

Safety Bulletin

Mines Inspectorate

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Storm season is coming — be prepared!

The Bureau of Meteorology is forecasting another wet, stormy and destructive summer. The storms, floods, operational mine stoppages and disruptions of less than 12 months ago should serve as a warning to **be prepared**: both on and off site.

The 2010–2011 storm season demonstrated tragically how not being prepared can put lives at risk and disrupt mine operations for months afterwards. Mine operators, site senior executives, contractors and service providers, and all mine workers should consider the hazards created by severe-weather events, and resulting disruptions while attempting to restore operations. These problems are not restricted to the site but apply also to nearby communities and district infrastructure.



Please use the checklists at the end of this document to help you prepare for, and recover from, whatever this summer's wet season may bring.

What can go wrong?

Severe-weather events are characterised by high-velocity destructive winds, intense thunderstorms, heavy rain and hail, and flash flooding. They can damage surface structures and harm people in open and enclosed spaces.

People in the vicinity of charged blast holes may be exposed to the detonation of explosives by a lightning strike.

Underground mine operations may be put at risk by sudden inundation from flash flooding; lightning strikes may disrupt critical electrical supply to winder, ventilation and computer-based control and communication systems, as well as transfer electrical energy to underground workings.

Severe-weather events may last from minutes to days. Because of the unpredictability of such events, a mine's response system must always be ready to deal with the hazards and resultant risks.

How can you prepare?

Conduct a risk assessment

The site senior executive (SSE) is required by law to conduct a risk assessment to identify potential emergency situations caused by severe weather. Part of this risk assessment is to identify, determine and communicate places of safety.

The SSE must ensure adequate resources, facilities and procedures are available to implement and maintain an effective management program before, during and after a storm (**see checklists**).

Ensure warning and evacuation systems work

A mine's safety and health management system (SHMS) must have:

- a process for identifying and warning anyone who could be affected by severe-weather events

- a system for moving people to a place of safety
- actions to bring risk into acceptable limits.

As an aid in this, mines, quarries and exploration projects should consider developing a trigger action response plan (TARP) based on warnings and observations. TARPs should also consider explosives-charging operations and the risks created by an approaching storm.

Ensure your structures are sound

Storm events have shown that some mine buildings, if not secured properly, can be turned over by strong winds, causing severe injuries to anyone inside.

For this reason, there must be a system to ensure that temporary and semi-permanent relocatable structures on a mine are adequately designed, sited, constructed and anchored.

For instance, to prevent movement during a storm, single or multi-modular semi-permanent (or permanent) units (mobile dongas, offices, cribsrooms or ablution blocks) must be mounted and anchored to pre-established concrete and steel pedestals and/or other specifically designed anchoring points, in accordance with building standards. Precautions should also be considered for other structures that are vulnerable to the effects of strong wind — tanks, conveyor belts or mobile equipment such as cranes.

Have an emergency response and rescue system

An adequate emergency response and rescue system must be in place in case a severe-weather event causes injury, entrapment or damage to buildings or infrastructure.

Communicate, communicate, communicate

Although severe weather is often localised and infrequent, this does not provide a real margin of safety. It is, therefore, important that everyone on site, including contractors, are made aware of the site's emergency response plan (including location of safe places), and

their individual responsibilities (i.e. what is expected of them). This must be done as part of the overall process of preparation.

In particular, procedures covering lightning strike to rubber-tyred vehicles should be reiterated to all mine employees.

Sites should also check their communication and mutual assistance protocols with adjacent mines or other off-site resources.

How can you recover?

The storm may have passed, but hazards may yet remain.

Use the checklist at the end of this document before resuming normal operations. Please note that the list does not cover your site-specific severe-weather hazards.

Additional information to assist in the management of severe weather, and recovery, can be obtained from:

- 'Weather forecasting — Bureau of Meteorology' at www.bom.gov.au/qld/
- Queensland Mines Inspectorate, *Safety Bulletin 78 Flood recovery in mines*, 12 February 2008
http://mines.industry.qld.gov.au/assets/mines-safety-health/safety_bulletin78.pdf
- Queensland Mines Inspectorate, *Safety Alert 177 Mobile crib hut blown over During Storm*, 7 November 2007
http://mines.industry.qld.gov.au/assets/mines-safety-health/safety_alert177.pdf
- Queensland Mines Inspectorate, *Safety Bulletin 102 Severe weather preparedness*
http://mines.industry.qld.gov.au/assets/mines-safety-health/safety_bulletin_102_severe_weather_preparedness.pdf

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Ensure all relevant people in your organisation receive a copy of this bulletin. Make sure it reaches the people who need it; and that it is placed on the mine noticeboards.

See more safety alerts and bulletins at <http://mines.industry.qld.gov.au/> Follow us on Twitter: <https://twitter.com/#!/MiningSafetyQLD>

Preparing for a storm Checklist

At your mine site:	Site status
1. Have all potential severe-weather emergencies been identified?	
2. Are adequate resources, facilities and procedures in place to implement and maintain an effective management program before, during and after a storm?	
3. Has the site checked its communication and mutual assistance protocols with adjacent mines or other offsite resources?	
4. Has a clean-up been conducted to remove loose 'flying object' debris?	
5. Are there park-up areas for mining equipment above the high-water mark? Have they been communicated?	
6. Has the site prepared shutdown and tie-down procedures for conveyor belts, crib huts, temporary structures and other plant and equipment exposed to the elements? Is all necessary hardware available — tie-downs, ropes etc.?	
7. Have all nominated storm shelters been inspected and cleaned?	
8. Have shelters been replenished with basic supplies — first aid supplies, drinking water and communication equipment?	
9. Do all mine personnel know where the nominated shelters are?	
10. Have sumps and environmental traps (oil, grease, fuel) been cleaned out to eliminate or minimise ground contamination should the trap or sump overflow?	
11. Has the integrity of mine communication and power systems been checked?	
12. Has the site's power back-up system been checked for ready operation in case of mains blackout?	
13. Is there a list of post-storm clean-up equipment, e.g. front-end loaders, bobcats, lighting plants, pumps and hoses, fuel tanks?	
14. Has the on-site emergency response equipment, including medical facilities and vehicles, been checked for readiness?	
15. Have containment dams, levies and weirs been checked to avoid accidental breaches?	
16. Have areas of potential ponding, e.g. on top of waste dumps, been identified and made to drain freely to avoid subsequent slope instability?	
17. Are effective systems, including TARPs, in place to identify and warn potentially affected persons of the onset of severe weather?	
18. Is there an effective system for evacuating people to a designated place of safety?	
19. Is there an efficient system for monitoring, analysing and evaluating the onset of any severe weather and identifying the actions required?	
20. Is there an effective system for ensuring that temporary and semi-permanent relocatable structures on a mine site are adequately designed, sited, constructed and anchored?	
21. Is there an effective system for ensuring tanks, conveyor belts or mobile equipment (such as cranes) that are vulnerable to the effects of strong wind are safe during severe weather?	
22. Is there an effective, adequate emergency response and rescue system in case severe weather causes injury, entrapment or damage to infrastructure?	
23. Have the procedures covering lightning strike to rubber-tyred vehicles been reiterated to all mine employees?	
24. Has everyone on site, including contractors, been made aware of the site's emergency response plan, and their individual responsibilities and expected actions?	

Recovering from a storm Checklist

At your mine site:	Site status
<p>1. Has pit wall instability and slope undercutting been assessed and considered? After a storm, there is increased likelihood of some form of pit wall instability (due to ingress of water and lubrication of joint/fault planes) and undercutting as surrounding areas are soaked and ground water tables are recharged, possibly at some distance from the operation.</p>	
<p>2. Have ramps, roads and safety bunds been checked for damage, undercutting, wash-outs, soft edges or loss of traction? Have they been reinstated to a safe standard? In rebuilding mine roads and other infrastructure, mobile equipment hazards, unprotected road edges from eroded safety banks, undercutting, wash-outs, loss of traction and soft edges, must be taken into account.</p>	
<p>3. Have pedestrian traffic areas been checked and reinstated to a safe standard?</p>	
<p>4. Has the stability of waste dumps, stockpiling areas, sedimentation ponds and dams been checked for their integrity and safety?</p>	
<p>5. Have all personnel and equipment hazards from working in and around water with mobile equipment been identified and dealt with before work re-starts; in particular, water management infrastructure, pumping and working near the water's edge?</p>	
<p>6. Are drowning hazards effectively controlled? Wearing of suitable, approved lifejackets will help with managing potential drowning hazards.</p>	
<p>7. Are hazards in handling mud effectively controlled?</p>	
<p>8. Have equipment recovery and equipment towing hazards been effectively addressed?</p>	
<p>9. Are hazards from water ingress into machinery effectively controlled?</p>	
<p>10. Are people aware of wildlife hazards — insects and snakes — inside cabinets and other enclosures?</p>	