

International Cyanide Management Institute

2021 Report



# RESULTS THAT MATTER

Every Day.

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## Introduction

Begun in 2005, the Cyanide Code certification program turns industrial gold and silver mining operations, producers, and transporters of cyanide into champions of responsible cyanide management.

***Every day***, participating operations commit to maintaining standards that cover transportation, handling, storage, operations, decommissioning, worker safety, emergency response, training and stakeholder engagement.

***Every three years***, participants demonstrate their continuous compliance by submitting to a rigorous audit that includes on-site inspections and independent-auditor review of internal records.

***The goal of the Cyanide Code is not just certification.*** The goal is for mines, producers, and transporters to ***use*** their certification ***as a tool*** for achieving ***meaningful results***.

## The Results that Matter:

- > **Safer cyanide management**  
during production, transportation and use
- > **Improved systems**  
for spill prevention and environmental protection
- > **Greater stakeholder confidence**  
in operational management
- > **Public demonstration**  
of use of effective best practices for cyanide management

They matter *every single day* to workers, insurers, lenders, investors, communities, and the environment at mining operations and along every kilometer of every cyanide supply chain stretching around the globe.

DURING THE 15 YEARS  
SINCE THE PROGRAM'S FIRST  
CERTIFICATION:

# ZERO

HEALTH, SAFETY,  
or ENVIRONMENTAL  
CATASTROPHIES

RELATED TO THE USE OF CYANIDE  
AT PARTICIPATING MINING OPERATIONS

# 2021 Highlights

Cyanide Code Signatories



9 new *mining* signatories = 20% increase

Countries w/ Cyanide Code at Work



41 have Certified Operations

Supply Chains



Certified Worldwide

Audit Reports Received



Prepared by 31 qualified lead auditors from 24 firms, assisted by 26 technical experts

Certifications Approved



As of the end of 2021:

During 2021:

Commitment to Certification				Continuous Improvement through Recertification	Approved Certifications
OPERATION TYPE	# Participating	# Certified	% Certified	% Certified Operations <i>recertified</i> once or more	# Certified
All Global Participants	358	290	81%	79%	72
Mining	136	106	78%	81%	37
Production*	44	34	77%	91%	8
Transport	178	150	84%	74%	27

\*Production operations include cyanide manufacturing facilities, transloading facilities, and warehouses.

# To our Stakeholders

Cyanide Code participants are delivering results that matter – every day, around the world.

**The Cyanide Code continued to expand its reach across the industry and the globe in 2021**, with solid growth in the number of participating companies and expanded implementation of the Cyanide Code's best practices at operations worldwide. At work in 50 countries, the Cyanide Code is being implemented at 136 mines around the globe, and 78% have achieved certification to the Cyanide Code's rigorous standards through independent audit assurance. A 20% rise last year in the number of participating mining companies speaks to an increasing recognition by mining companies of the Cyanide Code's value in helping companies deliver results that matter to a range of stakeholders: communities, workers, operations, investors, governments and many others. This accelerated growth has placed the program at a tipping point, where today an estimated 56% of the global industrial gold production by cyanidation at primary gold mines is produced by Cyanide Code signatories; we expect further growth in the coming year.

While participation rose to new levels, so did the number of certified operations. Fully 81% of the participating operations – including mines, cyanide production facilities, and transporters – were certified at the end of the year. Notably, 79% of all certified operations have been recertified at least once, publicly demonstrating continuous improvement and sustained commitment to best practice.

The results go beyond just certifications, translating into actual improvements on the ground at operations throughout the industry; such as better management of cyanide solution and water balances, protection of wildlife, and analytical procedures for measuring cyanide. Together, these achievements evidence ongoing global recognition of the Cyanide Code's value and benefits to industry and its partners, but also reflect the global commitment to the Cyanide Code and its transformative role in elevating corporate and industry performance. The progress has continued in 2022, when in February the Cyanide Code reached a milestone with the 1000th certification in the program's history.



The transparency and rigor of the Cyanide Code and its audit process results in high regard for those operations that achieve certification, which can be important for investor, regulatory, and community decision-making. Certification benefits all stakeholders: companies gain the assurance of certification and the social license to operate, communities and the environment are protected by the Cyanide Code's environmental standards, and workers are protected by the Cyanide Code's health and safety standards.

Through adherence to the Cyanide Code, the program's participants are delivering results that matter, every day, in working to ensure safer operations that are protective of employees, communities, and the environment. This requires continuous compliance, continuous improvement, and continuous commitment by companies, employees, and business partners. We thank our signatory companies who have done this, you stand at the top of the industry, advancing best practices for cyanide management — and a better future for employees, communities, and the planet.

It should be noted that last June, we released revised program documentation for the Cyanide Code program, the result of an extensive review and public consultation process that began in 2019. The objective of the revisions was to account for changes in industry practices since initial development of the Cyanide Code and its supporting documents, addressing gaps and “soft spots” in requirements for auditing and compliance, clarification of procedures and guidance for compliance auditing and certification, and making documents more “user friendly” by eliminating duplicate materials and discrepancies. For purposes of audit compliance, the new program requirements and related

documentation were effective September 1, 2021. Translations of the documents into Chinese, French and Spanish are available on our website.

In conjunction with the release of the revised program documentation, ICMI has relaunched the Cyanide Code website, with a new look, improved navigation, and enhanced content. Amongst the new features is the podcast series, CodeCast, with an initial nine episodes.

The ICMI team is lean, efficient, and experienced and they performed exceedingly well in 2021, and each team member has my respect and gratitude. A further strength of the Institute is our active and engaged Board of Directors; their wise and collegial counsel has ensured our program remains rigorous and credible. We thank them for their leadership, which has enabled us not just to respond to industry changes, but to anticipate them. We are also pleased to have welcomed Günter Becker to our Board in September, a seasoned insurance executive with deep knowledge of the mining industry. We are grateful to departing Directors Elisa Tonda and Dirk Van Zyl for their tremendous contributions during their eight years of service.

Finally, I want to thank the many stakeholders with whom we have established rewarding relationships. On behalf of the Board and the ICMI staff, thank you for your support in 2021. We look forward to strengthening our alliances in the years ahead.

**Paul Bateman**, *President*



# The Standard of Excellence for Cyanide Management

During 2021, the *number of signatories to the Cyanide Code* rose from 195 at the start of the year to 215 by year-end. ***This is the largest annual increase since 2014***, and includes nine new mining companies.

Individually these signatory mining companies, cyanide producers and transporters are champions of safe cyanide management. Together, they create a global standard of excellence that is raising community, investor and regulator awareness of the Code's value. This is driving an increasing number of companies to follow these standards, even if they do not become actual signatories.

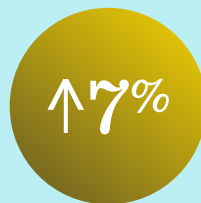
### Signatory Increases



Mining



Production



Transport

195 215

START OF 2021

YEAR END



## Visibility of the Cyanide Code's Value

Signatories' safety records, best practices and operational excellence have increased global awareness of the Cyanide Code's value — resulting in positive environmental, social, and corporate governance encouragement for more companies to implement the Cyanide Code.

**RESULTS  
THAT  
MATTER**

Signatory	Total	Europe	Asia	North America	South America	Oceania	Africa
<b>Total</b>	<b>215</b>	<b>17</b>	<b>40</b>	<b>49</b>	<b>52</b>	<b>15</b>	<b>42</b>
Mining	54	6	6	26	5	5	6
Production*	29	5	11	2	4	2	5
Transport	132	6	23	21	43	8	31

\* Signatory production operations include cyanide manufacturing facilities, transloading facilities, and warehouses.

## Mining

Agnico Eagle Mines Limited, Canada	Gabriel Resources Ltd., Canada	Minera Sotrami S.A., Peru
AK Altynalmas JSC, Republic of Kazakhstan	Gold Fields Limited, South Africa	Minera Yanaquihua S.A.C., Peru
Anaconda Mining Inc., Canada	Golden Queen Mining Company, LLC, United States	Nampala SA, Republic of Mali
AngloGold Ashanti, South Africa	Golden Star Resources Ltd., Canada	Newcrest Mining Ltd, Australia
Asanko Gold Ghana Limited, Ghana	Gorubso-Kardzhali PLC, Bulgaria	Newmont Corporation, United States
Auplata S.A., French Guiana	Haile Gold Mine, Inc., United States	Orea Mining Corp., Canada
Aura Minerals Inc., Canada	Harmony Gold Mining Company Ltd, South Africa	Otso Gold Corp., Canada
Barrick Gold Corporation, Canada	Kalgoorlie Consolidated Gold Mines Pty Ltd., Australia	PanAust Limited, Australia
Belo Sun Mining Corporation, Canada	Kingsgate Consolidated Limited, Australia	Polymetal International PLC, Cyprus
Boroo Gold, LLC, Mongolia	Kinross Gold Corporation, Canada	Polyus Verninskoye JSC, Russia
Centerra Gold Inc., Canada	Lydian International Limited, United States	PT Indotan Halmahera Bangkit, Indonesia
Compagnie Minière Montagne d'Or, France	Ma'aden Gold & Base Metals Co., Saudi Arabia	PT J Resources Nusantara, Indonesia
Detour Gold Corporation, Canada	Marathon Gold Corporation, Canada	Société d'Exploitation des Mines d'Or de Sadiola S.A., Republic of Mali
Dundee Precious Metals Inc., Canada	Marigold Mining Company, United States	Torex Gold Resources Inc., Canada
Eldorado Gold Corporation, Canada	Minas Argentinas S.A., Argentina	Troy Resources Guyana Inc., Guyana
Equinox Gold Corp., Canada	Minera Penmont S de R.L. de C.V., Mexico	TUMAD Madencilik Sanay Ve Ticaret A.S., Turkey
Evander Gold Mining Limited, South Africa	Minera San Julián, Mexico	Wharf Resources (USA) Inc., United States
Evolution Mining (Cowel) Pty Ltd, Australia		Yamana Gold, Canada
Evolution Mining - Red Lake Operation, Canada		

## Cyanide Manufacturers

Anhui Anqing Shuguang Chemical Co., Ltd., P.R. China

Arabian Petrochemical Company (PETROKEMYA), Saudi Arabia

Asahi Kasei Corporation, Japan

Australian Gold Reagents Pty Ltd., Australia

Cyanco, United States

CyPlus, Germany

CyPlus Idesa S.A.P.I. de C.V., Mexico

Draslovka Mining Solutions, Czech Republic

Guang'an Chengxin Chemical Co., Ltd., P.R. China

Hebei Chengxin Co., Ltd., P.R. China

Hindusthan Chemicals Company, India

Inner Mongolia Chengxin Yongan Chemical Co., Ltd., China

Joint-Stock Company "Korund-CN," Russia

JSC Rustavi Azot, Georgia

Orica Australia Pty Ltd., Australia

Proquigel Quimica S/A, Brazil

Saratovorgsintez LLC, Russia

Sasol South Africa (Pty) Limited, South Africa

TaeKwang Industrial Co., Ltd., Republic of Korea

Talas Investment Company, Republic of Kazakhstan

Tongsuh Petrochemical Corporation, Ltd., Republic of Korea

UPL Limited, India

## Global Assurance

The Cyanide Code's assurance framework covers cyanide not just at mines, but along every kilometer of supply chains stretching around the world — resulting in production-to-disposal protections for workers, communities and the environment.

**RESULTS  
THAT  
MATTER**

## Expansion of Certified Supply Chains

Cyanide's journey from production facilities to mining operations can involve supply chains that stretch thousands of kilometers, throughout the world. As more mining signatories come on board, more certified supply chains are needed to safely transport and deliver cyanide.

Supply chain certification has been part of the program since its inception. To be included in a certified supply chain, each port, rail carrier, and marine carrier must undergo a due diligence review to make sure each transporter can safely manage cyanide.





5.  
**Truck**

The Isotainers are transported by road to Code-certified mining operations in West African countries like Ghana and Mali.



4.  
**Transloading Facility**

The boxed cyanide is opened and transferred into specially designed bulk shipping units called Isotainers.



3.  
**Truck**

At the destination port, sea containers are transferred from the ship and onto truck carriers.



1.  
**Producer Facility, Truck, Train**

Sea containers filled with one-tonne boxes of cyanide are trucked to a railhead, then loaded onto a railcar.



2.  
**Port, Marine Vessel**

Sea containers are delivered to a port and loaded onto a ship for transport overseas.

## COVID-19 Challenges & Response

**During 2021, COVID-19 continued to challenge mines, cyanide production facilities, and cyanide transporters.** Reduced workforces and temporary closures presented significant challenges, while cyanide supply chain issues and travel restrictions disrupted operations worldwide. Cyanide Code audits were also affected, with travel disruptions and restricted access for on-site visits complicating the process of scheduling and conducting audits.

### Guidance

At the start of the outbreak, ICMI anticipated industry-wide challenges. On March 12, 2020, signatories due for audits received guidance on how to obtain extensions should pandemic restrictions make it impossible to meet deadlines for completing the on-site portion of certification audits. Although a number of operations remain under extensions, the number has declined as travel restrictions and health concerns due to COVID-19 have diminished.

### Monitoring

Operations requesting extensions were asked to contact ICMI no later than 30 days prior to the extended audit date, providing notification of the scheduled audit date and the name of the auditor contracted. ICMI closely monitored the dates and whether audits were rescheduled, and also periodically contacted selected lead auditors to confirm what audits had been conducted. This direct contact also enabled ICMI to gauge changing travel restrictions in different areas of the world so the potential for additional extensions could be anticipated.

### Audit-Date Extensions

#### March 2020 - December 2021

Of 85 total extensions granted:

- **57** have now been audited
- **Only 28** remain under extensions

89

**Extension Requests received**

85

**Total Extensions granted**

24 Mining

8 Production

53 Transport/  
Transport Supply Chains



## A Mature Certification Program

The Cyanide Code is among the most stable and long-running certification programs in the minerals sector – resulting in its recognition as the global standard for cyanide use and management.

**RESULTS  
THAT  
MATTER**

In 2021, the commitment of companies to comply with the Cyanide Code continued to raise industry standards for everything from emergency response to operating systems and daily management activities *around the globe.*

50

Countries with participating operations  
> **41 with Code-certified operations**

72

Certifications Announced

**290**  
CERTIFIED OPERATIONS  
**AN ALL-TIME HIGH**

**Certified Operations**

Approved certifications were lower than expected due to the cyclical nature of audit flow and the continuing impact of the pandemic. Even so, *the number of certified operations* reached a high of 290 and ICMI expects to announce 110 certifications next year – with each certification representing a company committed to protecting safety, health and the environment.

**Certification**  
**#1**  
 Apr. 17, 2006

**Barrick Gold’s Cowal Operations, Australia**  
*(now owned by Evolution Mining)*

**Certification**  
**#1,000**  
 Feb. 15, 2022

**Gold Fields’ South Deep Gold Mine, South Africa**

**72**

**Certifications Announced 2021\***

- 37 Mining
- 8 Production
- 27 Transport (16 truck transporters & 11 supply chains)

**992**

**Certifications Announced**

April 17, 2006 through December 31, 2021, with 1,000 certifications reached by February 15, 2022.

428 Mining      116 Production      448 Transport

\* Despite the departure of a few certified transporters and mining operations, newly certified operations replaced them so the 2021 total for certified operations remained level with 2020.

Certified Operations	Total	Europe	Asia	North America	South America	Oceania	Africa
<b>Total</b>	<b>290</b>	<b>23</b>	<b>38</b>	<b>70</b>	<b>67</b>	<b>27</b>	<b>65</b>
<b>Mining</b>	<b>106</b>	<b>8</b>	<b>7</b>	<b>32</b>	<b>20</b>	<b>13</b>	<b>26</b>
<b>Production</b>	<b>34</b>	<b>4</b>	<b>6</b>	<b>12</b>	<b>5</b>	<b>2</b>	<b>5</b>
<b>Transport</b>	<b>150</b>	<b>11</b>	<b>25</b>	<b>26</b>	<b>42</b>	<b>12</b>	<b>34</b>



**50 Countries with Participating Operations**

	Africa	Asia	Europe	North America	Oceania	South America
<b>32 Countries</b> with participating <b>Mining</b> <b>Operations</b>	Ghana Guinea Mali Mauritania South Africa Tanzania	Indonesia Kazakhstan Kyrgyzstan Laos Mongolia Saudi Arabia Turkey	Armenia Bulgaria Finland Romania Russia	Canada Dominican Republic Honduras Mexico United States	Australia Papua New Guinea	Argentina Brazil Chile French Guyana Guyana Peru Suriname
<b>19 Countries</b> with participating <b>Production</b> <b>Operations</b>	Burkina Faso Ghana South Africa	China India Japan Kazakhstan Korea Saudi Arabia	Czech Republic Georgia Germany Russia	Canada Mexico United States	Australia	Brazil Peru
<b>42 Countries</b> with participating <b>Transport</b> <b>Operations</b>	Burkina Faso Egypt Ghana Guinea Ivory Coast Kenya Mauritania Namibia Niger Senegal South Africa Tanzania	China Indonesia Kazakhstan Korea Kyrgyzstan Laos Saudi Arabia Thailand Turkey Viet Nam	Czech Republic Finland Germany Russia	Canada Dominican Republic Honduras Mexico United States	Australia Indonesia New Zealand Papua New Guinea	Argentina Brazil Chile Ecuador Mexico Peru Suriname

## Continuous Compliance

The Cyanide Code provides an independent, transparent certification process that publicly demonstrates operations' credibility as responsible operations. Communities, regulators, investors, and other stakeholders view recertification as the benchmark of strong leadership — resulting in even greater value for recertified operations.

**RESULTS  
THAT  
MATTER**



**Recertifications —  
The Benchmark of Leadership**

**Marigold Mine** —  
Certified for a **6th time** and representing  
**15 years** of continuous adherence to the  
Cyanide Code.

**It's no easy task for signatory companies and their operations to commit to Cyanide Code certification or recertification.** It takes strong leadership to meet the standards because it requires an ongoing enterprise-wide investment in training, technology and best practices.

32

**Mining Operations recertified in 2021**

37 total certifications include 5 initial certifications

Every three years, this continuous compliance-and leadership-must be *demonstrated* through independent audits that are both rigorous and transparent. The fact that by the end of 2021, **79% of all Cyanide Code-certified operations had been certified more than once** is a demonstration of the long-term commitment of signatories and their operations to the program and its value.



**Operations certified 4 or more times**

- 53 of 106 certified mining operations
- 16 of 34 certified producers
- 24 of 150 certified transporters



**Operations certified 5 or more times**



**Of all certified operations certified more than once**

- 81% of certified mining operations
- 91% of certified producers
- 74% of certified transporters



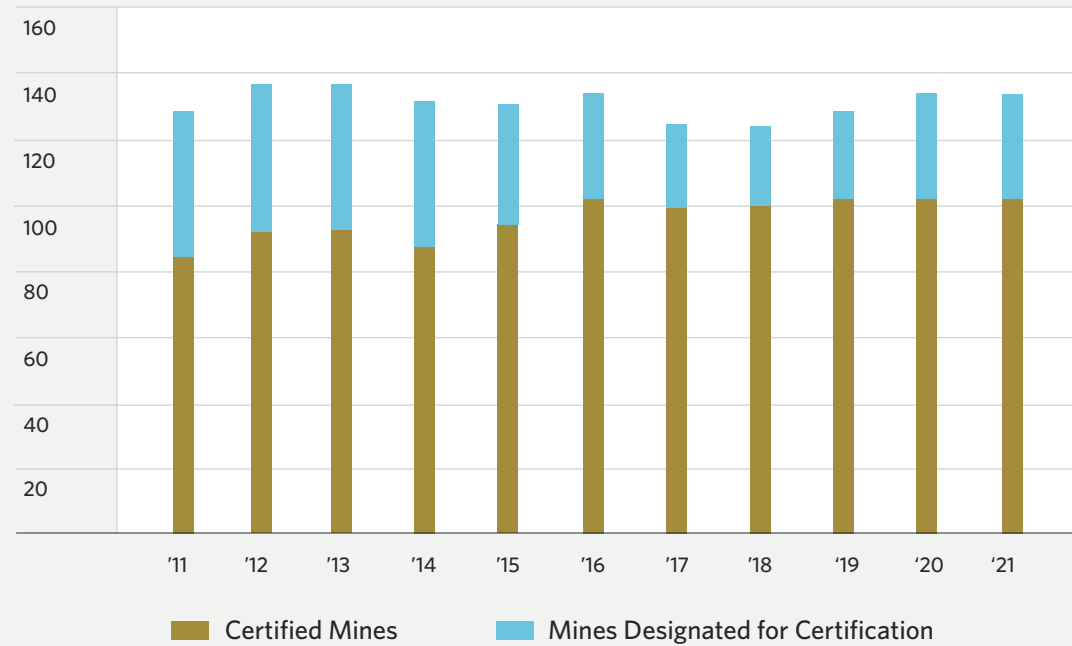
**Code participants maintain certification for years** – despite industry consolidation, mine closings, and contract turnover amongst suppliers of services and products.

Certifications	Signatory Companies	Designated Operations	Certified Operations	% Certified	Average Duration/ <i>yrs</i>
<b>Total</b>	<b>215</b>	<b>358</b>	<b>290</b>	<b>81%</b>	
Mining	54	136	106	78%	9.15
Production	29	44	34	77%	9.48
Transport	132	178	150	84%	6.94

Duration of Certifications	1 <sup>st</sup>	2 <sup>nd</sup>	3 <sup>rd</sup>	4 <sup>th</sup>	5 <sup>th</sup>	6 <sup>th</sup>	7 <sup>th</sup>	8 <sup>th</sup>	Average Duration/ <i>yrs</i>
<b>Total</b>	<b>61</b>	<b>71</b>	<b>64</b>	<b>60</b>	<b>31</b>	<b>1</b>	<b>0</b>	<b>1</b>	
Mining	20	17	16	35	16	1	0	1	9.15
Production	3	8	7	7	9	0	0	0	9.48
Transport*	38	46	41	18	6	0	0	0	6.94

\* Transport signatories and their operations experience significant turnover due to lost contracts or closures of customer mines. Despite this, 24 Cyanide Code-certified transport operations have been certified *four or more times*.

**Code-participant Mining Operations** display continuous improvement and adherence to certification.



# Non-Compliance, Substantial Compliance, Inactive

0

11

10

## Non-compliance / 2021

Non-compliance with the Cyanide Code can be triggered by issues such as deficiencies in operational practices or documentation or failing to complete certification audits by the deadline. Four operations (two mining operations and two transporters) are currently listed as non-compliant. All of these non-compliances occurred before 2021 and resulted from missed audit deadlines.

## Substantial Compliance / 2021

- **6 mining operations/1 truck transporter found in substantial compliance**
- **3 mining operations/1 transport operation remain in substantial compliance**
- **2 returned to full compliance**

To be substantially compliant (vs. non-compliant), operations must be able to correct deficiencies within one year, the deficiencies must not present an immediate risk to health, safety, or the environment, and the operation must have made a good faith effort to correct any deficiencies prior to the audit.

To provide full transparency to stakeholders, audit reports with findings of substantial compliance are also posted on the Cyanide Code website, along with the Corrective Action Plan to return the operation to full compliance. When an operation completes all necessary actions to correct deficiencies, it may return to full compliance status.

## Inactive Operations

- **10 operations were listed as inactive by year-end 2021**

Operations participating in the Cyanide Code program that have suspended their activity for at least six months can enter “temporarily inactive” status. They can later re-enter the program under certain conditions. Reasons for inactivity might include economic and operational changes such as mine expansions or operational improvements.

## Rigorous Audits

Operational assessments must be conducted by audit professionals validated by ICMI to be competent, qualified, independent, and properly accredited—resulting in audit reports and certifications that signatories and stakeholders can trust (and “mine” for best practices).

**RESULTS  
THAT  
MATTER**



**There is No Guessing about Compliance**

**Signatories must do more than comply with the Cyanide Code's high standards — they must demonstrate compliance to professional and experienced auditors.**

From initial certification to recertifications every three years, these audits eliminate any guessing about whether signatories are in compliance.

Designed to investigate and independently validate every aspect of compliance, the Cyanide Code certification audit ranks as one of the most demanding audits in *any* industry. In fact, it has become the model used by other standards programs around the world.



### Auditor

Signatories can choose the best match for their operation from a pool of ICMI-validated auditors.

### Site Visit

Independent, professional auditors visit signatories' mines, production sites, or transport facilities. They interview personnel, inspect operations, and review records and documentation involving employee training, safety, environmental and health protections, emergency response and other aspects of cyanide management.

### Report

Auditors submit to ICMI a report that verifies and documents continuous compliance with the Cyanide Code.

### Review

ICMI "Completeness Review" is conducted for quality assurance and to provide consistency across reports from different auditors, countries, and environments. The review confirms that sufficient details are provided to support the auditors' findings and that the findings are consistent with Cyanide Code expectations.

### Value

ICMI posts a summary on the Cyanide Code website. Other signatories, communities, regulators, investors and employees all have full access to these online summary reports, and to the safety and management trends, challenges and best practices they document.

## Auditors validate operations' continuous adherence to the Cyanide Code's Principles:

### Production

Use cyanide only from certified producers that have met the Cyanide Code's high standards for safety and environmental protection.

### Transportation

Receive cyanide transported in compliance with rigorous safety and emergency response standards.

### Handling & Storage

Handle and store cyanide in a manner that best protects workers, communities, and the environment.

### Operational Use

Safely manage cyanide process solutions and waste streams.

### Decommissioning

Develop thorough plans for decommissioning cyanide facilities.

### Worker Safety

Protect workers from exposure to cyanide.

### Emergency Response

Prepare to act with well-tested and coordinated emergency response strategies and capabilities.

### Training

Equip workers and first-responders with tools and knowledge for managing cyanide safely.

### Dialogue

Engage in public consultation and disclosure on cyanide management at operations.

[Click here to view the full text of the Cyanide Code's Principles.](#)

Audits play a crucial role in the full certification process – and its value to all stakeholders.

<p>Company Compliance</p>	<p><b>Standards:</b> 31 auditable Standards of Practice for mining operations</p> <p><b>Requirements:</b> Defined requirements for achieving each specific standard</p>
<p>Independent Verification</p>	<p><b>Audits &amp; Certification:</b> Every 3 years, independent, third-party auditors verify compliance and certify <i>each</i> participating operation</p>
<p>Public Access</p>	<p><b>Transparency:</b> Every audit report (including deficiencies and any Corrective Action Plans) is <b>publicly available</b> on the <a href="#">Cyanide Code website</a></p>



## Industry-wide Commitment

An estimated 56% of the world's industrial gold production by cyanidation is produced by companies participating in the Cyanide Code program — demonstrating an industry-wide commitment to meeting the highest standards of safety, health, and environmental protection.

**RESULTS  
THAT  
MATTER**



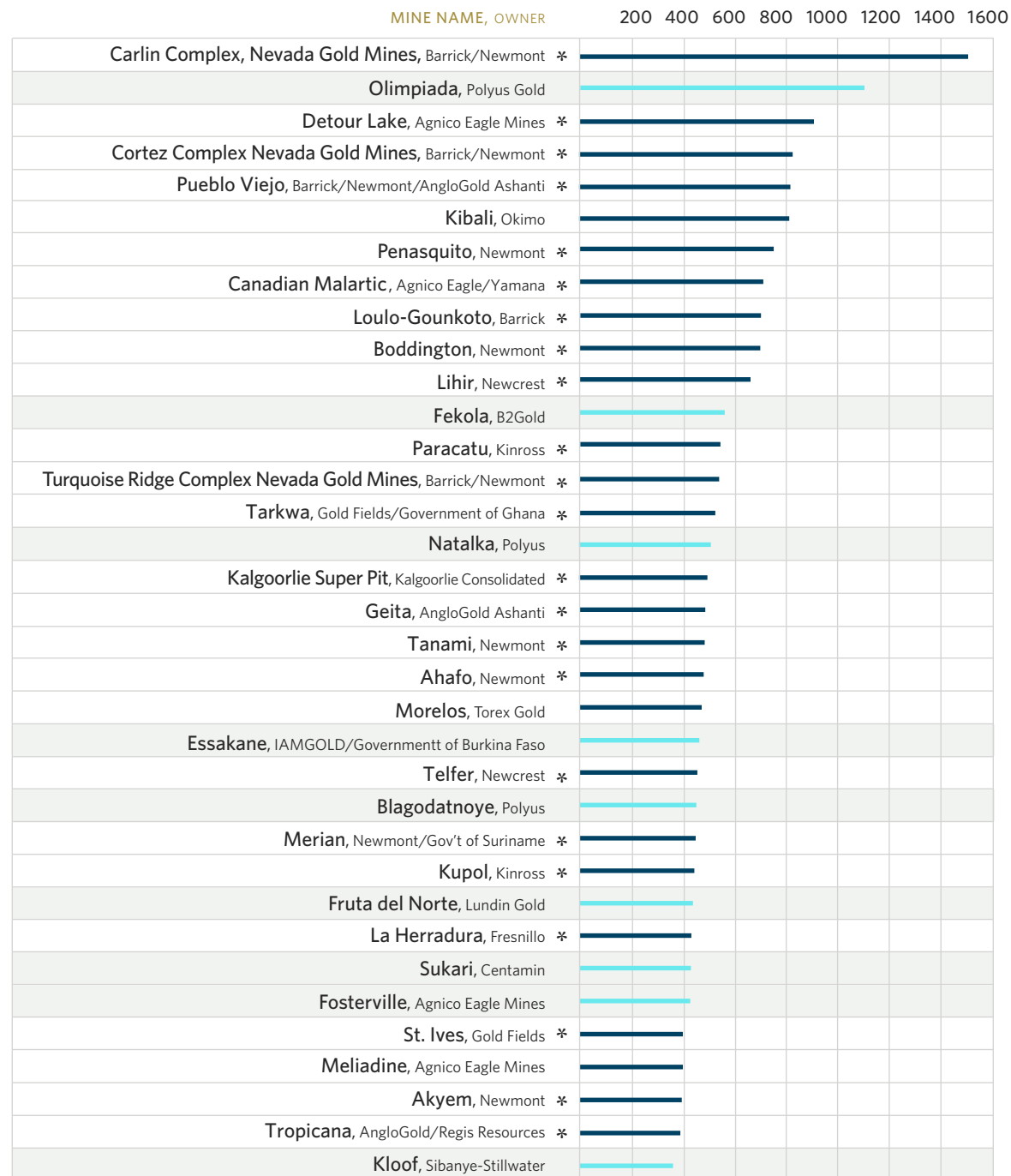
**Leading Primary Gold Mines Using Cyanide**

# Top Primary Commercial Gold Mining Operations

using Cyanide in 2021

Compiled by ICMI from various sources; list excludes operations majority-owned by governments.

ANNUAL GOLD PRODUCTION IN 1000 OZ.



■ Participant in Cyanide Code

■ Non-Participant in Cyanide Code

\* Certified Operation(s)



## Operational Insights

Summary Reports of all audits are publicly available on the Cyanide Code website.

Companies and all stakeholders can review these reports – resulting in timely insights on trends, technology and new practices.

**RESULTS  
THAT  
MATTER**



**Notable Developments  
in Cyanide Use & Management**

## AUDIT REPORTS

### **Audit Reports reveal important developments in the management and use of cyanide**

As a quality control mechanism, ICMI conducts a **“Completeness Review”** of every Audit Report submitted. In addition, ICMI publishes the Summary Audit Report for every certified operation.

This process opens an important window into the infrastructure and systems used by operations to safely manage cyanide. By reviewing scores of these reports each year, ICMI also gains industry-wide insights on the newest developments in the management of cyanide and its real-world impact on controls and behaviors.

## Technical advances in cyanide management

### 1 Code Requirement:

#### Protect wildlife and the environment through cyanide limits in tailings and discharges

TECHNICAL ADVANCE:

**New analytical methods for measuring cyanide in solution *and* identifying its presence at lower levels.**

RESULTS:

**Ability to conduct highly accurate cyanide analysis on site.** Automated instrumentation makes it possible for most operations to conduct their own cyanide analysis, even at low concentrations, vs. shipping samples to commercial laboratories. This has been particularly beneficial to remote operations with long shipping times to commercial laboratories.

**Real-time monitoring and management of cyanide concentrations.** Analytical Improvements have also enabled operations to conduct in-stream automated sampling and analysis at high frequency, enabling improved real-time monitoring of cyanide concentrations in process circuits and tailings streams, and real-time management of cyanide concentrations.

REPORT INSIGHTS:

During early implementation of the Cyanide Code most mining operations used manual distillation and manual titration of samples. Now, information included in audit reports indicates ***almost all certified mining operations have replaced manual cyanide sample preparation and analysis with automated analysis.***

### 2 Code Requirement:

#### Tracking and communications for cyanide shipments

TECHNICAL ADVANCE:

New radio, mobile/satellite phone and GPS systems.

RESULTS:

**Driver safety and productivity.** Data tracking motivates drivers to maintain speed limits, observe safe-driving practices and avoid unnecessary, overly long stops.

**NEW & NOTABLE**  
in 2021

## NEW & NOTABLE in 2021

### Developments in Use & Management

**Greater protection against theft and cyanide incidents.** Tracking systems continuously track data on exact vehicle locations and can alert the home base to any deviation from predetermined routes. The home base can even remotely turn off the engine of any truck that goes off-route.

REPORT INSIGHTS:

Although tracking of vehicles by GPS has been available since inception of the Cyanide Code, ICMI notes that use of GPS tracking has increased from a small minority of transporters to the point where **tracking by GPS is used by almost all certified transporters.**

3

#### Code Requirement:

### A water management program to protect against unintentional release of solutions containing cyanide

TECHNICAL ADVANCE:

**Sophisticated water-balancing software** helps compliance by analyzing potential risks, such as how a “100-year” rain event could affect tailings storage facilities and solution pond capacities and discharges.

RESULTS:

**Ability to explore more scenarios.** Compared to simple spreadsheet models, sophisticated water-balancing software can analyze more—and more complex—potential risks *and* how to address them.

**More comprehensive, pro-active water management programs.** Using software models can create stronger programs for managing ponds and impoundments to prevent overtopping and releases.

REPORT INSIGHTS:

Audit report review leads ICMI to anticipate that **use of simple spreadsheet models will continue to decline**, and that may be accelerated by the implementation of the Global Tailings Standard and water supply-side issues such as climate change.

## 2021 TRENDS

### Trends in Mines' Use of Cyanide

#### Secondary cyanide suppliers

Audit reports reviewed in 2021 showed a change in the number of mining operations using secondary cyanide suppliers. Secondary suppliers are primarily in place to account for supply shortfalls from the primary supplier, although some are in place while transitioning suppliers. In 2018, 10 mining operations received cyanide from three secondary suppliers. ***By the end of 2021, the number of certified mining operations using secondary suppliers had almost doubled, from 10 to 18, sourced from eight different cyanide producers.***

#### Solid cyanide

Audit documents indicate that ***solid cyanide remains the primary form delivered to mining operations***, and one-tonne intermediate bulk containers (IBCs), the typical "bag-in-box," remains the dominant packaging type. A trend that ICMI noted in 2018 of operations switching from delivery of solid cyanide in IBCs to delivery in Isotainers appears to have not expanded further.

#### Dyed cyanide solution

Since July 1, 2019, the Cyanide Code has required dyed cyanide solution at mining operations and in transported liquid cyanide. As of 2021, data on dye usage has been collected for 56 certified operations. To date, ICMI has not learned of any issues regarding use of dyed cyanide at certified operations.

Dye is typically added at the production facility for liquid cyanide transport. For briquettes, dye is typically added as a dissolvable packet within an IBC or Isotainers. Manufacturers also make dye available so operations can add the dye themselves during cyanide mixing, but ***only six of the 56 operations reported adding the dye themselves.*** The predominant type of dye in use appears to be the red dye Carmoisine.



## POTENTIAL ROLE of THE CODE

Download  
both  
reports  
here

free of charge  
from the planetGold website  
at planetgold.org

## The Cyanide Code's Potential Role in Small-Scale Mining

### Managing the shift from mercury to cyanide

The Cyanide Code was developed for industrial operators. Its principles, however, can offer useful guidance on cyanide's use and management for stakeholders in the Artisanal Small Gold Mine (ASGM) sector — especially as the sector shifts away from the use of mercury.

According to a **report produced by Pact** (an international development, non-governmental organization) **ASGM facilities could use the Code's Principles to make operations safer and more environmentally responsible.** The report, Best Management Practices for Cyanide Use in the Small Scale Gold Mining Sector, was produced for the planetGOLD program, a GEF funded, UNEP-implemented initiative.

Although cyanide risks in the ASGM sector are similar to those in industrial mining, the lack of skilled operations management, financial and other resource limitations, and the high number of individual sites where cyanide is being used, result in the ASGM sector having a risk profile for cyanide that is challenging to assess and control.

While the Code was not designed for the ASGM sector, the report tracks the nine principles of the Cyanide Code and presents specific guidance and insights for applying the Cyanide Code's requirements, best practices, and guidance to reduce cyanide risks within the ASGM sector.

### Management of ASGM tailings

In October 2021, the **United Nations Environment Programme issued a report** on ASGM tailings. It explores the potential for adapting the Cyanide Code to the ASGM sector to minimize adverse cyanide impacts on the environment and human health.

ICMI is pleased to see this recognition of the Cyanide Code by these stakeholders and will be exploring how it might collaborate to extend the Cyanide Code to the ASGM sector.



## Best Practices

The industry's stakeholders value Code participants' diligent adherence to cyanide management safety — resulting in no catastrophic events among Cyanide Code-certified mines, and no fatalities at any participating operation over the 15 years since program inception.

**RESULTS  
THAT  
MATTER**



**Code Participants Achieved  
Another Year Free of Major Cyanide Incidents**

Significant Cyanide Incidents

51

REPORTED  
SINCE 2006

1

REPORTED  
IN 2021

**ZERO**  
FATALITIES  
SINCE THE  
CYANIDE CODE WAS IMPLEMENTED  
IN 2006

Signatories to the Cyanide Code agree to notify ICMI of any significant cyanide incidents that occur at any of their operations. They also agree to notify ICMI of the use of any cyanide not produced by or transported to a certified mine by Cyanide Code-certified manufacturers and transporters.

In December 2020, ICMI's Board adopted a definition of significant cyanide incidents to include any one of the following events:

**Human exposure** that requires an action by an emergency response team, such as decontamination or treatment

**An unpermitted release** which enters natural surface waters, on or off site

**An unpermitted release** that occurs off site or migrates off site

**An on-site release** requiring action by an emergency response team

**A transport incident** requiring emergency response for cyanide release

**An event with multiple wildlife fatalities** where cyanide is known or credibly believed to be the cause of death

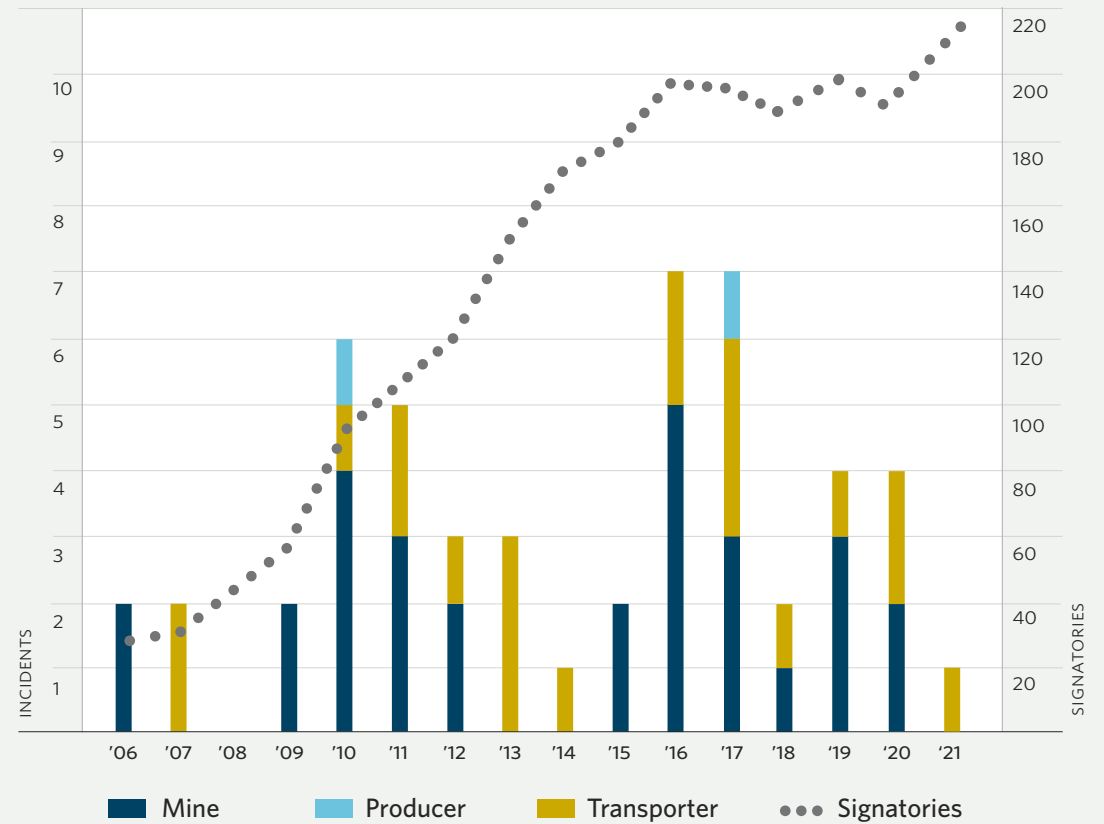
**Theft** of cyanide





## A Strong 15-year Safety Record

Reported Cyanide Incidents, 2006 – 2021



### 2021 Incident

#### Heavy seas damaged cyanide containers

RESULT:

**No injuries, fatalities, or environmental damage were reported.**

There was one significant cyanide incident reported to ICMI by Cyanide Code signatories in 2021. During a maritime shipment, containers of solid cyanide were damaged in heavy seas. Of the 220 containers onboard, 15 suffered damage and partial loss of containment. Upon arrival in port, the damaged containers were discharged and repacked by a qualified hazmat team. All product was contained.

## Resources

In one source, companies, communities, regulators, employees, environmental groups and other stakeholders can find standards, references, audit reports — materials that can be applied and used by mining operations, and cyanide transport and production operations.

**RESULTS  
THAT  
MATTER**



**Expanded Online Resources**

## In mid-2021, ICMI relaunched the Cyanide Code website.

With a new look and improved navigation, [cyanidecode.org](https://cyanidecode.org) makes it easier to find information about participating companies, certified operations, and the Cyanide Code itself through enhanced and expanded content, including **CodeCast**, ICMI's new monthly podcast.

CodeCast is available on [cyanidecode.org](https://cyanidecode.org), iTunes and Spotify.



## Sample of resources available on [cyanidecode.org](https://cyanidecode.org):

- The Cyanide Code standards and requirements
- Over 800 audit summary reports for Cyanide Code-certified facilities
- Credentials of the auditors who conducted those audits
- Updated Cyanide Code program documents
- Training videos and workshops
- Annual Reports
- Information on current signatories and certified operations
- CodeCast episode links... and more.

## CodeCast Podcast Series

CodeCast is designed to supplement training and guidance materials already available on the [Cyanide Code website](https://cyanidecode.org). Topics explored in the initial nine episodes include:

- The Cyanide Code's expectations for change management
- Decommissioning a facility
- Wildlife protection
- Emergency-response planning
- Auditor judgement
- ... and more.

Episode lengths are 15 minutes or less. Additional episodes to be developed and made available.

# Financial Statement

	2021	2020
<b>Receipts</b>		
Signatory Fees	1,381,651	1,386,401
Signatory Fees for Future Year	174,365	186,136
Training Workshop Fees	3,800	7,600
Miscellaneous Income	147	500
Investment Income	1,973	19,349
<b>Total Receipts</b>	<b>1,561,936</b>	<b>1,599,986</b>
<b>Expenditures</b>		
Communications	84,036	33,392
General Office Expenses	150,151	110,208
Legal Services and Audit Fees	18,475	14,195
Outreach & Training	46,974	38,349
Staffing and Overhead	1,183,500	1,204,775
Travel Expense	-	-
<b>Total Expenditures</b>	<b>1,483,136</b>	<b>1,400,919</b>
<b>Change in Net Assets</b>	<b>78,800</b>	<b>199,067</b>
<b>Net Assets at Beginning of Year</b>	<b>1,975,972</b>	<b>1,776,905</b>
<b>Net Assets at End of Year</b>	<b>2,054,772</b>	<b>1,975,972</b>

## Notes

- i. The above summary is based on audited financial statements issued by Kosciw & Associates, LLC. Their financial statements were prepared on a modified cash basis of accounting, which is a comprehensive basis of accounting other than U.S. generally accepted accounting principles.
- ii. ICMI is not a membership organization, and the corporation has no members. Companies choosing to participate in the program become signatories to the Cyanide Code and are assessed an annual fee. For 2021, the annual fees for signatories were: US\$1,100 for transporters, \$6,300 for cyanide producers, and gold mining companies were assessed \$0.042 per ounce of gold produced by cyanidation in 2020, and \$0.042 per ounce of gold equivalent ounces produced by primary silver mines in 2020.
- iii. ICMI files annual information returns with the State of California, where it is incorporated, and with the U.S. Internal Revenue Service.

# Leadership

## Board of Directors

Paul Bateman, Chair  
Günter Becker  
Edward Bickham  
Thomas Hynes

Philip Klapwijk  
Peter V. O'Connor, J.D.  
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*Treasurer*

Edward M. Green, J.D.  
*General Counsel*



To become a Cyanide Code signatory and be able to display this symbol, contact the Institute at [info@cyanidecode.org](mailto:info@cyanidecode.org) or visit the [Cyanide Code website](http://www.cyanidecode.org).

International  
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