



REPORT

OCTOBER 2017

## ICMC RECERTIFICATION SUMMARY AUDIT REPORT

# Cerro de San Pedro Mine San Luis Potosí, México

**Submitted to:**

International Cyanide Management Institute (ICMI)  
1400 I Street NW-Suite 550  
Washington, D.C. 20005  
United States of America

**And**

Minera San Xavier, SA de CV  
Camino a Cerro de San Pedro #200  
Col. La Zapatilla  
Cerro de San Pedro  
San Luis Potosí, México CP 78440

**Submitted by:**

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**Project Number:** REV 1 1667515

**Distribution:**

ICMI – 1 pdf  
MSX – 1 pdf



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1.0 SUMMARY AUDIT REPORT FOR GOLD MINING OPERATIONS

**Name of Mine:** Cerro de San Pedro Mine  
**Name of Mine Owner:** New Gold Inc.  
**Name of Mine Operator:** Minera San Xavier, SA de CV  
**Name of Responsible Manager:** Angel F. Chung  
**Address:** Camino a Cerro de San Pedro #200  
Col. La Zapatilla  
Cerro de San Pedro  
**State/Province:** San Luis Potosi  
**Country:** Mexico CP 78440  
**Telephone:** +01 444 834 9200  
**Fax:** Not provided  
**E-Mail:** angel.chung@newgold.com



## 2.0 LOCATION DETAIL AND DESCRIPTION OF OPERATION

### 2.1 Mine Location

The Cerro de San Pedro Mine is operated by Minera San Xavier, SA de CV (MSX), a subsidiary of Canadian company New Gold Inc. (New Gold). The Cerro de San Pedro Mine is located approximately 20 kilometers northeast of the city of San Luis Potosi in Mexico (see area highlighted in red in Figure 1). Smaller nearby villages with their approximate population in parentheses include:

- Cuesta de Campa (60)
- Monte Caldera (200)
- Portezuelo (1,000)
- Cerro de San Pedro (100)
- La Nueva Zapatilla (100)

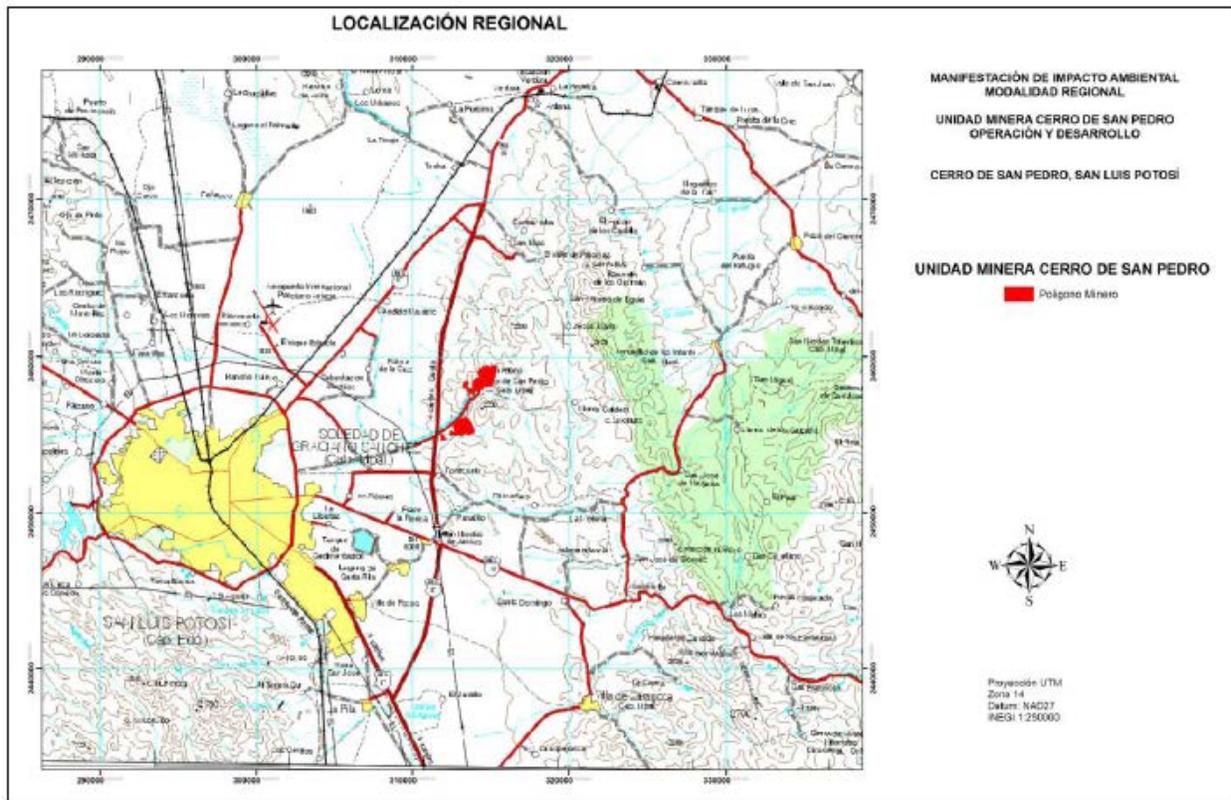


Figure 1: Regional Location Map



### 2.2 Background

The Cerro de San Pedro Mine is an open pit mine that commenced commercial production in mid-2007. The pit was mined at rate of approximately 63,000 tonnes per day until mid-2016 when mining ceased due to the lack of economical ore. Up until mid-2016, the run-of-mine mineral was sent to the heap leach pad, where the ore is leached with a cyanide solution by drip irrigation. No new ore has been added to the heap leach pad since that time, but leaching has continued and now includes injection leaching as well as drip irrigation leaching.

Gold and silver recovery is achieved through a typical heap leaching process using dilute cyanide solution to recover metal from the ore on the heaps. The metal enriched solution is transported to the Merrill Crowe processing facility where the gold and silver is extracted from the solution using a zinc precipitation process. No carbon in leach is required due to the composition of the ore (see Figure 2). The resulting precious metal precipitant collected in the filter presses is refined on-site and poured in to gold/silver doré bars.

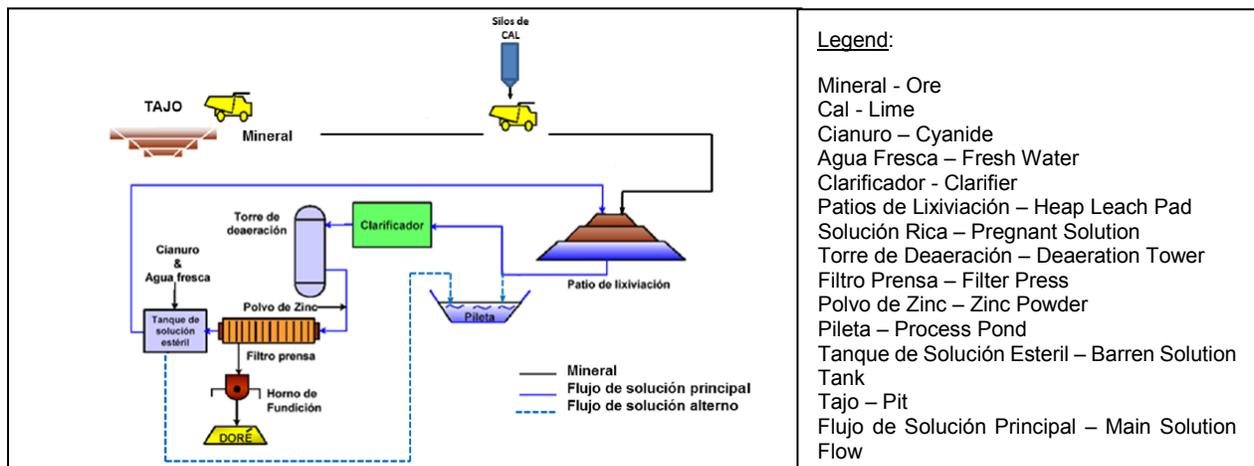


Figure 2: Process Flow Diagram

MSX receives solid sodium cyanide packaged in flobins and ecosacks from Chemours Company (formerly E.I. DuPont de Neumors and Company [DuPont or Chemours hereafter]) who manufacture it at their facility in Memphis, Tennessee. Cyanide was also received in wooden boxes until approximately 2015. The cyanide is transported by both rail and road. Segutal is the local transporter in Mexico subcontracted by Chemours.

The cyanide facilities consist of two cyanide mixing tanks, one cyanide storage tank, a pre-coat tank to the zinc cone, two barren tanks, five booster station tanks, clarifiers, a deoxygenation tower, a zinc cone, filter presses, leach pad facilities, one pregnant pond, and one storm pond. The former Barren Tank #1 is no longer in use, but a new Barren Tank 1B was installed inside the plant. Barren Tank #2 continues to be



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used and is located within the pad footprint. The mixing tank, storage tank, barren tank (i.e., 1B), and pre-coat tank for the zinc cone are located within secondary containment consisting of reinforced concrete walls and floor. Each secondary containment drains to a main sump. From this sump, solutions report to the sump of the storm pond. The remainder of the tanks are located within the footprint of the heap leach pad. The tanks are constructed of stainless steel and pipelines are constructed with stainless steel, carbon steel, and HDPE. The plant, including all areas with tanks, is lined with reinforced concrete. A storm pond, located adjacent to the pregnant pond, is available for containment of cyanide solutions during heavy precipitation periods.

The pipelines between the leach pad and plant are contained within a geomembrane-lined channel. There are five booster pump stations located within the pad limits, each with a metal tank and pumps installed in concrete containment. The pregnant pond is double-lined with geomembrane and is equipped with a leak detection, collection, and recovery system. The storm pond is single-lined with geomembrane over a low permeability soil. The storm pond sump is double-lined with geomembrane and is equipped with a leak detection, collection, and recovery system. The heap leach pad was constructed with a composite liner of compacted clay and geomembrane. The mine has one heap leach pad that has been sub-divided into three phases and 11 cells. The heap leach pad has run-on diversion ditches on the upgradient sides.

MSX constructed a milk of lime plant next to barren tank 2 in 2016 to raise the pH of the barren solution as it is pumped to the pad for leaching. Previously, lime was added to the haul trucks before they dumped ore on the pad, but ore hauling stopped in mid-2016 and this approach to pH control became infeasible. Figure 2 still shows the original point of lime addition.



### 3.0 SUMMARY AUDIT REPORT

#### Auditors Findings

in full compliance with

**The International  
Cyanide Management  
Code**

**Cerro de San Pedro Mine is:**  in substantial compliance with

not in compliance with

The operation experienced a significant cyanide release off the mine site and that was reported under applicable regulations during the previous 3-year audit cycle. This release is discussed under Standard of Practice 9.3.

**Audit Company:** Golder Associates, Inc.

**Audit Team Leader:** Kent Johnejack, Lead Auditor and Mining Technical Specialist

**Email:** kjohnejack@golder.com

#### Name of Other Auditors

Name, Position	Signature
Juan Cartajena, Support Auditor	

#### Dates of Audit

The recertification audit was undertaken over 4 days from May 8 to 11, 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 I 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 Mining Operations Verification Protocol and using standard and accepted practices for health, safety and environmental audits.

Cerro de San Pedro Mine  
Name of Facility



\_\_\_\_\_  
Signature of Lead Auditor

October 23, 2017  
Date

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PRINCIPLE 1 – PRODUCTION

Encourage Responsible Cyanide Manufacturing by Purchasing from Manufacturers that Operate in a Safe and Environmentally Protective Manner

Standard of Practice 1.1: Purchase cyanide from manufacturers employing appropriate practices and procedures to limit exposure of their workforce to cyanide, and to prevent releases of cyanide to the environment

in full compliance with

The operation is

in substantial compliance with

Standard of Practice 1.1

not in compliance with

Summarize the basis for this Finding/Deficiencies Identified:

The operation is in full compliance with Standard of Practice 1.1, requiring the operation purchase cyanide from manufacturers employing appropriate practices and procedures to limit exposure of their workforce to cyanide and to prevent releases of cyanide to the environment.

MSX purchases cyanide from DuPont/Chemours (hereafter Chemours) under a contract that was originally signed in January 1, 2013 and it was extended until December 31, 2019. Section 12 of the contract specifies that Chemours shall remain a signatory of the Code and shall comply with all applicable Code Principles, Standards of Practice and other requirements applicable to Chemour’s production facilities and transportation to MSX. Chemours was initially certified in 2006 and recertified in 2009, 2013, and 2016. As a contingency measure between November 2014 and April 2015 to mitigate a potential issue in the production of cyanide from Chemours, MSX also purchased cyanide from Tongsoh Petrochemical Corporation Ltd (Tongsoh) and Orica Australia Pty. Ltd. (Orica). Tongsoh was initially certified in 2008 and recertified in 2011, 2014, and 2017. Orica was initially certified in 2006 and recertified in 2010, 2013, and 2017. Verification was conducted by reviewing the Chemours and MSX contract for cyanide purchases within the recertification period; ICMI website certification reports for Chemours, Tongsoh, and Orica; bills of lading for cyanide deliveries to the mine within the recertification period; and interviews with the mine warehouse chief.

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PRINCIPLE 2 – TRANSPORTATION

Protect Communities and the Environment during Cyanide Transport

Standard of Practice 2.1: Establish clear lines of responsibility for safety, security, release prevention, training, and emergency response in written agreements with producers, distributors and transporters.

[X] in full compliance with

The operation is

[ ] in substantial compliance with

Standard of Practice 2.1

[ ] not in compliance with

Summarize the basis for this Finding/Deficiencies Identified:

The operation is in full compliance with Standard of Practice 2.1, requiring that the operation establish clear lines of responsibility for safety, security, release prevention, training and emergency response in written agreements with producers, distributors, and transporters.

MSX does not contract the cyanide transport directly. Transport is arranged by the cyanide producers. Section 12 (a) of the MSX contract with Chemours establishes that Chemours’s designated responsibilities extend to any subcontractors used by the producer, distributor, transporter or the operation for transportation related activities. Section 12(b) of the contract establishes that Chemours is responsible for all aspects of packaging, labelling, storage prior to the delivery, route selection, transport, unloading, safety, training, security and emergency response until the cyanide is delivered to the mine. The Chemours supply chains in the US/Canada and in Mexico were initially certified in 2010 and recertified in 2014.

As a contingency measure between November 2014 and April 2015 to mitigate a potential issue in the production of cyanide from Chemours, MSX also purchased cyanide, produced by Tongsuh and Orica, through different distributors. The cyanide produced by Tongsuh was distributed by Green Supply and Logistics SA de CV (Green Supply), who is a Mexican distributor of the cyanide distributed by Hyosung Corporation (Hyosung), who is a Korean distributor of the cyanide produced by Tongsuh. The cyanide produced by Orica was distributed by Orion Productos Industriales SA de CV (Orion), who is a Mexican distributor of the cyanide produced by Orica. The supply chains for Green Supply, Hyosung and Orion are all certified under the Code. Green Supply’s Mexico supply chain was certified in 2016. Hyosung’s South America supply chain, which includes Mexico, was initially certified in 2013 and recertified in 2016. Orion’s Mexico supply chain was certified in 2014. For the last step of land transport to the mine, Chemours uses Transportes Segutal, Green Supply uses Transportes Suri, and Orion uses its own fleet of trucks. Transportes Segutal is part of the certified Chemours Mexico Supply chain most recently recertified in 2014; Transportes Suri is a certified transporter as of 2014; and Orion is a certified transporter as of 2014.





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Verification was conducted by reviewing the contract between Chemours and MSX, and the summary audit reports for the distributors and transporters used by MSX during the recertification period.

**Standard of Practice 2.2: Require that cyanide transporters implement appropriate emergency response plans and capabilities and employ adequate measures for cyanide management**

in full compliance with

The operation is

in substantial compliance with

**Standard of Practice 2.2**

not in compliance with

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

The operation is in full compliance with Standard of Practice 2.2, requiring that cyanide transporters implement appropriate emergency response plans and capabilities and employ adequate measures for cyanide management.

MSX does not contract the cyanide transport directly. Transport is arranged by the cyanide producers. Evidence for compliance under this Standard of Practice for emergency response plans and capabilities is provided by certification of the distributors and transporters used by the producers. The Chemours supply chains in the US/Canada and in Mexico were initially certified in 2010 and recertified in 2014. Green Supply's Mexico supply chain was certified in 2016. Hyosung's South America supply chain, which includes Mexico, was initially certified in 2013 and recertified in 2016. Orion's Mexico supply chain was certified in 2014. Transportes Segutal was most recently certified in 2014. Transportes Suri is a certified transporter as of 2014. Orion is a certified transporter as of 2014. MSX has maintained complete records for all the elements involved in the supply chain prior to the cyanide arrival to site during the recertification period, which includes MSX purchase orders; invoices; interim storage facility documents (when applicable); logs of the receipt of cyanide; and bills of lading which include the number of containers and their identification in each shipment. All elements identified in the records are in compliance with the Code.

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PRINCIPLE 3 – HANDLING AND STORAGE

Protect Workers and the Environment during Cyanide Handling and Storage

Standard of Practice 3.1: Design and construct unloading, storage, and mixing facilities consistent with sound, accepted engineering practices, quality control/quality assurance procedures, spill prevention and spill containment measures.

[X] in full compliance with

The operation is

[ ] in substantial compliance with

Standard of Practice 3.1

[ ] not in compliance with

Summarize the basis for this Finding/Deficiencies Identified:

The operation is in full compliance with Handling and Storage Practice 3.1, requiring that cyanide handling and storage facilities are designed and constructed consistent with sound, accepted engineering practices, quality assurance/quality control (QA/QC) procedures, spill prevention, and spill containment measures.

MSX receives only solid cyanide and stores it in two locations: the preparation warehouse and the reagent warehouse. Solid cyanide is mixed only in the preparation warehouse. The design and construction were evaluated during the initial audit and full compliance was achieved at that point in time. The ability of the concrete bases and floor to prevent seepage to the subsurface, as well as the competence of the secondary containment to provide a barrier to leakage, were evaluated during the initial audit and full compliance was achieved at that point in time. There have been no changes to either warehouse since the initial audit. The auditors visited both warehouses during the recertification audit and observed them to be in good condition.

Both warehouses are located away from people and surface water (which is ephemeral in the vicinity of the mine). Runoff originating from around the warehouses reports to the lined process ponds or a borrow area downgradient to the reagent storage warehouse; the borrow area does not connect with any watercourses. Both warehouses are located away from where mine staff may congregate and both have fixed hydrogen cyanide (HCN) gas monitors with audible and visual alarms. MSX has a security guard checkpoint at the mine entrance, as well as a chain link fence around the mine. The doors of the warehouses area kept locked except during mixing or transfer events, and only supervisors have keys to unlock the door. The auditors observed that the fences, gates, doors, and locks were in place and in good condition to prevent unauthorized access to the warehouses.

MSX has three tanks for reagent grade cyanide located inside the preparation warehouse. These tanks are equipped with level sensors that report to readouts at the tank and the screen in the plant control room. The auditors observed the tank levels on the local readouts and the control room screen to verify that the





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level sensors were functioning. The auditors also reviewed electrical maintenance histories from the recertification period to verify that maintenance was performed.

MSX receives solid cyanide in ecosacks, and flobins at the reagent warehouse, but stores a few containers for daily use at the preparation warehouse. Wooden boxes were received until approximately 2015. Both warehouses have adequate ventilation via roof vents, louvered wall panels, and screened areas over the entry ramps. Both warehouses are located on raised pads to prevent entry of run-on and both are walled and roofed to prevent entry of precipitation. Both warehouses are within the fenced mine area with controlled access at the gate and continuous security. MSX does not allow storage of incompatible materials in either warehouse, as confirmed by inspection, signage, and procedures. The only incompatible material in the vicinity of the warehouses is anti-scalant (an acid), but it is stored in its own tank well away from the warehouses and within its own secondary containment. The auditors observed that its flow path would not commingle with the flow paths from the warehouses in the event of release.

**Standard of Practice 3.2: Operate unloading storage and mixing facilities using inspections, preventative maintenance, and contingency plans to prevent or contain releases and control and respond to worker exposures.**

in full compliance with

The operation is

in substantial compliance with

**Standard of Practice 3.2**

not in compliance with

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

The operation is in full compliance with Handling and Storage Practice 3.2 requiring that cyanide handling and storage facilities are operated using inspections, preventive maintenance, and contingency plans to prevent or contain releases and control and respond to worker exposures.

MSX manages the empty flobins, ecosacks, and wooden boxes as to prevent unauthorized reuse, to prevent exposure to residual cyanide, and to properly dispose of components. MSX tracks the entry of each container delivery into the reagent or preparation warehouses and uses a green cone to implement a first in – first out usage. MSX returns flobins to Chemours to prevent reuse. MSX rinses the lower interior part of the flobins over a sump that returns the rinse water to the process circuit, and securely closes them, before they are returned to Chemours. The auditors observed a mixing event to verify the procedure was implemented. MSX ships the plastic bags to a hazardous waste landfill via a government-certified shipper. The auditors reviewed examples of shipping manifests from throughout the recertification period to verify compliance.



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MSX has implemented an alternative to rinsing the plastic bags that is based on a written Chemours procedure. The procedure specifies that the outer and inner bags are to be folded together and then strapped on a pallet for shipping. The inner bag that had contact with the briquettes is to be folded inside the outer bag to prevent the potential for contact. The operators wear the prescribed PPE during this activity. The auditors observed a mixing to verify the procedure was implemented. The auditors concluded that this alternative approach meets the Code intent to prevent exposure to, or releases from, residual cyanide in empty plastic bags.

Until 2015 while boxes were received, MSX managed the wooden boxes as non-hazardous waste according to a written procedure. The wooden boxes shipped to a non-hazardous waste landfill via a government-certified shipper. Wooden pallets from the ecosacks are also managed in accordance with the same written procedure. The pallets are shipped to a government-approved recycler. The auditors reviewed examples of shipping manifests to verify compliance.

MSX follows two written procedures and uses a checklist during mixing events; one for opening containers and the other for mixing the cyanide. The steps include opening the containers, checking HCN levels, partially filling the tank with fresh water, adding sodium hydroxide to reach the required pH of 10.5, emptying the containers of solid cyanide into the top of mixing tank, mixing the solution, and transferring the solution to the storage tank. The mixing procedure also requires that the operators inspect for spills and/or residues of solid cyanide at the end of mixing event. The auditors observed a mixing event and reviewed checklists to verify compliance.

MSX follows a written procedure and uses two checklists for unloading cyanide containers at the reagent warehouse and transferring them to the preparation warehouse. A separate procedure describes the measures for opening and handling the containers during mixing, such as use of the crane for lifting the containers to the top of the mix tank. The auditors observed a mixing event and reviewed checklists to verify compliance.

The written procedure for unloading cyanide containers specifies no more than three-high stacking of cyanide containers. The auditors observed that the maximum stacking height was marked on the walls of both warehouses, but that MSX was only stacking the containers two-high at the time of the site visit.

The written procedure for mixing cyanide specifies personal protective equipment (PPE), equipment, and tools. The PPE consists of a Tyvek suit, hardhat, full-face respirator, nitrile gloves, rubber boots, radio, and portable HCN monitor. Mixing must be undertaken with two operators present even though MSX has also installed two video cameras for remote observation. The auditors observed a mixing event on the second day of the site visit and reviewed completed checklists to confirm that MSX follows the procedure.

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PRINCIPLE 4 – OPERATIONS

Manage Cyanide Process Solutions and Waste Streams to Protect Human Health and the Environment

Standard of Practice 4.1: Implement management and operating systems designed to protect human health and the environment including contingency planning and inspection and preventative maintenance procedures.

[X] in full compliance with

The operation is

[ ] in substantial compliance with

Standard of Practice 4.1

[ ] not in compliance with

Summarize the basis for this Finding/Deficiencies Identified:

The operation is in full compliance with Standard of Practice 4.1, requiring that the operation implement management and operating systems designed to protect human health and the environment including contingency planning and inspection and preventive maintenance procedures.

The list of MSX cyanide facilities is largely the same as in the initial audit report with some new or modified facilities as noted below:

- The heap leach pad with a total of 11 phases where Phase 11 was added this audit cycle; the pad stopped receiving ore in 2016 and some side slopes have been regraded in preparation of closure, although leaching continues
■ Injection leaching system in the heap leach pad, a modification to the pad this audit cycle
■ The process ponds (pregnant pond and overflow pond)
■ The preparation warehouse (includes two mixing tanks and a storage tank)
■ Reagent storage warehouse
■ Process plant (Merrill Crowe)
■ Five booster stations, each with its own tank, with booster station five added this audit cycle
■ Barren tank 1B, a new tank located within the plant building. (note that this new tank replaces the original barren tank 1, which is no longer in use)
■ Barren tank 2 located on the southwest corner of the pad
■ Associated pipelines, pumps, valves, and appurtenances, including modified high-grade feed lines to the cyanide addition points
■ Surface water diversions for upgradient run-on for the pad and ponds

MSX has maintained certification in two high-level management systems relevant to cyanide management: ISO-14001 Environmental Management Certification; ISO-9001 Quality Certification for Gold/Silver Beneficiation. MSX has developed the following detailed plans and programs: SAP database for managing maintenance; program for environmental monitoring; emergency response plan; initial and expansion design reports and drawings; and a set of more than 25 standard operating procedures for safe operation





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of the cyanide facilities. These plans and programs identify the design criteria, assumptions, parameters, and regulatory requirements to prevent and control cyanide releases and exposures.

MSX has developed a written procedure to manage operational and physical changes, either temporary or permanent. The procedure requires assessment of health, safety, environmental, production, and stakeholder risks. The list of approvers includes the safety and environmental manager. The auditors reviewed three signed examples of the change management form from throughout the recertification period to verify compliance.

MSX has prepared an Emergency Response Plan (ERP) that contains cyanide contingency procedures. Appendix 10 describes contingency actions for: spills of solid and liquid cyanide; elevated HCN concentrations; pond overtopping; pond leaks; pad seepage; elevated cyanide in groundwater and surface water; remediation, and temporary closure of cyanide facilities.

MSX inspects the cyanide facilities at frequencies that vary from daily, weekly, monthly, and every 6 months depending on the facility and type of inspection. These frequencies are adequate to ensure the cyanide facilities function as intended. Wildlife inspections are performed daily at the pad and ponds. Tanks, secondary containments, leak detection for the pregnant pond, pipelines, pumps, sumps, and valves are inspected by process staff on a weekly basis. MSX commissioned a contractor with certified technicians in 2014 and 2017 to complete ultrasound testing and liquid penetration testing on process tanks. The tanks that were tested were found suitable for their intended use. The leak detection systems for the pregnant pond and the overflow pond sump are monitored three times per week. The pregnant and overflow ponds are inspected on a weekly basis by the process department and on a daily basis by the environmental department to document available freeboard. These inspections also include run-on diversions for the pad and ponds. MSX uses forms to document inspections. The forms include the date of the inspection, the name of the inspector, the item to be inspected, and its condition. The inspection forms have a section for observations and corrective actions. Corrective actions are tracked via the SAP database for maintenance. The auditors observed the cyanide facilities to be in good condition, indicating effective inspections. The auditors reviewed examples of completed inspection forms from throughout the recertification period to verify compliance.

MSX has implemented a maintenance program via the SAP software that includes both proactive (scheduled) maintenance and reactive (unscheduled) maintenance. This program is described in a written procedure for maintenance coordination. The auditors reviewed maintenance histories extracted from the SAP database for eight randomly selected pieces of cyanide-related equipment from the preparation warehouse, pad, and plant to verify compliance throughout the recertification period.

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MSX has nine backup generators with a total capacity of 8.66 megawatts that are sufficient to run the plant, pad, and ponds without stoppage in the event of an outage of the mine power supply. MSX has developed a written procedure for generator operation and maintenance. The auditors reviewed maintenance histories extracted from the SAP database for selected generators to verify compliance throughout the recertification period.

**Standard of Practice 4.2: Introduce management and operating systems to minimize cyanide use, thereby limiting concentrations of cyanide in mill tailings.**

in full compliance with

The operation is

in substantial compliance with

**Standard of Practice 4.2**

not in compliance with

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

The operation is in full compliance with Standard of Practice 4.2, requiring that the operation limit the use of cyanide to that optimal for economic recovery of gold so that the waste tailings material has as low a cyanide concentration as practical.

Not applicable because MSX does not have a mill or generate tailings.

**Standard of Practice 4.3: Implement a comprehensive water management program to protect against unintentional releases.**

in full compliance with

The operation is

in substantial compliance with

**Standard of Practice 4.3**

not in compliance with

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

The operation is in full compliance with Standard of Practice 4.3, requiring the operation to implement a comprehensive water management program to protect against unintentional releases.

MSX contracted with a consultant in 2017 to create an updated GoldSim water balance that reflects the operational changes since the cessation of ore addition to the heap leach pad in mid-2016. The model is probabilistic in that it addresses the 100-year, 24-hour storm event and annual precipitation for wet, dry, and average years. The model is comprehensive in that it includes the appropriate facilities (i.e., the pad, process pond, and overflow pond) and the appropriate physical mechanisms and reasonable input values (i.e., solution application via irrigation and injection leaching, ore moisture retention, precipitation, evaporation, changes in process pond volumes, and power outages). Freeze/thaw, run-on from upgradient, seepage losses, and discharge to surface water are inapplicable. Simulations were run with the process pond at 10, 50 and 100 percent capacity for a 100-year 24-hour event of 100 mm with no power loss, a

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2-hour power loss, and a 24-hour power loss. The results indicated that the 100-year 24-hour event can be contained with the existing storage capacity even in the unlikely event that the process pond is 100 percent full at the beginning of the storm event. Similarly, the design storm event can be contained within existing storage capacity even in a 24-hour power loss and the process pond at 50 percent capacity at the start of the storm event. The auditors reviewed the water balance technical memorandum to verify compliance.

MSX has developed a written procedure to implement the water balance and prevent overtopping of the overflow pond. MSX monitors pond levels by level sensors that report to the screen in the plant control room and weekly inspections. MSX inspects both ponds weekly using a form that documents the water levels based on elevations painted on the sides of the ponds. MSX also completes weekly inspections of the upgradient run-on diversions for the pad and the ponds. The auditors reviewed inspection forms from throughout the recertification period, to verify compliance.

MSX has established 1 meter freeboard in the process and overflow ponds. MSX provided a time series graph for the process pond that showed the required freeboard level was not exceeded during the recertification period. MSX also provided a time series graph for the overflow pond that showed that it was generally dry throughout the recertification period and levels never even approached the required freeboard level.

MSX collects precipitation data from two meteorological stations at and near the mine. These data are incorporated into the 2017 water balance model. MSX also receives daily rainfall predictions from a commercial weather service. The auditors reviewed spreadsheets of data from throughout the recertification period to verify compliance.

**Standard of Practice 4.4: Implement measures to protect birds, other wildlife, and livestock from adverse effects of cyanide process solutions.**

in full compliance with

The operation is

in substantial compliance with

**Standard of Practice 4.4**

not in compliance with

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

The operation is in full compliance with Standard of Practice 4.4, requiring the operation implement measures to protect birds, other wildlife, and livestock from adverse effects of cyanide process solutions.

The pregnant pond and the storm pond are the only open waters at the operation. Although the concentration of WAD cyanide in the pregnant pond is greater than 50 parts per million (ppm), MSX has



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installed fencing around and netting over the pond to restrict wildlife, bird, and livestock access. MSX keeps the storm pond dry, except for the sump with netting, to reduce the potential for access. MSX installed a backup sodium hypochlorite treatment system for overflows to the storm pond, but MSX stated that it did not need to be used during the recertification period. MSX has also installed hazing measures and video observation at both ponds. Pregnant solution is conveyed from the pad to the pregnant pond in piping bedded on gravel, thus eliminating open water in the lined containment channels. Finally, MSX has installed a chain link fence around the mine property. In addition to measures to restrict wildlife access, MSX has installed guzzlers away from the pad perimeter to attract wildlife away from the pad.

MSX has prevented significant wildlife mortalities during the recertification period. The auditors reviewed a register showing that there were no mortalities of mammals or birds at the ponds during the recertification period and no mortalities of mammals at the pad. However, there were a total of 10 bird mortalities at the pad in 2016 and 2017. MSX attributed this bird mortality to the reduced presence of vehicles and operators after mining and ore placement ceased in June 2016. MSX identified the increase in mortalities, however, and developed an action plan to limit future mortalities. The auditors reviewed the action plan and evidence that the corrective actions were implemented. The auditors concluded that the level of bird mortality was not significant and that MSX has acted responsibly and reasonably to the recent trend in bird mortalities.

MSX has developed a written procedure to manage ponding on the surface of the heap leach pad. The process and environmental staff inspect for ponding and wildlife daily. The auditors observed locations where netting and flashers were installed over puddles and small channels were dug to drain puddles. In addition a propane cannon was in use and video observation is conducted via drones and tower mounted cameras. Overall, the minor ponding was being addressed according to the written procedure. MSX applies solution by drip irrigation; thereby eliminating the possibility of overspray.

**Standard of Practice 4.5: Implement measures to protect fish and wildlife from direct or indirect discharges of cyanide process solutions to surface water.**

in full compliance with

The operation is

in substantial compliance with

**Standard of Practice 4.5**

not in compliance with

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

The operation is in full compliance with Standard of Practice 4.5, requiring the operation implement measures to protect fish and wildlife from direct or indirect discharges of cyanide process solutions to surface water.



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MSX does not have direct or indirect discharges to surface water; nor is MSX engaged in any remedial activity for surface water. However, there are two ephemeral watercourses passing near the cyanide facilities. Both report to a temporary waterhole (“bordo”) that may seasonally contain water. To confirm the lack of discharges to surface water, MSX samples these “bordos” every 6 months, although they are usually dry. The analytical results for free cyanide were below the Code’s threshold of 0.022 ppm throughout the recertification period.

**Standard of Practice 4.6: Implement measures designed to manage seepage from cyanide facilities to protect the beneficial uses of groundwater.**

in full compliance with

The operation is

in substantial compliance with

**Standard of Practice 4.6**

not in compliance with

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

The operation is in full compliance with Standard of Practice 4.6, requiring the operation implement measures designed to manage seepage from cyanide facilities to protect the beneficial uses of groundwater.

MSX has implemented measures to protect groundwater. The heap leach pad and pipeline secondary containment channel are constructed with a composite liner of compacted clay and geomembrane. The pregnant pond is double-lined with geomembrane and is equipped with a leak detection, collection, and recovery system. The storm pond is constructed with a single geomembrane liner and the sump is double-lined with geomembrane and a leak detection, collection, and recovery system. The plant and warehouses are constructed with concrete floors. Barren tank 1 is no longer used for cyanide solution, but the new Barren tank 1B was installed on a concrete base inside the plant. Barren tank 2 and the five booster station tanks are within the limits of the lined heap leap pad.

Groundwater is used for the following beneficial uses in the vicinity of the mine: mining, agriculture, industry, and human consumption. MSX staff referred to the Mexican federal regulation (NOM 127 SSA1 [1994]) for total cyanide in groundwater for human consumption at the point of use as the most stringent (relative to the other beneficial uses). The numerical value in that regulation is 0.07 ppm total cyanide.

MSX monitors groundwater quarterly for compliance purposes at the point of use in eight groundwater production wells downgradient of the site. The auditors reviewed a spreadsheet of quarterly groundwater monitoring results that showed the results were non-detect for total cyanide throughout the recertification period.

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MSX does not have a mill or an underground mine and therefore does not place tailings in underground workings.

MSX is engaged in groundwater remediation under the oversight of Mexican environmental authorities to prevent further degradation and restore beneficial use for human consumption. Concentrations of total cyanide exceeded the standard of 0.07 ppm in alert well SPMW-01 at the southwest corner of the storm pond, which is downgradient of all of the cyanide facilities. MSX notified environmental authorities in December 2013. MSX installed a groundwater extraction well (PR-01) in March 2014. The concentration of total cyanide at the extraction well has diminished to below the standard since March 2016. Six other monitoring wells were installed in the downgradient and cross gradient from the extraction well. Results from these wells have all been non-detect for total cyanide since 2014, indicating the plume of affected groundwater has been contained by the groundwater extraction. The auditors visited the extraction well and associated monitoring wells, and reviewed data and correspondence, to verify compliance.

**Standard of Practice 4.7: Provide spill prevention or containment measures for process tanks and pipelines.**

in full compliance with

The operation is

in substantial compliance with

**Standard of Practice 4.7**

not in compliance with

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

The operation is in full compliance with Standard of Practice 4.7 requiring that the operation provide spill prevention or containment measures for process tanks and pipelines.

MSX has provided secondary containment for all cyanide-related tanks and vessels with the measures noted in the initial audit largely the same. All tanks were confirmed during the initial audit to be installed on solid concrete bases.

MSX has sized secondary containments, or designed them for gravity flow to tertiary containment, for all cyanide-related tanks and vessels. The sizes and flow paths are largely the same as those noted during the initial audit. MSX has sized the secondary containments in the preparation warehouse and the plant for more than 110 percent of the largest tank volume, but in any case, all of the secondary containments for the preparation warehouse, plant, and booster station tanks are designed for gravity flow-through to tertiary containment provided by the heap leach pad or the process ponds. The auditors observed all of the secondary containments to be in good condition.



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MSX has designed all of their secondary containments report to tertiary containment, thereby precluding the need for a written procedure for discharge to the environment. All secondary containments ultimately report to the heap leach pad or the process ponds.

MSX has provided secondary containment measures for all cyanide-related pipelines. The containments are the same as noted during initial audit. The new Phase 11 for the pad uses the same main piping as the other phases. Where the pipelines are not within the footprint of the plant or the heap leach pad, these measures consist of geomembrane wrapping and geomembrane-lined channels. The auditors observed the pipeline secondary containments to be in good condition.

MSX does not have any cyanide-related pipelines that run across or adjacent to surface water because there are no perennial watercourses or permanent surface water bodies in the vicinity of the mine.

MSX has constructed the cyanide-related tanks and pipelines of stainless steel, mild steel, or HDPE. These materials are compatible with high pH and cyanide. The auditors observed the pipelines to be in good condition.

**Standard of Practice 4.8: Implement quality control/quality assurance procedures to confirm that cyanide facilities are constructed according to accepted engineering standards and specifications.**

in full compliance with

**The operation is**

in substantial compliance with

**Standard of Practice 4.8**

not in compliance with

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

The operation is in full compliance with Standard of Practice 4.8 requiring that operations implement QA/QC procedures to confirm that cyanide facilities are constructed according to accepted engineering standards and specifications.

The existence and contents of the Construction Quality Assurance (CQA) programs for the original cyanide facilities were evaluated and found compliant during the initial audit. The CQA programs for the new or modified cyanide facilities this audit cycle were reviewed. MSX subcontracted an engineer to provide CQA services for the new barren tank 1B, the new booster station no. 5, and the cell 11 expansion to the heap leach pad. The content of the CQA program included borrow characterization, earthworks observation and testing (including compaction), liner placement and testing, concrete placement and testing, and welding inspection as applicable to each new or modified facility. The auditors reviewed CQA reports to verify compliance. MSX has employed or subcontracted to qualified civil engineers to review and approve the completed projects for the new and modified cyanide facilities this audit cycle. The CQA reports and



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turnover packages were signed by the subcontract engineer and the MSX construction manager, respectively. Both engineers have “cedulas”, which are considered the equivalent of professional registration in Mexico. MSX has retained CQA records in a library in the engineering office. The auditors observed the hard copy reports in the library to verify compliance.

**Standard of Practice 4.9: Implement monitoring programs to evaluate the effects of cyanide use on wildlife, surface and groundwater quality.**

in full compliance with

The operation is

in substantial compliance with

**Standard of Practice 4.9**

not in compliance with

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

The operation is in full compliance with Standard of Practice 4.9 requiring that operations implement monitoring programs to evaluate the effects of cyanide use on wildlife, surface, and groundwater quality.

MSX has developed a written program for environmental monitoring called the General Environmental Monitoring Program. The document covers air, surface water, groundwater, and soil monitoring. The environmental monitoring procedures were prepared and updated by qualified MSX staff with degrees in chemical engineering, environmental engineering, and agricultural-ecological engineering. Staff from the laboratory collect the samples according to a written procedure. MSX contracts with certified laboratories for external analysis of cyanide. The MSX document contains sampling methods, a map of sampling locations, tables of constituents (including cyanide species), chain-of-custody requirements, and a sampling schedule. The laboratory procedure contains details on sampling, containerization, preservation, handling and shipping. The auditors reviewed procedures and field sheet packages from throughout the recertification period to verify compliance.

MSX monitors groundwater in eight groundwater wells downgradient of the site that are actual points of use. MSX also monitors shallow and/or perched groundwater in 15 monitoring wells around the perimeter of the heap leach pad. There are two ephemeral watercourses in the vicinity of the cyanide facilities that report to temporary waterholes (“bordos”) that may seasonally contain water. MSX monitors groundwater quarterly, shallow groundwater monthly, groundwater remediation system monthly, and “bordos” every 6 months if water is present. These frequencies are adequate to characterize the media being monitored and to identify changes in a timely manner.

MSX has developed a written procedure for rescue, relocation and monitoring of wildlife. Staff from the MSX Environment Department inspect for wildlife at the heap leach pad and ponds on a daily basis and document the findings on two field forms. MSX also documents wildlife sightings in a logbook.

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PRINCIPLE 5 – DECOMMISSIONING

Protect Communities and the Environment from Cyanide through Development and Implementation of Decommissioning Plans for Cyanide Facilities.

Standard of Practice 5.1: Plan and implement procedures for effective decommissioning of cyanide facilities to protect human health, wildlife and livestock.

[X] in full compliance with

The operation is

[ ] in substantial compliance with

Standard of Practice 5.1

[ ] not in compliance with

Summarize the basis for this Finding/Deficiencies Identified:

The operation is in full compliance with Standard of Practice 5.1 requiring that the site plan and implement procedures for effective decommissioning of cyanide facilities to protect human health, wildlife and livestock.

MSX has developed and updated their closure plans that include written procedures to decommission cyanide facilities at the cessation of operations. The last update of the Closure Plan was developed in August 2014. The plan covers the description of decommissioning activities for the heap leach pad, process ponds, laboratory, preparation warehouse, pipelines, and pump stations. An appendix includes a series of detailed closure schedules for the head leach pad, process ponds, laboratory, and infrastructure. It is the auditors' opinion that MSX has updated its Closure Plan with reasonable frequency to reflect changes over time in its mine layout and processes.

MSX has also developed a procedure titled "Decontamination of Equipment and Tools in Contact with Cyanide (Decontamination de Herramientas y Equipos en Contacto con Cianuro)", which describes the methods for decontamination for all equipment and tools, the use of appropriate PPE, and the handling and disposal of residual solutions.

Standard of Practice 5.2: Establish an assurance mechanism capable of fully funding cyanide related decommissioning activities.

[X] in full compliance with

The operation is

[ ] in substantial compliance with

Standard of Practice 5.2

[ ] not in compliance with

Summarize the basis for this Finding/Deficiencies Identified:

The operation is in full compliance with the Standard of Practice 5.2 requiring that the site establish an assurance mechanism capable of fully funding cyanide related decommissioning activities.





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MSX updated their Closure Plan in 2014. This plan includes a summary of the total closure costs for the implementation of the cyanide-related decommissioning measures described in the plan. The estimation of unit costs was done by using an inflation rate of 4 percent (average) over the costs used in the 2013 update. The 2013 update relied on the units costs used in the 2012 plan. The 2012 plan states in Section 4.6.5 that the units cost were estimated using, almost exclusively, local contractor quotes. MSX updated the closure costs in 2015 to include the reclamation of a portion of the stockpiles that had not been considered in the 2014 closure cost estimate. MSX obtained third party unit costs estimated from local contractors (reviewed by the auditors) for the added activities and adjusted other costs using the inflation rate. The developed of costs estimates in 2014 and 2015 are evidence of ongoing updating. MSX has established a financial mechanism via an irrevocable standby letter of credit issued by Scotiabank and approved by the Mexican agency Secretaria de Medio Ambiente y Recursos Naturales (SEMARNAT) in August 2016. This letter of credit was issued for an amount greater than estimated decommissioning costs for the cyanide facilities.

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PRINCIPLE 6 – WORKER SAFETY

Protect Workers’ Health and Safety from Exposure to Cyanide

Standard of Practice 6.1: Identify potential cyanide exposure scenarios and take measures as necessary to eliminated, reduce, and control them.

[X] in full compliance with

The operation is

[ ] in substantial compliance with

Standard of Practice 6.1

[ ] not in compliance with

Summarize the basis for this Finding/Deficiencies Identified:

The operation is in full compliance with Standard of Practice 6.1 requiring that the site identify potential cyanide exposure scenarios and take measures as necessary to eliminate, reduce, and control them.

MSX has developed procedures describing how cyanide-related tasks should be conducted to minimize worker exposure during cyanide unloading, mixing, plant operation, entry to confined spaces, and equipment decontamination. These procedures address cyanide supply, maintenance, environment, process, safety, system, and medical tasks. Each procedure describes in detail PPE requirements and pre-work inspections (addressing the appropriate forms to be used). MSX provided examples of pre-work inspections.

In order to review how process changes and modifications may affect workers’ health and safety, MSX developed a Management of Changes procedure. The procedure requires the sign-off of a designated review team to ensure the implementation of preventive and correct actions identified. MSX provided three completed forms to verify use of the procedure during cyanide-related changes.

MSX actively solicits input from workers in developing and evaluating health and safety procedures through direct interaction between workers and their supervisors, daily 5-minute safety meetings, monthly safety committee meetings, regular task observations, and annual refresher training. In all these activities the workers regularly ask about concerns and identify improvements. Verification was conducted by reviewing procedures, completed forms, and meeting records from throughout the recertification period.

Standard of Practice 6.2: Operate and monitor cyanide facilities to protect worker health and safety and periodically evaluate the effectiveness of health and safety measures.

[X] in full compliance with

The operation is

[ ] in substantial compliance with

Standard of Practice 6.2

[ ] not in compliance with

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The operation is in full compliance with Standard of Practice 6.2 requiring that the site operate and monitor cyanide facilities to protect worker health and safety and periodically evaluate the effectiveness of health and safety measures.

MSX has developed procedures that state the appropriate pH for limiting the evolution of HCN gas during mixing and production activities. For mixing, the required pH is 10.5 standard units (su) or higher. For leaching and operating the plant, the required pH is 11.0 to 11.5 su. The auditors reviewed time series for the in-line pH meters that showed that the pH was maintained at or above 10.5 su during mixing activities throughout the recertification period. MSX constructed a milk of lime plant next to barren tank 2 in 2016 to raise the pH of the barren solution as it is pumped to the pad for leaching. Previously, lime was added to the haul trucks before they dumped ore on the pad, but ore hauling stopped in mid-2016. The auditors reviewed example plant operator logs that showed the pH varied and the target was generally achieved.

MSX has installed fixed HCN gas monitors in the reagent warehouse, preparation warehouse, and the plant. When the HCN monitors read 4.7 ppm, workers temporarily leave the area and wait until the area ventilates and HCN concentrations decrease. When the HCN monitors read 10 ppm or above, all workers in the area must immediately evacuate and report the incident. The adequacy of the fixed HCN gas monitor locations is quantitatively assessed in compliance with the MSX's Work Environment Monitoring Program. The last assessment conducted resulted in the relocation of the fixed HCN gas monitor inside the process plant. Workers are also required to wear portable HCN gas monitors when working in areas where cyanide is present. The auditors reviewed calibration records to verify that the fixed and portable monitors were regularly calibrated throughout the recertification period.

Eye wash stations, showers, and fire extinguishers are located throughout the operation and are regularly inspected and maintained to ensure their proper functioning and availability. The auditors randomly checked these items to verify functionality and to verify that the fire extinguishers were compatible with cyanide. The auditors also reviewed inspection and maintenance records to verify compliance.

MSX has placed binders containing Safety Data Sheets (SDS) and first aid information, written in the language of the task force, in areas where cyanide is present and in the clinic. Verification was by inspection of the binders.

MSX has placed signage in areas where cyanide is being used advising workers that cyanide is present and prohibiting smoking, open flames, eating and drinking. Signage also clearly lists and displays the minimum PPE requirements for entering and working in the areas. The signage on pipelines indicates the contents and flow direction. Verification was conducted by visual inspection of the signage during the site tour.

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MSX has developed a procedure titled "Accident and Incident Investigation, Reporting and Follow-up" with the objective of establishing the cause of the incident/accident, and implementing the preventive and corrective actions that will avoid the accident/incident from reoccurring. The auditors reviewed completed investigation reports for three minor cyanide incidents that occurred during the recertification period to verify that the incidents were investigated and corrective actions were completed.

**Standard of Practice 6.3: Develop and implement emergency response plans and procedures to respond to worker exposure to cyanide.**

in full compliance with

The operation is

in substantial compliance with

**Standard of Practice 6.3**

not in compliance with

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

The operation is in full compliance with Standard of Practice 6.3 which requires that the site develop and implement emergency response plans and procedures to respond to worker exposure to cyanide.

MSX has provided and inspected equipment to respond to cyanide emergencies. Operators are required to carry a radio while performing their tasks. MSX has placed cyanide antidote kits in the plant, laboratory, preparation warehouse, and clinic. The cyanide antidote kits include amyl nitrate, activated charcoal, water, oxygen, and medical first aid supplies. The auditors verified that the antidote was not expired and was stored at the manufacturer's recommended temperature. MSX has an onsite clinic that it is equipped to treat workers that have been exposed to cyanide. The clinic has a cyanide antidote kit and an ambulance equipped with resuscitator, oxygen, and water. Professional medical staff are available 24 hours a day, 7 days a week and they have been appropriately trained by Chemours to provide first aid for cyanide exposure. MSX completes monthly inspections of their first aid equipment.

MSX has developed a procedures for first aid and land transport of workers in case of cyanide-related incident. MSX has a formalized agreement with the Hospital de Especialidades de la Salud (HEMS), located approximately 20 minutes from the mine in San Luis Potosi, to provide treatment to workers who have been exposed to cyanide. HEMS medical staff have been regularly trained by Chemours to provide treatment to patients that have been exposed to cyanide. MSX renewed the service agreement with HEMS on February 27, 2017.

MSX has developed a calendar of mock drills with the objective of regular testing of their response procedures. Mock drills are evaluated to identify opportunities for improvement. MSX has conducted at least one mock drill a year about a cyanide-related scenario. The mock drills covered both worker exposures and releases to the environment. As a result of mock drill evaluating for the mock drills

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conducted in July 2015 and July 2016, MSX decided to give an additional refresher on cyanide response procedure to the Emergency Response Team (ERT) to improve their response times during cyanide related incidents.

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PRINCIPLE 7 – EMERGENCY RESPONSE

Protect Communities and the Environment through the Development of Emergency Response Strategies and Capabilities

Standard of Practice 7.1: Prepare detailed emergency response plans for potential cyanide releases.

[X] in full compliance with

The operation is

[ ] in substantial compliance with

Standard of Practice 7.1

[ ] not in compliance with

Summarize the basis for this Finding/Deficiencies Identified:

The operation is in full compliance with Standard of Practice 7.1 which requires that the site prepare detailed emergency response plans for potential cyanide releases.

MSX has developed the site-wide ERP and the Cyanide Emergency Response Plan (CN ERP) that include appropriate cyanide failure scenarios for the site, including catastrophic release of HCN gas, transportation accidents, releases during unloading and mixing activities, releases during fires and explosions, pipe, valve and tank ruptures, overtopping of ponds, uncontrolled seepage, failure of cyanide treatment, and failure of heap leach facilities. The cyanide distributors/transporters are responsible for the emergency response and remediation/clean-up in case of an accident prior to the delivery of the cyanide at the reagent warehouse. All cyanide distributors/transporters are certified transporters under the Code. The ERP and CN ERP describe in detail the procedures for clearing site personnel from the areas of exposure, first aid in case of cyanide exposure, control and containment of releases at their source, and mitigation of future prevention of releases.

Standard of Practice 7.2: Involve site personnel and stakeholders in the planning process.

[X] in full compliance with

The operation is

[ ] in substantial compliance with

Standard of Practice 7.2

[ ] not in compliance with

Summarize the basis for this Finding/Deficiencies Identified:

The operation is in full compliance with Standard of Practice 7.2 which requires that the site involve site personnel and stakeholders in the planning process.

MSX has involved its workforce and stakeholders in cyanide emergency response planning. MSX's workforce is regularly approached by the operation via the 5-minute safety talks, monthly safety meetings and task observations with the objective of getting their opinions about emergency response practices. Stakeholders and potentially affected communities are involved in the response planning by participating





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in community meetings and in scheduled visits to the Information Center in Cerro de San Pedro where they have the opportunity to voice their concerns and ask questions to personnel of the operation. MSX has developed an Internal Civil Defense program that is registered with the Civil Defense Department of San Luis Potosi. MSX has a formalized agreement with the HEMS that was renewed in February 2017, in which HEMS is made aware of the emergency response planning in case of a cyanide-related incident. MSX does not designate specific internal emergency response responsibilities to off-site responders or communities with the exception of the hospital agreement with HEMS. MSX has updated their ERP and CN ERP once per year by involving operators in the revision process.

**Standard of Practice 7.3: Designate appropriate personnel and commit necessary equipment and resources for emergency response.**

in full compliance with

**The operation is**

in substantial compliance with

**Standard of Practice 7.3**

not in compliance with

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

The operation is in full compliance with Standard of Practice 7.3 which requires that the site designate appropriate personnel and commit necessary equipment and resources for emergency response.

MSX has developed a site-wide ERP and a CN ERP that include primary and alternate emergency response coordinators, a list of the ERT, requirements for appropriate training for emergency responders, call-out procedures and 24-hour contact information for the coordinators and members of the ERT, duties and responsibilities of the coordinators and ERT members, a list of emergency response equipment, procedures to inspect emergency response equipment to ensure its availability, and descriptions of the roles of outside medical facilities in the emergency response procedures. MSX does not use any outside response agencies for onsite emergencies. However, MSX coordinates with external emergency responders, such as Civil Defense of San Luis Potosi, for support in case an emergency response outside the mine property is needed. MSX has a formalized service agreement with HEMS to treat patients who have been exposed to cyanide. The agreement states that HEMS shall treat patients who have been exposed to cyanide and that their professionals have received the appropriate training for this. Chapter 3 of the ERP includes a full contact list for off-site emergency services, if additional support is needed for off-site emergencies.



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**Standard of Practice 7.4: Develop procedures for internal and external emergency notification and reporting.**

in full compliance with

The operation is

in substantial compliance with

**Standard of Practice 7.4**

not in compliance with

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

The operation is in full compliance with Standard of Practice 7.4 which requires that the site develop procedures for internal and external emergency notification and reporting.

MSX has developed an ERP that include procedures and contact information for notifying management, regulatory agencies, outside providers and medical facilities in case of an emergency. If the emergency expands to the outside of the facility affecting the nearby communities the operation would contact the Civil Defense Department of San Luis Potosi to support in the evacuation efforts. MSX Crisis Management plan (Appendix 9 of the ERP) contains procedures for communicating with the media in case of an emergency.

**Standard of Practice 7.5: Incorporate in response plans and remediation measures monitoring elements that account for the additional hazards of using cyanide treatment chemicals.**

in full compliance with

The operation is

in substantial compliance with

**Standard of Practice 7.5**

not in compliance with

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

The operation is in full compliance with Standard of Practice 7.5 which requires that the site incorporate in response plans and remediation measures monitoring elements that account for the additional hazards of using cyanide treatment chemicals.

MSX has developed a CN ERP that describes specific remediation measures for recovery and neutralization of solutions and solids; decontamination of soils and other contaminated media; management and disposal of clean-up debris; provisions for alternate water supply; and environmental monitoring to identify the nature and extent of a release outside of containment. The CN ERP prohibits the use sodium hypochlorite, ferrous sulphate and hydrogen peroxide to treat cyanide that has reached surface waters. The CN ERP in several sections defines the monitoring requirements to be followed to determine the effects of a cyanide release. The specific sampling and analysis procedures for each case are addressed by the General Environmental Monitoring Program.



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**Standard of Practice 7.6: Periodically evaluate response procedures and capabilities and revise them as needed.**

**in full compliance with**

**The operation is**

in substantial compliance with

**Standard of Practice 7.6**

not in compliance with

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

The operation is in full compliance with Standard of Practice 7.6, which requires that the site periodically evaluate response procedures and capabilities and revise them as needed.

Chapter 5 of the ERP states that the ERP must be updated at least once a year, or more often if changes need to be implemented as a result of mock drills evaluations or changes in the operation. MSX has updated the ERP at least once per year, during the recertification period. The document has a section titled “Document Control (Control de Cambios y Modificaciones)” in which the revision dates and the changes made to the document are listed.

MSX has developed a mock drill calendar that is included in Chapter 5 of the ERP. Chapter 5 states that once a mock drill is finished a committee will meet to document their observations and evaluations. MSX has conducted at least one mock drill a year about a cyanide-related scenario. As a result of the evaluations for the mock drills conducted in July 2015 and July 2016, MSX decided to give an additional refresher on cyanide response procedure to the ERT to improve their response times during cyanide related incidents.

MSX completes incident investigations after actual exposures or releases. If the root-cause analysis indicates the ERP should be modified, MSX would do so. By interview with MSX staff, none of the investigations for incidents this recertification period indicated changes were needed to the ERP.



PRINCIPLE 8 – TRAINING

Train Workers and Emergency Response Personnel to Manage Cyanide in a Safe and Environmentally Protective Manner

Standard of Practice 8.1: Train workers to understand the hazards associated with cyanide use.

[X] in full compliance with

The operation is

[ ] in substantial compliance with

Standard of Practice 8.1

[ ] not in compliance with

Summarize the basis for this Finding/Deficiencies Identified:

The operation is in full compliance with Standard of Practice 8.1 which requires that the site train workers to understand the hazards associated with cyanide use.

MSX has developed an annual training program that includes elements of cyanide hazard recognition. The annual program identifies the training requirement of workers based on the department they belong to and the specific tasks they will perform. New hires and contractors are required to complete a site induction training prior to beginning work at the operation. Refresher training on cyanide hazard recognition is provided annually and it is also covered during the 5-minute talks, monthly safety committee meetings, and task observations. MSX keeps all training records (hard copies) for up to 5 years and in electronic format for the duration of the worker’s employment at the operation.

Standard of Practice 8.2: Train appropriate personnel to operate the facility according to systems and procedures that protect human health, the community and the environment.

[X] in full compliance with

The operation is

[ ] in substantial compliance with

Standard of Practice 8.2

[ ] not in compliance with

Summarize the basis for this Finding/Deficiencies Identified:

The operation is in full compliance with Standard of Practice 8.2 which requires that the site train appropriate personnel to operate the facility according to systems and procedures that protect human health, the community, and the environment.

MSX has trained workers to perform their normal production tasks with minimum risk to worker health and safety in a manner that prevents unplanned cyanide releases. MSX has developed an annual training program that includes task-specific procedure training. Training materials consist of the operation’s standard procedures. MSX has also developed a procedure titled “Competency, Formation and Awareness (Competencia, Formación y Toma de Conciencia)” that describes the steps to be followed to ensure that





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workers will receive the appropriate training to perform their assigned tasks, as well as evaluation and testing criteria for competency and training efficiency. The procedure also includes requirements to be met before the workers are ready to perform their duties independently.

MSX uses experienced managers and supervisors to give task training related to cyanide management activities to their workers. Additionally, Chemours instructors are regularly visiting the operation to give cyanide training. Task-specific cyanide training was provided multiple times a year as refreshers during the recertification period.

Additionally, MSX has developed a procedure titled "Task Observations (Observaciones de la Tarea)" that establishes the criteria for task observations. These observations are conducted on a regular basis by supervisors. MSX keeps training records electronically throughout an individual's employment. Records include the name of the employee, name of the instructor, date of training, topic covered, and test scores.

Verification was conducted by reviewing the annual training program, records of task-specific training, the competency and observation procedures, and the electronic database of training records, as well as by interviewing supervisors and operators.

**Standard of Practice 8.3: Train appropriate workers and personnel to respond to worker exposures and environmental releases of cyanide.**

in full compliance with

The operation is

in substantial compliance with

**Standard of Practice 8.3**

not in compliance with

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

The operation is in full compliance with Standard of Practice 8.3 which requires that the site train appropriate workers and personnel to respond to exposures and environmental releases of cyanide.

All cyanide unloading, mixing, production and maintenance personnel are trained in task specific procedures for emergency response, decontamination and first aid to be followed if cyanide is release. Operators are trained in cyanide first aid to assist workers that may be exposed to cyanide. Operators are instructed to, if possible, remove the exposed workers to a safe area and to contact the ERT for transport of the affected worker to the onsite clinic. The annual training program includes refresher training of the contents of the ERP and CN ERP, including cyanide safe management, first aid, emergency response protocols, and response procedures for potential cyanide releases.

MSX has developed a calendar of mock drills with the objective of regular testing of response capabilities and training purposes. MSX has conducted at least one mock drill a year about a cyanide-related scenario.



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The drills covered both worker exposures and releases to the environment. Mock drills are evaluated to incorporate opportunities for improvement to the response planning and to implement corrective actions. As a result of the evaluations for the mock drills conducted in July 2015 and July 2016, MSX decided to give an additional refresher on cyanide response procedure to the ERT to improve their response times during cyanide related incidents.

MSX emergency response coordinators and members of the ERT have received training in the procedures included in the ERP regarding cyanide, including the use of response equipment. Chemours has also provided cyanide management training to the ERT and emergency coordinators.

MSX has not assigned specific responsibilities for internal emergency response to outside entities. MSX would use external entities to support emergency activities outside the mine property, if necessary. MSX has registered their ERP with the Civil Defense Department of San Luis Potosi and shared the ERP with the local hospital (HEMS) for support with off-site medical assistance.

MSX retains electronic records of cyanide training throughout the individual's employment with the operation. Records include the name of the employee, name of the instructor, date of training, topic covered, and test scores.

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PRINCIPLE 9 – DIALOGUE

Engage in Public Consultation and Disclosure

Standard of Practice 9.1: Provide stakeholders the opportunity to communicate issues of concern.

[X] in full compliance with

The operation is

[ ] in substantial compliance with

Standard of Practice 9.1

[ ] not in compliance with

Summarize the basis for this Finding/Deficiencies Identified:

The operation is in full compliance with Standard of Practice 9.1 which requires that the site Provide stakeholders the opportunity to communicate issues of concern.

MSX has developed a thorough community relations plan that manages the interactions with the local communities. MSX provides opportunities for stakeholders to communicate issues of concerns regarding the management of cyanide through the following mechanisms: Suggestion boxes (information received is then processed following the procedure titled "Mechanism for Management of Suggestions, Congratulations and/or Complaints" to track and answer to all matters that require the attention of MSX); the establishment of an information center at the Cerro de San Pedro village where multimedia materials explaining how the mine operates, chemicals used by the operation (including a dedicated section for cyanide), and how the minerals are processed are shown. Visitors can directly communicate with front desk personnel and leave comments on the visitor's book; and the development of a "Community Involvement Plan" in which activities are defined with the goal of including the communities in the development of better avenues for sustainable growth. In each of these activities the participants have the opportunity to directly communicate their concerns to the operation.

Standard of Practice 9.2: Initiate dialogue describing cyanide management procedures and responsively address identified concerns.

[X] in full compliance with

The operation is

[ ] in substantial compliance with

Standard of Practice 9.2

[ ] not in compliance with

Summarize the basis for this Finding/Deficiencies Identified:

The operation is in full compliance with Standard of Practice 9.2 which requires that the site initiate dialogue describing cyanide management procedures and actively address identified concerns.

MSX has developed a Community Involvement Plan that includes several activities in which the operation creates opportunities to interact directly with stakeholders and provide them with information regarding





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cyanide management. This plan includes the operation of the information center in Cerro de San Pedro village, weekly visits to the surrounding communities, processing of the information received via suggestion boxes, community meetings, and community environmental monitoring events. In each of these activities the operation has the opportunity to interact with the communities and stakeholders and provide them with general information on safe cyanide management.

**Standard of Practice 9.3: Make appropriate operational and environmental information regarding cyanide available to stakeholders.**

in full compliance with

The operation is

in substantial compliance with

**Standard of Practice 9.3**

not in compliance with

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

The operation is in full compliance with Standard of Practice 9.3 which requires that the site make appropriate operational and environmental information regarding cyanide available to stakeholders.

MSX has established an information center at Cerro de San Pedro village in which they exhibit multimedia and written descriptions of how their activities are conducted and how cyanide is managed. Additionally, MSX has developed brochures, PowerPoint presentations and videos that are presented to the communities during quarterly meetings. MSX actively publishes articles about their operation in the mining magazine Mundo Minero that is distributed to the public event though United Nations statistics for Mexico show that the 2007-2012 literacy rate is above 98 percent.

As part of the Community Involvement Plan, MSX publishes an Annual Sustainability Report which includes information about the safe management of cyanide at the Cerro de San Pedro mine and incidents recorded during the relevant year. Sustainability reports can be accessed at: <http://www.newgold.com/corporate-responsibility/sustainability-report/default.aspx>.

MSX has developed a site-wide ERP and a CN ERP that include procedures for reporting of accidental cyanide releases or exposure incidents. Significant releases are reported to the Mexican environmental agencies in accordance to their guidelines for incident reporting. All incidents that result in hospitalization and/or a fatality would be reported to two Mexican government agencies: the Instituto Mexicana de Seguro Social (IMSS) and the Secretaria de Trabajo y Prevision Social (STPS).

MSX experienced a significant release of cyanide solution on May 26, 2014 due to a slope failure from the pad out of containment. The release affected two waterholes (“bordos”). Contaminated soils were excavated and disposed of on the heap leach pad, post-remediation sampling was conducted until concentrations were less than 0.5 ppm WAD cyanide. The incident was appropriately reported to the

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Mexican environmental agencies and the ICMI. MSX has not experienced any incidents that resulted in hospitalization or fatality during the recertification period.

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## Report Signature Page

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