



Consultation Regulation Impact Statement

Managing the risks of respirable crystalline silica at work

June 2022

Safe Work Australia is an Australian Government statutory agency established in 2009. Safe Work Australia consists of representatives of the Commonwealth, state and territory governments, the Australian Council of Trade Unions, the Australian Chamber of Commerce and Industry and the Australian Industry Group.

Safe Work Australia works with the Commonwealth, state and territory governments to improve work health and safety and workers' compensation arrangements. Safe Work Australia is a national policy body, not a regulator of work health and safety. The Commonwealth, states and territories have responsibility for regulating and enforcing work health and safety laws in their jurisdiction.

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Abbreviations

Acronym or term	Meaning
ABS	Australian Bureau of Statistics
AIOH	Australian Institute of Occupational Hygienists
BEA	Breakeven analysis
CRIS	Consultation Regulation Impact Statement
CSC material	Crystalline silica containing material
DALY	Disability adjusted life year
EY	Ernst and Young Pty Ltd
HRCT	High-resolution computed tomography
icare	Insurance and Care NSW
OBPR	The Office of Best Practice Regulation
MCA	Multi-criteria analysis
PCBU	Person conducting a business or undertaking
PPE	Personal protective equipment
RCS	Respirable crystalline silica
RIS	Regulation Impact Statement
RPE	Respiratory protective equipment
SWMS	Safe work method statement
TWA	Time weighted average
VSL	Value of a statistical life year
WES	Workplace exposure standard
WHS	Work health and safety

Executive Summary

This consultation regulation impact statement (CRIS) presents regulatory and non-regulatory options, under the model work health and safety (WHS) laws, to manage the risks of respirable crystalline silica (RCS) to improve protection of the health and safety of workers. The objective of this CRIS is to seek stakeholder feedback on the options and analysis.

RCS is a significant health hazard for workers in Australia. Many materials used to fabricate products, such as engineered stone benchtops, contain varying levels of crystalline silica. RCS is released when materials containing silica are processed, particularly with power tools. When airborne, workers can inhale RCS deep into their lungs where it can lead to a range of respiratory diseases, including silicosis, progressive massive fibrosis, chronic obstructive pulmonary disease, chronic bronchitis, and lung cancer.

Silicosis is a serious, irreversible lung disease that causes permanent disability and can be fatal. A silicosis diagnosis can have serious impacts on all aspects of a person's life and that of their families. There is no proven treatment for silicosis other than a lung transplant. However, all silicosis and silica related diseases are preventable.

Statement of the problem

Workers in a broad range of industries including manufacturing, stonemasonry, construction, tunnelling, demolition, mining and quarrying are exposed to RCS. In 2011, an estimated 6.6 per cent of Australian workers were exposed, and 3.7 per cent of workers were heavily exposed, to RCS. There are also multiple reports of personal exposure above the current workplace exposure standard across industry sectors, where adequate engineering controls are not employed. There has been a recent focus on compliance in the engineered stone sector given the high prevalence of silicosis in stonemasons and engineered stone workers. However, workers in a broad range of industries outside of the engineered stone sector have also developed silicosis.

Preliminary consultation with stakeholders highlighted that a lack of awareness of the risks associated with RCS and a lack of clarity on how to comply with the model WHS laws contributes to the number of cases of silicosis and silica related diseases. Despite several awareness campaigns being undertaken since 2018, awareness of silica related risks remains sub-optimal. It was also highlighted that requirements of the model WHS laws are difficult to understand for those without regulatory expertise and that there has been an inadequate level of compliance with the current requirements of the model WHS laws regarding RCS.

The following problem statement has been developed following preliminary consultation with stakeholders:

Workplace exposures to RCS have led to a substantial increase in the number of cases of silicosis in Australian workers. Health screening programs of stonemasons and engineered stone workers in several Australian states have identified that approximately 1 in 4 workers screened have evidence of silicosis.

Silicosis is an irreversible and debilitating disease, largely caused by workplace exposure to RCS. The National Dust Disease Taskforce noted that silicosis is "entirely preventable", largely driven by the increase in use of engineered stone in Australia. They also noted that "... every case of silicosis affecting a stone benchtop worker is evidence that businesses, industry and governments need to do more to recognise and control the risks of working with engineered stone". Silicosis, and other silica related diseases, can be prevented by implementing effective controls to eliminate or minimise the generation of and exposure to RCS at the workplace.

Why is Government action needed?

Silicosis and silica related diseases pose an unacceptable health risk to workers. There are significant financial and non-financial costs associated with diagnosis of silicosis and other silica related disease, including significant physical and emotional harm, reduced ability to work, reduced quality of life and premature death of workers. There are also significant costs to the public health system, including for health screening, diagnosis, treatment, and disease management, and to the workers' compensation system.

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

What policy options are being considered?

Safe Work Australia is seeking feedback on the following regulatory and non-regulatory options that have been developed to reduce workplace exposures to RCS and the number of cases of silicosis and silica related diseases:

Option 1:	Base case
Option 2:	Awareness and behaviour change initiatives
Option 3:	Clarification of existing requirements in the model WHS Regulations for defined high risk silica processes
Option 4:	National licensing framework for PCBUs working with engineered stone
Option 5a:	Additional regulation of defined high risk crystalline silica processes, including engineered stone
Option 5b:	Additional regulation of defined high risk crystalline silica processes, excluding engineered stone

A summary outlining the key elements associated with these options is presented in the table below, noting that combinations of options may also be considered.

Summary of proposed options

	Option 1	Option 2	Option 3	Option 4	Option 5a	Option 5b
National awareness and behaviour change initiatives						
Clarifies existing requirements under the model WHS laws in specific regulations for high risk crystalline silica processes						
National licensing framework for engineered stone						
Mandatory reporting of all air monitoring						
Mandatory reporting of all health monitoring						
Risk assessment						
Silica risk control plan/engineered stone control plan						

What is the likely impact of each option?

This CRIS uses a combination of multi-criteria analysis (MCA) and breakeven analysis (BEA) to measure the impact of each option. MCA is used to produce detailed estimates of the additional costs of each option, to industry and government, above the base case. Whereas BEA was used to quantify the economic cost of each case of silicosis and assesses the number of silicosis cases which would need to be avoided under each option for the benefits to outweigh the additional costs. The table below outlines the costs for each option along with the required number of cases of silicosis that would need to be avoided for each option to breakeven from an economic perspective.

Net present cost of options to industry plus cost to government and breakeven point over 10 years

Option	Net present cost (\$m)	Required number silicosis cases prevented to breakeven
Option 2	\$6.08	1.49
Option 3	\$0.11	0.03
Option 4	\$24.02	5.90
Option 5a	\$195.35	48.00
Option 5b	\$192.70	47.35

Discussion of options

The base case, Option 1, is unlikely to be successful in addressing workplace exposure to RCS and reducing the incidence of silicosis and other silica related diseases. Despite the extensive compliance and enforcement activities in recent years, workers are continuing to be exposed to hazardous levels of RCS in the workplace.

Option 2 includes the implementation of national awareness and behaviour change initiatives without clarification of the model WHS Regulations and is unlikely to effectively reduce RCS exposure alone. Awareness campaigns have been conducted across all state and territories as well as through specific industries and organisations. Option 2 would be relatively low cost (\$6.08 million over 10 years) and if undertaken in conjunction with one of the regulatory options, would be expected to further reduce workplace RCS exposures.

Option 3 would ensure regulations related to high risk silica processes are clarified for PCBU's, workers and other duty holders. It is a relatively cost-effective measure with no additional regulatory burden to industry beyond the base case. However, this option is unlikely to be as effective as Option 4, 5a or 5b as it only clarifies existing regulatory and compliance requirements and contains no additional reforms.

Option 4 involves the implementation of a national licensing framework for PCBU's working with engineered stone and is expected to pose a moderate cost option to governments and industry, costing \$24.02 million over a 10-year period. Additional requirements under this option include the reporting of health monitoring and air monitoring data to regulators within 30 days of receiving a report and requiring licensees to undertake a risk assessment and develop and implement an engineered stone control plan. However, Option 4 is likely to have competition effects on the market which may have disproportionate effects on micro- and small businesses. However, it is unlikely to be as effective as Options 5a and 5b in reducing workplace exposures to RCS and the number of cases of silicosis and silica related diseases as it only relates to the engineered stone sector.

Options 5a and 5b would impose additional regulations on PCBU's undertaking high risk crystalline silica processes including risk assessments, silica risk control plans and the reporting of air and health monitoring data to regulators. These options are expected to incur large costs to industry and government (\$195.35 million and \$192.70 million over a 10-year period, respectively), although the overall cost is affected by the large number of businesses and industries that would be covered by the regulations. To breakeven, around 48 cases of silicosis would need to be prevented over this period. This represents around 10 per cent of the total number of accepted workers' compensation cases accepted in Australia (excluding Victoria) over the 10 year period from 2010-11 to 2019-20.

Next steps

Safe Work Australia is engaging in a 6-week consultation period with parties with an interest in minimising the WHS risks of RCS in Australia to seek stakeholder and public feedback on the problem statement, proposed options, impact analysis and the preferred option or options.

Stakeholder feedback received from this CRIS will be used to revise information in the problem statement, options for analysis and assumptions in the impact analysis, before determining the proposed preferred option or options and developing an implementation and evaluation plan. Stakeholder feedback received as part of this CRIS will be used to prepare a decision regulation impact statement for agreement by Australian WHS ministers.

Acknowledgements

Safe Work Australia engaged Ernst and Young Australia Pty Ltd (EY) to support development of this Regulation Impact Statement. Safe Work Australia thanks EY for their input into the development of the problem statement and options chapters, for undertaking the impact analysis and supporting in the preliminary consultation process. This analysis was conducted in April 2022, and parameter assumptions were current at that point in time.

Safe Work Australia also thanks the stakeholders who participated in the preliminary consultation process.

1 Introduction

1.1 About Safe Work Australia

Safe Work Australia is an independent Australian Government statutory agency jointly funded by the Commonwealth, state and territory governments through an Intergovernmental Agreement.

Safe Work Australia was established by the Safe Work Australia Act 2008 (Cth) with primary responsibility to lead the development of policy to improve work health and safety (WHS) and workers' compensation arrangements across Australia.

Safe Work Australia does not regulate WHS. The Commonwealth, states and territories retain responsibility for implementing WHS laws in their jurisdiction.

Safe Work Australia is governed by a tripartite body comprising 15 Members, including:

- an independent Chair
- nine Members representing the Commonwealth and each state and territory
- two Members representing the interests of workers
- two Members representing the interests of employers, and
- the Chief Executive Officer of Safe Work Australia, who is responsible for managing Safe Work Australia's administration and assisting it in the performance of its statutory functions.

Safe Work Australia's role includes:

- monitoring and evaluating the model WHS laws to improve safety outcomes and address issues that have the potential to impede the effective and efficient operation of the laws, and
- facilitating the development of accessible, effective and practical material to aid understanding and compliance; minimise regulatory cost; and support improved work health and safety outcomes, particularly for small business and individuals.

The model WHS laws (summarised in Section 1.3 and described further in Appendix A) have been implemented in the Commonwealth and all states and territories except Victoria.

1.2 Background

Crystalline silica dust is a significant health hazard for workers. Respirable crystalline silica (RCS) refers to particles of crystalline silica that are less than 10µm in diameter. RCS is released when materials containing silica are processed, particularly with power tools. When airborne, workers can easily inhale RCS deep into their lungs where it can lead to a range of respiratory diseases, including:

- silicosis
- progressive massive fibrosis
- chronic obstructive pulmonary disease

- chronic bronchitis, and
- lung cancer.

Exposure to RCS can also increase the risk of workers developing chronic kidney disease, autoimmune disorders (such as scleroderma and systemic lupus erythematosus), and other adverse health effects, including eye irritation, eye damage and an increased risk of activating latent tuberculosis.

Silicosis is a serious, irreversible lung disease that causes permanent disability and can be fatal. When RCS comes into prolonged contact with the lung tissue, it causes inflammation and scarring and reduces the lungs’ ability to take in oxygen. Silicosis may continue to progress even after a worker is removed from exposure to silica dust and as the disease progresses, a worker may experience shortness of breath, a severe cough, chest pain or respiratory failure. The three types of silicosis are outlined in Table 1.

Table 1: Types of silicosis

Silicosis type	Exposure type	Respiratory impact of exposure
Acute	Can develop after short-term and very high levels of silica dust (for example less than one year, and after a few weeks).	Causes severe inflammation and protein in the lung.
Accelerated	Results from short term exposure to large amounts of silica dust (1 to 10 years of exposure).	Causes inflammation, and protein and scarring in the lung (fibrotic nodules).
Chronic	Results from long term exposure (over 10 years of exposure) to low levels of silica dust.	Causes scarring of the lung and shortness of breath.

Symptoms of silicosis and other silica related diseases (such as lung cancer, silicosis, and progressive massive fibrosis) may not appear for many years. The time between exposure and onset of symptoms, referred to as the latency period, for silicosis and silica related diseases can be extended in some cases up to 10-30 years (Hoy & Chambers 2020), although this can be shorter for workers exposed to high quantities of RCS. Some workers may not show any symptoms, even at the point of initial diagnosis (Nicol et al. 2015).

A silicosis diagnosis can have serious impacts on all aspects of a person’s life and that of their families, and generally will require preventing people with silicosis from further exposure to RCS (Hoy & Chambers 2020). This often renders workers unable to work in their industry of choice and may force the person to retrain, work in a suboptimal job or even exit the workforce altogether. Depending on the severity of their disease, this may also mean a shortened life or living with severe disability.

There is no proven treatment for silicosis other than a lung transplant. However, all silicosis and silica related diseases are preventable by eliminating or minimising exposure to RCS at the workplace.

In 2019, the Commonwealth established the National Dust Disease Taskforce to develop a national approach for the prevention, early identification, control and management of occupational dust diseases in Australia. The National Dust Disease Taskforce presented its Final Report to the Australian Minister for Health and Aged Care in June 2021, which recommended that “... a regulatory impact analysis be undertaken to identify and decide implementation of measures that provide the highest protection to workers from the risks associated with [RCS] generating activities in the engineered stone industry” (Department of Health 2021). WHS Ministers supported the Taskforce’s recommendations and referred the Final Report to Safe Work Australia for consideration in this Regulation Impact Statement (RIS).

Prior to the release of the National Dust Disease Taskforce Final Report, Safe Work Australia Members agreed to commence regulatory impact analysis on regulatory and non-regulatory options to minimise the risks of RCS in Australian workplaces.

1.3 Legislative and regulatory framework for crystalline silica under the model WHS laws

In 2011, Safe Work Australia developed the model WHS laws to be implemented across Australia. To become legally binding the Commonwealth, states and territories must separately implement them as their own laws.

The model WHS laws include:

- the model WHS Act
- the model WHS Regulations, and
- model Codes of Practice.

The model WHS laws have been implemented in all jurisdictions except Victoria. Commonwealth and state and territory WHS regulators oversee and enforce the laws in their jurisdictions.

Appendix A provides an extensive summary of the duties and responsibilities regarding exposure to RCS at the workplace are described in the model WHS Act, model WHS Regulations, and the following model Codes of Practice:

- Construction work (Safe Work Australia 2018a)
- Demolition work (Safe Work Australia 2018b)
- How to manage work health and safety risks (Safe Work Australia 2018c)
- Managing risks of hazardous chemicals in the workplace (Safe Work Australia 2020a)
- Managing the risks of respirable crystalline silica from engineered stone in the workplace (Safe Work Australia 2021a), and
- Work health and safety consultation, cooperation and coordination (Safe Work Australia 2022a).

Appendix A also summarises the duties of the following duty holders related to the risks of RCS at work:

- persons conducting businesses or undertakings (PCBUs)
- officers
- designers, manufacturers, importers, suppliers, and those who commission plant or structures
- primary contractors
- workers, and
- other persons at the workplace.

This includes duties around not exceeding the workplace exposure standard (WES) for RCS, duties to undertake air and health monitoring, and describes the need to include RCS risk controls in Safe Work Method Statements (SWMS) (where the work is high risk construction work) and consultation with workers and their representatives.

1.4 National WHS policy initiatives

Following the emergence of new cases of silicosis, there have been a range of additional policy measures implemented by both Safe Work Australia and the states and territories to address the risks of exposure to RCS in the workplace.

1.4.1 Review of the WES for RCS

In 2019, WHS ministers agreed to reduce the WES for RCS from 0.1 mg/m³ 8-hour time weighted average (TWA) to 0.05 mg/m³. A further reduction of the WES to 0.02 mg/m³ 8-hour TWA has been considered by Safe Work Australia Members (Safe Work Australia 2020b). However, due to the uncertainty in measuring levels of RCS below 0.05mg/m³ 8-hour TWA, a further reduction of the WES was not considered feasible at this time. As part of its Occupational Lung Diseases Workplan, Safe Work Australia will continue to monitor developments in the measurability of RCS to inform future reductions in the WES (Safe Work Australia 2022b).

1.4.2 Prohibition on uncontrolled processing of engineered stone

Safe Work Australia Members have also agreed to include a specific regulation in the model WHS Regulations to expressly prohibit the uncontrolled processing of engineered stone. This regulatory amendment is being drafted. It will cover the cutting, grinding, trimming, sanding, polishing, or drilling of engineered stone using power tools or another form of mechanical plant. If a PCBU is unable to eliminate, substitute or isolate the hazard, one or more of the following engineering controls are required: a water delivery system, on tool dust extraction, and/or local exhaust ventilation. In addition to engineering controls, the amendment regulation would require that each worker who may be exposed to RCS from the processes is provided with and wears respiratory protective equipment (RPE).

1.4.3 Incident notification provisions for long latency diseases under the model WHS laws

Recommendation 20 of the Decision RIS for the 2018 Review of the model WHS laws recommended that Safe Work Australia “review incident notification provisions in the model WHS Act to ensure the provisions meet the intention outlined in the 2008 National Review; the provisions capture relevant incidents, injuries and illnesses that are emerging from new work practices, industries and work arrangements; and, WHS regulators have appropriate visibility of work-related psychological injuries and illnesses” (Safe Work Australia 2021b). Improving WHS regulator visibility of incidents related to long latency diseases, such as silicosis and silica related diseases, has been included as part of this review. Recognising that mandatory reporting of silicosis will be a requirement of the National Occupational Lung Diseases Registry, this review is considering potential notification requirements for exposures to RCS and other airborne contaminants. Subject to Safe Work Australia Members’ consideration of the incident notification review recommendations later this year, a separate preliminary assessment for a regulatory impact analysis will be submitted to the Office of Best Practice Regulation.

1.4.4 Undertaking the Clean Air. Clear Lungs. national awareness campaign

The Clean Air. Clear Lungs. national education and awareness campaign concluded in December 2021. The campaign aimed to raise awareness of occupational lung diseases and provide practical information to eliminate or manage the risk of workers developing a lung disease (Safe Work Australia 2021c). The campaign was a key initiative of the occupational lung disease work plan agreed by Safe Work Australia Members in 2018 and targeted the construction, agriculture, manufacturing and engineered stone sectors. The campaign evaluation showed that the campaign was successful in increasing audience awareness of occupational lung diseases.

1.4.5 Publication of revised national guidance on RCS

In 2022, Safe Work Australia published a revised version of the national guide: Working with silica and silica containing products (Safe Work Australia 2022c), which will be translated into 6 additional languages. Safe Work Australia also recently revised its

guidance on health monitoring, including publication of guides on Health monitoring: Guide for crystalline silica (Safe Work Australia 2020c), and Health monitoring: Guide for registered medical practitioners (Safe Work Australia 2020d).

1.4.6 State and territory initiatives to manage RCS risks

Table 2 below summarises state and territory initiatives to manage the risks of RCS.

Table 2: Overview of state and territory measures to manage RCS exposure in jurisdictions subject to the model WHS laws

Jurisdiction	Education and awareness	Health screening ¹ and registries	Other measures
ACT	Developed online materials (WorkSafe ACT 2020) Produced 2 guidance notes on the risks of RCS (WorkSafe ACT 2021, WorkSafe ACT 2022).		
NSW	Awareness campaigns ran in 2018, 2019 and 2020 including radio and online advertising, a Silica Symposium and regional roadshow event series, webinars and safety videos as well as 107 industry presentations (SafeWork NSW 2021).	Commenced the NSW Dust Disease Register which required all NSW medical practitioners to notify NSW Health upon diagnosing a silicosis case from 1 July 2020 (SafeWork NSW 2021).	Banned uncontrolled dry cutting of manufactured stone and offered rebates of up to \$1,000 to businesses for the purchase of necessary equipment (NSW Legislative Council Standing Committee on Law and Justice 2022). Implemented the model Code of Practice: Managing the risks of RCS from engineered stone in the workplace (SafeWork NSW 2022).
NT			NT WorkSafe conducted a compliance campaign in 2019 visiting 35 businesses in the engineered stone benchtop manufacturing industry (Australian Government 2022).
QLD	Issued a safety alert in September 2018 for uncontrolled dry cutting of engineered stone (Queensland Government 2018).	Diagnoses of silicosis are notifiable in Queensland, in the opinion of the prescribed medical practitioner (Queensland Health 2022).	Managing RCS dust exposure in the stone benchtop industry Code of Practice commenced on 31 October 2019 (Workplace Health and Safety Queensland 2019).
SA		Wellbeing SA conducted a baseline finding screening program (Wellbeing SA 2020).	Silicosis database and compliance program from 2019 to 2021 (SafeWork SA 2019, SafeWork SA 2021).
TAS	A media campaign ran by WorkSafe Tasmania between November 2019 and January 2020 targeting tradespeople and others with the tagline: 'don't breathe dust' and		Implemented the model Code of Practice: Managing the risks of RCS from engineered stone in the workplace (WorkSafe Tasmania 2022).

¹ Health screening refers to programs undertaken by state and territory regulators and health authorities to detect previously undetected cases of silicosis in workers. This is distinct from health monitoring, which is undertaken by PCBU's (as required of them under WHS laws) and carried out by or supervised by a registered medical practitioner with experience in health monitoring.

Jurisdiction	Education and awareness	Health screening ¹ and registries	Other measures
	'be silica safe' (WorkSafe Tasmania 2019).		
WA	<p>WorkSafe Western Australia issued a safety alert in November 2018 for stone benchtop workers at risk of silicosis (WorkSafe Western Australia 2018).</p> <p>Guidance note developed for those working with stone (WorkSafe Western Australia 2021).</p>	<p>Between July 2018 and May 2021, workers participated in the WorkSafe Health Surveillance Recall Project or the WA Silicosis Screening Project (WorkSafe Western Australia 2021).</p> <p>In January 2021, amended the OHS regulations to require employers to provide a low-dose HRCT scan instead of previously required chest X-ray (Government of Western Australia 2021)</p>	

1.5 Other complementary policy initiatives

Several regulatory and non-regulatory initiatives are being progressed in parallel with this RIS process at the national level, which are intended to reduce the risks associated with RCS exposures at the workplace. These include Commonwealth initiatives in the All of Australian Governments' Response to the National Dust Disease Taskforce Report and development of a nationally recognised silica safety training package. These are summarised in Appendix B.

1.6 Purpose and scope of this consultation RIS

The purpose of this consultation RIS (CRIS) is to seek stakeholder feedback on non-regulatory and regulatory options for managing the risks of RCS at work.

As explained in Section 2.2.2, workplace exposure to RCS occurs in a wide range of industries. The scope of this CRIS covers all workplaces during which workers may be exposed to hazardous levels of RCS and that are subject to the model WHS laws.

Victoria has not adopted the model WHS laws, and therefore workplaces in Victoria are out of the scope of this CRIS. However, recent amendments to the Victorian Occupational Health and Safety Regulations 2017 have been considered in developing the proposed options. The amendments include the introduction of a licensing scheme for employers working with engineered stone, duties on manufacturers and suppliers of engineered stone, and additional regulatory oversight of high risk crystalline silica work outside of engineered stone across a broad range of industries (WorkSafe Victoria 2021).

The quarrying and mining industries in New South Wales, Queensland, Tasmania and Western Australia are not regulated under the model WHS laws and are also out of scope. The Commonwealth does not regulate quarrying and mining; however, the Commonwealth regulator, Comcare, regulates self-insured licensees, which includes businesses involved in the tunnelling sector.

1.7 Structure of this report

This CRIS was prepared in accordance with the Regulatory Impact Analysis Guide for Ministers' Meetings and National Standard Setting Bodies (Department of Prime Minister and Cabinet 2021a). It is structured as follows:

Chapter 1 – Introduction

Chapter 2 – Statement of the problem

Chapter 3 – Why is government action needed?

Chapter 4 – What policy options are being considered?

Chapter 5 – Who was engaged in preliminary consultation and how was their feedback incorporated?

Chapter 6 – What is the likely impact of each option?

Chapter 7 – Discussion of options

Chapter 8 – Consultation plan

1.8 How to provide your feedback

This CRIS has been developed to seek feedback from stakeholders and the general public the impact of regulatory and non-regulatory options to minimise exposures to respirable crystalline silica at Australian workplaces. Interested parties are invited to comment on the options outlined in this consultation RIS. The consultation process is open until 15 August 2022, with the objective of gathering additional evidence and data on the extent of the problem and to seek views on the impact of the proposed options. In addition, there are several targeted consultation questions to consider when making a submission. There is no obligation to answer any or all of the consultation questions, and there is no limit to the length of submissions.

Consultation questions that you may consider in your response are included throughout the document and are listed in Appendix C.

The options outlined in this paper have not received approval by WHS ministers and are not yet law. As a result, this paper is merely a guide as to how the options address the problem and might be implemented.

Submissions are requested by 11.59 pm on 15 August 2022. Submissions can be made using Safe Work Australia's online Engage consultation platform available at: <https://engage.swa.gov.au/cris-managing-the-risks-of-respirable-crystalline-silica>.

If you are unable to lodge your submission using Engage, please email, occhygiene@swa.gov.au.

Respondents may choose how their submission is published on the Safe Work Australia website by choosing from the following options:

- submission published
- submission published anonymously, or
- submission not published.

For further information on the publication of submissions on Engage, please refer to the [Safe Work Australia Privacy Policy](#) and the [Engagement HQ privacy policy](#).

Enquiries can be directed to: Director, Occupational Diseases and Hygiene Policy by email: occhygiene@swa.gov.au.

2 Statement of the problem

2.1 Problem definition

The following problem statement has been developed following preliminary consultation with stakeholders:

Workplace exposures to RCS have led to a substantial increase in the number of cases of silicosis in Australian workers. Health screening programs of stonemasons and engineered stone workers in several Australian states have identified that approximately 1 in 4 workers screened have evidence of silicosis (Department of Health 2021).

Silicosis is an irreversible and debilitating disease, largely caused by workplace exposure to RCS. The National Dust Disease Taskforce noted that silicosis is “entirely preventable”, largely driven by the increase in use of engineered stone in Australia. They also noted that “... every case of silicosis affecting a stone benchtop worker is evidence that businesses, industry and governments need to do more to recognise and control the risks of working with engineered stone” (Department of Health 2021). Silicosis, and other silica related diseases, can be prevented by implementing effective controls to eliminate or minimise the generation of and exposure to RCS at work.

Evidence to support the problem statement are presented in Table 3 below and discussed further in the following sections.

Table 3: Summary of problem statement

Problem definition	Evidence to support problem definition
Workers in a broad range of industries are at risk of silicosis and silica related diseases	<ul style="list-style-type: none">• Evidence that workers in a broad range of industries are exposed to RCS• The number of cases of silicosis• The number of cases of other silica related diseases
Worker exposure to RCS is due to lack of understanding of the risks and the current regulatory requirements to ensure the health and safety of those working with silica-containing materials	<ul style="list-style-type: none">• Lack of awareness of silica related risks• Lack of clarity around how to comply with the WHS laws
There are inadequate levels of compliance and enforcement with the current model WHS laws.	<ul style="list-style-type: none">• Lack of compliance with current regulatory requirements• Current regulations are insufficient to ensure workers are not exposed to RCS• WHS regulators may be unable to adequately ensure compliance with the model WHS laws

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

2.2.1 The problem of RCS

Crystalline silica (silicon dioxide) is a common chemical in earth’s crust and is found in many rocks and natural stones like granite, slate and sandstone, and is also present, often at high concentrations, in some manufactured products such as engineered stone, concrete, bricks and tiles. Silica containing materials *in situ* do not cause silicosis and silica related

diseases; it is the dust that is generated from processing these materials that has the potential to cause harm when it is airborne and breathed in.

The crystalline silica content of common materials used across industries can vary significantly, ranging up to 97 per cent, as outlined in Table 4 below.

Table 4: Silica composition of common materials (Safe Work Australia 2021a)

Type	Amount of silica (per cent)
Marble	2
Limestone	2
Slate	25 to 40
Shale	22
Granite	20 to 45 (typically 30)
Natural sandstone	70 to 95
Composite (engineered or manufactured) stone	Up to 97
Aggregates, mortar and concrete	various

It is well established that the main source of RCS exposure is occupational and that the accumulation of RCS dust in the lungs of exposed workers can lead to silicosis and other silica related diseases (as outlined in Section 1.2). Recent health screening programs carried out by state and territory regulators and health authorities have determined that of the 4,743 workers screened, approximately 11 per cent received a positive diagnosis of a silicosis or silica related disease because of workplace exposure to RCS (See Section 2.2.3.2).

Given the wide range of materials that contain crystalline silica, workers in many industries may be exposed to RCS at work. Examples of work activities that can generate RCS include:

- fabrication, cutting and installation of engineered stone countertops
- cutting and installation of natural stone countertops
- excavation, earth moving and drilling plant operations
- clay and stone processing machine operations
- concrete cutting
- mining, quarrying and mineral ore treating processes²
- tunnelling
- brick, concrete or stone cutting; especially using dry methods, and
- angle grinding, jack hammering and chiselling of concrete or masonry.

The first cases of silicosis in Australian engineered stone fabricators were reported in 2015 (Frankel et al. 2015). Subsequent health screening of stonemasons and other engineered stone workers has revealed a high prevalence of silicosis in this cohort of workers (see Section 2.2.3.2). Although this sector has been a focus of additional regulation, compliance and

² As mentioned in Section 1.6, mining and quarrying is only considered in the scope of this regulation impact statement where it is covered by the model WHS laws.

enforcement, workers in a broad range of industries outside of the engineered stone sector have also developed silicosis, as described in Section 2.2.3.1.

Risks associated with processing engineered stone

Engineered stone is an artificial product that is created by combining and heat curing natural stone materials that contain crystalline silica with other chemical constituents (such as water, resins, or pigments) and can be manipulated through mechanical processes to manufacture other products (such as benchtops). The crystalline silica content in engineered stone varies widely but it can contain greater than 90 per cent silica, which is significantly more than in natural stone.

Engineered stone has been available in Australia since the late 1990s. The uncontrolled cutting, grinding, trimming, drilling, sanding, and polishing engineered stone products can produce high concentrations of RCS.

Workers fabricating, processing, installing, maintaining, or removing engineered stone products without appropriate control measures in place may be exposed to high levels of RCS (for example through dust or mist clouds). Workers can also be exposed to RCS from poor cleaning and maintenance methods that disturb accumulated dust, including dry sweeping, using compressed air or high-pressure water cleaners and general-purpose vacuum cleaners that are not designed for use with hazardous dusts. The risks are much greater where the engineered stone contains high levels of crystalline silica.

One of the most common uses for engineered stone in Australia is in benchtops. Engineered stone is the most popular material used in benchtops as it is high quality, stylish and relatively cheap. Its popularity has been bolstered by recent booms in renovation and housing development, where its use has become common.

The installation of engineered stone benchtops involves several steps that may generate RCS. For example, workers are required to cut a kitchen benchtop to size, as well as create holes for positioning sinks, plumbing, stovetops, and appliances.

As mentioned in Section 2.2.3.2, screening programs of stonemasons and engineered stone workers have shown that this cohort of workers has a high prevalence of silicosis, indicating that there have been widespread past exposures to RCS across the sector.

Silicosis and other silica related diseases, can be prevented by implementing effective controls to eliminate or minimise the generation of, and exposure to, RCS at work, such as through:

- eliminating the need to process silica-containing materials
- substitution of silica-containing products with alternative products that do not contain silica, or contain less silica
- isolating people from areas where they would be exposed to RCS
- implementing engineering controls such as on tool dust extraction, water suppression and/or local exhaust ventilation
- implementing administrative controls, such as policies for housekeeping and decontamination, and
- ensuring workers use appropriate RPE (Safe Work Australia 2022c).

Safe Work Australia's national guide on Working with silica and silica containing products (Safe Work Australia 2022c) and model Code of Practice: Managing the risks of RCS from engineered stone in the workplace (Safe Work Australia 2021a) contain further information on available controls.

2.2.2 Workers in a broad range of industries are exposed to RCS

Hazardous levels of RCS exposure occur in a broad range of in Australian workplaces. Workers in industries such as manufacturing, stonemasonry, construction, tunnelling, demolition, mining and quarrying, are at an increased risk of exposure to RCS. One study estimated, for 2011, approximately 6.6 per cent of Australian workers were exposed, and that 3.7 per cent

of workers were heavily exposed, to RCS (Si et al. 2016). This study was a comprehensive assessment of exposures of Australian workers to RCS. However, it was based on interviews of workers and did not undertake personal air monitoring, so may not be an accurate estimate of the extent of workforce exposure. Using information in the Australian Bureau of Statistics Labour Force data for August 2021, it is estimated that up to 1.45 million workers are employed in industries where there may be exposures to RCS in the workplace (Table 5).

Table 5: Australian Bureau of Statistics Labour Force data for selected industries (Australian Bureau of Statistics 2021a)

Division	Subdivision	Employed total ('000)
B Mining	06 Coal Mining	41.7
	07 Oil and Gas Extraction	22.9
	08 Metal Ore Mining	112.8
	09 Non-Metallic Mineral Mining and Quarrying	14.9
	10 Exploration and Other Mining Support Services	76.7
C Manufacturing	20 Non-Metallic Mineral Product Manufacturing	38.9
E Construction	30 Building Construction	283.6
	31 Heavy and Civil Engineering Construction	116.9
	32 Construction Services	744.8
Total		1,453.2

The Australian Institute of Occupational Hygienists (AIOH) has confirmed that common tasks in the manufacturing, demolition, construction, tunnelling and quarrying industries can result in exposure to RCS in excess of the WES (AIOH 2021). This is supported by historical data supplied to the Queensland inquiry into occupational respirable dust issues in 2017 showing exceedances of the then WES (0.1 mg/m³ 8-hour TWA) across a range of construction operations. This report also recorded WES exceedances in the tunnelling and ferrous foundry industries (Queensland Parliament Coal Workers' Pneumoconiosis Select Committee 2017). Personal air monitoring has also revealed that common tasks involved in engineered stone manufacturing (Gaskin et al. 2018) and stonemasonry (Alamango et al. 2015) can expose workers to RCS at levels above the current WES if effective engineering controls (e.g., water suppression and local exhaust ventilation) are not in place. Similarly, a study of 47 individual stone and quarry workers, not using adequate engineering controls, revealed that one in four workers were exposed to levels of RCS above the then WES (0.1mg/m³ 8-hour TWA), and more than one in ten were exposed to concentrations double that of the WES (Hedges 2016). A study of workers in the demolition sector also revealed exposures in some groups of workers were in excess of the then WES (0.1 mg/m³ 8-hour TWA), prior to the introduction of additional control measures including misting dust suppression, dust extraction, and greater management of respirator fit testing (Cole & Fisher 2019). Although there are few published studies about the Australian construction industry, uncontrolled cutting of concrete is relatively common. In one study, it was shown that six minutes of uncontrolled concrete cutting would greatly exceed the current WES even if it was the worker's only exposure to RCS in the workday (Brooks & Rae 2021). Workers who are not directly involved with tasks that produce RCS may still be exposed. This includes administrative staff, cleaning staff and other support staff who are located near sites where RCS is produced. Data taken from an engineered stone fabrication workshop showed that all areas of the premises, including areas that were not used for processing of engineered stone, had airborne concentration levels of RCS well in excess of the current WES. This indicates that any persons working near areas where engineered stone is processed may be exposed to hazardous levels of RCS, regardless of their role (Jennings 2021).

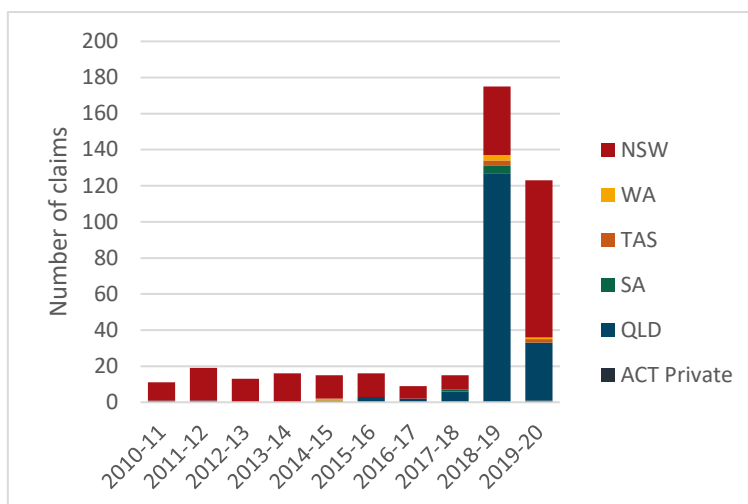
2.2.3 Number of cases of silicosis

The number of cases of silicosis in Australia has been estimated from results of state and territory health screening programs, data registries, and accepted workers' compensation claims. It is likely that this estimate is conservative, and the true number

of cases may be higher. This is primarily a result of the time-lag between worker exposure to RCS and diagnosis of silicosis. This also presents significant challenges to estimating the future number of cases of silicosis.

2.2.3.1 Number of accepted workers' compensation claims for silicosis

Between 2010-11 and 2019-20 there were 412 accepted workers' compensation claims for silicosis in the jurisdictions covered by the model WHS laws (Figure 1). Approximately 77 per cent (around three quarters) of the accepted claims were in the manufacturing, mining and constructions sectors (Table 6).



Sources: Safe Work Australia's National Data Set for Compensation-based Statistics and icare.

Figure 1: Total number of accepted silicosis workers' compensation claims in jurisdictions subject to the model WHS laws, 2010-11 to 2019-20

Approximately 72 per cent of the claims were accepted after mid-2018, following the implementation of awareness and health screening programs for stonemasons and engineered stone workers.

Whilst many accepted cases have been in the engineered stone sector, workers in other industries have also developed silicosis. For example, of the 57 workers with silicosis notified to the NSW dust disease register in 2020-21, approximately 42 per cent of were from industries not associated with stonemasonry (SafeWork NSW 2021). Another analysis of 284 pre-employment medical examinations for tunnelling workers undertaken between December 2019 and December 2020 identified 11 workers (3.87 per cent of the total cohort) with confirmed chronic silicosis. This suggests that there may be a larger cohort of tunnelling workers who have yet to be diagnosed with silicosis (Seevnarain et al. 2021).

Table 6: Number of accepted workers' compensation claims for silicosis by industry in jurisdictions subject to the model WHS laws, 2010-11 to 2019-20p

Industry	NDS	icare	Total
Manufacturing	149	65	214
Construction	21	51	72
Mining	22	11	33
Electricity, gas, water and waste services	np	6	7
Wholesale trade	6	0	6
Administrative and support services	5	0	5
Transport, postal and warehousing	np	np	np
Retail trade	np	0	np
Education and training	np	0	np
Health care and social assistance	np	0	np

Industry	NDS	icare	Total
Other services	0	np	np
Not stated/Unknown	5	60	65
Total	215	197	412

'np' data is suppressed where there are fewer than 5 serious claims.

Note 1: All accepted workers' compensation claims excluding journey claims.

Note 2: The 2019-20 data are preliminary (denoted by 'p'). They are likely to rise as revisions occur in future years.

Sources: Safe Work Australia's National Data Set for Compensation-based Statistics (NDS) and iCare.

2.2.3.2 Results of health screening programs for silicosis

Health screening refers to programs undertaken by state and territory regulators and health authorities to detect previously undetected cases of silicosis in workers. This is distinct from health monitoring, which is undertaken by PCBUs and carried out by, or supervised by, a registered medical practitioner with experience in health monitoring (as required by the model WHS laws).

The incidence of cases detected through health screening suggests that health monitoring (as required by the model WHS laws) is not occurring at the rates that it should be. Table 7 below sets out the outcomes of state and territory silicosis health screening programs for stonemasons and engineered stone workers, where 436 workers have been referred for further assessment or diagnosed with silicosis since 2017.

Table 7: Outcomes of state and territory silicosis health screening programs

Jurisdiction	Source	Period	Number of workers participating in screening programs	Number of people with silicosis
QLD (Queensland Government 2020)	Regulator health screening program	September 2018 - 30 November 2021	1,053	238 ³
NSW (2017 – 2020) (Golder Associates Pty Ltd 2021)	icare NSW screening	Financial years 2017-18, 2018-19 and 2019-20	3,030	156
SA (Wellbeing SA 2020)	Health screening program	1 March to 16 August 2019	295	18 ⁴
WA (WorkSafe Western Australia 2021)	Regulator health screening program	July 2018 to May 2021	365	24

³ Figure includes 34 cases of progressive massive fibrosis.

⁴ Note 18 cases of probable, possible or confirmed simple silicosis.

2.2.3.3 Number of cases of other silica related diseases

As mentioned in Section 1.2, exposure to RCS can cause other diseases, including chronic kidney disease, autoimmune disorders and lung cancer. The Cancer Council of Australia has estimated that over 5,700 of the 587,000 Australian workers exposed to RCS in 2011 would develop lung cancer (Cancer Council 2021). However, Safe Work Australia is not aware of other estimates of the number of cases of the other silica related diseases that could be attributed to exposure to RCS. These numbers cannot be estimated directly from existing workers' compensation claims data, as these conditions can also have long latency periods and may have other causes. It is important to note that many people suffering from these conditions caused by RCS exposure will also have silicosis (Alif et al. 2020).

2.3 Understanding of silica related risks and current regulatory requirements

In the preliminary consultation for this CRIS, stakeholders identified that a lack of awareness of the risks associated with RCS and a lack of clarity on how to comply with the model WHS laws contribute to the number of cases of silicosis and silica related diseases.

These issues may be exacerbated by the structure of some industries, particularly the engineered stone sector, which is characterised by small- and micro-businesses and a portion of the workforce is made up of culturally and linguistically diverse workers. Market research commissioned by the Australian Government Department of Health in 2021 showed that 44 per cent of businesses operating as stonemasons were sole traders and a further 24 per cent had five employees or less, and 42 per cent of other trades employed 20 employees or less (Quantum Market Research 2021).

2.3.1 Lack of awareness of silica related risks

Despite several awareness campaigns being undertaken since 2018 at the national and state and territory levels, awareness of silica related risks remains sub-optimal. Market research in 2021 revealed that 94 per cent of stonemasons and 73 per cent of tradespeople interviewed had heard of silica dust (Quantum Market Research 2021). Stonemasons reported that they were very familiar with the risks of silica dust (73 per cent), with 94 per cent agreeing that exposure to silica dust should be avoided. However, only 24 per cent of other tradespeople employed in construction industry interviewed agreed they were 'very familiar' with the risks of silica dust and 76 per cent agreed that exposure to silica dust should be avoided (Quantum Market Research 2021).

It is likely that the different levels of awareness reflect the awareness campaigns and media attention that occurred in response to the emergence of silicosis in the engineered stone sector. The lower level of awareness of the risks of silica amongst tradespeople outside of the engineered stone sector may reflect a lack of awareness activities in other industries, including manufacturing, demolition, quarrying and mining.

2.3.2 Lack of clarity on how to comply with the model WHS laws

The National Dust Disease Taskforce noted that in their consultations, stakeholders identified issues with the complexity of existing WHS regulations and a lack of clarity around regulatory requirements (Department of Health 2021).

In preliminary consultations undertaken for this CRIS, some stakeholders said that the requirements of the model WHS laws are difficult to understand for those without regulatory expertise, particularly for workers and PCBUs around the requirements regarding the WES, appropriate risk controls, air monitoring and health monitoring. Although Safe Work Australia and state and territory WHS regulators have published relevant Codes of Practice, guides, and other information, further work could be undertaken to explain the requirements of model WHS laws in accessible formats that are suitable for the range of different PCBUs, workers and other duty holders.

In a 2021 submission to the NSW Dust Disease Scheme, the AIOH noted they “...believe that the sad cases of silicosis and progressive massive fibrosis seen in the engineered stone benchtop industry of recent times would not have occurred if the [current] RCS [WES] had been complied with by employers and enforced by regulators, and workers had been made aware of the health hazard of RCS over exposure and complied with the relevant control strategies both in the factory manufacturing process and installation and fitting on customer premises” (AIOH 2021).

In preliminary consultations, some government and industry stakeholders expressed concerns that campaigns focusing solely on awareness, without an explicit behavioural change element, have limited effectiveness in increasing worker safety and that there are gaps in PCBU’s capabilities to undertake risk assessments in some industries.

2.4 Inadequate levels of compliance and enforcement of current regulations

2.4.1 Lack of compliance with current regulatory requirements

State and territory regulators indicated in the preliminary consultations that they have observed a general improvement in compliance in the engineered stone sector since 2018, which aligns with the greater focus on workplace inspections. This is evidenced by the outcomes of consecutive South Australian compliance programs in Table 8, which demonstrated a 42 per cent reduction in improvement notices and 12 per cent reduction in prohibition notices issued in their 2020-21 compliance campaign compared to their 2019 campaign (SafeWork SA 2021). This was despite an over 500 per cent increase in the number of workplace visits as a result of their greater focus on workplace inspections. The South Australian report also noted “25 fabricators of engineered stone had increased compliance, with most maintaining safe systems of work that were implemented as a result of the 2019 campaign”. However, as Table 8 shows, many notices are still being issued which indicates that employers possibly continue to find it difficult to comply or choose not to comply.

In addition to a lack of awareness of the requirements of the model WHS laws, financial costs of complying with the current regulations, such as providing health monitoring and undertaking air monitoring, may be driving the low levels of compliance seen amongst PCBUs, particularly for small and micro businesses. Workplace culture may also contribute to low compliance levels. Pressure to avoid delays, take on or finish a job can lead to the adoption of poor techniques and a lack of consideration for personal safety (ThinkPlace 2018). In preliminary consultation, some stakeholders said that these non-compliant practices become embedded as a matter of workplace culture, with newer employees following the example of more established employees, leading to unsafe practices becoming more widespread. Additionally, the lack of access to persons with specific competency for conducting health and air monitoring may result in inadequate assessments. Air monitoring conducted by persons who are lacking in knowledge and understanding of the proper procedures results in some workplaces being non-compliant with regulatory requirements, even where air monitoring is being carried out (Cole 2017). Furthermore, the costs of air monitoring can be a barrier for some PCBUs to engage an expert to undertake the air monitoring. At the 2019 NSW Standing Committee on Law and Justice 2019 Review of the Dust Diseases Scheme, SafeWork NSW noted that the majority of the cost comes from hiring an occupational hygienist to undertake the monitoring, estimating that “... regular air monitoring can take some businesses one to two weeks. In terms of the cost, it can be \$10,000 to \$20,000 per experience” (NSW Legislative Council Standing Committee on Law and Justice 2020).

Table 8: State and territory compliance program outcomes (excluding Victoria)

Jurisdiction	Industry	Period	Workplace visits	Improvement notices ⁵	Infringement notices	Prohibition notices	Immediate compliance	Penalty notices
Queensland ⁶	Natural and engineered stone benchtop industries	August 2020-May 2021	230	302	27	24	12	-
NT (Australian Government 2022)	Engineered stone workshops	2019-20	35	3		0		0
NSW (NSW Government 2022)	Engineered stone, construction, tunnelling, manufacturing, foundries and stonemason industries	2018 to 31 March 2022	2082	1271		47		2
SA (SafeWork SA 2019)	Fabricators and installers of engineered stone	From 25 February 2019 to 21 May 2019	26	103		8		0
SA (SafeWork SA 2019)	Construction industry	From 9 April 2019 to 14 May 2019	12	62		0		0
SA (SafeWork SA 2021)	Fabrication of stone benchtops, monumental stone, construction and mining industries	From 1 October 2020 to 1 April 2021	199 and 71 compliance audits	95		7		N/A
WA (WorkSafe Western Australia 2021)	Engineered stone benchtop fabrication and installation	July 2018 – May 2021	150	Over 1000				

⁵ Note in the case of WA these were enforcement notices

⁶ Data supplied by WHS Queensland

Case study: WorkSafe WA silica compliance project (WorkSafe Western Australia 2021)

Between July 2018 and May 2021, WorkSafe WA undertook a proactive compliance project into engineered stone benchtop fabrication and installation to investigate silica dust exposure risks and controls. The WorkSafe WA silica compliance project found that silica controls were inadequate in many WA workplaces. The results included:

- 150 workplace inspections with over 1,000 enforcement notices issued. Common compliance issues were inadequate controls, no risk assessment conducted, lack of health surveillance, inadequate respiratory protective equipment and poor hygiene practices.
- Air monitoring was conducted at 38 workplaces with 75 per cent recording silica dust levels above action levels (i.e. half of the WES).
- The results of air monitoring (117 samples) indicated that the current work practices of fabricating engineered stone benchtops generate elevated levels of silica dust in the workplace, i.e. current workplace engineering and process controls are not sufficiently effective. This presents a significant risk to worker health and places reliance on correct and consistent use of respiratory protective equipment to manage remaining risks.
- Generally, stonemasons in fabrication workshops recorded higher silica dust exposure than benchtop installers.

2.4.2 The model WHS laws may be insufficient to manage exposure to silica dust

There are general duties under the model WHS laws for duty holders to manage health and safety risks by eliminating or minimising those risks so far as is reasonably practicable. However, some stakeholders have indicated that the general duties are insufficient and targeted regulation of work involving materials containing crystalline silica is required to address the problem. For instance, the Australian Council of Trade Unions has called for specific regulation of RCS exposure, in a similar manner to lead, as has been implemented in the Victorian Occupational Health and Safety Regulations 2021 (Australian Council of Trade Unions 2021).

The National Dust Disease Taskforce considered a licensing scheme for PCBUs working with engineered stone would improve compliance in that sector by "... restricting access to the product to those businesses able to demonstrate that they can eliminate or minimise risks associated with engineered stone" (Australian Government 2022).

2.4.3 Regulators may be unable to adequately ensure compliance with the model WHS laws

In the preliminary consultations for this CRIS, some stakeholders have expressed that the current regulations are appropriate to deal with the problem, but greater effort is required to ensure compliance with the WHS laws. Government and industry stakeholders indicated that there are differing levels of capability, resources and enforcement activity amongst jurisdictions. Some stakeholders also noted that a lack of in-house knowledge of relevant industries may hinder the ability of regulators to determine compliance with the model WHS laws. This indicates that the problem of compliance exists to varying degrees across jurisdictions, and successful prosecutions in some jurisdictions do not necessarily indicate that enforcement has been adequate across all jurisdictions.

2.5 Consultation questions

Safe Work Australia is seeking feedback on the following consultation questions related to the problem statement:

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

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

3 Why is Government action needed?

3.1 The case for government intervention

The primary case for government intervention is that silicosis and silica related diseases pose an unacceptable health risk to workers. There are significant financial and non-financial costs associated with diagnosis of silicosis and other silica related disease, including significant physical and emotional harm, reduced ability to work, reduced quality of life and premature death of workers. There are also significant costs to the public health system, including for health screening, diagnosis, treatment and disease management.

The recent and significant increase in the number of cases of these preventable diseases and the impacts on workers, their families and communities present an urgent case for government intervention to reduce exposure to RCS at work and subsequently reduce the number of cases of these diseases.

3.1.1 Alternatives to government action

A range of non-government stakeholders, including trade unions and peak health bodies, have undertaken activities and initiatives in recent years to raise awareness of the risks of exposure to RCS, particularly in the engineered stone sector. These stakeholders may continue and even enhance these activities. However, they are unlikely on their own to result in the level of prevention of silicosis and silica related diseases that is needed.

There is a diverse range of markets where workers are exposed to RCS. To have viable alternatives to government action, these markets would need to either adopt substitute products, develop new approaches to eliminate or minimise the risks, or incentivise a broad range of businesses to self-regulate. Given the range of industries utilising silica-containing materials, the large numbers of workers estimated to be exposed, and the broad range of silica-containing materials (including manufactured and natural materials), this is unlikely to occur in the short or medium term.

3.2 Objectives of government intervention

The 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.

3.3 Consultation questions

Safe Work Australia is seeking feedback on the following questions related to the justification for government action:

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

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

4 What policy options are being considered?

4.1 Overview

Five regulatory and non-regulatory options have been developed to reduce workplace exposures to RCS and the number of cases of silicosis and silica related diseases (Table 9). These options are consistent with the Regulatory Impact Analysis Guide for Ministers' Meetings and National Standard Setting Bodies, which advises that the base case and at least one non-regulatory option should be included (Department of Prime Minister and Cabinet 2021a).

Table 9: Regulatory and non-regulatory options

Number	Option	Option type	Description
1	Base case	N/A	This option includes the existing requirements of the model WHS laws, as well as several national regulatory initiatives that are underway.
2	Awareness and behaviour change initiatives	Non-regulatory	Awareness and behaviour change initiatives targeted to workers, PCBUs and other duty holders in the construction, manufacturing, demolition tunnelling, quarrying, and mining industries.
3	Clarification of existing requirements in the model WHS Regulations for defined high risk silica processes	Regulatory	Amendments to the model WHS Regulations to clarify how the existing requirements apply to defined "high risk silica processes". This would have no additional regulatory burden.
4	National licensing framework for PCBUs working with engineered stone	Regulatory	Implementation of a national licensing framework for PCBUs working with engineered stone through changes to the model WHS laws.
5a	Additional regulation of defined high risk crystalline silica processes, including engineered stone	Regulatory	Amendments to the model WHS Regulations for high risk silica processes (as per Option 3) with additional regulatory requirements.
5b	Additional regulation of defined high risk crystalline silica processes, excluding engineered stone	Regulatory	

4.2 Option 1: Base case

The base case includes the existing duties under the model WHS Act, model WHS Regulations and relevant model Codes of Practice that are described in Section 1.3. It assumes compliance and enforcement activities of state and territory regulators and education and awareness activities undertaken by Safe Work Australia, state and territory governments and industry

groups will continue at current levels. It is anticipated that such activities will continue regardless of what option may be chosen by decision makers.

The base case also includes measures that have yet to be fully implemented, including:

- the implementation of the model Code of Practice: Managing the risks of respirable crystalline silica from engineered stone in the workplace (Safe Work Australia 2021a) in all states and territories covered by the model WHS laws apart from Queensland (which has already implemented a Code of Practice (Workplace Health and Safety Queensland 2019)), and
- amendments to the model WHS Regulations prohibiting uncontrolled processing of engineered stone, so clarifying existing duties under the model WHS laws.

4.3 Option 2: National awareness and behaviour change initiatives to minimise the risks of RCS exposure

Safe Work Australia and state and territory regulators have undertaken extensive education and awareness raising campaigns (see Section 1.4.6). However, preliminary consultation with state and territory regulators indicated that additional awareness raising and behavioural economics approaches would improve overall understanding of and compliance with WHS duties, and reduce exposures to respirable crystalline silica.

Option 2 involves national awareness and behaviour change initiatives focussed on duty holders in the construction, manufacturing, tunnelling, quarrying, demolition and mining industries and compliance with the model WHS laws.

These initiatives would target the following groups across all industries where silica exposure is known to occur:

- workers
- PCBUs
- officers, designers, manufacturers, importers, suppliers, and those who commission plant or structures
- primary contractors, and
- officers.

The initiatives would seek to improve:

- duty holders' understanding of the risks associated with exposure to RCS
- knowledge of PCBUs on how and when to conduct a risk assessment, control risks and consult with workers, and
- awareness and compliance of workers, PCBUs, and other duty holders with the requirements of the model WHS laws.

The Clean Air. Clear Lungs. campaign (discussed at Section 1.4.4) is an example of a successful national awareness campaign on occupational lung diseases, including silicosis.

The behaviour change component of Option 2 would move beyond simply clarifying or raising awareness of the requirements of the model WHS laws and take a behavioural economics approach to improving the compliance practices of duty holders.

The design of such an initiative would be guided by behavioural economics experts, who would be engaged in the first year of the project to advise and develop appropriate strategies to improve compliance. Tactics that may be used include highlighting the extent of risks of RCS amongst workers, investigating incentives and disincentives to compliance and trialling different approaches amongst various industries and sectors. It is anticipated the initiatives would be repeated on an annual basis for a period of five years. This option would directly address the lack of understanding of silica related risks and current regulatory requirements and is expected to improve compliance with the requirements. This can be measured through compliance and enforcement data (e.g., non-compliance notices issued, outcomes of workplace audits) which is currently collected by state and territory regulators.

4.4 Option 3: Clarifying the existing requirements of the model WHS laws for high risk silica processes

Option 3 would clarify the existing requirements of the model WHS laws into specific regulations covering defined high risk silica processes. It would have no additional regulatory burden to industry beyond the current requirements of the model WHS laws. This will specifically involve the consolidation of existing requirements for high risk silica processes in the model WHS laws in a similar way to those that exist currently for asbestos. The specific regulations for high risk silica processes will explicitly outline the current requirements as they relate to PCBUs working with crystalline silica substances, including requirements for air and health monitoring.

This option is based on the recent amendments in the Victorian Occupational Health and Safety Amendment (Crystalline Silica) Regulations 2021. It would specifically include:

- Definitions of *crystalline silica substance*, *crystalline silica process* and *high risk crystalline silica process*.
- A *crystalline silica substance* would be defined as materials containing over 1 per cent crystalline silica and would include engineered stone.
- A *crystalline silica process* would be defined as:
 - use of power tools and machinery that generates crystalline silica dust
 - use of roadheaders⁷ involving material that is a crystalline silica substance
 - quarrying involving material that is a crystalline silica substance
 - mechanical screening involving material that is a crystalline silica substance
 - tunnelling involving material that is a crystalline silica substance, or
 - a process that exposes or is reasonably likely to expose a person to crystalline silica dust during manufacture or handling of a crystalline silica substance.
- A *high risk crystalline silica processes* would be defined as *crystalline silica processes* where:
 - it is reasonably likely that workplace exposure standards will be exceeded, or
 - the PCBU is not certain on reasonable grounds that workplace exposure standards will be exceeded, or
 - there is a health risk from exposure to silica dust.

⁷ A roadheader is a piece of excavation equipment that can be used in tunnelling and mining.

- This would specify that:
 - Where work involving silica-containing materials meets the definition of construction work⁸, crystalline silica processes would be considered high risk construction work. Therefore, a Safe Work Method Statement must be produced, complied with, provided to the principal contractor (if any), reviewed and retained as per model WHS Regulations regs 299-303.
 - As per model WHS Regulations reg 50, PCBUs must undertake air monitoring in the breathing zone of workers when the work involves a *high risk crystalline silica process*.
 - PCBUs undertaking a high risk crystalline silica process must provide and pay for health monitoring for workers, provide information to the registered medical practitioner undertaking health monitoring, obtain health monitoring reports, provide health monitoring reports to workers, regulators and other relevant PCBUs and retain health monitoring records as per model WHS Regulations regs 368-378.

Specific regulations would assist in improving understanding of the requirements of the model WHS laws for defined high risk silica processes and may improve compliance in sectors where the understanding of the requirements of the model WHS laws is limited. Clarification that air monitoring and health monitoring are required is expected to reduce the risk to workers from exposure to RCS.

4.5 Option 4: Implementation of a national licensing framework for PCBUs working with engineered stone

This option seeks to implement a national licensing framework for PCBUs working with engineered stone, under the model WHS laws. This option is based on the recent amendments related to licensing of employers working with engineered stone under the Victorian Occupational Health and Safety Amendment (Crystalline Silica) Regulations 2021 and would require all PCBUs working with engineered stone to obtain a licence to do so.

The requirements would be as follows:

- engineered stone would be defined consistent with the definition of Model Code of Practice: Managing the risks of respirable crystalline silica from engineered stone in the workplace (Safe Work Australia 2021a).
- an “engineered stone process” would be defined, in line with the Victorian regulations, as “a process involving engineered stone at a workplace that generates crystalline silica dust, including cutting, grinding or abrasive polishing of engineered stone”.
- PCBUs (not individual workers) undertaking an engineered stone process would be required to obtain and hold a licence with the state or territory regulator. Licences would require renewal every 5 years.
- suppliers of engineered stone would be prohibited from supplying engineered stone to a person who requires an engineered stone licence but does not have one. Suppliers would be required to retain records of PCBUs who have been supplied engineered stone.

⁸ Chapter 6 of the model WHS Regulations defines construction work as “any work carried out in connection with the construction, alteration, conversion, fitting-out, commissioning, renovation, repair, maintenance, refurbishment, demolition, decommissioning or dismantling of a structure”. For a full definition, refer to r289.

- licensees would be required to provide information to workers prior to commencing work with engineered stone. This includes instruction, information and training about the health risks associated with exposure to crystalline silica dust, the need for appropriate controls, and application of controls.
- licensees would have an explicit duty to undertake and report health monitoring for their workers. In addition to the requirements of model WHS Regulations r368-378, licensees would be required to provide all results of health monitoring to the WHS regulator within 30 days of receiving reports.
- licensees would have an explicit duty to undertake and report air monitoring. In addition to the requirements of model WHS Regulations r50, licensees must provide all results of air monitoring to the WHS regulator within 30 days of receiving reports.
- licensees would be required to develop and implement an engineered stone control plan which:
 - identifies the work undertaken by the licence holder that requires an engineered stone licence,
 - states the hazards and risks associated with that work (i.e. includes a risk assessment),
 - sufficiently describes measures to control those risks,
 - describes how the risk control measures are to be implemented, and
 - is set out and expressed in a way that is readily accessible and comprehensible to all people who use it.
- licensees would be required to implement specific control measures, including:
 - use of local exhaust ventilation, on tool dust extraction and/or water suppression when using a power tool or mechanical plant to process engineered stone,
 - ensuring that workers are provided and use appropriate respiratory protective equipment,
 - provision of information, instruction and training, and
 - ensuring compressed air is not used for cleaning.

It is also expected that WHS regulators would implement a program of scheduled and unscheduled audits of licensees to support the licensing scheme.

If implemented, this licensing framework would be expected to:

- improve identification of PCBU's working with engineered stone
- clarify the duties related to air and health monitoring for PCBU's working with engineered stone and include a duty to report all results to WHS regulators. This would allow identification of PCBU's not undertaking air and health monitoring at the expected frequency.
- improve uptake of engineering controls through specific regulation and introducing a requirement for an engineered stone control plan, noting that amendments to the model WHS regulations are being developed to expressly require the use of engineering controls and RPE when processing of engineered stone, and
- scheduled and unscheduled audits would be expected to improve compliance.

However, as this option is only limited to engineered stone, it will not address the risks of silicosis and silica related diseases for workers in other industries outside of the engineered stone sector.

4.6 Option 5a: Additional regulation of high risk crystalline silica processes for all materials including engineered stone

Option 5a would include additional regulation of processes involving all materials meeting the definition of a crystalline silica substance, including engineered stone (crystalline silica containing materials, CSC materials). It is consistent with the regulatory amendments proposed in Option 3; however, it includes additional duties that are based on the amendments to the Victorian Occupational Health and Safety Amendment (Crystalline Silica) Regulations 2021. The additional regulations would require PCBUs to identify, and assess the risks of all processes involving CSC materials. This risk assessment would specifically require the identification of potential hazards and measures to control the subsequent risk of RCS exposure. Ensuring adequate control measures are implemented will reduce the risk of RCS exposure in these workplaces.

The requirements in addition to Option 3 would be:

- PCBUs undertaking high risk silica work would be required to conduct a risk assessment and develop and implement a silica risk control plan if they or their workers undertake a high risk crystalline silica process.
- the risk assessment would require the following to be taken into account:
 - the specific tasks or processes required to be undertaken with CSC materials
 - the form of crystalline silica to be used
 - the proportion of crystalline silica contained in the CSC material
 - previous air monitoring and health monitoring results
 - the likely frequency and duration of exposure of workers to crystalline silica dust, and
 - any information about incidents, illnesses or diseases associated with exposure to crystalline silica dust at the workplace.
- PCBUs undertaking high risk silica work would be required to develop a silica risk control plan based on the outcomes of the risk assessment. This would include:
 - identify the high risk crystalline silica process or processes to be undertaken
 - the hazards and risks associated with that work
 - the measures to control those risks, and
 - document/ provide information on how the risk control measures are to be implemented.

Note for *high risk crystalline silica work* that is *high risk construction work*, preparation of a SWMS would be sufficient to meet the requirement for a *silica risk control plan*.

- in addition to the clarification of the existing requirements in the model WHS Regulations for regular health monitoring (Option 3), under this option, under Option 5, PCBUs would be required to provide all results of health monitoring to the WHS regulator within 30 days of receiving reports.
- in addition to the clarification of the existing requirements in the model WHS Regulations for air (Option 3), under this option, PCBUs would be required to provide all results of workplace air monitoring to the WHS regulator within 30 days of receiving reports.

The benefits of Option 5a, in addition to those of Option 3, are expected to include:

- improving compliance with the WHS requirements, including air and health monitoring, through specific regulations and additional reporting requirements
- improving PCBU and workers' understanding of the risks and controls by requiring a risk assessment and risk control plan, which is expected to reduce the risk of exposure to RCS, and
- collating air and health monitoring reports would provide a source of data for regulators to determine whether control measures are adequate to reduce the risk of exposure to RCS. Health monitoring reports may also provide additional data on whether the regulatory requirements are supporting a reduction in the numbers of cases of silicosis.

4.7 Option 5b: Regulation of defined high risk crystalline silica processes for all materials excluding engineered stone

Option 5b is equivalent to Option 5a but it would exclude engineered stone, so that the regulation of high risk crystalline silica processes for CSC materials except engineered stone could be implemented in combination with a national licensing framework for PCBUs working with engineered stone (Option 4). This is because the proposed national licensing framework includes overlapping elements of Option 5a, such as requirements to undertake risk assessments, develop and implement risk control plans and report results of all air and health monitoring.

4.8 Options that were considered but assessed as infeasible

4.8.1 Ban on engineered stone

A ban on the use of engineered stone has not been included in this CRIS. The reasons for this include:

- the National Dust Disease Taskforce's Final Report did not recommend a ban on manufacture or use of engineered stone. It recommended that a ban on the importation of some or all engineered stone be considered by July 2024 if:
 - “There is no measurable and acceptable improvement in regulatory compliance rates for the engineered stone sector as reported by jurisdictions; and
 - Evidence indicates preventative measures are not effectively protecting those working with engineered stone from silicosis and silica-associated diseases” (Department of Health 2021).
- the All of Australian Governments' response to the National Dust Disease Taskforce report noted this recommendation and recognised that “... a comprehensive framework [is required] to evaluate the effectiveness of compliance with WHS duties and the effectiveness of measures to protect workers, including any further measures implemented following Safe Work Australia's regulatory impact analysis process”. The response also noted that further time may be required to make this assessment beyond the July 2024 proposed deadline (Australian Government 2022).
- further information from research, compliance and enforcement initiatives will assist in determining whether engineered stone can be worked with safely, which will inform the decision around a ban.

- as is the case for asbestos, the scope of the model WHS laws could only be extended to prohibit the use of engineered stone within each jurisdiction. It could not prevent the importation of engineered stone into Australia, which would need to be considered under the Commonwealth Customs Regulations, and
- a ban on importation, manufacture and supply of engineered stone will not address the risks of silicosis in Australian workers exposed to RCS in other industries such as mining, tunnelling and construction, nor will it address the risks associated with the processing or removal of engineered stone that is currently *in situ*.

4.8.2 Replacement of chest X-Ray with low dose High Resolution Computerised Tomography in the minimum regulatory requirements for health monitoring

The National Dust Disease Taskforce Final Report also recommended “strengthening the health monitoring requirements include contemporary methodologies such as low dose [HRCT] scans” (Department of Health 2021). It also noted that: “A HRCT scan has been demonstrated to be more sensitive than X-rays in detecting early dust lung disease. Use of a HRCT scan of the chest (non-contrast) may be considered depending on the worker’s history and levels of individual silica exposure. If the worker’s role involves a very high level of silica exposure (such as working with engineered stone benchtops) or a high level of silica exposure for over three years, then a HRCT scan should be used as a replacement or adjunct to [chest] X-ray. Health professionals need to balance the risk of radiation exposure versus the risk associated with exposure to silica dust.”

Currently, the model WHS Regulations prescribe a chest X-ray as a minimum but allow for another type of health monitoring where the registered medical practitioner considers it is equal or better.

Inclusion of low dose HRCT as a mandatory minimum regulatory requirement for health monitoring has not initially been included as an option because:

- as mentioned above, the model WHS Regulations already allow for equal or better methods to be used for health monitoring such as HRCT.
- this would remove the medical practitioner’s ability to determine that chest X-rays may be an appropriate method when carrying out or supervising health monitoring. There may be circumstances where chest X-rays are preferred, such as where workers have lower levels of exposure to RCS and the risks of radiation exposure outweigh the benefits of HRCT. The National Guidance for Doctors Assessing Workers Exposed to Respirable Crystalline Silica Dust notes that “... because of the risk of false positives with the use of low dose HRCT in a screening context, it is not currently recommended as a frontline screening modality in those who do not meet eligibility criteria that would otherwise warrant immediate investigation for diagnostic purposes” (Department of Health 2022).
- some stakeholders, in preliminary consultation for this RIS, also expressed concerns about access to low dose HRCT in rural and regional parts of Australia. The possible lack of availability of low dose HRCT technology to all workers, in all locations where workers may be exposed to RCS, could result in delays or decreased regularity of health monitoring, particularly in rural and regional areas.

4.8.3 Cost recovery of activities related to licensing of PCBU’s working with engineered stone

The National Dust Disease Taskforce Final Report noted that “... [t]here may be scope as part of the introduction of regulatory changes, including potential licensing schemes, to consider options for cost recovery from industry to support additional enforcement efforts by WHS regulators” (Department of Health 2021).

Monetary amounts for fees and charges are not prescribed under the model WHS laws. However, fees and charges for licensing and other services can be set at levels that are appropriate for each jurisdiction. This RIS estimates the costs to industry for licence applications (based on the Victorian scheme), and the costs to government of administering the licensing framework and undertaking additional compliance and enforcement activities in the engineered stone sector. The issue of whether these government costs should be recovered through the licensing fees has been excluded from this analysis. This is a matter for individual jurisdictions, should they implement a licensing framework for the engineered stone sector.

4.9 Consultation questions

Safe Work Australia is seeking feedback on the following consultation questions related to the regulatory and non-regulatory options:

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

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

5 Who was engaged in preliminary consultation and how was their feedback incorporated?

5.1 Overview

Preliminary consultations were held with a range of stakeholders including state and territory WHS regulators, industry peak bodies, employee representatives, employer representatives and health organisations. The consultation consisted of 3 workshops and 4 discussions with single organisations. In total 24 stakeholders were invited to participate in the consultations, with 23 stakeholders taking part.

All consultations were conducted virtually, with the assistance of interactive digital tools for workshops, and single organisation consultation consisted of a structured discussion.

This was undertaken to:

- gain a deeper understanding of exposures to RCS in Australian workplaces and the extent of the risks of silicosis and silica related diseases
- seek comment on and inform the development of regulatory and non-regulatory options
- identify and define gaps in available data and evidence that may affect the assessment of the impacts of each option, and
- understand implementation barriers that may exist for each of the proposed options.

5.2 Stakeholder consultation

5.2.1 Stakeholder participation and attendance

Safe Work Australia and EY conducted stakeholder workshops and individual consultations with 37 individuals representing 22 key stakeholders. A list of the participating organisations and participant numbers can be found in Table 10.

Table 10: Summary of stakeholder workshops

Workshop / consultation	Participating organisations (participant numbers)
Workshop 1: State and territory WHS regulators and Commonwealth Attorney-General's Department	Office of Industrial Relations (3) SafeWork NSW (5) WorkSafe Tasmania (3) WorkSafe Victoria (1) SafeWork SA (1) NT WorkSafe (1) WorkSafe WA (2) WorkSafe ACT (2) Attorney-General's Department (2)
Workshop 2: Union and peak health bodies	Australian Council of Trade Unions (1) Australian Institute of Health & Safety (1) Thoracic Society of Australia and New Zealand (3) Lung Foundation Australia (2) Public Health Association Australia (1) Australian and New Zealand Society of Occupational Medicine Inc (1) Australian Institute of Occupational Hygienists (1)
Individual consultation	Institute of Quarrying Australia (1)
Individual consultation	Commonwealth Department of Health (2)
Workshop 3: Industry representatives	Australian Chamber of Commerce and Industry (1) Australian Industry Group (1)
Individual consultation	Australian Institute of Health and Welfare (1)
Individual consultation	Cement Concrete and Aggregates Australia (1)

5.2.2 Preliminary consultation process

Stakeholder feedback during the consultation process informed the development of the problem statement and supporting evidence base.

Feedback from all stakeholders was considered to build a more comprehensive understanding of the problem statement and evidence base. Stakeholder feedback on the problem statement was received in workshops and individual consultations, with some stakeholders providing supporting evidence following workshops and consultations. Materials received include quantitative data, reports and peer-reviewed papers.

Stakeholders will have further opportunity to provide feedback on the problem statement and additional evidence in the public consultation phase of this CRIS.

5.2.3 Key findings – problem statement

Stakeholders raised concerns with explicitly naming some industry sectors in the overarching problem statement. The predominant concern was that listing individual industry sectors may be misleading due to the different context and varied levels of RCS exposure across industry sectors. As a result, the problem definition was amended to refer to industries in a generalised sense, with a greater focus on individual industries in the evidence base that supports the problem statement.

Additionally, union stakeholders expressed that the problem definition should include a reference to the prevention of illness and premature death.

5.2.3.1 Information gaps where workers have developed silica related illnesses

Feedback for the first problem component centred around the lack of consistent and reliable data across jurisdictions. Government stakeholders noted that data gaps include the type of silicosis diagnosed and mapping of these diagnoses across industries. Some regulators and union stakeholders expressed that the quality of reported health monitoring data is inconsistent across jurisdictions. This is resulting in challenges for regulators in monitoring and comparing the data effectively. Similarly, the lack of a national requirement to report exposure above the WES threshold has resulted in inadequate and inconsistent records for workplace exposure data across jurisdictions.

It was noted during the consultation process that there has been a focus on improving measurement and data in the last 12 months. However overall data collection and interpretation remains poor. Screening and surveillance programs have been, and continue to be, implemented to identify cases and inform data gaps.

5.2.3.2 Understanding of silica related risks and current regulatory requirements

A range of factors contributing to the lack of understanding of regulatory requirements was noted by stakeholders including, the risks posed by RCS exposure and the ways to manage those risks. The complexity of regulatory frameworks was identified by regulators and union stakeholders as a key cause for the lack of understanding. Complexities arise from the multiple duty holder arrangements on a site (e.g., for employees, contractors, suppliers) as well as the technical nature of WHS regulations.

Some industry stakeholders also identified complexities arising from inconsistencies across jurisdictions in approaches to awareness campaigns and communication of regulations. Stakeholders noted the delivery of awareness campaigns could be improved upon. Union stakeholders noted that the communication of regulations is often delivered through an unsuitable and inconvenient medium for workers (such as regulator websites) and does not address the needs of workers. There is a lack of plain English explanations and appropriate resources for culturally and linguistically diverse workers.

While some industry and government stakeholders expressed that awareness has increased over the last two to three years, due to regulator, union and industry awareness campaigns, it was recognised there are still gaps in knowledge and an unwillingness to change behaviour. For example, one industry stakeholder noted that whilst workers are now more aware of the risks posed by RCS, this may not translate to knowledge of how to mitigate those risks or willingness to change their behaviour accordingly.

5.2.3.3 Inadequate levels of compliance and enforcement of current regulations

Stakeholder feedback on issues of compliance and enforcement focused on the inconsistency of enforcement capability and activities across jurisdictions, as well as workplace cultural factors contributing to a lack of compliance. Some regulator and industry stakeholders noted that regulator capability and resources vary between jurisdictions, resulting in inconsistent levels of activities including enforcement and prosecution. Additionally, some regulators pointed to a change in regulator skill sets, with a lack of in-house knowledge and capability contributing to insufficient enforcement activity. In terms of workplace compliance, industry stakeholders noted the prevalence of non-compliance in workplace cultural behaviour. For example, control methods such as wet cutting may not be followed if workers are only making one cut, as the effort and time cost associated with these control methods are seen as too cumbersome to be worth it for a minimal amount of activity. Similarly, workplace dynamics can result in newer employees following the example of more established employees, further entrenching non-compliant behaviours within the workplace.

5.2.4 Key findings: regulatory and non-regulatory options

Feedback from stakeholders on the policy options focussed primarily on the design of the policy options. Draft options were tested in workshops and individual consultations and were further refined for including in the RIS. While the options did not undergo significant change, an additional option (Option 3) was added based on stakeholder feedback. Stakeholders also provided feedback regarding the qualitative benefits and challenges of each option.

5.2.4.1 Option 1: Base case

There was stakeholder consensus that the activities under the base option are insufficient to address the problem statement. Some stakeholders noted that within the context of the RIS, the base case should include recent efforts to address the problem, including concerted efforts by jurisdictions over the last few years focussing on awareness, education, new Codes of Practice and compliance campaigns.

5.2.4.2 Option 2: Awareness and behaviour change

Stakeholders agreed there is a role for further awareness and behaviour change efforts and that this option would benefit from additional input from industry. It was acknowledged that cultural and behavioural factors do have significant impact on the uptake of messaging. Feedback from some industry stakeholders suggests that tailoring awareness campaigns to different industries and risk levels is important in achieving increased awareness and behaviour change. Several stakeholders noted that behavioural economics to identify incentives and disincentives for change which would reduce workplace exposures to RCS.

Additionally, stakeholders expressed that these campaigns should consider different formats to be more effective for workers, such as audio-visual, online learning and translated materials for culturally and linguistically diverse workers.

5.2.4.3 Option 3: Clarification of existing requirements in the model WHS laws

This option was created following feedback from stakeholders about the need to clarify of existing requirements in the model WHS laws.

5.2.4.4 Option 4: National licensing framework

Several stakeholders questioned the ability of a licensing framework to effectively achieve the desired outcome. It was noted that many of the proposed initiatives, such as the licensing framework were already in place, which may lead to minimal additional benefit, especially if licensing did not change compliance behaviour as intended. Additionally, stakeholders noted that the licensing fees are an important consideration, as a fee that is set at too high a rate may lead to employers allocating money away from control measures and other compliance activities.

5.2.4.5 Option 5a and 5b: Regulation of defined high risk crystalline silica processes

Feedback on these options primarily concerned the design of each option, with stakeholders noting that regulation would need to find balance between flexibility and prescriptiveness to achieve effective outcomes. Stakeholders also expressed concerns that regulations should consider the specific contexts of industries so that they are fit for purpose.

Feedback on the benefits of this option centred around establishing a regulatory framework that has the potential benefit of future proofing industries. The tailored nature of this option also means that it could be combined with other options such as licensing for maximum effect.

5.2.5 Key findings: Assessment of out of scope options

Several stakeholders raised the possibility of other options that were not considered in the CRIS. The first option was a free assessment service to small businesses; however, it was noted that this was likely to incur a high cost. Another was the idea of an advisory service provided by regulators whereby PCBUs may engage regulators for advice. However, it was noted that this option may be minimally effective as the PCBUs that are currently non-compliant and are in greatest need of assistance are unlikely to seek help from regulators.

Finally, union and peak health bodies expressed a preference for the consideration of a ban on engineered stone, or a phased partial ban. Stakeholders noted that the findings from the National Dust Disease Taskforce report recommended that a ban be considered in July 2024 if other measures are insufficient in addressing the problem. Stakeholders noted that a ban would eliminate the risks associated with engineered stone installation from workplaces, consistent with the hierarchy of controls, and that it may incentivise research into safer alternatives.

6 What is the likely impact of each option?

6.1 Approach to impact analysis

The RIS process seeks to ensure that proposed regulatory and non-regulatory options are well-targeted, effective and appropriate, and any burden imposed on business and the community is comparatively appropriate to address the identified issue. A key part of this process is to compare the impact of the proposed options.

Typically, costs imposed on business and government can be assessed quantitatively, while other costs and benefits can be more difficult to estimate in monetary terms. In this CRIS, efforts are made to identify the monetary costs to business and government for the proposed options that are additional to the base case option.

Following consultation with OBPR, a combination of multi-criteria analysis (MCA) and breakeven analysis (BEA) has been used to measure the impact of each option.

MCA can be used when it may not be feasible to fully quantify the impacts of an option and allows qualitative information to be used in decision-making. The criteria used to assess each option are described in Section 6.2. This CRIS includes detailed estimates of the additional costs of each option above the base case. However, it was not feasible to quantify the benefits of the effectiveness of each of the proposed options to reduce exposures to RCS and reduce silicosis and silica related diseases, in monetary terms. This is because there is insufficient data to estimate the benefits of a reduction in workplace exposure in RCS and a reduction in silicosis and silica related disease for each of the regulatory and non-regulatory options. Even though Victoria has implemented regulations consistent with Options 4 and 5b, there has been insufficient time to evaluate how these changes have reduced exposures to RCS and reduced silicosis and silica related diseases.

This CRIS also includes a BEA, which quantifies the economic cost of each case of silicosis and assesses the number of silicosis cases which would need to be avoided under each option for the benefits to outweigh the additional costs.

6.2 Criteria development for multicriteria analysis

In an MCA, it is important to clearly define the criteria when assessing options to integrate quantitative and qualitative information in a way that allows options to be compared on a transparent and consistent basis.

This MCA uses the following criteria to assess each option:

- the additional costs to industry and government: quantitative estimates of the costs to industry of complying with the proposed regulations and the costs to government of implementing and administering the regulations above those of the base case (Option 1), and
- the effectiveness: qualitative assessment of the effectiveness of each option in reducing occupational exposures to RCS and the number of cases of silicosis and silica related diseases.

6.3 Defining the additional costs to industry and government

Analysis of the costs to industry and government for Options 2-5 has been undertaken using information available at the time of drafting. The costs presented below do not include costs of controls associated with complying with the current requirements of the model WHS laws.

Safe Work Australia is seeking stakeholder feedback on the identified costs and key assumptions underpinning the estimated cost to industry and government for each option. The methodology and assumptions presented in Appendix D.

6.3.1 Additional costs to industry

A description of the additional costs to industry are summarised in Table 11 below. No additional costs to industry would be incurred for Options 2 and 3. Under Option 4, there would also be no additional cost to industry to provide instruction, information, and training to workers prior to commencing work with engineered stone, and to implement specific control measures under Option 4 as these are already required under the model WHS laws.

Table 11: Description of additional costs to industry of Options 4, 5a and 5b

Cost to industry	Description
Option 4	
Licence application	Labour to prepare a licence application
Engineered stone suppliers – retention of records	Labour for suppliers of engineered stone to retain records of PCBUs who have been supplied engineered stone.
Licence fee	Licence fee paid by PCBUs to work with engineered stone for a period of 5 years. Note that this would be set in jurisdictional legislation and not under the model WHS laws.
Engineered stone control plan	Labour to develop an engineered stone control plan, including a risk assessment
Compliance and monitoring enforcement	Labour to participate in scheduled and unscheduled audits
Health monitoring – provision of report to regulators	Labour to submit health monitoring report to regulators
Air monitoring – provision of report to regulators	Labour to submit air monitoring report to regulators
Option 5a and 5b	
Risk assessment	Labour to undertake risk assessment, supported by sampling of substrate in the quarrying, mining, and tunnelling industries
Silica risk control plan	Labour to develop a silica risk control plan based on the outcomes of the risk assessment. Note: For high risk crystalline silica work that is high risk construction work, preparation of a SWMS would be sufficient to meet the requirement for a silica risk control plan. This is an existing requirement of the model WHS laws.
Compliance and monitoring enforcement	Labour to participate in scheduled and unscheduled audits
Health monitoring – provision of report to regulators	Labour to submit health monitoring report to regulators
Air monitoring – provision of report to regulators	Labour to submit air monitoring report to regulators

6.3.2 Additional costs to government

Table 12 summarises the additional costs to government for Options 2-5 above the baseline option (Option 1).

Table 12: Description of additional costs to government of Options 2-5

Cost to government	Description
Option 2	
Planning and design of awareness raising and behaviour change initiative	Labour to plan and design behaviour change initiatives
Roll out across a range of industry sectors of awareness raising and behaviour change initiative	Roll out of awareness/behaviour change initiative across a range of industry sectors
Option 3	
Implementation of a national education and awareness campaign to support the regulatory change	Cost of campaign to inform PCBUs and other relevant duty holders of regulatory changes
Option 4	
Implementation of a national awareness campaign to support the regulatory change	Cost of campaign to inform PCBUs and other relevant duty holders of regulatory changes
Development, implementation, and maintenance of a system for administration of licensing framework	Labour to develop the administration system to support the licensing framework and implement in each jurisdiction Note: the system could also be used to collate health and air monitoring data
Processing of licences	Labour to assess licence applications
Compliance and monitoring enforcement	Labour to participate in additional scheduled and unscheduled audits
Options 5a and 5b	
Implementation of a national awareness campaign to support the regulatory changes	Cost of campaign to inform PCBUs and other relevant duty holders of additional requirements resulting from regulatory changes
Administration related to collation and analysis of reports	Labour associated with developing an administrative system to support the collation and analysis of air and health monitoring reports. Labour associated with processing and analysis of the reports submitted by PCBUs on an annual basis

6.4 Cost of options

6.4.1 Option 1: Base case

The base case has been included as a baseline option to demonstrate the incremental impact of regulatory/non-regulatory changes over and above the baseline costs. There would be no additional costs to industry or government under the base case.

6.4.2 Option 2: National awareness and behaviour change initiatives

6.4.2.1 Costs to industry

Awareness campaigns and behaviour change initiatives would not present an additional cost to industry as the cost of development and distribution would be borne by government.

6.4.2.2 Costs to government

Compared to the base case, additional costs borne by government relate to the planning and design and the subsequent development and distribution of information for behaviour change and awareness initiatives on an annual basis.

The total estimated net present cost over a 10-year forecast period is presented in Table 13.

Table 13: Net present cost to government of awareness and behaviour changes initiatives (Option 2) over 10 years

Cost	Net present cost over 10-year period (\$m)
Awareness and behaviour change initiatives – planning and design	\$0.11
Awareness and behaviour change initiative – roll out across all industry sectors	\$5.96
Total	\$6.08

6.4.3 Option 3: Clarification of existing requirements in model WHS laws

6.4.3.1 Costs to industry

This option presents no additional regulatory burden to industry and as such, poses no additional costs of compliance compared with the base case.

6.4.3.2 Costs to government

Compared to the base case, additional costs borne by government include the drafting of regulations, and the implementation of an information and awareness campaign to promote the changes.

The total estimated net present cost over a 10-year forecast period is presented in Table 14 below.

Table 14: Net present cost to government of clarification of existing requirements in the model WHS laws (Option 3) over 10 years

Cost	Net present cost over 10-year period (\$m)
Implementation of a national awareness campaign to support the regulatory change	\$0.11
Total	\$0.11

6.4.4 Option 4: Implementation of a national licensing framework for PCBUs working with engineered stone

6.4.4.1 Costs to industry

Additional costs incurred by industry above the base case for Option 4 include the licensing fee and labour costs associated with preparation of a licence application every 5 years, retention of records by engineered stone suppliers, preparation and revision of risk assessments and control plans, and submission of air and health monitoring reports to WHS regulators.

The total estimated net present cost over a 10-year period is presented in Table 15.

Table 15: Net present cost to industry of a national licensing framework for PCBUs working with engineered stone (Option 4) over 10 years

Cost	Net present cost over 10-year period (\$m)
Preparation of licence application	\$1.40
Engineered stone suppliers – retention of records	\$0.03
Licence fee	\$0.49
Preparation and maintenance of an engineered stone control plan, including risk assessment	\$0.66
Participation in compliance and enforcement activities	\$1.31
Health monitoring – provision of report to regulators	\$0.99
Air monitoring – provision of report to regulators	\$0.99
Total	\$5.88

6.4.4.2 Costs to government

Additional costs incurred by government above the base case include labour costs associated establishing and implementing the national licensing framework, assessment of licence applications, and preparing for and participating in scheduled and unscheduled audits of licensees. Other costs include implementation of an awareness campaign to support implementation of the licensing scheme, and the development of a system for administering the licensing framework, which could also capture health and air monitoring data.

The total estimated net present cost over a 10-year period is presented in Table 16.

Table 16: Net present cost to government of a national licensing framework for PCBUs working with engineered stone (Option 4) over 10 years

Cost	Net present cost over 10-year period (\$m)
Implementation of a national awareness campaign to support the regulatory change	\$0.11
Administration of licensing framework	\$4.75
Processing of licences	\$4.63
Compliance and enforcement	\$8.65
Total	\$18.14

6.4.5 Option 5a: Additional regulation of defined high risk crystalline silica processes

6.4.5.1 Costs to industry

Additional costs incurred by industry beyond the base case for Option 5a include labour for the preparation of risk assessments and a control and implementation plan, and submission of air and health monitoring reports to WHS regulators.

The total estimated net present cost over a 10-year period is presented in Table 17.

Table 17: Net present cost to industry of additional regulation of defined high risk crystalline silica processes for industry (Option 5a) over 10 years

Cost	Net present cost over 10-year period (\$m)
Preparation and maintenance of a risk assessment	\$78.46
Preparation and maintenance of a silica risk control plan	\$14.82
Health monitoring – provision of report to regulators	\$50.79
Air monitoring – provision of report to regulators	\$50.79
Total	\$194.86

6.4.5.2 Costs to government

Additional costs incurred by government over and above the requirements under the WHS laws for this option include funding for an awareness campaign on amendments to the model WHS laws.

The total estimated net present cost over a 10-year period is presented in Table 18.

Table 18: Net present cost to government of additional regulation of defined high risk crystalline silica processes for industry (Option 5a) over 10 years

Cost	Net present cost over 10-year period (\$m)
Implementation of a national awareness campaign to support the regulatory change	\$0.11
Data analysis and reporting	\$0.38
Total	\$0.49

6.4.6 Option 5b: Additional regulation of defined high risk crystalline silica processes (excluding engineered stone)

6.4.6.1 Costs to industry

The costs to industry incurred under Option 5b are equivalent to Option 5a, with the exception that costs associated with PCBUs working with engineered stone are excluded from the analysis.

The estimated net present cost to industry over a 10-year period is presented in Table 19.

Table 19: Net present cost to industry of additional regulation of defined high risk crystalline silica processes for industries (Option 5b) over 10 years

Cost	Net present cost over 10-year period (\$m)
Preparation and maintenance of a risk assessment	\$77.80
Preparation and maintenance of a silica risk control plan	\$14.82
Health monitoring – provision of report to regulators	\$49.80
Air monitoring – provision of report to regulators	\$49.80
Total	\$192.21

6.4.6.2 Cost to government

The estimated net present cost to government over a 10-year period is presented in Table 20.

Table 20: Net present cost to government of additional regulation of defined high risk crystalline silica processes for government (Option 5b) over 10 years

Cost	Net present cost over 10-year period (\$m)
Implementation of a national awareness campaign to support the regulatory change	\$0.11
Data analysis and reporting	\$0.38
Total	\$0.49

6.4.7 Summary assessment

Table 21 summarises the net present cost to industry, government and total costs incurred for each option. These costs would be cumulative if combinations of various Options are to be considered.

Table 21: Comparison of net present cost for Options 2-5 over 10-year period (\$m)

Criterion	Option 2	Option 3	Option 4	Option 5a	Option 5b
Cost to industry	\$0.00	\$0.00	\$5.88	\$194.86	\$192.21
Cost to government	\$6.08	\$0.11	\$18.14	\$0.49	\$0.49
Total cost	\$6.08	\$0.11	\$24.02	\$195.35	\$192.70

6.5 Effectiveness

6.5.1 Option 1: Base case

The base case describes the current regulatory and non-regulatory measures implemented to minimise the risks of RCS and consequently, reduce the number of cases of silicosis and other silica related diseases (see Section 4.2). As outlined in Chapter 3, factors such as a lack of understanding of silica related risks and current regulatory requirements, and levels of compliance and enforcement, have led to workplace exposure to RCS. As set out in Chapter 4, current experience indicates that due to the wide range of materials that contain crystalline silica, the range of affected industries, and the current levels of silicosis and silica related diseases, it is unlikely that the market will effectively address this issue without government intervention. In many cases, it is not viable to substitute other materials (e.g., bricks and concrete) or alternative processes to minimise the risks of RCS.

While not considered an acceptable option, the base case has been included for comparison to demonstrate the incremental impact of regulatory/non-regulatory changes over and above the baseline option.

6.5.2 Option 2: National awareness and behaviour change initiatives

As described in Section 4.3, Option 2 includes additional awareness and behaviour change initiatives targeted at workers, PCBUs and other duty holders in the construction, manufacturing, demolition, tunnelling, quarrying and mining industries.

Targeted and accessible awareness and behaviour change initiatives are expected to lead to increased compliance, a reduction in workplace exposure to RCS and reduced instances of silicosis and silica related diseases compared with base case as this option would:

- provide industry specific information to workers and PCBUs and other duty holders, targeting changing compliance behaviours, and
- aim to reach a broad audience across a wider range of industries.

Awareness and behaviour change initiatives are expected to improve compliance with the model WHS laws, particularly for those who are less aware of the risks of RCS and the appropriate control measures. Improved compliance is expected to result in a reduction in the risks to workers. However, these initiatives may be less effective at improving compliance if they are not combined with either Options 3, 4 or 5, all of which would provide greater additional clarity about what is specifically required to reduce the risk of exposure to RCS and reduce the number of cases of silicosis and silica related diseases. The non-regulatory nature of awareness and behaviour change initiatives may create a sense that RCS exposure is not a serious issue, and reduce effectiveness.

The initiatives would need to cover a broad range of industries and workers and may need to be tailored to be most effective. Ongoing and varied behaviour change strategies may be required for a long-lasting change.

6.5.3 Option 3: Clarification of existing requirements in model WHS laws

Option 3 consolidates and clarifies the existing requirements of the model WHS laws into specific regulation covering defined high-risk silica processes. Clarification of existing requirements in model WHS laws will lead to increased compliance, a reduction in workplace exposure to RCS and a reduced number of cases of silicosis and other silica related diseases beyond the base case, as this option would:

- clarify existing regulatory requirements related to high-risk silica work, and if combined with an associated communication campaign, will improve awareness of the risks of RCS and appropriate controls
- provide greater certainty and understanding around regulatory requirements to manage RCS exposure for PCBUs and other duty holders, and
- address concerns among stakeholders about the subjective thresholds that are included in the model WHS laws. For example, this would clarify the circumstances under which air monitoring and health monitoring are required.

However, initiatives under this option are unlikely to be as effective as those presented in Option 4, 5a or 5b as this option:

- only clarifies the existing regulatory and compliance requirements and contains no additional regulatory reforms. For instance, it:
 - does not contain additional provisions for PCBUs undertaking high risk silica work to conduct risk assessments and develop silica risk control plans
 - does not contain additional provisions to report all results of air monitoring and health monitoring to WHS regulators
 - does not contain additional requirements for PCBUs working with engineered stone, such as undertaking a risk assessment and developing and implementing an engineered stone control plan, and
 - may not result in additional compliance and enforcement initiatives.

6.5.4 Option 4: Implementation of a national licensing framework for PCBUs working with engineered stone

This option involves development and implementation of a national licensing framework for PCBUs working with engineered stone, based on the recent amendments related to licensing of employers working with engineered stone under the Victorian Occupational Health and Safety Amendment (Crystalline Silica) Regulations 2021.

Compared with the base case, Option 4 is likely to result in increased compliance, a reduction in workplace exposure to RCS and reduced number of cases of silicosis and silica related diseases in the engineered stone sector as it would:

- provide an incentive for PCBUs working with engineered stone to become licensed as supply of engineered stone to unlicensed PCBUs will be prohibited

- provide an incentive for PCBU's who do not want to become licensed to work with alternative products with no crystalline silica content
- ensure that licensees assess the risk of processes involving engineered stone through the development of engineered stone control plans
- increase the likelihood of adoption of appropriate control measures, air monitoring and health monitoring among PCBU's working with engineered stone
- result in greater compliance and enforcement of the model WHS laws through scheduled and unscheduled visits of licensees' workplaces and the imposition of financial penalties for non-compliance
- provide regulators with greater information on the number and location of workplaces where engineered stone is processed
- allow state and territory regulators to analyse air monitoring and health monitoring data to:
 - draw insights into trends of RCS exposure for workers processing engineered stone
 - make an initial assessment into a PCBU's ability to manage RCS exposure, and
 - better target enforcement and compliance actions where required.

However, initiatives under this policy option are unlikely to be as effective in reducing the level of workplace exposure to RCS and the number of cases of silicosis and silica related diseases compared to Option 5a and 5b, as this option focuses solely on PCBU's working with engineered stone, which are small subset of the estimated number of workers exposed to RCS.

Another disadvantage of this option is that it would place a greater financial burden on small to medium size businesses (which form a large portion of the engineered stone industry) who may lack the economies of scale to absorb licensing costs. This may have negative effects on market competition.

It is also possible that some PCBU's, instead of seeking alternative products, could seek engineered stone from unregulated sources, such as repurposing engineered stone from the second-hand market. This could result in workers still being exposed to the risks of RCS.

6.5.5 Option 5a: Additional regulation of defined high risk crystalline silica processes

This option applies to a broad range of high risk silica processes and covers additional processes and control measures when working with CSC materials. Option 5a would include amendments to the model WHS Regulations applying to CSC materials (including engineered stone).

Additional regulation of defined high risk crystalline silica processes would lead to increased compliance, a reduction in workplace exposure to RCS and reduced instances of silicosis and other silica related diseases over and above the base case (Option 1) as this option would:

- increase the likelihood of PCBU's being aware of the risks of high risk silica processes and the need to implement appropriate controls to eliminate or minimise these risks
- impose greater accountability on PCBU's undertaking high risk silica work as they would be required to conduct risk assessments and develop silica risk control plans and report air monitoring and health monitoring results to WHS regulators, and
- allow state and territory regulators to analyse air monitoring and health monitoring data to:
 - draw insights into trends of RCS exposure
 - make an initial assessment into a PCBU's ability to manage RCS exposure, and

- better target enforcement and compliance actions where required.

6.5.6 Option 5b: Additional regulation of defined high risk crystalline silica processes (excluding engineered stone)

As noted in Section 4.7, Option 5b is equivalent to Option 5a with the exclusion of PCBUs working with engineered stone.

Amendments to the model WHS Regulations applying to all silica containing materials, covering specific processes, and prescribing specific control measures when working with silica containing materials. This option would exclude engineered stone so that the costs and impacts of this option can be considered in combination with Option 4.

The effectiveness of this option is presented in Option 5a with key findings applicable to all industry sectors excluding engineered stone.

6.6 Benefits assessment

The qualitative assessment undertaken in Section 6.5 demonstrates that to varying extents, Options 2-5 would be likely to lead to increased compliance, reduced workplace exposure to RCS and a reduction in silicosis. This will result in direct and indirect benefits including:

- reduction in premature death from silicosis
- reduced number of workers living with silicosis
- reduced health care costs, including hospitalisations and treatment, for silicosis
- improved worker productivity by extending working life, and
- avoided mental health and quality of life effects for workers, family and friends.

A further benefit of capturing and analysing air and health monitoring data is that it will allow a national assessment on the effectiveness of initiatives to reduce exposure to RCS at the workplace and inform assessments about the ongoing risks to workers.

Due to uncertainty and insufficient data, it is not possible to assess effectiveness of each option in monetary terms. The following section assesses the economic impact per case of silicosis.

6.6.1 Assessing the benefits of silicosis prevention

The economic impact associated with a worker developing silicosis can occur across many years, from the time an injury is diagnosed through to the end of the worker's life. In most cases, silicosis diseases will worsen over time. This means that workers who receive an early diagnosis are required to live with this burden and the increased likelihood of premature death.

These health benefits are typically estimated economically through the quantification of value of lives saved and illness avoided. This is an accepted economic method for analysing and comparing policy options for reducing fatalities and illness.

However, this analysis is conservative and is likely to underestimate the full costs of silicosis to the Australian economy. It does not assess the costs associated with other silica related diseases (such as lung cancer, silicosis, and progressive massive fibrosis), nor the difference in the progression of acute or accelerated silicosis that is associated with higher exposures to RCS. It also does not consider other significant benefits that are associated with not having silicosis such as:

- improved mental health and wellbeing benefits for affected workers and their families
- reduced costs to the public health and workers' compensation systems, and

- improved productivity and efficiency resulting from reduced absenteeism.

6.6.1.1 Value of lives saved and illness avoided

The value of lives saved and illness avoided is estimated by comparing the duration an individual life with silicosis and the number of years lost due to premature death before the average life expectancy.

This is measured using the value of a statistical life year (VSL) as an estimate of the value society places on a year of life. The VSL is most appropriately measured by estimating how much society is willing to pay to reduce the risk of death. The value of an individual living with the disease is measured using a disability adjusted life year (DALY) factor, representing the loss of one year of full health.

Key assumptions used in the CRIS undertaken in the Occupational Health and Safety Amendment (Crystalline Silica) Regulations 2021 Regulatory Impact Statement commissioned by WorkSafe Victoria (Deloitte 2021) as presented in Table 22.

Table 22: Key assumptions for breakeven analysis

Assumption	Value
Average life expectancy of an Australian	82.30 years (Australian Institute of Health and Welfare 2022)
Average age of diagnosis with silicosis	43.30 years (Deloitte 2021)
Average time between diagnosis of silicosis and death	9.30 years (Deloitte 2021)
Estimated average age of death due to silicosis	52.6 years
Proportion of silicosis diagnoses that led to a fatality	28% (Deloitte 2021)
Proportion of silicosis diagnoses that do not lead to a fatality	72% (Deloitte 2021)
Weighted average life expectancy of people with silicosis	73.9 years
Value of a statistical life year (VSL)	\$217,000 (Department of Prime Minister and Cabinet 2021b)
Disability adjusted life year (DALY)	\$94,338 (Department of Prime Minister and Cabinet 2021b)

Under this scenario, the quantification of the value of life saved and illness avoided is calculated using the following formula:

Expected value of life saved and illness avoided = VSL × (Average life expectancy of an Australian – Weighted average life expectancy of people with silicosis) + DALY × Number of avoided years living with silica related illness (years).

The average value of life saved and illness avoided per person is **\$4.07 million**.

6.7 Breakeven analysis

Breakeven analysis measures how effective an option needs to be so that the benefits outweigh the costs. In this analysis, the breakeven point expresses how many cases of silicosis would need to be prevented to justify the cost of each of the proposed options.

Table 23 lists the net present cost of each of the options over the ten-year reporting period. The number of cases of silicosis that would need to be prevented for each option to breakeven is determined by dividing the net present cost of each option by the costs of illness and death due to silicosis.

Table 23: Breakeven analysis results over ten years

Option	Net present cost (\$m)	Required number of silicosis cases prevented to breakeven
Option 2	\$6.08	1.49
Option 3	\$0.11	0.03
Option 4	\$24.02	5.90
Option 5a	\$195.35	48.00
Option 5b	\$192.70	47.35

It is difficult to forecast the effectiveness of each option. Although Options 4 and 5 have been developed based on the Victorian Occupational Health and Safety Amendment (Crystalline Silica) Regulations 2021 there has been insufficient time to assess the effectiveness of these options. Commencement of Victoria’s high risk silica regulations occurred in May 2022, and the licensing scheme for employers working with engineered stone will commence in November 2022. However, it is estimated that lower cost options (i.e. Options 2-4) would require fewer cases to be prevented to breakeven, compared with Option 5.

6.8 Consultation questions

Safe Work Australia is seeking feedback on the following consultation questions related to the impact analysis:

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

6.2 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.

6.3 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.

6.4 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.

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

7 Discussion of options

7.1 Option 1: Base case

The base case, Option 1, is unlikely to be successful in addressing workplace exposure to RCS and reducing the number of cases of silicosis and other silica related diseases. Despite the extensive education, compliance and enforcement activities undertaken in recent years, workers are continuing to be exposed to RCS and the number of cases of silicosis and silica related diseases has not declined. These activities alone are likely to be insufficient in addressing the risks of RCS exposure in the workplace. However, because of the latency of silicosis and silica related diseases, it is acknowledged that there has been insufficient time to evaluate the effectiveness of recent initiatives included in this option.

7.2 Option 2: National awareness and behaviour change initiatives to minimise the risks of RCS exposure

Implementation of Option 2 alone is unlikely to adequately address the problem. Awareness campaigns have been conducted across all state and territories (Table 2) as well as through specific groups such as the Australian Workers Union (Australian Workers Union 2021) and Lung Foundation Australia (Lung Foundation Australia n.d.). While there is some evidence of increase in compliance especially in relation to the engineered stone sector (e.g. Kreitals et al. 2022), there continues to be a lack of awareness and understanding among PCBU, workers and other duty holders engaged in other high risk silica work of the requirements of the model WHS laws (e.g. Glass et al. 2022, SafeWork SA 2021). Implementation of national awareness and behaviour change initiatives without clarification of the model WHS Regulations is unlikely to effectively reduce RCS exposure. Option 2 would be relatively low cost (\$6.08 million over 10 years) and if undertaken in conjunction with one of the regulatory options, would be expected to further reduce workplace RCS exposures. From an economic standpoint, it would break even if 1.49 cases of silicosis were prevented over 10 years.

7.3 Option 3: Clarifying the existing requirements of the model WHS laws for high risk silica processes

Option 3 is a lower cost approach to addressing the risks of RCS exposure and is estimated to cost \$0.11 million over 10 years. It would ensure regulations related to high risk silica processes are clarified for PCBU, workers and other duty holders. Clarification of the existing regulations would remove the existing ambiguity about the requirements of the model WHS laws with respect to RCS, and will provide certainty for PCBU undertaking high risk silica work about their duties to undertake air monitoring and health monitoring, and raise awareness of the need to address risks of RCS for high risk silica processes.

Option 3 is a relatively cost-effective measure, both in the immediate and projected period of 10 years, with no additional regulatory burden to industry beyond the base case. Because of its low additional cost, it would require 0.03 cases of silicosis to be avoided to break even from an economic perspective. However, this option would not introduce additional regulation, such as requirements to undertake risk assessments, to develop and implement silica risk control plans and/or engineered stone control plans, and provide air monitoring and health monitoring reports to regulators.

7.4 Option 4: Implementation of a national licensing framework for PCBUs working with engineered stone

The regulatory requirements of Option 4 may offer limited additional benefits compared with the base case or Option 3. Most of the intended outcomes for this option are addressed in the base case and clarified further in Option 3. For instance:

- proposed requirements for PCBUs to be licensed would enable data on the characteristics and locations of business to be retained by regulators to inform further compliance action. However, WHS regulators are able to identify engineered stone workplaces through existing regulatory mechanisms (NSW Legislative Council Standing Committee on Law and Justice 2022)
- requirements for provision of training to workers engaged by licensees are similar to the current requirements of reg 39 in the model WHS regulations, which require a PCBU to ensure that information, training and instruction provided to a worker are suitable and adequate
- requirements for PCBUs to implement specific engineering and RPE controls when using a power tool or mechanical plant when processing engineered stone are consistent with the amendments to the model WHS regulations to prohibit uncontrolled processing of engineered stone that are under development (see Section 4.2), and
- the proposed prohibition on the use of compressed air for cleaning is included in the model Code of Practice: managing the risks of respirable crystalline silica from engineered stone in the workplace (Safe Work Australia 2021a).

Additional requirements of Option 4 involve reporting of all health monitoring and air monitoring data to regulators within 30 days of receiving a report, requiring licensees to undertake a risk assessment, and develop and implement an engineered stone control plan. The reports would provide WHS regulators with greater visibility of the number and proportion of PCBUs working with engineered stone who are undertaking air and health monitoring programs.

Currently, a PCBU working with engineered stone must ensure that air monitoring is carried out to determine the airborne concentration of RCS in a worker's breathing zone, if necessary, to determine whether there is a risk to a worker's health, or if the PCBU is not certain whether RCS levels exceed the WES.

Although there is currently no explicit requirement for results of air monitoring data to be provided to regulators, Safe Work Australia is currently investigating if reporting of exceedances of the WES for some or all airborne contaminants could be mandatory under the dangerous incident provisions of the model WHS Act (see Section 1.4.3). If this work was to proceed, it would be part of a separate regulatory impact analysis process.

Under the model Code of Practice: managing the risks of respirable crystalline silica from engineered stone in the workplace, a PCBU working with engineered stone must organise and pay for health monitoring for all workers involved in fabrication and installation. The model WHS laws currently require that a PCBU disclose the results of health monitoring to the regulator as soon as practicable after obtaining the report if it contains advice that test results indicate that the worker may have contracted a disease (such as silicosis).

Licensees would also be required to develop and implement an engineered stone control plan which would include equivalent requirements to a SWMS. As noted previously, the model WHS laws already require a SWMS to be developed and implemented where processing of engineered stone is considered construction work (e.g., installation of benchtops). However, this requirement would require PCBUs involved in off-site manufacture and fabrication of engineered stone components to develop and implement an engineered stone control plan, as this is not covered under the definition of high risk construction work.

Additionally, Option 4 is likely to have competition effects on the market. OBPR advises that for options that are likely to restrict competition, the benefits must outweigh the costs and that there should be no alternative option to achieve the same objective (Department of Prime Minister and Cabinet 2020). Implementing a fixed licensing fee would be expected to have

disproportionate effects on micro- and small-businesses with lower revenue compare with larger businesses. This is important because 44 per cent of stonemasonry businesses are sole traders, and a further 24 per cent have between 1 and 5 staff (Quantum Market Research 2021).

Option 4 is expected to pose a moderate cost option to governments and industry, costing \$24.02 million over a 10-year period. To breakeven from an economic perspective, it is estimated that about 6 additional cases of silicosis would need to be prevented over a 10-year period.

7.5 Options 5a and 5b: Additional regulation of high risk crystalline silica processes

Additional regulations included in Option 5 would require PCBUs undertaking high risk crystalline silica processes to:

- undertake a risk assessment and develop and implement a silica risk control plan, unless a SWMS is already required
- provide all results of health monitoring to the WHS regulator within 30 days of receiving reports.
- provide all results of air monitoring to the WHS regulator within 30 days of receiving reports.

These options are expected to incur large costs due to additional administration costs for industry. Although the cost to individual businesses to undertake a risk assessment, develop a silica risk control plan, and provide health monitoring and air monitoring reporting to WHS regulators may be low for individual PCBUs, the overall cost of this option is due to the large number of businesses and industries that would be covered by the regulations.

As stated above, currently PCBUs must currently organise and pay for health monitoring for all workers exposed to crystalline silica where there is a risk to workers' health. PCBUs must disclose the results of health monitoring to the regulator as soon as practicable after obtaining the report if it contains advice that the worker may have contracted a disease (such as silicosis).

Options 5a and 5b include an additional requirement for all results of air and health monitoring to be provided to the regulator within 30 days of a report being received. Again, when multiplied across the number of businesses, industries and the ten-year projected timeframe considered, the cost accumulates. Provision of air and health monitoring data also would be expected to incur a cost to government in processing reports and analysing the data. While this would be a relatively small task per each report, due to the large number of reports this may lead to a significant workload and additional cost for regulators.

Options 5a and 5b would have a high cost for governments and industry (\$195.35 million and \$192.70 million over a 10-year period, respectively). To breakeven, around 48 cases of silicosis would need to be prevented over this period. To put this figure into context, this represents around 11 per cent of the total number of accepted workers' compensation cases for silicosis in Australia (excluding Victoria) over the 10 year period from 2010-11 to 2019-20.

7.6 Combinations of options

As discussed in Section 6.4.7, although the costs of different options would be expected to be cumulative, there may be additional benefits in implementing combinations of options. For instance, if the awareness and behaviour change initiatives were combined with one of the regulatory options, there would be benefits in awareness raising through clarifying or modifying the requirements of the model WHS laws together with implementing tailored behaviour change initiatives in the relevant industries. For example, a national licensing framework for PCBUS working with engineered stone (Option 4) when combined with further awareness and behaviour change initiatives (Option 2) would be expected to have a greater effect on compliance than either option alone.

7.7 Consultation questions

Safe Work Australia is seeking feedback on the following consultation questions related to the regulatory and non-regulatory options presented:

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

7.2 Are there any significant barriers to implementation of the options presented? What are those barriers? Is there a cost associated with them? How could they be overcome?

8 Consultation plan

8.1 Objective

Safe Work Australia is engaging in extensive and ongoing consultation with parties with an interest in minimising the WHS risks of RCS in Australia to seek stakeholder and public feedback on problem statement, proposed options, impact analysis and the preferred option or options.

8.2 Stakeholders

Safe Work Australia invites the public, governments, industry groups, and peak bodies to comment on the proposed options and to assist Safe Work Australia in testing its assumptions and understand the potential risks and impacts of the proposed options.

Stakeholders that will be approached for feedback on this CRIS include:

- Commonwealth and state and territory WHS regulators
- Commonwealth and state and territory Departments of Health
- Australian Institute of Health and Welfare
- Commonwealth Department of Employment and Workplace Relations
- Employee representatives, including but not limited to:
 - Australian Council of Trade Unions
 - Construction Forestry Maritime Mining Energy Union
 - Australian Workers Union
- Employer representatives, including but not limited to:
 - Australian Chamber of Commerce and Industry
 - Australian Industry Group
- Industry peak bodies, including but not limited to:
 - Australian Engineered Stone Advisory Group
 - Australian Tunnelling Society
 - Cement Concrete and Aggregates Australia
 - Institute of Quarrying Australia
 - Minerals Council of Australia
- Peak health groups and professional bodies
 - Australian and New Zealand Society of Occupational Medicine Inc
 - Australian Institute of Health & Safety

- Australian Institute of Occupational Hygienists
- Cancer Council Australia
- Lung Foundation Australia
- Public Health Association Australia
- Royal Australasian College of Physicians
- Thoracic Society of Australia and New Zealand

8.3 Consultation approach

Safe Work Australia welcomes feedback on this CRIS. This includes using our consultation platform Engage. Once registered with Engage, users can:

- ask questions about the RIS process, and
- make a formal submission on the questions asked in this CRIS.

Emails will be sent to Safe Work Australia subscribers to promote the CRIS. Social media, including posts on Facebook, LinkedIn and Twitter, will be used to promote the opportunity to provide views and evidence on the options proposed in the CRIS. We may also contact stakeholders directly for comment.

Safe Work Australia Members will be provided with material to publish on the CRIS, including links to the Engage platform. Safe Work Australia will also work with national organisations, businesses and associations to promote the consultation process on their respective websites and through their contact lists.

8.4 Next steps following consultation

Stakeholder feedback received from this CRIS will be used to revise information in the problem statement, options for analysis and assumptions in the impact analysis, before determining the proposed preferred option or options and developing an implementation and evaluation plan.

Once the 6-week consultation period has closed, stakeholders may be contacted for further information or to clarify information provided in submissions.

Safe Work Australia will use the stakeholder feedback received as part of this CRIS to prepare a Decision RIS for WHS ministers. The Decision RIS will identify options that result in the greatest net benefit to the Australian community, based on an analysis of the relative costs and benefits. It is expected the Decision RIS will be provided to WHS ministers for consideration in August 2022.

8.5 Implementation and evaluation

The Decision RIS will include a specific chapter on the implementation and evaluation of the preferred option or options. However, the following information has been included to provide clarity for stakeholders who may be affected the potential options.

Option 2 involves no additional regulation and could be implemented rapidly if it was the preferred option. The implementation of a regulatory option (i.e. Options 3-5), should it be agreed by WHS ministers, would take more time. It is anticipated that drafting instructions could be provided to the Australasian Parliamentary Counsel's Committee within 6 to 12 months of a

decision. Once an amendment has been made to the model WHS laws, Commonwealth and state and territory jurisdictions must enact the amendments in their relevant legislation. Options 4 and 5 involve additional regulatory burden for industry and it is expected that jurisdictions would decide upon a lead time to allow industry sufficient time to transition to the new regulations. In the case of the Victorian Occupational Health and Safety Amendment (Crystalline Silica) Regulations 2021, the transition period to implement regulations on high risk silica work was 6 months after commencement of the regulations, and there will be a 12 month transition period for the introduction of an engineered stone licensing scheme.

Evaluation will be conducted to assess the impact of the preferred option or options on exposures to RCS at workplaces and the number of cases of silicosis and silica related diseases. If a regulatory option is preferred, evaluation would begin from the commencement of the amendments to jurisdictional legislation. Given the long latency of silicosis and silica related diseases it is anticipated that this evaluation would need to occur for at least 5-10 years to demonstrate change.

9 References

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Appendix A: Legislative and regulatory framework for crystalline silica under the model WHS laws

What are the duties of PCBUs?

Under the model WHS laws, a PCBU has a primary duty of care to ensure the health and safety of workers while they are at work in the business or undertaking and that the health and safety of others is not put at risk from carrying out of the work.

A PCBU is often an employer. However, the concept of PCBUs also captures modern work relationships outside of the traditional contract of employment. For example, it includes principal and subcontractor relationships, host employers in a labour hire arrangement, as well as multiple employers in sub-contracting arrangements.

It is the PCBU's responsibility to eliminate risks arising from exposure to RCS or, where not reasonably practicable⁹, minimise the risks so far as is reasonably practicable to workers and other persons at the workplace¹⁰. This includes the maintenance and monitoring of the workplace environment, as well as the provision of information, training, instruction, or supervision to protect people from risks to their health and safety.¹¹ PCBUs must also, so far as is reasonably practicable, consult with workers who carry out work for the business or undertaking who are or are likely to be directly affected by a work health and safety matter.¹² PCBUs must also consult with the workers' health and safety representatives on work health and safety matters.¹³ For PCBUs working with RCS, examples of when consultation must occur include when preparing risk assessments and SWMS, developing a silica dust control plan, deciding on control measures and selecting the medical practitioner to undertake health monitoring.¹⁴

Where there is more than one person responsible for a duty in relation to the same WHS matter, each person with the duty must, so far as is reasonably practicable, consult, cooperate and coordinate activities with all other persons who also owe the have a duty in relation to the same matter.¹⁵

Workplace exposure standard for RCS

A PCBU must ensure that no person at the workplace is exposed to a substance or mixture in an airborne concentration that exceeds the exposure standard for the substance or mixture.¹⁶ The duty to ensure the WES is not exceeded is absolute and not qualified by so far as is reasonably practicable. A WES must not be adjusted upwards, even for shifts of less than eight hours (Safe Work Australia 2021a).

⁹ Safe Work Australia has published an interpretive guideline on the meaning of reasonably practicable (Safe Work Australia 2011).

¹⁰ model Work Health and Safety Act s17 (WHS Act); model Work Health and Safety Regulations r35 (WHS Regulations).

¹¹ model WHS Act s19 and s21; model WHS Regulations r39.

¹² model WHS Act s47.

¹³ model WHS Act s70.

¹⁴ model WHS Act s47; model WHS Regulations r299 and r369.

¹⁵ model WHS Act s46.

¹⁶ model WHS Regulations r49.

This means that a PCBU must ensure that no person at the workplace is exposed to RCS at a concentration above the WES, which is an eight-hour TWA of 0.05 mg/m³. An exposure standard represents the airborne concentration of a particular substance or mixture that must not be exceeded. However, it does not represent a line between a 'safe' and 'unsafe' concentration of an airborne substance or mixture. The exposure standard does not eliminate risk of disease and some people might experience adverse health effects below the exposure standard.

Air monitoring

A PCBU must undertake air monitoring in the breathing zone of workers (Safe Work Australia 2013) if there is uncertainty that the workplace exposure standard is being exceeded or if it is necessary to determine whether there is a risk to a worker's health.¹⁷ Air monitoring records must be kept for a period of 30 years and must be readily accessible to persons in the workplace who may be exposed to RCS.¹⁸ The air monitoring report should be made available to a work health and safety inspector on request and to a registered medical practitioner carrying out or supervising health monitoring (Safe Work Australia 2021a).

Health monitoring

PCBUs must also provide and pay for health monitoring for workers if they carry out ongoing work generating RCS, or there is a significant risk to the worker's health because of exposure.¹⁹ Health monitoring must be undertaken by or under the supervision of a medical practitioner with experience in health monitoring and a record must be kept for a period of 30 years and be given to the worker as soon as practicable after receipt and to the regulator in certain circumstances.²⁰

Under Schedule 14 to the model WHS Regulations, the minimum requirements for health monitoring for crystalline silica through exposure to RCS are:

- collection of demographic, medical and occupational history
- records of personal exposure
- standardised respiratory questionnaire
- standardised respiratory function tests, and
- chest X-Ray full posterior-anterior view.

The model WHS Regulations allow for alternative types of health monitoring if they are equal or better to these methods and the use of that other type of monitoring is recommended by a registered medical practitioner with experience in health monitoring.²¹ In Western Australia low dose HRCT is explicitly required instead of chest X-Ray for health monitoring.

The PCBU is also responsible for providing information to staff about health monitoring, and for providing copies of the health monitoring report to the worker, other PCBUs who have a duty to the worker, and in some cases the WHS regulator (Safe Work Australia 2021a). If a report indicates that a worker is experiencing adverse health effects or signs of illness because of exposure to RCS, control measures in the workplace must be reviewed and revised as necessary (Safe Work Australia 2021a).

High risk construction work and preparation of SWMS

Construction work is defined in the model WHS Regulations as any work carried out in connection with the construction, alteration, conversion, fitting-out, commissioning, renovation, repair, maintenance, refurbishment, demolition, decommissioning or dismantling of a structure. Regulation 291 of the model WHS Regulations sets out a list of high risk construction work for which a SWMS is required. This includes work carried out in an area that may have a contaminated or flammable atmosphere. Construction work that involves processing silica containing materials is high risk construction work

¹⁷ model WHS Regulations r50 and r368.

¹⁸ model WHS Regulations r378.

¹⁹ model WHS Regulations r370.

²⁰ model WHS Regulations rr371, 375, 378.

²¹ model WHS Regulations r370.

when it generates RCS that may contaminate the workplace's atmosphere and would require a SWMS (Safe Work Australia 2021a).

The SWMS must be accessible and understandable to any individual who needs to use it.²² If any high risk construction work is carried out, outside the manner stipulated in the SWMS, the PCBU must ensure that the work is stopped immediately or as soon as it is safe to do so, and only resumed in accordance with the SWMS.²³

Other duties for PCBUs working with engineered stone

The model Code of Practice: Managing the risks of respirable crystalline silica from engineered stone in the workplace (the model Code), published in October 2021, outlines specific duties for PCBUs working with engineered stone.

To have legal effect in a jurisdiction, a model Code must be approved as a code of practice in that jurisdiction. As of June 2022, the model Code has been enacted in New South Wales and Tasmania. In 2019, Queensland implemented a Code of Practice: Managing respirable crystalline silica dust exposure in the stone benchtop industry covering natural and engineered stone (Workplace Health and Safety Queensland 2019). WorkSafe Victoria has also implemented a Compliance Code: Managing Exposure to Crystalline Silica - Engineered Stone (WorkSafe Victoria 2020).

The model Code:

- provides a definition of engineered stone
- clarifies that the on-site installation of engineered stone is considered high risk construction work if the processes used to install, modify or repair the engineered stone such as, cutting, grinding, trimming, drilling, sanding, or polishing generate RCS and contaminates the work area
- requires PCBU(s) to prepare a SWMS before any on-site installation of engineered stone that involves any processing, modification or repair of engineered stone that may generate RCS,
- clarifies the duties for PCBUs working with engineered stone to undertake air and health monitoring, and
- specifies that PCBUs must not direct or allow workers to undertake uncontrolled dry cutting or processing of engineered stone.

Duties of designers, manufacturers, importers, suppliers and those who install or commission plant or structures

A designer, manufacturer, importer or supplier of silica containing products must ensure, so far as is reasonably practicable, that the silica containing products they design, manufacture, import, supply or install is without risk to health and safety. This includes undertaking necessary testing and providing adequate information about the silica containing products.

Suppliers of equipment (such as hand-held water-fed power tools or RPE) should take all reasonable steps to ensure appropriate information about the safe use of the equipment is available.

A PCBU who installs, constructs or commissions structures must also ensure, so far as is reasonably practicable, all workplace activity relating to the plant or structure including its decommissioning or dismantling is without risks to health or safety. A structure is defined as anything that is constructed, whether fixed or moveable, temporary or permanent, including buildings and underground works (such as shafts or tunnels).

Duties of principal contractors

Projects involving construction work that cost \$250,000 or more are classified as 'construction projects' under the model WHS laws. Each construction project has a 'principal contractor'. A principal contractor is also a PCBU.

²² model WHS Regulations r299

²³ model WHS Regulations r300

In addition to the primary duties imposed on a principal contractor as a PCBU, the principal contractor has duties relating to WHS management plans, ensuring general compliance, and managing specific risks.

Duties of workers

Workers have a duty to take reasonable care for their own health and safety, and to take reasonable care to not adversely affect the health and safety of other persons.²⁴

Workers must also:

- comply as far as they are reasonably able with any reasonable WHS instructions given by the PCBU, such as participating in health monitoring and wearing relevant personal protective equipment (PPE), and
- co-operate with any reasonable policy or procedure relating to WHS at the workplace that has been notified to them.²⁵

The PCBU must make workers aware of the hazards associated with the use of silica containing materials, including the process for reporting safety incidents.

If a worker refuses to participate in health monitoring or refuses to use PPE as they have been trained and instructed, a PCBU would need to take other action to meet its duties under the WHS laws. This could include removing the worker from the source of exposure to RCS.

Duties of officers

An officer (for example a company director) must exercise due diligence to ensure the PCBU complies with the WHS Act and WHS Regulations.²⁶ This includes taking reasonable steps to ensure the PCBU has and uses appropriate resources and processes to eliminate or minimise risks of working with silica and silica containing products. This includes:

- identifying the hazard of RCS
- controlling the risk of exposure to RCS
- conducting air monitoring, and
- providing health monitoring for workers.

Duties of other persons at the workplace

Other persons at the workplace, like visitors, must take reasonable care for their own health and safety and must take care not to adversely affect other people's health and safety.²⁷ They must comply, so far as they are reasonably able, with reasonable instructions given by the PCBU to allow that person to comply with the WHS Act.

²⁴ model WHS Act s28

²⁵ model WHS Act s28

²⁶ model WHS Act s27

²⁷ model WHS Act s29

Appendix B: Complementary initiatives

Whole of Australian Governments' response to the National Dust Disease Taskforce Final Report

In April 2022, the Commonwealth, in consultation with state and territory governments, released the All of Governments' Response to the Final Report of the National Dust Disease Taskforce (Australian Government 2022). Australian governments supported 14 of the National Dust Disease Taskforce's sub-recommendations, and noted 2 others related to a full or partial ban on importation of engineered stone by July 2024 and funding multi-disciplinary teams of medical professionals to support treatment of patients with silicosis.

Key initiatives not otherwise mentioned in this CRIS include:

- a request for Heads of Workplace Safety Authorities to consider developing best practice compliance and enforcement principles in relation to the risks associated with RCS
- collaboration between Commonwealth, state and territory governments to develop a framework to measure the progress and impact of initiatives on worker safety and health outcomes, and to support evaluation of a full or partial ban on importation of engineered stone by July 2024
- development of National Guidance for doctors assessing workers exposed to respirable crystalline silica dust with specific reference to engineered stone related silicosis, which was published in February 2022 (Department of Health 2022)
- funding for the continued operation of the National Occupational Respiratory Disease (building on the election commitment of \$1.6 million provided through the 2019-20 Budget), which will capture mandatory notifications of silicosis diagnoses by respiratory and occupational physicians
- finalisation of the National Silicosis Prevention Strategy and National Action Plan, to support more effective prevention of silicosis in Australia
- Commonwealth funding for specific education and awareness activities to raise awareness about the risks to lung health in the workplace, targeting high risk employees, high risk industries, carers and families of those impacted, and culturally and linguistically diverse employees and employers
- developing a silicosis care management plan for health professionals to use in consultation with their silicosis patients
- funding to support additional training for medical practitioners to better recognise, diagnose and treat silicosis and other occupational respiratory diseases
- funding to deliver a support service for affected workers and their families to provide information, advice and referrals, and peer to peer virtual support groups
- establishment a research forum focused on further developing the evidence base in relation to dust diseases, and
- funding for the development of a protocol to enable the early identification of and response to, emerging occupational respiratory risks and associated diseases.

Silica safety awareness – nationally recognised training

In February 2021, the Construction, Plumbing and Services Industry Reference Committee agreed to develop a Silica Safety training package to address WHS skills gaps related to RCS.

With Commonwealth funding, four units of competency were subsequently developed:

- CPCSIL1001 Prepare to work safely with products and materials containing crystalline silica,
- CPCSIL2001 Use and maintain respiratory protective equipment,
- CPCSIL3001 Work with products and materials containing crystalline silica, and
- CPCSIL4001 Supervise and manage work with products and materials generating respirable crystalline silica.

At its April 2022 meeting, the Australian Industry and Skills Committee agreed to approve these units of competency, which are currently being considered by Skills Ministers for endorsement.

Appendix C: List of consultation questions

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

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

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

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

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

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

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

6.2 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.

6.3 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.

6.4 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.

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

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

7.2 Are there any significant barriers to implementation of the options presented? What are those barriers? Is there a cost associated with them? How could they be overcome?

Appendix D: Cost modelling key assumptions and methodology

Key assumptions

The following tables present the key assumptions and methodology used to estimate the total cost to industry and government for each option. This analysis was conducted in April 2022, and parameter assumptions were current at that point in time.

Number of businesses covered by regulatory and non-regulatory options

Industry classification

The number of businesses captured by the regulatory and non-regulatory options assessed were estimated using *Counts of Australian Businesses* data published by the Australian Bureau of Statistics (2021b). This data presented the total number of businesses at the four-digit ANZIC industry classification level for each jurisdiction. For the purposes of our analysis, relevant ANZIC industry codes were grouped into broad industry sectors as outlined in Table 24.

Table 24: ANZIC industry classification

Industry category	ANZIC industry classification
<i>Construction</i>	Bricklaying Services, Concreting Services, Non-Residential Building Construction, Other Construction Services, Plastering and Ceiling Services, Plumbing Services, Roofing Services, Tiling and Carpeting Services
<i>Manufacturing</i>	Cement and Lime Manufacturing, Clay Brick Manufacturing, Concrete Product Manufacturing Other Ceramic Product Manufacturing, Other Non-Metallic Mineral Product Manufacturing, Plaster Product Manufacturing, Ready-Mixed Concrete Manufacturing
<i>Quarrying</i>	Gravel and Sand Quarrying Other Non-Metallic Mineral Mining and Quarrying
<i>Mining</i>	Bauxite Mining, Coal Mining, Copper Ore Mining, Gold Ore Mining, Iron Ore Mining, Mineral Sand Mining, Nickel Ore Mining, Other Construction Material Mining, Other Metal Ore Mining, Silver-Lead-Zinc Ore Mining
<i>Tunnelling</i>	Other Heavy and Civil Engineering Construction, Road and Bridge Construction
<i>Demolition</i>	Site Preparation Services

Size of the industry

Given the variability of some costs is dependent on the size and scale of operations, businesses count data was further split into the following categories to account for this variability:

- Sole trader and small: non-employing (sole trader) - 19 employees
- Medium: 20 – 199 employees
- Large: 200+ employees.

It is likely that not all PCBUs in each industry sector are undertaking high risk silica work and therefore would not be required to meet the additional duties outlined in the proposed options.

Using assumptions developed in the Occupational Health and Safety Amendment (Crystalline Silica) Regulations 2021 Regulatory Impact Statement, a proportion of businesses within each industry category will be required to meet the additional duties beyond the existing model WHS laws as presented in Table 25. It is to be noted that these percentages contain a high degree of uncertainty.

Table 25: Size of industry and proportion of businesses undertaking high risk silica work

Industry category	ANZIC industry classification	Proportion of businesses covered by options
<i>Construction</i>	Non-Residential Building Construction, Other Construction Services, Plastering and Ceiling Services, Plumbing Services, Roofing Services, Tiling and Carpeting Service	10%
	Bricklaying services, Concreting services	100%
<i>Manufacturing</i>	Cement and Lime Manufacturing, Clay Brick Manufacturing, Other Ceramic Product Manufacturing, Other Non-Metallic Mineral Product Manufacturing, Plaster Product Manufacturing, Ready-Mixed Concrete Manufacturing	10%
	Concrete Product Manufacturing	100%
<i>Quarrying, mining, tunnelling, demolition</i>	Bauxite Mining, Coal Mining, Copper Ore Mining, Gold Ore Mining, Gravel and Sand Quarrying, Iron Ore Mining, Mineral Sand Mining, Nickel Ore Mining, Other Construction Material Mining, Other Heavy and Civil Engineering Construction, Other Metal Ore Mining, Other Non-Metallic Mineral Mining and Quarrying, Road and Bridge Construction, Silver-Lead-Zinc Ore Mining, Site Preparation Services	37%

Assumptions around the number of businesses in Australia not subject to the model WHS laws

As mentioned in Section 1.6, the scope of this CRIS covers industries that are subject to the model WHS laws. Therefore, Victorian businesses have been excluded from the total business count estimates, as are mining and quarrying businesses in Tasmania, Western Australia, Queensland and New South Wales.

The total estimated number of businesses covered by Options 3 and 5 is presented in Table 26.

Table 26: Estimated number of businesses per industry category covered by Options 2, 3 and 5 (Australian Bureau of Statistics 2021b)

Industry category	Small		Medium		Large		Total	
	Total number of businesses	Businesses covered by regulation	Total number of businesses	Businesses covered by regulation	Total number of businesses	Businesses covered by regulation	Total number of businesses	Businesses covered by regulation
	s	s	s	s	s	s	s	s
<i>Construction</i>	92,745	16,979	1,293	129	34	3	94,072	17,111
<i>Manufacturing</i>	2,075	415	114	11	27	3	2,216	429

Industry category	Small		Medium		Large		Total	
	Total number of businesses	Businesses covered by regulation	Total number of businesses	Businesses covered by regulation	Total number of businesses	Businesses covered by regulation	Total number of businesses	Businesses covered by regulation
<i>Quarrying</i>	109	40	3	1	-	-	112	41
<i>Mining</i>	841	311	55	20	17	6	913	338
<i>Tunnelling</i>	7,150	2,646	417	154	48	18	7,615	2,818
<i>Demolition</i>	14,578	1,458	426	43	12	1	15,016	1,502
Total	117,498	21,848	2,308	359	138	31	119,944	22,239

Worker wage assumptions

The average wage per hour has been estimated using Average Weekly Earnings (AWE) data provided by the Australian Bureau of Statistics (ABS). Table 30 summarises the number of businesses included within this assessment across each industry category. Table 27 presents estimates of SWA salary costs per employee.

Table 27: Employee wage by industry category (Australian Bureau of Statistics 2021c)

Industry category	Average weekly earnings (\$)	Average weekly hours worked (hrs)	Employee hourly rate (\$)
<i>Construction</i>	\$1,734.10	37.5	\$46.24
<i>Manufacturing</i>	\$1,557.10	37.5	\$41.52
<i>Quarrying</i>	\$2,656.30	37.5	\$70.83
<i>Mining</i>	\$2,656.30	37.5	\$70.83
<i>Tunnelling</i>	\$1,734.10	37.5	\$46.24
<i>Demolition</i>	\$1,734.10	37.5	\$46.24

Annual employee wages for SWA staff have been used to estimate the average annual government labour cost for each option (as presented in Table 28).

Table 28: Government employee salaries (Safe Work Australia 2022d)

Industry category	Average annual salary (\$)
APS 6 or equivalent	\$94,966
EL1 or equivalent	\$118,733
EL2 or equivalent	\$149,595

Methodology

The methodology and underlying assumptions used to estimate the total costs to industry and government for each option are presented in Tables 29 and 30.

Table 29: Additional cost to industry: key assumptions and cost estimate methodology

Cost assumption	Description	Variable	Input/assumption	Formula
Option 4				
<i>Licence application</i>	Labour to prepare a licence application for PCBUs working with engineered stone	Number of hours to prepare licence application (hours)	18.75 (Deloitte 2021)	Total licence application cost = Number of hours to prepare licence application × Average wage/hour × Number of PCBUs working with engineered stone in Australia
		Average wage / hour (\$)	\$46.24 (Australian Bureau of Statistics 2021c)	
		Number of PCBUs working with engineered stone in Australia (#)	1,000 (Australian Engineered Stone Advisory Group 2019)	
<i>Licence fee</i>	Licence fee paid by PCBUs to work with engineered stone	Licence fee (\$)	\$302 (Deloitte 2021)	Total licence fee cost = Licence fee × Frequency of licence fee payment × Number of PCBUs working with engineered stone in Australia
		Frequency of licence fee (years)	5 years (Deloitte 2021)	
		Number of PCBUs working with engineered stone in Australia (#)	1,000 (Australian Engineered Stone Advisory Group 2019)	
<i>Engineered stone suppliers – retention of records</i>	Labour for suppliers of engineered stone to retain records of PCBUs who have	Number of hours per year to retain records on an annual basis	2 ²⁸	Total cost for retention of records = Number of hours to prepare application × Average wage/hour
		Average wage / hour (\$)	\$46.24 (Australian Bureau of Statistics 2021c)	

²⁸ Model assumption

Cost assumption	Description	Variable	Input/assumption	Formula
	been supplied engineered stone for a period of 5 years.	Number of businesses supplying engineered stone in Australia (#)	50 ²⁹	x Number of businesses supplying engineered stone in Australia
<i>Engineered stone control plan</i>	Labour costs to prepare an engineered stone control and implementation plan	Number of hours per year to prepare engineered stone control plan (hours/year)	2 (Deloitte 2021)	Cost of engineered stone control plan = Number of hours to prepare an engineered stone control plan x Average wage/hour x Number of PCBUs working with engineered stone in Australia
		Average wage/hour (\$)	\$46.24 (Australian Bureau of Statistics 2021c)	
		Number of PCBUs working with engineered stone in Australia (#)	1,000 (Australian Engineered Stone Advisory Group 2019)	
<i>Health monitoring – provision of report to regulators</i>	Additional labour costs for the preparation of health monitoring reports for submission to WHS regulators in each jurisdiction.	Number of hours per year to prepare health monitoring report for submission (hours/year)	2 (Deloitte 2021)	Cost of health monitoring - provision of report to regulators = Number of hours to prepare health monitoring report for submission x Average wage/hour x Number of PCBUs working with engineered stone in Australia
		Average wage/hour (\$)	\$46.24 (Australian Bureau of Statistics 2021c)	
		Number of PCBUs working with engineered stone in Australia (#)	1,000 (Australian Engineered Stone Advisory Group 2019)	
<i>Air monitoring – provision of report to regulators</i>	Additional labour costs for the preparation of air monitoring reports for submission to WHS regulators in each jurisdiction	Number of hours per year to prepare air monitoring report for submission (hours/year)	2 (Deloitte 2021)	Cost of air monitoring – provision of report to regulators = Number of hours to prepare air monitoring report for submission x Average wage/hour x Number of PCBUs working with engineered stone in Australia
		Average wage/hour (\$)	\$46.24 (Australian Bureau of Statistics 2021c)	
		Number of PCBUs working with engineered stone in Australia (#)	1,000 (Australian Engineered Stone Advisory Group 2019)	

²⁹ Model Assumption

Cost assumption	Description	Variable	Input/assumption	Formula
<i>Compliance and monitoring enforcement</i>	Labour to prepare for and participate in scheduled and unscheduled audits of licensees.	Average number of scheduled and unscheduled audits per PCBU per annum (# / PCBU / year)	1 (Deloitte 2021)	Cost of compliance and monitoring enforcement = Average number of scheduled and unscheduled audits per annum × Time to participate in scheduled and unscheduled audits × Number of workers to participate in scheduled and unscheduled audits × Average wage/hour × Number of PCBUs working with engineered stone in Australia
		Time to participate in scheduled and unscheduled audits (hours)	2 (Deloitte 2021)	
		Number of workers required for scheduled and unscheduled audits (#)	2 (Deloitte 2021)	
		Average wage/hour (\$)	\$46.24 (Australian Bureau of Statistics 2021c)	
		Number of PCBUs working with engineered stone in Australia (#)	1,000 (Australian Engineered Stone Advisory Group 2019)	
Option 5a and 5b				
<i>Risk assessment: quarrying, mining, tunnelling, demolition (Year 1 only)</i>	Additional labour costs for the preparation of a risk assessment report for submission to WHS regulators in year 1. This includes initial upfront costs for x-ray diffraction analysis	Cost of consultant to conduct risk assessment per hour (\$)	\$160 (Construction Material Processors Association 2021)	Cost of risk assessment: quarrying, mining, tunnelling, demolition (Year 1) = Cost of consultant to conduct risk assessment per hour × Number of hours to conduct risk assessment × Number of businesses undertaking high risk silica work in the quarrying, mining, tunnelling and demolition industries + Cost of x-ray diffraction analysis × Number of businesses undertaking high risk silica work in the quarrying, mining, tunnelling and demolition industries
		Number of consultant hours required to conduct risk assessment (hours)	16 (Construction Material Processors Association 2021)	
		Number of businesses undertaking high risk silica work in the quarrying, mining, tunnelling and demolition industries (#)	Refer to Table 26	
		Cost of x-ray diffraction analysis (\$/risk assessment)	\$500 (Construction Material Processors Association 2021)	

Cost assumption	Description	Variable	Input/assumption			Formula
<i>Risk assessment: quarrying, mining, tunnelling, demolition (Year 2 – 10)</i>	Additional labour costs for the preparation of a risk assessment report for submission to WHS regulators on an annual basis	Time taken to prepare risk assessment submission (hours)	Small 2	Medium 3	Large 4 (Deloitte 2021)	Cost of risk assessment – quarrying, mining, tunnelling, demolition (year– 2 - 10) = Time taken to prepare risk assessment submission × Average wage/hour × Number of businesses undertaking high risk silica work in the quarrying, mining, tunnelling and demolition industries
		Average wage per hour - quarrying, mining, tunnelling, and demolition (\$)	Refer to Table 27			
		Number of businesses undertaking high risk silica work in the quarrying, mining, tunnelling and demolition industries (#)	Refer to Table 26			
<i>Risk assessment: construction, manufacturing (year 1 – 10)</i>	Additional labour costs for the preparation of a risk assessment report for submission to WHS regulators on an annual basis	Time taken to prepare risk assessment submission (hours)	Small 2	Medium 3	Large 4 (Deloitte 2021)	Cost of Risk assessment: construction, manufacturing (year– 1 - 10) = Time taken to prepare risk assessment submission × Average wage/hour × Number of businesses undertaking high risk silica work in the construction and manufacturing industries
		Average wage per hour - by industry (\$)	Refer to Table 27			
		Number of businesses undertaking high risk silica work in the manufacturing and construction industries (#)	Refer to Table 26			
<i>Silica risk control plan</i>	Additional labour costs for the preparation of a silica risk control plan	Number of hours per year to prepare silica risk control plan for submission (hours/year)	Small 2	Medium 3	Large 4 (Deloitte 2021)	Cost of silica risk control plan = Number of hours to prepare silica risk control plan for submission × Average wage/hour × Number of businesses undertaking high risk silica work in Australia
		Average wage per hour by industry (excluding construction industry) (\$)	Refer to Table 27			
		Number of businesses undertaking high risk silica work Australia (excluding	Refer to Table 26			

Cost assumption	Description	Variable	Input/assumption			Formula
		<i>construction industry</i> (#)				
<i>Health monitoring – provision of report to regulators</i>	Additional labour costs for the preparation of health monitoring reports for submission to WHS regulators in each jurisdiction.	Number of hours per year to prepare health monitoring report submission (hours/year)	Small 2	Medium 3	Large 4 (Deloitte 2021)	Cost of health monitoring - provision of report to regulators = Number of hours to prepare health monitoring report submission × Average wage/hour × Number of businesses undertaking high risk silica work in Australia
		Average wage/hour (\$)	Refer to Table 27			
		Number of businesses undertaking high risk silica work in Australia (#)	Refer to Table 26			
<i>Air monitoring – provision of report to regulators</i>	Additional labour costs for the preparation of air monitoring reports for submission to WHS regulators in each jurisdiction.	Number of hours per year to prepare air monitoring report submission (hours/year)	Small 2	Medium 3	Large 4 (Deloitte 2021)	Cost of air monitoring - provision of report to regulators = Number of hours to prepare air monitoring report submission × Average wage/hour × Number of businesses undertaking high risk silica work in Australia
		Average wage/hour (\$)	Refer to Table 27			
		Number of businesses undertaking high risk silica work in Australia (#)	Refer to Table 26			

Table 30: Additional cost to government: key assumptions and cost estimate methodology

Cost assumption	Description	Variable	Input/assumption	Formula
Option 2				
<i>Behaviour change initiative – planning and design</i>	Costs related to the planning and design for behaviour change and awareness campaigns on an annual basis.	Engagement with behavioural insights consultants (\$)	\$120,000 ³⁰	Cost of behaviour change initiative – planning and design = Cost to plan and engage with behavioural insights consultants

³⁰ Model assumption

Cost assumption	Description	Variable	Input/assumption	Formula
<i>Behaviour change initiative – roll out across all industry sectors</i>	Costs related to the development and distribution of information for behaviour change and awareness campaigns	Costs related to the development and distribution of information for behaviour change/awareness campaigns across seven jurisdictions (\$)	\$840,000 ³¹	Cost of behaviour change initiative – roll out across industry sectors = Cost to rollout behaviour change initiatives x Number of jurisdictions
Option 3				
<i>Awareness campaign</i>	Cost of education/awareness campaign to inform PCBUs and other relevant duty holders of requirements resulting from regulatory changes	Cost of education/awareness campaign to inform PCBUs and other relevant duty holders of requirements resulting from regulatory changes (\$)	\$120,000 ³²	Cost of awareness campaign = Cost of national awareness campaign x Frequency of campaign (year 1 only)
Option 4				
Development, implementation, and maintenance of a system for administration of licensing framework	Cost of developing of a licensing platform(s) and implementation across in each jurisdiction.	Cost of developing of a licensing platform(s)	\$750,000 (Deloitte 2021)	Cost of developing of a licensing platform = Cost to acquire online licensing portal x Number of jurisdictions (excluding Victoria)
		Number of jurisdictions (excluding Victoria) (#)	7 ³³	
<i>Implementation and processing of licences</i>	Labour to implement licensing software and assess licence applications	Number of workers to implement licensing and assess applications (#)	1 (Deloitte 2021)	Cost to implement licence software and process applications = Number of workers to implement licensing and assess applications x
		Labour per year to implement licensing	Refer to Table 28 Table	

³¹ Model assumption

³² Model assumption

³³ Model assumption

Cost assumption	Description	Variable	Input/assumption	Formula
		and assess applications (\$/year)		Labour cost to implement licensing and assess applications × Number of jurisdictions
		Number of jurisdictions (excluding Victoria) (#)	7 ³⁴	
<i>Compliance monitoring and enforcement</i>	Labour to participate in additional scheduled and unscheduled audits	Average number of scheduled and unscheduled per year (#/year)	1	Cost of compliance monitoring and enforcement = Average number of scheduled and unscheduled audits per annum × Time to participate in scheduled and unscheduled audits × Average wage/hour (\$) × Number of employees required for scheduled and unscheduled audits
		Time to participation in scheduled and unscheduled audits (hours)	2	
		Number of workers required for scheduled and unscheduled audits (#)	2	
		Number of businesses undertaking high risk silica work in Australia (#)	Refer to Table 26	
		Annual salary for government workers	Refer to Table 28	
<i>Awareness campaign</i>	Implementation of a national awareness campaign to support the regulatory change	Cost of national awareness campaign (\$)	\$120,000 ³⁵	Cost of awareness campaigns = Average annual cost of national awareness campaign × Frequency of campaign (Year 1 only)

³⁴ Model assumption

³⁵ Model assumption

Cost assumption	Description	Variable	Input/assumption	Formula
Option 5a and 5b				
<i>Awareness campaign (year 1 only)</i>	Cost of education/awareness campaign to inform PCBUs and other relevant duty holders of requirements resulting from regulatory changes	Cost of education/awareness campaign	\$120,000 ³⁶	Cost of education/awareness campaign
<i>Data analysis and reporting</i>	Labour associated with processing of health monitoring and air monitoring reports submitted by PCBUs on an annual basis	Number of workers to conduct data analysis and reporting (#)	2 ³⁷	Cost of data analysis and reporting = Number of workers × Duration of employment (years) × Average wage/hour (\$)
		Duration of employment (years)	0.25 ³⁸	
		Annual salary/worker (\$)	Refer to Table 28	

³⁶ Model assumption

³⁷ Model assumption

³⁸ Model assumption