Attachment F

PLAINTIFF'S EXHIBIT

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GRACE

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May 4, 1984

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Document Control Officer
Office of Toxic Substances (TS-793)
Environmental Protection Agency
Room 108
401 M. Street, S.W.
Washington, DC 20460

Re: Document OPTS-211012
Asbestos Response to Citizen's Petition
EPA 40 CFR Part 763

Dear Sirs:

This document is in response to the request of the U. S. Environmental Protection Agency (EPA) for written comments on the subject of asbestos in schools and public and commercial buildings as announced in the Federal Register March 7, 49 Fed. Reg. - 8450, Asbestos: Response to Citizens Petition.

W. R. Grace & Co. (GRACE) supplied certain products containing chrysotile, a type of commercial asbestos, prior to the early 1970's which were used in the construction of some schools and public and commercial buildings. The products supplied by GRACE were primarily used because of their ability to protect buildings and their occupants from fire, and to enhance sound control, or to fulfill a decorative function.

Because of GRACE's past role in supplying products containing commercial asbestos and because of fairly recent government publications on the question of asbestos-containing products in buildings, GRACE has become familiar with the literature on asbestos and has had extensive discussions with a number of physicians and scientists during recent years concerning asbestos-containing materials in buildings. GRACE believes that asbestos-containing products it supplied which have been properly installed, maintained and used do not represent a risk of injury to the health of building owners and occupants. GRACE disputes the generalization that the mere presence of asbestos-containing products in buildings presents risk of injury to health and believes that actions taken upon acceptance of this generalization will result in the creation of risk of injury where none exists.

The following commentary reflects GRACE's views on the referenced petition based on our current state of knowledge, and on the noted literature and discussions.

I. BACKGROUND

Commercial asbestos has been a widely-used material because of its fire and heat resistance and other unique properties.

It is well documented that in certain occupational environments (particularly the mining of asbestos and the manufacture of certain products containing commercial asbestos) employees were historically exposed to levels of airborne asbestos dust which were many times that permitted by the current U. S. Occupational Safety and Health Administration (OSHA) regulations of 2.0 fibers per cubic centimeter (eight hour time-weighted average) (OSHA, 1975).

A number of epidemiological studies have demonstrated an association between such high occupational exposures and adverse health effects, such as asbestosis, lung cancer and mesothelioma. Current government standards for occupational exposures have been in effect since 1976. The permissible exposure limits in these regulations (and those which have been proposed) are based on numerous studies carried out by a large number of scientific experts commissioned by the government and by private institutions and are directed towards protecting the health of workers.

The question of whether there is a health risk associated with the presence of asbestos in schools and public and commercial buildings is relatively recent, having been first identified in the mid 1970's (Sawyer, 1975; Nicholson, 1975; Sawyer, 1977; Nicholson, 1978). Today, the question of risk to occupants within buildings containing asbestos remains unresolved.

GRACE believes it is essential that the government, the scientific community, and industry work together to assess the important public health question of asbestos in buildings. We also believe all parties must recognize both the complexity of the issue and the difficulty in determining the appropriate course of action. We must avoid wasting significant resources removing asbestos from buildings where the risk is minimal or nonexistent. Above all, we must avoid taking actions which would result in increased risk, when the intent is risk reduction.

Given the complexity of the issues, it is imperative that EPA take the necessary time to seek out the viewpoints of a broad spectrum of medical and scientific experts to address the issue in a thoughtful and open manner.

II. SEIU PETITION

On November 16, 1983, Mr. John Sweeney, President of the Service Employees International Union (SEIU), AFL-CIO, on behalf of the 750,000 members in his Union, submitted a petition to the Environmental Protection Agency for "asbestos in the schools rulemaking." In the petition, SEIU requested that EPA fulfill its commitment and initiate a rulemaking to establish:

a. Requirements for corrective action where a hazard has been found to exist;

b. Standards for the determination of where hazards requiring correction exist;

c. Standards for the performance of abatement activities, including standards for the protection of those performing the abatement activities,

d. Rules for inspection and abatement in other public and commercial buildings.

GRACE agrees with the overall intent of the Service Employees International Union (SEIU) petition. Its concern for the health of its members and for occupants of buildings is understandable. In particular, SEIU's concern about the conscription of its members in removal programs is well founded.

We believe that the definition of realistic contamination and hazard criteria is the most important benefit which could result from the EPA information gathering and rulemaking process. Presently, the nation's school systems have insufficient criteria to guide them in decision making, often resulting in inappropriate actions.

SEIU also petitioned that standards for the performance of abatement activities be established. Such standards, crucial to protect workers during maintenance, remodeling, and abatement, are required. However, worker protection is more appropriately within the jurisdiction of OSHA and, therefore, should not be subject to EPA rulemaking.

While being generally supportive of SEIU's petition, we do not join with them in questioning EPA's commitment to the subject. We believe that EPA has shown dedication in addressing the question. It is quite understandable that EPA has not been able to develop a general rule that would be appropriate for all situations. In fact, practically every situation differs in terms of both physical and temporal factors. Important factors in determing the presence of an existing or potential hazard are: building design and use, types and condition of materials present, and very importantly, whether the material in place is presently emitting, or may in the future emit asbestos at unacceptable levels.

EPA is well aware that the evidence for concluding that a health risk exists is virtually non existent, and the cost of unnecessary action is wasteful and potentially dangerous. Further, we believe EPA recognizes that without assuring quality workmanship, the health of SEIU members and school occupants may be put at unnecessary risk as a result of some abatement actions.

We strongly believe that the question of asbestos in other public and commercial buildings should be dealt with separately from the issue of asbestos in schools. Public and commercial buildings are substantially different from schools in design and use, population characteristics, and types of material used. These factors all result in a significantly lower risk than one could possibly postulate for schools.

III. ASBESTOS IN BUILDINGS

Asbestos has been used extensively in buildings. Construction materials that contain asbestos include floor tile, asbestos pipe and sheet, textured paints, coatings and sealants, asbestos reinforced plastics, textiles, paper for roofing, insulation, fireproofing, lagging, and acoustical materials.

There are a number of classification systems for asbestos containing materials in buildings. A useful method for classification is by the following four general functions:

1. Thermal insulation, including pipe insulation and lagging on equipment such as boilers and heat exchangers.
2. Ceiling applications, including exposed acoustical treatments.
3. Fireproofing on structural steel.
4. Other materials, including floor tiles, Transite, and textured paints.

Each of these materials can be further categorized by consideration of their potential fiber release, primarily a function of material matrix characteristics.

Thermal insulation includes pipe insulation and lagging on equipment such as boilers and heat exchangers. These materials are normally most prevalent in boiler rooms and mechanical spaces, although they can be found on distribution lines as well. Intact and undamaged thermal insulation does not pose a contamination risk. While capable of being damaged and releasing fibers into the atmosphere, the damage is generally localized, results in minimal fiber release and can be repaired by simple techniques. Wholesale removal of thermal insulation is potentially hazardous and unwarranted.

Ceiling treatments include asbestos-containing materials that have been applied to ceilings to provide an acoustical or decorative function. These exposed materials are susceptible to potential damage and disruption, either inadvertent or intentional. It is essential to consider the differences among the types of ceiling materials to estimate the potential for fiber release. Highly friable fibrous material requires little pressure or force to crumble and release fibers. Cementitious material, on the other hand, has a relatively high cohesive strength and is not considered friable by most experts. It requires significant force to crumble and release fibers. These differences are important not only for estimating susceptibility to damage but also are significant in selecting an appropriate control technique. Wholesale removal of ceiling materials is potentially hazardous and unwarranted.

Structural steel fireproofing is applied to beams, columns, and floor sections to prevent deformation and structural failure during a fire. This material is generally above suspended ceilings or behind walls, is not usually accessible and is not subjected to damage from occupants. It can however, be subjected to disruption during maintenance or renovation and to damage from water. In the case of cementitious (as opposed to fibrous) fireproofing materials, there is much evidence [including Nicholson, (1975) under contract to the EPA] which shows that cementitious fireproofing materials do not contribute to elevated levels of asbestos fibers in the building environment. It is clear that the control actions for cementitious fireproofing materials should differ from actions which may be appropriate for fibrous fireproofing. Wholesale removal of steel fireproofing is potentially hazardous and unwarranted.

Other materials, such as Transite sheet, floor tiles, or textured paints do not contribute to airborne contamination under normal conditions. These materials will, however, release fibers if abraided or machined.

It is important to distinguish the difference among these applications and materials as both the potential for fiber release and the selection of control technique will be dependent upon material use, location, and matrix characteristics. This concept, of course, has been stressed by EPA, (EPA, 1979, 1983). It is, however, important to restate the concept. In some cases, totally safe materials have been incorrectly treated as hazardous resulting in inappropriate abatement action.

IV. CONTAMINATION EVALUATION TECHNIQUES

GRACE strongly believes in the necessity for the development of more quantitative evaluation criteria and for the establishment of standards for determining where hazards requiring correction exist.

At present, EPA provides no methodology to produce quantitative data for evaluation of contamination or hazard potential within a structure, or for comparisons among structures.

The use of both inspection and air sampling for this evaluation is essential to enable the building owner to determine whether or not a problem exists and, if it does, to separate existing problems from potential problems and to allow priority setting for control procedures. Air sampling will allow the building owner the opportunity to arrive at a quantitative measure of the current fiber levels. Rating systems can be used to arrive at a quantitative measure of potential fiber release. These values may then be compared against values which are used for risk assessment allowing a judgment to be made as to whether or not a hazard exists.

Both methodologies were initially endorsed by EPA and should be reinstituted.

Since the major mode of exposure to asbestos is the inhalation of airborne fibers, the most significant environmental parameter is the concentration of airborne fibers in the environment of those potentially exposed. Reportedly, there are two general difficulties in air sampling. The first involves the problems associated with sampling airborne particulate contamination from intermittent release. The second is the complex set of restrictions of the presently available technologies of measurement. (Thompson, 1971; EPA, 1978, 1979a).

Despite its limitations, air sampling is the only technique presently available which can determine whether an unacceptable airborne concentration exists. Therefore, it must be used as part of the hazard evaluation protocol.

Improvements in methodologies of air sampling which can minimize these limitations are presently under study for both optical and electron microscopy. These include new sampling methods with higher volumes of sampled air and a definition of the minimum number and location of samples.

Rating systems are an approach to evaluation of a complex process involving fiber type and aerodynamics, material characteristics, structural effects, and human activity. Such systems assign quantitative (numerical) values to qualitative evaluation factors. Rating systems ideally provide predictive information (EPA 1979a, 1979b; Ferris, 1978; Brandner, 1980; Lory, 1980; Pinchon, 1982; DOE, 1980).

Rating systems have been found effective in providing numerical characterizations for communication, data collection, guidance in contamination control requirements, and priority ranking for control action. However, present rating systems are in great part subjective and are subject to variation among different observers who assess the condition of materials.

These rating systems can be improved by providing a consistent method of quantitation for the qualitative rating factors listed in the EPA Guidance Document (1983). This would provide a great increase in the value of the assessment system. Further improvements can be effected by providing an evaluation service by a cadre of trained experts that could increase the objectivity of the rating system, and provide continuity of staffing and informed inspectors.

Use of a quantitative rating method will appropriately complement air sampling techniques by providing a methodology for determining if a potential hazard exists and, if done properly, will aid in providing information and establishing priorities for the appropriate control or monitoring efforts.

Considering both the capabilities and restrictions of present evaluation methodologies, hazard estimation should include both air sampling and some form of quantitative inspection. Either methodology is inadequate if used alone. Used together, these assessment methods will provide information on both present, real-time levels of demonstrable contamination, if they exist, and predictive information on contamination potential. Such a scheme of assessment is mandatory in this complex situation.

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V. RISK ASSESSMENT MODELS

It is widely acknowledged in the scientific community that the question of exposure to low levels of asbestos in schools relates solely to whether or not there is risk of mesothelioma, a rare form of cancer.

Mesothelioma is the least understood of the diseases associated with asbestos exposure and the mechanism for carcinogenisis in humans from asbestos is unknown. Further, it is the disease on which the least information on dose response data exists.

It is this lack of data on mesothelioma which has led EPA to rely upon risk assessment models in addressing low levels of asbestos contamination that may be present in schools. While the use of risk assessment models may be necessary in the absence of data, it is this same absence of data and lack of knowledge of the carcinogenic mechanism which makes reliance on the numbers generated by these models perilous.

It is imperative that such risk assessments, written specifically for policy makers, be thoroughly understood. Unless the limitations are recognized, the numerical results may be erroneously accepted in their entirety and this will likely result in faulty (and perhaps counter-productive) policy.

Several models for the mesothelioma risk associated with low levels of exposure have recently been completed including one for EPA (Nicholson, 1983).

The limitations of these models, i.e., selective use of studies, non recognition of differences in fiber types, lack of dose-response data, assumptions of linearity, rejection of threshold values and the limits of extrapolation are outlined below.

Selective Use of Studies

There are a number of studies (31) which measure the incidence of mesothelioma in exposed populations and all of these are for high occupational exposures. None of the risk models, presently published, use all of the data which are available from all of these studies, with the attendant consequence that valuable information has been overlooked. For example, the model done for EPA (Nicholson, 1983) considers only eight of these studies and, in fact, uses only four to estimate the dose-response curve. All of the eight studies were on fiber types other than chrysotile (the primary fiber type used in schools), including the four used for the quantitative model. Even these latter four had no quantitative dose-response data.

There are eight epidemiological studies of six populations with exposure solely to chrysotile. In three out of six[a] cohorts studied, no cases of mesothelioma were found in a total population of 5087 despite chrysotile exposures well above current occupational levels. In the other three cohorts, only 13 cases were found in a studied population of 13,933

(a) McDonald et al (1980), Rubino, et al (1979), Thomas et al (1982), Weiss (1977), McDonald, et al (1984), McDonald and Fry (1982).

who had high levels of occupational exposure. These studies support the conclusion that chrysotile has very low mesothelioma potency at occupational levels. At levels that might exist in buildings, there is no evidence to support any mesothelioma potential for chrysotile. This information has not been considered in the risk model constructed for EPA.

Risk of death from mesothelioma is different for different fiber types, exposures in different industries, mixed populations, varying ages, and different exposure intervals, to name a few variables. All valid information must be used in order to discriminate among these variables. The risk assessment models now available, based on selected studies, are an average of biological gradients for mixed fiber types as well as an average of the other variables and are meaningless when applied to specific situations. As a result, these models do not provide policy makers with the information needed to make sound decisions in situations involving a discrete fiber type, population or type of exposure.

Differences In Fiber Types

Of the several mesothelioma studies used in risk modeling, all are based on crocidolite, amosite or mixed-fiber exposures. However, chrysotile is the primary fiber found in the school setting.

There is no evidence to support the position that the crocidolite and amosite model in humans will hold for chrysotile. The stability of chrysotile in the human host and its size, shape, and respirability are different than for the other types of asbestos fibers which were used in the risk models. The following table shows the different mesothelioma mortality for different fiber types based on 25 of the 31 studies done to date:

Mesothelioma and Fiber Types: 25 Cohorts Consolidated[a]

Type of Asbestos	Number of Studies	Deaths all causes	Mesothe-lioma	Proportional mortality (per 1,000)
Chrysotile Only	6	5,520	12	2
Amosite Only	1	528	14	35
Crocidolite Only	3	403	43	107
Chrysotile w/ crocidolite and/or amosite	15	10,235	398	37
All Studies	25	16,686	467	28

The above table suggests that there is a large difference in the potency of various fiber types with chrysotile being by far the lowest.

(a) Adapted from data presented in Occupational Lung Disease edited by J. Bernard L. Gee, W. Keith, C. Morgan, and Stuard M. Brooks. Raven Press, New York c 1984.

Fiber Dose

Dose is all-important in the estimation of lifetime risk for mesothelioma. Accurate dose-response data are crucial for the development of a useful risk model. The exposure data in all of the studies used are, at best, good guesses. Measurement of airborne fibers in the 1940's, 50's and early 60's were either non-existent or they were made with techniques which do not correlate well, if at all, with existing measurements.

Exposures which were measured in the past were measured in terms of millions of dust particles per cubic foot of air rather than fibers per milliliter of air. Today, because sampling technology is different, a conversion factor must be used to compare those measurements in yesterday's workplace with those of today. No good conversion techniques exist. The various studies use different conversion factors, none of which is reliable. To further confound the problem, measurement techniques for low level exposures (nanograms per cubic meter) are different from the two mentioned above and again no good conversion factor exists.

Linearity

All models assume that the dose-response curve is linear. While data at the observed levels may be linear, errors in quantification and measurement can make a dose-response curve look linear when, in fact, it may be curved. There are too few data points and too many gross assumptions to conclude linearity.

Virtually all of the data used today, representing past exposures, have been estimated from present or near-recent exposure measurements. Additionally, there are important differences in even a single exposure index. A 100 fiber-year/ml value can represent an exposure of 50 f/ml for 2 years as well as an exposure of 2 f/ml for 50 years. It should be intuitively obvious that these identical numerical values, which are derived from two distinctly different kinds of exposures, must have different risks associated with them. The risk associated with a 100 fiber year exposure from a 2 f/ml dose for 50 years, must be significantly lower than the risk from a 50 f/ml dose for 2 years.

This would imply that the dose-response curve is non linear. Cumulative exposure (duration x intensity) is an average term which, in most studies is a good guess which may have limited biological applicability.

Threshold Estimates

All of the models assume there is no threshold level for mesothelioma risk from asbestos. Data from Hobbs (1980) for crocidolite exposure, Seidman (1979) for amosite exposure, and Jones (1980) for mixed exposures (crocidolite/chrysotile) show that there were exposure categories within which there were no deaths from mesothelioma. Exposure in these circumstances is described in a time frame of months, and deaths from mesothelioma are related to number of deaths per thousand person-years. Of significance are the observations by Seidman, who found no mesothelioma in workers with exposure of less than 2.2 months duration, by Jones, who found no mesotheliomas in workers with exposures of less than 5.0 months duration, and by Hobbs that mesothelioma did not occur in exposures less than 3.0 months duration. These data, in fact, support the concept of a threshold level for mesothelioma induction.

The EPA Study uses a dose estimate of 35 f/ml for the above-mentioned amosite factory (Seidman). Using a 10-hour workday and a 20-day month (the years are 1941-1954), the 2.2 month exposure computes to 15,400 fiber-hours/milliliter (f-hr/ml) (the equivalent of 7.7 fiber-years/ml). A person would have to be exposed to the nearly highest measured level (0.01 f/ml) of asbestos in schools (Constant, 1983) for 1700 years to receive the same cumulative dose. And, of course, the primary potential exposure in schools is to chrysotile, a different fiber, which as discussed previously appears to have a signficantly lower carcinogenic potency for mesothelioma.

Limits Of-Extrapolation

Even for the fibers on which the risk models were based (i.e. crocidolite, amosite, etc.), extrapolation beyond the "measured interval" by many orders of magnitude, is statistically perilous, and therefore, should be scrutinized before use in policy making.

For "response" at low levels to asbestos in the non-occupational setting, the author of the EPA report states that there may be great uncertainties in the calculation. He suggests that the risk values must be "viewed with caution as they are uncertain and aspects of them are necessarily based on estimates that are subjective to some extent because of limitation of the data." Therefore, extrapolation from high occupational asbestos fiber levels to much lower ambient levels further increases the unreliability of dose-response models.

Applicability to Exposed Populations

Risk assessment models do not attempt to take into account either the segment of the population exposed or the distribution of exposures for the population. Without careful analysis of these factors, one might erroneously conclude that the risk relates to the entire population at one level of exposure. This, of course, is not the case. According to EPA estimates, about 10% to 12% of the schools have any asbestos-containing materials of potential concern. Even these schools have different materials in different conditions and have different levels of airborne fiber. Risk assessment for policy making must take into account the population exposed and the varying degree of exposure for even that population.

Given all of the limitations outlined previously, it is likely that any estimate of the mesothelioma risk based on these models is a gross overstatement of the risk from asbestos in schools. Further, the available data strongly suggests that the risk, for all practical purposes, is non existent and certainly non detectible.

If risk assessment models are to be used in the absence of data, then the limitations of the method should be known before they are taken into account by policy makers. The shortcomings must be appreciated, understood, and improved upon before the regulatory machinery is set in motion. As fiber levels approach the values observed in ambient air, where no risk has

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been demonstrated, then prudence dictates that premature, potentially risky, and certainly costly action should not be undertaken.

VI. COMMENTS ON CONTROL PROCEDURES

The selection of the appropriate control action method depends on a number of factors including surface complexity, material condition, structural integrity, cost, and building destiny. EPA has considered four techniques for the control of asbestos-containing materials in school buildings. These are removal, enclosure, encapsulation, and management. Control methods can be used separately or in combination, and each has attendant advantages and disadvantages. (EPA, 1979a).

Asbestos removal has become the most popular abatement methodology in schools. It should, however, be the alternative of last resort. It is clearly the most expensive and disruptive and presents the greatest health risk to both the involved removal workers and building occupants. Although removal is considered by some as the method by which asbestos and exposure risk is eliminated from a building, improper or poorly contracted work may contaminate areas of the building and air plenums or other air supply systems precipitating new and protracted high levels of exposure. It is the abatement procedure with the greatest attendant risks. The potential for contamination in removal projects is emphasized in EPA Guidance Documents. Under some circumstances, this contamination can actually produce health risks which did not exist prior to the removal process. It is only after all other control methods and strategies fail to control emission that removal should be undertaken.

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On the other hand, leaving the asbestos-containing materials in place and implementing an appropriate management plan will usually result in the least health risk and certainly the least cost of any of the alternatives. Unnecessary material disturbance is prevented, and both anticipated and unexpected disturbance is controlled to minimize contamination. Management functions include:

1. Personnel instruction and work restrictions to minimize unnecessary or inadvertent disturbance of asbestos-containing materials.
2. Control and containment of contamination if disturbance is necessary for anticipated repairs, maintenance, or renovation.
3. Control of contamination resulting from unexpected events.
4. A continued monitoring of the results of the control program by periodic audit and environmental sampling.

As to the other abatement alternatives, enclosure does cover the asbestos-containing material to prevent material disruption and movement of fibers into the occupied environment (EPA, 1979a.).

Encapsulation can rapidly and effectively seal friable surfaces, prevent fiber release by fallout, and provide a level of protection against disturbance. The more complex the surface, the more attractive will be encapsulation as a control method. Encapsulation can be a particularly effective method for cementitious surface treatments when needed (EPA, 1979a, 1981).

An example of an approach using each of these techniques is the City of New York and how it dealt with the issue. Of the more than 1,400 school buildings in New York City, 240 reportedly required immediate abatement procedures (Smith, 1980). Materials were found in different situations so that abatement procedures, work practices, safety precautions and abatement techniques ranged considerably. Multiple abatement techniques were used in single buildings.

Using the N.Y. City school example, EPA has witnessed a management control program with significant applicability to the national situation.

VII. SUMMARY AND RECOMMENDATIONS

1. There are a variety of asbestos-containing materials used throughout school buildings in the United States. These materials differ in use, application, and physical integrity. Each has significant differences in fiber release potential and compatibility with different control methodologies.

   In light of this, we recommend that the EPA guidelines and rulemaking establish criteria which distinguishes and fully recognizes those important differences.

2. Contamination evaluation methodologies are currently deficient because quantitative information is lacking.

   Methodology must be introduced to provide a numerical, quantitative basis. The methodology should incorporate a standardized rating system, air sampling, and asbestos fiber counting by electron and optical microscopy.

3. Risk assessment used in current policy making deserves particular focus. The variance in the models, based on poor and/or unavailable data, combined with extrapolation over several orders of magnitude yield estimates which are likely to be grossly inaccurate. The lower carcinogenic potency of chrysotile asbestos must be taken into account for effective policy making.

We recognize the need for such risk models in the absence of data. However, it is imperative that such risk assessments, written specifically for policy makers, be thoroughly understood. This is not so much for the numbers produced but for what the numbers actually mean, how they were arrived at, the basis for their use in the calculation, and their limitations. Re-evaluation of old models is mandated and new models must be based on the data most relevant to the situation being addressed.

4. Decisions on abatement are currently being made without benefit of quantitative supporting data, and without integration of hazard criteria with risk assessment thereby resulting in inappropriate action, particularly unwarranted removal.

We recommend that EPA establish quantitative hazard criteria based on air sampling and a quantitative rating system. These hazard criteria should be integrated with risks estimated from new risk-assessment models to develop a decision matrix or decision tree for use in local decision making.

5. The risk associated with the fact that asbestos exists in construction materials commonly found in schools is minimal, and clearly no crisis exists. On the other hand, given the drive towards wholesale removal by inadequately trained contractors, it is likely that there will be a greater unfavorable health impact from continuing this course of action rather than doing nothing. Clearly, asbestos removal should be the option of last resort since the attendant risks to both abatement personnel and occupants very likely exceeds potential risks of leaving materials in place.

We would recommend that in order to minimize the risk, EPA should require that requests for removal be approved by EPA after EPA establishes that: (1) removal is necessary based on the risk evaluation; (2) adequate specifications for contamination control and worker protection are defined; (3) contractors have satisfactory performance records and; (4) worker acceptance criteria are established.

We strongly recommend that a moratorium be established on the removal of asbestos until EPA has established appropriate guidelines as outlined above.

6. We strongly believe that the question of asbestos in other public and commercial buildings should be dealt with separately from the issue of asbestos in schools. Public and commercial buildings are substantially different from schools in design and use, population characteristics, and types of materials used. These factors all results in a significantly lower risk than one could possibly postulate for schools.

We would urge that EPA direct its resources to resolving the questions concerning asbestos in schools before considering programs for other buildings.

Respectfully submitted,
W. R. Grace & Co.

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