

# Gold mines harm public health and the environment.



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*Aston Bay Holdings Ltd., a Canadian mineral exploration company, started drilling for gold in Buckingham County, Virginia in 2019 and has expanded its search for metals into additional localities of the Commonwealth. Industrial-scale gold mining has never taken place in Virginia. However, the environmental and public health impacts from gold mines in the U.S. are well-known and widely reported. Damage typically occurs through hazardous leaks, spills, and accidents; acid mine drainage; and airborne pollutants.*

## LEAKS, SPILLS, AND ACCIDENTS

Mining waste products—typically containing sodium cyanide, calcium oxide, and potassium amyl xanthate<sup>1</sup>—regularly escape into the environment.<sup>2</sup> A recent study of gold mines in the U.S. found that 100% of the mines studied—representing 93% of gold produced in the United States in 2013—experienced an accidental release of hazardous materials.<sup>3</sup>

Recent examples of hazardous releases and accidents include the following:

- In 2020, the Haile Gold Mine in South Carolina released excessive amounts of thallium, a toxic metal, into a nearby creek.<sup>4</sup> The mine did not self-report the pollution until years after its operations began.<sup>5</sup>
- In 2015, an accident at a wastewater pond in Colorado released more than 3 million gallons of gold mining waste into the Animas River watershed, a primary source of drinking water for Colorado, New Mexico, Utah, and the Navajo Nation.<sup>6</sup>
- Accidents also threaten the health and safety of mine employees. In the U.S. in 2020, there were at least 797 injuries from accidents at metal mines.<sup>7</sup>

**Cyanide, used to extract over 90% of gold mined in the U.S., is extremely toxic.<sup>8</sup> It is lethal to humans (even in small amounts) and has been used as a chemical warfare agent for millennia. Sub-lethal exposures may cause Parkinson's disease and other neurological disorders.<sup>9</sup>**

## ACID MINE DRAINAGE

Open-pit waste dumps can contain pyrite and other sulfides that are unearthed during the mining process.<sup>10</sup> Rainwater oxidizes these compounds, which acidifies the waste.<sup>11</sup> Acid mine drainage occurs when

acidic waste escapes into the surrounding environment through runoff or infrastructure failures.<sup>12</sup> As it travels downstream, acid mine drainage leaches toxic metals from rocks into surface and groundwater resources, thereby posing a serious threat to human health and the environment.<sup>13</sup>

In Prince William County, Virginia, acidic drainage from an abandoned pyrite mine was found to have leached dangerously high levels of cadmium, copper, lead and zinc.<sup>14</sup> Each of these toxic metals accumulate in fish<sup>15</sup> and, if ingested in excess quantities, are hazardous to human health:

- Cadmium and copper can damage the lungs and kidneys and irritate the digestive tract.
- Lead damages the brain and kidneys and can cause reproductive harm.
- Zinc damages the pancreas and may cause anemia.<sup>16</sup>

## AIRBORNE POLLUTANTS

Gold mining generates dust and airborne pollutants that are carried by wind into surrounding communities.<sup>17</sup> Soil contaminated with toxic metals poses a substantial risk to small children, who are more likely to accidentally ingest soil through crawling and playing, and who are physiologically more vulnerable to metal poisoning.<sup>18</sup> In addition, toxic metals present in soil may bioaccumulate in crops.

Exposure to small-particle pollutants, which travel much greater distances and are more harmful to human health than large-particle pollutants,<sup>19</sup> has been linked to:

- Heart attacks
- Asthma
- Decreased lung function
- Respiratory symptoms, such as coughing or difficulty breathing
- Premature death in individuals with heart and lung disease<sup>20</sup>

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