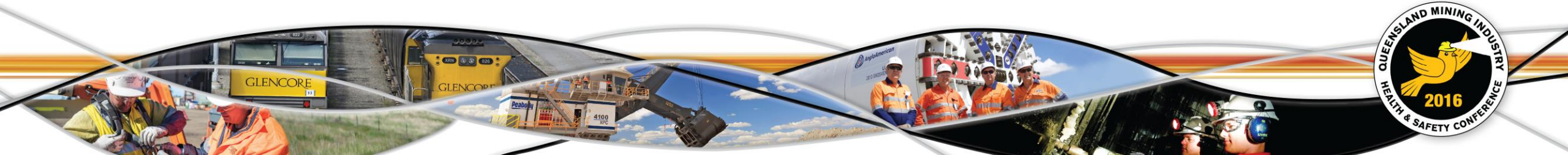


Respirable Dust Monitoring for Underground Coal Mines

Anne Kelly

Health, Safety & Environmental
Scientist

Simtars

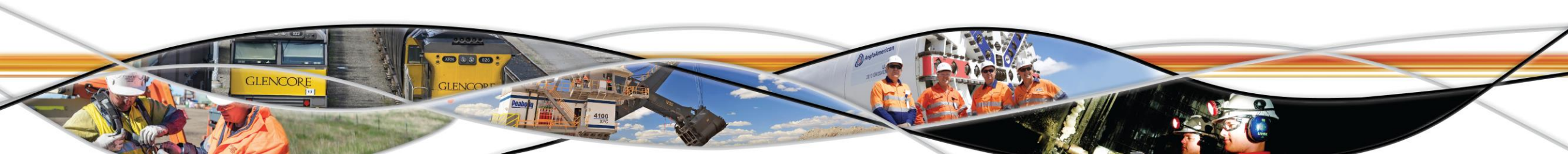




A Past forgotten is a future repeated

Topics Being Covered:

- Occupational Hygiene Exposure Assessment Programs,
- Level of detail required from workers to effectively assess factors influencing their exposure,
- Worker behaviours towards occupational hygiene sampling,
- Common limitations for on-site hygienists
- Importance of communication and engagement between occupational hygienist and site representatives,
- Data review, interpretations and investigation processes,
- Questions on the possible future direction/s of this issue.

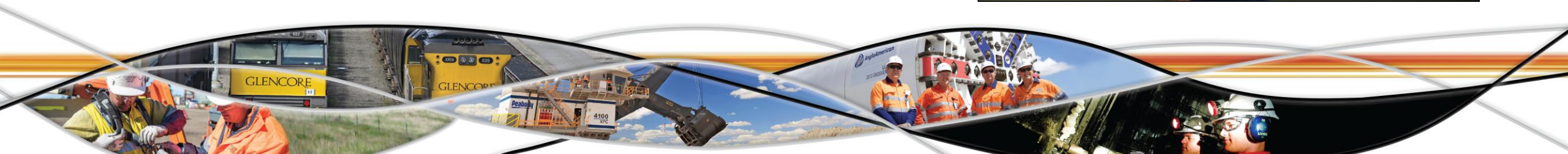




A Past forgotten is a Future repeated

Occupational Hygiene Exposure Assessment Programs

- Exposure is regulated in section 89 in Queensland's 'Coal Mining Safety and Health Regulation 2001' as an 8-hr time-weighted-average (TWA) exposure of 3 mg/m^3
- Sampling conducted in accordance with Australian Standard AS2985
- Result does not take into account protection afforded by the use of respiratory protective equipment



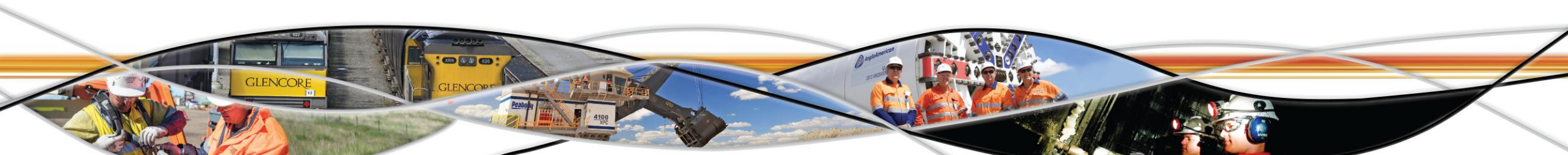


A Past forgotten is a future repeated

Occupational Hygiene Exposure Assessment Programs

The fundamental question:

“How will the data and information generated from this exercise be used?”





A Past forgotten is a future repeated

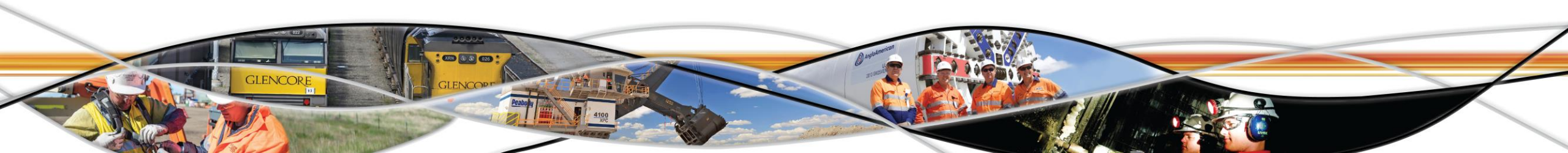
Occupational Hygiene Exposure Assessment Programs

Compliance Based Programs

- Tend to monitor worst case scenarios
- May be Ad-hoc or complaint driven
- Unlikely to provide an accurate picture of exposure over the long term

Comprehensive exposure assessment programs

- Holistic and provide better indication of long term exposure
- More cost effective pathway for control
- Can be more expensive to design, implement and maintain in the short term

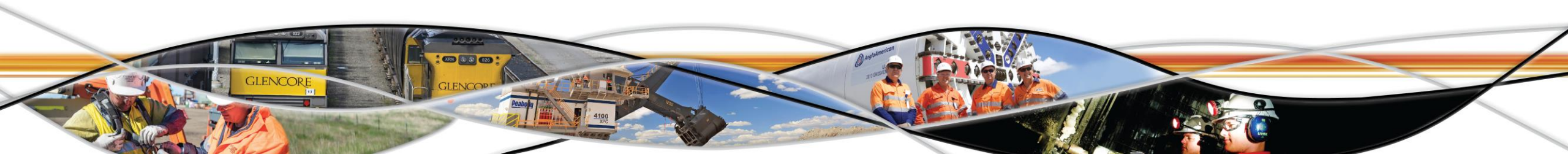




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Occupational Hygiene Exposure Assessment Programs

- 1. Establish the exposure assessment strategy and goals**
- 2. Basic characterisation of the workplace, workforce and environment**
- 3. Exposure assessment**
- 4. Further information gathering and resolving uncertain exposures**
- 5. Implementing prioritised and effective control strategies**
- 6. Periodic review and reassessment of exposures and workplace information**
- 7. Communication and documentation**

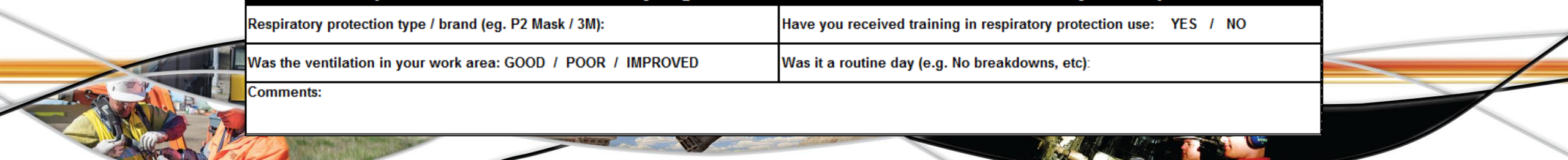




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Level of Detail Required to Assess Exposure

NAME:		SITE:		DATE:	OCCUPATION:	
WORK AREA:		EMPLOYEE #	CREW:	SHIFT: DAY / AFTERNOON / NIGHT		SHIFT LENGTH + ROSTER:
Time		Vehicle ID / Activity <i>(Dust & noise generating activities conducted or worked adjacent to during survey period)</i>	Material Being Handled <i>(Waste / Overburden / Coal)</i>	Location <i>(Location where work was being conducted)</i>	Respiratory Protection Worn	
From	To					
					Yes <input type="checkbox"/>	No <input type="checkbox"/>
					Yes <input type="checkbox"/>	No <input type="checkbox"/>
					Yes <input type="checkbox"/>	No <input type="checkbox"/>
					Yes <input type="checkbox"/>	No <input type="checkbox"/>
					Yes <input type="checkbox"/>	No <input type="checkbox"/>
					Yes <input type="checkbox"/>	No <input type="checkbox"/>
					Yes <input type="checkbox"/>	No <input type="checkbox"/>
Full completion of this work activity log sheet will assist in the evaluation of your exposure data						
Respiratory protection type / brand (eg. P2 Mask / 3M):				Have you received training in respiratory protection use: YES / NO		
Was the ventilation in your work area: GOOD / POOR / IMPROVED				Was it a routine day (e.g. No breakdowns, etc):		
Comments:						

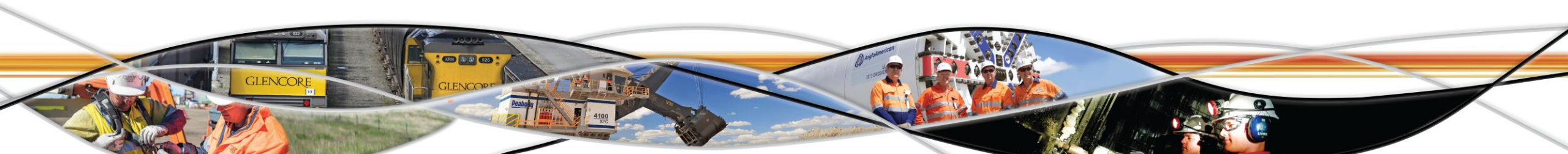




A Past forgotten is a Future repeated

Level of Detail Required to Assess Exposure

- Shift length and rosters
- Specifics of the work conducted
- Duration of time spent conducting tasks and location of activities
- Controls utilised e.g. ventilation details, dust suppression, personal protective equipment (PPE) use and times
- Production rates
- Break-downs or other factors that aren't considered 'normal'. This includes identifying worker activities conducted during periods of down-time
- Other factors contributing to worker dust exposure e.g. has the panel been recently stone dusted; location of gas drainage points, dust generating activities occurring upwind of worker position.





A Past forgotten is a future repeated

Worker Behaviours Towards Occupational Hygiene Sampling

Time		Vehicle ID / Activity <i>(Dust generating activities conducted or worked adjacent to during survey period)</i>	Material Being Handled <i>(Coal / Stone)</i>	Location <i>(Location where work was being conducted)</i>	Respiratory Protection Worn
From	To				
1 PM	2 PM	TOOK BOX, TRAVEL TO [REDACTED]	COAL	SURFACE - [REDACTED]	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
2 PM	6:15	CUTTING OPERATIONS	COAL	[REDACTED] 9CT BREAK OFF	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
6:15	7:15	CRIB	COAL	[REDACTED] 6CT	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
7:15	11 AM	CUTTING OPERATIONS	COAL	[REDACTED] 9CT BREAK OFF	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
11 AM	12 PM	TRAVEL - SHIFT CHANGE	COAL	[REDACTED] - SURFACE	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
					Yes <input type="checkbox"/> No <input type="checkbox"/>
					Yes <input type="checkbox"/> No <input type="checkbox"/>
					Yes <input type="checkbox"/> No <input type="checkbox"/>

Full completion of this work activity log sheet will assist in the evaluation of your exposure data

Respiratory protection type / brand (eg. P2 Mask / 3M):	Have you received training in respiratory protection use: YES / NO
Was the ventilation in your work area: GOOD / POOR / IMPROVED	Was it a routine day (e.g. No breakdowns, etc):
Comments:	





A Past forgotten is a future repeated

Common Limitations for on-site Hygienists

Cost and Resourcing

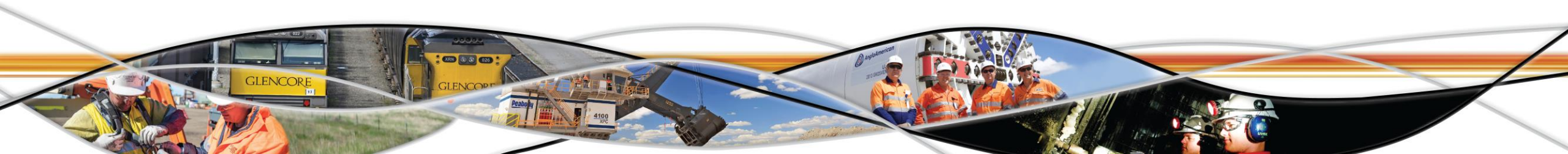
- Balance between providing a cost effective service and not compromising the hygienists ability to collect data and information that meets quality expectations
- The assistance and input of site representatives is crucial in achieving this.

Time Restrictions

- Due to production pressures
- Site logistics

Access to site

- Ability to conduct observations of production areas and work groups

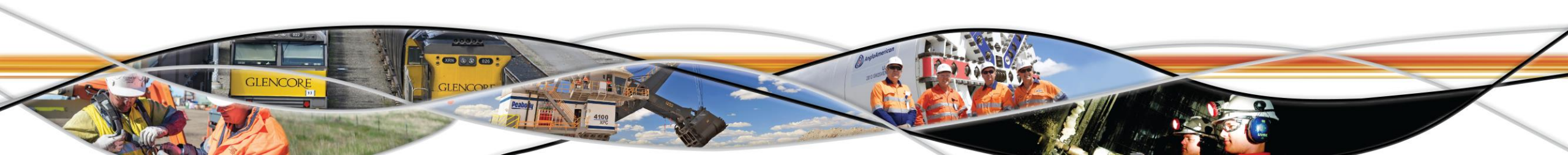




A Past forgotten is a Future repeated

Data Review, Interpretation and Investigations

- A review of all occupational data should be done within a timely manner
- Investigate causes of elevated exposures
- Worker consultation is important
- Out of the ordinary low exposures should also be reviewed
- Difficulty in collecting comparable data under similar conditions





A Past forgotten is a future repeated

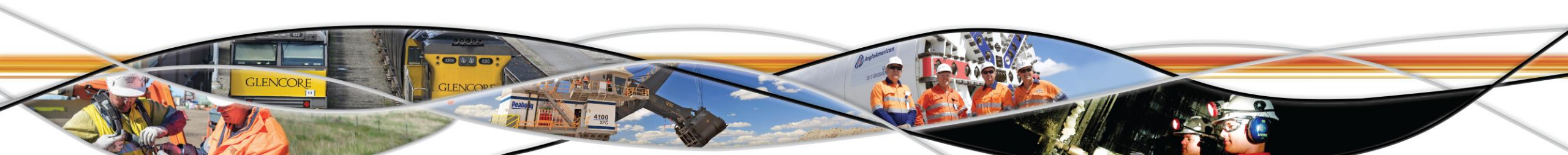
Data Review, Interpretation and Investigations

Static Sampling:

- valuable tool for assessing the effectiveness of controls and understanding background dust levels at specific locations

Real-time Instruments:

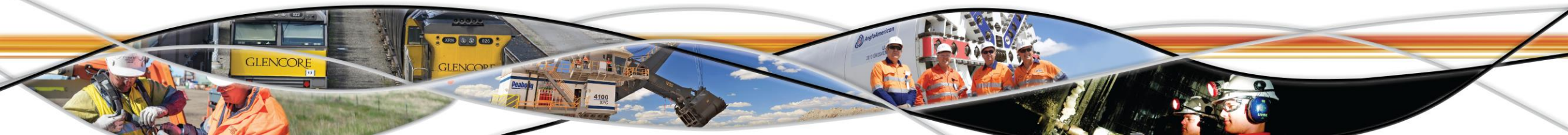
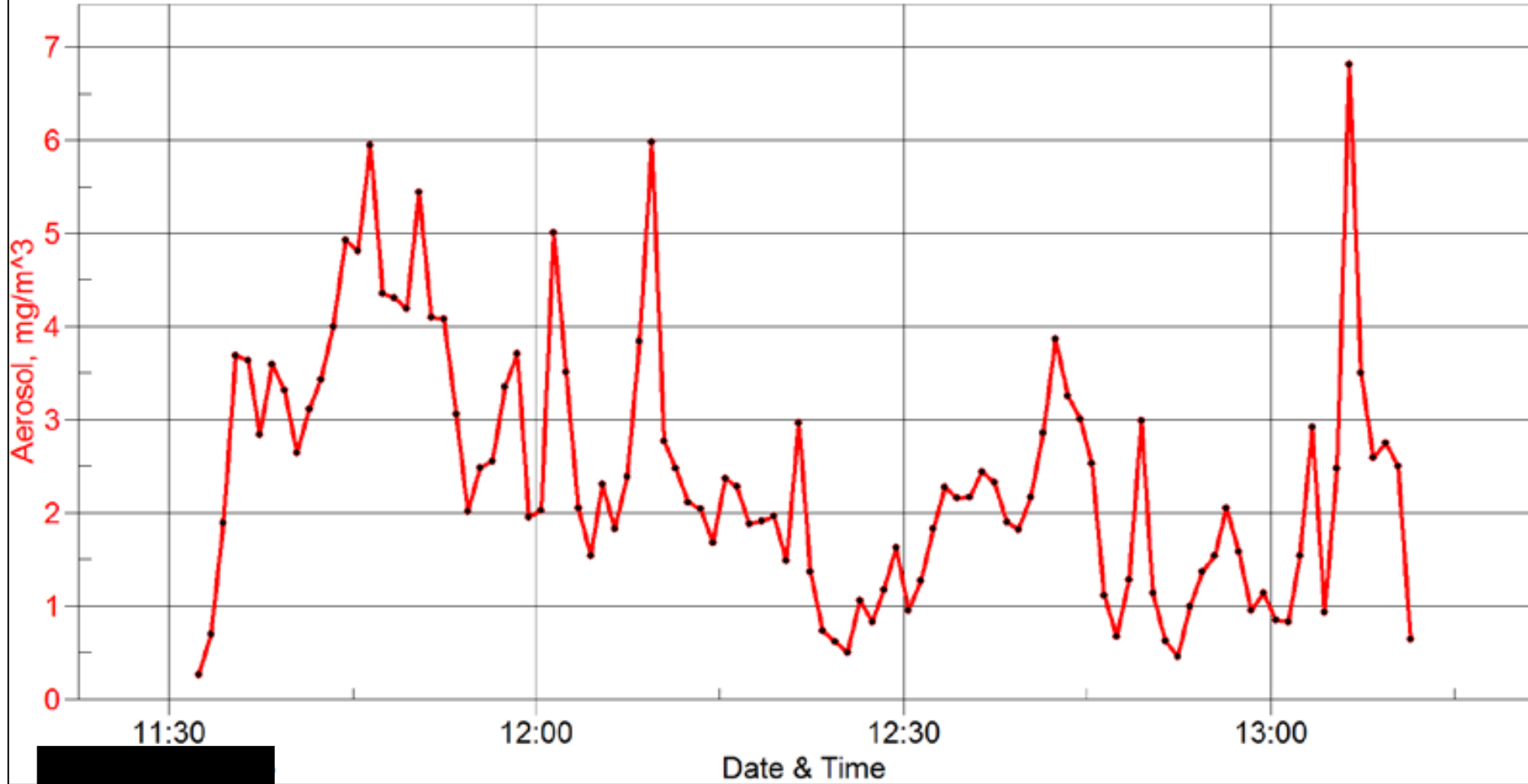
- educating personnel on worker positioning in relation to dust generating activities
- assessing effectiveness of controls
- assessing exposure trends over a shift
- using it as a point source (sniffing tool) to identify and somewhat quantify sources of dust emission





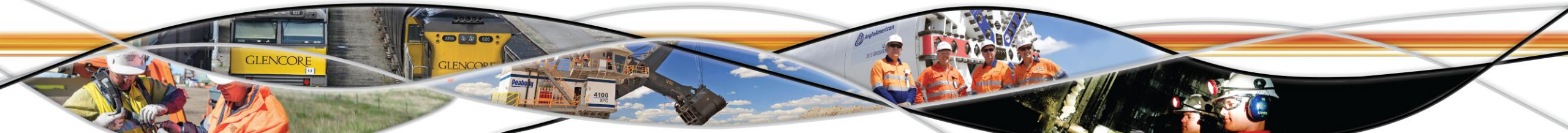
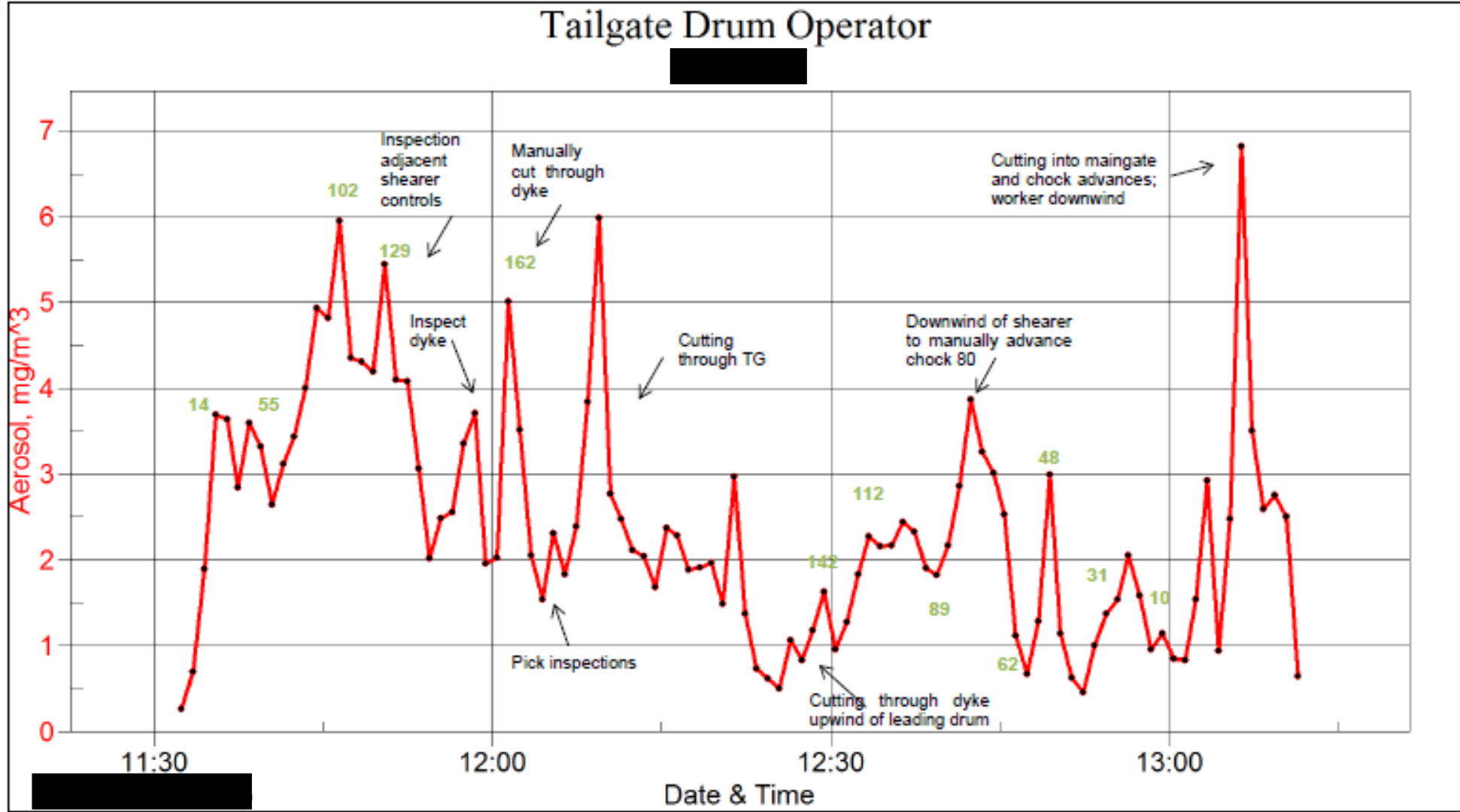
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Tailgate Drum Operator





A Past forgotten is a future repeated

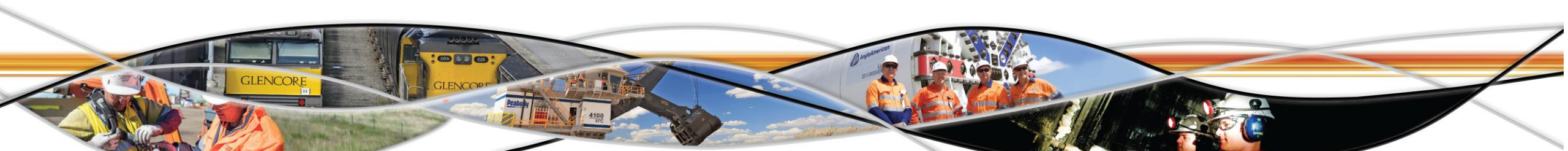




A Past forgotten is a Future repeated

Future Direction

- Development of a well structured committee focused on dust mitigation strategies
- Use of automation and remote control technologies
- Understanding ventilation patterns
- Focus on dust suppression at the source
- Effective use of respiratory protective equipment





A Past forgotten is a Future repeated

Conclusion

1. Encourage and facilitate active worker and management engagement and participation in the exposure assessment program.
2. Ensure that the exposure assessment program is adequately resourced to achieve the program goals.
3. Collect quality supporting information to make informed decisions.
4. Interpret, understand and act on the data to reduce worker exposure and risk of CWP.

