

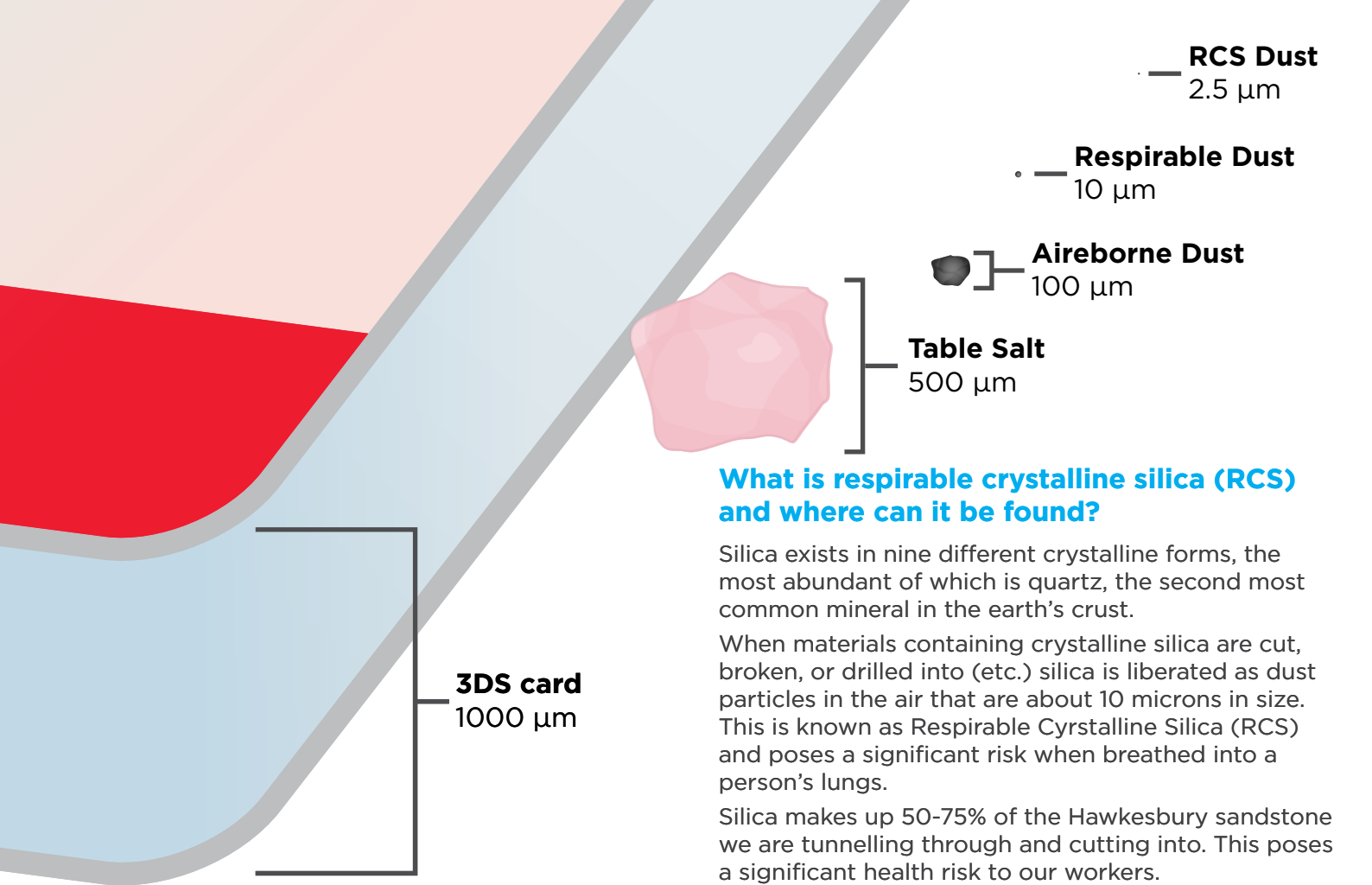
Respirable Crystalline Silica

Understanding the new
Workplace Exposure Standard

Rozelle Interchange
WestConnex

**JOHN
HOLLAND**

CPB
CONTRACTORS



RCS Dust

2.5 μm

Respirable Dust

10 μm

Aireborne Dust

100 μm

Table Salt

500 μm

3DS card

1000 μm

What is respirable crystalline silica (RCS) and where can it be found?

Silica exists in nine different crystalline forms, the most abundant of which is quartz, the second most common mineral in the earth's crust.

When materials containing crystalline silica are cut, broken, or drilled into (etc.) silica is liberated as dust particles in the air that are about 10 microns in size. This is known as Respirable Crystalline Silica (RCS) and poses a significant risk when breathed into a person's lungs.

Silica makes up 50-75% of the Hawkesbury sandstone we are tunnelling through and cutting into. This poses a significant health risk to our workers.



Health effects from exposure to RCS

The chronic or long-term health effects associated with RCS are:

- Silicosis
- Lung cancer
- Renal / kidney disease
- Chronic obstructive pulmonary disease
- Emphysema / asthma / breathing difficulties

Acute, or short-term health effects associated with RCS include:

- Dermatitis
- Bronchitis
- Eczema

Workplace Exposure Standard (WES) for RCS

From July 1, 2020, the Workplace Exposure Standard (WES) for respirable crystalline silica has changed from $0.1\text{mg}/\text{m}^3$ (for an equivalent 8-hour Time Weighted Average TWA) to $0.05\text{mg}/\text{m}^3$ (for an equivalent 8-hour TWA). This means that construction workers can legally be exposed to no more than $0.05\text{mg}/\text{m}^3$ of silica at work.

Controls have been put in place to manage respirable crystalline silica exposures in the tunnel and surface works spaces and where our workers can potentially come in contact with RCS. These controls are outlined on the other side of this pamphlet.





Health Surveillance

Health surveillance involves sending current and prospective employees for health-related check-ups to see if they have any outstanding health issues that relate to contaminants they have been exposed to previously.

Health surveillance for exposure to silica (and some other contaminants) is a legal requirement and a minimum standard that must be adhered to.

Employers have the right to request an individual to undertake more frequent health surveillance if they are at 'high risk' of exposure.

Health surveillance includes:

- Background checks and a Safework silica questionnaire
- Spirometry
- Chest X-rays
- Low dose CT scans



Exposure monitoring

Exposure monitoring includes regular checks of the air in our workplace environments to ensure we are below the WES of 0.05mg/m3.

This monitoring is currently conducted monthly for tunnel sites and every three months for surface works sites however this may become more frequent.



Reporting and communicating exposure monitoring

The results of our exposure monitoring are communicated through regular reporting. The reports briefly detail how the monitoring is conducted, the results that were recorded and whether these exceed the WES. The report will also mention observations that were made during the monitoring and may list recommendations or actions that should be undertaken.

Resilient Interchange
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CONSTRUCTION

Exposure Sampling Communication Form

Project Site	Tunnel C	Assessor	Craig Wright
Date	28/05/2020	Shift	Day (12-hour shift)
Key Contact	David Etheridge	Assessment round	R32

Monitoring was carried out at Tunnel site C on the 28th of May (Respirable crystalline silica and diesel particulate matter) as part of the Resilient Interchanges' monthly monitoring schedule (noise monitoring was cancelled on the day as there weren't enough workers present on the day to do noise monitoring as well as monitoring for the other two hazards). Six respirable crystalline silica samples were taken (five personal samples, one static sample). Four diesel particulate matter samples were taken, but one of these samples was invalidated due to the pump faulting (the other was a static sample).

There are four exceedances of the workplace exposure standard for respirable crystalline silica, three of which are only just over the shift-adjusted standard. All tunnel and shed workers are required to wear respiratory protection and workers were observed on the day to ensure compliance with requirements. All four exceedances have been noted as 'controlled exceedances' with no further actions, other than to continue to reinforce the requirement to wear respiratory protection in the tunnel and shed as all four exceedances fall within the protection afforded by instrument wearing respiratory protection. Of note is that MCCO was being 'benched' on this day, which is an activity that can make controlling dust levels difficult - although ventilation data and results from the real time dust measurement instrument indicated that controls were operating effectively at the time they were measured (particularly in MCCO). There was also one exceedance of the respirable dust workplace exposure standard, this has been noted as a 'controlled' exceedance with no further actions, other than to continue to reinforce the requirement to wear respiratory protection in the tunnel and shed as the exceedance falls within the protection afforded by wearing respiratory protection.

Sampling Exposure Groups (SEG) Assessed	Respirable Crystalline Silica	Diesel Particulate Matter	Noise
SEG701C	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
SEG704C	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
SEG705C	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
SEG706C	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
SEG707C	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
SEG708C	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
SEG710C	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
SEG711C	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Current Control Measures In Place	Additional Control Measures
Ventilation extraction systems in place and operating as per design (multiple 40 cubic scrubbers, operating at required speeds for activities in area) Electrically powered equipment available where possible to reduce diesel emissions within tunnel Comprehensive respirator fit-testing program conducted on all staff who may be exposed to hazardous agents Dust suppression systems in place (scrubbers, road kept wet, sprinker system in decline)	Mandatory P2 RPE implemented in tunnel and spoil shed Crib rooms established including air conditioning, break room and cooler / ice Air supplied to tunnel face via 2 vent bags



Respirable Crystalline Silica

Controls

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What we are doing



Above the line

Elimination

During excavation release of Silica from the tunnel and earthworks environment is inevitable, which means we are more dependant than ever on our above the line controls.



What we are doing



Above the line

Substitution

Substitution involves utilising a less hazardous material or practise in place of a more hazardous material or practice. These can be fairly simple changes in both equipment and methodology; for example:

Equipment:

Use a vacuum or wet mop instead of a broom, or use a HEPA vacuum in place of a household vacuum.



Methodology:

Instead of using jack hammers to trim concrete off the top of piles the piles can be trimmed using concrete saws and hydraulic rock splitters - this drastically reduces both noise and worker exposure to dust.



What we are doing



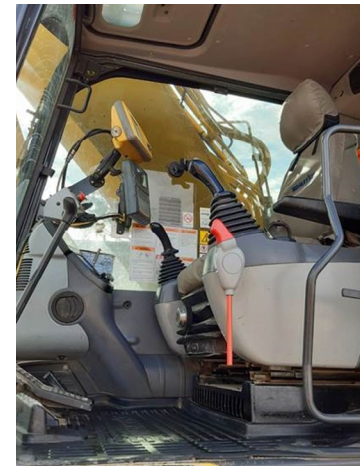
Above the line Isolation

Isolation is creating an enclosure either for workers or for a hazard in such a way that it prevents or lessens the amount to which a worker will be exposed to the hazard. Sectioning off an area using brattice or with physical barriers and enclosing plant such that workers have an enclosed cabin while they are working are examples of isolation controls.

Brattice:



Clean Plant Cabin:



What we are doing



Above the line

Engineering

Engineering controls involve modifying or adding to a piece of plant, equipment, tool, or process in such a way that it makes the workplace safer for the worker. The two main engineering controls for silica are ventilation and water. Ventilation can be further broken down into general ventilation (or supplied air) and extraction.

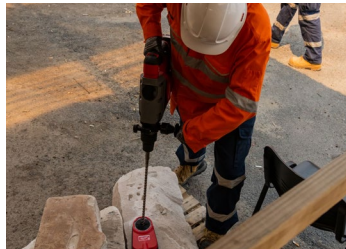
General Ventilation:



Ventilation shaft:



Extraction:



Water misting systems:

Prevents dust from becoming airborne



Water canons spraying:

Removes dust from air

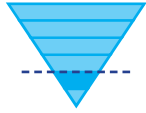


Wetting down areas:

Prevents dust from becoming airborne



What we are doing



Below the line

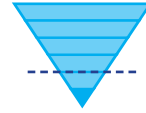
Administration

Administration involves implementing changing or altering work practises to lower the risk posed to workers by a hazard. This can be done by training workers, scheduling hazardous work so that is done when the smallest amount of other workers are around, restricting access to areas and using signage to inform workers of hazards.

Signage:



What we are doing



Below the line

PPE

- Any worker involved in dust generating activities or who will be exposed to RCS will be required to wear respiratory protection
- To be able to wear a respirator, the worker needs to be clean shaven, be trained in how to use the respiratory protection and be fit tested on the model of mask they will use for work
- Non-disposable respiratory protection needs to have its filters changed when required, be clean and be stored appropriately
- Disposable respiratory protection should be replaced regularly or when breathing becomes difficult as a result of contaminants such as mud, water, oil, sweat or dust.

