INDUSTRIAL HYGIENE DIRECTIVE

July 27, 1988

ASBESTOS DEMOLITION AND REMOVAL

It is the policy of Reynolds Metals Company that all employee exposures to asbestos be kept as low as possible. Consequently, where feasible, all asbestos demolition/removal work should be performed by qualified outside contractors. A list of qualified contractors and a Performance Audit Form are enclosed. The Performance Audit Form should be returned to the attention of R. E. Benton, Industrial Hygiene, upon the completion of each job.

For small-scale asbestos demolition/removal jobs, where time is critical and a contractor cannot be obtained, properly trained RMC employees may perform the asbestos demolition/removal work. These employees, however, must be thoroughly trained on proper work practices for handling asbestos. (See Appendix A.) Part of the training program should include videotapes which are available from Corporate Industrial Hygiene. Employees must also be advised about the types of asbestos present and their potential health effects.

At least one supervisor should attend an asbestos training course, if the plant anticipates using Reynolds' employees for any asbestos demolition/removal work. Training courses are sponsored by the Environmental Protection Agency (EPA) Asbestos Training Centers and other groups. (See enclosed list of training centers in Appendix B.) The supervisor who attends the course would then be responsible for training all affected plant personnel, to ensure that proper work practices are used during all asbestos demolition/removal jobs.

Air sampling is also required on all asbestos demolition/removal jobs, to assure the effectiveness of the controls and work practices. This requirement may necessitate the purchase of air sampling equipment. (See Appendix C.) Should the plant wish to purchase equipment, please contact Ron Benton (Ext. 2265) or me (Ext. 3506), regarding the type of equipment recommended and its proper use.

From an environmental standpoint, EPA's National Emission Standard for Hazardous Air Pollutants (NESHAP) for asbestos dictates: 1) agency notification of planned demolition and renovation activities, 2) adherence to specified procedures for asbestos emissions control during removal activities, and 3) proper handling and disposal of the asbestos materials at the landfill site. These standards are applicable to the renovation and/or demolition of friable asbestos. Please notify C. R. Bent (extension 2918) of the Corporate Environmental Control Department, when asbestos removal activities are planned, to determine the applicability of the NESHAP regulations and/or to discuss the specifics of these requirements.

Homer M. Cole

Homer M. Cole
Director
Industrial Hygiene
and Toxicology

PLAINTIFF'S EXHIBIT
RMC-374

Dist.: EH-1

July 27, 1988

In past years, we have issued Industrial Hygiene Bulletins covering safety, health, and environmental matters. There has been some confusion regarding those bulletins, as often they have been treated as informational, rather than as a reflection of company policy and/or approaches to industrial hygiene matters.

Henceforth, such information will be released in the form of Industrial Hygiene Directives, which should be considered mandatory.

Attached is an Industrial Hygiene Directive dealing with asbestos demolition/removal procedures.

Homer M. Cole

Homer M. Cole
Director
Industrial Hygiene
and Toxicology

Att.

TX TINER
RMC0086299

003615

APPENDIX A

WORK PRACTICES AND ENGINEERING CONTROLS FOR ASBESTOS REMOVAL/DEMOLITION ACTIVITIES

—Work Practices and Engineering Controls for Small-Scale Short-Duration Asbestos Renovation and Maintenance Activities

Definition of Small-Scale, Short-Duration Activities

For the purposes of this appendix, small-scale, short-duration renovation and maintenance activities are tasks such as, but not limited to:

- Removal of asbestos-containing insulation on pipes;
- Removal of small quantities of asbestos-containing insulation on beams or above ceilings;
- Replacement of an asbestos-containing gasket on a valve;
- Installation or removal of a small section of drywall;
- Installation of electrical conduits through or proximate to asbestos-containing materials.

Evidence in the record (see the Summary and Explanation section of the preamble for paragraph (g) Methods of Compliance, for specific citations) suggests 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/cc). 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:

- Wet methods;
- Removal methods

—Use of Glove bags
—Removal of entire asbestos insulated pipes or structures
—Use of mini-enclosures

- Enclosure of asbestos materials; and
- 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 a 6-mil-thick polyethylene plastic sheeting 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. As discussed in the Summary and Explanation section of the preamble for paragraph (g), Methods of Compliance, 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 materials 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 mini-enclosures. The procedures that employers must use for each of these operations if they wish to avail themselves of the final rule's exemptions are described in the following sections.

Glove Bags

As discussed in the Summary and Explanation section of the preamble for paragraph (g), Methods of Compliance, evidence in the record indicate that the use of glove bags to enclose the work area during small-scale, short-duration maintenance or renovation activities will result in employee exposures to asbestos that are below the final standard's action level of 0.1 f/cc. This appendix provides requirements for glove-bag procedures to be followed by employers wishing to avail themselves of the standard's exemptions for such activities. OSHA has determined that the use of these procedures will reduce the 8 hour time weighted average (TWA) exposures 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 final 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 (see Figure C-1(A)). 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 flexibile, easily installed, and quickly dismantled temporary small work area enclosure that is ideal for small-scale asbestos renovation or maintenance jobs.

TX TINER
RMC0086300

003616

INDUSTRIAL HYGIENE DIRECTIVE

July 27, 1988

ASBESTOS DEMOLITION AND REMOVAL

It is the policy of Reynolds Metals Company that all employee exposures to asbestos be kept as low as possible. Consequently, where feasible, all asbestos demolition/removal work should be performed by qualified outside contractors. A list of qualified contractors and a Performance Audit Form are enclosed. The Performance Audit Form should be returned to the attention of R. E. Benton, Industrial Hygiene, upon the completion of each job.

For small-scale asbestos demolition/removal jobs, where time is critical and a contractor cannot be obtained, properly trained RMC employees may perform the asbestos demolition/removal work. These employees, however, must be thoroughly trained on proper work practices for handling asbestos. (See Appendix A.) Part of the training program should include videotapes which are available from Corporate Industrial Hygiene. Employees must also be advised about the types of asbestos present and their potential health effects.

At least one supervisor should attend an asbestos training course, if the plant anticipates using Reynolds' employees for any asbestos demolition/removal work. Training courses are sponsored by the Environmental Protection Agency (EPA) Asbestos Training Centers and other groups. (See enclosed list of training centers in Appendix B.) The supervisor who attends the course would then be responsible for training all affected plant personnel, to ensure that proper work practices are used during all asbestos demolition/removal jobs.

Air sampling is also required on all asbestos demolition/removal jobs, to assure the effectiveness of the controls and work practices. This requirement may necessitate the purchase of air sampling equipment. (See Appendix C.) Should the plant wish to purchase equipment, please contact Ron Benton (Ext. 2265) or me (Ext. 3506), regarding the type of equipment recommended and its proper use.

From an environmental standpoint, EPA's National Emission Standard for Hazardous Air Pollutants (NESHAP) for asbestos dictates: 1) agency notification of planned demolition and renovation activities, 2) adherence to specified procedures for asbestos emissions control during removal activities, and 3) proper handling and disposal of the asbestos materials at the landfill site. These standards are applicable to the renovation and/or demolition of friable asbestos. Please notify C. R. Bent (extension 2918) of the Corporate Environmental Control Department, when asbestos removal activities are planned, to determine the applicability of the NESHAP regulations and/or to discuss the specifics of these requirements.

Homer M. Cole
Director
Industrial Hygiene
and Toxicology

TX TINER
RMC0086301

003617

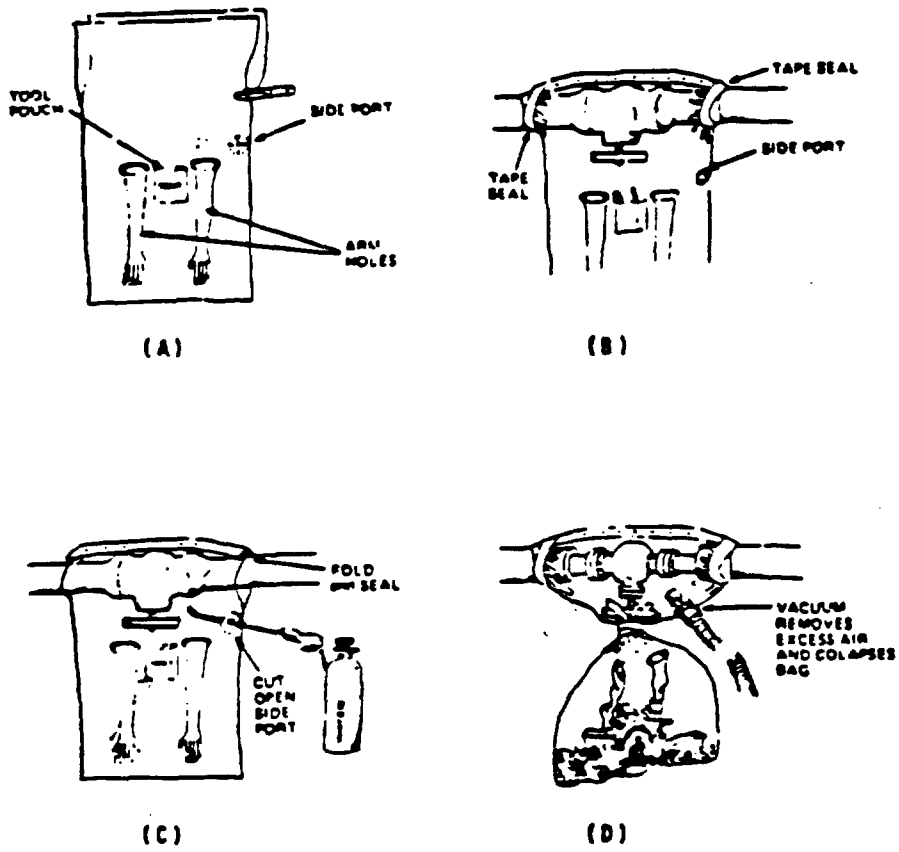


Figure G-1. Diagrams Showing Proper Use of Glove Bags in Small-Scale, Short-Duration Maintenance and Removal Operations.

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 arms of Tyvek * material (the same material used to make the disposable 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-labeled 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 the glove bag to the area from which absbestos 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 be removed;

(5) Tools such as razor knives, nips, and wire brushes (or other tools suitable for cutting wire, 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; and

(7) HEPA-equipped dust cartridge 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 (Figure G-1(B)).

(2) The employee who is performing the asbestos removal with the glove bag must don 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 pre-cut port provided in most gloves bags or applied through a small hole cut in the bag) (Figure G-1(C))

(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 re-sprayed 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.

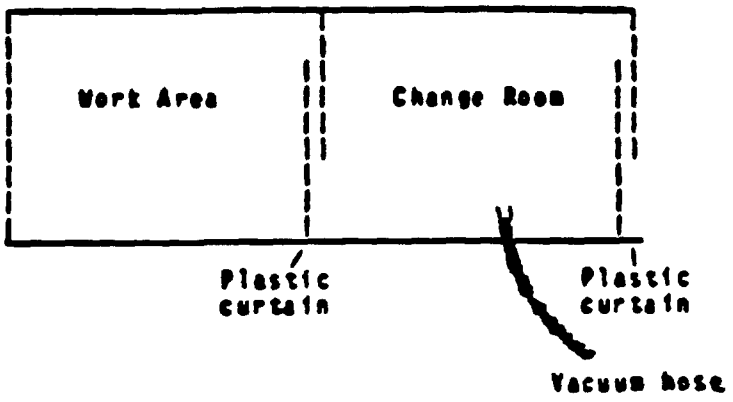
(7) When the asbestos removal and encapsulation have been completed, a vacuum hose from a HEPA filtered vacuum must be inserted into the glove bag through the port to remove any air in the bag that may contain asbestos fibers. When the air has been removed from the bag, the bag should be squeezed tightly (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

---

Mention of trade names or commercial products does not constitute endorsement or recommendation for use.

then be removed from the bag and the glove bag itself can be removed from the work area to be disposed of properly (Figure C-1(D)).

Top View



Side Vie

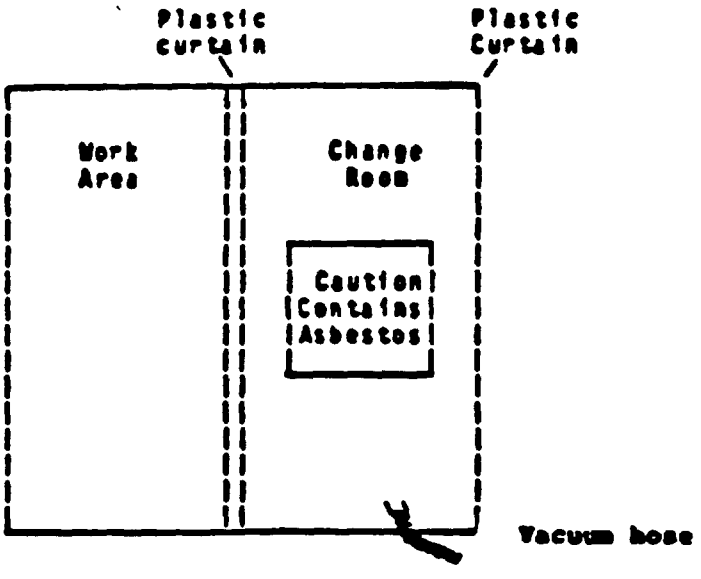


Figure C-2. Schematic of Mini-enclosure

Mini-Enclosures

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 mini-enclosure can be built around the area where small-scale, short-duration asbestos maintenance or renovation work is to be performed (Figure C-2). Such an enclosure 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 mini-enclosure 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;

TX TINER
RMC0086303

(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, and

(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 mini-enclosure, and is necessary to allow the worker to vacuum off his protective coveralls and remove them before leaving the work area. While inside the enclosure, the worker should wear Tyvek® disposable coveralls and use the appropriate HEPA filtered dual cartridge respiratory protection.

The advantages of mini-enclosures 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 mini-enclosures 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.

Maintenance Program

An asbestos maintenance program must be initiated in all facilities that have asbestos-containing materials. Such a program should include:

- Development of an inventory of all asbestos-containing materials in the facility;
- Periodic examination of all asbestos-containing materials to detect deterioration;
- Written procedures for handling asbestos materials during the performance of small-scale, short-duration maintenance and renovation activities;
- Written procedures for asbestos disposal, and
- 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:

- Information regarding types of asbestos and its various uses and forms;
- Information on the health effects associated with asbestos exposure;
- Descriptions of the proper methods of handling asbestos-containing materials, and
- Information on the use of HEPA-equipped dual cartridge respiratory 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:

- *Not* to drill holes in asbestos-containing materials;
- *Not* to hang plants or pictures on structures covered with asbestos-containing materials;
- *Not* to sand asbestos-containing floor tile;
- *Not* to damage asbestos-containing materials while moving furniture or other objects;
- *Not* to install curtains, drapes, or dividers in such a way that they damage asbestos-containing materials;
- *Not* to dust floors, ceilings, moldings or other surfaces in asbestos-contaminated environments with a dry brush or sweep with a dry broom;
- *Not* to use an ordinary vacuum to clean up asbestos-containing debris;
- *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;
- *Not* to remove ventilation system filters dry; and
- *Not* to shake ventilation system filters.

TX TINER
RMC0086304

003620

OVERVIEW OF THE GLOVEBAG PROCEDURE

A glovebag is a 6-12 mil bag fitted with long-sleeved gloves, a tool pouch, and a two-inch opening for water. Although glovebags can be fabricated by the user for each project, most contractors prefer to purchase readymade bags. The size, quality, style, and cost vary depending on the manufacturer. In addition to the glovebag, several other tools and materials are commonly required to perform the project successfully. These materials, listed below, are readily available from most asbestos abatement contractor suppliers.

MATERIALS

1. Glovebag (one or more, depending on project size)
2. Pump-up garden sprayer (2-3 gallon size)
3. Amended water (surfactant, availble from local garden shop or safety supply company)
4. Duct tape (3-inch width)
5. Polyethylene disposal bags (6 mil)
6. Smoke tubes with aspirator bulb
7. HEPA-filtered vacuum cleaner
8. Bone saw
9. Utility knife with retractable blade
10. Wire cutters
11. Tin snips (if aluminum jacket is present)
12. Polyethylene plastic (roll of 4 or 6 mil)
13. Dual cartridge respirators with high efficiency cartridges
14. Disposable full-body suits with hood and feet covering
15. Small scrub brush
16. Stapler
17. Several rags
18. Wettable cloth
19. Asbestos caution signs and labels
20. Reinsulation materials, as necessary

BEFORE STARTING A GLOVEBAG PROJECT

Two persons are required to perform a glovebag removal project. Also, a third person is sometimes available, to assist with supplies, to keep unwanted visitors out of the area, and to conduct air monitoring. Each of the team members should be trained on the use and limitations of glovebags. They should also be included in the respiratory protection and medical surveillance programs.

Before any work begins, all necessary materials should be brought into the work area. The work area should be roped off and warning signs should be posted on the perimeter to minimize the chance of visitors entering the area. Barrier tape (3-inch) with a pre-printed asbestos warning is recommended. If applicable, the HVAC supplying the work area should be shut down.

Employees should also be trained about emergency procedures, in the event of a glovebag rupture. The emergency training should cover wet cleaning, HEPA vacuuming procedures, and shower use. The following guidelines may be used for most pipe lagging projects:

REMOVAL PROCEDURES

1. Follow the manufacturer's directions and mix the surfactant with water in the garden sprayer.

2. Each employee should wear a cartridge respirator and check the face-fit.

3. Each employee should wear a disposable full-body suit, being mindful that the hood goes over the respirator straps.

4. The pipe on which the work will be performed should be checked. REMEMBER...NEVER PERFORM GLOVEBAG REMOVAL ON HOT PIPES OVER 150°F. This may cause the bag or gloves to melt over the workers' hands and arms. If the pipe is damaged (broken, lagging, hanging, etc.), the entire length of the pipe should be wrapped in polyethylene plastic and "candystriped" with duct tape. A common problem with glovebag work is that loose pipe lagging several yards from the glovebag may be jarred during the work, causing a release of asbestos into the air. Another problem is failure to clean up debris on the floor and other surfaces. If the pipe is undamaged, it is still necessary to place one layer of duct tape around the pipe at each location where the glovebag will be attached. This serves two purposes. First, it gives a good surface on which to seal the ends of the glovebag. Second, it minimizes the chance of releasing fibers when the tape at the ends of the glovebag is peeled off at the completion of the job.

5. Slit the top of the glovebag open (if necessary) and cut down the sides to accommodate the size of the pipe (about two inches longer than the pipe diameter). One brand has a zipper top and straps at each end facilitating installation of the bag on the pipe.

6. Place the necessary tools into the pouch located inside the glovebag. This will usually include the bone saw (flexi saw), utility knife, rags, scrub brush, wire cutters, tin snips, and wettable cloth. Note: It is easiest to pre-cut the wettable cloth at this point. Cut out a donut shape with the inner diameter 1/2-inch smaller than the diameter of the pipe beneath the insulation. The outer diameter of the donut should be three inches longer than the diameter of the pipe insulation being removed. Finally, cut a slit in each of the two donuts, so they can be slipped around the pipe.

7. Place one strip of duct tape along the edge of the open top slit of the glovebag for reinforcement.

TX TINER
RMC0086306

003622

8. Place the glovebag around the section of pipe to be worked on and staple the top together through the reinforcing duct tape. Staple at intervals of approximately one inch. This should provide an adequate seal along the top. Next, duct tape the ends of the glovebag to the pipe itself, previously covered with plastic or duct tape (See Step 4).

9. A smoke tube and aspirator bulb are needed to test the glovebag. Place the tube into the water sleeve (two-inch opening to glovebag). By squeezing the bulb, fill the bag with visible smoke. Remove the smoke tube and twist the water sleeve closed. While holding the water sleeve tightly, gently squeeze the glovebag and look for smoke leaking out, especially at the top and ends of the glovebag. If leaks are found, they should be taped closed, using duct tape, and the bag should be retested with smoke.

10. Insert the wand from the water sprayer through the water sleeve. Using duct tape, tape the water sleeve tightly around the wand, to prevent air leakage.

11. One person should place his hands into the long-sleeved gloves, while the second person directs the water spray at the work.

12. If the section of pipe is covered with an aluminum jacket, it should be removed by first using the wire cutters to cut any bands and then using the tin snips to remove the aluminum. It is important to fold in the sharp edges to prevent cutting the bag when it is placed in the bottom. <u>Use caution to prevent cuts - these edges are sharp!</u>

13. With the insulation exposed, use the bone saw to cut the insulation at each end of the section to be removed inside the glovebag. Note: A bone saw is a serrated heavy-gauge wire with ring-type handles at each end. Throughout this process, water is sprayed on the cutting area to keep dust to a minimum.

14. Once the ends are cut, the section of insulation should be slit from end to end, using the utility knife. The cut should be made along the bottom of the pipe and water continually supplied. Again, care should be taken, when using the knife, not to puncture the bag. Some insulation may have wire to be clipped, as well.

15. Spray all tools with water inside the bag and place back into pouch.

16. The insulation can now be lifted off the pipe and gently placed in the bottom of the bag.

TX TINER
RMC0086307

17. Using the scrub brush, rags, and water, scrub and wipe down the exposed pipe inside the glovebag. Note: The inexpensive horse rub-down mittens work well for this.

18. Wet the donut-shaped pieces of wettable cloth over the exposed ends of insulation remaining on the pipe. Wettable cloth is a plaster impregnated fiberglass webbing available at many hardware and/or plumbing supply stores.

19. Remove the water wand from the water sleeve and attach the small nozzle from the HEPA-filtered vacuum. Turn on the vacuum only briefly to collapse the bag.

20. Remove the vacuum nozzle, twist the water sleeve closed, and seal it with duct tape.

21. From outside the bag, pull the tool pouch away from the bag and twist it to separate it from the bag. Place duct tape over the twisted portion and then cut the tool bag from the glovebag, cutting through the twisted/taped section. This will allow the contaminated tools to be placed directly into the next glovebag without cleaning. Alternatively, the tool pouch with the tools can be placed in a bucket of water, opened underwater, and the tools cleaned and dried without releasing asbestos into the air. Note: Rags and the scrub brush cannot be cleaned in this manner and should be discarded with the asbestos waste. If more than one adjacent section of pipe is to be removed, the glovebag may be loosened at each end and slid along the pipe to the next section. In this case, the tools would remain in the bag for continued use.

22. With the removed insulation in the bottom of the bag, twist the bag several times and tape it to keep the material in the bottom during removal of the glovebag from the pipe.

23. Slip a 6 mil disposal bag over the glovebag (still attached to the pipe). Remove the tape, open the top of the glovebag, and fold it down into the disposal bag.

24. Remove the disposable suits and place these into the bag with the waste.

25. Twist the top of the bag closed, fold this over, and seal it with duct tape. Then put a warning label on the bag.

26. Using a clean damp rag, wipe the exterior of the respirator and leave the work area. Then, remove the respirator.

TX TINER
RMC0086308

27. Asbestos-containing material must be disposed of at an approved landfill in accordance with EPA regulations.

TX TINER
RMC0086309

003625

APPENDIX B

ASBESTOS TRAINING CENTERS

INSTITUTION	TELEPHONE #
Southeast Asbestos Info. Center GEORGIA INSTITUTE OF TECHNOLOGY Atlanta, GA 30332	404/894-2400
Asbestos Information Center TUFTS UNIVERSITY Medford, MKA 02155	617/381-3531
Natioal Asbestos Info. Center UNIVERSITY OF KANSAS Shawnee Mission, KS 66207-3398	913/648-5790
MEDICAL COLLEGE OF VIRGINIA Dept. of Preventive Medicine Richmond, VA 23298-0212	804/786-9785 804/786-0494
PACIFIC ASBESTOS INFORMATION CENTER UNIVERSITY OF CALIFORNIA, EXTENSION DIV. 2223 Fulton St. Berkeley, CA 94720	415/643-7143
MIDWEST ASBESTOS INFORMATION CENTER School of Public Health UNIVERSITY OF ILLINOIS 2035 West Taylor St. Chicago, IL 60612	312/996-5762

TX TINER
RMC0086310

PERFORMANCE AUDIT

CONTRACTOR ASBESTOS REMOVAL/REPAIR

DATE _____ PLANT _____

DEPARTMENT _____ TYPE INSULATION _____

NAME OF AUDITOR _____

To ensure that the contractor is complying with the contract, please answer the following questions. Any question which is answered "No" should be explained in detail on the back of this form.

	YES	NO	N/A	
1.	☐	☐		HAS A REGULATED AREA WITH WARNING SIGNS BEEN ESTABLISHED?*
2.	☐	☐	☐	IS AN ENCLOSURE BEING USED (CONTAINMENT ROOM OR A GLOVE BAG)?
3.	☐	☐	☐	IF THE ENCLOSURE IS A CONTAINMENT ROOM, IS IT KEPT UNDER NEGATIVE PRESSURE WITH A VENTILATION SYSTEM EQUIPPED WITH HEPA (HIGH EFFICIENCY PARTICULATE AIR) FILTERS?
4.	☐	☐	☐	IF THE ENCLOSURE IS NOT BEING USED, HAS THE CONTRACTOR ESTABLISHED BORDERS TO HIS REGULATED AREA BASED ON AIR SAMPLING RESULTS?
5.	☐	☐		IS ACCESS TO THE REGULATED AREA LIMITED TO THOSE INVOLVED IN THE REMOVAL/REPAIR PROJECT?
6.	☐	☐		ARE PERSONS ENTERING THE REGULATED AREA PROVIDED WITH RESPIRATORY PROTECTION AND PROTECTIVE CLOTHING (RUBBER FACEPIECE RESPIRATOR, HEAD, HAND, WHOLE BODY, AND FOOT COVERINGS)?
7.	☐	☐		ARE PERSONS LEAVING THE REGULATED AREA REQUIRED TO DECONTAMINATE THEMSELVES?
8.	☐	☐		ARE WET METHODS USED TO REMOVE AND CLEAN UP THE ASBESTOS-CONTAINING MATERIAL?
9.	☐	☐		IS THE WET ASBESTOS-CONTAINING WASTE PLACED IN IMPERMEABLE, LABELED PLASTIC BAGS?**
10.	☐	☐	☐	AFTER THE ASBESTOS-CONTAINING MATERIAL HAS BEEN REMOVED OR REPAIRED, IS A HEPA VACUUM CLEANER USED TO CLEAN ALL CONTAMINATED SURFACES?
11.	☐	☐	☐	AFTER THE VACUUMING, ARE THESE SURFACES WET WIPED/MOPPED?

_____
AUDITOR'S SIGNATURE

* Warning Sign Language:

Danger
Asbestos
Cancer and Lung Disease Hazard
Authorized Personnel Only
Respirator and Protective Clothing
are required in this Area.

TX TINER
RMC0086311

** Label Language:

Danger
Contains Asbestos Fibers
Avoid Creating Dust
Cancer and Lung Disease Hazard

003627

EXPLANATION

QUESTION #	COMMENTS

TX TINER
RMC0086312

003628

APPENDIX C

RECOMMENDED SAMPLING PROCEDURE FOR ASBESTOS.

1. The preferred collection device shall be the 25mm mixed cellulose ester filter in a cassette with an open-faced 50mm extension cowl. The 37mm cassette may be used in those situations where dust loadings reduce the sampling time to less than one hour. (See Item 3, below.)

2. An airflow rate between 1.5 liter/min. and 2.5 liters/min. shall be used for either the 25mm or 37mm cassette.

3. If, during sampling, the filter darkens noticeably (i.e. changes color), or if loose dust is seen on the filter, a second sample shall be started.

4. All pumps should be calibrated with a bubble flow meter before and after each day's use. An inverted 500ml buret will suffice as the bubble meter.

5. Before starting the sampling, record the date, plant name, sample number (written on the white shrinkband), pump number, employee's name, work description, and controls used on the enclosed sampling data sheet. Also, note the type of protective clothing and respirator worn by the employees.

6. The tubing from the pump should be attached to the end of the cassette that has the "ribbed" appearance. The cassette should be sampled with an open face (i.e. entire cap removed from the end of the cassette, rather than the small plug) and attached to the worker's shirt collar.

7. After the pump is turned on, ensure that it is functioning properly and has an 8-hour charge. The time the pump is started is also recorded on the sampling data sheet.

8. Unless the filter darkens, as in Item 3, the sampling period should be a series of 4-hour samples until the project has been finished and clean-up completed. At the end of each sampling period, the cassette should be removed from the tubing, the end cap and bottom plug replaced, and the time pump stopped should be recorded on the sampling data sheet.

9. During sampling, any conditions which might affect the results should be noted on the sampling data sheet (e.g. glovebag rupture, insulation not kept wet, etc.).

10. After sampling has been completed, each cassette should be taped around the ends, to prevent accidental opening during shipment, and returned to Corporate Industrial Hygiene in a rigid container, along with the completed sampling data sheets. (Note: One unused cassette should be returned as a blank, for every 6 filters used.)

* * *

TX TINER
RMC0086313