

## CHEMICAL EXPLOSION IN LABORATORY FUME CUPBOARD



### INCIDENT

The plastic lid of a bottle containing a residue of hydrochloric acid, nitric acid, tetrabromomethane and water was blown off in the fume cupboard of the laboratory of a sand operation. The explosion blew open the fume cupboard doors, spraying the contents of the bottle out into the laboratory, causing extensive "pitting" damage to the surface of the door of a new oven about 1.5 metres away.

### INVESTIGATION

As the incident happened early in the morning, no one was in the laboratory. The weather had been extremely hot the previous evening, and there was no airconditioning in the building when staff were absent. Further, there was no ventilation to the fume cupboard.

- The three chemical residues in the bottle should not have been mixed. Mixing hydrochloric and nitric acid gives off hydrogen. These acids should not be mixed with organic compounds such as tetrabromomethane.
- The Chemical Material Data Sheets provided by the supplier were not followed.
- The hot conditions would have contributed to the conditions leading to the explosion.

### PRELIMINARY RECOMMENDATIONS

All mine sites should ensure that:

- chemical residues are stored separately.
- ventilation exhaust to fume cupboards are adequate.
- safety management procedures for the use and storage of all chemicals in the laboratory are put in place by qualified persons, and that all laboratory staff are trained in procedures.
- procedures are in place so that Chemical Material Data sheets are kept up to date, and a quality system implemented for compliance.

For additional information contact Keith Chilman, Regional Inspector of Mines (Hunter), on 0418 858 057.

A handwritten signature in black ink, appearing to read 'N. Sneddon', is written over a white background.

N. SNEDDON  
ASSISTANT DIRECTOR SAFETY OPERATIONS