

# Respirable Crystalline Silica (RCS) Dust and Noise Exposures during Rock Processing & Soil Grinding

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## 1. Background

- 3 UQ Facilities involve **rock processing & soil grinding**, capable of generating RCS dust and noise



Rock processing



Soil grinding at St Lucia



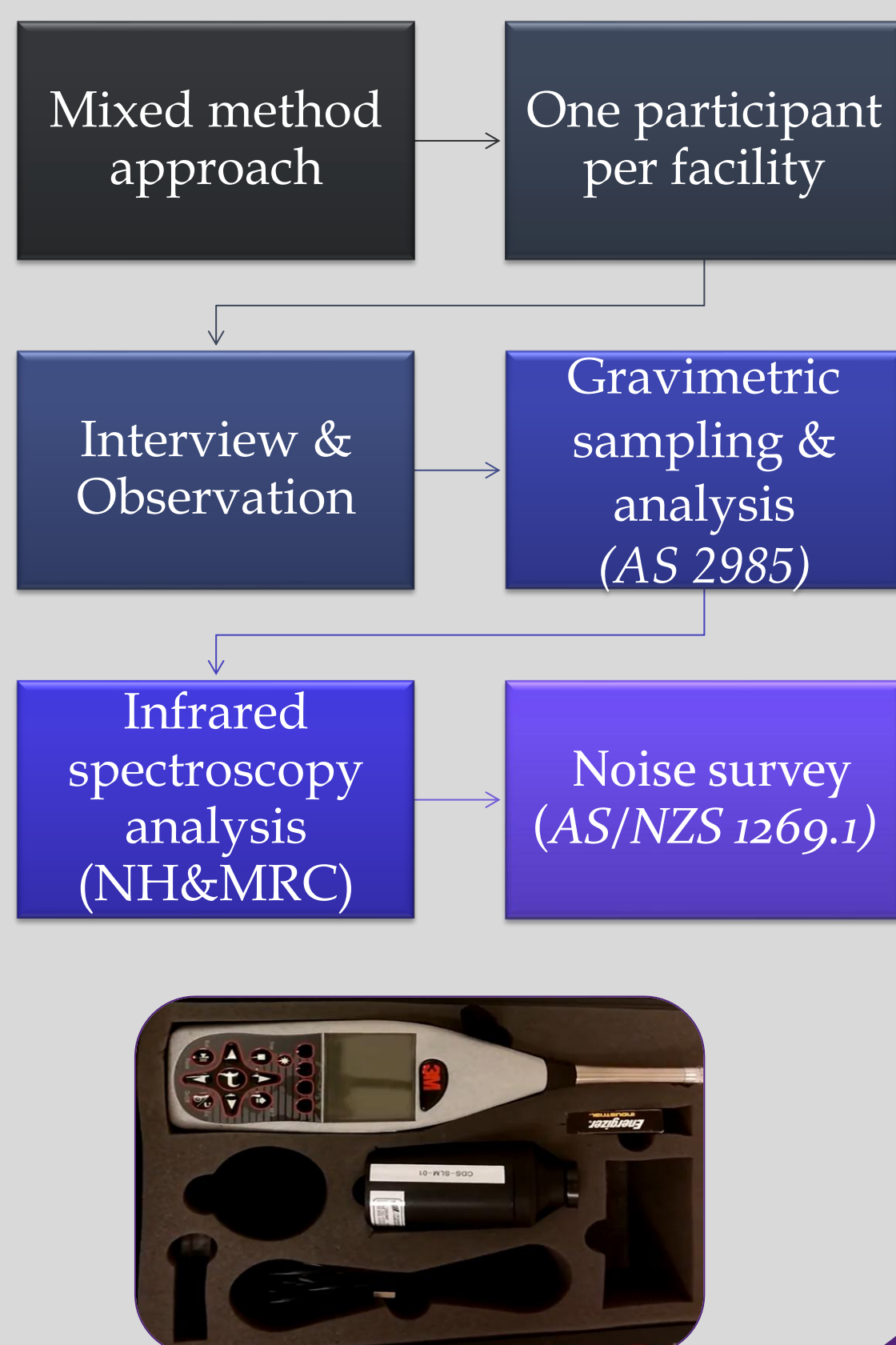
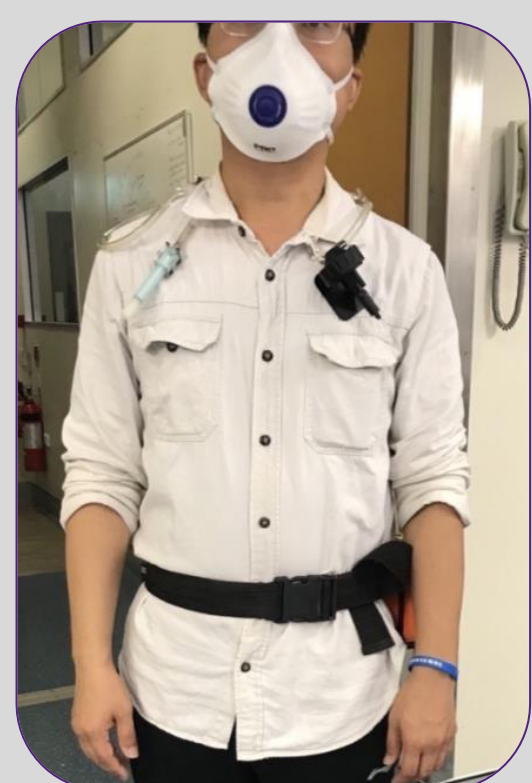
Soil grinding at Gatton

- Silica accounts for **>20%** of rock & soil composition
- Lack of pre-existing research** on RCS dust and noise in rock processing & soil grinding
- Health effects include **silicosis, lung cancer and noise-induced hearing loss**
- Paramount to have **effective dust and noise management strategies**

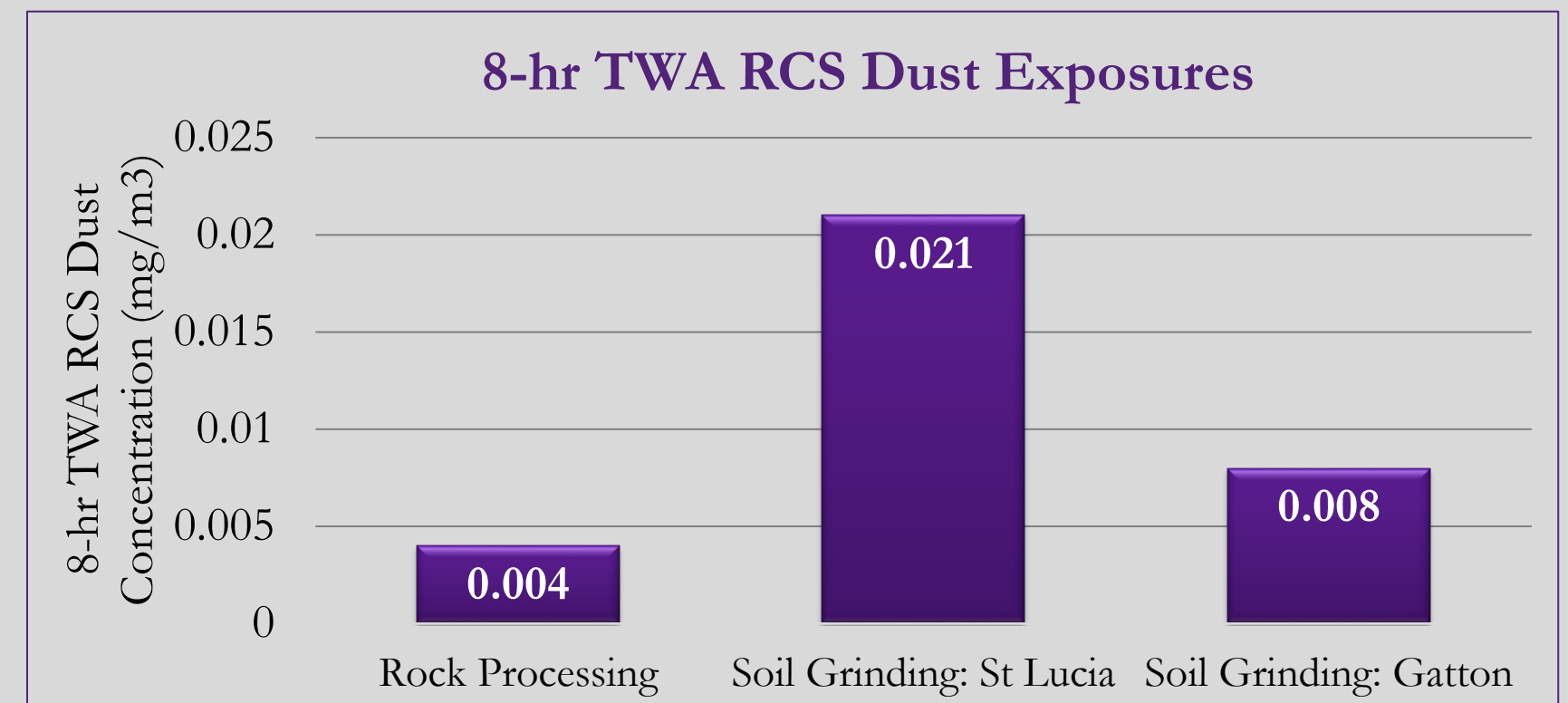
## 2. Objectives

- Measure **workers' exposures** to RCS dust and noise
- Check for **compliance** with WES for RCS dust (8-hr TWA 0.05 mg/m<sup>3</sup>) and noise (L<sub>Aeq,8h</sub> 85 dB(A))
- Justify the **risk level** to workers' health and if **corrective actions** are required
- Provide **recommendations** to mitigate RCS dust and noise exposures

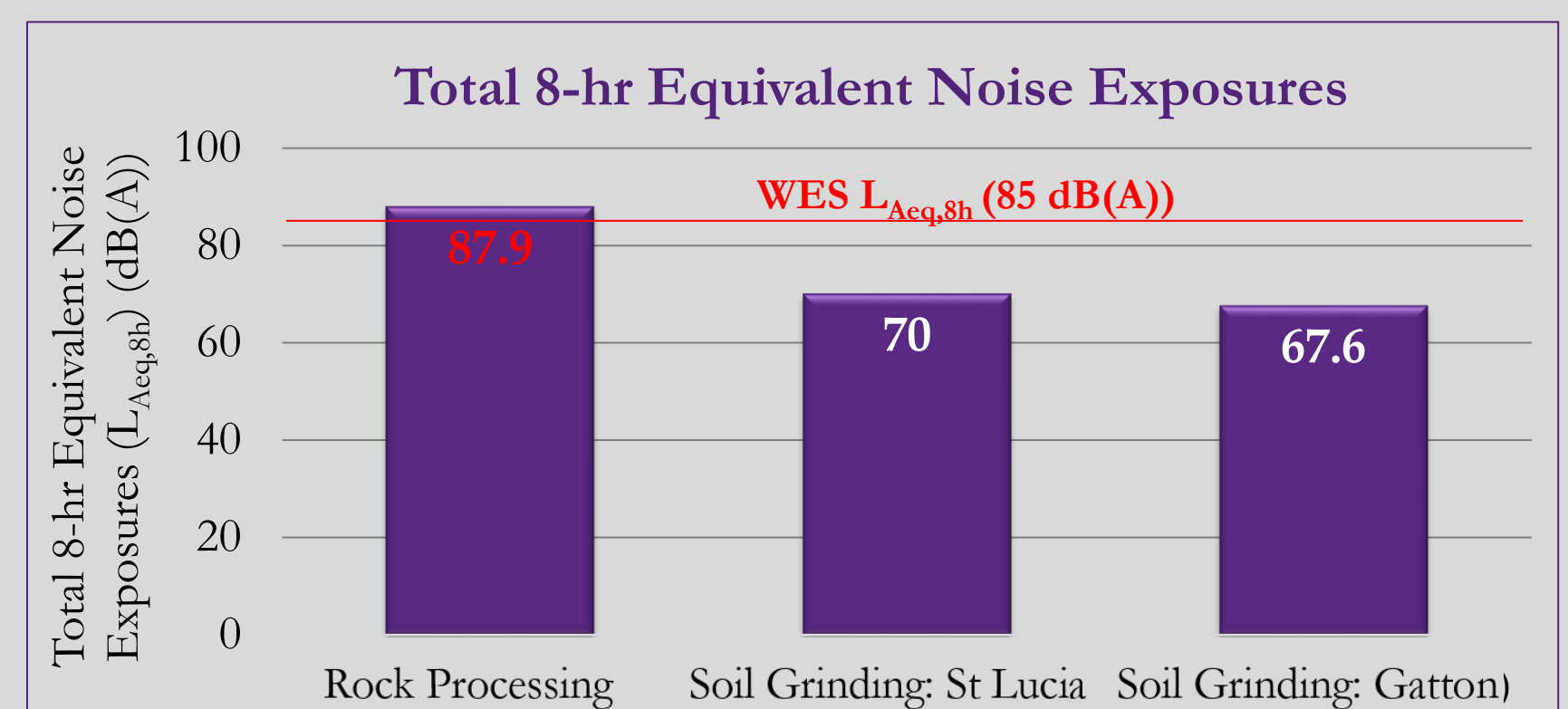
## 3. Methodology



## 4. Results



All RCS exposures **complied** with WES (0.05 mg/m<sup>3</sup>) & ½ WES (0.025 mg/m<sup>3</sup>)



Noise exposure for the rock processing worker was **non-compliant** with the WES L<sub>Aeq,8h</sub> (85 dB(A)) while the other two complied.

## 5. Conclusion

- All RCS dust exposures **complied** with WES of 0.05 mg/m<sup>3</sup>
  - **Very low risk** of silicosis and lung cancer
- Noise exposure for the rock processing worker was **non-compliant** with the WES L<sub>Aeq,8h</sub> of 85 dB(A)
  - **Risk** of noise-induced hearing loss with prolonged exposure.
- Key **recommendations** include:
  - 1) Replacing dry sweeping with **wet cleaning**
  - 2) Upgrading dust extraction with **cyclone**
  - 3) **Enclosed** barrel grinder
  - 4) Portable **pedestal fan**
  - 5) **Training** on RCS dust and noise management
  - 6) Ensuring proper **earmuff classes**
  - 7) Respirator **fit-testing** and **clean-shaven policy**
  - 8) Hearing protection **fit-testing**

## 6. Implications

- The study is a **valuable starting point** for determining best dust and noise practices for rock processing and soil grinding
- Require further research** to represent dust and noise levels in real occupational settings
- Reflects the **need for Brunei Darussalam workplaces** to **strengthen** the management of RCS dust and noise exposures.

Abbreviations  
LEV - Local Exhaust Ventilation  
TWA - Time-Weighted Average  
WES - Workplace Exposure Standard

### References

- 1) Workplace Health and Safety Queensland.(2019). *Code of Practice: Managing respirable crystalline silica dust exposure in the stone benchtop industry*. Retrieved from [Managing respirable crystalline silica dust exposure](#)
- 2) Workplace Health and Safety Queensland. (2021). *Code of Practice: Managing Noise and Preventing Hearing Loss at Work*. Retrieved from [Managing noise and preventing hearing loss at work Code of Practice 2021](#)

