TAILINGS FACILITY PERFORMANCE:
2017 AND 2018

Tailings & Mine Waste 2018
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Design and Operation 1

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Tailings Incident History*

*Updated from Strachan and Van (2018)*
Dam Height and Incident Type*

*From Strachan and Van (2018)
Dam Height and Active/Inactive Facility

*From Strachan and Van (2018)
# Reported incidents: second half 2017 through first half 2018

<table>
<thead>
<tr>
<th>Name</th>
<th>Date</th>
<th>Location</th>
<th>Incident Type</th>
<th>Status</th>
<th>Probable Cause</th>
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<tbody>
<tr>
<td>Kokova</td>
<td>Sep 27, 2017</td>
<td>Liberia</td>
<td>Failure</td>
<td>Active</td>
<td>Piping</td>
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<td>Hernic</td>
<td>Dec 29, 2017</td>
<td>South Africa</td>
<td>Accident</td>
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<td>Peñarroya</td>
<td>Feb 15, 2018</td>
<td>Spain</td>
<td>Failure</td>
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<td>Alunorte</td>
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<td>Brazil</td>
<td>Accident</td>
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<td>Minera Lincuna</td>
<td>Mar 5, 2018</td>
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<td>Failure</td>
<td>Active</td>
<td>Slope stability</td>
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<tr>
<td>Bong Mieu</td>
<td>Mar 16, 2018</td>
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<td>Failure</td>
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<td>Cadia Valley</td>
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<td>Cieneguita</td>
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<td>Mexico</td>
<td>Failure</td>
<td>Active</td>
<td>Slope stability</td>
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</table>
Kukova (Liberia)  September 27, 2017

• A release of approximately 11,000 m$^3$ of slurry containing cyanide from the Kokova Gold Mine in Liberia (operated by MNG Gold Liberia, registered in Turkey) into nearby Sig Creek and surrounding wetlands.

• The reported cause was a rupture in a section of the geomembrane liner within the tailings impoundment.

• Sources of information: *The News* (a Liberian newspaper) and Bowker and Associates, Science & Research In the Public Interest.
Hernic (South Africa)  December 29, 2017

• A release of tailings at the Hernic Ferrichrome processing facility in South Africa (used for recovery of chrome and platinum), associated with the Dilokong chrome mine, owned by Jubilee Metals Group PLC.

• The release was through a v-shaped failure of a side wall (embankment), was contained within a former open-pit mine area on mine property, and was repaired the same day of the release.

• Sources of information: *Alliance News* (a London newspaper) and <miningreview.com>.
Peñarroya (Spain) February 15, 2018

• A tailings release from a reported dam breach reached the nearby Brandelos River in southwest Spain. The dam is part of an old copper/gold mining complex operated by Mining and Metallurgical Society of Peñarroya and Río Tinto Patiño.

• Source of information: <mining.com>.
Aunorte (Brazil)  February 17, 2018

• A release of waste fluid from holding basins flowed into adjacent areas at the Norske Hydro Alunorte bauxite and aluminum refining plant, operated by Norske Hydro, a Norwegian company.

• The affected holding basin was geomembrane-lined, and appeared to be overtopped, following heavy precipitation in the area (with no damage to the geomembrane).

A release of approximately 50,000 m$^3$ of tailings into the Sipchoc Basin and the Rio Santa. The operator is Minera Lincuna SA.

Source of information: <elcomercio.pe>.
Bong Miew (Vietnam) March 16, 2018

• A release of tailings from the Bong Mieu gold mine reached the Que Phuong River. The site was owned by 6666 Mineral Industry Joint Stock Company, and the previous operator was the Bong Mieu Gold Mining Limited Company.

• The release was from a tailings dam breach, which was sealed with sand bags two days later.

• Source of information: <e.vnexpress.net>.
Cadia Valley (Australia) March 16, 2018

• The embankment between the northern and southern tailings impoundments at Newcrest Mining’s Cadia Valley Mine experienced a partial failure, releasing tailings from the northern impoundment into the southern impoundment. There was no external release of tailings.

• The cause of the partial embankment failure appears to be slope instability, perhaps due to seismic activity two days before the event.

Cieneguita (Mexico)  June 4, 2018

- A tailings release of approximately 250,000 m³ at the Cieneguita Mine migrated up to 29 km downstream along the Cañitas River, with reported fatalities. The mine is operated by Minera Rio Tinto (Cluster Minero de Chihuahua A.C.).

- The release was due to an embankment failure, with cracks in the embankment reported prior to the failure.

- Sources of information: The London Free Press, WISE Uranium Project, and Bowker and Associates, Science & Research In the Public Interest.
Recent Documents

Mining Association of Canada (MAC) guidelines
• A Guide to the Management of Tailings Facilities (third edition)
• Maintenance and Surveillance Manual for Tailings and Water Management Facilities

Mine Environmental Neutral Drainage (MEND) Program
• Study of Tailings Management Technologies

United Nations Environment Programme (UNEP)
• Mine Tailings Storage: Safety Is No Accident
Recommendations

- Minimize ponded water within the impoundment, maintain ponded water away from dams, and accommodate excess process water or precipitation with dam freeboard or emergency spillways.
- Operate tailings facilities to optimize tailings densities through consolidation and drainage or by compaction or mechanical methods.
- Educate site personnel to recognize proper tailings dam performance and best management practices, and know established procedures to notify the appropriate personnel and take action when unforeseen conditions are observed.