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PLAINTIFF'S
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Act Controlling Hazardous Pollutants

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1. The Act is designed to control the discharge of hazardous pollutants to the atmosphere to protect the public. Mercury, beryllium, and asbestos are specified as hazardous pollutants. Webster's Dictionary definition of asbestos is the basis for the mineral fibers considered to be asbestos.
2. The vermiculite deposits at Libby have tremolite interspersed with the other gangue material and some of this tremolite at times is intermingled with the vermiculite. The tremolite is found in two forms -- as hard ore and crystalline fibers. Tremolite is one of the six mineral fibers defined as asbestos. Considerable information has been collected and a great deal is known about the health hazards of chrysotile and crocidolite fibers, the two principal mineral fibers in commercial use. Tremolite is not used commercially and little study or knowledge is available concerning the health hazards of this mineral.

The vermiculite deposits in South Carolina are quite different from those at Libby. The deposits occur in relatively small pods widely scattered. Many of the deposits contain no tremolite fibers with the other gangue material associated with the vermiculite. Those deposits which do have some tremolite will generally contain the material in such minute quantities that it is not easily recognized as being present. Even then it is usually found only in the bottom layers of the specific deposit.

3. Tremolite fibers are removed along with other gangue material during the beneficiation process at both South Carolina and Libby. At South Carolina the beneficiation process is more efficient than at Libby. The vermiculite concentrate purity averages between 94-95%; Libby 87-91%.

The South Carolina process is an all wet process; Libby is part dry and part wet. The wet process is far superior as a means of separating tremolite fiber books and fibers from the vermiculite. As a final step in the beneficiation process the vermiculite concentrate is graded into different sizes by flowing the material dry over vibrating screens. This is referred to as the dry screening step and the equipment is in a separate building called a dry mill. Air sampling tests for tremolite fibers in the South Carolina dry mill show time weighted averages below the 1975 standards.

This is indicative of the minute quantities of tremolite fibers associated with the vermiculite concentrate after the beneficiation process is complete at South Carolina.

Because of the greater amount of tremolite found in the Libby vermiculite deposits and the poor efficiency of the beneficiation

process, a new mill has been constructed at Libby at a cost of \$8,000,000. Extensive research work was also carried out to develop a new beneficiation process, including development of new equipment which would make a cleaner and sharper separation between the vermiculite and the gangue material. This process is very specific as it relates to the separation of tremolite and vermiculite. This new mill is currently going through a mechanical check-out in preparation for start-up. Trial runs with solid material will be made by the end of May. Operational shake-down and training of operating personnel should take place in June and the new facility is expected to be in operation in July.

We cannot be certain of the final average level of trace amounts of tremolite that will be present in the vermiculite concentrate until the new mill is in production and operating at design capability, but we are expecting to approach the South Carolina levels. An all wet process is being used. There are no grinding circuits that break up tremolite books into fine fibers. Separation circuits are designed to separate tremolite books from vermiculite. Other circuits using the principles of surface chemistry and specialized equipment are very specific in separating tremolite fibers and vermiculite.

4. To control emissions of hazardous pollutants in the atmosphere that could endanger the general public, the Act can be divided into two general categories:

- A. Emissions to the atmosphere from fixed or stationary sources which are enclosed, and
 - B. Emissions to the atmosphere which are not fixed and not enclosed.
- A. To establish standards and controls covering the first category the Act
- (1) Selects 9 types of manufacturing industries considered the most likely to be polluting. All others are excluded. (We are one of the 9.)
 - (2) An emission is only considered to be a hazard from one of the 9 types of manufacturers if the emission is visibly detectable without the aid of instruments and contains asbestos particulates. Visible emissions from other manufacturers that contain asbestos particulates are permitted. However, I am told that even at one of our plants had no visible emissions an EPA inspector who believed we had asbestos with our vermiculite had the right to enter our plant, conduct air sampling for asbestos in the plant from the stack, and take samples of ore for testing. If as a result of any of these tests a tremolite fiber was found we would be found in violation of the Act for processing hazardous pollutants.

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- (3) A visible emission which contains asbestos particulates must have a pollution control device of a type specified or of equivalent efficiency. Any asbestos particulates which pass through this device are acceptable. No standard is established because no one knows how to measure such air streams in a manner that would make it possible to set a standard. Furthermore, the fibers passing through would differ depending on the level of fibers occurring on the intake side. A manufacturer with a dust collection system on a process using 20% asbestos would emit to the atmosphere an entirely different level than a manufacturer such as ourselves using South Carolina ore which contains no reliably measurable quantities of tremolite.
- (4) Since no standard is set for the asbestos particulates that can be discharged, either in visible or invisible emissions, there is no reasonable basis for deciding whether control devices are needed. If we sampled the air stream emissions from an expanding furnace and found 1 fiber of tremolite in an hour we are required to have an approved pollution device. This level is possible with present South Carolina ore. On the other hand, a manufacturer using commercial asbestos as a part of his process could be emitting significantly greater amounts and not be in violation.
- (5) Since any fibers of tremolite in the air stream no matter how small from a designated manufacturer place the firm under the control provisions of the Act, certain reports must be submitted even for those locations that have approved control devices. Additional reports are required for locations without control devices along with waiver requests to obtain time to install such devices.
- (6) The act of filling out such forms is an admission that you are processing a hazardous material.
- (7) The forms also request information of a type which is appropriate if you were using asbestos as part of the manufacturing process. For example: "Amount of Pollutant - Indicate average weight of the hazardous material named in Item 2 which enters the process in pounds per month (based upon the previous twelve months of operation)."

We haven't the vaguest idea of the amount of tremolite that may be part of the ore and only recently have we developed a test method that might through extensive sampling establish that it is under .2%, the better limit of any accurate, reliable

reproducible quantitative test method. We are still developing the test method and have not been able to carry out a sample test plan which would be representative of the tremolite level in either South Carolina or Libby ore. We are quite sure, however, that South Carolina ore will be far below any quantitative detectable limit and expect the Libby material from the new mill to be below.

(8) I believe our position should be that:

- a. We are not processing hazardous pollutants when using South Carolina ore and once the inventories of ore produced in the old mill at Libby are cleaned out of the system that we do not expect the Libby material to be a hazardous pollutant. We will set up a sampling plan to check out the Libby material from the new mill after it is on-stream. By that time we should have the test method development work far enough along to determine reliable quantitative levels.
- b. In the meantime, we will advise EPA that we have approved pollution control devices on 25 expanding furnaces, acceptable control devices on 5 expanding furnaces, compliance schedules with states and/or definite interval plans for installation on 13 additional furnaces, will establish schedules for equipping the remaining 10 furnaces. The last furnace would be completed by April 1975.
- c. The Act permits the administrator to approve waivers for compliance up to two years. He may impose additional conditions during the waiver period to assure protection of the health of persons during this period. Since no standard is set for allowable asbestos particulate emissions other than the use of a control device, there is no basis for the ~~administrator~~ or ourselves to determine whether the emissions are unduly hazardous during the waiver period. Consequently I don't see how he can impose other conditions, what such conditions might be, or make a judgment to require less time except on an arbitrary basis.

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B. To establish standards and controls covering the 2nd category -- emissions to the atmosphere that are not fixed and not enclosed.

- (1) The Act states - "EPA considered the possibility of banning production, processing, and use of asbestos or banning all emissions of asbestos into the atmosphere, but rejected these approaches." ---

"For example, demolition of any building containing asbestos fireproofing or insulating materials would have to be prohibited as would the use of materials containing even trace amounts of asbestos which could escape into the atmosphere." ---

"Taking both these considerations into account, the Administrator has determined that, in order to provide an ample margin of safety to protect the public health from asbestos, it is necessary to control emissions from major man-made sources of asbestos emissions into the atmosphere, but that it is not necessary to prohibit all emissions."

- (2) The means of control utilized is one of prohibitions of certain materials and certain operations because --
"These means of control are required because of the impossibility at this time of prescribing and enforcing allowable numerical concentrations or mass emission limitations known to provide an ample margin of safety."

- (3) Five operations were selected as major sources. Two of these are demolition and spraying.

- (4) To control emissions during building demolition, the Act specifies certain work practices which must be followed and covers all industrial and commercial and houses having more than 4 dwelling units, if the structure was fireproofed with asbestos-containing material or contains friable asbestos material. No standard however is established or definition given for an asbestos-containing material or a friable asbestos material. The material could contain 5% asbestos, 10% asbestos, or 1 fiber and the material would be classified as a hazardous source requiring special precautions during demolition. The Administrator must be notified 20 days in advance before demolition of such a structure.

- (5) To control spray emissions, materials containing more than 1% asbestos may be sprayed to insulate or fireproof equipment or machinery but emissions to the outside air are prohibited. In other words, spray operation must be enclosed. Spray-on materials containing less than 1% asbestos used for insulation

and fireproofing may be used without enclosure. Spray-on materials containing either over 1% or under 1% asbestos but are not materials used for insulation or fireproofing may be sprayed even though there are emissions to the outside atmosphere. All other materials are considered to not represent major sources and are excluded.

- (6) Any operator who intends to spray asbestos materials to insulate or fireproof buildings or equipment, whether over 1% and enclosed or under 1% and not enclosed, must report such intention 20 days before commencement of spraying operation. As with building demolition no standard or definition is established for an asbestos material. The required could be imposed for a material containing 10% asbestos, 0.9%, or a few fibers that represented a 0.001% if such could be quantitatively determined.
- (7) As a result, there is an inconsistency present throughout the entire Act of the grossest magnitude: no control over numerous uses, numerous materials, numerous manufacturers and extreme control of 2 uses (insulation and fireproofing), 1 use method (spraying), and the materials so used if the most minute amount of asbestos is found in the material.
- (8) The reporting provision is most onerous as a safe procedure to be certain of compliance. The dangers and hazards of asbestos have been so widely publicized and in many cases so over-exaggerated that the suggestion of even very small amounts of asbestos could bring on all types of unpredictable results. The packages must be labeled to state material may contain asbestos. This could lead to requiring the same statement on all packages containing vermiculite. Workmen could refuse to use the material. Application contractors or general contractors, or architects, or building owners, or any combination thereof, could decide not to use the material.
- New York City, Philadelphia, Chicago, Milwaukee and other cities currently have a ban on the use of spray-on materials containing asbestos. T4 and MX5 are now being used in these cities because neither contain commercial asbestos additives. Accepting the principle or literal reading of the Act that small amount of contaminant constitutes an asbestos-containing material could result in banning its use in these cities.
- (9) The public would be seriously injured by removing from the market a material proven to be the best fireproofing material so far developed. Competitors might dispute this but efforts are being made to duplicate it. There are also architects,

contractors, and insurance underwriters who also support the greater reliability of the product both from a control during application as well as performance in a real fire. The opportunity for a choice would be removed from the marketplace as essentially only one other type material would be available; mineral wool. The dry spraying of these materials causes gross fall-out and air pollution. How certain is EPA that this may not represent some type of health or property hazard. Furthermore, it is highly unlikely that the other product is available in sufficient quantity to meet the market demand in the near future.

- (10) Air filter tests on job sites using M13 which contained 12% commercial asbestos showed that this wet slurry or cementitious sprayed material produced fiber counts within present standards in the work area. How could a material of this type even containing 1.0% asbestos represent a hazard to the general public.
- (11) The Act points out that it did not completely prohibit the spraying of any material containing asbestos because they did not wish to --

- "(1) Prohibit the use of materials containing only the trace amounts of asbestos which occur in numerous natural substances,
- "(2) prohibit the use of materials to which very small quantities of asbestos are added in order to enhance their effectiveness, and
- "(3) prohibit the use of materials in which the asbestos is strongly bound and which would not generate particulate asbestos emissions."

It further states -- "The promulgated standard applies to those uses of spray-on asbestos materials which could generate major emissions of particulate asbestos material."

It seems to me that these stated intentions rule out the necessity to consider or define our material as being an asbestos-containing material in violation of the Act. I say this for three reasons:

- a. ^{At every} It contains trace amounts ^{if any} as does occur with numerous other natural substances;
- b. The asbestos ^{if any} is bound to other materials with the wet slurry spray method; and
- c. The standard does not apply to our wet spray-on material because major emissions of particulate asbestos material cannot be generated.

I would also agree that the reporting requirements if applied to a material of this type would have the effect of prohibiting the use because of the reasons stated above.

In effect an interpretation of the reporting requirement which would require us to have applicator report is inconsistent with the basic intent and stated purpose of the Act.

- (12) The Act also refers to an electron microscopy test method which has been developed by independent laboratories. It states this test is accurate within $\pm 50\%$ and costs \$300 to perform. The purpose for selecting a test method was to have a control tool which would make it possible to determine whether a material being sprayed contained asbestos. It is not clear from the Act how this tool will be used. It would be used to determine whether a material contains over 1.0% asbestos in order to insure that violations of this type do not occur. It could also be used to identify percentages below 1.0% in order to enforce the control reporting provisions as opposed to the prohibition provisions.

Some points need to be made regarding this test method. Our Dr. Duecker has reviewed carefully the electron microscopy test methods used by Johns-Manville. (They are one of the "five" independent laboratories selected by EPA to do testing for them.) He has personally had discussions with Dr. Leinewebber of Johns-Manville who is probably the top-most expert in the use of this test method for analyzing asbestos fibre content. Dr. Leinewebber has stated that the degree of accuracy possible is not $\pm 50\%$ but rather one of an order of magnitude error. That is if the test resulted in a calculation showing 0.1% asbestos, the accuracy would be either 1.0% or 0.01%. As a result, an answer from the test of 0.2% could mean there was as much as 2.0% which means the test is not even suitable to determine reliably whether the material contains over 1.0%. To overcome this problem Dr. Leinewebber uses xray spectrophotometry to determine the upper limit. He checks another sample of the same material with this test which he claims has an accuracy of 0.3%. As a result, taking the example of the electron microscopy test saying the material contains 0.2%, after checking on the xray equipment and determining the upper limit was 0.3%, he would use that number. However, if the xray test showed no detectable level, he would then conclude that the material contained less than 0.3% but as little as 0.02%.

- a. There are further problems connected with electron microscopy tests. We asked Dr. Leinewebber to run 4 samples for us and the cost of doing so. The cost is \$675 per sample rather than \$300.

- b. Sample preparation is lengthy and extremely critical.
- c. The sample is very small, making it extremely difficult to be satisfied it is a truly representative sample of the material.
- d. Operator technique is very difficult to standardize, both from a sampling preparation point of view and also in operating the electron microscopy.

The magnification is 30,000 times. The operator must scan the grid to determine the parts that have a suitable field for analysis. He is then supposed to randomly select six grids where fibers are sorted out and counted. Considerable operator error can occur based on the selection of the suitable field for random selection. Since the operator is supposed to be looking for fibers, he could settle on those grids that have fibers. By so doing, he has completely destroyed the random selection so necessary. It is unlikely that for materials with small amounts of asbestos fiber separate independent laboratories could get similar results.

- e. Because of the very high cost of such testing, the ability to run two or three samples from a single bag of material in order to have a representative average is virtually prohibitive.

- (13) The x-ray spectrophotometer test method which we have developed when employed with the machine that has an electronic counter can be accurate at the 0.2% level. This test in our case would pick up both tremolite platelets and tremolite fibers. To establish which, the sample must then be checked under an electron microscope to determine whether it is fibrous or not. This test is much less costly -- approximately \$30 per sample. It uses a larger sample and scans a greater portion of it which improves the reliability. Sample preparation is less complicated; there is less chance for operator interpretation; it is much more likely to be reliable and reproducible by independent laboratories. It will not, however, identify the fibers below the 0.2% limit.

This method requires the calibration for each of the various asbestos fibers. The accuracy is dependent upon the strength of signal obtained for each fiber, i.e., chrysotile, crocidolite, tremolite, etc. The lower accuracy limit noted above applies to a particular tremolite fiber calibration developed at A. D. Little. This accuracy limit could change with other fibers and even with the same fiber from a different source. More development work is needed with the x-ray spectrophotometer test method but it offers the ability to result in an accurate, reliable, reproducible test method.

- (14) For the reasons previously outlined irrespective of the limitations and inadequacies of the electron microscopy test method, I believe we should take the position that our MK4 and MK5 does not contain asbestos within the intent or terms of the Act and that we would not expect to report its use as so containing. However, without taking this position I would further argue that the electron microscopy test method is not a suitable method to be utilized as an enforcement tool to require reporting of materials containing less than 1% asbestos.

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