

# CYANIDE DISTRIBUTION ICMC SUMMARY AUDIT REPORT QUIMTIA PERÚ 2017

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## SUMMARY AUDIT REPORT

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Name of Cyanide Production Facility: Quimtia S.A.

Name of Facility Owner: Quimtia S.A.

Name of Facility Operator: Quimtia S.A.

Name of Responsible Manager: Joceline Villar

Address: Av. Nestor Gambetta 369

State/Province: Callao Country: Perú

Telephone: (51 1) 630-6500 Fax: (51 1) 630-6500 E-Mail: [joceline.villar@quimtia.com](mailto:joceline.villar@quimtia.com)

### Location detail and description of operation:

Quimtia is a company that operates in the market of distribution of chemical products for Latin America. Quimtia S.A is a distributor for sodium cyanide in solid state (briquettes) in Peru. Currently, Quimtia supplies several mines in Peru.

Quimtia operations consist in the reception of solid cyanide in their warehouse located in El Callao province, cyanide storage and shipping to the client. Quimtia does not have transport operations.

This audit comprises the warehousing operations of the Distribution Center. Quimtia has followed the Cyanide Code principles since early 2012; therefore, records were reviewed back to 2012.

The distribution center operations include storage of 1,000 kg- double-bag-lined wooden boxes as received inside the containers coming from the port; each container has 20 wooden boxes that are unloaded in the distribution center facility. Forklifts transport these boxes to the storage area one by one from which they are dispatched to clients.

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### Auditor's Finding

This operation is

- in full compliance
- in substantial compliance<sup>1.1</sup>
- not in compliance with

with the International Cyanide Management Code.

This operation has maintained full compliance with the International Cyanide Management Code throughout the previous three-year audit cycle. Quimtia has not experienced any significant cyanide incidents during the previous three-year audit cycle.

Audit Company: Bruno A. Pizzorni

Audit Team Leader: Bruno A. Pizzorni E-mail: [bpizzorni73@gmail.com](mailto:bpizzorni73@gmail.com)

Names and Signatures of Other Auditors:

Production Technical Auditor: Bruno A. Pizzorni



Date(s) of Audit: March 27 and 28, 2017

I attest that I meet the criteria for knowledge, experience and conflict of interest for Code Verification Audit Team Leader, established by the International Cyanide Management Institute and that all members of the audit team meet the applicable criteria established by the International Cyanide Management Institute for Code Verification Auditors.

I attest that this Summary Audit Report accurately describes the findings of the verification audit. I further attest that the verification audit was conducted in a professional manner in accordance with the International Cyanide Management Code Verification Protocol for Cyanide Production Operations and using and accepted practices for health, safety and environmental audits.

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<u>Quimtia</u>		<u>August 8, 2017</u>
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1 OPERATIONS: Design, construct and operate cyanide production facilities to prevent release of cyanide.

1.1 Production Practice 1.1: Design and construct cyanide production facilities consistent with sound, accepted engineering practices and quality control/quality assurance procedures.

Full Compliance

The operation is  in substantial compliance with Production Practice 1.11.1

not in compliance with

### Summarize the basis for this Finding/Deficiencies Identified:

The auditor reviewed the warehouse plans signed by a collegiate civil engineer and a certificate dated March 28, 2017 issued by AGR the cyanide manufactures, in which an expert from AGR confirms after his site inspection, that Quimtia's warehouse is suitable to store cyanide in boxes. Due to these previous considerations, the auditor who is a Civil Engineer, attests that Quimtia's warehouse design and construct cyanide facilities are consistent with sound, accepted engineering practices and built with quality materials.

The warehouse areas have concrete floors. There are epoxy sealed joints on the floors. The warehouse is constructed with concrete block walls, and metal sheet roof. Cyanide is handled within the manufacturer containers. A concrete lined trench along the southern side of the storage area is present as secondary containment, providing a competent barrier to leakage.

The facility is completed roofed with metallic structures and covered with calamines; rain water from roofing is collected with gutters to a separate water drainage system. To ensure that the cyanide boxes do not meet water sources (drizzles), the storage of cyanide boxes has been established at 1 meter from the warehouse walls, to avoid any possibility that are exposed despite having a roof.

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### 1.2 Production Practice 1.2: Develop and implement plans and procedures to operate cyanide production facilities in a manner that prevents accidental releases.

Full Compliance

The operation is  in substantial compliance with Production Practice 1.21.1

not in compliance with

#### Summarize the basis for this Finding/Deficiencies Identified:

Quimtia has standard procedures to describe the safe practices for unloading cyanide boxes, transfer to the final storage area, storage requirements, personal protection equipment requirements, training requirements and dispatch of cyanide containers.

For contingencies on its activities, Quimtia has developed the procedure Emergency Preparedness and Response and a Contingency Plan. To manage changes in the operation, Quimtia has implemented the procedure Risk Management and Hazards Identification in Processes and Facilities Changes and new Projects. Also, the procedure requires review and sign-off by environmental and safety personnel prior to implementation of the proposed operating practices.

A preventive maintenance program and procedures are implemented in Quimtia. Forklifts and HCN (hydrogen cyanide gas) detectors are maintained according to the frequency and responsibilities established in the procedure.

Reportedly, there has been no need for disposal of cyanide or cyanide contaminated solids. However, Quimtia has stated in the procedure Solid Waste Management and in the Contingency Plan, the methodology and activities to dispose hazardous chemical waste disposal. In case of water produced from floors cleaning in the storage area, it would be collected through the secondary containment trench along the south side of the storage area and will remain in the trough which has no connection to the public drainage network. All solids or liquids possibly contaminated with cyanide will be transported by a specialized contractor to its final disposition as hazardous waste. A certification of adequate disposal will be issued by the contractor.

Cyanide is stored with adequate ventilation and appropriated measures to avoid moisture. Quimtia's facility is completely closed and monitored 24 hours a day to prevent access to unauthorized persons.

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Quimtia procedures Control of Entry and Departure of Transport Units, and Transportation of Hazardous Materials, requires inspections to ensure hazardous material, including cyanide, are properly labeled.

### 1.3 Production Practice 1.3: Inspect cyanide production facilities to ensure their integrity and prevent accidental releases.

Full Compliance

The operation is  in substantial compliance with Production Practice 1.31.1

not in compliance with

#### Summarize the basis for this Finding/Deficiencies Identified:

Quimtia operations are limited to the storage of boxes with cyanide in solid state, there are no tanks holding cyanide solutions. A trench along the south side of the storage area is present to collect cyanide dust that potentially can be spilled on the floor this trench has closed ends.

Quimtia inspects the cyanide storage area monthly, the cyanide antidote and oxygen weekly, the forklifts as well as showers and low-pressure eye stations daily and to the transport units arriving to his warehouse every two weeks, which the auditor considers sufficient to assure that equipment is functioning within design parameters. Quimtia has procedures to standardize their operations and to prevent overloading of the transport vehicle: Safe Use of the Forklift and Stacker, Control of Entry and Departure of Transport Units, and Transportation of Hazardous Materials. Each procedure address inspections to the cargo. Inspections include the secondary containment trench at the warehouse for its physical integrity.

No deficiencies had been noted on the inspection forms that were available for review. Interviews demonstrated awareness that corrective actions need to be documented. Records are retained in hard copy and were acceptable.

## 2 WORKER SAFETY: Protect workers' health and safety from exposure to cyanide.

### 2.1 Production Practice 2.1: Develop and implement procedures to protect plant personnel from exposure to cyanide.

The operation is  Full Compliance

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- in substantial compliance with Production Practice 2.11.1
- not in compliance with

### Summarize the basis for this Finding/Deficiencies Identified:

To minimize workers exposure, Quimtia has implemented procedures for normal operations, including equipment maintenance. The procedures include the required practices for reception, transport within the facility with the forklift, storage and personal protection equipment requirements, training and dispatch of cyanide containers.

For non-routine operations and emergencies, Quimtia has developed the Contingency Plan, which describes the concrete actions to be taken in case of an emergency to minimize the effects on people, property and the environment.

To review proposed changes, Quimtia has developed and implemented the procedure Risk Management in Processes and Facilities Changes and New Projects. The procedure includes hazards identification and risks assessment for cyanide operations in the distribution Center. The procedure indicates that it is necessary to evaluate the risks whenever significant changes are done to cyanide handling practices. The procedure requires written notification to safety personnel and a sign-off before process and operational changes can be instituted. The facility has implemented the procedure Communication, Participation and Consultation to facilitate workers participate during H&S meetings and to allow them to provide relevant input to maintain a safe operation.

Quimtia has two portable HCN detectors to monitor cyanide air concentrations while unloading cyanide containers; the detectors are calibrated to trigger the alarm at 4.7 ppm. HCN detectors are calibrated as issued by the manufacturer. The auditor reviewed calibration registers performed by Higseg company during recertification period. Maintenance of the cyanide detectors is performed by the local MSA's agent. As stated in the Contingency Plan, in the case of detection of HCN (hydrogen cyanide gas) levels greater than 4.7 ppm, all personnel must evacuate the area.

Quimtia has published in diverse places of the warehouse the risks map, updated to November 2016, where the places that could be exposed to hydrogen cyanide gas are signaled, and require use of personal protective equipment as necessary in these areas although no areas or activities with such concentrations have been identified. Despite this, A class suits are maintained at the facility: chemically resistant, vapor and gas-proof suit; fully enclosed and independent self-contained breathing apparatus; used when the highest degree of protection of the skin, respiratory system, eyes and mucous membranes is needed. To ensure that a buddy system is used the procedure Storage and Handling

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Cyanide, addresses in section 6.3 that cyanide related activities must be performed at least by two workers.

Quimtia performs pre-employment medical tests prior to hiring new personnel, then annually tests and upon leaving Quimtia.

The Contingency Plan addresses that the forklifts operators must keep their personal working clothes in a determined place within the dresser area. It is Quimtia's policy that all the operators of the warehouse must change and leave their working clothes such as T shirts, pants and boots, in the dresser area.

Signs advising cyanide is present and that protective equipment must be worn are posted at the entrance of the warehouse and at the cyanide storage area. Quimtia prohibits all workers to smoke, eat or drink and having open flames in all the warehouse.

### 2.2 Production Practice 2.2: Develop and implement plans and procedures for rapid and effective response to cyanide exposure.

Full Compliance

The operation is  in substantial compliance with Production Practice 2.21.1

not in compliance with

#### Summarize the basis for this Finding/Deficiencies Identified:

To respond to cyanide exposures, Quimtia has developed and implemented the procedure *Emergency and Response Preparation*, the instruction "*Activation of the Incident Command*" and the *Contingency Plan* which addresses spillages, fires and intoxication due to cyanide exposure. The site has an emergency shower and two portable low pressure eye wash stations. Chemical powder extinguishers all properly located all along the warehouse. All equipment is inspected on an adequately basis. The facility has water, oxygen tanks, sodium nitrite, sodium thiosulfate and an Ambu® Oval Silicone Resuscitator at the doctor's office, near the cyanide storage area. The employees have radio for internal communication and telephones. Quimtia has implemented a monthly inspection checklist for first aids and emergency response equipment. The availability of the oxygen and equipment was confirmed during the audit, as well as the storing temperature for the antidote and its validity. The MSDS (Material Safety Data Sheet) of the cyanide manufacturer is in Spanish, the workers language, available near the cyanide storage area.

Quimtia as the warehouse only manages solid cyanide in 1 ton boxes. There are no tanks, containers or piping.

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Only authorized personnel can enter in the cyanide storage area, no box containing cyanide is open. Disposable Tyvek suit is mandatory to enter the area. The Contingency Plan addresses forklifts operators must leave their working cloths in the dresser room.

The facility has a physician on-site who is familiar with the cyanide intoxication symptoms and first aid procedures, an oxygen tank and antidote kit are available on site as well.

Quimtia's Contingency Plan includes a procedure to transport exposed workers to the nearest medical facility. The emergency response team and / or the warehouse supervisor will proceed to call an ambulance and / or medical alert to be attended to immediately or taken to a nearest medical facility supported by the occupational physician or first aid brigade.

Written communications with external responders were available for review with the local hospital Daniel Alcides Carrion Hospital. Quimtia cyanide's provider has trained San Gabriel private clinic physicians in the use of sodium nitrite and thiosulfate to ensure responsiveness to treat patients on exposure to cyanide. The facility is confident that both the Daniel Alcides Carrion Hospital and San Gabriel Clinic have adequate, qualified staff, equipment and expertise to respond to cyanide exposures.

Mock drills were conducted periodically in Quimtia's warehouse during the re-certification audit period, at least one per year. Lessons learned from the response drills are discussed in meetings following the drills and that corrective actions are established and closed.

Quimtia has developed and implemented the procedure Incident Investigation which in section 6 includes an emergency response procedure that applies to cyanide; this procedure indicates that such incident investigation must be backed up by a report. The procedure addresses to follow up the corrective actions until closing them.

- 3 The facility temporarily stores the disposable Tyvek suits worn by workers in the cyanide storage area, at the hazardous waste area in the warehouse. This is a place where it is consolidated hazardous and flammable solid waste from the areas of Quimtia, in spaces and containers for later collection and final disposal through an authorized contractor.  
**MONITORING:** Ensure that process controls are protective of the environment.

- 3.1 Production Practice 3.1: Conduct environmental monitoring to confirm that planned or unplanned releases of cyanide do not result in adverse impacts.

The operation is  Full Compliance

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- in substantial compliance with Production Practice 3.11.1
- not in compliance with

### Summarize the basis for this Finding/Deficiencies Identified:

Quimtia manages only solid cyanide briquettes in boxes, there are no cyanide solutions. Quimtia does not have a direct discharge to surface water. For the possible case of floor washing, the cyanide store in its southern part has a water collection channel that does not connect to any drainage. Storage is on concrete surfaces and under a roof. Effluents monitored bi-annually include tests for cyanide. In all cases the results showed undetectable levels of cyanide in effluents.

The facility does not monitor groundwater quality. No indirect discharges, such as seepage, have occurred from the facility.

Quimtia limits atmospheric emissions of HCN gas avoiding solid cyanide briquettes contact with water. Cyanide is stored with appropriated measures to avoid moisture. The storing area is on a concrete slab, all the warehouse is in a roofed area. Cyanide is received in plastic bags within a wooden box.

Quimtia do not monitors neither surface water nor ground water as the facility This question does not apply as Quimtia do not has discharges to surface or ground water

Quimtia's operations do not generate air emission or wastewater containing cyanide under normal conditions. Waste generated by an emergency would be handled as hazardous waste. However, Quimtia monitors effluents bi-annually as is required by local regulations.

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4 TRAINING: Train workers and emergency response personnel to manage cyanide in a safe and environmentally protective manner.

4.1 Production Practice 4.1: Train employees to operate the plant in a manner that minimizes the potential for cyanide exposures and releases.

Full Compliance

The operation is  in substantial compliance with Production Practice 4.11.1

not in compliance with

**Summarize the basis for this Finding/Deficiencies Identified:**

Quimtia has a formal training program that include cyanide awareness training, prior to the start of work and periodic refresher training at least once per year for cyanide safe management. Procedural training is also completed prior to working with cyanide

Quimtia train his workers in the use of personal protective equipment. The facility training program includes training in the use of personal protective equipment (PPE) and when and where this equipment is required, according to which the use of personal protective equipment training is given to all personnel. The training is given twice a year. Internal training in the operational procedures as cyanide reception and dispatch has been given to all operations personnel during the re-certification period. Quimtia’s annual training program includes hazard identification and risk analysis training to all cyanide operators.

The facility uses the work procedures as training materials. All necessary job requirements are included in the procedures, and therefore the training.

Quimtia training program appoints a responsible person or entity for each training session, all of which are appropriately qualified personnel from Quimtia and outside companies.

All personnel are trained internally on cyanide awareness prior to working in the facility. Training effectiveness is evaluated through testing and observation of on-the-job performance by the Operations Supervisor, a qualified person

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### 4.2 Production Practice 4.2: Train employees to respond to cyanide exposures and releases.

- The operation is  Full Compliance
- in substantial compliance with Production Practice 4.21.1
- not in compliance with

#### Summarize the basis for this Finding/Deficiencies Identified:

Quimtia's employees are trained in the Contingency Plan, in which all the employees are trained in the different scenarios that could result in an emergency such as cyanide release.

The facility has an annual drill program, stating that all the employees at the distribution center must take part of 2 annual drills including the different scenarios that could result in an emergency such as cyanide release, including worker exposure.

The drills were evaluated and improvement opportunities found were addressed. The need for changes to the Contingency Plan was evaluated, but no changes were deemed necessary.

The training records include the names of the employee and the trainer, the date, topics covered, and tests demonstrating understanding. Records are retained throughout an individual's employment documenting the training they receive.

### 5 EMERGENCY RESPONSE: Protect communities and the environment through the development of emergency response strategies and capabilities.

#### 5.1 Production Practice 5.1: Prepare detailed emergency response plans for potential cyanide releases.

- The operation is  Full Compliance
- in substantial compliance with Production Practice 5.11.1
- not in compliance with

Quimtia maintains a comprehensive emergency response plan (ERP) -Contingency Plan for the Callao Headquarters- updated to 2016, for the necessary response procedures and

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actions to respond in a timely, efficient and with the necessary resources to the various emergency situations such as: HCN gas releases, accidents, fire, spills and medical emergencies, which workers can be exposed in daily operations in the facilities.

The ERP in section 1.8.1 Sodium Cyanide spill during reception, storage and dispatch, considers the scenario of a catastrophic release. This section also addresses a release emergency during loading and unloading operations. Releases during fires and explosions and power outages are addressed in the ERP, section 1.8.

No emergency procedures for cyanide solutions applies to the facility as there is no cyanide solution in the warehouse. The facility does not utilize any pipes, valves or tanks for the storage or management of cyanide. The facility does not utilize any ponds, tanks or waste treatment facilities for the storage or management of cyanide. The ERP does not include instructions to evacuate communities as the possible scenarios do not have consequences beyond Quimtia's facility limits. Besides Quimtia only handles sodium cyanide in solid state (briquettes) and there are no residential areas adjacent to the facility. Additionally, the ERP includes specific and detailed response instructions for the identified scenarios.

The ERP in section 1.8.1.4.3 includes the instructions for the use of cyanide antidotes and first aid procedures. The on-site doctor was familiar with these procedures.

The ERP considers control of releases at their source for different scenarios: transport, unloading/loading and warehouse, the scenarios are related to releases from wooden boxes. The ERP states that if possible to contain the spill without risk of harm, the release must be controlled at its source. For each of the scenarios the ERP describes the necessary actions to take for spill prevention, assessment, containment, and mitigation.

### 5.2 Production Practice 5.2: Involve site personnel and stakeholders in the planning process.

- The operation is
- Full Compliance
  - in substantial compliance with Production Practice 5.21.1
  - not in compliance with

#### Summarize the basis for this Finding/Deficiencies Identified:

Quimtia has involved its workforce and stakeholders in the emergency response planning process. Quimtia's workforce comprises the emergency response team. The ERP was developed by the facility EHS Supervisor. Although the nearest residential and public areas are located over 1 km away from the facility and that according to the ERP considers in the

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worst case an area of 400 m should be evacuated, the following entities were communicated about the hazardous substances un Quimtia's warehouse: The Regional Government of Callao authorities, the police, the Ministry of Transport and Communications, the local hospital Daniel Alcides Carrion and the firefighters informing them that they are considered as support facilities in case of an emergency with cyanide.

Quimtia has informed the district government about their operations and that Quimtia would require their support to evacuate the area in case of emergency.

The facility has established annually formal communication with neighboring companies and public entities, where they inform about the ERP and risks associated with their activities of chemicals storage.

### 5.3 Production Practice 5.3: Designate appropriate personnel and commit necessary equipment and resources for emergency response.

Full Compliance

The operation is  in substantial compliance with Production Practice 5.31.1

not in compliance with

#### Summarize the basis for this Finding/Deficiencies Identified:

The ERP includes the name of the different members of the emergency committee and details their roles and responsibilities. In general, the senior-most manager present at the site is granted the authority to provide all necessary resources.

The plan includes list of the members of the emergency brigades including HazMat, evacuation, and first aid. Section 4 addresses the training that must be provided to the internal emergency responders, the distribution center operators and the supervisors. In section 2.1.1 lists the contact information of all the coordinators and response team members, where is stated these members have been given cell telephones that must answer always (24 hours). The ERP includes the call-out procedures that workers would initiate in the event of an emergency. Section 2.1.2 lists the roles and responsibilities of the emergency committee for each stage of the emergency (before, during, and after). Section 6 provides a complete list of the emergency response equipment and first aids kits that is at the warehouse. Section 2.1.2 includes the role of external responders (firefighters, ambulance, and police), which would be limited to the support of the internal teams, to control access to the emergency zone, and provide medical assistance.

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Quimtia has implemented a monthly inspection checklist; the availability of the equipment was confirmed during the audit.

Quimtia has established annually formal communication with neighboring companies and public entities, where they inform about the ERP and risks associated with their activities of chemicals storage. The auditor review Quimtia's formal communication to these entities covering the re-certification period.

### 5.4 Production Practice 5.4: Develop procedures for internal and external emergency notification and reporting.

Full Compliance

The operation is  in substantial compliance with Production Practice 5.41.1

not in compliance with

#### Summarize the basis for this Finding/Deficiencies Identified:

The ERP includes a communication protocol including internal communication roles as well as notification to the authorities and external responders. The Plan includes a directory of internal and external contacts. The ERP does not consider necessary the evacuation of communities. Instructions for communication with the authorities and external responders are included in the plan.

The ERP do not include procedures for communication with the media, but includes procedures to communicate the incident to the authorities. Should an emergency arise, Quimtia will inform DGASA (General Directorate of Environmental Affairs).

### 5.5 Production Practice 5.5: Incorporate into response plans and remediation measures monitoring elements that account for the additional hazards of using cyanide treatment chemicals.

Full Compliance

The operation is  in substantial compliance with Production Practice 5.51.1

not in compliance with

#### Summarize the basis for this Finding/Deficiencies Identified:

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The ERP describes in section 1.8.1.4.5 the methodology to decontaminate, remediate soils or other contaminated materials as well as to dispose of all spill clean-up debris and test water bodies to rule out the presence of cyanide. Based on Quimtia's risk analysis there is no potential to affect drinking water sources. This section also indicates the recommended amount of ferrous sulfate heptahydrate to destroy cyanide in case of a release.

The ERP also describes the procedure for recovery of solution and solids. Recovered solid or solutions will be transported by an authorized contractor to its final disposition as hazardous waste. A certification of adequate disposal will be issued by the contractor

Sodium hypochlorite and hydrogen peroxide are not used. This element is not applicable to Quimtia as there is no surface water in the area. Based on Quimtia's risk analysis, there is no potential to affect water bodies.

Although none of the site-specific scenarios considers that a release would reach soil (the warehouse and patios are concrete paved) or water bodies, Section 1.8.1.4.5 Activities of Disposal and Disposal of Hazardous Chemical Waste of the ERP addresses the potential need for environmental monitoring to the extent and effects of a release. Monitoring would be limited to air and it will be done with a portable cyanide detector.

### 5.6 Production Practice 5.6: Periodically evaluate response procedures and capabilities and revise them as needed.

- The operation is  Full Compliance
- in substantial compliance with Production Practice 5.61.1
- not in compliance with

### Summarize the basis for this Finding/Deficiencies Identified:

The ERP establishes in section 6.1.4 that Quimtia's Distribution Center Manager and the Q&HSE Manager must review the contingency plan after an emergency drill, an emergency or annually. According to the signatures pages, the plan was last reviewed in January 2017.

The facility conducted several emergency drills during the re-certification period, including response to cyanide emergencies. The drills were evaluated and improvement opportunities found were addressed. The need for changes to the Contingency Plan was evaluated, but no changes were deemed necessary.

Section 6.1.5 of the plan establishes that it must review after each emergency drill an after any emergency.

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