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SUMMARY OF EVIDENCE OF BRIAN M. MUNDAY

#. My home address is 5 Sligo Close,
Killarney Heights, Sydney.

#. My business address is Spruson &
Ferguson Patent & Trademark Attorneys, St.
Martins Tower, 31 Market Street, Sydney.

#. My formal qualifications are BSc
(HONS) DIC PhD.

#. I was previously employed by CSR
Limited and the positions held by me were
as follows:

1959 - Joined CSR.

1959-1962 - Full-time student at
University of Sydney; vacation
employment at CSR Pyrmont.

1963-1966 - Chemist at Central
Laboratory, Sydney, and at Sugar
Mills (CSR and other) in New South
Wales and Queensland. Analytical
and applied chemical research into
aspects of raw sugar quality.

1966-1969 - Postgraduate studies for
Ph.D at Imperial College, University
of London.

1970-1973 - Project Officer with the
Chief Chemists Department at CSR,
Head Office.

I was engaged in planning and budgeting for applied chemical research in sugar mills.

1973-1976 - Environment Officer.

I reported to the Chief Chemist. I was responsible for providing advice on legal requirements and legislative developments in all states and overseas. I developed and recommended standards of performance and planning assumption.

1976-1978 - Manager Environment and Occupational Health.

(Concurrently) 1978 - Industry Representative ASTEC Review Panel on Environment.

1979 - Manager, Environment and Occupational Health.

1980 - Manager, Environment and Occupational Health; Industry Representative AEC/CAI Steering Committee on Disposal of Hazardous Industrial Waste; Industry Representative NHMRC Industry Liaison Standing Committee.

N.B. AEC = Australian Environment Council (Federal Government).

CAI = Confederation of Australian Industry.

Dec 1980 - Posted to Japan and was President, CSR International, in Tokyo from Dec 1980 to Dec 1984.

1985-1987- General Manager.
Corporate Affairs CSR Ltd.

#. In 1988 I joined Spruson and Ferguson, Patent & Trademark Attorneys.

Environment and Occupational Health - CSR
Corporate Background 1970 - 1980

#. Mr Charles Davis (then Chief Chemist) was one of the forward thinkers in CSR in the early 1970's.

#. He was interested to identify emerging issues that might influence the activities of the company.

#. The focus was initially on external issues that may infringe on the company.

#. However, increasingly attention was also directed inwards to examine operations and practices in existence and what room there might be for improvements and avoidance of risk.

#. The attitude of CSR was seen to be generally positive and forward looking.

#. Action was taking place within a number of key areas of the company.

#. For example the appointment of a full-time corporate Environment Officer in 1972 (myself); study of various

environmental issues with the Sugar Division (eg water pollution abatement studies at sugar mills by Ian Burgess); occupational health in Wunderlich (asbestos and noise, Geoff Pickford and Arne Parts).

#. The focus on external environmental issues was gradually extended to the internal environment, occupational hygiene factors.

#. The developing Corporate attitude could be linked to similar developments in other areas.

#. For example, considerable attention was being given by the General Manager, Gordon Jackson to Corporate Planning.

#. Dr Barry Aldrich as Director of Corporate Planning established a formal planning system and extended the standard assumptions for planning beyond base economic assumptions to include environmental assumptions.

#. At the same time the General Manager was looking to more considered and enlightened management through a process of "industrial democracy" (Work by Jim Hennlingham and, for example, the Randwick Racecourse Meetings), having chaired the "Jackson Green Paper Committee" for the Federal Government in early 1970's.

#. Technical experts in CSR in the early 1970's were active in relevant organisations outside the Company (eg myself; Clean Air Society, Australian Water and Waste Water Association, Industrial Hygiene Committee of the National Health and Medical Research Committee; Geoff Pickford, national noise standards (Standards Association of Australia) (Australian Acoustical Society) and asbestos standards and measurement methods).

#. Formal planning by means of Planning Assignments were used to address potential issues in CSR in the 1970's. Largely I believe at the instigation of Charles Davis a Planning Assignment (No 48) was issued in August 1974 to look at the need to improve attention to industrial hygiene and occupational health matters within the CSR Group.

#. The Planning Assignment was issued under the signature of the Deputy General Manager, Jack Campbell.

#. A related staff circular was signed by an Assistant General Manager, Malcolm King, whose responsibilities included Personnel and the CSR Building Materials operations.

#. The Project was directed by a steering committee of:

Mr C.W. Davies (Chairman)

Mr J.F. Blaxland (alternate Mr I.G. Burgess)

Mr B.L. Brennan (alternate Mr J G

Mr N Tuffley (later Mr P J Field)

Dr B.M. Munday

Mr G C Pickford

#. The project team consisted of:

Mr V J Winley (Manager)

Mr O L Aubrey

Mr J H Elfverson

(All with tertiary technical qualifications and practical industrial experience).

#. This project was completed in "typically thorough CSR fashion" with a "walk through" survey of CSR establishments, discussions at all levels internally and discussions with known experts externally, both in Australia and overseas.

#. The program or work was carried out over the period January - August 1975 leading to a comprehensive final report "Occupational Health CSR - 1975" being submitted to General Management by C W Davis on September 1975.

#. I visited United States in connection with the project.

#. The United States had issued comprehensive Federal legislation in 1970 (Occupational Safety and Health Act and the associated Occupational Safety and Health Administration). This provided for a highly regulated standards-driven system. CSR was aware of this legislation, but its interest in occupational health and safety was proactive and preceded any significant legislative pressure in Australia.

#. An interesting reaction from overseas experts to the situation at the time in CSR was surprise that an industrial company of the scale of CSR did not employ a full-time medical expert.

#. Indeed little use had historically been made of medical consultants.

#. Subsequently and in the course of the project, significant use was made of external occupational health consultants.

#. For example, Professor David Ferguson, Professor of Occupational Health (a leading occupational health physician) and Mr Gersh Major of the School of Occupational Health and Tropical Medicine at Sydney University (a leading hygienist) were consulted.

#. They had a good insight into the actions and relative status of CSR in the area of occupational health at the time.

#. Arising from the recommendations of the project report on the Occupational Health Survey issued in September, 1975 an Occupational Health Policy was issued under the signature of M G King in May 1976, and widely distributed.

#. The policy was based on a system of self regulation. Compliance with the policy rested with divisional and functional management.

#. The policy was progressively implemented in practical terms.

#. For example, occupational hygiene factors were incorporated in the CSR Environmental Assumptions for Planning (Jan 1977).

#. Sugar Division had already employed a full-time Occupational health Officer from the end of 1976 (Dr Maurice Oxenburgh). A working policy designed to implement corporate policy, but specific to Sugar Division was issued in April 1977.

#. The Building and Construction Materials Division already had full time industrial hygienists prior to the issue of the corporate policy document.

#. (Geoff Pickford, Wunderlich Limited: Arne Parts, Building and Construction Materials Research Laboratories).

#. They were closely involved with the practical issues of noise standards and control and asbestos standards, control and measurement in CSR's building materials factories.

#. In 1976 a proposed Code of Practice for "Removal of Insulation Materials Containing Asbestos" was developed by the Corporate Department of Environment and Occupational Health, headed by myself, in consultation with the Environment Officer, Wunderlich (Geoff Pickford) and circulated for comment in 1977.

#. A final Code of Practice was issued in July 1979, (Hearing Conservation Guidelines were also issued and circulated at this time).

#. The Code of Practice did not call for the immediate removal and replacement of insulation materials containing asbestos.

#. Rather, damaged insulation warranted immediate attention and insulation materials containing asbestos were to be progressively replaced.

#. Asbestos containing materials were not to be used in the re-insulation of plant.

#. Under no circumstances should blue asbestos materials be used.

#. In the more general context of occupational health a paper on Occupational Hygiene Principles was also issued by Corporate Environment and Occupational Health Department in July 1979 and circulated throughout CSR.

#. The Occupational Health Report issued in 1975 did not recommend the appointment of a full-time occupational health physician.

#. However, this matter was pursued by myself and I was instrumental in the recruitment of the first full-time medical occupational health physician, Dr David Douglas, in 1979 (?).

#. I transferred from Manager, Environment and Occupational Health to become President, CSR International based in Tokyo in December 1980.

General

#. I consider that CSR would have been viewed as a front runner and relatively enlightened in respect of occupational health in the Australian context in the period considered.

#. Other well known corporations tended to concentrate in very specific areas e.g.

ICI (specific chemical hazards, MIM (noise and heat stress) James Hardie (asbestos hazards).

#. For CSR in this period, asbestos was a known hot issue, but not a driving issue.

#. "We thought we knew about asbestos and it was more a case of what else might be there".

#. Blue asbestos was recognised as a serious hazard.

#. White asbestos was not regarded so seriously.

#. No connection was recognised between white asbestos and mesothelioma.

#. The main hazard was seen as asbestosis and this was seen to be dose related and thus amendable to control by restriction of exposure, and measurement.

#. The aim was to reduce exposure by methods of work and monitoring.

#. The decision to phase out insulation materials containing asbestos was not regarded as a "rush job".

#. It should be noted that the National Health and Medical Research Council were still only in the process of developing standards at that time.

#. Also the CSR policies and practices were corporately and not union driven.

My Comments on Specific Documents

#. B.M.D. Investigation and Development Department document dated 14th February 1969 entitled "Asbestosis and Related Afflictions - A Literature Survey".

#. I was not involved in the preparation of this document. I was studying in London at the time.

Memorandum dated 20th February 1974 from me to Mr J.F. Blaxland.

#. As Environmental Officer and with the assistance of Mr Blaxland I arranged for Mr Gersh Major to give a talk on Occupational Health and Safety to various CSR personnel.

#. The talk was given on the 15th November 1974.

#. I prepared some notes from Mr Major's talk and they are attached to my memorandum of the 20th February 1974.

#. At that time the Building Materials Division of CSR owned and operated a number of factories where asbestos was used to manufacture building materials.

#. These included Wunderlich asbestos cement factories, a vinyl tile factory, and a Wunderlich Window factory where marine ply-board containing asbestos was handled.

#. At that time Wittenoom was the subject of occasional press (print and radio) comment but I was not specifically involved in matters relating to Wittenoom.

Memo of the 14th June 1974 - "Occupational Exposure to Asbestos"

#. This document was prepared by Dr B.M. Smythe who was the Manager, CSR Research Laboratories.

#. The Memorandum was prepared by Dr Smythe based on his review of the literature.

#. By "occupational exposure" I would have assumed that Dr Smythe was referring to occupations involving fairly constant work with asbestos, i.e. where asbestos was a raw material in the manufacturing process.

#. That is, work with asbestos which was a main part of the job, not intermittent work with asbestos-containing materials.

"Dust Committee" note of the 25th June 1974.

#. This was prepared by Mr M.G. King who was Chairman of the Committee.

#. Dr Rennie who is mentioned in Item 1 of the check list for the meeting of the 4th of July 1974 was a general physician engaged by CSR Ltd.

Memorandum 8th July 1974 from Mr A.A. Parts
to Mr A.V. Shaw

#. Arne Parts was a technical officer at CSR Building Materials Research Laboratories, Concord West.

#. He was involved in devising methods for dust measurement, and noise measurement.

Memo of the 12th July 1974 from Dr B.M.
Smythe to Mr M.G. King

#. The memo is headed "review of precautions taken throughout CSR on handling of asbestos" and notes that asbestos was handled on a commercial scale in three areas of CSR being:

The Wunderlich Asbestos Cement
Factories;

Vinyl floor tiles at Concord;

Gyprock jointing cements at Concord.

#. The factory at Rosehill was an asbestos cement factory.

#. Asbestos fibre (not crocidolite) was used in the manufacture of asbestos cement.

#. The dust sampling by personnel at Rosehill" involved the use of personal monitors.

#. By this method the air is brought in through a filter for a certain period of time and then measurement of the asbestos content is done microscopically.

#. Mr Geoff Pickford and Mr A. Parts were at that time assisting in the development of a standard method for dust counting.

#. It is quite a difficult task to measure the microscopic fibre because it involves distinguishing asbestos fibre from other components of the dust.

#. Only fibres in a certain size range are relevant.

Memo of the 12th July 1974 from Mr G.C. Pickford to Dr M. Smythe

#. This document was prepared by Mr Geoff Pickford who at that time was involved in dust sampling analysis.

#. As indicated in the memo he was working on "a Code of Practice on asbestos dust sampling/analysis".

#. Again, the memo prepared by Geoff Pickford dealt with factories where asbestos was being used in the manufacture of building products.

#. As mentioned in the memo, at that time chrysotile (and in some products, small amounts of amosite) were used in the manufacture of AC Products.

Memo of the 11th September 1974 from E.C. Ludowici to Mr M.G. King - Mr Ludowici was Chief Engineer of Building Materials Division

#. On that memo has been handwritten by Mr Charles Davis the following note:

"I think we have two very difficult decisions;

1. What standard to adopt;
2. Likelihood of long-term standard being zero".

#. This was an indication of the foresight of Mr Davis.

#. He was aware of the Occupational Safety and Health Act in America in 1970 and the work of the Robens Committee in the UK at about that time.

#. He foresaw that the uncertainty about safe levels of asbestos dust exposure might lead to a zero standard being adopted at some time in the future.

Memo of the 13th September 1974 from Mr G. Pickford "Standards for Asbestos Exposure".

#. In that memorandum is set out the standards of the British Occupational Hygiene Society, 1968 and the United States of America.

#. As regards the Australian Standard Mr Pickford says:

"Again, the BOHS hygiene standard was used as a basis by the Occupational Health Committee of the National Health and Medical Research

Council (NH and MRC).

However, after considering the nature of Australian working conditions, the generally shorter lengths of employment in the industry, the Council accepted the concept of 100 fibre year/ml and decided to base the standard on a 25 year exposure period (i.e. 4f/ml) instead of 50 years (2f/ml). This standard was published by the NH and MRC in their booklet "Atmospheric Contaminants" 1971 - pages 1, 2, and 14 are attached. At least, the NSW Department of Labour and Industry have adopted this standard in their "proposed asbestos regulations".

Memo of the 15th November 1974 from Mr M.G. King concerning "Occupational Health in CSR"

#. As is reflected in that memo I was a member of a steering committee appointed to survey occupational health practices and standards in CSR.

#. I participated in the work which was done to prepare the CSR Occupational Health Report of September 1975.

#. In the course of preparing this report a "walk through" survey of all CSR factories and premises was done.

#. This survey was carried out by experienced people who were looking for obvious hazards in the work place.

#. They were not concentrating so much on more subtle hazards.

#. During the course of this work I visited Dr Irving Selikoff in 1975, in New York.

#. My meeting with Dr Selikoff was brief (about 45 mins).

#. I believe he stated he was uncertain about mesothelioma risk from white or brown asbestos, but white asbestos was certainly safer than blue.

#. He was aware of the Wittenoom situation.

#. I did this mainly to get his ideas on Wittenoom and also to get his ideas on the dangers of white and brown asbestos in relation to its use in asbestos factories.

#. The survey did not concentrate on asbestos use in lagging in sugar refineries because it was not considered that there was any relevant occupational exposure to asbestos in sugar refineries.

#. Any exposure by maintenance people to asbestos in lagging would have been intermittent and not a main part of the job.

#. The exposure to asbestos in this type of job was therefore not considered to present a significant danger.

#. I recall that standards were based on 100 fibre-years/ml, and to respirable fibres, not visible dust.

#. There seemed to be a difference in philosophy between the USA and Britain as regards measurement of and compliance with minimum dust level standards.

#. The British approach tended to be more practical.

#. As regards the smoking issue, it would not have been appropriate at that time to take action to stop people who were working with asbestos from smoking.

#. This would have led to trouble with the unions and probably also on civil liberty grounds.

#. I do not know whether warnings were specifically issued to smokers working in the asbestos factories.

#. I am not aware of what was done as regards these employees.

#. On page 33 of the report table 1 shows the refineries and factories visited during the course of the survey.

#. The refineries are listed as numbers 1-6 inclusive and Cottessloe is listed as number 2.

#. On page 34 of the report the list of "industrial hygiene factors" is set out.

#. In none of the refineries was it considered that there were "pneumoconiosis producing dusts" or "carcinogens".

#. It was not considered that asbestos in lagging at the refineries constituted a significant health risk factor.

#. On page 49 of the report it is stated, inter alia, as follows:

"Chrysotile, the least dangerous of the asbestos group, is the major form of asbestos used in our present manufacture. It is used in the manufacture of asbestos cement products at the Wunderlich A.C. Factories at Gaythorne, Sunshine and Rosehill. Small amounts of amosite are also used. At all three factories exposure is less than the Australian standard of 4 fibres per ml. However, this standard is based principally on the avoidance of asbestosis. A regular program of dust and health monitoring is carried out at all three plants. A major conclusion of the IARC is that if exposure levels are low, there is no excess risk to workers of lung

cancer. A working party committee of the IARC is meeting in early December to update the monograph on asbestos. This is an example of the dynamic state of likely asbestos regulations."

#. I have seen a photocopy of page 49 of the report, which photocopy I was informed was provided by Messrs Slater & Gordon to Messrs Jackson McDonald.

#. In handwriting on the left hand side of the page appear the words "no longer true - update concluded "no safe level".

#. I do not recognise that handwriting.

#. It is not mine.

#. On page 76 of the report under the heading "carcinogens" is written:

"Tobacco smoking is claimed to synergise with other carcinogens, and should be taken into account in job placements."

#. Booklet headed "Your Health and Asbestos Dust" - 5th draft - 16th February 1976.

#. This booklet was prepared by asbestos cement industry people and ultimately issued (I don't know when) under the auspices of the Asbestos Association of Australia.

#. Geoff Pickford had a considerable input into this document.

#. The booklet represents the asbestos-using industry reaction to the concerns which were being expressed about asbestos and asbestos-containing products at the time.

#. I was not immediately involved in the preparation of this booklet.

#. I probably saw the document but do not recall it specifically.

#. I do not know what the distribution was.

#. A forward was written for this booklet by Professor Ferguson.

#. The abovementioned comments also relate to the 6th draft of the booklet dated the 25th February 1976.

#. Mr S.A. Gardiner who wrote the CSR internal correspondence of the 11th March 1976 was a public relations/communication officer.

#. Mr Browne to whom the correspondence was sent was the head of public affairs for CSR.

#. The words in hand writing "Not true!" against the paragraph "There is no risk of contracting disease by handling asbestos properly" could have been written by Mr Browne but I am not sure.

CSR Internal correspondence of the 4th June 1976.

#. I was a coauthor of this document addressed to Mr M.G. King.

#. It refers to the CSR proposed Code of Practice for the removal of insulation materials containing asbestos.

#. In the letter reference is made to asbestos regulations in Queensland and South Australia.

#. These would not have applied to Western Australia.

#. The reference in the correspondence to "most CSR factories" in the second paragraph is a reference to CSR factories other than asbestos cement and asbestos materials factories.

#. The reference to "major stripping of asbestos containing insulation" in the third paragraph would not cover the removal from time to time of asbestos containing lagging in a sugar refinery by a maintenance fitter/welder in the course of his ordinary work.

#. That would not be "major stripping".

#. The Code of Practice dealt with health risks generally from the removal of insulation materials containing asbestos.

#. It was intended that the proposed Code of Practice be foreword to the various CSR refineries and factories and I note that a copy was forwarded to the Cottesloe Refinery on the 19th July 1976 with a covering letter which in the second paragraph stated:

"The regulations are directed principally at circumstances where an individual is handling asbestos containing materials as a major part of his work. Where the handling of asbestos containing materials is done on an intermittent basis, as will be the case in sugar division factories, the regulations provide for the Chief Inspector of the Department of Labour and Industry in the respective State to suspend the operation of any part of the regulations. The regulations impose stringent requirements as to medical surveillance, local exhaust ventilation, etc and a failure to apply for an exemption may result in that factory contravening them."

#. As previously mentioned the regulations are a reference to those in Queensland and South Australia.

Letter of the 29th September 1976 from Associate Professor Michael Hobbs to Dr Smythe

#. Dr Smythe was the person who had contact with Associate Professor Hobbs.

#. I did not have contact with Dr Hobbs at that time although I did speak with him sometime later concerning the Wittenoom Trust.

#. I note that in the the "preliminary findings" prepared by Associate Professor Hobbs he states in the third paragraph as follows:

"Cancer of the lung, on the other hand, is the most common cancer in the general male population. It has moreover increased dramatically in the past 20 years and is known to vary widely with smoking habit and possibly with other environmental factors yet to be defined. In the absence of detailed information on smoking habits in both the asbestos employees and the general population, the exact risk attributable to asbestos exposure is difficult to determine. From the literature relating to this it is

clear that the risk of lung cancer is significantly increased in the presence of clinical evidence of asbestosis, but there is uncertainty about this in the absence of asbestosis. It also seems fairly clear from recent reports that there is a multiplicative effect between smoking and asbestos exposure."

#. The document headed "The Sugar Division Occupational Health Policy and Plan" of May 1976 was probably prepared by Dr Oxenburgh.

Letter of the 16th August 1977 from myself (Manager, Environment and Occupational Health for CSR) to Dr S.F. McCullagh of James Hardie & Co Pty Ltd.

#. In this letter I refer to a copy of the brief "comments" section from the latest IARC monograph on the Evaluation of the Carcinogenic Risk of Chemicals to Man: Asbestos (Vol 14) from the December 1976 meeting at the IARC.

#. That document concludes with the statement:

"At present, it is not possible to assess whether there is a level of exposure in humans below which an

increased risk of cancer won't occur."

This is a rather safe conclusion. What it is saying is really that science at that time could not provide a certain answer to the question of whether there was any "safe" level of exposure to asbestos or indeed to any other carcinogen, be it ionising radiation, sunlight, or tobacco smoke. In my CSR internal correspondence of the 19th August 1977 to Mr M.G. King I drew attention to the significance of the IARC monograph on the Evaluation of the Carcinogenic Risk of Chemicals to Man: Asbestos (Vol 14). I said in that memo:

"The working party concluded that all forms of asbestos, including chrysotile (white asbestos), are carcinogenic, and at present it is not possible to assess whether there is a level of exposure in humans below which an increased risk of cancer would not occur."

One of the recommendations which I made at the conclusion of this correspondence was the mandatory implementation of the CSR Code of Practice on removal of insulation material containing asbestos.

#. A revision of the Code of Practice was carried out and issued in October 1977.

#. The main changes made in the revision were in sections 1 and 2.

#. In paragraph 1.2 of the previous proposed codes it was stated under the heading "Health Risk":

"Asbestosis significantly increases the likelihood of lung cancer, particularly where the person is also a smoker."

#. In the proposed Code of October 1977 it was stated in paragraph 1.3 under the heading "Health Risks of Asbestos":

"Asbestos exposure significantly increases the likelihood of lung cancer, particularly in people who smoke."

#. In addition, in paragraph 2.3 of the October 1977 issue it was stated:

"The Code applies to situations in which removal or handling of

insulation materials containing asbestos constitutes a minor and infrequent aspect of any employees duties and either legislation does not exist, or the operations to be undertaken are not covered by, or have been exempted from, any existing legislative requirements.

#. By this paragraph it was intended to cover people who might become involved in the removal or handling of insulation materials containing asbestos from time to time.

#. It was intended to be applied in a common sense way.

#. The Code was not intended to cover relagging operations - see paragraph 2.6.

#. The type of work carried out by Mr Culkin at the sugar refinery in Cottesloe would have been covered by paragraph 7.1.2 under the heading "Personal Hygiene and Protective Clothing - Work Clothing".

#. That paragraph provided:

"7.1.2 - Where only very minor handling of asbestos containing insulation is required, for example in gaining access to a particular part of the equipment for maintenance purposes, the

requirement to supply work clothing may be deleted without prejudicing safe working conditions provided:

- (a) the insulation does not contain crocidolite;
- (b) the operation is not likely to result in the clothing or any part thereof becoming dusty; and
- (c) adequate dust suppression techniques are employed."