

Silica Levels at the FBH

What is Silica?

Silica, also known as silicon dioxide, is a naturally found mineral abundant in rocks and soils, including talc, and comes in crystalline and non-crystalline forms.

Respirable crystalline silica, is produced during various mechanical processes in the workplace and has the capability to deeply penetrate the lungs, leading to irreversible lung damage.

Quartz is the most prevalent type of crystalline silica and α -quartz is the accepted method for measuring respirable crystalline silica.

The workplace exposure standard for respirable crystalline silica is 0.05 mg/m³ (eight-hour time weighted average). A person must not be exposed to respirable crystalline silica above the workplace exposure standard.

Reference: Safe Work Australia, "Health Guide, Monitoring for crystalline silica".

At a Glance

Respirable Talc Dust

Workplace Exposure
Standard

2.5
mg/m³

Geraldton Fishing
Boat Harbour

< 0.1
mg/m³

α -Quartz Content

Workplace Exposure
Standard

0.05
mg/m³

Geraldton Fishing
Boat Harbour

< 0.005
mg/m³

It was determined that both respirable talc and α -quartz in the dust measured was well below the Australian Workplace Exposure Standards at the FBH, with α -quartz below the laboratory's level of reporting.

Background

Talc product is currently received into an open stockpile within a leased area of the Port on Gillam Road prior to export.

Located to the south of the Geraldton Fishing Boat Harbour (FBH), talc dust can impact the FBH community, particularly on days with prevailing southerly winds.

Talc is not classified as an inhalable hazard or to have toxicological effects however, quartz contained within talc is classified by the IARC (International Agency for Research on Cancer) as a Group 1 carcinogen to humans. Talc contains less than 1% quartz, a proportion of which present in respirable dust. The relevant Australian Workplace Exposure Standards note that this is a risk where exposure to talc exceeds 2.5mg/m³ or exposure to α -quartz exceeds 0.05mg/m³.

On Wednesday, 11th October 2023, Mid West Ports deployed three monitors to determine respirable talc dust and α -quartz content in the area. The monitoring was scheduled to coincide with the most consistent dust producing activity at the Gillam Road talc yard, being during ship loading with continual front-end loader activity and trucking movements. Monitoring was also aligned to a day with strong southerly winds, replicating summer conditions and the most likely wind direction to affect the FBH community.

Samples were collected for an uninterrupted period of 12 hours from 11am on 11/10/2023 and sent for independent lab analysis by a NATA Accredited Laboratory.

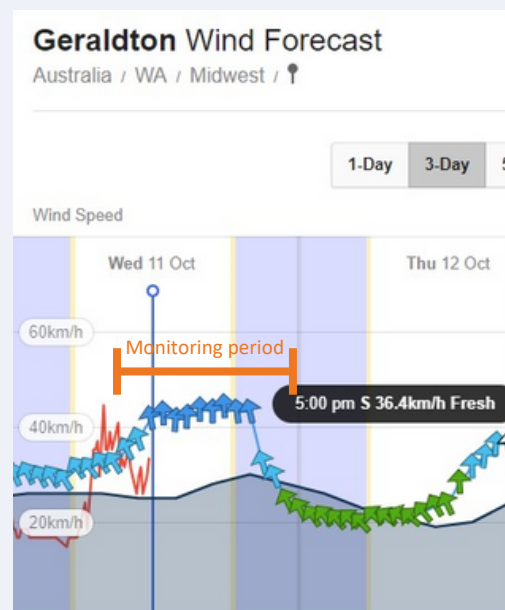
Mid West Ports intends to conduct ongoing monitoring of α -Quartz (respirable crystalline silica) to ensure levels remain below Safe Work Occupational Exposure Levels as defined by Safe Work Australia.

Monitoring

Monitor locations



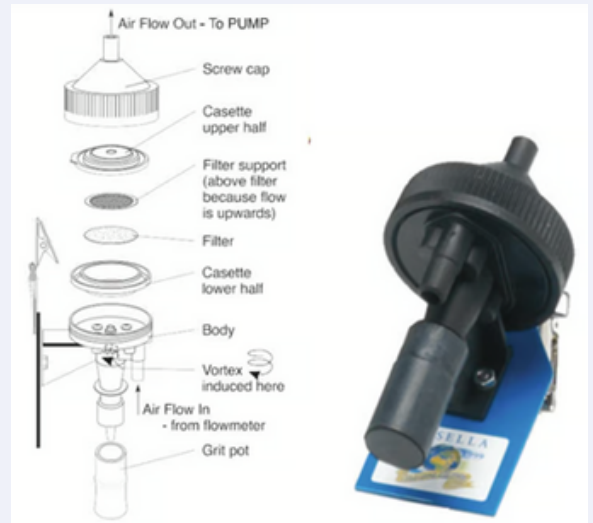
Wind during ship loading



Sampling equipment

SKC - Air Chek XR5000 and SKC - Air Chek Connect model air sampling pumps were deployed. A 'cyclone' sampling head was used for monitoring, which when connected to a pump, draws an air intake similar in volume to a human breathing. Where that air contains dust, this is also drawn into the sampler head.

Inside the cyclone, the dust is induced into a vortex, where heavier / larger particles are caught in the lower part, and smaller lighter particles are drawn upwards towards the filter. This allows only the respirable fraction within the dust to be captured for analysis and comparison to the exposure standards.



Technical detail

The Safety Data Sheet (SDS) for Talc, from the producer of the Gillam Road stockpile states:

This product contains less than 1% quartz (fine fraction):

A proportion of the quartz may become available in the respirable fraction. The level of exposure to Respirable Crystalline Silica will depend on the actions performed on the product during handling and use. Exposure levels should, therefore, be measured during use, in comparison to relevant occupational exposure limits, as exposure cannot be determined from bulk product analysis.

Symptoms of acute accidental exposure would be non-specific and similar to those of a massive inhalation of any dust without toxic effects.

The exposure standards for the product are listed as:

Australia Occupational Exposure Limits:

Talc: Long-term exposure limit (8-hour TWA): 2.5 mg/m³

Quartz: Long-term exposure limit (8-hour TWA): 0.05 mg/m³ (Respirable fraction)

In 2006, the International Agency for Research on Cancer (IARC) concluded that inhaled talc not containing asbestos or asbestiform fibers is not classifiable as a human carcinogen (Group 3).

This product (talc) does not meet the criteria for classification as hazardous as defined in the Regulation EC 1272/2008. Airbourne dust may cause irritation to the eyes.

This product is not expected to be hazardous to the environment.

20 October 2023 - Extract from Lab Report on Respirable Talc at the Geraldton Fishing Boat Harbour:

Client Sample ID	Sample Matrix	Eurofins Sample No.	Sampling Date	Sample Description	Respirable Dust - Total	Respirable Dust - Concentration	a-Quartz - Total	a-Quartz - Concentration
Respirable Dust								
LOR					0.01	0.1	5	0.005
Units					mg	mg/m ³	ug	mg/m ³
R77147	Filter paper	L23-Oc0030162	Oct 11, 2023	Lemmon Road	0.04	< 0.1	< 5	< 0.005
R78533	Filter paper	L23-Oc0030163	Oct 11, 2023	GFC Boat Yard	0.05	< 0.1	< 5	< 0.005
R77159	Filter paper	L23-Oc0030164	Oct 11, 2023	Batavia Shipping	0.04	< 0.1	< 5	< 0.005