or previously inscribed with a scale or concentric circles (all scales should be metric).

ii. Insert a diffraction grating replica (for example a grating containing 2,160 lines/mm) into the specimen holder and place into the microscope. Orient the replica so that the grating lines fall perpendicular to the scale on the TEM fluorescent screen. Ensure that the goniometer stage tilt is 0 degrees.

iii. Adjust microscope magnification to 10,000X or 20,000X. Measure the distance (mm) between two widely separated lines on the grating replica. Note the number of spaces between the lines. Take care to measure between the same relative positions on the lines (e.g. between left edges of lines).

Note.—The more spaces included in the measurement, the more accurate the final calculation. On most microscopes, however the magnification is substantially constant only within the central 8–10 cm diameter region of the fluorescent screen.

iv. Calculate the true magnification (M) on the fluorescent screen:

$$M = XC/Y$$

where:

X = total distance (mm) between the designated grating lines;

C = calibration constant of the grating replica (lines/mm);

Y = number of grating replica spaces counted along X.

c. Calibration of the EDXA System. Initially, the EDXA system must be calibrated by using two reference elements to calibrate the energy scale of the instrument. When this has been completed in accordance with the manufacturer's instructions, calibration in terms of the different types of asbestos can proceed. The EDXA detectors vary in both solid angle of detection and in window thickness. Therefore, at a particular accelerating voltage in use on the TEM, the count rate obtained from specific dimensions of fiber will vary both in absolute X-ray count rate and in the relative X-ray peak heights for different elements. Only a few minerals are relevant for asbestos abatement work, and in this procedure the calibration is specified in terms of a "fingerprint" technique. The EDXA spectra must be recorded from individual fibers of the relevant minerals, and identifications are made on the basis of semiquantitative comparisons with these reference spectra.

d. Calibration of Grid Openings.

i. Measure 20 grid openings on each of 20 random 200-mesh copper grids by placing a grid on a glass slide and examining it under the PCM. Use a calibrated graticule to measure the

average field diameter and use this number to calculate the field area for an average grid opening. Grids are to be randomly selected from batches up to 1,000.

Note.—A grid opening is considered as one field.

ii. The mean grid opening area must be measured for the type of specimen grids in use. This can be accomplished on the TEM at a properly calibrated low magnification or on an optical microscope at a magnification of approximately 400X by using an eyepiece fitted with a scale that has been calibrated against a stage micrometer. Optical microscopy utilizing manual or automated procedures may be used providing instrument calibration can be verified.

e. Determination of Camera Constant and ED Pattern Analysis.

i. The camera length of the TEM in ED operating mode must be calibrated before ED patterns on unknown samples are observed. This can be achieved by using a carbon-coated grid on which a thin film of gold has been sputtered or evaporated. A thin film of gold is evaporated on the specimen TEM grid to obtain zone-axis ED patterns superimposed with a ring pattern from the polycrystalline gold film.

ii. In practice, it is desirable to optimize the thickness of the gold film so that only one or two sharp rings are obtained on the superimposed ED pattern. Thicker gold film would normally give multiple gold rings, but it will tend to mask weaker diffraction spots from the unknown fibrous particulates. Since the unknown d-spacings of most interest in asbestos analysis are those which lie closest to the transmitted beam, multiple gold rings are unnecessary on zone-axis ED patterns. An average camera constant using multiple gold rings can be determined. The camera constant is one-half the diameter, D, of the rings times the interplanar spacing, d, of the ring being measured.

K. Quality Control/Quality Assurance Procedures (Data Quality Indicators)

Monitoring the environment for airborne asbestos requires the use of sensitive sampling and analysis procedures. Because the test is sensitive, it may be influenced by a variety of factors. These include the supplies used in the sampling operation, the performance of the sampling the preparation of the grid from the filter and the actual examination of this grid in the microscope. Each of these unit operations must produce a product of

defined quality if the analytical result is to be a reliable and meaningful test result. Accordingly, a series of control tests and reference standards is performed along with the sample analysis as indicators that the materials used are adequate and the operations are within acceptable limits. In this way, the quality of the data is defined and the results are of known value. These checks and tests also provide timely and specific warning of any problems which might develop within the sampling and analysis operations. A description of these quality control/quality assurance procedures is summarized in the following Table III:

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TABLE III--SUMMARY OF LABORATORY
DATA QUALITY OBJECTIVES

Unit Operation	QC Check	Frequency	Conformance Expectation
Sample receiving	Review of receiving report	Each sample	95% complete
Sample custody	Review of chain-of-custody record	Each sample	95% complete
Sample preparation	Supplies and reagents	On receipt	Meet specs. or reject
	Grid opening size	20 openings/20 grids/lot of 1000 or 1 opening/sample	100%
	Special clean area monitoring	After cleaning or service	Meet specs or reclean
	Laboratory blank	1 per prep series or 10%	Meet specs. or reanalyze series
	Plasma etch blank	1 per 20 samples	75%
	Multiple preps (3 per sample)	Each sample	One with cover of 15 complete grid sqs.
Sample analysis	System check	Each day	Each day
	Alignment check	Each day	Each day
	Magnification calibration with low and high standards	Each month or after service	95%
	ED calibration by gold standard	Weekly	95%
	EDS calibration by copper line	Daily	95%
Performance check	Laboratory blank (measure of cleanliness)	Prep 1 per series or 10% read 1 per 25 samples	Meet specs or reanalyze series
	Replicate counting (measure of precision)	1 per 100 samples	1.5 x Poisson Std. Dev.
	Duplicate analysis (measure of reproducibility)	1 per 100 samples	2 x Poisson Std. Dev.
	Known samples of typical materials (working standards)	Training and for comparison with unknowns	100%
	Analysis of NBS SRM 1876 and/or RM 8410 (measure of accuracy and comparability)	1 per analyst per year	1.5 x Poisson Std. Dev.
	Data entry review (data validation and measure of completeness)	Each sample	95%
	Record and verify ID electron diffraction pattern of structure	1 per 5 samples	80% accuracy
Calculations and data reduction	Hand calculation of automated data reduction procedure or independent recalculation of hand-calculated data	1 per 100 samples	85%

1. When the samples arrive at the laboratory, check the samples and documentation for completeness and requirements before initiating the analysis.

2. Check all laboratory reagents and supplies for acceptable asbestos background levels.

3. Conduct all sample preparation in a clean room environment monitored by laboratory blanks and special testing after cleaning or servicing the room.

4. Prepare multiple grids of each sample.

5. Provide laboratory blanks with each sample batch. Maintain a cumulative average of these results. If this average is greater than 53 f/mm^2 per 10 200-mesh grid openings, check the system for possible sources of contamination.

6. Check for recovery of asbestos from cellulose ester filters submitted to plasma asher.

7. Check for asbestos carryover in the plasma asher by including a blank alongside the positive control sample.

8. Perform a systems check on the transmission electron microscope daily.

9. Make periodic performance checks of magnification, electron diffraction and energy dispersive X-ray systems as set forth in Table III of Unit III.K.

10. Ensure qualified operator performance by evaluation of replicate counting, duplicate analysis, and standard sample comparisons as set forth in Table III of Unit III.K.

11. Validate all data entries.

12. Recalculate a percentage of all computations and automatic data reduction steps as specified in Table III.

13. Record an electron diffraction pattern of one asbestos structure from every five samples that contain asbestos. Verify the identification of the pattern by measurement or comparison of the pattern with patterns collected from standards under the same conditions.

The outline of quality control procedures presented above is viewed as the minimum required to assure that quality data is produced for clearance testing of an asbestos abated area. Additional information may be gained by other control tests. Specifics on those control procedures and options available for environmental testing can be obtained by consulting References 6, 7, and 11 of Unit III.L.

L. References

For additional background information on this method the following references should be consulted.

"Guidelines for Controlling Asbestos-Containing Materials in Buildings," EPA 560/5-85-024, June 1985.

2. "Measuring Airborne Asbestos Following an Abatement Action," USEPA/ Office of Toxic Substances, EPA 600/4-85-049, 1985.

3. Small, John and E. Steel. Asbestos Standards: Materials and Analytical Methods. N.B.S. Special Publication 619, 1982.

4. Campbell, W.J., R.L. Blake, L.L. Brown, E.E. Cather, and J.J. Sjoberg. Selected Silicate Minerals and Their Asbestiform Varieties. Information Circular 8751, U.S. Bureau of Mines, 1977.

5. Quality Assurance Handbook for Air Pollution Measurement System. Ambient Air Methods, EPA 600/4-77-027a, USEPA, Office of Research and Development, 1977.

6. Method 2A: Direct Measurement of Gas Volume Through Pipes and Small Ducts. 40 CFR Part 60 Appendix A.

7. Burdette, G.J. Health & Safety Exec., Research & Lab. Services Div., London, "Proposed Analytical Method for Determination of Asbestos in Air."

8. Chatfield, E.J., Chatfield Tech. Cons., Ltd., Clark, T., PEI Assoc. "Standard Operating Procedure for Determination of Airborne Asbestos Fibers by Transmission Electron Microscopy Using Polycarbonate Membrane Filters." WERL SOP 87-1, March 5, 1987.

9. NIOSH. Method 7402 for Asbestos Fibers, December 11, 1986 Draft.

10. Yamate, G., S.C. Agarwall, R.D. Gibbons, IIT Research Institute, "Methodology for the Measurement of Airborne Asbestos by Electron Microscopy." Draft report, USEPA Contract 68-02-3286, July 1984.

11. Guidance to the Preparation of Quality Assurance Project Plans. USEPA, Office of Toxic Substances, 1984.

IV. Mandatory Interpretation of Transmission Electron Microscopy Results to Determine Completion of Response Actions

A. Introduction

A response action is determined to be completed by TEM when the abatement area has been cleaned and the airborne asbestos concentration inside the abatement area is no higher than concentrations at locations outside the abatement area. "Outside" means outside the abatement area, but not necessarily outside the building. EPA reasons that an asbestos removal contractor cannot be expected to clean an abatement area to an airborne asbestos concentration that is lower than the concentration of air entering the abatement area from outdoors or from other parts of the building. After

the abatement area has passed a thorough visual inspection, and before the outer containment barrier is removed, a minimum of five air samples inside the abatement area and a minimum of five air samples outside the abatement area must be collected. Hence, the response action is determined to be completed when the average airborne asbestos concentration measured inside the abatement area is not statistically different from the average airborne asbestos concentration measured outside the abatement area.

The inside and outside concentrations are compared by the Z-test, a statistical test that takes into account the variability in the measurement process. A minimum of five samples inside the abatement area and five samples outside the abatement area are required to control the false negative error rate, i.e., the probability of declaring the removal complete when, in fact, the air concentration inside the abatement area is significantly higher than outside the abatement area. Additional quality control is provided by requiring three blanks (filters through which no air has been drawn) to be analyzed to check for unusually high filter contamination that would distort the test results.

When volumes greater than or equal to 1,199 L for a 25 mm filter and 2,799 L for a 37 mm filter have been collected and the average number of asbestos structures on samples inside the abatement area is no greater than 70 s/mm^2 of filter, the response action may be considered complete without comparing the inside samples to the outside samples. EPA is permitting this initial screening test to save analysis costs in situations where the airborne asbestos concentration is sufficiently low so that it cannot be distinguished from the filter contamination/background level (fibers deposited on the filter that are unrelated to the air being sampled). The screening test cannot be used when volumes of less than 1,199 L for 25 mm filter or 2,799 L for a 37 mm filter are collected because the ability to distinguish levels significantly different from filter background is reduced at low volumes.

The initial screening test is expressed in structures per square millimeter of filter because filter background levels come from sources other than the air being sampled and cannot be meaningfully expressed as a concentration per cubic centimeter of air. The value of 70 s/mm^2 is based on the experience of the panel of microscopists who consider one structure in 10 grid openings (each grid opening with an area of 0.0057 mm^2) to

be comparable with contamination/background levels of blank filters. The decision is based, in part, on Poisson statistics which indicate that four structures must be counted on a filter before the fiber count is statistically distinguishable from the count for one structure. As more information on the performance of the method is collected, this criterion may be modified. Since different combinations of the number and size of grid openings are permitted under the TEM protocol, the criterion is expressed in structures per square millimeter of filter to be consistent across all combinations. Four structures per 10 grid openings corresponds to approximately 70 s/mm².

B. Sample Collection and Analysis

1. A minimum of 13 samples is required: five samples collected inside the abatement area, five samples collected outside the abatement area, two field blanks, and one sealed blank.

2. Sampling and TEM analysis must be done according to either the mandatory or nonmandatory protocols in Appendix A. At least 0.057 mm³ of filter must be examined on blank filters.

C. Interpretation of Results

1. The response action shall be considered complete if either:

a. Each sample collected inside the abatement area consists of at least 1,199 L of air for a 25 mm filter, or 2,799 L of air for a 37 mm filter, and the arithmetic mean of their asbestos structure concentrations per square millimeter of filter is less than or equal to 70 s/mm²; or

b. The three blank samples have an arithmetic mean of the asbestos structure concentration on the blank filters that is less than or equal to 70 s/mm² and the average airborne asbestos concentration measured inside the abatement area is not statistically higher than the average airborne asbestos concentration measured outside the abatement area as determined by the Z-test. The Z-test is carried out by calculating

$$Z = \frac{\bar{Y}_1 - \bar{Y}_0}{0.8(1/n_1 + 1/n_0)^{1/2}}$$

where \bar{Y}_1 is the average of the natural logarithms of the inside samples and \bar{Y}_0 is the average of the natural logarithms of the outside samples, n_1 is the number of inside samples and n_0 is the number of outside samples. The response action

is considered complete if Z is less than or equal to 1.65.

(Note.—When no fibers are counted, the calculated detection limit for that analysis is inserted for the concentration.)

2. If the abatement site does not satisfy either (1) or (2) above, the site must be recleaned and a new set of samples collected.

D. Sequence for Analyzing Samples

It is possible to determine completion of the response action without analyzing all samples. Also, at any point in the process, a decision may be made to terminate the analysis of existing samples, reclean the abatement site, and collect a new set of samples. The following sequence is outlined to minimize the number of analyses needed to reach a decision.

1. Analyze the inside samples.

2. If at least 1,199 L of air for a 25 mm filter or 2,799 L of air for a 37 mm filter is collected for each inside sample and the arithmetic mean concentration of structures per square millimeter of filter is less than or equal to 70 s/mm², the response action is complete and no further analysis is needed.

3. If less than 1,199 L of air for a 25 mm filter or 2,799 L of air for a 37 mm filter is collected for any of the inside samples, or the arithmetic mean concentration of structures per square millimeter of filter is greater than 70 s/mm², analyze the three blanks.

4. If the arithmetic mean concentration of structures per square millimeter on the blank filters is greater than 70 s/mm², terminate the analysis, identify and correct the source of blank contamination, and collect a new set of samples.

5. If the arithmetic mean concentration of structures per square millimeter on the blank filters is less than or equal to 70 s/mm², analyze the outside samples and perform the Z-test.

6. If the Z-statistic is less than or equal to 1.65, the response action is complete. If the Z-statistic is greater than 1.65, reclean the abatement site and collect a new set of samples.

Appendix B to Subpart E—Work Practices and Engineering Controls for Small-Scale, Short-Duration Operations Maintenance and Repair (O&M) Activities Involving ACM

This appendix is not mandatory, in that LEAs may choose to comply with all the requirements of 40 CFR 763.121. Section 763.91(b) extends the protection provided by EPA in its 40 CFR 763.121 for worker protection during asbestos abatement projects to employees of local education agencies who perform

small-scale, short-duration operations, maintenance and repair (O&M) activities involving asbestos-containing materials and are not covered by the OSHA asbestos construction standard at 29 CFR 1926.58 or an asbestos worker protection standard adopted by a State as part of a State plan approved by OSHA under section 18 of the Occupational Safety and Health Act. Employers wishing to be exempt from the requirements of § 763.121 (e)(8) and (f)(2)(i) may instead comply with the provisions of this appendix when performing small-scale, short-duration O&M activities.

Definition of Small-Scale, Short-Duration Activities

For the purposes of this appendix, small-scale, short-duration maintenance activities are tasks such as, but not limited to:

1. Removal of asbestos-containing insulation on pipes.
2. Removal of small quantities of asbestos-containing insulation on beams or above ceilings.
3. Replacement of an asbestos-containing gasket on a valve.
4. Installation or removal of a small section of drywall.
5. Installation of electrical conduits through or proximate to asbestos-containing materials.

Small-scale, short-duration maintenance activities can be further defined, for the purposes of this subpart, by the following considerations:

1. Removal of small quantities of asbestos-containing materials (ACM) only if required in the performance of another maintenance activity not intended as asbestos abatement.
2. Removal of asbestos-containing thermal system insulation not to exceed amounts greater than those which can be contained in a single glove bag.
3. Minor repairs to damaged thermal system insulation which do not require removal.
4. Repairs to a piece of asbestos-containing wallboard.
5. Repairs, involving encapsulation, enclosure or removal, to small amounts of friable asbestos-containing material only if required in the performance of emergency or routine maintenance activity and not intended solely as asbestos abatement. Such work may not exceed amounts greater than those which can be contained in a single prefabricated minienclosure. Such an enclosure shall conform spatially and geometrically to the localized work area, in order to perform its intended containment function.

OSHA concluded that the use of certain engineering and work practice controls is capable of reducing employee exposures to asbestos to levels below the final standard's action level ($0.1 f/cm^3$). (See 51 FR 22714, June 20, 1986.) Several controls and work practices, used either singly or in combination, can be employed effectively to reduce asbestos exposures during small maintenance and renovation operations. These include:

1. Wet methods.
2. Removal methods.
 - i. Use of glove bags.
 - ii. Removal of entire asbestos insulated pipes or structures.
 - iii. Use of minienclosures.
3. Enclosure of asbestos materials.
4. Maintenance programs.

This appendix describes these controls and work practices in detail.

Preparation of the Area Before Renovation or Maintenance Activities

The first step in preparing to perform a small-scale, short-duration asbestos renovation or maintenance task, regardless of the abatement method that will be used, is the removal from the work area of all objects that are movable to protect them from asbestos contamination. Objects that cannot be removed must be covered completely with 6-mil-thick polyethylene plastic wetting before the task begins. If objects have already been contaminated, they should be thoroughly cleaned with a High Efficiency Particulate Air (HEPA) filtered vacuum or be wet-wiped before they are removed from the work area or completely encased in the plastic.

Wet methods. Whenever feasible, and regardless of the abatement method to be used (e.g., removal, enclosure, use of glove bags), wet methods must be used during small-scale, short-duration maintenance and renovation activities that involve disturbing asbestos-containing materials. Handling asbestos materials wet is one of the most reliable methods of ensuring that asbestos fibers do not become airborne, and this practice should therefore be used whenever feasible. Wet methods can be used in the great majority of workplace situations. Only in cases where asbestos work must be performed on live electrical equipment, on live steam lines, or in other areas where water will seriously damage materials or equipment may dry removal be performed. Amended water or another wetting agent should be applied by means of an airless sprayer to minimize the extent to which the asbestos-containing material is disturbed.

Asbestos-containing material should be wetted from the initiation of the maintenance or renovation operation and wetting agents should be used continually throughout the work period to ensure that any dry asbestos-containing material exposed in the course of the work is wet and remains wet until final disposal.

Removal of small amount of asbestos-containing materials. Several methods can be used to remove small amounts of asbestos-containing materials during small-scale, short-duration renovation or maintenance tasks. These include the use of glove bags, the removal of an entire asbestos-covered pipe or structure, and the construction of minienclosures. The procedures that employers must use for each of these operations if they wish to avail themselves of the rule's exemptions are described in the following sections.

Glove bags. OSHA found that the use of glove bags to enclose the work area during small-scale, short-duration maintenance or renovation activities will result in employee exposure to asbestos that are below the rule's action level of $0.1 f/cm^3$. This appendix provides requirements for glove-bag procedures to be followed by employers wishing to avail themselves of the rule's exemption for each activity. OSHA has determined that the use of these procedures will reduce the 8-hour time weighted average (TWA) exposure of employees involved in these work operations to levels below the action level and will thus provide a degree of employee protection equivalent to that provided by compliance with all provisions of the rule.

Glove bag installation. Glove bags are approximately 40-inch-wide times 64-inch-long bags fitted with arms through which the work can be performed. When properly installed and used, they permit workers to remain completely isolated from the asbestos material removed or replaced inside the bag. Glove bags can thus provide a flexible, easily installed, and quickly dismantled temporary small work area enclosure that is ideal for small-scale asbestos renovation or maintenance jobs. These bags are single-use control devices that are disposed of at the end of each job. The bags are made of transparent 6-mil-thick polyethylene plastic with areas of Tyvek¹ material (the same material

¹ Mention of trade names or commercial products does not constitute endorsement or recommendation for use.

used to make the disposal protective suits used in major asbestos removal, renovation, and demolition operations and in protective gloves). Glove bags are readily available from safety supply stores or specialty asbestos removal supply houses. Glove bags come pre-labelled with the asbestos warning label prescribed by OSHA and EPA for bags used to dispose of asbestos waste.

Glove bag equipment and supplies.

Supplies and materials that are necessary to use glove bags effectively include:

1. Tape to seal glove bag to the area from which asbestos is to be removed.
2. Amended water or other wetting agents.
3. An airless sprayer for the application of the wetting agent.
4. Bridging encapsulant (a paste-like substance for coating asbestos) to seal the rough edges of any asbestos-containing materials that remain within the glove bag at the points of attachment after the rest of the asbestos has been removed.
5. Tools such as razor knives, nips, and wire brushes (or other tools suitable for cutting wires, etc.).
6. A HEPA filter-equipped vacuum for evacuating the glove bag (to minimize the release of asbestos fibers) during removal of the bag from the work area and for cleaning any material that may have escaped during the installation of the glove bag.
7. HEPA-equipped dual-cartridge or more protective respirators for use by the employees involved in the removal of asbestos with the glove bag.

Glove bag work practices. The proper use of glove bags requires the following steps:

1. Glove bags must be installed so that they completely cover the pipe or other structure where asbestos work is to be done. Glove bags are installed by cutting the sides of the glove bag to fit the size of the pipe from which asbestos is to be removed. The glove bag is attached to the pipe by folding the open edges together and securely sealing them with tape. All openings in the glove bag must be sealed with duct tape or equivalent material. The bottom seam of the glove bag must also be sealed with duct tape or equivalent to prevent any leakage from the bag that may result from a defect in the bottom seam.
2. The employee who is performing the asbestos removal with the glove bag must don at least a half mask dual-cartridge HEPA-equipped respirator; respirators should be worn by employees who are in close contact with the glove bag and who may thus be exposed as a result of small gaps in the

seams of the bag or holes punched through the bag by a razor knife or a piece of wire mesh.

3. The removed asbestos material from the pipe or other surface that has fallen into the enclosed bag must be thoroughly wetted with a wetting agent (applied with an airless sprayer through the precut port provided in most glove bags or applied through a small hole in the bag).

4. Once the asbestos material has been thoroughly wetted, it can be removed from the pipe, beam, or other surface. The choice of tool to use to remove the asbestos-containing material depends on the type of material to be removed. Asbestos-containing materials are generally covered with painted canvas and/or wire mesh. Painted canvas can be cut with a razor knife and peeled away from the asbestos-containing material underneath. Once the canvas has been peeled away, the asbestos-containing material underneath may be dry, in which case it should be resprayed with a wetting agent to ensure that it generates as little dust as possible when removed. If the asbestos-containing material is covered with wire mesh, the mesh should be cut with nips, tin snips, or other appropriate tool and removed.

A wetting agent must then be used to spray any layer of dry material that is exposed beneath the mesh, the surface of the stripped underlying structure, and the inside of the glove bag.

5. After removal of the layer of asbestos-containing material, the pipe or surface from which asbestos has been removed must be thoroughly cleaned with a wire brush and wet-wiped with a wetting agent until no traces of the asbestos-containing material can be seen.

6. Any asbestos-containing insulation edges that have been exposed as a result of the removal or maintenance activity must be encapsulated with bridging encapsulant to ensure that the edges do not release asbestos fibers to the atmosphere after the glove bag has been removed.

7. When the asbestos removal and encapsulation have been completed, a vacuum hose from a HEPA filtered vacuum must be inserted into the glove bag through the port to remove any air in the bag that may contain asbestos fibers. When the air has been removed from the bag, the bag should be squeezed tightly (as close to the top as possible), twisted, and sealed with tape, to keep the asbestos materials safely in the bottom of the bag. The HEPA vacuum can then be removed from the bag and the glove bag itself can be

removed from the work area to be disposed of properly.

Minienclosures. In some instances, such as removal of asbestos from a small ventilation system or from a short length of duct, a glove bag may not be either large enough or of the proper shape to enclose the work area. In such cases, a minienclosure can be built around the area where small-scale, short-duration asbestos maintenance or renovation work is to be performed. Such enclosures should be constructed of 6-mil-thick polyethylene plastic sheeting and can be small enough to restrict entry to the asbestos work area to one worker.

For example, a minienclosure can be built in a small utility closet when asbestos-containing duct covering is to be removed. The enclosure is constructed by:

1. Affixing plastic sheeting to the walls with spray adhesive and tape.
2. Covering the floor with plastic and sealing the plastic covering the floor to the plastic on the walls.
3. Sealing any penetrations such as pipes or electrical conduits with tape.
4. Constructing a small change room (approximately 3 feet square) made of 6-mil-thick polyethylene plastic supported by 2-inch by 4-inch lumber (the plastic should be attached to the lumber supports with staples or spray adhesive and tape).

The change room should be contiguous to the minienclosure, and is necessary to allow the worker to vacuum off his protective coveralls and remove them before leaving the work area. While inside minienclosure, the worker should wear Tyvek¹ disposable coveralls and use the appropriate HEPA-filtered dual-cartridge or more protective respiratory protection.

The advantages of minienclosures are that they limit the spread of asbestos contamination, reduce the potential exposure of bystanders and other workers who may be working in adjacent areas, and are quick and easy to install. The disadvantage of minienclosures is that they may be too small to contain the equipment necessary to create a negative pressure within the enclosure; however the double layer of plastic sheeting will serve to restrict the release of asbestos fibers to the area outside the enclosure.

Removal of entire structures. When pipes are insulated with asbestos-containing materials, removal of the entire pipe may be more protective, easier, and more cost-effective than stripping the asbestos insulation from the pipe. Before such a pipe is cut, the asbestos-containing insulation must be wrapped with 6-mil polyethylene plastic

and securely sealed with duct tape or equivalent. This plastic covering will prevent asbestos fibers from becoming airborne as a result of the vibration created by the power saws used to cut the pipe. If possible, the pipes should be cut at locations that are not insulated to avoid disturbing the asbestos. If a pipe is completely insulated with asbestos-containing materials, small sections should be stripped using the glove-bag method described above before the pipe is cut at the stripped sections.

Enclosure. The decision to enclose rather than remove asbestos-containing material from an area depends on the building owner's preference, i.e., for removal or containment. Owners consider such factors as cost effectiveness, the physical configuration of the work area, and the amount of traffic in the area when determining which abatement method to use.

If the owner chooses to enclose the structure rather than to remove the asbestos-containing material insulating it, a solid structure (airtight walls and ceilings) must be built around the asbestos covered pipe or structure to prevent the release of asbestos-containing materials into the area beyond the enclosure and to prevent disturbing these materials by casual contact during future maintenance operations.

Such a permanent (i.e., for the life of the building) enclosure should be built of new construction materials and should be impact resistant and airtight. Enclosure walls should be made of tongue-and-groove boards, boards with spine joints, or gypsum boards having taped seams. The underlying structure must be able to support the weight of the enclosure. (Suspended ceilings with laid-in panels do not provide airtight enclosures and should not be used to enclose structures covered with asbestos-containing materials.) All joints between the walls and ceiling of the enclosure should be caulked to prevent the escape of asbestos fibers. During the installation of enclosures, tools that are used (such as drills or rivet tools) should be equipped with HEPA-filtered vacuums. Before constructing the enclosure, all electrical conduits, telephone lines, recessed lights, and pipes in the area to be enclosed should be moved to ensure that the enclosure will not have to be re-opened later for routine or emergency maintenance. If such lights or other equipment cannot be moved to a new location for logistic reasons, or if moving them will disturb the asbestos-containing materials, removal rather than enclosure of the asbestos-

containing materials is the appropriate control method to use.

Maintenance program. An asbestos maintenance program must be initiated in all facilities that have friable asbestos-containing materials. Such a program should include:

1. Development of an inventory of all asbestos-containing materials in the facility.
2. Periodic examination of all asbestos-containing materials to detect deterioration.
3. Written procedures for handling asbestos materials during the performance of small-scale, short-duration maintenance and renovation activities.
4. Written procedures for asbestos disposal.
5. Written procedures for dealing with asbestos-related emergencies.

Members of the building's maintenance engineering staff (electricians, heating/air conditioning engineers, plumbers, etc.) who may be required to handle asbestos-containing materials should be trained in safe procedures. Such training should include at a minimum:

1. Information regarding types of ACM and its various uses and forms.
2. Information on the health effects associated with asbestos exposure.
3. Descriptions of the proper methods of handling asbestos-containing materials.
4. Information on the use of HEPA-equipped dual-cartridge respirators and other personal protection during maintenance activities.

Prohibited activities. The training program for the maintenance engineering staff should describe methods of handling asbestos-containing materials as well as routine maintenance activities that are prohibited when asbestos-containing materials are involved. For example, maintenance staff employees should be instructed:

1. *Not* to drill holes in asbestos-containing materials.
2. *Not* to hang plants or pictures on structures covered with asbestos-containing materials.
3. *Not* to sand asbestos-containing floor tile.
4. *Not* to damage asbestos-containing materials while moving furniture or other objects.
5. *Not* to install curtains, drapes, or dividers in such a way that they damage asbestos-containing materials.
6. *Not* to dust floors, ceilings, moldings or other surfaces in asbestos-contaminated environments with a dry brush or sweep with a dry broom.

7. *Not* to use an ordinary vacuum to clean up asbestos-containing debris.

8. *Not* to remove ceiling tiles below, asbestos-containing materials without wearing the proper respiratory protection, clearing the area of other people, and observing asbestos removal waste disposal procedures.

9. *Not* to remove ventilation system filters dry.

10. *Not* to shake ventilation system filters.

Appendix D to Subpart E—Transport and Disposal of Asbestos Waste

For the purposes of this appendix, transport is defined as all activities from receipt of the containerized asbestos waste at the generation site until it has been unloaded at the disposal site. Current EPA regulations state that there must be no visible emissions to the outside air during waste transport. However, recognizing the potential hazards and subsequent liabilities associated with exposure, the following additional precautions are recommended.

Recordkeeping. Before accepting wastes, a transporter should determine if the waste is properly wetted and containerized. The transporter should then require a chain-of-custody form signed by the generator. A chain-of-custody form may include the name and address of the generator, the name and address of the pickup site, the estimated quantity of asbestos waste, types of containers used, and the destination of the waste. The chain-of-custody form should then be signed over to a disposal site operator to transfer responsibility for the asbestos waste. A copy of the form signed by the disposal site operator should be maintained by the transporter as evidence of receipt at the disposal site.

Waste handling. A transporter should ensure that the asbestos waste is properly contained in leak-tight containers with appropriate labels, and that the outside surfaces of the containers are not contaminated with asbestos debris adhering to the containers. If there is reason to believe that the condition of the asbestos waste may allow significant fiber release, the transporter should not accept the waste. Improper containerization of wastes is a violation of the NESHAPs regulation and should be reported to the appropriate EPA Regional Asbestos NESHAPs contact below:

Region I

Asbestos NESHAPs Contact, Air Management Division, USEPA, Region I, JFK Federal Building, Boston, MA 02203, (617) 223-3266.

Region II

Asbestos NESHAPs Contact, Air & Waste Management Division, USEPA, Region II, 26 Federal Plaza, New York, NY 10007, (212) 264-6770.

Region III

Asbestos NESHAPs Contact, Air Management Division, USEPA, Region III, 841 Chestnut Street, Philadelphia, PA 19107, (215) 597-9325.

Region IV

Asbestos NESHAPs Contact, Air, Pesticide & Toxic Management, USEPA, Region IV, 345 Courtland Street, NE, Atlanta, GA 30365, (404) 347-4298.

Region V

Asbestos NESHAPs Contact, Air Management Division, USEPA, Region V, 230 S. Dearborn Street, Chicago, IL 60604, (312) 353-6793.

Region VI

Asbestos NESHAPs Contact, Air & Waste Management Division, USEPA, Region VI, 1445 Ross Avenue, Dallas, TX 75202, (214) 655-7229.

Region VII

Asbestos NESHAPs Contact, Air & Waste Management Division, USEPA, Region VII, 726 Minnesota Avenue, Kansas City, KS 66101, (913) 236-2896.

Region VIII

Asbestos NESHAPs Contact, Air & Waste Management Division, USEPA, Region VIII, 999 18th Street, Suite 500, Denver, CO 80202, (303) 293-1814.

Region IX

Asbestos NESHAPs Contact, Air Management Division, USEPA, Region IX, 215 Fremont Street, San Francisco, CA 94105, (415) 974-7633.

Region X

Asbestos NESHAPs Contact, Air & Toxics Management Division, USEPA, Region X, 1200 Sixth Avenue, Seattle, WA 98101, (206) 442-2724.

Once the transporter is satisfied with the condition of the asbestos waste and agrees to handle it, the containers should be loaded into the transport vehicle in a careful manner to prevent breaking of the containers. Similarly, at the disposal site, the asbestos waste containers should be transferred carefully to avoid fiber release.

Waste transport. Although there are no regulatory specifications regarding the transport vehicle, it is recommended that vehicles used for transport of containerized asbestos waste have an enclosed carrying compartment or

utilize a canvas covering sufficient to contain the transported waste, prevent damage to containers, and prevent fiber release. Transport of large quantities of asbestos waste is commonly conducted in a 20-cubic-yard "roll off" box, which should also be covered. Vehicles that use compactors to reduce waste volume should not be used because these will cause the waste containers to rupture. Vacuum trucks used to transport waste slurry must be inspected to ensure that water is not leaking from the truck.

Disposal involves the isolation of asbestos waste material in order to prevent fiber release to air or water. Landfilling is recommended as an environmentally sound isolation method because asbestos fibers are virtually immobile in soil. Other disposal techniques such as incineration or chemical treatment are not feasible due to the unique properties of asbestos. EPA has established asbestos disposal requirements for active and inactive disposal sites under NESHAPs (40 CFR Part 61, Subpart M) and specifies general requirements for solid waste disposal under RCRA (40 CFR Part 257). Advance EPA notification of the intended disposal site is required by NESHAPs.

Selecting a disposal facility. An acceptable disposal facility for asbestos wastes must adhere to EPA's requirements of no visible emissions to the air during disposal, or minimizing emissions by covering the waste within 24 hours. The minimum required cover is 6 inches of nonasbestos material, normally soil, or a dust-suppressing chemical. In addition to these federal requirements, many state or local government agencies require more stringent handling procedures. These agencies usually supply a list of "approved" or licensed asbestos disposal sites upon request. Solid waste control agencies are listed in local telephone directories under state, county, or city headings. A list of state solid waste agencies may be obtained by calling the RCRA hotline: 1-800-424-9348 (382-3000 in Washington, DC). Some landfill owners or operators place special requirements on asbestos waste, such as placing all bagged waste into 55-gallon metal drums. Therefore, asbestos removal contractors should contact the intended landfill before arriving with the waste.

Receiving asbestos waste. A landfill approved for receipt of asbestos waste should require notification by the waste hauler that the load contains asbestos. The landfill operator should inspect the loads to verify that asbestos waste is

properly contained in leak-tight containers and labeled appropriately. The appropriate EPA Regional Asbestos NESHAPs Contact should be notified if the landfill operator believes that the asbestos waste is in a condition that may cause significant fiber release during disposal. In situations when the wastes are not properly containerized, the landfill operator should thoroughly soak the asbestos with a water spray prior to unloading, rinse out the truck, and immediately cover the wastes with nonasbestos material prior to compacting the waste in the landfill.

Waste deposition and covering. Recognizing the health dangers associated with asbestos exposure, the following procedures are recommended to augment current federal requirements:

- Designate a separate area for asbestos waste disposal. Provide a record for future landowners that asbestos waste has been buried there and that it would be hazardous to attempt to excavate that area. (Future regulations may require property deeds to identify the location of any asbestos wastes and warn against excavation.)

- Prepare a separate trench to receive asbestos wastes. The size of the trench will depend upon the quantity and frequency of asbestos waste delivered to the disposal site. The trenching technique allows application of soil cover without disturbing the asbestos waste containers. The trench should be ramped to allow the transport vehicle to back into it, and the trench should be as narrow as possible to reduce the amount of cover required. If possible, the trench should be aligned perpendicular to prevailing winds.

- Place the asbestos waste containers into the trench carefully to avoid breaking them. Be particularly careful with plastic bags because when they break under pressure asbestos particles can be emitted.

- Completely cover the containerized waste within 24 hours with a minimum of 6 inches of nonasbestos material. Improperly containerized waste is a violation of the NESHAPs and EPA should be notified.

However, if improperly containerized waste is received at the disposal site, it should be covered immediately after unloading. Only after the wastes, including properly containerized wastes, are completely covered, can the wastes be compacted or other heavy equipment run over it. During compacting, avoid exposing wastes to the air or tracking asbestos material away from the trench.

- For final closure of an area containing asbestos waste, cover with at

least an additional 30 inches of compacted nonasbestos material to provide a 36-inch final cover. To control erosion of the final cover, it should be properly graded and vegetated. In areas of the United States where excessive soil erosion may occur or the frost line exceeds 3 feet, additional final cover is recommended. In desert areas where vegetation would be difficult to maintain, 3-6 inches of well graded crushed rock is recommended for placement on top of the final cover.

Controlling public access. Under the current NESHAPs regulation, EPA does not require that a landfill used for asbestos disposal use warning signs or fencing if it meets the requirement to cover asbestos wastes. However, under RCRA, EPA requires that access be controlled to prevent exposure of the public to potential health and safety hazards at the disposal site. Therefore, for liability protection of operators of landfills that handle asbestos, fencing and warning signs are recommended to control public access when natural barriers do not exist. Access to a landfill should be limited to one or two entrances with gates that can be locked when left unattended. Fencing should be installed around the perimeter of the disposal site in a manner adequate to deter access by the general public. Chain-link fencing, 6-ft high and topped with a barbed wire guard, should be used. More specific fencing requirements may be specified by local regulations. Warning signs should be displayed at all entrances and at intervals of 330 feet or less along the property line of the landfill or perimeter of the sections where asbestos waste is deposited. The sign should read as follows:

ASBESTOS WASTE DISPOSAL SITE
BREATHING ASBESTOS DUST MAY
CAUSE LUNG DISEASE AND CANCER

Recordkeeping. For protection from liability, and considering possible future requirements for notification on disposal site deeds, a landfill owner should maintain documentation of the specific location and quantity of the buried asbestos wastes. In addition, the estimated depth of the waste below the surface should be recorded whenever a landfill section is closed. As mentioned previously, such information should be recorded in the land deed or other record along with a notice warning against excavation of the area.

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ENVIRONMENTAL PROTECTION AGENCY

EPA-62055; FRL-3269-8)

Asbestos-Containing Materials in Schools; EPA Approved Courses Under the Asbestos Hazard Emergency Response Act (AHERA)**AGENCY:** Environmental Protection Agency (EPA).**ACTION:** Notice.

SUMMARY: In section 206(c)(3) of Title II, the Administrator, in consultation with affected organizations, was directed to publish (and revise as necessary) a list of asbestos courses and tests in effect before the date of enactment of this title which qualify for equivalency treatment for interim accreditation purposes and a list of asbestos courses and tests which the Administrator determines are consistent with the Model Plan and which will qualify a contractor for accreditation. This Federal Register notice includes the initial list of course approvals. In addition, the list includes State accreditation programs that EPA has approved as meeting the requirements of the Model Plan.

FOR FURTHER INFORMATION CONTACT:

Edward A. Klein, Director, TSCA Assistance Office (TS-799), Office of Toxic Substances, Environmental Protection Agency, Rm. E-543, 401 M St., SW., Washington, DC 20460, Telephone: (202) 554-1404.

SUPPLEMENTARY INFORMATION: Section 206 of Title II of the Toxic Substances Control Act (TSCA), 15 U.S.C. 2646, required EPA to develop by April 20, 1987 a Model Contractor Accreditation Plan. The Plan was issued on April 20, and was published in the Federal Register of April 30, 1987, as Appendix C to Subpart E, 40 CFR Part 763.

To conduct asbestos-related work in schools, persons must receive accreditation in order to inspect school buildings for asbestos, develop management plans, and design or conduct response actions. Such persons can be accredited by States, which are required to adopt contractor accreditation plans at least as stringent as the EPA Model Plan, or by completing an EPA-approved training course and passing an examination for such course. The EPA Model Contractor Accreditation Plan establishes those areas of knowledge of asbestos inspection, management plan development, and response action technology that persons seeking accreditation must demonstrate and States must include in their accreditation programs.

Elsewhere in this issue of the Federal Register EPA is promulgating a final "Asbestos-Containing Materials In Schools" rule (40 CFR Part 763, Subpart E) which requires all local education agencies (LEAs) to identify asbestos-containing materials (ACM) in their school buildings and take appropriate actions to control the release of asbestos fibers. The LEAs are also required to describe their activities in management plans, which must be made available to the public and submitted to State governors. Under Title II, LEAs are required to use specially-trained persons to conduct inspections for asbestos, develop the management plans, and design or conduct major actions to control asbestos.

The length of initial training courses for accreditation under the Model Plan varies by discipline. Briefly, inspectors must take a 3-day training course; management planners must take the inspection course plus an additional 2 days devoted to management planning; and abatement project designers are required to have at least 3 days of training. In addition, asbestos abatement contractors and supervisors must take a 4-day training course and asbestos abatement workers are required to take a 3-day training course. For all disciplines, persons seeking accreditation must also pass an examination and participate in annual re-training courses. A complete description of accreditation requirements can be found in the Model Accreditation Plan at 40 CFR Part 763, Subpart E, Appendix C.I.1.A. through E.

In section 206(c)(3) of Title II, the Administrator, in consultation with affected organizations, was directed to publish (and revise as necessary) a list of asbestos courses and tests in effect before the date of enactment of this title which qualify for equivalency treatment for interim accreditation purposes and a list of asbestos courses and tests which the Administrator determines are consistent with the Model Plan and which will qualify a contractor for accreditation. This Federal Register notice includes the initial list of course approvals. In addition, the list includes State accreditation programs that EPA has approved as meeting the requirements of the Model Plan.

Three types of EPA approvals are included in this Federal Register notice. Unit I discusses EPA approval of State accreditation programs. Unit II covers EPA approval of training courses. Unit III discusses EPA approval of training courses for interim accreditation. Lastly, Unit IV provides the list of State accreditation programs and training courses approved by EPA as of October

1987. Subsequent Federal Register notices will add other State programs and training courses to this initial list.

I. EPA Approval of State Accreditation Programs

As discussed in the Model Plan, EPA will approve State accreditation programs that the Agency determines are at least as stringent as the Model Plan. In addition, the Agency is able to approve individual disciplines within a State's accreditation program. For example, a State that currently only has an accreditation requirement for inspectors can receive EPA approval for that discipline immediately rather than waiting to develop accreditation requirements for all disciplines in the Model Plan before seeking EPA approval.

As listed in Unit IV, New Jersey has received EPA approval for two accreditation disciplines. Any training courses in these two disciplines approved by New Jersey are EPA-approved courses for purposes of accreditation. These training courses are EPA-approved courses for purposes of TSCA Title II in New Jersey and in all States without an EPA-approved accreditation program for that discipline. For a current list of courses approved by New Jersey, interested parties should contact the State agency listed under Unit IV. EPA plans to include the training courses approved by New Jersey in the next Federal Register notice listing EPA-approved courses.

The State of Kansas currently has a training program for asbestos abatement contractors and supervisors that does not meet all of the Model Plan's requirements for this discipline. However, the Kansas program's training course requirements do meet the requirements for EPA approval of training courses for interim accreditation (see Unit III). As a result, persons who have met the training and exam requirements of the Kansas abatement contractor and supervisor program are accredited as listed under Unit IV on an interim basis. The Kansas contractor and supervisor accreditation program still must be upgraded within the time period specified in TSCA Title II to be at least as stringent as the Model Plan.

II. EPA Approval of Training Courses

Training courses approved by EPA are listed under Unit IV. The examinations for these approved courses under Unit IV have also been approved by EPA. EPA has three categories of course approval: full, contingent, and approved for interim accreditation Courses

approved for interim accreditation will be discussed in Unit III.

Full approval means EPA has reviewed and found acceptable the course's written submission seeking EPA approval and has conducted an on-site audit and determined that the training course meets or exceeds the Model Plan's training requirements for the relevant discipline.

Contingent approval means the Agency has reviewed the course's written submission seeking EPA approval and found the materials to be acceptable (i.e. the written course materials meet the Model Plan's training course requirements). However, EPA has not yet conducted an on-site audit.

Successful completion of either a fully approved course or a contingently approved course provides full accreditation for course attendees. If EPA subsequently audits a contingently approved course and withdraws approval due to deficiencies discovered during the audit, future course offerings would no longer have EPA approval. However, withdrawal of EPA approval would not effect the accreditation of persons who took previously offered training courses including the course audited by EPA.

EPA-approved training courses listed under Unit IV are approved on a national basis. EPA has organized Unit IV by EPA Region to assist the public in locating those training courses that are offered nearby.

EPA-approved State accreditation programs have the authority to have more stringent accreditation requirements than the Model Plan. As a result, some EPA-approved training courses listed under Unit IV may not meet the requirements of a particular State's accreditation program. Sponsors of training courses and persons who have received accreditation or are seeking accreditation should contact individual States to check on accreditation requirements.

A number of training courses offered by several universities before EPA issued the Model Plan equaled or exceeded the subsequently issued Model Plan's training course requirements. These courses are listed under Unit IV as being fully approved. It should be noted that persons who successfully completed these courses are fully accredited; they are not limited only to being intermly accredited.

III. EPA Approval of Training Courses for Interim Accreditation

TSCA Title II enables EPA to permit persons to be accredited on an interim basis if they have attended previous EPA-approved asbestos training and

have passed (or pass) an asbestos exam. As a result, the Agency is approving training courses offered previously for purposes of accrediting persons on an interim basis. Only those persons who have taken training courses since January 1, 1985 will be considered under these interim accreditation provisions. In addition, EPA will not grant interim accreditation to any person who takes an equivalent training course after the date the asbestos-in-schools rule takes effect. This accreditation is interim since the person shall be considered accredited for only 1 year after the date on which the State where the person is employed establishes an accreditation program at least as stringent as the EPA Model Plan. If the State does not adopt an accreditation program within the time period required by Title II, persons with interim accreditation must become fully accredited within 1 year after the date the State was required to have established a program.

For purposes of the Model Plan, an equivalent training course is one that is essentially similar in length and content to the curriculum found in the Model Plan. In addition, an equivalent examination must be essentially similar to the examination requirements found in the Model Plan.

Persons who have taken equivalent courses in their discipline for purposes of interim accreditation, and can produce evidence that they have successfully completed the course by passing an examination, are accredited on an interim basis under TSCA Title II. Evidence of successful completion of a course would include a certificate or photo identification card that showed the person completed the training course on a certain date and passed the examination.

For persons who took one of the EPA-approved courses for interim accreditation listed under Unit IV, but did not take the course's examination, these persons may become intermly accredited by passing an examination at an EPA-funded training center. These EPA funded training centers are listed under Unit IV. Before taking the exam, persons must provide evidence to the EPA-funded center that they previously had taken one of the training courses listed under Unit IV that is approved by EPA for interim accreditation.

Courses approved by EPA as of October 17 for interim accreditation are listed under Unit IV. Examinations offered by these courses also are approved for purposes of interim accreditation. EPA expects to approve additional courses for interim accreditation purposes, and will list these courses in subsequent Federal

Register notices. Training course vendors that believe their courses offered since January 1, 1985 are suitable sources for interim accreditation should contact their EPA Regional asbestos coordinator (See addresses in Unit IV).

IV. List of EPA-Approved State Accreditation Programs and Training Courses

Below is the first listing of EPA-approved State accreditation programs and training courses. As discussed above, periodic notifications of EPA approval of State accreditations programs and EPA approval of training courses will be published in subsequent Federal Register notices. The closing date for the acceptance of submissions to EPA for inclusion in this first notice was early October. Omission from this list does not imply disapproval by EPA, nor does the order of the courses reflect priority or quality. The format of the notification lists first the State accreditation programs approved by EPA, followed by EPA-approved training courses listed by Region. The name, address, phone number, and contact person is provided for each training provider followed by the courses and type of course approval (i.e. full, contingent, or for interim purposes). Unless otherwise specified by an alternative date, interim approvals are issued from January 1, 1985.

All five of the EPA-funded asbestos information centers and the three EPA-funded satellite training centers will use the EPA model inspector and management planner course recently developed with EPA funds. As a result, EPA anticipates that all of the EPA-funded training facilities will receive approvals for inspection and management planning courses offered beginning in October. Currently, the EPA-funded centers at the Georgia Institute of Technology and the University of Illinois at Chicago have inspection and management planning courses that EPA has fully approved. The five centers are: The Georgia Institute of Technology in Atlanta, Georgia; the University of Kansas in Overland Park, Kansas; Tufts University in Medford, Massachusetts; the University of Illinois at Chicago, and the University of California, Berkeley. The three satellite centers are: The University of Texas at Arlington; the Robert Wood Johnson Medical School in Piscataway, New Jersey, and Temple University in Philadelphia, Pennsylvania. The University of Texas at Arlington has received contingent

approval of its inspector and management planner course.

Recently developed EPA-funded model course for inspectors and management planners, and an earlier course developed with EPA funding for asbestos abatement contractors and supervisors are available for interested parties that plan to offer training courses. Interested parties should contact the following firm to receive copies of the training courses: Sterling Federal Systems, Incorporated, Suite 600, 6011 Executive Blvd., Rockville, MD 20852.

A fee for each course will be charged to cover the reproduction costs for the written and visual aid materials.

The following is the initial list of EPA-approved State accreditation programs and training courses:

Approved State Accreditation Programs

(1)(a) *State: Kansas*—State Agency: Kansas Department of Health and Environment, Forbes Field, Topeka, KS 66620. Attn: John C. Irwin (913) 298-1500.

(b) *Approved Accreditation Program Discipline*—Contractor/Supervisor (training and exam requirements) (approved for interim accreditation).

Abatement worker¹ approved for interim accreditation).

Effective date of regulation: 1/6/1986.

(1) *State: New Jersey*—State Agency: New Jersey Department of Health, CN 360, Trenton, New Jersey 08625-0360. Attn: James Brownlee (609) 984-2193.

(b) *Approved Accreditation Program Discipline*—Contractor/Supervisor. Abatement worker. Effective date of regulation: June 18, 1985.

EPA-Approved Training Courses

Region I—Boston, MA

Regional asbestos coordinator. Alison Roberts, EPA, Region I, Air and Management Division (APT-231), JFK Federal Building, Boston, MA 02203. (617) 585-3273 (FTS) 835-3275.

List of approved courses. The following training courses have been approved by EPA. The courses are listed under (b). This approval is subject to the level of certification indicated after the course name. Courses are listed in alphabetical order and do not reflect a prioritization. Approvals for Region I training courses and contact points for each, are as follows:

(1)(a) *Training provider.* Abatement Technology Corp., One Boston Place, Suite 1025, Boston, MA 02108. Attn: Scott Keyes (617) 723-3100.

¹Applies only to workers who have taken the Kansas Contractor/Supervisor course and passed the State's worker exam.

(b) *Approved courses.* Contractor/Supervisor (contingent).

(2)(a) *Training provider.* Con-Test, P.O. Box 591, East Longmeadow, MA 01028. Attn: Brenda Bolduc (413) 525-1198.

(b) *Approved courses.* Contractor/Supervisor (contingent). Abatement Worker (contingent). Inspector/Management Planner (contingent). Refresher course (for each of the above disciplines) (contingent).

(3)(a) *Training provider.* Hygientica, Inc., 150 Causeway St., Boston, MA 02114. Attn: John W. Cowdery (617) 723-4664.

(b) *Approved courses.* Inspector (contingent).

(4)(a) *Training provider.* Institute for Environmental Education, 208 West Cummings Park, Woburn, MA 01801. Attn: Janet Oppenheim-McMullen (617) 935-7370.

(b) *Approved courses.* Contractor/Supervisor (full from 9/18/87). Inspector/Management planner (contingent).

(5)(a) *Training provider.* Maine Labor Group on Health Inc., P.O. Box 5, Augusta, Maine 04330. Attn: Dianna White (207) 289-2770.

(b) *Approved courses.* Contractor/Supervisor (contingent). Abatement Worker (contingent).

(6)(a) *Training provider.* New England Laborers' Training Trust Fund, 37 East Street, Hopkinton, MA 01748. Attn: Jim Merloni, Jr. (617) 435-6318.

(b) *Approved courses.* Abatement Workers (contingent).

(7)(a) *Training provider.* Tufts University, 474 Boston Ave., Medford, MA 02155. Attn: Brenda Cole (617) 381-3531.

(b) *Approved courses.* Contractor/Supervisor Course (Interim from 9/85-5/31/87). Contractor/Supervisor Course (Full from 6/22/87).

Region II—Edison, NJ

Regional asbestos coordinator. Arnold Freiburger, EPA, Region II, Woodbridge Ave., Raritan Depot, Bldg. 10, Edison, NJ 08837. (201) 321-6668. (FTS) 340-6671.

List of approved courses. The following training courses have been approved by EPA. The courses are listed under (b). This approval is subject to the level of certification indicated after the course name. Courses are listed in alphabetical order and do not reflect a prioritization. Approvals for Region II training courses and contact points for each, are as follows:

(1)(a) *Training provider.* UMDNJ Robert Wood Johnson Medical School, 675 Hoes Lane, Piscataway, NJ 08854-5635. Attn: Lee Laustsen (201) 463-4500.

(b) *Approved courses.* Abatement Worker (full from beginning). Contractor/Supervisor (full from beginning).

Region III—Philadelphia, PA

Regional asbestos coordinator. Pauline Levin, EPA, Region III (3HW-40), 841 Chestnut Bldg., Philadelphia, PA 19107. (215) 597-9859. (FTS) 597-9859.

List of approved courses. The following training courses have been approved by EPA. The courses are listed under (b). This approval is subject to the level of certification indicated after the course name. Courses are listed in alphabetical order and do not reflect a prioritization. Approvals for Region III training courses and contact points for each, are as follows:

(1)(a) *Training provider.* Alice Hamilton Center for Occupational Health, 410 7th Street SE., Second Floor, Washington, DC 20003. Attn: Brian Christopher (202) 543-0005.

(b) *Approved courses.* Abatement Workers (contingent).

(2)(a) *Training provider.* The Association of Wall and Ceiling Industries, 24 K Street, NE., Suite 300, Washington, DC 20002. Attn: Chris Hullinger (202) 783-2924.

(b) *Approved courses.* Abatement Worker (full 5/19/87). Contractor/Supervisor (full 5/19/87).

(3)(a) *Training provider.* Biospherics, Inc., 12051 Indian Creek Court, Beltsville, MD 20705. Attn: Marian F. Meiselman (301) 369-3900.

(b) *Approved courses.* Contractor/Supervisor (full from 10/1/87). Abatement worker (full from 10/1/87).

(4)(a) *Training provider.* Drexel University, Environmental Studies Institute, Building 29, 32nd and Chestnut Streets, #216, Philadelphia, PA 19104. Attn: Robert Ross (215) 895-2269.

(b) *Approved courses.* Contractor/Supervisor (full from beginning). Abatement Worker (full from beginning).

(5)(a) *Training provider.* South East Michigan Committee on Occupational Safety and Health (SEMCOHS), 1550 Howard Street, Detroit, MI 48216. Attn: Barbara Boylan (313) 961-3345.

(b) *Approved courses.* Abatement Worker (contingent).

(6)(a) *Training provider.* The National Training Fund for the Sheet Metal and Air Conditioning Industry (in conjunction with the Workers' Institute for Safety and Health), 1128 Sixteenth Street NW., Washington, DC 20036. Attn: Scott Schneider (202) 887-1980.

(b) *Approved courses.* Abatement Worker (contingent).

(7)(a) *Training provider.* Temple University, College of Engineering, 12th and Norris Streets, Philadelphia, PA 19122. Attn: Lester Levin (215) 787-8479.

(b) *Approved courses.* Contractor/Supervisor (full from beginning). Workers (full from beginning).

(8)(a) *Training provider.* Medical College of Virginia, Virginia Commonwealth University, Department of Preventive Medicine, P.O. Box 212, Richmond, VA 23298. Attn: Leonard Vance (804) 786-9785.

(b) *Approved courses.* Contractor/Supervisor (contingent).

(9)(a) *Training provider.* WACO, Inc., P.O. Box 838, 5450 Lewis Road, Sandston, VA 23150. Attn: William Belanich (804) 222-8440.

(b) *Approved courses.* Contractor/Supervisor (contingent). Abatement Workers (contingent).

Region IV—Atlanta, GA

Regional asbestos coordinator. Jim Littell, EPA Region IV, 345 Courtland St. NE., Atlanta, GA 30365. (404) 347-3864. (FTS) 257-3864.

List of approved courses. The following training courses have been approved by EPA. The courses are listed under (b). This approval is subject to the level of certification indicated after the course name. Courses are listed in alphabetical order and do not reflect a prioritization. Approvals for Region IV training courses and contact points for each, are as follows:

(1)(a) *Training provider.* University of Florida, TREEO Center, 3900 SW 83rd Blvd., Gainesville, FL 32608. Attn: Sandra Scaggs (904) 392-9570.

(b) *Approved courses.* Contractor/Supervisor (full from 5/87).

(2)(a) *Training provider.* Georgia Tech Research Institute, Environmental Health and Safety Division, Room 029, O'Keefe Building, Atlanta, GA 30332. Attn: William Ewing (404) 894-3806.

(b) *Approved courses.* Contractor/Supervisor (full from 5/11/87). Contractor/Supervisor (interim from 8/85-5/10/87). Refresher Course for Contractor/Supervisor (contingent). Inspector/Management Planner (full from 10/87).

(3)(a) *Training provider.* National Asbestos Council, Training Department, 2786 North Decatur Road, Decatur, GA 30033. Attn: Eva Clay (404) 292-0629.

(b) *Approved courses.* Abatement Workers (2 day) (interim from beginning). Abatement Workers (3 day) (full from 7/87).

Region V—Chicago, IL

Regional asbestos coordinator. Anthony Restaino, EPA Region V, 538 S.

Clark St., Chicago, IL 60604. (312) 886-6879. (FTS) 886-6879.

List of approved courses. The following training courses have been approved by EPA. The courses are listed under (b). This approval is subject to the level of certification indicated after the course name. Courses are listed in alphabetical order and do not reflect a prioritization. Approvals for Region V training courses and contact points for each, are as follows:

(1)(a) *Training provider.* AHP Research, Inc., 1501 Johnsons Ferry Rd., Suite 230, P.O. Box 71928, Marietta, GA 30007. Attn: Dwight Brown (404) 565-0061.

(b) *Approved courses.* Inspector/Management Planner (interim from beginning).

(2)(a) *Training provider.* BDN Industrial Hygiene Consultants, 8105 Valleywood Lane, Portage, MI 49002. Attn: Keith Nichols (616) 329-1237.

(b) *Approved courses.* Contractor/Supervisor (contingent).

(3)(a) *Training provider.* DeLisle Consulting and Laboratories, Inc., 2401 East Milham Ave., Kalamazoo, MI 49002. Attn: Mark DeLisle (616) 343-9698.

(b) *Approved courses.* Contractor/Supervisor (contingent).

(4)(a) *Training provider.* Heat & Frost Insulators Local 17, Apprentice Training Center, 3850 South Racine Ave., Chicago, IL 60609. Attn: John P. Shine (312) 247-1007

(b) *Approved courses.* Abatement Workers (contingent).

(5)(a) *Training provider.* I.P.C., Chicago, 4309 West Henderson, Chicago, IL 60641. Attn: Robert G. Cooley (312) 973-3495.

(b) *Approved courses.* Abatement Workers (contingent).

(6)(a) *Training provider.* University of Illinois at Chicago, Midwest Asbestos Information Center, 2035 Taylor, School of Public Health, Chicago, IL 60612. Attn: Tony Billotti (312) 996-5782.

(b) *Approved courses.* Contractor/Supervisor (full from beginning). Inspector/Management Planner (full). Abatement Worker (2 day) (interim from beginning to 10/1/87). Abatement Worker (3 day) (contingent).

Region VI—Dallas, TX

Regional asbestos coordinator. John West, 8t-Pt. EPA, Region VI, 1445 Ross Avenue, Dallas, TX 75202-2733. (214) 655-7244. (FTS) 255-7235.

List of approved courses. The following training courses have been approved by EPA. The courses are listed under (b). This approval is subject to the level of certification indicated after the course name. Courses are listed in alphabetical order and do not reflect a

prioritization. Approvals for Region VI training courses and contact points for each, are as follows:

(1)(a) *Training provider.* GEBCO Associates, Inc., 805-A, Elizabeth Drive, Bedford, TX 76022. Attn: Ed Kirch (817) 268-4006.

(b) *Approved courses.* Asbestos Workers (full from 8/20/87). Asbestos Workers (interim prior to 8/19/87).

(2)(a) *Training provider.* The International Association of Heat and Frost Insulators and Asbestos Workers Union, Local 22, 3219 Pasadena Blvd., Pasadena, TX 77503. Attn: Owen Tilley (713) 473-0888.

(b) *Approved courses.* Asbestos Worker (3 day course) (contingent). Asbestos Worker (2 day course) (interim prior to 10/87). Worker refresher course (contingent).

(3)(a) *Training provider.* Louisiana State University and Agricultural and Mechanical College, Baton Rouge, LA 70803-1520. Attn: George Smith (504) 388-6621.

(b) *Approved courses.* Contractor/Supervisor (contingent).

(4)(a) *Training provider.* The Texas A&M University System, The Texas Engineering Extension Service, Building Codes Inspection Training Division, College Station, TX 77843-8000. Attn: Charles Flanders (409) 845-6682.

(b) *Approved courses.* Contractor/Supervisor (full from 9/14/87). Contractor/Supervisor (interim prior to 9/14/87). Abatement Worker (contingent). Inspector/Management Planner (contingent).

(5)(a) *Training provider.* The University of Texas at Arlington Satellite Center, Bureau of Engineering Research, P.O. Box 19020, Arlington, TX 76019. Attn: Ernest Crosby (817) 273-2557.

(b) *Approved courses.* Contractor/Supervisor (full from beginning). Inspector/Management Planner (contingent).

(6)(a) *Training provider.* Tulane University, School of Public Health and Tropical Medicine, Department of Environmental Health Sciences, 1430 Tulane Avenue, New Orleans, LA 70112. Attn: Shau-Wong Chang (504) 588-5374.

(b) *Approved courses.* Contractor/Supervisor (full from 9/15/87). Contractor/Supervisor (interim prior 9/14/87).

Region VII—Kansas City, KS

Regional asbestos coordinator. Wolfgang Brandner, EPA Region VII, 728 Minnesota Ave., Kansas City, KS 66101. (913) 236-2834. (FTS) 757-2834.

List of approved courses. The following training courses have been

approved by EPA. The courses are listed under (b). This approval is subject to the level of certification indicated after the course name. Courses are listed in alphabetical order and do not reflect a prioritization. Approvals for Region VII training courses and contact points for each, are as follows:

(1)(a) *Training provider.* Hall-Kimbrell Environmental Services, 4840 West 15th St., Lawrence, KS 66046. Attn: Alice Hart (913) 749-2381.

(b) *Approved courses.* Contractor/Supervisor (full from 8/17/87). Abatement Worker (full from 8/17/87). Project Designer (full from 8/17/87). Inspector/Management Planner (full from 8/17/87).

(2)(a) *Training provider.* Mahew Environmental Training Assoc., Inc. (META), P.O. Box 1961, Lawrence, KS 66044. Attn: Brad Mayhew (913) 842-8382.

(b) *Approved courses.* Contractor/Supervisor (contingent). Abatement Worker (contingent).

(3)(a) *Training provider.* The University of Kansas National Asbestos Training Center, 6600 College Blvd., Suite 315, Overland Park, KS 66211. Attn: Lani Himegarner (913) 491-0181.

(b) *Approved courses.* Contractor/Supervisor (contingent). Contractor/Supervisor (interim from 8/85-9/9/87). Abatement Worker (contingent).

Region VIII—Denver, CO

Regional asbestos coordinator. David Combs, [8AT-TS], EPA, Region VIII, 1

Denver Place, 999-18th St., Suite 1300, Denver, CO 80202-2413. (303) 564-1730. (FTS) 564-1742.

List of approved courses. The following training courses have been approved by EPA. The courses are listed under (b). This approval is subject to the level of certification indicated after the course name. Courses are listed in alphabetical order and do not reflect a prioritization. Approvals for Region VIII training courses and contact points for each, are as follows:

(1)(a) *Training provider.* Northern Engineering and Testing, Inc. 600 South 25th Street, P.O. Box 30615, Billings, MT 59107. Attn: Kathleen Smit (406) 248-9181.

(b) *Approved courses.* Asbestos worker (contingent).

(2)(a) *Training provider.* Rocky Mountain Center for Occupational and Environmental Health, Building 512, University of Utah, Salt Lake City, UT 84112. Attn: Jeffery Lee (801) 581-5710.

(b) *Approved courses.* Contractor/Supervisor (contingent).

Region IX—San Francisco, CA

Regional asbestos coordinator. Joanne Semones, [T-52], EPA, Region IX, 215 Fremont St., San Francisco, CA 94105. (415) 974-7290. (FTS) 454-7290.

List of approved courses. The following training courses have been approved by EPA. The courses are listed under (b). This approval is subject to the level of certification indicated after the course name. Courses are listed in

alphabetical order and do not reflect a prioritization. Approvals for Region IX training courses and contact points for each, are as follows:

(1)(a) *Training provider.* Environmental Sciences, 375 S. Meyer, Tucson, AZ 85701. Attn: Dale Keyes (602) 577-1764.

(b) *Approved courses.* Inspector/Management Planner (full).

(2)(a) *Training provider.* University of California at Berkeley Pacific Asbestos Information Center, U.C. Extension, 2223 Fulton St., Berkeley, CA 94720. Attn: Debra Dobin (415) 843-7143.

(b) *Approved courses.* Contractor/Supervisor (full from beginning).

Region X—Seattle, WA

Regional asbestos coordinator. Walter Jasper, EPA, Region X, 1200 Sixth Ave., Seattle, WA 98101. (206) 442-2870. (FTS) 399-2870.

List of approved courses. The following training courses have been approved by EPA. The courses are listed under (b). This approval is subject to the level of certification indicated after the course name. Courses are listed in alphabetical order and do not reflect a prioritization. Approvals for Region X training courses and contact points for each, are as follows:

No approvals for Region X.

Dated: October 17, 1987.

Lee M. Thomas,
Administrator.

[FR Doc. 87-24939 Filed 10-29-87; 8:45 am]

BILLING CODE 6560-60-M

**APPENDIX F
INSPECTOR TIPS**

TIPS FOR CONDUCTING OPENING CONFERENCE

The inspector should do the following during the opening conference:

- **Try to establish a good rapport with LEA officials, especially the Designated Person.**
- **Be prepared to answer questions concerning AHERA, the AHERA Schools Rule, and inspection procedures and to provide copies of the rule and other EPA guidance materials relating to AHERA upon request.**
- **Acknowledge, up front, that the inspection may cause some disruption to the daily routine at the LEA and its school buildings and that every attempt will be made to keep any disruptions to a minimum.**
- **Listen carefully to questions and concerns from LEA representatives about the inspection and try to address them.**
- **Bear in mind that schools originally selected for inspection may change based upon information discovered at the LEA and or school within the LEA.**
- **Be aware that s/he may need to complete all four sections of the Checklist, which are:**
 - **inspecting the management plan at the LEA administrative office**
 - **inspecting school management plans and school buildings (i.e., conducting the walk-through inspection of selected schools within the LEA**
 - **determining compliance with AHERA response action provisions**
 - **determining compliance with AHERA exclusion provisions.**

TIPS FOR INSPECTOR UPON ARRIVAL AT SCHOOL

Upon arrival at a school selected for inspection, the inspector should do the following:

- Enter the facility through main entrance unless the LEA designates a different entrance.
- Present credentials to school representative(s) (although presentation is only required to be made at the LEA site; see Chapter VI, A, 3).
- Request that the school representative(s) be the liaison between the school inspector and the employees (e.g., teachers, custodians) as necessary during the inspection.
- Establish a rapport with the secretary at the school, as this person will likely be of the most assistance to the inspector concerning the location of the management plan and associated records.
- Request a quiet room or area in the school to use to review the management plan.
- Ensure that all required management plan records (i.e., records required under §763.94: "living documents") are available for review as they are sometimes stored separately from the management plan.
- Request that a member of the school's maintenance (or custodial) staff accompany the inspector on the inspection.
- Request a copy of the floor plan of the school for use during the walk-through.
- Ensure that all necessary equipment for conducting the inspection is on hand (e.g., a ladder for looking above drop ceilings, etc.) (see Chapter V, for suggested equipment list).

TIPS ON CONDUCTING THE WALK-THROUGH

The following is a list of tips on conducting an efficient walk through:

- **Take along the Checklist (at least the school section, pages 7-12 of the Checklist); the walk-through form (page 19 of Appendix E); a copy of the school floor plan (to ensure that all rooms and areas in the school are inspected); and a field logbook to take notes as necessary.**
 - **Request the accompaniment of a member of the maintenance staff.**
 - **Bring all necessary equipment (e.g., ladder, camera).**
 - **Identify and record on the walk-through form all homogeneous areas (whether suspect or not), including square or linear feet of such areas.**
 - **Take any necessary photographs that may be helpful to EPA (and State) CDOs in subsequent case development and enforcement efforts.**
-

TIPS FOR COMPLETING THE RESPONSE ACTION SECTION OF THE CHECKLIST

- As this section of the Checklist need be completed only if a response action occurred at the school to be inspected, the inspector should determine first whether such a response action occurred. Therefore, s/he should review the management plan for that school which, in accordance with §763.94(b)(1), must contain descriptions of any response actions taken. Once it is determined that a response action occurred, the inspector should follow the steps below, to complete the response action section of the checklist.
- Provide accreditation information pertaining to workers (see page 12, Part VII, A, of the Checklist) by obtaining a list of the workers from the project designer, LEA, or the abatement contractor during follow-up (see Chapter IX, B).
- Obtain the name and accreditation number of the project designer from records required to be kept under §763.94(b)(1).
- Ascertain whether a proper number of air clearance samples was collected (see page 15 of the Checklist) by obtaining copies of drawings or diagrams of functional spaces from the air sampling agency during follow-up.
- Obtain disposal records from the LEA project designer or abatement contractor.
- Obtain answers to questions on the Checklist pertaining to laboratory contractor responsibilities (page 15 of the Checklist) by reviewing management plan records required under §763.94.

TIPS ON CONDUCTING CLOSING CONFERENCE

- Provide LEA with a copy of the Receipt for Samples and Documents.
 - Provide LEA with a copy of the Summary of Observations.
 - Discuss the Summary of Observations.
 - Obtain copies of management plans components or other records needed by the inspector as attachments to the inspection report (see Chapter IX).
 - Supply the Designated Person with a dated list of outstanding documents or records that are not immediately available to the inspector—the inspector and Designated Person should agree on a specific date for submission of outstanding documents and such a date should be identified in the list.
 - Answer questions from the Designated Person and other attendees concerning the inspection and/or AHERA.
 - Discuss actions that the LEA may take to correct potential violations of AHERA and how to document such actions.
 - Provide public outreach information to such attendees if requested.
-

APPENDIX G

**ABBREVIATED NESHAP COMPLIANCE
REFERRAL FORM**

**ABBREVIATED NESHAPs COMPLIANCE REFERRAL FORM
(for AHERA INSPECTOR)**

INSPECTION DATE: _____

SCHOOL NAME: _____

ADDRESS: _____

CITY/STATE/ZIP: _____

GRADES (i.e., K, K - 12, etc.) _____

Telephone No.: _____

SCHOOL OWNERS NAME: _____

ADDRESS: _____

CITY/STATE/ZIP: _____

Telephone No.: _____

ASBESTOS REMOVAL CONTRACTOR INFORMATION:

NAME: _____

ADDRESS: _____

CITY/STATE/ZIP: _____

Telephone No.: _____

Did you observe an asbestos removal in progress? _____ Yes _____ No
[If yes, indicate method of removal, i.e., glovebag, handstripping, machine stripping, etc.]

PIPES: _____

BOILER/FURNACE: _____

DUCTS: _____

CEILING: _____



FLOOR(S): _____

WALLS: _____

LABORATORY HOODING: _____

ROOF: _____

If removal was outside, was temperature below 32 degrees F? _____ Yes _____ No

ESTIMATE THE AMOUNT OF ASBESTOS REMOVED:

Linear feet on pipes: _____

Square feet on other components: _____

Describe method used to calculate the estimated amounts: _____

Where any facility components (i.e., pipes, ducts, boilers, tanks or furnaces) covered with asbestos being taken out in units or sections? _____ Yes _____ No

Was a containment barrier used? _____ Yes _____ No

Was the containment area under negative pressure? _____ Yes _____ No

Was the asbestos wetted down before removal? _____ Yes _____ No _____ Not determined

Were hoses, portable water pumps, sprayers, or other sources of water available? _____ Yes _____ No

If yes, please describe: _____



Was any of the material being removed dropped or thrown to the floor? Yes No N/A

Were there any chutes for conducting waste from the upper floors to the ground? Yes No N/A

Was the waste being placed in bags or drums? Yes No N/A

Was the wastes being wetted down before and/or after it was bagged? Yes No N/A

Where were the waste bags stored before disposal?

Was there any dust inside or outside of the containment area? Yes No N/A

If yes, please describe:

AHERA INSPECTOR'S NAME

DATE



APPENDIX H
ABBREVIATED AHERA COMPLIANCE
REFERRAL FORM

**ABBREVIATED AHERA COMPLIANCE REFERRAL FORM
(for NESHAPs INSPECTOR)**

LEA: _____

() Public or () Private Grades (i.e., K - 12) _____

ADDRESS: _____

CITY/STATE/ZIP: _____

Telephone: _____

Designated Person: _____

Telephone: _____

SCHOOL: _____

ADDRESS: _____

CITY/STATE/ZIP: _____

Telephone: _____

ABATEMENT PROJECT DESCRIPTION (including size of project):

WAS PROJECT SUPERVISOR ACCREDITED? _____ Yes _____ No

PROJECT SUPERVISOR'S STATE/ACCREDITATION NUMBER: _____

ON THE BACK OF THIS SHEET, LIST EACH WORKER, STATE/ACCREDITATION NUMBER, AND DATE OF ACCREDITATION.

WAS AIR CLEARANCE IN PROGRESS? _____ Yes _____ No

NAME OF PERSON CONDUCTING CLEARANCE: _____

AFFILIATION: _____



LABORATORY CONTRACTED TO ANALYZE SAMPLES:

NAME: _____

ADDRESS: _____

CITY/STATE/ZIP: _____

Telephone: _____

DATE OF ANALYSIS: _____

DATE RESULTS PROVIDED TO LEA: _____

TYPE OF ANALYSIS: TEM PCM

WAS THE MANAGEMENT PLAN AVAILABLE FOR INSPECTION? _____ Yes _____ No

LOCATION OF PLAN: _____

@ LEA SITE: _____

@ SCHOOL SITE: _____

WAS THE ABATEMENT PROJECT INCLUDED IN THE PLAN? Describe:

NESHAP INSPECTOR'S NAME

DATE



APPENDIX I
GLOSSARY OF TERMS

GLOSSARY

ACCESSIBLE

When referring to ACM, the material is subject to disturbance by school building occupants or custodial or maintenance personnel in the course of their normal activities.

ACCREDITATION NUMBER

A unique number assigned to an individual who has successfully completed an EPA/State approved accreditation course.

ACCREDITED or ACCREDITATION

When referring to a person or laboratory, that such person or laboratory is accredited in accordance with Section 206 of Title II TSCA.

ACCREDITED PERSON

A person who has taken an EPA-approved training course and has successfully passed an examination. Schools must use accredited persons to conduct initial ACM identification inspections, develop ACM management plans, design and carry out response actions (including abatements), and conduct reinspections.

ACCREDITED WORKER

Workers who have attended an EPA/State approved asbestos worker training course.

ACM CONDITION

1. **DAMAGED:** ACM showing physical injury or deterioration such that the internal structure of the material is inadequate, or which has delaminated such that its bond to the substrate is inadequate, or which lacks fiber cohesion or adhesion properties for any other reason, or where TSI lacks part or all of its covering. Such damage may be illustrated by the separation of ACM into layers; flaking, blistering, or crumbling; water damage or stains; scrapes, mars, or gouges; exposed TSI beneath its covering.
2. **SIGNIFICANTLY DAMAGED:** ACM showing damage that is extensive and severe.

ACTION LEVEL

An airborne concentration of asbestos of 0.1 fiber cubic centimeter (f/cc) of air calculated as an 8-hour time-weighted average.

ADMINISTRATION

U.S. Environmental Protection Agency.

AIR CLEARANCE

Sampling of air following response actions to determine whether air meets regulatory clearance requirements. Laboratory analysis is conducted using TEM and PCM.

ASBESTOS

The asbestiform varieties of: Chrysotile (serpentine); Crocidolite (riebeckite); Amosite (cummingtonitegrunerite); Anthophyllite; Tremolite; and Actinolite.

ASBESTOS DEBRIS

Pieces of ACM that can be identified by color, texture, or composition, or dust, if the dust is determined by a accredited inspector to be ACM.

ASBESTOS-CONTAINING BUILDING MATERIAL (ACBM)

Surfacing ACM, thermal system insulation ACM, or miscellaneous ACM that is found in or on interior structural members or other parts of a school building.

ASBESTOS-CONTAINING MATERIAL (ACM)

When referring to school buildings, any material or product that contains more than 1 percent asbestos as determined using methods in Appendix A, Subpart F of 40 CFR Part 763 PLM.

CONTRACTOR SUPERVISOR

The contractor supervisor (may be referred to as the foreman or leadman) must have attended an EPA/State approved contractor/supervisor training course.

DAMAGED OR SIGNIFICANTLY DAMAGED THERMAL SYSTEM INSULATION

Thermal system insulation ACM on pipes, boilers, tanks, ducts, and other thermal system insulation equipment where the insulation has lost its structural integrity, or its covering, in whole or in part, is crushed, water-stained, gouged, punctured, missing, or not intact such that it is not able to contain fibers. Damage may be further illustrated by occasional punctures, gouges, or other signs of physical injury to ACM; occasional water damage on the protective coverings/jackets; or exposed ACM ends or joints. Asbestos debris originating from the ACBM in question may also indicate damage.

DAMAGED FRIABLE MISCELLANEOUS ACM

Friable miscellaneous ACM that has deteriorated or sustained physical injury such that the internal structure (cohesion) of the material is inadequate or, if applicable, that has delaminated such that its

bond to the substrate (adhesion) is inadequate or that for any other reason lacks fiber cohesion or adhesion qualities. Such damage or deterioration may be illustrated by the separation of ACM into layers; separation of ACM from the substrate; flaking, blistering, or crumbling of the ACM surface; water damage; significant or repeated water stains, scrapes, gouges, mars, or other signs of physical injury on the ACM. Asbestos debris originating from the ACBM in question may also indicate damage.

DAMAGED FRIABLE SURFACING ACM

Friable surfacing ACM that has deteriorated or sustained physical injury such that the internal structure (cohesion) of the material is inadequate or that has delaminated such that its bond to the substrate (adhesion) is inadequate, or that, for any other reason, lacks fiber cohesion or adhesion qualities. Such damage or deterioration may be illustrated by the separation of ACM into layers; separation of ACM from the substrate; flaking, blistering, or crumbling of the ACM surface; water damage; significant or repeated water stains, scrapes, gouges, mars, or other signs of physical injury on the ACM. Asbestos debris originating from the ACBM in question may also indicate damage.

DEMOLITION

The wrecking or taking out of any load-supporting structural member and any related razing, removing, or stripping of asbestos products.

DESIGNATED PERSON

Each LEA is required to designate one individual to be responsible for ensuring that the general requirements of the LEA under §763.84 are properly implemented.

ENCAPSULATION

The treatment of ACBM with a material that surrounds or embeds asbestos fibers in an adhesive matrix to prevent the release of fibers, as the encapsulant creates a membrane over the surface (bridging encapsulant) or penetrates the material and binds its components together (penetrating encapsulant).

ENCLOSURE

An airtight, impermeable, permanent barrier around ACM to prevent the release of asbestos fibers into the air.

EPA

The United States Environmental Protection Agency.

FIBER RELEASE EPISODE

Any uncontrolled or unintentional disturbance of ACBM resulting in visible emission.

FRIABLE

When referring to material in a school building, material that when dry may be crumbled, pulverized, or reduced to powder by hand pressure, and includes previously nonfriable material after such material becomes damaged to the extent that when dry it may become crumbled, pulverized, or reduced to powder by hand pressure.

FRIABLE ASBESTOS MATERIAL (as determined using method in Appendix A, Subpart F of 40 CFR Part 763, Section 1, PLM)

Any material containing more than 1 percent asbestos by weight that, when dry, may be crumbled, pulverized, or reduced to powder by hand pressure.

FUNCTIONAL SPACE

A room, group of rooms, or homogeneous area (including crawl spaces or the space between a dropped ceiling and the floor or roof deck above), such as classroom(s), a cafeteria, gymnasium, hallway(s), designated by a person accredited to prepare management plans, design abatement projects, or conduct response action.

HIGH-EFFICIENCY PARTICULATE AIR (HEPA)

Refers to a filtering system capable of trapping and retraining at least 99.97 percent of all monodispersed particles 0.3 um in diameter or larger.

HOMOGENEOUS AREA

An area of surfacing material, thermal system insulation material, or miscellaneous material that is uniform in color and texture.

LOCAL EDUCATION AGENCY (LEA)

- (1) Any local educational agency as defined in section 198 of the Elementary and Secondary Education Act of 1965 (20 U.S.C. 3381).
- (2) The owner of any nonpublic, nonprofit elementary, or secondary school building.
- (3) The governing authority of any school operated under the defense dependents' education system provided for under the Defense Dependents' Education Act of 1978 (20 U.S.C. 921, et. seq.).

MISCELLANEOUS ACM

Miscellaneous material that is ACM in a school building.

MISCELLANEOUS MATERIAL

Interior building material on structural components, structural members or fixtures, such as floor and ceiling tiles, that does not include surfacing material or thermal system insulation.

NONFRIABLE

Material in a school building that when dry may not be crumbled, pulverized, or reduced to powder by hand pressure.

OPERATIONS AND MAINTENANCE PROGRAM (O&M)

A program of work practices to maintain friable ACBM in good condition, ensure clean up of asbestos fibers previously released, and prevent further release by minimizing and controlling friable ACBM disturbance or damage.

PHASE CONTRAST MICROSCOPY (PCM)

A method of analyzing air samples that may be used following response actions, other than small-scale, short-duration activities, and less than 160 square feet or 260 linear feet.

POTENTIAL DAMAGE

Circumstances in which:

- (1) Friable ACBM is in an area regularly used by building occupants, including maintenance personnel, in the course of their normal activities.
- (2) There are indications that there is a reasonable likelihood that the material or its covering will become damaged, deteriorated, or delaminated due to factors such as changes in building use, changes in operations and maintenance practices, changes in occupancy, or recurrent damages.

POTENTIAL SIGNIFICANT DAMAGE

Circumstances in which:

- (1) Friable ACBM is in an area regularly used by building occupants, including maintenance personnel, in the course of their normal activities.
- (2) There are indications that there is a reasonable likelihood that the material or its covering will become significantly damaged, deteriorated, or delaminated due to factors such as changes in building use, changes in operations and maintenance practices, changes in occupancy, or recurrent damage.
- (3) The material is subject to major or continuing disturbance, due to factors including, but not limited to, accessibility or, under certain circumstances, vibration or air erosion.

PREVENTIVE MEASURES

Actions taken to reduce disturbance of ACBM or otherwise eliminate the reasonable likelihood of the material's becoming damaged or significantly damaged.

REMOVAL

The taking out or the stripping of substantially all ACBM from a damaged area, a functional space, or a homogeneous area in a school building.

REPAIR

Repair refers to procedures used to patch or cover damaged asbestos-containing materials other than enclosure or encapsulation. Examples include covering the damage with plastic sheeting, duct tape, or plaster.

RESPONSE ACTION

A method, including removal, encapsulation, enclosure, repair, operations and maintenance, that protects human health and the environment from friable ACBM.

ROUTINE MAINTENANCE AREA

An area, such as a boiler room or mechanical room, that is not normally frequented by students and in which maintenance employees or contract workers regularly conduct maintenance activities.

SCHOOL

Any elementary or secondary school as defined in section 198 of the Elementary and Secondary Education Act of 1965 (20 U.S.C. 2854).

SCHOOL BUILDING

- (1) Any structure suitable for use as a classroom, including a school facility such as a laboratory, library, school eating facility, or facility used for the preparation of food.
- (2) Any gymnasium or other facility that is specially designed for athletic or recreational activities for an academic course in physical education.
- (3) Any other facility used for the instruction or housing of students or for the administration of educational or research programs.
- (4) Any maintenance, storage, or utility facility, including any hallway, essential to the operation of any facility described in this definition of "school building" under paragraphs (1), (2), or (3) of the regulations.
- (5) Any portico or covered exterior hallway or walkway.
- (6) Any exterior portion of a mechanical system used to condition interior space.

SIGNIFICANTLY DAMAGED FRIABLE MISCELLANEOUS ACM

Damaged friable miscellaneous ACM where the damage is extensive and severe.

STATE

A State, the District of Columbia, the Commonwealth of Puerto Rico, Guam, American Samoa, the Northern Marianas, the Trust Territory of the Pacific Islands, and the Virgin Islands.

SURFACING MATERIAL

Material in a school building that is sprayed-on, troweled-on, or otherwise applied to surfaces, such as acoustical plaster on ceilings and fireproofing materials on structural members, or other materials on surfaces for acoustical, fireproofing, or other purposes.

THERMAL SYSTEM INSULATION (TSI)

Material in a school building applied to pipes, fittings, boilers, breeching, tanks, ducts, or other interior structural components to prevent heat loss or gain, or water condensation, or for other purposes.

THERMAL SYSTEM INSULATION ACM

Thermal system insulation that is ACM.

TOXIC SUBSTANCES CONTROL ACT

The Toxic Substances Control Act (TSCA), 15 U.S.C. 2601, *et. seq.*

TRANSMISSION ELECTRON MICROSCOPY (TEM)

A method of analyzing air samples for asbestos fibers using a transmission electron microscope and possibly associated instruments for further identifying asbestos. TEM is to be used for jobs greater than 260 linear feet for 160 square feet.

APPENDIX J
REFERENCE LIST

REFERENCE LIST

For a copy of any one of the following, contact the Toxic Substance Control Act Assistance Information Service (TSCA Hotline) at (202) 554-1404, unless otherwise indicated.

1. ASBESTOS-CONTAINING MATERIALS IN SCHOOLS; DEFERRAL OF DEADLINE FOR SUBMISSION OF ASBESTOS MANAGEMENT PLANS; NOTICE *FEDERAL REGISTER*, AUGUST 2, 1988
2. 100 COMMONLY ASKED QUESTIONS ABOUT THE NEW AHERA ASBESTOS-IN-SCHOOLS RULE, MAY 1988
3. COMPLIANCE MONITORING STRATEGY FOR THE ASBESTOS HAZARD EMERGENCY RESPONSE ACT (AHERA), OCTOBER 5, 1988: CONTACT OFFICE OF COMPLIANCE MONITORING AT EPA HEADQUARTERS
5. INTERIM FINAL ENFORCEMENT RESPONSE POLICY FOR THE ASBESTOS HAZARD EMERGENCY RESPONSE ACT, JANUARY 31, 1989: CONTACT OFFICE OF COMPLIANCE MONITORING AT EPA HEADQUARTERS
6. A GUIDE TO PERFORMING REINSPECTIONS UNDER THE ASBESTOS HAZARD EMERGENCY RESPONSE ACT (AHERA), FEBRUARY 1992
7. AHERA REACCREDITATION MEMORANDUM, AUGUST 9, 1991: CONTACT OFFICE OF COMPLIANCE MONITORING AT EPA HEADQUARTERS
8. ASBESTOS ABATEMENT PROJECTS; WORKER PROTECTION; FINAL RULE *FEDERAL REGISTER*, FEBRUARY 25, 1987
9. FINAL COMPLIANCE MONITORING STRATEGY ASBESTOS ABATEMENT PROJECTS, WORKER PROTECTION RULE, NOVEMBER 14, 1988; CONTACT OFFICE OF COMPLIANCE MONITORING AT EPA HEADQUARTERS
10. ENFORCEMENT RESPONSE POLICY ASBESTOS ABATEMENT PROJECTS; WORKER PROTECTION; FINAL RULE, NOVEMBER 14, 1989; CONTACT OFFICE OF COMPLIANCE MONITORING AT EPA HEADQUARTERS
11. GUIDANCE FOR CONTROLLING ASBESTOS-CONTAINING MATERIALS IN BUILDINGS, (THE "PURPLE BOOK"), JUNE 1985
12. MODEL ACCREDITATION PLAN, *FEDERAL REGISTER*, APRIL 30, 1987
13. NATIONAL DIRECTORY OF AHERA ACCREDITATION COURSES (NDAAC) AVAILABLE TO STATE AND EPA REGIONAL INSPECTORS BY CALLING THE NDAAC HOTLINE AT 301-984-1929. ASK FOR JOYCE DOE.