



Chapter 4.7 Cyanide Management

BACKGROUND

Cyanide is a chemical used in the processing of gold and silver at many mine sites and as a minor processing reagent at some base metal mines. If released to the environment, or if improperly used in mineral processing, cyanide can pose a risk to workers, surrounding communities, aquatic resources and wildlife.

The International Cyanide Management Institute (ICMI) has developed a program for the gold and silver mining industry to improve the life cycle management of cyanide used in gold and silver mining, to enhance the protection of human health, and to reduce the potential for environmental impacts.²⁴⁹ Although the *International Cyanide Management Code* only provides for the certification of gold and silver mines, the same principles can be applied to other types of mining operations that use cyanide for the extraction of commercial quantities of minerals.

This chapter builds on the ICMI Principles and Standards of Practice.

TERMS USED IN THIS CHAPTER

Adaptive Management ■ Baseline Water Quality ■ Existing Mine ■ Mining Project ■ Mixing Zone ■ New Mine ■ Operating Company ■ Process Water ■ Secondary Containment ■ Stakeholders ■ Water Quality Criteria ■ Whole Effluent Testing ■

These terms appear in the text with a dashed underline. For definitions see the Glossary of Terms at the end of the document.

OBJECTIVES/INTENT OF THIS CHAPTER

To protect human health and the environment through the responsible management of cyanide.

SCOPE OF APPLICATION

RELEVANCE: This chapter is applicable to operating companies that own, control or operate mining projects associated with the production, storage, use or transportation of cyanide; and to any mining project that requires the storage onsite of cyanide in bags or bulk containers, or that use cyanide in a mill process. It applies during operations and decommissioning of the mining project. This does not apply to cyanide for laboratory use or other de minimis testing purposes.

Mining projects must also maintain and provide documentation that cyanide producers and transporters supplying the projects are International Cyanide Management Code (Code) certified.

NEW VS. EXISTING MINES: New mines shall meet all of the requirements of this chapter. Existing mines are not required to meet the design/construction requirements in 4.7.2 unless new cyanide storage facilities, mixing, and process tanks are constructed after the IRMA Standard takes effect.

²⁴⁹ International Cyanide Code website: <https://www.cyanidecode.org/>

Cyanide Management Requirements

4.7.1. Compliance with the International Cyanide Management Code (The Cyanide Code)

4.7.1.1. If the operating company is eligible to be a signatory to the Cyanide Code,²⁵⁰ it shall obtain a certification of compliance in accordance with the requirements of the International Cyanide Management Institute (ICMI).²⁵¹

4.7.1.2. If the operating company is not eligible to become a signatory of the Cyanide Code, but the mining project requires the storage onsite of cyanide in bags or bulk containers, or uses cyanide in a mill process, the mine's cyanide management practices shall be:²⁵²

- a. Audited against the Cyanide Code's "Gold Mining Operation Verification Protocol" by auditors meeting ICMI requirements;²⁵³ and
- b. Verified as being generally consistent with Cyanide Code requirements.

4.7.1.3. The operating company shall demonstrate that it has taken steps to ensure that cyanide producers and transporters supplying the mining project are certified as meeting the "Cyanide Production and Transport Practices" of the Cyanide Code.²⁵⁴

4.7.2. Construction

4.7.2.1. In addition to the requirements of the Cyanide Code, the following design criteria shall be met:²⁵⁵

- a. Impermeable secondary containment for cyanide unloading, storage, mixing and process tanks shall be sized to hold a volume at least 110% of the largest tank within the containment and any piping draining back to the tank, and with additional capacity for the design storm event; and
- b. Pipelines containing process water or process solution shall utilize secondary containment in combination with audible alarms, interlock systems, and/or sumps as spill control measures.²⁵⁶

4.7.3. Discharges

4.7.3.1. Discharges to a surface water mixing zone shall not contain cyanide, either alone or in combination with other toxins, that will that will be lethal to resident aquatic life or interfere with the passage of migratory fish.

²⁵⁰ Gold and silver mining companies with either single or multiple operations, and the producers and transporters of cyanide used in gold and silver mining, can become signatories to the Cyanide Code. (International Cyanide Management Code. "Become a Signatory." <http://www.cyanidecode.org/become-signatory>)

²⁵¹ An operating company whose ICMI certification is current, or conditionally current, at the time of an IRMA audit shall be considered in compliance with IRMA requirement 4.7.1.1.

²⁵² This section does not apply to cyanide for laboratory use, or for other de minimis purposes.

²⁵³ Information on auditing protocols and auditor accreditation can be found at: <https://www.cyanidecode.org/auditors-auditing>

²⁵⁴ See Cyanide Production and Transportation verification protocols here: <http://www.cyanidecode.org/auditors-auditing/auditing-cyanide-code>

²⁵⁵ This requirement applies to all storage facilities and mixing or processing tanks constructed at new mines, and new facilities and tanks constructed at existing mines.

²⁵⁶ This applies if process water/solution has a concentration of 0.5 mg/l WAD cyanide or greater.

4.7.4. Monitoring

4.7.4.1. The operating company shall carry out baseline water quality sampling and monitor discharges to surface waters or groundwaters for weak acid dissociable (WAD) cyanide.

4.7.4.2. If WAD cyanide is detected in discharges to surface waters, then the operating company shall also monitor total cyanide, free cyanide, and thiocyanate levels.

4.7.5. Reporting

4.7.5.1. Cyanide water quality monitoring data shall be published on at least a quarterly basis in tabular format, and graphical format if available, on the mine or the operating company website, or provided to stakeholders upon request.

4.7.5.2. If the operating company is a Cyanide Code signatory it shall include in its annual report or sustainability report a link to the company's audit information and corrective actions published on the ICMI website.

NOTES

The International Cyanide Management Institute (ICMI) Principles broadly state commitments that signatories make to manage cyanide in a responsible manner. Standards of Practice identify the performance goals and objectives that must be met in order to comply with the Principles. Separate verification protocols have been developed for cyanide production, transportation, and gold and silver mine operations. Cyanide production, transportation, and operations are certified as being in compliance with the Code following an independent third-party audit (paid for by the operating company) verifying conformance with the Code's Standards of Practice. Audit results are made public on the ICMI website to inform stakeholders of the status of cyanide management practices at certified operations. The IRMA Cyanide Management Chapter requires the same auditing procedures, and certified auditors, as for the Cyanide Code.

CROSS REFERENCES TO OTHER CHAPTERS

CHAPTER	ISSUES
1.1—Legal Compliance	As per Chapter 1.1, if there are <u>host country laws</u> governing cyanide transport, storage, use, etc., the company is required to abide by those laws. If IRMA requirements are more stringent than <u>host country law</u> , the company is required to also meet the IRMA requirements, as long as complying with them would not require the <u>operating company</u> to violate <u>host country law</u> .
1.2—Community and Stakeholder Engagement	Reporting to <u>stakeholders</u> in 4.7.5 shall conform with the Communications and Access to Information requirements in Chapter 1.2, criterion 1.2.4, which require that communications and information be in culturally appropriate formats and languages that are <u>accessible</u> and understandable to <u>affected communities</u> and <u>stakeholders</u> , and provided in a timely manner.
1.4—Complaints and Grievance Mechanism and Access to Remedy	As per Chapter 1.4, the company is required to have a <u>grievance mechanism</u> available to <u>stakeholders</u> for filing complaints, and having them investigated and resolved in a timely manner. <u>Stakeholders</u> with complaints related to an <u>operating company's</u> use of cyanide can raise complaints through the company's operational-level <u>grievance mechanism</u> .
2.1—Environmental and Social Impact Assessment and Management	The potential impacts to nearby communities and the environment from cyanide may be scoped as part of the Environmental and Social Impact Assessment process, and <u>mitigation strategies</u> developed as part of the Environmental and Social Management System.

CROSS REFERENCES TO OTHER CHAPTERS	
2.5—Emergency Preparedness and Response	The transportation of cyanide is a potential hazard to communities and the environment along transportation routes, and releases of cyanide from the handling, storage and use of cyanide at the mine site may also have impacts on workers, nearby communities and the environment. Chapter 2.5 mandates emergency response planning for spills or other incidents that pose risks workers and communities, and requires coordination between the mine and emergency responders in potentially affected communities. If relevant, the emergency response plan should contain procedures related to cyanide that conform with the Cyanide Code (see Standard of Practice 7.1 in the Code’s Implementation Guidance). ²⁵⁷
3.2—Occupational Health and Safety	Cyanide use is an occupational health and safety consideration, and its use, storage and transport should be included in the OHS risk assessment process, mitigation and monitoring processes outlined in Chapter 3.2, and be carried out in conformance with the Cyanide Code (see Implementation Guidance for Standards of Practice 6.1, 6.2 and 6.2). ²⁵⁸
3.3—Community Health and Safety	The use of cyanide at mining operations may present a health risk to local communities, and if transported to, stored or used at the mining project should be analyzed during the community health and safety risk and impact assessment process.
4.1—Waste and Materials Management	If cyanide is present in mine waste facilities (E.g., tailings storage facilities, heap leach facilities) then monitoring for potential impacts on wildlife from cyanide is required as per 4.7.4. Relevant information should be incorporated in the Operations, Maintenance and Surveillance plan) as per 4.1.5.5.c.
4.2—Water Management	IRMA’s water quality criteria for cyanide discharge limits appear in Tables 4.2.a–h. If a mixing zone is used for surface water discharges that contain cyanide, the requirements 4.2.3.2.b.i and ii apply (i.e., the mixing zone cannot be lethal to aquatic life, and shall not interfere with the passage of migratory fish). Monitoring of cyanide in water, as required in 4.7.4, may be incorporated into the water management program in Chapter 4.2 (see criteria 4.2.4).

²⁵⁷ Cyanide Code. Standard of Practice 7.1. <https://www.cyanidecode.org/become-signatory/implementation-guidance#emergency>

²⁵⁸ Cyanide Code. Standards of Practice 6.1, 6.2 and 6.3. <https://www.cyanidecode.org/become-signatory/implementation-guidance#safety>