

## CYANIDE MANAGEMENT

### Approach

Cyanidation – the process of using a diluted sodium cyanide solution to separate gold from ore – is the safest and most effective and economical metallurgical technique to recover gold currently available. However, in large doses, cyanide can pose serious health risks to humans, animals and plant life, and the right to health has been identified as a salient human rights issue associated with our business activities.

We state our commitment to manage the risks posed by our use of cyanide in gold processing in our **Sustainability and Stakeholder Engagement Policy**, and our Hazardous Materials Management Standard details the minimum requirements all sites must meet.

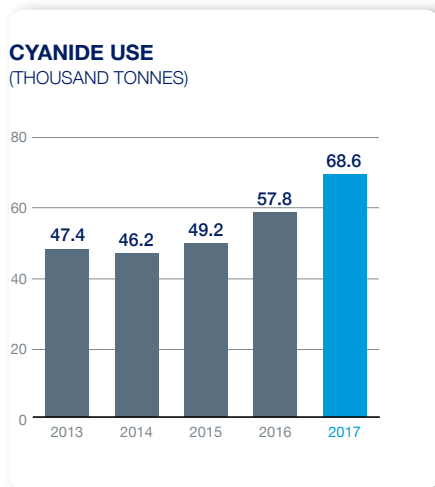
In 2005, Newmont became one of the 14 initial signatories to the **International Cyanide Management Code** (ICMC or “the Code”), a voluntary industry program. The Code focuses on the responsible management of cyanide and cyanide solutions during every stage of the mining process to protect human health and the environment.

All our gold processing facilities that use cyanide must have a cyanide management plan, be certified to the Code, and comply with the Code requirements to conduct independent third-party audits and recertification every three years. We also require new operations that use cyanide to carry out an initial certification audit within 12 months of commercial production. This requirement is more stringent than the Code requirement for new sites and facilities to achieve certification within three years. In between formal audits, sites engage internal and external auditing teams to review Code compliance. Newmont requires all suppliers and transporters of cyanide products to our mines to be Code compliant.

Audit documents and details for each of our mines that use cyanide for processing can be found on the **Code website**.

We actively participate in and engage with industry organizations such as the International Council on Mining and Metals (ICMM), Euromines, the Cyanide Council – an organization of cyanide manufacturers – and the International Cyanide Management Institute’s Industry Advisory Group (IAG) to maintain high standards and effectively manage the social, political and regulatory risks related to cyanide’s use in gold mining.

### 2017 Performance



In 2017, Newmont operations used 68.6 kilotonnes of sodium cyanide. Quantities vary each year due to mineral variations in our ore bodies as well as processing variables. The increase in use compared to 2016 is due to the addition of Long Canyon and Merian to our operations portfolio, and to changing ore types and lower grades. We continued work during the year to improve our cyanide management performance and to evaluate opportunities to minimize cyanide use.

At year end, 11 of the 13 sites that use cyanide were certified with the Code, with the two sites – Merian and Long Canyon – completing their independent certification audit during the year. Merian received its Code certification in early 2018.

Changes in the ore types processed at **Yanacocha have required a number of different measures** to be implemented in order to reduce WAD cyanide concentrations to less than 50 parts per million (ppm) in process ponds, and thus limit potential risk to wildlife. A summary letter was provided to ICMI in 2017 to inform them of the actions and progress.

Updated information on certifications is available on the **ICMI website**.

We rate cyanide-related incidents on a severity scale of one to five, and consider levels 1 and 2 events to be relatively minor and levels 3 to 5 events to be more significant.

In 2017, we experienced one cyanide-related event at a level 3 or higher. The level 3 event occurred at the Phoenix operation in Nevada. During an investigation of a faulty spigot, operators discovered a breach in the tailings pond liner and determined approximately 2,080 gallons of very low concentration slurry (0.35 ppm of cyanide) leaked underneath the pond liner.

During the event, the solution did not leave the property, and there was no threat to human health, communities or wildlife. The event was reported to the appropriate regulatory authorities and the spill was cleaned up and remediated. Training and spigotting methods were evaluated to avoid similar events in the future.

Activities in 2017 to improve the effectiveness of our cyanide management approach included:

- We used ISO standard 17690, which specifies methods to test for the presence of cyanide in process solutions and treated water. These methods include flow injection analysis, amperometric detection and **gas diffusion**, the last of which Newmont adapted for use in mining applications. The gas diffusion methodology allows for real-time measurement of cyanide, and it has been found to have a higher degree of accuracy.
- We continued to report events in our Integrated Management System (IMS), which improves our ability to track cyanide-related health, environment and community events, supports the Code’s reporting requirements, and helps identify any trends that may require additional focus or action.

## Future Focus

In 2018, we will conduct recertification audits at Ahafo and Akyem in Ghana; KCGM and Boddington in Australia; Carlin (including Emigrant) and Phoenix in Nevada; and Yanacocha in Peru.

Our Integrated Management System (IMS), which will be fully implemented in 2018, will support compliance with the Code certification program.

### Cyanide Management – Case Study

#### Changing Ore Types Challenge Compliance with Cyanide Code

Our Yanacocha operation in Peru has been one of the most prolific gold mines in the world, producing more than 37 million ounces of gold since pouring its first gold bar in 1993. Today, only one oxide ore deposit remains at Yanacocha, so much of the ore currently being processed is considered transitional – located between oxides and sulfides – and has a higher content of copper, iron and other metals.

One challenge with these transitional ores is that they require higher levels of reagents, including cyanide and lime, during the gold and silver recovery process. At Yanacocha, the higher reagent requirements – exacerbated by heavy rainfall events early in the year – have resulted in the concentration of weak acid dissociable (WAD) cyanide in process ponds increasing to levels that are higher than allowed under the **International Cyanide Management Code** (ICMC or “the Code”).

In response, Yanacocha undertook – and continues to pursue – a number of actions to maintain compliance with the Code at the processing facilities, including:

- Sulfidization, acidification, recycling and thickening (SART) and acidify, volitize and re-neutralize (AVR) processes are both being used to help in copper-gold processing and cyanide reuse.
- A new peroxide dosing system, which went online in September, began reducing the tailings discharge cyanide to levels in compliance with the Code.
- To prevent wildlife from ingesting waters when concentrations exceeded the Code limits, as an interim measure the site has used wildlife hazing and deterrent techniques including propane cannons, bird balls and holographic balloons. The tailings storage facility (TSF) is inspected daily along with weekly field inspections to monitor for wildlife activities and mortalities.

To date, the controls have been effective in restricting wildlife access to ponds with elevated WAD cyanide concentrations and in reducing concentrations to below the threshold in other ponds and locations where bird balls and other techniques are not feasible. Yanacocha is committed to maintaining compliance and certification under the Code as it prepares for Code recertification in 2018.

