REMEDIAL ACTION PROJECT PLAN

BUILDING DEMOLITION EVALUATION PHASE III STUDY
ALTERNATIVE ASBESTOS CONTROL METHOD
FOR BUILDING DEMOLITION

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1.0 PROJECT DESCRIPTION

This Remedial Action Plan is being prepared to address concerns with the potential for release of asbestos during the upcoming test of the Alternative Asbestos Control Method (AACM) on the former office of the Oak Hollow Apartment Complex located at 5901 Boca Raton Boulevard in Fort Worth, Texas.

This document will provide a description of the AACM, a description of the subject building, the organizational chart and responsibility for conduct of the project and contingency plans for responding to various release mechanisms.

1.1. Background

The Clean Air Act provides the USEPA with the authority to promulgate and enforce a "work practice standard" for control of asbestos during building demolition if it is not feasible to establish an emission standard. Section 112 of the Clean Air Act, determined asbestos to be a hazardous air pollutant, and the use of asbestos regulated under the National Emission Standard for Hazardous Air Pollutants (NESHAP) for Asbestos, 40 CFR Part 61, Subpart M (Asbestos NESHAP). Requirement for the demolition and renovation of buildings that contain asbestos are contained in 40 CFR 61.145.

The asbestos NESHAP defines a regulated asbestos-containing material (RACM) as the following [40 CFR 61.141]:

(a) Friable asbestos material,
(b) Category I nonfriable ACM[1] that has become friable,
(c) Category I nonfriable ACM that will be or has been subjected to sanding, grinding, cutting, or abrading, or
(d) Category II nonfriable ACM[2] that has a high probability of becoming or has become crumbled, pulverized, or reduced to powder by the forces expected to act on the material in the course of demolition or renovation operations.

[1] Category I nonfriable asbestos-containing material (ACM) means asbestos-containing packings, gaskets, resilient floor covering, and asphalt roofing products containing more than 1 percent asbestos as determined using the method specified in 40 CFR 763, Appendix E(1), Polarized Light Microscopy.

[2] Category II nonfriable ACM means any material, excluding Category I nonfriable ACM, containing more than 1 percent asbestos as determined using the methods specified in 40 CFR 763Appendix E(1), Polarized Light Microscopy that, when dry, cannot be crumbled, pulverized, or reduced to powder by hand pressure. [40 CFR 61.141]

The asbestos NESHAP requires emissions control when demolition or renovating a facility if the combined amount of RACM is: [40 CFR 61.145(a)(1)]

- At least 80 linear meters (260 linear feet) on pipes or at least 15 square meters (160 square feet) on other facility components, or

- At least 1 cubic meter (35 cubic feet) of facility components where the length or area could not be measured previously.

For facilities containing asbestos above the threshold quantity, the emissions controls required for demolition include removal of all RACM prior to any demolition activity that would break up, dislodge, or similarly disturb the material or preclude access to the material for subsequent removal. The asbestos NESHAP specifies emissions control procedures to be used during RACM removal and/or building demolition [40 CFR 61.145(c)] and wastes generated during demolition must be disposed of in accordance with the requirements of 40 CFR 61.150.

If the facility is being demolished under an order issued by a State or local government agency because the facility is structurally unsound and in danger of imminent collapse, the RACM is not required to be removed prior to demolition, but the portion of the building that contains RACM must be kept adequately wet during demolition [40 CFR 145(a)(3) and 40 CFR 61.145(c)(9)].

It is generally regarded that the cost of compliance with the asbestos NESHAP is currently forestalling redevelopment efforts in a number of communities because the labor costs associated with removal of the RACM is significantly greater than the costs of building demolition. As a result, the USEPA has devised the Alternate Asbestos Control Method (AACM) that provides emissions controls believed to be equivalent to the current work practices required by the asbestos NESHAP, particular for abandoned buildings that are left unoccupied and unmaintained until the building becomes in “imminent danger of collapse” and can be demolished without removal of all of the RACM prior to demolition. Previous studies indicated that there were situations where undesirable releases of asbestos were documented from demolition of these unsafe structures. These studies included both demolitions conducted by the NESHAP process and ones conducted under imminent danger of collapse situations. (Wilmoth et al 1993, Wilmoth et al 1994, City of Saint Louis 2004).

To date, the USEPA has conducted an evaluation of the AACM by performing a controlled side-by-side comparison of the AACM and the NESHAP on identical buildings at Fort Chaffee Redevelopment Authority (Wilmoth et al, 2007). The buildings in the first study had positive asbestos–containing wall systems and vinyl asbestos floor tile. A Follow-up Study has also been conducted to evaluate the AACM’s ability to control emissions from the demolition of a building that had exterior transite siding.

This third phase of the AACM evaluation is intended to evaluate the ability of the AACM to control emissions from a building that has textured wallboard surfaces, such as popcorn ceiling. These data would then be used in conjunction with data obtained during the initial study involving evaluations on environmental impacts during implementation of two demolition

processes (one using the AACM) and the other following NESHAP to help EPA determine whether it is appropriate to include an alternate method in the current asbestos regulations contained in 40 CFR Part 61 Subpart M. The AACM, if determined to be equally environmentally acceptable to the current regulations, may have the benefit of allowing municipalities to demolish abandoned buildings that otherwise would remain standing until they were in danger of imminent collapse.

The AACM requires that certain RACM (such as thermal system insulation and fireproofing) be removed before demolition in accordance with the asbestos NESHAP; other RACM (such as transite, wallboard joint compound, resilient flooring/mastic, glazing compound) may remain in place. The AACM varies from the existing Asbestos NESHAP in the use of an amended-water wetting process, type of demolition equipment, and demolition techniques. Once the RACM has been removed, the demolition can then be conducted using amended water to suppress emissions of asbestos before, during, and after demolition to trap asbestos fibers, minimizing the potential for release to the air. The RACM is less likely to become friable when the wetting process and demolition techniques specified in the AACM are used. Wastewater generated during the demolition is collected and filtered, and all debris is disposed of as asbestos-containing waste. Soil in the affected area is excavated and disposed as asbestos-containing waste. Appendix A contains the AACM developed by EPA Region 6, the EPA ORD, and with input from the EPA QAPP Technical Development Team.

The purpose of this research project is to gather additional data to document the environmental and cost-effectiveness of the AACM. This research project will assist EPA in considering modification of the practices of the Asbestos NESHAP.

1.2. Site Description

The site selected for conduct of this study is the former office building for the Oak Hollow Apartment complex located at 5901 Boca Raton Boulevard, Fort Worth, Texas. The subject building is a two-story structure that is slab-on grade construction, as shown in Figure 1. It appears that the building was constructed with wood frame, and has exterior brick veneer applied to the lower portion of the structure. The upper portion of the structure exterior is finished with wood panel siding. The building has an asphalt shingled roof. The interior of the building contains a wallboard system that has a surface texture coating and a wallboard system ceiling with asbestos-containing “popcorn” ceiling texture. The wells have been painted, likely numerous times, using latex paint. Various flooring materials are present in the structure, including flexible tile with mastic and carpets.

The City of Fort Worth conducted an asbestos survey of the building for their own purposes. The RACM identified during this inspection are listed in Table 1.

Table 1. RACM Identified in the former office of the Oak Hollow Apartments, 5901 Boca Raton Boulevard, Fort Worth, Texas.

RACM Type	Description	Location
Sheetrock	Ceiling Texture (White, Popcorn)	Office #1 Upstairs Open Area Next to Fire Place Lounge
Sheetrock	Sheetrock (White) and Joint Compound	Upstairs Open Area Office #3 Foyer
Flooring Materials	9" x 9" Floor Tile with Mastic	Kitchen
Sheetrock	Ceiling Texture (Beige, Popcorn)	Work Room Sauna
Sheetrock	Sheetrock and Joint Compound, Beige Walls	Work Room Storage Room

The area surrounding the project is primarily residential, including apartment complexes, townhouses and single-family homes. There are no occupied buildings within 300 feet of the building. A police substation is located approximately 500 feet from the site. For purposes of the evaluation, Boca Raton Boulevard will be closed during the demolition and subsequent soil removal. Additionally, the bus stop located along Boca Raton Boulevard will be relocated. Also, to assure against accidental release of asbestos in the direction of the occupied structures, a protective poly wall will be built to shield potential releases in that general direction. As an additional safeguard, if the wind is blowing toward the occupied buildings, the demolition will be delayed until a time when that is not the case.

1.3. Environmental Condition of Building

The comprehensive pre-demolition inspection has been conducted in accordance with the Asbestos Hazard Emergency Response Act (AHERA) (40 CFR 763) and the requirements of the ASTM E2356-04e1 Standard Practice for Comprehensive Building Asbestos Surveys to identify the type, quantity, location, and condition of Asbestos-Containing Materials (instead of only RACM) in the building in accordance with the asbestos NESHAP and the Texas Department of State Health Services (DSHS) asbestos program requirements. As noted in the asbestos NESHAP [40 CFR 61.145(a)], in addition to RACM, Category I and Category II Non-friable Asbestos-Containing Materials must also be identified prior to demolition or renovation.

The building has been surveyed for the presence of inorganic lead (*e.g.* lead paint) in accordance with Housing and Urban Development's (1997) "Guidelines for the Evaluation and Control of Lead-Based Paint Hazards in Housing" to characterize the potential for occupational exposure during demolition. Representative composite bulk samples of the suspect lead-containing building materials were collected in accordance with the HUD sampling protocols

and analyzed to determine the lead content by EPA SW-846 Methods 3050B/7420. Based upon these results, additional samples may be collected for waste characterization purposes.

Figure 1. Oak Hollow Apartment Complex Office Building located at 5901 Boca Raton Boulevard in Fort Worth, Texas.

2.0 Purpose

This Remediation Plan is intended to:

- Identify communication channels for response effort;
- Set criteria for determining if an airborne asbestos release has occurred based on air monitoring data;
- Outline impacts based on wind speeds observed;
- Outline cleanup methods; and
- Set criteria for sampling methods.

3.0 Criteria for Determining Impacts

The demonstration of the AACM will be conducted on the two-story office building for the former Oak Hollow Apartment Complex. As in any demolition operation allowed under the asbestos NESHAP, visible emissions will be monitored and demolition operations will be adjusted based on the visible emissions.

Visible emissions will serve as a real-time trigger for corrective actions; particularly if the emission is more than a momentary release. The corrective action will attempt to correct the work practice implementation that might have caused the release. If visible emissions are observed, the demolition will be halted while the practice is investigated and then resumed when the practice has been corrected.

Airborne asbestos samples will be collected and analyzed during the demonstration project as described in the QAPP. Laboratory analysis of the air samples will be conducted by both PCM (NIOSH 7400) and TEM analysis (ISO Method 10312:1995). If the asbestos airborne concentrations downwind are found to be statistically significantly different that upwind then the average upwind concentration will be subtracted from the downwind concentration and then:

- If the adjusted downwind sample average is less than or equal to 0.01 asbestos structures per cubic centimeter of air analyzed by TEM using PCME (equivalency) techniques then a response action is not necessary.

- If the adjusted downwind sample average exceeds 0.01 asbestos structures per cubic centimeter of air analyzed by TEM using PCME (equivalency) techniques then a response action will be initiated.

4.0 Organizational System

The United States Environmental Protection Agency's (U.S. EPA's) Office of Research and Development (ORD) and U.S. EPA's Region 6 are cooperatively conducting this research project to determine the effectiveness of the Alternate Asbestos Control Method. The Cadmus Group, Inc. (Cadmus) is the prime contractor on the project and will have overall responsibility to ensure that the project is conducted in accordance with the approved Quality Assurance Project Plan (QAPP). The Louis Berger Group, Inc. (Berger) will assist Cadmus in the conduct of this study.

The overall project organization is presented in Figure 2. It graphically shows the functional organization structure and lines of communication for this project. The project structure along with the technical personnel selections are designed to provide efficient management and a high level of technical competence to accomplish this research project. The roles and responsibilities of key project personnel are summarized in

Table 2.

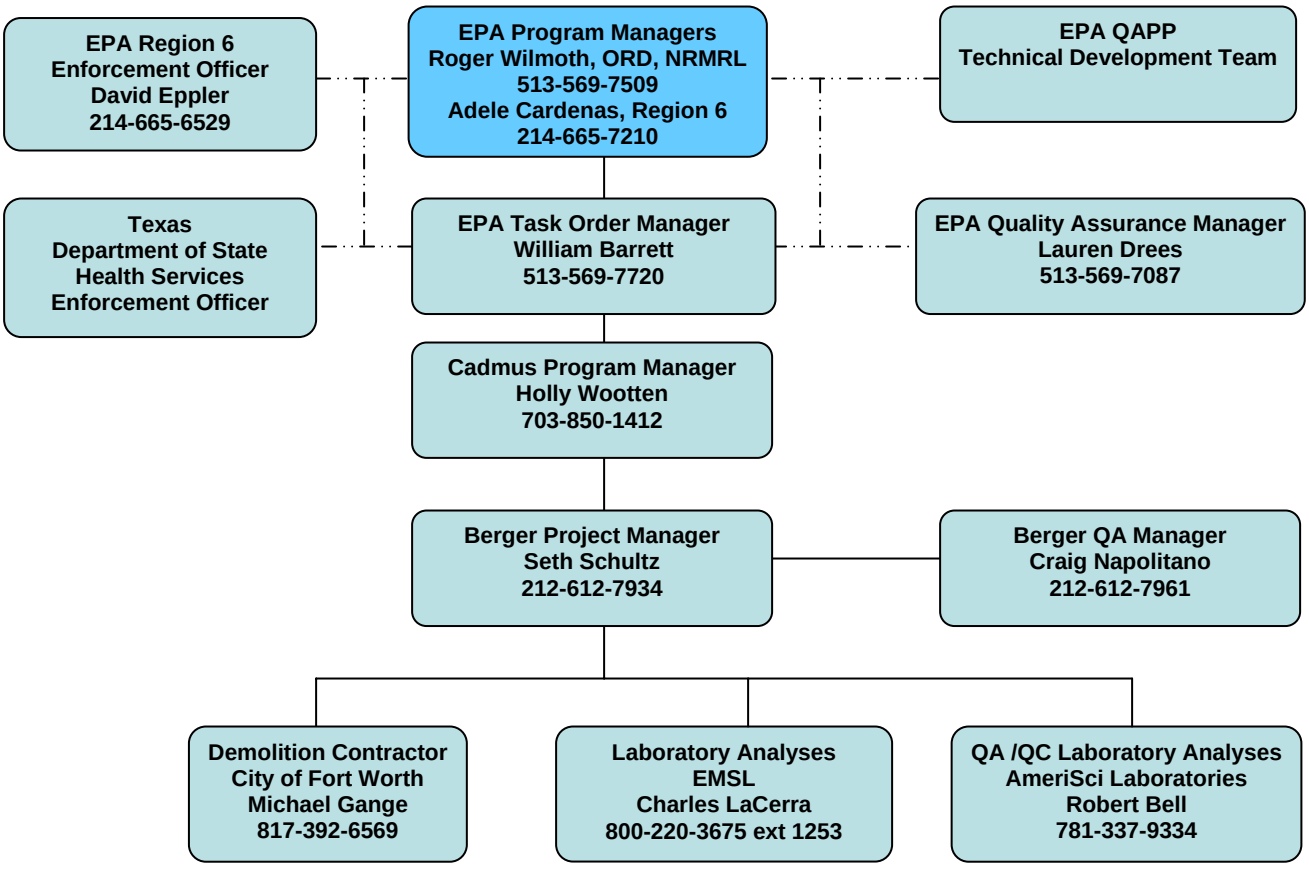

Figure 2. Project Organizational Structure.

Table 2. Roles and Responsibilities of Key Project Personnel

Personnel	Role and Responsibility
Roger Wilmoth U.S. EPA, ORD, NRMRL	*Program Manager*, will have overall administrative and technical responsibility for this program.
William Barrett U.S. EPA, ORD, NRMRL	*Task Order Manager (TOM)*, will direct the project and ensure that it is proceeding on schedule and within budget. Point of contact for Cadmus.
Lauren Drees U.S. EPA, ORD, NRMRL	*QA Officer*, will provide QA oversight to ensure that the planning and plan implementation are in accordance with the approved QAPP. In addition, ORD's QA Officer will oversee a field audit and laboratory audit.
Holly Wootten Cadmus	-*Overall Project and Task Order Lead*, will have overall administrative responsibility for the Cadmus Team and to serve as the primary client interface to ensure continuity between EPA, the Cadmus Team and all subcontractors (listed below) in working towards stated project objectives.
Seth Schultz LBG	*Berger's Project Manager*, will have overall administrative and technical responsibility for Berger on this project. Will also have overall administrative and technical responsibility for Berger and its sub-contractors to ensure that data collection and analysis and the technical report meet the planned study objectives.
Craig Napolitano LBG	*Quality Assurance Manager* to ensure compliance with final QAPP and study objectives. Will oversee laboratory analysis and perform data validation.
Michael Gange City of Fort Worth, Texas	Will Provide Contractor to Perform AACM demolition
Charles LaCerra EMSL	Will provide primary laboratory analysis of asbestos samples
Amerisci Laboratories, Inc.	Will provide quality assurance (QA) secondary sample analysis

The actual demolition will be performed by a contractor properly trained in accordance with the OSHA Hazard Waste Operations and Emergency Response (HAZWOPER). The City of Fort Worth's Fire and Rescue Department will be first responder for a potential transportation related accident to ensure waste debris remains adequately wet and contained. The City of Fort Worth – Transportation and Public Works Department will be on ready call to provide heavy equipment support as necessary to respond to transportation related emergencies. The demolition contactor will be primary responder to release to outdoor air or surface water from the demolition operation. Contractor will utilize personnel with current HAZWOPER Training in accordance with OSHA requirements.

5.0 Response Actions

5.1. Visible Emissions

Response actions will vary based on the observed visible emission(s). Visible emissions from the demolition operation (i.e., demolition of structure, handling of demolition debris, loading of demolition debris for disposal and transportation of demolition debris), and associated response actions will be grouped into the following categories:

- Momentary release (e.g., puff) that is controlled by the water stream in an immediate fashion will not require additional engineering controls. For example, a slight puff from a working edge of demolition that is dissipated by the applied water as it is produced.

- Small sustained release (e.g., small dust cloud) that either dissipates through dispersion into the air column or through additional use of the wetting hoses will require a temporary halt in demolition operations while the working edge of demolition is wetted for approximately one minute. At the initiation of demolition activities both wetting water streams will be directed at this area providing a mixture of misting and wetting.

- Medium sustained release (e.g., small dust cloud that drifts) that is transported away from the working edge of demolition but dissipates prior to leaving the footprint of the demolition area will require a temporary halt in demolition operations while the while the working edge of the demolition is wetted for approximately five minutes. At the initiation of demolition activities both wetting water streams will be directed at this area providing a mixture of misting and wetting.

- Large sustained release (e.g., dust cloud that drifts) that is transported away from the working edge of the demolition but dissipates prior to leaving the property boundary will require a temporary halt in demolition while the working edge of the demolition is wetted for approximately 15 minutes. At the initiation of demolition activities both wetting water streams will be directed at this area providing a mixture of misting and wetting.

- Uncontrolled release (e.g., dust cloud leaves site) that is transported off the facility boundary and onto surrounding properties. Demolition operations will cease immediately. Wetting of the demolition debris will continue to ensure all exposed areas are adequately wetted. Response actions will be initiated following TEM analysis of air samples. Visibly impacted areas may be cleaned with a HEPA vacuum if possible.

Special Note: an uncontrolled release may occur if the building becomes unstable for some reason collapses under its own pressure. Also, an uncontrolled release as defined here is any release, not necessary an asbestos release, and the NESHAP trained individual on site as well as other observers will have to determine the potential source of the release.

5.2. Airborne Fiber Release

Response actions will vary based on the observed wind conditions on the day of the release. Wind speeds will be grouped into the following categories:

- Light: Less than or equal to 3 mph on average.
- Moderate: Greater than 3 mph and less than or equal to 10 mph with an average wind speed of 6 mph.
- High: Greater than 10 mph with an average wind speed of 16 mph.

It should be noted that in the event of high winds, the demolition will be halted. Monitoring of the site for visible emissions will continue through the duration of the high winds. If the winds remain elevated and the evaluation must be halted overnight, the structure will be covered with visqueen until the winds subside and the demolition can be resumed. The light and high wind speed ranges reportedly have similar potential impacts and will treated as the equivalent for cleanup method use.

- Light Wind Speeds

1. HEPA vacuum hard surfaces within 300 feet of the site.
2. Wet wipe hard surfaces within 300 feet of the site.
3. Wash down roadways, walkways, and driveways within 300 feet of the site and collect rinse and filter rinse water prior to discharge to the sanitary sewer system. Filter media will be disposed as asbestos-contaminated waste.
4. Recommend HVAC filters be changed in buildings within impacted area

- Moderate wind speeds observed

1. HEPA vacuum hard surfaces within 350 feet of the site.
2. Wet wipe hard surfaces within 350 feet of the site.
3. Wash down roadways, walkways, and driveways within 350 feet of the site and collect rinse and filter rinse water prior to discharge to the sanitary sewer system. Filter media will be disposed as asbestos-contaminated waste.
4. Recommend HVAC filters be changed in buildings within impacted area

- Heavy Wind Speeds

1. HEPA vacuum hard surfaces within 400 feet of the site.
2. Wet wipe hard surfaces within 400 feet of the site.
3. Wash down roadways, walkways, and driveways within 400 feet of the site and collect rinse and filter rinse water prior to discharge to the sanitary sewer system. Filter media will be disposed as asbestos-contaminated waste.
4. Recommend HVAC filters be changed in buildings within impacted area

5.3. Surface Water Impacts

In accordance with the Quality Assurance Project Plan (QAPP) for the Phase 3 Demonstration of the AACM, if runoff is produced in sufficient quantities to sample then samples will be collected on a periodic basis of runoff water collected and contained.

1. The containment system will be inspected hourly for breaches, and if a breach in the containment system is identified, it will immediately be repaired.
2. The following response actions will be initiated as follows based on the estimated release amount:

a) Less than 10 gallons no further response action will be initiated.
b) Greater 10 gallons and less than 50 gallons then hard surfaces of the impacted area will be HEPA vacuumed.
c) Greater than 50 gallons then the surface water body will be temporarily dammed using earthen material and the water pumped and filtered before disposal into the sanitary sewer.

All collected water will be contained on site and filtered with a five-µm particle filter prior to being discharged into the sanitary sewer located at the site. Samples of the filtered water will be collected and analyzed for asbestos as described in the QAPP.

5.4. Soil Impacts

A minimum depth of three inches of soil within the containment area shall be removed and disposed as asbestos-containing wastes in accordance with the Quality Assurance Project Plan (QAPP) for the Phase 3 Evaluation of the AACM. Should there be a breach of the water containment system that spills onto soil surfaces, soil removal in the affected areas shall be accomplished to minimum depth of three inches and disposed as asbestos-containing waste.

a) Soil will be wetted during excavation activities to suppress airborne dust.
b) Soil will be loaded for transportation. During loading operations the soil will be wetted.
c) All transportation dumps will be covered with a tarp during transport and shall not leak.

Following the excavation of the 3+ inches of soil from within the containment area, soil samples will be collected in accordance with the QAPP. If the concentrations of asbestos in any of these samples exceed the Texas Risk Reduction Program (TRRP) standard of 2,900 mg/kg asbestos for a residential source area less than 0.5 acres, an additional 3 inches will be excavated and re-sampled until the soil meets the TRRP cleanup criterion.

6.0 Worker Protection

Cleanup workers will have the following Personal Protective Equipment (PPE) during remediation efforts:

- Half-face air purifying respirators equipped with P-100 (formerly HEPA) cartridges;
- Disposable Tyvek suits;
- Safety glasses as necessary; and
- Steel toe boots.

Decontamination of workers will be performed using a one-stage dry decontamination system. This system will include:

1. HEPA vacuum Tyvek suit.
2. Wash face and hands.
3. Remove Tyvek suit by inverting or rolling it into itself.
4. Only after completion of the above tasks will the respirator be removed and prepared for proper storage.

Comply with OSHA 29 CFR 1926.1101 and 1910.134 as applicable.

APPENDIX A

ALTERNATE ASBESTOS CONTROL METHOD

ALTERNATIVE ASBESTOS CONTROL METHOD
Developed by EPA Region 6 and EPA Office of Research and Development
November 1, 2007

1.0 Background

In response to Section 112 of the Clean Air Act which requires EPA to develop emission standards for hazardous air pollutants, EPA promulgated the National Emission Standards for Hazardous Air Pollutants (NESHAP). 40 CFR Part 61 Subpart M (Asbestos NESHAP) specifically addresses asbestos, including demolition activities.

Asbestos NESHAP regulations require that all regulated asbestos-containing materials (RACM) above a specified amount be removed from structures prior to demolition. Asbestos-containing materials (ACM) are defined as those materials containing more than one percent asbestos as determined using the method specified in Appendix E, Subpart E, 40 CFR Part 763, Section 1, Polarized Light Microscopy (PLM).

RACM includes friable ACM; Category I non-friable ACM that has become friable, Category I non-friable ACM that will be or has been subjected to sanding, grinding, cutting, or abrading; and Category II non-friable ACM that has a high probability of becoming or has become crumbled, pulverized, or reduced to powder by the forces expected during demolition operations.

Asbestos removal can account for a significant portion of the total demolition costs. In many cities, the cost of asbestos removal prohibits timely demolitions and results in substandard structures which become fire and safety hazards, attract criminal activity, and lower property values.

For structures that are structurally unsound and in imminent danger of collapse, the Asbestos NESHAP requires that the portion of the structure which contains RACM must be kept adequately wet during demolition and during handling and loading of debris for transport to a disposal site. No other engineering controls are required.

This Alternative Asbestos Control Method (AACM) was developed by EPA as an alternative work practice to the Asbestos NESHAP, where certain RACM are removed prior to demolition and other RACM are left in place.

The goal is to provide significant cost savings while achieving an equal or better standard of protection of human health and the environment. This method is much more restrictive than the Asbestos NESHAP requirements for buildings in imminent danger of collapse.

2.0 Applicability

This Alternative Asbestos Control Method applies to any structure subject to the Asbestos NESHAP regulation (i.e., structures that meet the definition of facility under the Asbestos NESHAP), except as noted below.

The size of structures which can be demolished using this method is limited to three stories or less (maximum height of 35 feet). This allows adequate wetting of both the interior and exterior of the structures and is within the working reach of both the wetting and the demolition equipment.

3.0 Building Inspection/Asbestos Assessment

A comprehensive inspection of the interior and exterior of the structure to be demolished shall be conducted in accordance with EPA's Asbestos Hazard Emergency Response Act (AHERA, 40 CFR Part 763). Specific criteria for inspection, sampling, and assessment are in Subpart E (763.85, 763.86, and 763.88, respectively). The inspection shall be performed by an accredited asbestos building inspector.

4.0 Asbestos Removal

Table 1 summarizes the ACM that may be present in buildings and whether or not the ACM must be removed prior to demolition.

All thermal system insulation (TSI) and spray-applied fireproofing shall be removed due to the inability to adequately wet these materials during demolition. Fire curtains may be removed if it is easier to do so than to adequately wet and handle this heavy material.

Vermiculite insulation, if present, shall be removed prior to demolition as an RACM, regardless of the measured asbestos concentration.

All asbestos removal operations shall be performed in accordance with state and federal law by a licensed asbestos abatement contractor.

5.0 Demolition Practices

Several demolition work practice standards shall be employed to ensure that the method is protective of human health and the environment. These standards involve the equipment used, the wetting process, the demolition process, and visible emissions.

Demolition contractors shall provide an Asbestos NESHAP-trained individual to oversee the demolition process.

5.1 Equipment Used

Track hoes and end loaders or equivalent shall be used during demolition to minimize the generation of dust. No bulldozers, explosives, or burning will be permitted.

5.2 Wetting Process

Structures to be demolished will be thoroughly and adequately wetted with amended water (water to which a surfactant has been added) prior to demolition, during demolition, and during debris handling and loading. Surfactants reduce the surface tension of the water, increasing its ability to penetrate the ACM.

For this method, the Asbestos NESHAP definition for "adequately wet" will be used. That is, "sufficiently mix or penetrate with liquid to prevent the release of particulates. If visible emissions are observed coming from the asbestos-containing material (ACM), then that material has not been adequately wetted. However, the absence of visible emission is not sufficient evidence of being adequately wet." The demolition contractor's Asbestos NESHAP-trained individual will verify that ACM is adequately wetted.

Amended water shall be applied with a minimum of two hoses. The water shall be delivered as a mist. Direct high-pressure water impact of RACM is prohibited.

The wetting process consists of three stages. In each stage, both interior and exterior wetting of the structure shall be performed. To the extent feasible, cavity areas and interstitial wall spaces shall be wetted during each of the wetting stages.

Table 1. Asbestos Removal Requirements of AACM

Asbestos-Containing Material	Removed Prior to Demolition?
Thermal System Insulation (TSI)	
▪ Tank insulation	Yes
▪ Pipe insulation	Yes
▪ Elbow/fitting/valve insulation	Yes
▪ Boiler insulation	Yes
▪ Duct insulation	Yes
▪ Cement and patching compound	Yes
Surfacing Material	
▪ Asbestos-impregnated plaster, stucco	No
▪ Spray-applied fireproofing	Yes
▪ Spray-applied surface coatings (popcorn ceiling, vermiculite treatments)	No
▪ Spray applied acoustical or decorative surfacing	No
▪ Troweled-on crows foot texture, splatter texture, and joint compound.	No
▪ Spray-applied surface coatings crows foot texture, splatter texture, etc.	No
Miscellaneous Material	
▪ Fire curtains in auditoriums	Optional
▪ Fire doors	Optional
▪ Vibration-dampening cloths	No
▪ Asbestos-cement tiles, sheets, roofing, shingles, and transite	No
▪ Asbestos-impregnated roofing cement and asphalt roofing	No
▪ Shingles	No
▪ Linoleum or other floor tile	No
▪ Roll flooring	No
▪ Ceiling tile	No
▪ Asbestos-impregnated pipe	No
▪ Vermiculite insulation	Yes
▪ Mastic for flooring	No
▪ Window Cauking	No

On the day before the demolition, access openings shall be made into the attic spaces from the exterior. The structure shall be first pre-wet (until adequately wet) from the interior and then from the constructed exterior attic access openings to enhance water retention and maximize wetting effectiveness.

This pre-wetting shall prohibit further access into the structure, because of safety concerns. The structure shall be re-wet (until adequately wet) from the exterior through the windows, doors, and attic access openings on the day of demolition prior to demolition. Finally, wetting (until adequately wet) shall be done during the demolition and during loading of debris into lined disposal containers.

5.3 Demolition Process

The demolition contractor shall minimize breakage of asbestos-containing materials. All demolition shall be completed in a timely manner that will allow the debris generated during that day to be completely removed from the demolition site for disposal.

5.4 Visible Emissions

The Asbestos NESHAP standard of "no visible emissions" shall be employed. Visible emissions mean any emissions, which are visually detectable without the aid of instruments, coming from RACM or asbestos-containing material. This does not include condensed, uncombined water vapor. The demolition contractor's NESHAP-trained individual shall verify the absence of visible emissions and has the authority to stop work if visible emissions are observed.

During a demolition, it is often not possible to distinguish visible emissions from ACM and those from construction debris; therefore, should a visible emission be observed, the demolition effort shall pause until the deficiencies in the application of the wetting controls eliminate the visible emission.

6.0 Weather Restrictions

Demolition activities shall be delayed/halted in the case of any inclement weather that will impede the demolition contractor's ability to adequately wet the structure (e.g., freezing temperatures).

In addition, if visible dusting is observed in the vicinity of the demolition site, the demolition shall be delayed/halted.

7.0 Monitoring Requirements

Demolition contractors are required to comply with all applicable OSHA (29 CFR 1926) regulations for worker protection during asbestos removal and demolition activities. This

includes the use of personal protective equipment (PPE) such as Tyvek suits or equivalent, respirators (as necessary), and gloves (as necessary); and personal monitoring.

Because, like the Asbestos NESHAP, this method is designed to be a work practice standard, monitoring of air (other than that mandated by OSHA statute), soil, and other media is not required.

8.0 Waste Handling

Several wastes are generated during demolition activities, including demolition debris, disposable PPE, and potentially contaminated water and soil, and must be properly disposed. All wastes generated must be removed from the site at the end of the day and transported to an appropriate disposal facility. Transport and disposal shall be in accordance with all federal, state, and local requirements. All waste haulers shall be leak-proof. Double-lining of the haulers with 4-mil or thicker polyethylene film and then sealing the top seams of the film is a suggested mechanism, but the contractor must do what is required to prevent leaks from the transport vehicles. Vehicles shall be decontaminated within the bermed area before leaving the demolition area.

8.1 Demolition Debris

Segregation of portions of a structure that may contain RACM from portions of a structure that clearly do not contain RACM shall be done when practical in an effort to minimize RACM debris. For example, segregation may be used if a large warehouse is being demolished and only a small portion (e.g., office space) contains RACM.

When segregation is not practical, all demolition debris shall be disposed as RACM in a licensed asbestos disposal facility. Debris shall be kept adequately wet during loading into containers. Containers shall be covered during transport.

8.2 PPE

All disposable PPE shall be disposed as RACM. Reusable PPE shall be decontaminated in accordance with OSHA standard practices.

8.3 Potentially Contaminated Water and Impervious Surfaces

No potentially contaminated water runoff is permitted from the site during the demolition period. All impervious surfaces will be thoroughly washed with amended water before site closure.

Construction site best management practices shall be used to prevent water runoff. Drains and sewer connections must be capped or plugged prior to wetting. Berms and/or trenches must be created as necessary to prevent runoff of water from the demolition site. If possible, the bermed/trenched area should extend 25 ft from the building and/or loading area. If not possible, adjacent areas and structures need to be covered with plastic.

The berm/trench must be sufficiently spaced from the building to permit the movement of the demolition equipment and to allow the truck loading to occur within the enclosed space. All plastic shall be disposed as RACM.

If large water volume use or impermeable conditions surrounding the building create excessive water volume and simple containment and percolation is not feasible, the water must be pumped and either disposed as ACM or filtered through a series of filters ultimately removing all fibers equal to or larger than five microns before transporting to a publicly-owned treatment works or discharging to a sanitary sewer. The filters must be disposed as RACM.

8.4 Potentially Contaminated Soil

Following the removal of demolition debris, bare soil within the bermed area shall be excavated to a minimum depth of three inches or until no debris is found. Berms created shall also be removed and disposed as potentially asbestos-contaminated. All removed soil shall be disposed as RACM.

9.0 Site Closure

Following demolition and waste disposal, all waste and debris must be gone from the site and the site must be secured so as not to create a safety hazard