AUSTRALIAN INSTITUTE OF OCCUPATIONAL HYGIENISTS
CELEBRATING OVER 40 YEARS OF PROTECTING AUSTRALIAN WORKER'S HEALTH

AIOH submission

Consultation Regulation Impact Statement
Managing the risks of respirable crystalline silica at work

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Summary of our Submission

We would like to thank Safe Work Australia for the opportunity to provide a submission in support of this important work.

The recent epidemic of accelerated silicosis in stonemasons working with engineered stone is a devastating tragedy for those afflicted and their families. The re-emergence of silicosis results from a failure by some stakeholders to control exposure. It is our view that without significant government intervention, the Australian community can expect to see a continuing increase in the incidence of otherwise preventable workplace diseases associated with exposure to respirable crystalline silica (RCS).

We are concerned that the primary objective of government intervention has changed from the "*elimination*" of silicosis, as supported by the *All of Government* response to the National Dust Disease Taskforce Report to one of "*reduction*". The difference between "*reduction*" and "*elimination*" is significant.

There are options presented in the Consultation Regulatory Impact Statement (CRIS) that are likely to address part of the identified problem. Those options include **Option 4** (a national licensing framework for those working with engineered stone) and **Option 5a** (Additional regulation of high-risk crystalline silica processes for all materials including engineered stone) which are both supported by **Option 2** (National awareness and behaviour change initiatives).

However, these policy options only partially address the wider problem facing Australian employers and workers, resulting in an increasing strain on our public health system. The additional complementary options that are missing are:

1. Progressing the implementation of a ban on the use of high quartz containing engineered stone; and
2. The need for a Centre for Disease Prevention and Control, with a multi-disciplinary Institute of Occupational Health.

We outline in our submission, the need for other activities that are both crucial and complementary to those above, which include:

- The urgent need to increase the number of specialist resources to support the effective implementation of regulatory and non-regulatory options in each State and Territory health and safety regulator;
- Regulatory improvements to product labelling requirements; and
- The need for High Resolution Computerised Tomography (HRCT) as a mandatory minimum regulatory requirement for health monitoring.

We recognise that the economic analysis of policy options is required for due process, however, we note that placing a monetary value on human life is inconsistent with the objectives of government intervention. We raise concern that the cost modelling methodology does not consider the many other diseases that are known to result from over-exposure to RCS and therefore the estimates presented are a gross under-estimate of the true cost to Australia.

1. Introduction

The Australian Institute of Occupational Hygienists Inc. (AIOH) represents professionals working in occupational hygiene in Australia. Established in 1980, membership is open to both professional occupational hygienists and to those with an interest in worker health protection and a healthier work environment.

Our mission is to promote healthy workplaces and protect the health of workers through the advancement of knowledge, practice, and standing of occupational health and occupational hygiene. The AIOH is a founding member of the International Occupational Hygiene Association, and many Australian occupational hygienists are engaged in occupational hygiene research with international collaborators. As such, AIOH brings worldwide experience and insights on a range of occupational hygiene issues.

The recent epidemic of silicosis is a tragedy for those afflicted and their families. The re-emergence of silicosis results from a failure of some stakeholders to control exposure. As many lung diseases are serious and irreversible, the focus must be on prevention of harm. Thus, there is a need to assess the degree of exposure and evaluate the associated risk to health. This will require tailored interventions with layered controls, health monitoring and effective enforcement of regulations. Good occupational hygiene and the engagement of competent occupational hygienists are fundamental to making such improvements to the health and safety of our workplaces.

Occupational hygienists work to prevent illness and disease in the workplace, including the prevention of silicosis and silica-related diseases. Occupational hygienists routinely work in and attend workplaces where respirable crystalline silica (RCS) presents a significant risk to health. They undertake health risk assessments, they measure RCS exposure, they check whether control measures are in place and whether they are effective. Further, occupational hygienists provide training and education in RCS awareness and management, they consult with workers about the tasks that they're performing, and they report on findings and provide recommendations to employers to both comply with the relevant legislation and to keep workers safe.

The insight from occupational hygienists on what is happening 'on the ground' provides a unique and valuable perspective. Occupational hygienists have first-hand experience of the current management of RCS exposure in Australian workplaces, however there is scarce public information available on how effectively RCS exposure has been controlled across Australia. This is absolutely vital information to understand the potential effectiveness of future regulatory or non-regulatory interventions.

To support the Regulatory Impact Analysis, the AIOH External Affairs Committee developed a survey to gauge the expertise of occupational hygienists on the front lines on the management of exposure to RCS and the prevention of silicosis in Australian workplaces. The findings of that survey have been provided in an Appendix to this submission as evidence to support many of our statements. The findings of that survey were also presented publicly on the 18th of June 2022 via a webinar which can be accessed here https://www.youtube.com/watch?v=ZjLUzHAFSCE

Answers to Questions

Q2.1 Do you agree with the identified problem? Has the entirety of the problem been identified? Please provide evidence to support your position.

We generally agree with the problem definition provided in that it appropriately identifies that:

a) Workers in a broad range of industries are at risk of silicosis and silica related diseases;

b) Worker exposure to RCS results from a lack of understanding of the risks and the current regulatory requirements to ensure the health and safety of those working with silica-containing materials; and

c) There are inadequate levels of compliance and enforcement with the current model WHS laws.

In addition to the evidence provided in the CRIS to support the problem definition, we provide the AIOH Survey[1] to support the above statements which found that:

- Workers in engineered stone, construction and tunnelling, and mining and quarrying are at risk of over-exposure to RCS.
- There is a low level of awareness among some employers of the risks of exposure to RCS.
- When air monitoring was conducted to assess exposure in comparison to the Workplace Exposure Standard (WES), hygienists report that in the main that "*some of the exposures exceeded the WES and there is the potential for higher exposures".*
- The effectiveness of compliance activities by the respective jurisdictional regulator was reported in the main to only be "*somewhat effective".*
- There is a need for increased enforcement by the inspectorate. Increased specialist resources are needed to undertake more inspections particularly in high-risk sectors. Increased compliance is needed on control measures, air monitoring, and health monitoring activities.
- While there is an element of lack-of-understanding of the risks and current regulatory requirements, the AIOH Survey demonstrated that more prescriptive regulations are needed that set out a practical and pragmatic approach.
- Occupational hygienists noted the need to move the focus towards control measures and control verification and that regulators need to work with industry to include specific control strategies into the legislation.
- Occupational hygienists noted the need for air monitoring to be specifically legislated for RCS and that there should be mandatory reporting of exceedances of the WES when personal air monitoring for RCS is conducted.

We also note that it is rare that RCS exposures are encountered alone without other agents. The presence of which can alter or contribute to the development of disease which may or may not be traditionally associated with RCS alone. Whilst the subject of the CRIS is focussed on RCS, it is critical that exposures to all health hazards are effectively controlled.

[1] Prevention of the occupational silicosis epidemic – What do those who assess workplace health risk think should be done now? – AIOH Member Survey 2022, Appendix 1

Q2.2 Do you have further information, analysis or data that will help measure the impact of the problem identified?

In addition to the AIOH Survey, we refer and are supportive of the following recent literature which provides additional evidence of the scale of the identified problem: Curtin University, "*The future burden of lung cancer and silicosis from occupational silica exposure in Australia: A preliminary analysis*"[2].

Q3.1 Do you agree with the case for government intervention? Please provide evidence to support your position.

The recent epidemic of silicosis represents a devastating tragedy for those afflicted and their families. The re-emergences of a diseases across high-risk sectors (once thought to be under control) is a failure by some stakeholders to control exposure. Indeed, Australian governments support the objective of the "*elimination of silicosis amongst workers and increased quality of life for those already impacted and their families"* .[3]

The Curtin University study predicted that 100,000 workers would be diagnosed with silicosis and up to 10,000 workers would develop lung cancer from exposure to RCS[2]. Without government intervention, the cost burden of that disease will be moved from employers under their existing obligations under WHS legislation, and onto the affected individuals and the public health system. Therefore, a federally coordinated response to government intervention is needed.

The case for government intervention is consistent with the view from occupational hygienists that the federal government needs to be engaged and to have a clear plan of how silicosis will be prevented in Australia[1]. Occupational hygienists have reported that Australian workers are being over-exposed to RCS, which is a significant cause for concern[1]. Increased government intervention is needed focusing on compliance with the Workplace Exposure Standard (WES), requiring exposure control, assessing continuing control effectiveness and reporting overexposures where they occur[1].

We note the reference to alternatives to government action included in the CRIS and we agree with the statement that, "*while these activities enhance awareness, they are unlikely on their own to result in the level of prevention of silicosis and silica related diseases that is needed".*

The AIOH is a non-government stakeholder which has undertaken activities and initiatives to raise awareness of the risks of exposure to RCS. In 2018 the AIOH launched the Breathe Freely Australia program[4] to enable readily available information for workers and supervisors about the hazards and prevention of lung diseases for construction, manufacturing, mining and engineered stone industries. The AIOH also initiated the RESP-FIT program in 2020[5], to support the continued protection of workers who rely on respiratory protection. These programs complement government, employer and worker programs, but cannot be the sole solution to the silicosis crisis.

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[2] https://about.curtin.edu.au/wp-content/uploads/sites/5/2022/07/FEFreport_formatted.pdf

[3] Australian Government 2022, *All of Governments' Response to the Final Report of the National Dust Disease Taskforce*

[4] https://www.breathefreelyaustralia.org.au/

[5] https://respfit.org.au/

Q3.2 Do you agree with the objectives of government intervention? Please provide evidence to support your position.

We only partly agree with the stated objectives.

The stated primary objective of government intervention is to "*reduce workplace exposure to RCS and the number of cases of silicosis and silica related diseases, and premature invalidity or death of workers".*

That is inconsistent with the objective in the response to the National Dust Disease Taskforce (NDDT) by the Australian Government which stated that their shared objective was the "*elimination of silicosis amongst workers and increased quality of life for those already impacted and their families"*[3].

The difference between "*reduction*" and "*elimination*" is significant. Further commentary on this is provided in our response to Question Q4.1.

It is our view that the objectives of government intervention must include the elimination of silicosis.

Q4.1 Do these options address the problem? Please provide evidence to support your position.

Some of the policy options presented are anticipated to reduce workplace exposures to RCS and thereby reduce the number of silica-related diseases. We provide evidence to support this in our answer to Question Q7.1. However, these policy options only partially address the wider problem facing Australian employers and workers. The additional complementary options that are missing are:

a) Progressing the implementation of a ban on the use of high-quartz containing engineered stone; and
b) The need for a Centre for Disease Prevention and Control, with a multi-disciplinary Institute of Occupational Health.

<u>Progressing the implementation of a ban on the use of high quartz containing engineered stone</u>

The National Dust Disease Taskforce Final Report[6] recommended that a regulatory impact analysis (RIA) be conducted to identify and decide implementation of measures that **provide the highest level of protection to workers** from the risks associated with respirable crystalline silica generating activities in the engineered stone industry. The Whole of Government's Response to the National Dust Disease Taskforce[3] stated that "*joint deliberate action is required from all levels of government, industry, unions and workers to drive change*". The stated objective was the "***elimination of silicosis*** *amongst workers and increased quality of life for those already impacted and their families" [emphasis added].*

The highest level of protection to workers in the hierarchy of control is elimination of the hazard. The AIOH notes duty holders under the Model WHS regulations[7] have a requirement in s35 to eliminate risks as far as is reasonably practicable as part of the hierarchy of control, a central tenant of Australian WHS law and practice. The CRIS discounts this option stating that a ban on engineered stone as infeasible. The reasons for not including a ban, in our opinion, are poor.

The AIOH, alongside other professional associations and stakeholders, including the Australian Institute of Health and Safety, the Public Health Association of Australia, the Australian and New Zealand Society of Occupational Medicine, the Thoracic Society of Australia and New Zealand, the

[6] Australian Government Department of Health 2021, *Final Report to Minister for Health and Aged Care, National Dust Disease Taskforce*

[7] SafeWork Australia https://www.safeworkaustralia.gov.au/sites/default/files/2022-06/model_whs_regulations_-_14_april_2022.pdf

Lung Foundation, the Cancer Council of Australia and the Australian Council of Trade Unions, support a ban of high silica manufactured stone[8]. This is further supported by recent research conducted by Curtin University whose modelling estimated that banning engineered stone would result in a reduction of 100 cases of lung cancer and approximately 1,000 cases of silicosis[2].

We now understand that delaying the decision to ban the importation and use of asbestos containing materials and the decision to prohibit the use of sand in sandblasting for example, had significant social and economic impacts on Australian society. Similarly, delaying a decision to ban the importation and use of high-quartz engineered stone is anticipated to have similar devastating impacts.

High-quartz containing engineered stone has toxicological properties that are distinctly and qualitatively different to that found in natural stone. Studies have indicated that engineered stone dust has particular properties which are likely to influence its toxicity. Both experimental and field studies have demonstrated generation of a high proportion of nanosized particles when working with engineered stone[9,10]. A recent experimental study reported that in addition to the high concentrations of very fine particles (<1 micron) emitted during cutting, that dust emissions from engineered stones had both larger surface areas and generally higher surface charge in comparison to natural stone[11].

The presence of very fine particles (<1 micron) and nanoparticles is important because it influences the effectiveness of control measures. In addition, nano size particles can more easily enter the body and have been associated with effects beyond the respiratory system such as autoimmune disease. The increased surface area and charge are also important factors relating to toxicity[11]. The types of tools used during fabrication and the quality of water (e.g. recycled water) used for dust suppression also influences the composition of the dust, such as the presence of a range of metals including iron, zirconium, titanium and aluminium[12].

Engineered stone contains epoxy resins as a binding agent. These resins may form a protective coating over freshly produced silica particles increasing their toxicity and have also been described in association with other occupational lung diseases including asthma and hypersensitivity pneumonitis[12]. Engineered stone is anticipated to contain many chemicals of special concern[13], some of which are the subject of current research[14].

Aside from the toxicological data, we raise concerns with the current limits of liability available by manufacturers. Caesarstone Annual Reports for 2020[15] and 2021[16] include declarations that their Australian product liability insurance coverage ceased, and it would not provide for any newly diagnosed silicosis related claims, therefore confirming that one of the largest manufacturers of engineered stone globally has not been able to obtain insurance for their product based on continuing liability associated with its use. In addition, at least one major insurance company has begun to implement policy exclusions to some exposed trades and industries in response to rising costs associated with claims[17]. This reinforces our concern of the recognition of the level of risk by

[8] https://www.parliament.nsw.gov.au/lcdocs/other/16959/Letter%20to%20Hon%20Kevin%20Anderson%20MP%20-%20Tabled%20by%20Mr%20Greg%20Donnelly%20-%2018%20March%202022.pdf

[9] Carrieri M, Guzzardo C, Farcas D, Cena LG. Characterization of Silica Exposure during Manufacturing of Artificial Stone Countertops. Int J Environ Res Public Health. 2020;17(12).

[10] Ophir N, Bar Shai A, Korenstein R, Kramer MR, Fireman E. Functional, inflammatory and interstitial impairment due to artificial stone dust ultrafine particles exposure. Occup Environ Med. 2019.

[11] Ramkissoon C, Gaskin S, Thredgold L, Hall T, Rowett S, Gun R. Characterisation of dust emissions from machined engineered stones to understand the hazard for accelerated silicosis. Sci Rep. 2022;12(1):4351.

[12] Di Benedetto F, Giaccherini A, Montegrossi G, Pardi LA, Zoleo A, Capolupo F, et al. Chemical variability of artificial stone powders in relation to their health effects. Scientific Reports. 2019;9(1):6531.

[13] https://www.epa.gov/trinationalanalysis/chemicals-special-concern

[14] Professor Graeme Zosky, https://www.utas.edu.au/profiles/staff/health/graeme-zosky

[15] https://s23.q4cdn.com/225400014/files/doc_financials/2020/ar/4c2d0fff-1d72-41d3-9b3f-4e1ba3fba95b.pdf

[16] https://s23.q4cdn.com/225400014/files/doc_financials/2021/ar/dac363be-01d1-48ce-bca2-d1f17603ea1f.pdf

[17] Financial Review, *IAG misses guidance, warns of pressure on margins* https://www.afr.com/companies/financial-services/iag-misses-guidance-warns-of-pressure-on-margins-20220722-p5b3pw

the business sector. Compliance with basic safety standards and correct use of personal protective equipment in the engineered stone sector is low[18] and continuing to use this product across our country puts workers at risk.

It is recognised that a ban of high quartz containing engineered stone does not address the problem of over-exposing workers in other industries. Evidence shows that approximately half workers with silicosis are from industries not associated with manufactured stone in the State of NSW as one example[19]. A ban should therefore be performed as a complementary activity to other policy options. It is not mutually exclusive to other options and should be performed in conjunction with the additional regulation of high-risk crystalline silica processes for all materials.

Centre for Disease Prevention and Control

The AIOH is firmly of the view that there is an overwhelming need for a multi-disciplinary *Institute of Occupational Health*, as part of a Centre for Disease Prevention and Control. An independent body is needed to provide timely and relevant information for decision makers on policy, conduct horizon scanning, conduct and coordinate research as referred to in the CRIS, and measure the effectiveness of interventions.

While the remit of Safe Work Australia includes the development and evaluation of the WHS legislative framework and the collection, analysis and reporting on WHS data, our experience has been that the level and depth of those elements on the issue of occupational health have been lacking. At present, there is no existing structure between Safe Work Australia, the Department of Health, and other agencies such as the Australian Industrial Chemicals Introduction Scheme (AICIS) or the Australian Border Force for example, to enable coordinated action and leadership.

Safe Work Australia state in the CRIS that the "*scope of the model WHS laws…could not prevent the importation of engineered stone into Australia*". This fails to reflect on one of the key functions of Safe Work Australia, being, "*to collaborate with the Commonwealth, the States and the Territories, and other national and international bodies, on WHS and workers' compensation policy matters of national importance"*[20]. A leadership role by Safe Work Australia is appropriately expected but is absent.

A multi-disciplinary *Institute of Occupational Health* could draw on the diverse expertise and knowledge of specialists including occupational hygienists, people who have worked in Australian workplaces, understand work practices, industry standards, engineering and other control measures and WESs. There are many international examples to draw from, including the National Institute of Occupational Health (NIOSH) in the USA. This accumulation and diversity of expertise does not appear to exist in Commonwealth agencies, such as Safe Work Australia.

The need for reform has been highlighted in discussions during the development of the National Silicosis Prevention Strategy (NSPS) and the National Action Plan (NAP), being led by the Lung Foundation Australia (LFA) [21]. The Strategy and Plan are recommendations from the NDDT Final Report to define the priorities and actions required to reduce the impact of silicosis on individuals, the community and the economy. The AIOH is represented on both the Expert Steering Committee and the Reference Group. Discussions have concluded that existing regulatory frameworks have not effectively protected people working with engineered stone and that reform is urgently required. They have also highlighted that government coordination required to address silicosis and other preventable workplace diseases, and that co-ordination is missing. The NDDT Consultation

[18] Kreitals, N, Weller, M, & Nand, A 2022, 'Industry change in the manufactured stone benchtop industry as a result of proactive compliance activities in NSW', in, Proceedings of the Australian Institute of Occupational Hygienists Annual Conference and Exhibition 2021.

[19] https://www.nsw.gov.au/sites/default/files/2021-08/nsw-dust-disease-register-annual-report-2020-21.pdf

[20] https://www.safeworkaustralia.gov.au/about-us/who-we-are-and-what-we-do#:~:text=Safe%20Work%20Australia%20is%20an,workers'%20compensation%20policy%20and%20strategies

[21] https://lungfoundation.com.au/advocacy/national-silicosis-prevention-strategy/overview/

Synthesis[22] outlined that a, "*whole-of-government integrated approach including national and state and territory governments across health and regulatory agencies is critical for success*".

Q4.2 Are there any other non-regulatory or regulatory options you think should be considered to address the problem?

Yes. We outline further options that should be considered below.

Increase in specialist resources to support effective implementation of regulatory and non-regulatory options

There is an urgent need to increase the extent of specialist resources to support the effective implementation of regulatory and non-regulatory options in each State and Territory health and safety regulator.

The AIOH Survey[1] reported that the most effective regulatory prevention strategy would be more specialist inspectors, with detailed knowledge of RCS assessment and control. Occupational hygienists reported that regulatory intervention was only "*somewhat effective*" and a greater focus on compliance with regulations was needed.

The scale of the problem is evident in Table 8 of the CRIS where the number of workplace visits and associated action with regards to notices issued is provided. That table shows a wide disparity of the frequency of visits to workplaces in each state.

As one example, there were approximately 255 manufactured stone facilities in NSW in 2019[23] while in comparison there were around half the number of facilities in Queensland around that same period[24]. The level of workplace visits undertaken in NSW however was an order of magnitude higher than the number performed in QLD. Similarly, the number of notices issued by the NSW Regulator was four times higher than that issued by the QLD Regulator. Other states had significantly fewer visits.

Despite the high number of workplace visits undertaken by the NSW WHS Regulator, less than 60% of manufactured stone workplaces received an inspection by the Regulator during 2020 to 2021[18]. It is evident that the structure of the respective State and Territory WHS Regulators, in terms of the number of specialist resources engaged at present, is insufficient to adequately intervene.

More than 80% of manufactured stone sites are small to medium sized businesses and the average number of workers at a manufactured stone workplace has been reported to be 4[23]. This is a different structure to other at-risk sectors such as construction and mining which are characterised by large organisations employing hundreds, and sometimes thousands, of workers likely with better understanding and application of health regulations and control measures. The level of effort involved in visiting hundreds of smaller workplaces in comparison to fewer larger workplaces is significant. While there have been increases to allocated funding to the inspectorate in some jurisdictions such as NSW[25], such increases are arguably still insufficient to enable effective intervention for all at-risk industries.

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[22] https://lungfoundation.com.au/wp-content/uploads/2022/03/Information-paper-National-Dust-Disease-Taskforce-Consultation-Synthesis-March2022.pdf

[23] Golder 2021, *Case Finding Study – Respirable crystalline silica exposure in the NSW manufactured stone industry* *https://www.nsw.gov.au/sites/default/files/2021-08/case-finding-study-respirable-crystalline-silica-exposure-nsw-manufactured-stone-industry.pdf*

[24] Office of Industrial Relations Workplace Health and Safety Queensland, *Findings report: Phase one audits of engineered stone benchtop fabricators in South East Queensland* *https://www.oir.qld.gov.au/sites/default/files/rti-200148-published-documents.pdf?acsf_files_redirect#:~:text=There%20are%20approximately%20130%20workplaces,the%20stone%20%2Dbenchtop%20fabrication%20industry*.

[25] https://www.aihs.org.au/news-and-publications/news/safework-nsw-hires-more-inspectors-boost-compliance

Regulatory improvement to product labelling requirements

Without the implementation of a ban of high quartz containing engineered stone, there is an urgent need to improve the availability and visibility of product labelling (e.g. label / Safety Data Sheets) across the supply chain to ensure data on silica content is readily available to inform both safety and customer behaviours.

Businesses use the Safety Data Sheet (SDS) to provide important information pertaining to composition, health risks and control measures. In the case of a complex mixture such as engineered stone, SDSs may provide inadequate information on overall health risks. A recent study compared empirically-determined mineral, metallic and organic resin content of 25 individual engineered products across six suppliers, with the corresponding SDS information[26]. Although the resin content for all engineered stone samples was within the SDS reported ranges for most suppliers, there was considerable variability in the crystalline silica content when comparing with supplier's SDS. Potentially toxicologically relevant metallic and mineral constituents were not reported. Only one of the six suppliers provided crystalline mineral content other than silica, and only two suppliers provided any information about metals. It has been reported that SDSs are not always available in the engineered stone sector[27].

Identifying the hazard for silica-containing products without an SDS is significantly more difficult. The current application of SDS for hazardous substances omits materials which if subject to additional processes can generate hazardous substances, so called "process-generated substances", which in Europe constitute the greatest source of worker exposure to carcinogenic substances[28]. The incorporation of requirements for the production and supply of SDS for process-generated carcinogens would in the main address inadequate information provision.

This was discussed at length during the 2021 review of the NSW Dust Diseases scheme which resulted in a recommendation by the Legislative Council that, "*the Minister for Small Business and Fair Trading advocate at the national level for a mandated, consistent format for product labels and safety data sheets for manufactured stone products*"[29].

Workers have a right to know about the hazards and risks associated with the products that they handle and work with. To address this, mandatory communication through multi-lingual product labels and SDSs for manufactured stone products must be provided. A national compliance campaign targeting towards chemical suppliers and SDSs for all RCS-containing products is also urgently needed.

High Resolution Computerised Tomography (HRCT)

High Resolution Computerised Tomography (HRCT) scans should be included as a mandatory minimum regulatory requirement for health monitoring.

The National Dust Disease Taskforce (NDDT) Final Report[30] recommended that a regulatory impact analysis (RIA) be conducted to identify and decide implementation of measures that **provide the highest level of protection to workers** from the risks associated with respirable crystalline silica generating activities in the engineered stone industry. The report stated that the RIA must consider, "*Strengthening the health monitoring requirements include contemporary methodologies such as low dose **high resolution computerised tomography (HRCT) scans**, and to cover **all workers** at*

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[26] Kumarasamy C, Pisaniello D, Gaskin S, Hall T. What Do Safety Data Sheets for Artificial Stone Products Tell Us About Composition? A Comparative Analysis with Physicochemical Data. Ann Work Expo Health. 2022.

[27] Gaskin S GR, Jersmann H, Pisaniello D. SWSA UoA Engineered Stone Benchtops Final Report for open access. Adelaide: The University of Adelaide; 2020.

[28] Olsson, A., and H. Kromhout. "Occupational Cancer Burden: The Contribution of Exposure to Process-Generated Substances at the Workplace." https://doi.org/10.1002/1878-0261.12925, MolOncol n/a, no. n/a (Feb 5 2021). Accessed 2021/02/17. https://dx.doi.org/10.1002/1878-0261.12925.

[29] NSW Legislative Council Standing Committee on Law and Justice 2021 Review of the Dust Diseases Scheme, Report 80 June 2022 https://www.parliament.nsw.gov.au/lcdocs/inquiries/2833/Report%20No.%2080%20-%202021%20Review%20of%20the%20Dust%20Diseases%20Scheme.pdf

[30] Australian Government Department of Health 2021, *Final Report to Minister for Health and Aged Care, National Dust Disease Taskforce*

risk of exposure to respirable crystalline silica" [emphasis added]. The all of government response supported that recommendation[3].

The National Guidance for Doctors Assessing Workers Exposed to Respirable Crystalline Silica Dust[31] states that, "*having identified at-risk individuals in the latency or lag phase of the disease, the minimum required activity as described by WHS legislation for health monitoring, may need to be augmented by other strategies. For example, the use of low-dose HRCT instead of an ILO chest X-ray (CXR) and the engaging the services of a clinical psychologist".*

During the development of the 2022–2027 National Silicosis Prevention Strategy (NSPS) and accompanying National Action Plan (NAP)[32], it was identified that General Practitioners needed support to use the *National Guidance for doctors assessing workers exposed to respirable crystalline silica dust with specific reference to engineered stone related silicosis.* Support mechanisms to date have not resulted in consistency.

A key recommendation from the 2021 Review of the Dust Diseases Scheme in NSW was for the NSW Government to ensure that all workers, former, current and future, exposed to RCS in the manufactured stone industry have been screened using HRCT[29]. The ACT Silica Dust Action Plan 2021 also identifies the need for HRCT scans. Legislation has already been passed in Western Australia for low dose CT scans to replace chest X-rays as the radiological screening test for occupational exposure to silica. This means that chest X-rays can no longer be used for this purpose.

HRCT costs more than a Chest X-ray. It is infeasible to expect employers, many of whom do not comply with existing obligations under the WHS Act, to voluntarily opt for a higher-cost method of health monitoring for their workers.

Q6.1 Is the cost modelling methodology appropriate to estimate the costs to industry and governments (Appendix D)? Please provide evidence to support your position.

The Value of a Statistical Life (VSL) estimates individuals' willingness to trade wealth for mortality risk reduction. While it is recognised that the economic analysis of the policy options is required[33] , placing a monetary value on human life is inconsistent with the objectives of government intervention.

Notwithstanding this, the cost modelling methodology does not consider other diseases that are known to result in over-exposure to RCS in addition to silicosis. Exposure to RCS is associated with a range of other respiratory and non-respiratory conditions including lymphadenopathy, Chronic Obstructive Pulmonary Disease (COPD), pulmonary fibrosis, sarcoidosis, lung cancer, Caplan's syndrome, pulmonary tuberculosis, rheumatoid arthritis, systemic lupus erythematosus, scleroderma, ANCA-associated vasculitis, and chronic renal disease[34]. Therefore the value for the average of life saved and illness avoided per person is an under-estimate.

Q6.2 Are the estimates of the number of businesses covered by each of the regulatory and non-regulatory options accurate? Please provide evidence to support your position.

[31] Australian Government Department of Health 2022, *National Guidance for Doctors Assessing Workers Exposed to Respirable Crystalline Silica Dust*

[32] https://lungfoundation.com.au/advocacy/national-silicosis-prevention-strategy/overview/

[33] Australian Government 2020, *Guide to Regulatory Impact Analysis* https://obpr.pmc.gov.au/sites/default/files/2021-06/australian-government-guide-to-regulatory-impact-analysis.pdf

[34] Rees DM, J. Silica. In: Newman Taylor A CP, Blanc P, Pickering A., editor. Parkes' Occupational Lung Disorders. Fourth ed. Boca Raton, FL.: CRC Press; 2017. p. 187-205.

We accept that these numbers are estimates. We cannot provide evidence to support the proportion of groups at risk, due to a lack of coordinated state or national exposure surveillance data. Notwithstanding, it is unlikely that these changes will apply to every business in each of the ANZIC groups noted in the CRIS, because of the different risk profiles associated with RCS exposure.

Q6.3 Are there other factors that should be considered in the assessment of the effectiveness of each option (Section 6.5)? Please provide evidence to support your position.

Multifaced approaches to the prevention of four key occupational diseases (including Occupational Cancer from silica exposure) were identified in a recent scoping review by Keefe et al[35] as being key to the effective reduction of disease. Common themes emerging from the work relevant to this submission included:

1. Health and safety outcomes were influenced by factors including regulatory frameworks, organisational and management structures, safety culture, worker engagement and empowered health and safety committees.
2. The impact of regulatory intervention depended on the presence or absence of a strong enforcement regime and mechanisms for keeping them up to date with scientific knowledge.
3. Current control technology was not being used to maximal benefit to reduce exposures. For many hazards, employers relied on respiratory protection, which shifted the onus of protection onto the worker.
4. A primary prevention approach that focussed on the elimination of exposures and adopting "prevention by design" principles should be a strategic goal rather than controlling exposure.
5. Effective disease prevention required a breaking down of silos between public health and occupational health sectors and treating work as a social determinant of health.
6. Multi-level sector-driven initiatives had a much better chance of success then traditional prevention initiatives.

Q6.4 Are the cost and other estimates (including worker wage assumptions) listed in Appendix D accurate and appropriate? If not, please provide additional data to support a more accurate estimate of costs.

Large businesses such as those in quarrying, mining, tunnelling, and demolition typically already perform and document risk assessments and risk control plans. Therefore the costs included in Table 29 under Option 5a and 5b are already borne by industry and not over and above existing established processes.

Similarly, large businesses in quarrying, mining, tunnelling perform geotechnical analysis of the ground conditions, including quartz analysis, as a routine risk control measure. Hence the cost of x-ray diffraction is not all in addition to existing established methods.

Occupational hygienists conduct air monitoring, as referred to in section 2.4 of the CRIS. The stated cost of *"$10,000 to $20,000 per experience*" in the CRIS is incorrect. The typical cost for an air monitoring assessment for RCS will range from $3,000 to $5,000 dependant on the number of workers assessed and the complexity of the workplace being assessed.

[35] Keefe AR, Demers PA, Neis B, et al. A scoping review to identify strategies that work to prevent four important occupational diseases. Am J Ind Med 2020;63(6):490-516. doi: 10.1002/ajim.23107 [published Online First: 2020/04/01]

Q6.5 Do you have further information regarding the costs to the public health system for silicosis and silica related diseases?

The Cancer Council of NSW[36] estimate the health system costs of lung cancer averaged $51,900 per incident case, with a range depending on age at diagnosis and survival rates.

The Canadian Occupational Cancer Research Centre estimates 570 lung cancers are attributed to occupational silica exposure each year, based on 2011 cancer statistics. That amounts to 2.4% of all lung cancers diagnosed annually in Canada. The cost of those cancers to the health system was estimated at approximately $562 million.

A retrospective population-based study of Italian hospitalisations treating asbestosis or silicosis in the period 2001-2018[37] showed silicosis consumed 3 times more resources than asbestosis, with longer durations of admissions for silicotics. The average annual costs were estimated at €3.78million and €10.1million for asbestosis and silicosis cases respectively. Hospitalisations of asbestosis and silicosis cases in North Carolina during 2002-2011 were examined by Dang[38] finding an estimated average state wide cost / year of USD$10.1 million for asbestos hospitalisations (average 500 / year) and USD $886K for Silicosis hospitalisations (average 44 / year). Both authors noting the importance of exposure reduction activities for these entirely preventable occupational diseases.

Aside from the direct costs of treatment, which may or may not end up in the public health system, the costs associated with psychosocial health and wellbeing impacts of the ill, and their families, are important additional considerations.

Q7.1 Which option or combination of the options presented is most likely to address the identified problem? Please provide evidence to support your position.

The combination of options that are almost certain to address the identified problem are:

- Placing an import ban on high quartz containing engineered stone; and
- The establishment of a Centre for Disease Prevention and Control, with a multi-disciplinary Institute of Occupational Health; and
- **Option 4** Implementation of a national licensing framework for PCBUs working with engineered stone; and
- **Option 5a** Additional regulation of high risk crystalline silica processes for all materials including engineered stone; and
- **Option 2** National awareness and behaviour change initiatives to minimise the risks of RCS exposure.

Evidence in support of Option 4 is as follows.

Further to the information already provided to Question Q4.2 regarding the need for increased specialist resources, we offer the following additional information:

A significant impediment to protecting worker health is the varied behaviour of engineered stone fabricators and, in some cases, the attitudes of the workforce. Some companies, particularly smaller

[36] Goldsbury DE, Weber MF, Yap S, Rankin NM, Ngo P, Veerman L, et al. (2020) Health services costs for lung cancer care in Australia: Estimates from the 45 and Up Study. PLoS ONE 15(8): e0238018. https://doi.org/10.1371/journal. pone.0238018

[37] Ferrante, P. "Costs of Asbestosis and Silicosis Hospitalization in Italy (2001-2018) : Costs of Asbestosis and Silicosis Hospitalization." Int Arch Occup Environ Health 94, no. 4 (May 2021): 763-71. https://dx.doi.org/10.1007/s00420-020-01637-z.

[38] Dang, G. T., N. Barros, S. A. Higgins, R. L. Langley, and D. Lipton. "Descriptive Review of Asbestosis and Silicosis Hospitalization Trends in North Carolina, 2002-2011." N C Med J 74, no. 5 (Sep-Oct 2013): 368-75.

enterprises, consider the costs associated with workplace monitoring, health surveillance and use of effective controls to be unacceptable and therefore avoid making changes that would entail cost. This has led to ongoing problems in these workplaces. Companies that have tried to manage dust exposures though implementing controls, workplace monitoring and health surveillance, have to pass on the cost to the consumer, which in turn makes their product less competitive. One fabricator has likened this situation to a sports team competing against drug cheats. Some workers do not comply with their employer's work and control systems such as, not wearing or incorrectly wearing respiratory protective equipment or using dry rather than wet cutting methods, such as when making adjustments to engineered stone articles on customers premises.

The marketplace for engineered stone benchtops should be a level playing field supplied by fabricators complying with regulations. Licensing will help establish a supply chain for developers and builders to engage reputable fabricators and not "backyard" operators. As a result of licensing, there is transparency with a list of registered fabricators for both the inspectorate to monitor and builders to engage for supply of fabricated stone bench tops from reputable companies. A ban on its use would be a simple way of levelling the playing field.

Evidence in support of Option 5a is as follows.

Option 5a includes the provision of results of air monitoring to the WHS regulator within 30 days of receiving reports. This is supported by the AIOH.

The existing system, of using disease notifications as a prompt to investigate safety standards relevant workplaces, is largely a moot point. As is evident from the NSW Dust Diseases Annual Report 2020-2021, more than 77% of workers diagnosed with silicosis were classified as having 'chronic' silicosis. The latency period between exposure and disease diagnosis for chronic silicosis can be more than 10-years. Many construction projects, and indeed companies, that existed 10-years ago are no longer in business. A more appropriate tool to use for regulatory intervention and predicting future trends in silica related disease is the establishment of a formal system to capture data on air monitoring and linking such to the specific control mechanisms in place, and the medical surveillance records of the workforce.

Unlike disease surveillance of any condition, exposure surveillance fills an important niche in occupational health because it identifies risks of ill-health, including long latency or chronic diseases, without waiting for the disease to manifest. It also allows for intervention and exposure reduction efforts to target interventions to locations already identified to be sources of exposure. In addition, it also removes any concerns of individual privacy in the reporting of health status. Exposure surveillance can also take into account the organisational context in which the exposure occurs — especially fixed industry versus mobile workforce such as construction, or on demand (gig) and freelance work etc[39].

This is supported by the AIOH Survey[1] which clearly highlights that with the exception of the mining and quarrying sector, the basic process of air monitoring is likely inadequate most of the time, and where air monitoring was performed, concerns were raised for exposures exceeding the WES.

The following examples of the need for this Option are presented as evidence:

1. The recent 2021 review of the dust diseases scheme in NSW appropriately concluded that, "*one vital control is regular monitoring that measures the concentration of dust in the air*"[29]. Two years earlier in 2019, that same review panel recommended that the NSW Government require all manufactured stone fabrication sites and employers to register with SafeWork NSW and to conduct regular air monitoring and provide the results. At the time, SafeWork NSW rejected that recommendation on the grounds that regulation already existed and that the implementation of a Code of Practice and continued scheduled visits were appropriate methods to address the issue of poor levels of compliance with air monitoring. Two years on and that has not been the case as

[39] Noah S. Seixas and David Wegman, (2019) Looking Upstream, Editorial, Annals of Work Exposures and Health, 2019, Vol. 63, No. 5, 485–487, https://academic.oup.com/annweh/article/63/5/485/5485363

evidenced by SafeWork NSW's own reports[18]. The lack of action by employers in conducting air monitoring resulted in the Legislative Council recommending that, *"the results of air monitoring are reported to SafeWork NSW when the workplace exposure standard is exceeded and immediate regulatory action is taken in response".*

2. SafeWork NSW are currently reviewing the Tunnels Under Construction Code of Practice (CoP). To support that work, SafeWork NSW have established an Advisory Committee with persons representing technical, industry, association and regulatory bodies to provide expertise on the content. The AIOH are represented on that Committee. Over the past 3-months of that committee's presence, the issue of the need to report exceedances of the workplace exposure standard for RCS to the Regulator has been discussed. That item has been unable to be accepted into the revised CoP however because the purpose of a CoP is to provide "*detailed information on how you can achieve the standards required under the work health and safety (WHS) laws*"[40], rather than being the mechanism to introduce a new requirement. As NSW adopts the Model WHS laws from Safe Work Australia, that requirement, like all new requirements, could only be enacted with legislative change.
3. During the development of the 2022–2027 National Silicosis Prevention Strategy (NSPS) and accompanying National Action Plan (NAP)[41] there has been much discussion and planning for improved prevention strategies at a national level. These have identified the urgent need for improved workplace controls including a silica risk control plan; additional requirements for air monitoring including notification of exceedances of the workplace exposure standard; and the need for increased levels of compliance and enforcement activities.
4. The introduction of *'The Agreement on Workers Health Protection through the Good Handling and Use of Crystalline Silica and Products Containing it'* (NEPSI agreement) across Europe in 2006 created a systematic approach to exposure surveillance. The results of that initiative of exposure surveillance combined with the implementation of good practice controls reduced exceedances in the Finnish workforce from >50% (WES 0.2 mg/m^3) to <10% (WES 0.05 mg/m^3) across 2006-2013[42]. Across Europe this initiative has resulted in sector wide reductions in RCS exposure driven cooperatively between employers and employees[43].

Evidence in support of Option 2 is as follows:

We note that targeted and accessible awareness and behaviour change campaigns under Option 2 have been in place across the country for some time. While these may have resulted in minor improvements, they are still well below the acceptable standard. We agree with Safe Work Australia that these initiatives are less effective at improving compliance if they are not combined with other Options which would provide greater additional clarity about what is specifically required to reduce the risk of exposure to RCS. This also assumes that all the (often small) workplaces can be identified and visited.

The AIOH Survey[1] looked at the effectiveness of behaviour change initiatives to reduce exposure to below the WES. The majority of occupational hygienists reported them to be only *"sometimes effective"* and noted a disparity in the effectiveness of initiatives across different industry sectors. The top two barriers to improved exposure control were a *lack of management commitment* and a *lack of financial resources*, and therefore is unlikely that behavioural change initiatives will be

[40] https://www.safework.nsw.gov.au/resource-library/list-of-all-codes-of-practice

[41] https://lungfoundation.com.au/advocacy/national-silicosis-prevention-strategy/overview/

[42] Tuomi, T., M. Linnainmaa, V. Vaananen, and K. Reijula. "Application of Good Practices as Described by the Nepsi Agreement Coincides with a Strong Decline in the Exposure to Respiratory Crystalline Silica in Finnish Workplaces." *Ann Occup Hyg* 58, no. 7 (Aug 2014): 806-17. https://dx.doi.org/10.1093/annhyg/meu035.

[43] Zilaout, H., J. Vlaanderen, R. Houba, and H. Kromhout. "15 Years of Monitoring Occupational Exposure to Respirable Dust and Quartz within the European Industrial Minerals Sector." *Int J Hyg Environ Health* 220, no. 5 (Jul 2017): 810-19. https://dx.doi.org/10.1016/j.ijheh.2017.03.010.

effective unless specifically required by regulation, which is why we recommend Option 2 only to be chosen in combination with Option 4 and Option 5a.

Options that are least likely to address the identified problem with supporting evidence:

Option 1

We agree with Safe Work Australia that Option 1 is not an acceptable option.

Occupational hygienists routinely work in and attend workplaces where RCS presents a significant risk to health. The AIOH Survey[1] demonstrated that the majority of occupational hygienists in Australia are concerned about the over-exposure of workers to RCS and that keeping the status quo was untenable, thereby ruling out Option 1.

Option 3

We agree with Safe Work Australia that initiatives under Option 3 are unlikely to be as effective as those presented in Option 4, 5a or 5b. The strongest theme in the AIOH Survey[1] was the need for increased enforcement by the inspectorate, aided by increased specialist resources undertaking more inspections across high-risk sectors. Increased compliance is needed to be extended to control measures, air monitoring, and health monitoring activities. Therefore, as this option does not result in additional compliance or enforcement activities, it would almost certainly not address the problem statement.

Safe Work Australia have previously acknowledged that compliance inspections in small and large businesses trigger different actions and businesses are likely to respond differently[44]. A variation in the Regulators approach to different businesses to achieve a desired level of effectiveness is required. The blanket approach proposed in Option 3 approach across all at-risk sectors, will almost certainly not be an effective regulatory model.

[44] Safe Work Australia 2013, *The Effectiveness of Work Health and Safety Interventions by Regulators: A Literature Review* https://www.safeworkaustralia.gov.au/resources-and-publications/reports/effectiveness-work-health-and-safety-interventions-regulators-literature-review

Additional Supporting Comments

Occupational hygienists are the only professionals formally trained in the conduct of personal exposure monitoring for RCS and the resultant application of workplace exposure standards (WES). Our members are in workplaces more frequently than any safety inspectorate or medical professional with the specific purpose, methods and equipment to quantify exposure to RCS for the purposes of worker health protection.

Based on the AIOH Survey, in 2021 alone, our members collected more than 7,600 samples to measure RCS exposure. We therefore have a unique and valuable perspective on the application of WESs and what they can, and cannot, achieve to facilitate risk reduction. We therefore offer the following additional supporting information that forms our area of expertise.

Reduction of the Workplace Exposure Standard (WES) to 0.02 mg/m^3 as an 8-hour time weighted average (TWA)

We note the release of the document *Report: Measuring respirable crystalline silica*[45] by Safe Work Australia on the 28th of June 2022. That document outlined the challenges of measuring airborne concentrations of RCS in Australian workplaces at and below 0.02 mg/m^3 as a TWA. The AIOH have reviewed that document and are of the view that it represents a good summary of the state of play with regards to analysis and generally reflects our position on the matter since lowering of the standard was first proposed.

For clarity, the AIOH supports the elimination of exposure to RCS, and where that is not practicable, the reduction of exposure to as low as reasonably practicable, and at all times below the WES. There is a duty on employers to minimise exposure so far as is reasonably practicable and at no times to be above the WES.

We understand that some stakeholders will point to the limit of the existing WES and argue that that the number is a key reason why Australia has an epidemic of silicosis. However, it is almost certain that the cases of silicosis that in Australia were caused by exposures well in excess of the previous WES of 0.1 mg/m^3 TWA.

Some examples of studies that have investigated the levels of RCS produced when fabricating benchtops from engineered stone include:

- A study performed by US National Institute of Occupational Safety and Health (NIOSH) which noted that the dust generated during grinding of engineered stone had a mean RCS content of 62%[46].
- A study of RCS exposures to stone fabrication workers found exposures exceeded the WES by orders of magnitude when using dry cutting methods and exceeded the standard when using wet cutting methods also[47].
- A small 2015 study noted that dry cutting of engineered stone generated levels of RCS 150 times above the recommended limit of exposure for a 30 minute period. Although there were limitations to this study, it also suggested that even with the use of water and local exhaust ventilation during cutting, the RCS was still double the recommended limit[48].

[45] Safe Work Australia 2020, *Report: Measuring respirable crystalline silica* https://www.safeworkaustralia.gov.au/doc/report-measuring-respirable-crystalline-silica

[46] Qi CL, L. Engineering Control of Silica Dust from Stone Countertop Fabrication and Installation. National Institute for Occupational Safety and Health; 2016.

[47] Phillips ML, Johnson DL, Johnson AC. Determinants of respirable silica exposure in stone countertop fabrication: a preliminary study. J Occup Environ Hyg. 2013;10(7):368-73.

[48] Cooper JH, Johnson DL, Phillips ML. Respirable silica dust suppression during artificial stone countertop cutting. Ann Occup Hyg. 2015;59(1):122-6.

Of paramount concern to the AIOH is worker health and safety, which relies on the ability, in part, to determine compliance with regulation. A regulation that tells employers not to exceed the WES is only effective if it is possible to determine, with useful reliability, when a workplace is compliant, and regulation is enforced.

The AIOH are supportive of more research into mechanisms to enable accurate measurement to assess compliance to a lower WES. However, we are of the firm view that this is not the leading cause, nor the leading solution to the problem. Continuing to focus on a number that is not complied with only shifts the focus away from the crucial elements of the need for more effective regulation, more enforcement, and national reform as outlined in our Submission.

Appendix 2 – Acronyms

AIOH	Australian Institute of Occupational Hygienists Inc.
COPD	Chronic obstructive pulmonary disease
CRIS	Consultation regulatory impact statement
HRCT	High Resolution Computerised Tomography
LFA	Lung Foundation Australia
NAP	National Action Plan
NATA	National Association of Testing Authorities
NDDT	National Dust Disease Taskforce
NIOSH	USA National Institute of Occupational Safety and Health
NSPS	National Silicosis Prevention Strategy
RIA	Regulatory Impact Statement
RCS	Respirable crystalline silica
SDS	Safety Data Sheet
SWA	Safe Work Australia
TWA	Time Weighted Average
WES	Workplace Exposure Standard
WHS	Work Health and Safety