FILE NAME: Weyerhaeuser (WEY)

DATE: 1968

DOC#: WEY005

DOCUMENT DESCRIPTION: Unpublished Internal Report

WEYERHAEUSER COMPANY

ASBESTOS PROCESSING PLANT

MARSHFIELD

OCCUPATIONAL HEALTH ASPECTS

Asbestos in the three principal geologic forms used commercial, and silica sand, have been known to be specific health hazards for years. In spite of an extensive and continuous concern on the part of occupational health personnel, those with responsibility for environmental health cannot agree on how serious a problem these dusts create. It is recognized to be a more complex problem than when disabling pneumoconiosis was first recognized. The increased incidence of lung cancer in these workers has been proven but this type of malignancy is shown to occur only in workers exposed to asbestos fiber who smoke. Recently, strong medical evidence has developed that rare pleural and peritoneal mesotheliomata occur with greater frequency in people working with crocidolite and amosite. A neighborhood environmental threat has been indicated when younger persons living near - but not working in - asbestos plants developed these same rare malignancies of pleura and peritoneum.

Asbestos will continue to be a basic material in modern economy. . The Weyerhaeuser Company decision to develop industrial fabricating processes requires us to adopt a respectful awareness of actual and potential health hazards to workers and neighbors. This dictates the necessity for a continuous and knowledgeable application of stringent occupational health controls. The present Threshold Limit Values may

not be low enough to prevent future development of asbestos, unless proper selection and control of workers is practiced. Prudent management requires us to eliminate all possible sources of exposure to asbestos by complete control of dusts within the plant and to control all factory effluents containing asbestos wastes.

Our engineering plans have been designed in recognition of the need to provide absolute and total dust control in the plant and in the plant external environment. The possibilities and probabilities of mechanical failures and errors of operation permitting accidental dust release require that personnel protective procedures be carefully followed.

The following comments are minimal practices if future extremely expensive health damages to employees or neighbors are to be avoided. These minimal requirements should be considered as a basis of further discussions with local management for development of detailed protective programs and procedures.

I. PRE-EMPLOYMENT SCREENING OF EMPLOYEES

Supervisory and hourly employees must follow some occupational health protective routine. The extremely high risk of lung disease requires that all employees adhere to protective practices. Any Weyerhaeuser Company employee who will not do so, or for any reason believes they cannot do so - should be promptly transferred or dismissed. Plant hiring practices must establish this as a basic condition of employment made positive and clear to organized labor as well.

Supervisory personnel shall be informed of occupational health hazards of asbestos and silica, and shall properly instruct hourly employees in the need for consistent and constant use of personal protection provided.

A. All employees shall have special pre-employment physical examinations after a careful critical interview screening by the employment office. This pre-employment screening shall supplement questions on Form 658 with a detailed and recorded chronologic employment history designed to identify all previous exposures to lung irritating dusts.

TABLE I

OCCUPATIONS POTENTIALLY ASSOCIATED WITH PNEUMOCONIOSES

(See next page)

cussed briefly—vegetable dusts, dust-pneumoconiosis, and chemicals—in illustration of specific knowledge available as well as concepts underlying the problem of recognition. Possible diagnoses and work operations associated with the dusty trades are presented in Table III.

Vegetable Dusts

Several disabling pulmonary entities are related to the inhalation of vegetable dusts. But accurate assessment of respiratory disease among farmers and in the textile industry in the United States has been prevented by two obstacles: (1) ignorance of potential hazards on the part of physicians and (2) current attention to the harmful effect of cigarette smoking. Nevertheless, a few syndromes of importance in diagnosis and correct treatment can be identified.

All textile workers come down with short bouts of so-called Mill Fever when they first enter the industry. The headache, malaise, fever (to 103°), cough, and sneezing they suffer until "acclimatized" are due to a non-

*TABLE III
Occupations Potentially Associated with Pneumoconioses

ALUMINUM PNEUMOCONIOSIS
- Fireworks maker
- Ammunition maker

ASBESTOSIS
- Asbestos weaver
- Auto mechanic
- Brake manufacturer
- Carpenter
- Clutch manufacturer
- Filter maker
- Floor tilemaker
- Insulator
- Lagger
- Mill worker
- Miner
- Roofer
- Shingle maker
- Shipbuilder
- Steam fitter

BARYTOSIS (barium)
- Barite miner
- Barite miller
- Ceramics worker
- Glassmaker
- Paint maker
- Rubber worker
- Well driller

BAGASSOSIS
- Cane worker
- Insulation manufacturer
- Papermaker
- Wallboard worker

BERYLLIUM DISEASE
- Alloy maker
- Bronze maker
- Ceramics worker

BERYLLIUM DISEASE
- Electronic tube maker
- Extraction worker
- Fluorescent lamp maker
- Metallurgist
- Missile worker
- Neon sign maker
- Nuclear energy worker
- Phosphor maker
- Propellent manufacturer
- Toxicologist
- X-ray tube maker

COAL WORKERS' PNEUMOCONIOSIS
- Coal miner
- Motorman
- Roof bolter
- Tipple worker
- Trimmer

"HARD METAL" PNEUMOCONIOSIS
- Abrasives maker
- Cutting tool worker
- Drill maker

KAOLINOSIS (clay)
- Brick maker
- Ceramics worker
- China maker
- Miner
- Papermaker
- Potter

SHAVER'S DISEASE
- Abrasives maker

SIDEROSIS (iron)
- Demolition man
- Fettler
- Horse cutter
- Foundryman
- Grinder

SIDEROSIS (iron)
- Metal worker
- Metallizer
- Polisher
- Scarfer
- Shipbreaker
- Welder

SILICOSIS
- Abrasives worker
- Bricklayer
- Brickmaker
- Ceramics worker
- Coal miner
- Diatomite worker
- Enameller
- Fettler
- Filter maker
- Foundryman
- Glassmaker
- Insulation worker
- Miner
- Motorman
- Polisher
- Sandblaster
- Shot blaster
- Stonecutter
- Stonedriller
- Tunnel driver
- Quarry man

TALCOSIS (certain talcs)
- Cable maker
- Ceramics worker
- Cosmetic worker
- Miner
- Papermaker
- Plastics worker
- Rubber worker

* Adapted from Tepper, L. B., Work History in Industrial Lung Disease, Seminars in Radiology, July 1957, Volume II, Page 236, with permission of author and publisher, Grune and Stratton.

Those with yes answers to 12, 13, 14, 35, 37 on Form 658 will be especially questioned as to the extent and severity of disease. This is important to help identify those with abnormal sensitivity to other lung irritations who may be especially susceptible to asbestos or silica dusts.

The chronologic history is important due to slow development of scarring and recognizable symptoms. Data indicates it requires 5 years to develop lung changes identifiable on x-ray.

After 5-10 years exposure to asbestos dusts 21% showed x-ray changes.

" 10-15 " " " " " 54% " " "

" 15-20 " " " " " 70% " " "

Over 20 " " " " " 100% " " "

Asbestos exposures at present Threshold Limit Values seldom develop malignancies in less than 30 years.

At present time 5 to 20 percent of all adult males have x-ray evidence of lung irritation generally related to previous disease or smoking.

(1) To identify these all employees must have a pre-employment chest x-ray with critical screening by a radiologist. This will be discussed with local doctors in advance to assure elimination of those with findings of previous lung troubles. This includes:

a. Pleural thickening

b. Emphysema or Asthma

c. Altered x-ray pattern of bronchial markings

d. Definite healed tuberculosis with large nodes or apical changes.

e. Increased vascular markings

f. Enlarged cardiac shadow

g. Marked bony deformity interfering with lung ventilation

h. Any evidence of previous lung disease or scarring

i. Chronic bronchitis

(2) The employees should be between 30-40 years of age at time of hire.

(3) No employee should be maintained in job over 10 years and preferable 5 years should be maximum.

(4) All employees must have pre-hire medical examination to include:

Chest x-ray

CBC and sputum examination

Timed Respiratory Ventilation Study

Persons who are now smokers will not be hired for work in mineral fiber.

The pre-employment examiner shall keep in mind that a respirator shall be worn at work and so appraise face and nose configurations and physiology.

(5) All employees should have respiratory function test done by trained person every 6 months. A Company plant nurse would be best to do this and other medical controls on these workers.

(6) All employees exposed to dust fibers in regular work will have 14 x 17 chest x-ray annually. These pre-hire and periodic x-ray films will be permanent property of Weyerhaeuser Company and permanently stored at Marshfield operation for 5 years after known death of employee or 10 years after termination of exposures to dusts.

(7) Absolutely no smoking will be permitted on mineral fiber plant site (the hazard is not of fire - but the greatly increased lung pathology, especially emphysema, chronic bronchitis and malignancies associated with this personal form of air pollution.)

(8) The Personnel Department or preferrable a plant R.N. will regularly check all absentee workers. Those off over one week with medical reasons referrable to respiration system must have clearance from M.D. for return to work. Those with chronic respiratory illness should not be kept on these jobs.

B. PERIODIC MEDICAL EXAMS

(1) All employees of plant - hourly and supervisory, must have an annual medical examination to include:

a. 14 x 17 x-ray of chest

b. Recorded Timed Vital Capacity analysis

c. Sputum exam for mineral fibers.

C. PERSONAL PROTECTIVE EQUIPMENT

(1) Each employee will have a personal respirator to be worn at all times in the prescribed dust hazard areas.

(2) These respirators must be of type with Bureau of Mines approval for exposure to asbestos and other pneumoconiosis producing dusts. This includes:

a. American Optical - R 2000
R 3000
R 6000 with proper filters

b. Bausch and Lomb - Bal Life R-20

c. Mind Safety Appliance - Dust Foe 77

d. Any approved type of air supplied hood under positive pressure of an air tank back pack or air hose connection type.

i.e. A.O. R-2099 Air Line Respirator

M.S.A. CS 85534 Air Line Respirator

CS 84283 " " "

It must be recognized that some employees will complain or will not, or allegedly cannot, wear effective respirators because of restriction of breathing by increased air flow resistance, excessive perspiration, discomfort and psychologic reaction to the cumbersome equipment. If a dust condition is temporarily excessive, these may use an air-supplied hood. The willingness and ability to wear respirators is a basic condition of the work.

At a recent conference on Respiratory Protection for Asbestos Workers in Cincinnati an ad hoc committee of concerned people was appointed to develop a better fitting, more comfortable respirator.

(3) An adequate respirator cleansing station will be developed with proper sanitizing facilities, with one employee designated responsible for all daily cleansing maintenance and dust proof packing of cleansed respirators. An ample supply of proper filters shall be furnished.

a. Personal respirators shall be available in a designated storage area at beginning of each shift.

(4) Company furnished work coveralls shall be worn at all times. These shall be tight fitting, wrist and ankle closures to minimize dust contact with body.

a. They shall be laundered regularly and so supervised to assure clean working clothes.

b. A washing machine and drier should be furnished in or near shower room and one worker assigned to duty of laundering Company furnished clothes.

(5) Each employee handling mineral dusts as routine part of his work shall be required to take a shower in plant wash room at end of shift, with 15-minutes time authorized for this change. Proper hand washing facilities must be available and used before each eating period.

D. PLANT PROTECTION

Complete control of generated dust must be made at all points of material handling or transfer. This includes:

a. freight car unloading

b. sack handling, palletizing, storage

c. bag emptying and bag disposal

d. formation of board

e. sawing and sizing of board, etc.

f. board storage.

All dust-generating points must be protected from spillage, breakage, erosion, etc. in such manner as not to contribute to air or water pollution of plant or community. The residual from industrial vacuum cleaning and/or flushing waters at all areas of dust must be enclosed and recirculated to avoid distribution of dust or external pollution.

Air dust control should be sufficient to avoid rafter dust settling. If not, or to correct accidental spillage, a regular frequent system of vacuum cleansing of rafter settling areas must be developed to control this source of air contamination.

E. ENVIRONMENT AIR SAMPLING

The accepted occupational health code for Threshold Limit of dust ore (millions of respirable particles/cu. foot air) per working day are:

Silica

Crystalline	5
Amorphous	20

Silicates (less 1% crystalline Silica)

Asbestos	5
Talc	20
Portland Cement	50

This is a very low level of permitted air borne dust material and to meet it requires a high degree of dust control. The efficiency of the ventilation systems and measure of control of mineral dusts by all housekeeping procedures must be measured by adequate air-borne dust counting methods. These have been discussed with Technical Center personnel and a program outlined to provide technically competent results on which to predicate additional health protection measures.

In the trial-run period all areas where men work must be adequately tested by dust counts to be certain of our control methods. After dust count tests indicate a stabilization of handling procedures and that all new plant problems have been adequately corrected, a regular sequence of dust counts must be scheduled.

The first repeat tests - barring unusual operational problems - should be at three months and regularly thereafter at 6-month intervals.

The goal of these efforts to control airborne dusts must be compliance with the Threshold Limit Values. When this is accomplished Weyerhaeuser Company should invite the Wisconsin Heath Department to make simultaneous counts so full assurance

may be honestly given all employees that appropriate and adequate occupational health protection is provided.

A continuous review of pre-employment examinations on new employees and of the periodic exams must be made by the Corporate Medical Director to assure management and employees that all known protection is being provided against this very hazardous material.

In-plant supervision must be clearly charged with responsibilities for providing protection that is known to be required in handling asbestos fibers.

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C. M. McGill, M.D.
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4/10/68