Climate change and its effect on the stability and lifespan of a tailings dam

Increased levels of acid mine drainage (AMD) due to increased rates of oxidation of metal sulphides, such as pyrite (iron sulphide), as a result of increased precipitation and/or temperatures.

Tailings pond

Mines

Lake

Tailings containing heavy metals and other pollutants could be transported further than previously experienced via surface run-off and wind-blown dust due to more extreme weather events.

Impacts on the health and well-being of individuals and communities due to inhalation of tailings dust, or contamination of local sources of food and water by tailings containing heavy metals.

Tailings pond

Increased risk of large-scale pollution incidents due to more extreme weather events, e.g. flooding caused by structural breach of dam, could result in significant long-term impacts on the local area in the vicinity of the dam. For example, contamination of agricultural and/or residential soils; loss of ecological habitats, flora and fauna; loss of local livelihoods and traditions; and contamination of local sources of drinking water.

Structural weakening of dams through:
a) Increased contraction-expansion cycles caused by more extreme wet-dry periods;
b) Erosion and instability of embankment slopes caused by more intense weather events and patterns (rain, wind, hot/humid periods);
c) Potential mass movement of embankment slopes due to increased precipitation, in the form of creep, solifluction and/or landslides.

Source: GRID-Arendal