SUMMARY AUDIT REPORT

for the July 2014
International Cyanide Management Code Recertification Audit

Prepared for:
Fairbanks Gold Mining, Inc.
Fairbanks, Alaska
and Kinross Gold Corporation

Submitted to:
International Cyanide Management Institute
1200 “G” Street NW, Suite 800
Washington, D.C. 20005

FINAL
January 8, 2015

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Seattle, Washington 98164
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Name of Operation: Fort Knox Mine

Operation Owner: Kinross Gold Corporation

Operation Operator: Fairbanks Gold Mining, Inc. (FGMI)

Name of Responsible Manager: Eric Hill, General Manager

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Location and Description of Operation:

The Fort Knox Mine is a conventional open-pit gold mine approximately 26 miles northeast of Fairbanks, Alaska. The mine was originally permitted in 1994 and is operated by Fairbanks Gold Mining Inc. (FGMI), a wholly owned subsidiary of Kinross Gold, and in its current configuration produces about 370,000 ounces of gold annually.

Ore processed through a crushing and grinding circuit and appropriately sized material then flows into a high-rate thickener and then into a carbon-in-pulp (CIP) cyanide leach circuit. After carbon stripping and electrowinning, the extracted gold and silver is melted into doré ingots. The mill was originally designed to incorporate an INCO copper sulfate/ammonium bisulfate detoxification circuit to reduce weak acid dissociable (WAD) cyanide concentrations to acceptable values prior to tailings deposition. However, in 2002 a tailings wash thickener was installed; cyanide is recovered and cycled back into the mineral separation process, substantially reducing WAD concentrations in tailings as well as reducing the amount of cyanide and other reagents required. The detoxification circuit is held in reserve and activated as necessary to address process fluctuations.

Tailings are routed to a tailings storage facility, comprised of a deposition area, decant pond, earth-filled containment dam, and a seepage interception, collection, and pump-back system. Water from the decant pond is recycled back to the mill, thereby minimizing the need for fresh makeup water.

In 2008, Kinross initiated the engineering and construction of a heap leach facility and expansion of the open pit mine, which will enable the stockpiling and processing of low-grade ore and is expected to extend the projected mine life to about 2020. The heap leach pad is a valley fill design, located in a drainage upstream from the tailings storage facility. The facility was designed with a single-lined side hill pad; a double lined linear low density polyethylene (LLDPE) liner with high density polyethylene (HDPE) collection piping beneath an in-heap storage pond; underdrains; and an underdrain leak detection system. Pumping stations and pipelines for pregnant and barren solution were also
constructed, along with a new Carbon in Column (CIC) plant in the mill complex in 2011 with a subsequent expansion in 2013.

The mine location is shown in the following Figure:
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Auditors’ Findings

The operation is: ■ in full compliance
                 in substantial compliance
                 not in compliance

with the International Cyanide Management Code.

This operation experienced three reportable incidents during the previous three-year
audit cycle involving cyanide solution spills, all of which were contained within the
boundaries of the operation. All incidents were properly reported and resolved with
appropriate regulatory authorities; underlying maintenance issues were investigated and
have been effectively corrected. More detailed discussions of these incidents and their
resolution are presented under Standard of Practice 9.3.

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Audit Team Leader: Clinton Phaal e-mail: cphaal@environcorp.com

Names and Signatures of other Auditors

Adrián Juárez

Date(s) of Audit: July 7 through July 11 2014

I attest that I meet the criteria for knowledge, experience and conflict of interest for ICMC
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 ICMC 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 ICMC Verification Protocol for
Gold Mine Operations and using standard and accepted practices for health, safety, and
environmental audits.

Fort Knox

Name of Mine

January 8, 2015

Signature of Lead Auditor

Date
SUMMARY AUDIT REPORT

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.

The operation is: ■ in full compliance
in substantial compliance
not in compliance…with Standard of Practice 1.1

Discuss the basis for this Finding/Deficiencies Identified:

Review of current contract documents indicates that FGMI continues to purchase cyanide mostly from E.I. du Pont de Nemours and Company (DuPont); but has also purchased sodium cyanide from Cyanco Company LLC (Cyanco) in 2011 and 2013. In both contracts, Section 5 commits the Buyer and Seller to maintaining ICMC certification and signatory status. DuPont’s and Cyanco’s ICMC certifications were verified as current. FGMI’s current contract with DuPont was signed in January 1, 2013 as an extension of the previous contract dated January 1, 2011. FGMI’s contract with Cyanco was signed in January 1, 2011. FGMI plans to purchase cyanide from Cyanco in future.

2. TRANSPORTATION Protect communities and the environment during cyanide transport.

Standards 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.

The operation is: ■ in full compliance
in substantial compliance
not in compliance…with Standard of Practice 2.1.

Discuss the basis for the Finding/Deficiencies Identified:

The current DuPont contract (January, 2013) indicates that DuPont is responsible for cyanide production as well as all aspects of transportation of cyanide to the FGMI site. Section 4.2 of the contract requires that all packages include labels and tags containing adequate and accurate information with respect to use, safety and treatment of the products. Section 5 of the contract requires DuPont compliance with the requirements of the ICMC applicable to all aspects of production and transportation, including...
appropriate packaging and labeling. Schedule B of the contract “specific purchase conditions (SPC)” includes details for packaging and labeling.

The current Cyanco contract (January, 2011) includes the same conditions as DuPont’s contract, related to packaging and labeling. Schedule C of this contract “specific purchase conditions (SPC)” in section 5 “product packaging” specifies the details for packaging and labeling.

All transportation from both Dupont and Cyanco takes place in the United States and all labeling is in English.

For both suppliers, contractual requirements for ICMC compliance extend to their entire transportation chain as follows:

Dupont’s Responsibilities
- Intermodal Cartage Company, Memphis, Tennessee (DuPont’s Memphis production facility to the Memphis railhead);
- Union Pacific railroad (Memphis railhead to the Alaska Marine Lines rail-barge loading facility in Seattle);
- Alaska Marine Lines (Seattle rail-barge loading facility to the port of Whittier, Alaska);
- Alaska Railroad Company (Port of Whittier by rail to the Fairbanks rail terminal);
- Alaska West Express (truck to the Fort Knox mine).

Cyanco’s Responsibilities
- Quality Carriers, from Cyanco Plant to Union Pacific Railhead – Houston, TX;
- Union Pacific, from UP Railhead, Houston TX – UP Railhead, Seattle WA;
- Alaska West Express (AWE), from UP Railhead, Seattle, WA – FGMI;
- AWE: UP Railhead – Seattle WA to FGMI, Alaska;
- AWE: UP Railhead - Seattle, Washington - SEA-PAC Transport Services, LLC Harbor Island / Port of Seattle, Washington;
- Alaska Marine Lines (AML): SEA-PAC Transport Services, LLC Harbor Island / Port of Seattle, Washington - Port of Whittier, Alaska;
- Alaska Railroad: Port of Whittier, Alaska - Alaska West Express (AWE) Interim Storage yard Fairbanks, Alaska;
- AWE: AWE Interim Storage yard Fairbanks, Alaska – FGMI.

All links in the transportation chain have been certified to ICMC requirements.

2.2 Require that cyanide transporters implement appropriate emergency response plans and capabilities, and employ adequate measures for cyanide management.

The operation is: ■ in full compliance
in substantial compliance
not in compliance…with Standard of Practice 2.2.
Discuss the basis for the Finding/Deficiencies Identified:

The current contracts indicate that the Sellers (DuPont and Cyanco) are responsible for all aspects of transportation of cyanide to the FGMI site, as well as cyanide production. Section 5 of both contracts commits the sellers to maintaining ICMC certification and signatory status.

The ICMI website and documentation provided to FGMI by DuPont and Cyanco, confirm that all transportation contractors have been certified to the ICMC. AWE shipping manifests document chain of custody from the point that containers are offloaded from rail cars in the Alaska Railroad Company terminal in Fairbanks, to the point of delivery at the Fort Knox mine. Review of sample paperwork from 2012, 2013, and 2014 indicates that this practice has remained constant since the date of the original certification audit. Upstream chain of custody documentation prior to offloading of intermodal containers in Fairbanks is not provided to AWE. However, all potential transporters involved in the transport of cyanide from DuPont’s Memphis facility to the Fort Knox mine have been identified and certification to the ICMC has been confirmed. Maintenance of chain of custody records within each other transportation segment is addressed as an element of each of the corresponding ICMC supply audit reports was found to be acceptable in each of the Summary Audit Reports (SARs) posted on the ICMI website for the noted audits. This audit item is therefore considered to be acceptable.

3. HANDLING AND STORAGE

Protect workers and the environment during cyanide handling and storage.

Standards of Practice

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

The operation is: ■ in full compliance
in substantial compliance
not in compliance…with Standard of Practice 3.1.

Discuss the basis for this Finding/Deficiencies Identified:

The engineering report cited in the 2007 audit and 2011 recertification audit reports remains on file. This document serves as the basis for cyanide storage and mixing facilities being deemed as constructed and designed in terms of the code up until 2011. Since the 2011 recertification audit, mine infrastructure has expanded including the construction of CIC #2 (2013) and the relocation of the cyanide loading dock and storage area (2012):

- CIC #2 plant construction was completed in 2013 to the same design as CIC #1 (with the exception of one additional column). A Construction Certification Letter

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provided from Morrison Maierle confirms that the plant was commissioned and all systems were functioning within the intent of the design.

- Due to the construction of the CIC #2 plant, the cyanide loading dock and storage area was relocated from adjacent the mixing bay to the north east corner of the Tails Wash Thickener Building. The design of the new loading dock and storage area formed part of the engineered design for CIC #1 with a construction certification letter also provided as part of the CIC #2 sign off documentation.

The field component of the audit confirms that the cyanide mixing area was located within the internal structure of the mill on concrete hardstanding maintained in good condition. Mixing tanks were located within secondary containment concrete berms which are sized to contain at least 110% volume of the largest tank. The storage and mixing areas are also subject to daily inspections at shift start to detect any obvious releases or failure in containment. The cyanide mixing area and arrangements for mixing remain substantially unchanged from the previous recertification audit.

The upper working deck of the mixing tanks contains a level indicator and high level alarm, which are connected to the mill control room. In the event of overfill, both the mixing operators and control room operators are notified through the automated system. Arrangements have remained unchanged since the 2011-recertification audit.

The area is access controlled with the appropriate cyanide warning signage. No other material storage is permitted in this area. The tail wash thickener building is secured from weather and is of large volume with ventilation vents present along the four side walls.

The cyanide storage area and loading dock are both located within the mill complex which is situated within the security perimeter of the mine, away from public access. In addition the mill complex is not located near to surface water receptors, being located several thousand feet from the nearest natural stream or watercourse. Sodium cyanide is only purchased in solid briquette format and as such no liquid form of cyanide is handled during unloading activities.

3.2 Operate unloading, storage and mixing facilities using inspections, preventive maintenance and contingency plans to prevent or contain releases and control and respond to worker exposures.

The operation is:

- in full compliance
- in substantial compliance
- not in compliance…with Standard of Practice 3.2.

Discuss the basis for this Finding/Deficiencies Identified:

Plans and procedures for managing empty containers are similar to those reviewed in the 2011 audit. Sodium cyanide is received onsite in the form of super sacks. Operating procedures specifies that measures are undertaken to ensure that sacks are managed in such a manner to prevent their use for any other purposes. Observation of mixing procedures confirms that sacks are rinsed a minimum of three times with rinse water.
directed into the cyanide mixing tank. Empty super sacks, once rinsed, are removed along with other packaging residue for buried disposal at the mine’s licensed waste disposal site. Cyanide is not purchased in reusable containers and therefore no packaging is returned to the supplier.

Plans and procedures for prevention of exposures and releases during cyanide unloading and mixing are virtually identical to those reviewed in the 2007 and 2011 audits. They contain specific directions on unloading, handling, storage, and disposal of palletized plywood crates, plastic bags, and empty super sacks. Procedures also instruct on actions for the cleanup of spills in the mixing area; the facility is designed to capture any such spills in the bermed containment, and pumping back to the mixing or storage tank. The procedure also requires mixing activities to be performed by two operators. Both workers used appropriate personal protective gear (raingear, face shields, hard hats, steel toed rubber boots, rubber gloves, and half-face respirators).

During the field component of the audit an example of correction of an operator task involving cyanide was noted. During mixing activities, water was being used to wash interior surfaces near to sodium cyanide super sack prior to being placed onto a hoist for emptying. This activity was not in accordance with SOP OPG 01 for mixing of cyanide. The operator was immediately corrected and the activity noted on a Cyanide Task Observation Form by a supervisor. The observation was formally communicated to the operator and filed on record.

4. OPERATIONS Manage cyanide process solutions and waste streams to protect human health and the environment.

Standards of Practice

4.1 Implement management and operating systems designed to protect human health and the environment including contingency planning and inspection and preventive maintenance procedures.

The operation is: ■ in full compliance
■ in substantial compliance
not in compliance...with Standard of Practice 4.1.

Discuss the basis for the Finding/Deficiencies Identified:

FGMI has established a series of plans and standard operating procedures for the routine operation of all cyanide facilities. These documents are largely similar to those observed in the 2011 audit with the addition of procedures for management of the heap leach facility. Procedures are retained as electronic versions as well as in hard copy format at specific work areas.

The design parameters for the major cyanide management facility components are stated within governing permit documents; the auditors confirmed that copies of the State of Alaska Waste Management Permit (2014DB0002) are retained on file. This
permit succeeds and replaces the previous permit (No. 2006-DB0043). The design parameters for the major cyanide management facility components are stated within governing permit documents in the same manner as noted in the 2011 recertification audit.

Manuals updated in 2014 for the operation and maintenance of the heap leach pad (HLP) and the tailings storage facility (TSF) provides directions considering the changes on those facilities. The new CIC#2 plant operates using the same procedures as the CIC#1. The new sodium cyanide storage area is operated under existing procedures (SOP 8).

FGMI continues to operate under the “Kinross Way for Maintenance - JDE Global data standards v3 06” (dated March 15, 2012) the preventive and corrective maintenance program with support of JD Edwards (JDE) software, as part of a business process optimization effort. This procedure describes how the JDE Maintenance module or Capital Asset Management works which includes the information about individual pieces of equipment, work orders that provide a general plan for maintenance work and allows users to add parts, labor, or other tailored instructions, preventive maintenance (PM) work orders which are triggered automatically and are time and usage dependent and crew scheduling and resource assignment.

FGMI plans general inspections as part of maintenance program and conducts inspections as part of the Health and Safety Management System which addresses the control and management of conditions in the workplace and the heap leach facility.

In the same manner noted in the 2011 DAFR, FGMI has three procedures to identify changes that may affect the process or operating practices:

- Major changes involving capital expenditures for design, engineering, construction, construction management, quality assurance/quality control (QA/QC), and other contracted services, all of which involve the Kinross Authorization for Expenditure (AFE) process;
- Generating new SOPs and changes to SOPs; and
- Communication of operational process or process control changes in the mill, heap leach pad and TSF.

The AFE process to initiate the engineering and construction projects requires the review of all AFEs and approval by the FGMI Environmental Manager and Health and Safety Manager prior to submittal for additional FGMI management and Kinross Corporate authorizations. The AFE process includes completion of a primary and a secondary checklist as follows:

- EH&S checklist; This prompts review by EHS staff to consider if the proposed project is related to CN storage, use, or management, and if so, to complete a secondary project review checklist; and
- The Project review checklist for ICMC compliance ensures that all ICMC requirements are identified, considered, planned for, and addressed early in the
project planning and project development cycle, and when any facility or operating process change is planned which might impact management of cyanide or cyanide solutions.

The AFE process was implemented for the CIC#2, HLP expansion, the TSF dam raise and the CIC#1 Seismic upgrade.

Changes in standard operating procedures within the Mill and TSF are managed through a management of change procedure which requires the approval of the Environmental and Health and Safety managers when use of cyanide or cyanide facilities is involved. A further procedure sets requirements for communication of operational process or process control changes. These include interdepartmental meetings that are held on at least a weekly basis and provide a forum by which SOP generation or modification requests, Operational & Maintenance (O&M) Manual modifications, or AFE requests can be originated.

FGMI conducts daily inspections around the mill area (Mill Route #1) and report any observations or deviations to supervisors. A log of these inspections is retained on file. Any corrective maintenance orders resulting from the daily inspections are generated and describe the nature of the problem, order number, date, and estimated hours for repair.

FGMI conducts daily inspections of the HLP. Inspection sheets lists a set of questions the inspector should review about, for example: pH in the solution (10-12), the physical conditions of the liner, if there are signs of ponding, wild life mortalities, the level at the in-heap pond, the structural conditions at all components (lime silo, pipeline corridor, water control system, spillway, pumps, etc.) and includes, hours spent on the inspection, date of inspection, name, signature of the responsible person. Daily inspections are also conducted at the TSF, focusing on the relevant components.

The Emergency Action Plan (EAP) Revision 2 includes response procedures, and internal, public and government agencies communication procedures, and detection, evaluation and classification procedures. Events covered include extreme runoff from rainfall or snowmelt, increased seepage, and earthquake events as well as process solution releases within the mill. The EAP describes ways to detect an event, including, observations by the FGMI personnel or contractors, and evaluation of instrumentation data. Also included are descriptions of unusual conditions to observe, including changes in piezometer readings, changes in quality or color of flow from the seepage collection system. Instrument readings are compared with design limits, and previous readings.

The EAP also provides contingency instructions for shutdowns and closures, short term and extended shutdowns, and for closures from one month up to three years. Any shutdown period is determined by the reservoir/in-heap pond capacity and the water balance.

FGMI continues to use a comprehensive, probabilistic water balance using Goldsim software platform. A dedicated professional is in charge of managing the water balance, and this effort is supported by an external consulting company (Schlumberger Water...
Services) who provide assistance on certain points of management. A description of the water balance model and calculation is described in the Water Balance SOP (FGMI EHS-E139) updated in December 2013 and again in August 2014.

FGMI maintains several O&M Manuals and SOPs that make provision for daily inspection including the heap leach facility, TSF fresh water dam and the heap leach facility.

Tanks holding cyanide solutions are inspected daily for signs of leakage and general deficiencies, within the Mill Route work order. All tanks are subject to wall thickness test annually including leach/CIP tanks, cyanide mix tank, cyanide storage tank and the caustic tank. Work for 2012, 2013 and 2014 were reviewed, and the inspection reports shows data were collected in multiple locations.

During the field audit, missing flange bolts were identified at the CIP/CIL tanks and leaks at every blind flange. Subsequent to the audit and during the preparation of this report, FGMI provided photographic evidence that the missing flange bolts were installed and provided a copy of the modified checklist used with the “Mill Route” work order, including identification of leaks and missing bolts, as well as training records of the updated procedures.

As noted in the 2011 recertification audit report, the CIC#1 containment has been fitted with an emergency overflow sump and a large diameter drain line reporting to the CIP/CIL impoundment. The CIP/CIL area contains 13 large solution tanks and is open to the weather, but drains to additional containment areas beneath the tails thickener and detoxification tanks, in the basement of the detoxification plant building. The CIC#2 tanks have their own containment area, which has been connected to the emergency overflow, mentioned above. This increases the available volume in the event of a spill, by connecting the CIP/CIL secondary containment volume with the tails thickener and detoxification tanks containment volume.

During the field audit, the CIP/CIL secondary containment volume was observed to partially contain fluids from maintenance actions and minor process upsets. Apart from reducing the availability of secondary containment volume in a potential spill event by an unknown amount, the retained fluids interrupted the connection with the secondary containment of the tails thickener and the additional containment volume in the detoxification facility, and inundated the seepage inspection ports on the ring beam foundations for CIL tanks # 5 and #6. However, during the preparation of this report, FGMI provided photographic evidence demonstrating that retained fluids had been pumped back to the process; and ring beam inspection ports were cleaned and examined, and photographs and inspection reports provided indicate no seepage of process solution from the interiors of CIL tanks # 5 and #6.

FGMI has four diesel generators for backup power, located in a separate dedicated building close to the process plant. In addition, generators are located near to the pumping station of the HLP. FGMI provided examples of preventive maintenance records for the HLP backup power for 2011, 2012, 2013 and 2014. A review of these records, confirmed that the generators are checked for fuel level, lighting, heating, and...
are also start tested. This inspection would trigger a corrective maintenance work order if required.

FGMI provided examples of preventive maintenance records for 2011, 2012, 2013 and 2014 for different facilities, which were reviewed during the field audit. It is the opinion of the auditors that inspections are undertaken at adequate frequencies and are documented to assure that cyanide facilities are functioning within design parameters.

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

The operation is:   ■ in full compliance  
                   in substantial compliance
                   not in compliance…with Standard of Practice 4.2.

Discuss the basis for this Finding/Deficiencies Identified:

The two drivers to control cyanide addition are the Permit issued by the State of Alaska related to a maximum WAD CN at the tailings slurry and the need to have adequate cyanide concentrations for gold extraction from the ore.

FGMI has defined, based on ore characteristics, a NaCN consumption of 0.135 lbs/ton for the leach circuit and 0.30 lbs/ton for heap leach. Addition rates vary depending on head grade of material and recovery. Cyanide addition rates are monitored and controlled with an optimum target set for cyanide consumption. The pH values in the solution are also monitored. Cyanide can be added to the process at any one of three leach tanks, or at CIP Tank #1. Cyanide addition is controlled from the primary control room in the mill. Actual monitoring and measurement of cyanide concentrations at various points in the process is conducted by mill personnel via real time titration analysis. Values so obtained are entered into the automated control system. The pH is controlled by addition of lime on to the SAG feed belt, as well on the ore being place on the heap leach pad. Reviews of randomly sampled operator logs completed during the past 3 years indicate that concentrations were generally maintained within the set parameters.

The TAC 1000 system and the Distributive Control System (DCS) allows control of cyanide addition, based on CN measurements in the solution, by achieving maximum recoveries using the correct concentration of cyanide. The permit requires FGMI to control CN in the tailings slurry, which requires FGMI to operate the tails thickener and allowing recovery of a large portion of CN solution, which is then reused in the process.
4.3 Implement a comprehensive water management program to protect against unintentional releases.

The operation is: ■ in full compliance
                  ■ in substantial compliance
                  ■ not in compliance…with Standard of Practice 4.3.

Discuss the basis for the Finding/Deficiencies Identified:

FGMI continues to use a comprehensive, probabilistic water balance using Goldsim software platform. A dedicated professional is in charge of managing the water balance, and this effort is supported by an external consulting company (Schlumberger Water Services) who provide assistance on certain points of management. A description of the water balance model and calculation is described in the Water Balance SOP (FGMI EHS-E139) updated in December 2013 and again in August 2014 following a request from the auditors to describe the entire calibration procedure.

The water balance SOP describes that the solution rates applied to the leach pads through the heap leach pumping rates. Tailings deposition rates into the TSF are considered during the calibration process. The operation measures precipitation and the data is used frequently to update the O&M manual for the TSF and HLP as they are in constant expansion. The water balance model is updated and calibrated quarterly using recorded water levels, site pumping records, and meteorological records.

The FGMI site has been design as a zero discharge facility and is permitted as such. To this end the TSF is designed to operate for a total required freeboard of 3 ft and to accommodate the design storm volume of 1546 ac-ft, resulting of a 100 yr/24-hr storm event. In order to keep this volume free at the TSF, the operation conducts biannual bathymetric surveys, keeps calculations of the free volume and plans accordingly the required lifts on the TSF. The water balance predicts water levels at the TSF pond and compares the result with final measured values adjusts the model as necessary and makes provision for TSF lifts as necessary in order to keep the facility as a Zero discharge facility.

The HLP was designed with a spillway reporting to the TSF, for the peak flow from the 100-yr/24-hour storm. This volume (680 ac-ft) was also considered within the TSF design.

A weather station is situated at the mine and has collected rainfall data since December 1997. The evaporation data is collected from the weather station operated by the University of Alaska Experiment Station, located 18.5 miles of the mine site. These data have been used to update the pre-feasibility study for the HLP Expansion.

The water balance considers evaporation losses, and calculated infiltration rates for both disturbed and undisturbed areas. Ice formation is also measured when conditions allow. No discharges are made to surface water; the TSF dam is designed with a seepage collection and return system.

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

The operation is:  ■ in full compliance
in substantial compliance
not in compliance…with Standard of Practice 4.4.

Discuss the basis for the Finding/Deficiencies Identified:

The mine does not operate ponds, impoundments or other areas of open waters with WAD concentrations above 50 mg/l.

Site procedure 24.11 (Ore Processing, Starting Reagents and INCO Process) specifies that that the tailings discharge and waste slurry to the TSF must be maintained at a monthly average of 10 ppm (mg/l) WAD cyanide and a maximum of 25 ppm (mg/l) WAD cyanide for any shift discharge. These limits are also specified within Waste Management Permit 2014 (dated March 28, 2014) issued by the State of Alaska Department of Environmental Conservation. To ensure compliance, tailing discharges are monitored for WAD cyanide levels by collecting a composite sample for each 12-hour shift. The samples are analyzed daily by the FGMI laboratory to determine WAD cyanide levels. A review of a sample of results from 2012 to 2014 showed recorded WAD cyanide maximum concentrations were generally below 20 mg/l, generally averaged between 8-10 mg/l and were all below 50 mg/l.

In addition to monitoring WAD cyanide levels in tailings discharged to the TSF, quarterly results from the decant pond are also submitted to the Alaskan Department of Environmental Conservation (ADEC). A review of records from 2012 to 2014 showed that WAD cyanide levels in the tailing dam decant solution varied between 0.017 mg/l and 4.1 mg/l.

Surface water locations and groundwater monitoring wells are sampled quarterly to demonstrate compliance with the conditions of the permit. Neither surface water nor groundwater monitoring sites showed evidence of impact having occurred from the mining operations or tailings impoundment dam. A cutoff interceptor drain and a series of twelve interceptor wells are located at the toe of the TSF dam and collects groundwater and seepage. The drain and wells are pumped on a continuous basis and directed back to the facility creating a hydraulic cone of depression in this area.

The heap leach facility design incorporates a covered heap leach containment pond for pregnant solution and there are no open ponds associated with the facility. The heap leach pad is loaded eight to nine months a year depending on weather as loading is impractical during winter months. During the recertification audit, the surface of the heap leach pad was observed to be free from ponding of pregnant solution. During winter months, pregnant solution emitters are buried beneath 3 feet of crushed material to provide cold weather protection. During warmer periods and non-winter months, emitter lines are laid upon the surface of the heap leach pad. One incidence of ponding
occurred in May 2014. The standing liquid was immediately covered with a polyethylene liner and a wildlife watch in instituted to ensure that fauna did not access the liquid.

All FGMI personnel receive environmental awareness training during which they are instructed to report any wildlife mortalities and environmental, maintenance, ore processing and mine operations personnel have specific responsibility to thoroughly inspect and report wildlife mortalities and terrestrial animals mired in unconsolidated tailing. Records show one incident in 2012 involving forty eight (swallow) mortalities associated with a cyanide solution leak into nests located beneath the upper deck housing of Leach Tank #1. Subsequent repairs to a cyanide solution pipeline were completed and hazing measures installed to discourage further nest building in this area. The incident was properly reported to the regulatory authorities. (See Standard of Practice 9.3 for more detailed discussion).

4.5 Implement measures to protect fish and wildlife from direct and indirect discharges of cyanide process solutions to surface water.

The operation is: ■ in full compliance
■ in substantial compliance
■ not in compliance…with Standard of Practice 4.5.

Discuss the basis for the Finding/Deficiencies Identified:

As noted in the 2011 recertification audit, this Standard of Practice is not applicable; FGMI does not make any direct discharge to surface waters. The TSF is operated and managed as a zero discharge facility with a seepage collection and return system installed at the toe of the TSF dam. Review of surface and groundwater monitoring data from 2011 to 2014 shows no evidence to indicate that cyanide related impacts have occurred.

4.6 Implement measures designed to manage seepage from cyanide facilities to protect the beneficial uses of ground water.

The operation is: ■ in full compliance
■ in substantial compliance
■ not in compliance…with Standard of Practice 4.6.

Discuss the basis for the Finding/Deficiencies Identified:

The FGMI facility is designed to protect the beneficial uses of groundwater through a combination of containment of process water and groundwater monitoring to ensure zero discharge is maintained.

The heap leach pad and its in-heap pond are placed on the top of a composite double liner system comprising a low permeability sub base overlain by a low density
polyethylene secondary geo membrane line. The HLP is also fitted designed with a 36-inch thick over liner drain, that acts as a drain and protects the underlying liner system during ore placement. The system is subject to daily inspections, which also includes the pipeline corridor from the HLP up to the mill. Since the HLP and pipeline corridor are lined as described previously, there is no contribution to seepage.

The TSF operates with a seepage control system including interception wells located at the toe of the TSF. Water collected in the wells is returned to the TSF pond. The TSF embankment includes a gravel drain incorporated into the downstream toe of the embankment, a bentonite clay liner, seepage reclaim sump and pump system to return any captured seepage to the tailings pond.

A quarterly groundwater monitoring program is conducted by FGMI and reported to Alaskan Department of Environmental Conservation (ADEC) quarterly. The FGMI waste management permit (Permit No. 2014DB002) issued by the State of Alaska, department of environmental conservation, on March 28, 2014, requires:

a) For monitoring wells (MW), WAD Cyanide may not exceed 0.020 mg/L.

b) For interceptor wells (IW), WAD Cyanide concentration may not exceed 1 mg/L

FGMI reports quarterly to the State of Alaska, as required by their waste management permit; the values reported for WAD CN at the MW are all below 0.003 mg/L, for the years 2011, 2012 and 2013. The WAD CN readings reported for the IW all showed values below 1 mg/L.

4.7 Provide spill prevention or containment measures for process tanks and pipelines.

The operation is: ■ in full compliance

in substantial compliance

not in compliance…with Standard of Practice 4.7.

Discuss the basis for the Finding/Deficiencies Identified:

The cyanide mixing and storage tanks and all solution tanks in the CIP/CIL and detoxification circuits are located in a fully bermed concrete containment impoundments sized to contain 110% of the largest tank volume.

Secondary containment volume calculations remain on file and containments have remained unchanged. Building CIC#2 is the only newly constructed facility with secondary containment volume confirmed by an independent engineering company as 106% of the largest tank volume. A gravity drain connects CIC#2 to CIP/CIL tank containment and provides additional reserve containment in the event of a CIC spill. In addition, it should be noted that the entire mill complex is up gradient of the tailings management facility.

During the field audit the CIP/CIL SC was observed to be partially filled with cyanide solution and sludge arising from tank cleaning that obstructed visual inspection of tank
bases #5 and #6. However, during the preparation of this report, FGMI provided photographic evidence demonstrating that these fluids had been pumped back to process areas and the containment cleaned; and ring beam inspection ports were cleaned and examined, and photographs and inspection reports provided that indicate no seepage of process solution from the interiors of CIL tanks # 5 and #6.

The maintenance procedure was also modified to require timely evaluation and evacuation of spillage within the CIP/CIL containment; prohibit obstruction of the inspection ports on the CIL tank, and discourages use of CIP/CIL containment as a maintenance or service pond. If for whatever reason the containment must be used for maintenance purposes, volume requirements must be estimated and compared against available volumes to ensure that the containment system will always holds sufficient reserve capacity to fulfill ICMC requirements, i.e. 110% of the largest contained tank volume plus a contingency corresponding to the expected 24-hour accumulation in a 100-year storm event.

In the auditors’ judgment, because the observed condition was corrected in a timely manner, procedural improvements were promptly implemented, no seepage of process solution was detected beneath the ring beams on CIL Tanks 5 and 6, and no spills to the environment have occurred since the 2010 incident discussed in the 2011 recertification audit, the observed condition did not represent a significant risk to the environment or the health and safety of the workforce.

At the process plant any spill would report into the CIP/CIL SC and subsequently flow over concrete surfacing into the secondary containment of the Detox Building. From the Detox Building, any liquid would be directed back into the system.

Cyanide solution is circulated outside of the process plant through three pipeline systems comprising the pregnant and barren solution corridor from HLP to the Mill, the tailings pipeline and the pipeline from the TSF pond to the Mill. None of the above pipeline routes have altered since the 2011 audit and containment measures remain in place. The new CIC#2 plant, receives pregnant solution from a new pipeline corridor which is an expansion of the pipeline corridor feeding the CIC#1 Plant. A review of as-built drawings show that all pipes are placed on a lined trench, filled with gravel and can drain by gravity back into the in-heap pond, the volume of which is sufficient to receive the total drain down volume. The new cyanide feed line completed at the end of 2012, is routed within the process plant, and therefore any spill would be captured within process tanks SC.

No cyanide pipelines present a direct risk to surface water. The expansion of the pipeline corridor from the heap leach pad to the CIC#2 Plant is also not considered to pose a surface water risk due to the presence of secondary containment, inspection ports, and the routing of any leaks towards the in-heap pond. Other pipelines to and from the TSF remain unchanged and retain the same safety features identified in 2011. The new cyanide feed line within the process plant is contained with the secondary containment of tanks.
All cyanide mixing, storage and process tanks are constructed of coated carbon steel; solution pipelines are constructed of steel or HDPE, which is compatible with high pH cyanide solutions. The materials used for the expansion of the pipeline corridor were steel or HDPE.

Tailings deposition pipelines and the reclaim water return line are all positioned so that any leakage would drain to the tailings facility. The pipelines are fitted with pressure sensors and flow meters capable of detecting blockage or leaks. Cutoff valves are also installed to facilitate the isolation and repair or replacement of any leaking pipeline sections.
4.8 Implement quality control/quality assurance procedures to confirm that cyanide facilities are constructed according to accepted engineering standards and specifications.

The operation is: ■ in full compliance
                      in substantial compliance
                      not in compliance…with Standard of Practice 4.8.

Describe the basis for the Finding/Deficiencies Identified:

The new facilities built since the 2011 audit include the Pregnant Solution Pump Station (PSPS):

- Two new abstraction wells (2012) constructed at the heap leach pad to increase solution flow to the CIC tanks;
- CIC#1 seismic upgrade (concrete and steel upgrades);
- Construction of CIC #2 Plant to process additional heap leach solution (2013);
- Walter Creek Heap Leach completion of Stage 3 expansion and commencement of Stage 4;
- Lift of the Tailings Storage Facility lift comprised a 27’ raise in 2011, and a 25’ raise in 2014;
- Construction of a new cyanide feed line within the Mill Building in 2012; and
- Construction of a new cyanide storage area within the tails thickener building.

FGMI has implemented QA/QC programs during the construction of the new facilities. These include the following:

- TSF expansion: Knight Piésold documents containing technical specifications, construction QA/QC for earthworks and concrete construction as well as for compaction equipment, geosynthetics and pipework specifications.
- Heap Leach Pad expansion Stages 2 and 3: Knight Piésold completion reports presents a description of the work completed, earthworks, solution collection pipework, and geosynthetics and membranes (liners). Each work package describes the QC/QA conducted as part of the construction work.
- Pregnant Solution Pump Station enlargement project construction certification letter. Morrison Maierle (MM) certifies that it reviewed QA testing for pipe welds, performed by Material Integrity, Inc.
- CIC#2: MM Documents reviewed includes verification of materials suitability, adequacy of soil compaction for earthworks such as tank foundations, and for construction of cyanide storage and process tanks
- CIC#1 upgrade: A Construction Certification Letter by MM lists QC/QA data, including daily reports of the construction observations, 3rd party QA concrete sampling and testing performed by MAPA, and QA weld inspections performed by Material Integrity, Inc.
- Cyanide Feed Line: A review by MM in September 2014 confirmed that the pipeline materials are compatible with cyanide solutions, that the pipeline is constructed and is functioning in accordance with the original design intent; and
design criteria are consistent with the Cyanide Code’s Principles and Standards of Practice.

For this audit, FGMI has retained all relevant QC/QA documentation and independent reviews for the new and updated facilities as noted in the 2007 and 2011 audits.

4.9 Implement monitoring programs to evaluate the effects of cyanide use on wildlife, surface and ground water quality.

The operation is:  ■ in full compliance
 ■ in substantial compliance
 ■ not in compliance…with Standard of Practice 4.9.

Describe the basis for the Finding/Deficiencies Identified:

The FGMI Monitoring Plan (updated in October, 2012) addresses surface water and groundwater monitoring and frequency, process fluids, decant water composition, avian and terrestrial wildlife, solid waste landfill, acid generation potential, and mine closure. The monitoring plan was prepared by suitably qualified personnel within FGMI’s environmental department with appropriate certification and/or experience. It is the auditors’ opinion that monitoring frequencies are adequate to characterize the medium being monitored and timeously identify changes.

The QA/QC and field procedures manual (updated October 2012) describes all required collection, prevention and analytical procedures. Modified limits and reporting requirements are also defined. Site-Specific Method Detection Limit (MDL) and Minimum Level (ML) procedures are described for WAD cyanide concentrations. Review of records confirms that weather conditions during sampling are recorded.

FGMI operates as a zero discharge facility to comply with its permits. FGMI also monitors groundwater and surface water quality as part of its compliance monitoring program, down gradient of the TSF and the reported values are all under the permissible levels.

FGMI inspect the HLP daily and it includes reporting for wildlife mortality, example records for 2011, 2012, 2013 and 2014 were reviewed.

FGMI’s Monitoring Plan includes a section on avian and terrestrial wildlife monitoring at the TSF pond and unconsolidated tailing deposition areas. This requires that tailing discharges and the associated pool should be non-toxic to avian and terrestrial wildlife species. The procedure for reporting remains the same as mentioned in the 2011 audit report. The Waste Management Permit requires FGMI to report any wildlife mortality within one working day of discovery to the appropriate state agency and to the Alaskan Department of Environmental Conservation.

FGMI report one incident relating to cyanide mortalities. In 2012 forty-eight bird mortalities were reported by cyanide solution leaked from a 2-inch pipe beneath Leach...
Tank #1 into several swallow nests; see Standard of Practice 9.3 for additional discussion.

5. DECOMMISSIONING Protect communities and the environment from cyanide through development and implementation of decommissioning plans for cyanide facilities.

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

The operation is:
- in full compliance
- in substantial compliance
- not in compliance…with Standard of Practice 5.1.

Describe the basis for the Finding/Deficiencies Identified:

FGMI submitted the latest Fort Knox Mine Reclamation and Closure Plan for regulatory approval in 2013. The Plan contains conceptual procedures for decommissioning and closure of all cyanide management facilities. Conceptual procedures for the monitoring of the closed tailings impoundment and long-term maintenance and monitoring are also included. During the preparation of this report, FGMI submitted a description for the decommissioning of the process circuit, including cyanide tanks, pipes and pumps and includes a cost estimate. The Plan also includes a schedule for site reclamation and closure.

FGMI will continue advancing the level of detail contained within the Mine Reclamation and Closure plan by producing detailed SOPs to manage activities approaching the closure period.

FGMI is required to update its Mine Reclamation and Closure Plan at least every 5 years, according the Alaskan law. FGMI had submitted its most recent update, dated November 2013 to Alaska Department of Natural Resources which was subsequently approved in March 2014.

5.2 Establish an assurance mechanism capable of fully funding cyanide-related decommissioning activities.

The operation is:
- in full compliance
- in substantial compliance
- not in compliance…with Standard of Practice 5.2.

Describe the basis for this Finding/Deficiencies Identified:

State of Alaska regulations require an annually updated decommissioning and closure cost estimate and a mining reclamation bond. Updated bonds are submitted to Alaska Department of Natural Resources.
Department of Natural Resources (ADNR) and ADEC, for review and approval. Review of the latest iteration of the Fort Knox Mine Reclamation and Closure Plan indicates that decommissioning cost estimates are based on third-party assumptions (prepared on November 2013) which, was provided to ADNR and is publicly available on the ADNR website. The estimate is also used to support discussions of reclamation costs and bonding requirements in Section 9 of the Closure Plan. The Closure Plan is updated at least every 5 years.

FGMI typically provides a letter of credit to secure the bonding obligation, the amount of which is reviewed and adjusted on an annual basis. ADNR in the Reclamation and Closure plan approval dated March 28, 2014, accepted the total financial assurance amount proposed. FGMI delivered to the State of Alaska an Irrevocable Standby Letter of Credit issued by the Bank of Nova Scotia.

6. WORKER SAFETY Protect workers’ health and safety from exposure to cyanide.

**Standards of Practice**

6.1 Identify potential cyanide exposure scenarios and take measures as necessary to eliminate, reduce and control them.

The operation is:
- in full compliance
- in substantial compliance
- not in compliance…with Standard of Practice 6.1.

**Describe the basis for the Finding/Deficiencies Identified:**

Standard operating procedures including those for cyanide related tasks are retained as controlled copies on an intranet portal referred to as Kinross Connected. Employees can access the portal to view relevant documents and procedures.

Procedures available include those for CN unloading and storage, solution preparation, mixing, plant operations, general handling, confined spaced entry, cyanide awareness information, and requirements for task dependent personal protective equipment.

In addition to the above, the FGMI procedures also include information on the calibration and use of hydrogen cyanide gas monitors.

Proposed process/operational changes and modifications are managed through an authorized expenditure process, management of change communications and a process for generating procedures as follows:

- Major changes involving capital expenditures for design, engineering, construction, construction management, QA/QC, and other contracted services, all of which involve the Kinross AFE process. The AFE process is described in more detail in 4.1 and requires approval by the FGMI Environmental Manager and Health and Safety Manager to include consideration of the cyanide management code.
• Generating new standard operating procedures and changes to procedures are managed in accordance with the “Ore Processing, Standard Procedure Generating and Revision” procedure.

• Communication of operational process or process control changes in the mill and/or TSF are managed in accordance with “Ore Processing - Management of Change Communication for Fort Knox Mill & TSF” process.

FGMI operates under the “Kinross Way”, a set of values including aspects such as continuous improvement and teamwork and recognizes that these are central to the business culture. The mine operates a suggestion program and implements an open door policy for employees to provide input into operations including health and safety matters. The suggestion program is coordinated by the Continuous Improvement Manager and managed through procedure OPG 31 Employee Suggestions. This procedure provides rewards for suggestions that result in improvement of work methods, reduction in safety hazards or reduction in waste of materials and labor.

OPG 59 Standard Procedure Generation and Revision also provides opportunity to make changes to an SOP. Proposed revisions or changes to the SOP are provided to the Department Head, Superintendent, Foreman and other management. Once approved, changes to the SOP are provided to the relevant department and these changes are confirmed as received on an acknowledgement form.

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

The operation is: ■ in full compliance
                   in substantial compliance
                   not in compliance...with Standard of Practice 6.2.

Describe the basis for the Finding/Deficiencies Identified:

Requirements for pH control within the leach circuit are specified within Procedure OPG 1 and require that the pH of the mix tank is checked to ensure a pH level of greater than 12 prior to the application of sodium cyanide. If necessary, pH is adjusted with caustic soda solution. Solutions within the leach circuit and areas where weak cyanide solutions are used, pH is to be maintained at a minimum of 10. Training materials and refresher training includes the requirements to maintain pH at 10.2 for process solutions and 12.0 for reagent solutions. Slurry within the leach circuit is maintained at a pH above 10 and controlled with the addition of pebble lime to the SAG mill feed belt. pH levels are recorded by measurement of leach tank samples using pH meters on a regular basis.

Within the CIC circuit pH is monitored every two hours by means of a pH meter in the Trash tank. Results are recorded by operators into the Plant Operator Log book.
Within the Heap Leach Facility, pH levels are maintained through the addition of lime to ore contained in the haul trucks. The application concentration is dependent on the pH of the heap leach solution but on average is applied at a loading of 0.5 lb/ton.

Static hydrogen cyanide gas monitoring units are located in fourteen areas of the mill where hydrogen cyanide generation is a potential risk. The units are fitted with a visual alarm comprising red and amber visual cues; and an audio alarm. If ambient HCN concentrations above 4.7 ppm are detected, the amber light is activated. The red alarm signals if HCN levels exceed 10 ppm. HCN levels are displayed at the front of the unit and also on monitors within the main control room.

Standard operating procedure SOP OPG 08 requires that in the event of a stationary alarm being triggered at levels above 4.7 ppm, but below 10 ppm, an ITX portable monitor is carried in the area to ensure continuous safe working conditions. Where HCN levels exceed 10 ppm, SOP OPG 08 requires evacuation of the area.

Portable ITX units are calibrated every 30 days by the Electronic and Instrumentation (E&I) Department as provided by an automated indicator generated by the instrument. The E&I department also retains a manual and electronic records system which provides a record of due calibration dates. The stationary Draeger Polytron units are calibrated based on Work Orders generated from the JD Edwards Management System. Where required sensors are calibrated or replaced as necessary. The calibration and maintenance schedule are considered to meet or exceed the manufacturer’s recommendation for maintenance of these units. A review of calibration records for 2012, 2013 and 2014 confirm calibration of this equipment was being performed.

Warning signs were noted throughout the process and mill facility with appropriate indications of where cyanide is stored or used within processes for example on storage tanks, mixing area and transfer pipework. Pipework was signed to indicate cyanide content and also direction of flow. Where required, signs indicating requirements for suitable personal protective equipment are clearly displayed. In addition, “No smoking” and “No Beverages or Food” signs were noted at key areas within the plant.

A section of cyanide solution pipework from the CIC building was rerouted in December 2012. Redundant sections of pipeline were labelled as inactive to prevent inadvertent use of this pipework. Signage was noted to be clearly displayed and legible.

No cyanide or other warning signage was noted in the heap leach facility. Subsequent to the field visit, FGMI prepared signage at 6 locations on the perimeter of the heap leach facility restricting access to “Authorized Personnel Only”.

Showers and eye-wash stations are located at strategic areas throughout the mill and where cyanide is used. Additionally, 32 oz bottles of eye wash solution are located at key locations throughout the mill area and are regularly checked for condition as part of routine safety inspections. Eye wash bottles are also available within the heap leach operating trailer.
During the sodium cyanide mixing process, operators were observed to check the condition and operation of safety showers prior to commencing with a cyanide mix. During the site inspection, several emergency showers were tested and found to functioning correctly. The shower/eyewash units are checked each shift during safety inspections.

Fire extinguishers are located at key areas throughout the mill and other operating areas. All extinguishers observed were fitted with inspection tags which documented monthly inspection checks. The Security department is responsible for monthly as well as annual checks of extinguishers.

The cyanide delivery bay and storage area constructed in 2012 has appropriate cyanide warning signs at the entrance door. This also includes instructions not to store any other chemicals or materials within this area. Sodium cyanide is received in “super sacks” with appropriate individual warning signage including MSDS information. Piping, tanks and vessels containing cyanide solution are labelled to identify contents with flow direction also indicated on cyanide pipework.

Electronic MDS sheets are accessible to all staff from computers located throughout the facility using the E3 Online portal and which all staff are trained to use. All information relating to cyanide management including MSDS information, SOPS, emergency response plans are provided in English which is the indigenous language used at the site. All employees receive training on the use and interpretation of MSDS and which is further documented in the Hazard Communication Program. In addition, in accordance with MSHA requirements for hazard training, new miner training includes a minimum of 24 hours training during which cyanide solutions are covered.

Cyanide hazard information is also provided within SOP OPG1 (Cyanide Solutions). In addition, all employees are provided with pocket cards published by DuPont, which describes the symptoms of cyanide poisoning, rescue procedures and appropriate first aid. A separate booklet “The Facts about Sodium Cyanide” is also provided to staff.

SOP OPG 16 provides procedures for actions to be taken in the event of an encountered spill or release of material. Further the procedure references the “Spill Reporting Procedures & Waste Disposal” handbook which is also made available to personnel and provided in new miner training.

Incident reporting procedures requires prompt incident reporting and investigation to determine the basic causes of the incident, provide remedial action and medical attention and ensure that the a similar incident does not reoccur. Incidents, occupational injuries, occurrences of property damage, loss to process and near misses are recorded onto an online reporting system. Reporting is required immediately on occurrence to a supervisor who is then required to complete a written report by shift end. The incident report is submitted to an Incident Distribution List and subsequently assessed further at incident report meetings. All incidents are investigated in accordance with procedures with root cause analyses completed with the use of a tracking (KATTAR) form. Incidents are retained on the database for categorization and aid in prevention of reoccurrence. The system is use to record health and safety related incidents only. There have been
no health and safety cyanide related incidents reported since the spill incident reported in May 2010 and reported in the 2011 recertification audit.

6.3 Develop and implement emergency response plans and procedures to respond to worker exposure to cyanide.

The operation is: ■ in full compliance
■ in substantial compliance
■ not in compliance…with Standard of Practice 6.3.

Describe the basis for this Finding/Deficiencies Identified:

Cyanide antidote kits consisting of ampoules of amyl nitrite are located within small refrigerators fitted with expiry date information as well as thermometers to ensure that the ampoules are stored within a regulated temperature range of between 36º and 46ºF. Antidote kits are stored at key locations throughout the mill, heap leach control room, security and within the site ambulance.

Oxygen resuscitator and trauma kits are retained within the Mill Control Room, Security Office and Crusher Control Room. In addition, nine self-contained breathing apparatus (SCBA) are located at key plant areas.

As discussed in Section 6.2 HCN alarms are located in key areas providing visual and audible warnings in the event of an emergency. Radio communications are provided in most mobile equipment, and to supervisors and select personnel. All mill workers are equipped with hand-held radios. There is also a GAI-Tronics speaker system in the mill that provides an additional avenue for communication.

As indicated previously showers and eye-wash stations are located at strategic areas of the mill where cyanide and other chemicals are used. In addition, there were several eyewash stations in the mill and elsewhere where bottles of eye wash solution or wall mounted eyewash units are maintained in the event of an emergency. Mill operators complete workplace inspections during each shift, including an inspection of area specific showers and eyewash stations.

Emergency response equipment is regularly checked by Security Officers. This includes inspections of cyanide antidote kits (amyl nitrite), first aid stations (31 in total) and kits, eye wash stations, emergency showers, self-contained breathing apparatus stations. Inspections include checks of expiration dates of cyanide antidote kits and eyewash bottles and notify safety if replacements are required.

FGMI have developed an Emergency response Plan (ERP) specific to operations which was last updated in June 2014. The ERP documents the FGMI Emergency Preparedness Policy, Emergency Response Procedures including communication roles and responsibilities, evacuation procedures, required notifications, reporting procedures, incident categories and risk assessment. Section 5 deals with Risk control with Section 5.10 specifically addressing emergency response relating to cyanide releases. In addition to the ERP, an Emergency Action Plan (EAP) is also in place and outlines steps
and measures to be undertaken in the event of a Heap Leach, Water Supply Dam or Tailings Storage Facility emergency condition. This details actions and measures assigned to individuals/organizations responsible for emergency response.

FGMI has a fully staffed emergency response team (ERT) and comprises 24 members, 22 of which are trained and certified to National or State of Alaska Emergency Medical Technicians EMT3 level. Two paramedics also form part of the ERT and are certified to provide onsite training. All employees receive training in the application of amyl nitrite and first aid response for cyanide exposure. In addition, annual cyanide refresher training is also provided to the ERT.

FGMI has a dedicated ambulance housed in an ambulance bay which is located within the main administration building. The ambulance is operated by members of FGMI’s ERT and in the event of an emergency will act to stabilize the scene, perform rescue, recover and stabilize the patient. The site has an agreement agreed with Steese Ambulance and Volunteer Fire Department (SAVFD) to provide ambulance services as required and is recorded as a Mutual Aid Agreement.

FGMI has agreements in place with SAVFD and Fairbanks Memorial Hospital (FMH). FGMI’s Health and Safety Supervisor has confirmed meeting with representatives of FMH and inspected and reviewed intensive care unit, hazmat treatment and other hospital facilities. FGMI has also provided FMH and SAVFD with the most current versions of the ERP.

FGMI’s ERT hold regular training sessions twice a month with each team member expected to attend a minimum of 10 training sessions annually. Mock scenarios are regularly held with the effectiveness, competency and performance of each team member evaluated. Refresher training on the symptoms of cyanide exposure is provided to ERT members with new ERT members also provided with appropriate training. ERT members confirmed that three cyanide exposure related drills were completed over 2013. The Emergency Response and Drill procedure provides for continuous improvement setting requirements to critique emergency and response procedures as well as performance against procedures. Where necessary, weaknesses are identified and improvements to the emergency response procedures made.

To test the effectiveness of the emergency response systems, FGMI regularly runs scenarios to determine the effectiveness of the EMQnet Crises and Emergency Management System. The system manages responses to injuries and incidents including for example failure of the tailings impoundment and natural disasters. The site generally holds scenarios every 18 months and has included an earthquake scenario and heap leach dam failure and a cyanide delivery vehicle accident.

Fort Knox
Name of Mine

January 8, 2015
Date
7. EMERGENCY RESPONSE Protect communities and the environment through the development of emergency response strategies and capabilities.

Standards of Practice

7.1 Prepare detailed emergency response plans for potential cyanide releases.

The operation is: ■ in full compliance
in substantial compliance
not in compliance…with Standard of Practice 7.1.

Describe the basis for the Finding/Deficiencies Identified:

The Emergency Response Plan (ERP) sets out emergency response procedures for the entire mine site including for cyanide releases. Procedures for initial response, first aid and spill response, and reporting are provided and are covered in Section 5.10 of the ERP. Emergency scenarios considered include releases during loading/unloading, transportation, bomb threats, fires and explosions; pipe, valve and tank ruptures; overtopping of ponds; power outages and pump failures; uncontrolled seepage; failure of cyanide treatment, destruction or recovery systems; and failure of tailings impoundments.

Additionally, FGMI have also developed an Emergency Action Plan (EAP) dated December 2013 which outlines steps and measures that would apply specifically to emergencies related to the Tailings Storage Facility (TSF), Walter Creek Heap Leach (WHL) Pad, Water Supply Dam and Reservoir (WSR). The EAP details communication procedures, outlines steps to be taken for event detection, the level of severity and relevant actions to be taken including shutdowns. Duties of the emergency response team and requirements for internal and external resources are also provided.

A Spill Reporting Procedures & Waste Disposal manual (dated January 2011) details reportable quantities of spills including cyanide solution or salts, spill response procedures, communication and reporting channels. Disposal procedures are also provided.

FGMI has agreements in place with cyanide suppliers Dupont and Cyanco, whereby these organizations and their transporters are responsible for shipping of cyanide to site. This responsibility extends to consideration of transport routes, storage and packaging of sodium cyanide briquettes, the condition of transport vehicles and response in the event of an emergency or release during transport. In the event of an emergency or incident within the mine property, FGMI would respond to such an incident. The ERP also provides for responses to offsite incidents involving hazardous materials that are being transported to site.

In the event of an emergency situation involving cyanide release, the ERP and EAP provides for specific actions to be undertaken in the event of a release scenario. Initial
response and communication procedures are provided the ERP and General Safety Policies and Required PPE SOP OPG 16. Roles, duties and responsibilities are detailed in Section 3 of the ERP and also provides a series of management checklists.

The ERP details responses specific to cyanide spills or leaks including mill solution and reagent spills and makes provision for initial response, first aid, spill reporting contacts and spill control and cleanup. The locations of cyanide emergency equipment are also provided. All ERT members are trained to respond to emergency incidents. In addition, all employees are trained emergency communication and evaluation procedures. A list of immediately reportable incidents is provided within the ERP.

The EAP provides specific procedures related to the Heap Leach, Water Supply Dam and Tailings Storage Facility and provides for specific roles and responsibilities, resources to be allocated, lines and communications and actions to be undertaken in the event of an emergency situations which include scenarios such as overtopping, embankment failures, sabotage, earthquakes and fires.

Any potential emergency that has the potential to affect a community will trigger the notification requirements outlined in Section 2 of the ERP. The Emergency Management Team will notify State and Federal parties and emergency services and in consultation will inform potentially affected communities and parties. A detailed list of contact information for relevant parties is contained within Section 6 of the ERP. Additional guidance in emergency response related to the TSF, Heap Leach Pad and Water Supply Dam is provided within the EAP.

7.2 Involve site personnel and stakeholders in the planning process.

The operation is:  ■ in full compliance
■ in substantial compliance
■ not in compliance…with Standard of Practice 7.2.

Describe the basis for the Finding/Deficiencies Identified:

FGMI are in regular communication with stakeholders such as SAVFD who are kept appraised of FGMI’s emergency response plans with any updates provided to them on a regular basis. SAVFD were invited to attend past training event as well as emergency drills. However they have been unable to attend in the past due to limited availability of resources. In addition, Fairbanks Memorial Hospital is regularly visited by a FGMI health and safety representative to inspect facilities and capabilities and who appraise FMH of emergency response planning.

FGMI engages extensively with local communities and provides information relating to cyanide. Community contact and liaison information is provided within the ERP. FGMI has appointed a Community and Government Relations liaison who is responsible for information flow to the public.
FGMI report that requests relating to cyanide management have been infrequent and primarily managed through mine tours. These consist of mine tours taken throughout the year by communities, schools and universities, peers; and ad hoc visits from State Representatives, Native Regional Corporations, and Regulators.

7.3 Designate appropriate personnel and commit necessary equipment and resources for emergency response.

The operation is: ■ in full compliance
in substantial compliance
not in compliance…with Standard of Practice 7.3.

*Describe the basis for the Finding/Deficiencies Identified:*

The ERP designates primary and alternative emergency management team members and identifies the emergency response team (ERT) members, the crew to which they are assigned and their contact information. Emergency Response Team members are listed in Appendix A of the ERP and indicate both coordinators and team members. The team members are indicated by name, department, and qualifications as well as key areas in which they are trained. Contact telephone numbers are also provided for ERT members, rescue coordinators and Kinross corporate contacts and members of the emergency management team. ERT training requirements are also set out in the ERP. Emergency response equipment lists including the location of cyanide antidote kits is provided in Appendix I of the ERP.

The role of outside responders is provided in the ERP including the role of Steese emergency services who are contacted by FGMI security personnel who then dispatch an ambulance. The Steese ambulance response is monitored by FGMI security.

7.4 Develop procedures for internal and external emergency notification and reporting.

The operation is: ■ in full compliance
in substantial compliance
not in compliance…with Standard of Practice 7.4.

*Describe the basis for the Finding/Deficiencies Identified:*

The ERP provides a communication and notification tree and procedures in the event of an emergency. The procedure requires that upon encountering an emergency the word “Mayday” is repeated on any FGMI radio channel or frequency or contact is made with security on a listed phone number. The emergency is then described to security who then follow a set of procedures including, broadcasting the type of emergency, location and type of assistance required implementing radio silence and requesting that all site
activities except for that of the ERT is brought to a halt. ERT members are then directed to the emergency location and will request SAVFD to respond if necessary.

The emergency management team members also have specific communication roles: The Emergency Manager oversees all operations at the facility during an emergency and is responsible for briefing other emergency team members and notifying Kinross Corporate personnel; the Public Relations Coordinator responds to media enquiries; the human resources coordinator prepares and disseminates information releases and responds to media inquiries; the Health and Safety Coordinator, coordinates the ERT, arranges for care of injured persons, advises when reporting to government agencies is required and when mutual aid assistance is required; the Human Resources Coordinator notifies employees families of injuries; the Environmental Coordinator provides technical expertise related to emergencies which may impact the environment and is responsible for notifying the regulators when reporting is required.

The ERP contains procedures for communication including emergency response contact information. In the event of an incident, the Emergency Management Team in consultation with SAVFD contact relevant State and Federal regulators who will in turn notify affected parties in local communities as necessary. Procedures for notifying outside agencies and the media are provided in the ERP, EAP and the FGMI Crisis Communication Manual.

7.5 Incorporate into response plans monitoring elements and remediation measures that account for the additional hazards of using cyanide treatment chemicals.

The operation is:  ■ in full compliance
          in substantial compliance
          not in compliance…with Standard of Practice 7.5.

Describe the basis for the Finding/Deficiencies Identified:

The ERP provides procedures in the event of a cyanide release and addresses cyanide recovery and remediation if necessary. In addition, any cyanide containing solutions spilled within the mill area outside of a contained area are pumped onto a contained area for temporary storage. Any spills of solid cyanide briquettes will be cleaned with brooms/shovels and placed in containers and subsequently recycled through the mill circuit. Cyanide impacted soils are to be excavated to depth of impact and deposited into the process or tailings storage facility until cyanide levels are below 27 mg/kg as free cyanide. The ERP notes that sodium hypochlorite is toxic to aquatic life and is not to be used to treat cyanide spills. Reportable quantities of sodium cyanide and process solution indicated in the ERP. Further guidance is provided in the Waste Disposal and Spill Reporting Manual (January 2011).

For process solution spills, the ERP and Reporting and Sampling procedures require operators to immediately stop the release of material and notify the Area Supervisor and security. The procedure requires that the time of spill is noted; samples are collected and provided to the laboratory for analyses. Guidance for assessing the area of impact on a

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mill map is provided. A spill report is then generated indicating the type and location of spill/discharge, the cause and the total area affected. Finally resampling of the affected area is specified.

The Environmental Department manages the characterization and remediation of any larger spills and is responsible for reporting spills to the regulatory agencies. In the unlikely event that cyanide were to be identified downstream of the tailings dam, the Environmental Department would plan a detailed sampling and monitoring program to investigate the extent of potential impact. The Fort Knox Monitoring Plan includes an enhanced surface water and groundwater sampling and regulatory reporting program that must be initiated in the event that cyanide is detected downstream of the dam.

7.6 Periodically evaluate response procedures and capabilities and revise them as needed.

The operation is: ■ in full compliance
                   in substantial compliance
                   not in compliance…with Standard of Practice 7.6.

Describe the basis for the Finding/Deficiencies Identified:

The EHS management system requires that the Emergency Response Plan is reviewed annually and is a corporate requirement. Revisions are indicated at the front of the document and show four updates since 2011, the most recent being June 2014 including an annual review, updated personnel and emergency contacts including health and safety and environmental staff.

In addition to maintaining an up to date ERP, current information such as emergency contact list is retained by the ERT and Security. The ERP requires that the Engineering Coordinator ensures that up to date maps and plans, contact lists and hard copies of the ERP are retained in the two designated Emergency Control Centers.

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

Standards of Practice

8.1 Train workers to understand the hazards associated with cyanide use.

The operation is: ■ in full compliance
                   in substantial compliance
                   not in compliance…with Standard of Practice 8.1.

Describe the basis for the Finding/Deficiencies Identified:

All new starters to the mine receive orientation training in accordance with MSHA 5023. This comprises 24 hours of orientation training of which 16 hours is dedicated to health
and safety training. Cyanide hazard recognition and awareness training is included in these modules. New Mill employees also received 8 hours of specific Mill Orientation training which includes elements specific to the use of cyanide in the process.

Employees are assigned to Supervisors who issue development plans including specific training requirements for their work areas. Development plans are used as the basis for employee career development.

Annual refresher training in cyanide hazard recognition is undertaken annually by all employees. The training is provided by the Mill Maintenance Trainer who also retains records and tracks training requirements. Training includes properties of cyanide; hazards of cyanide; symptoms of cyanide exposure; emergency response; and first aid, including use of oxygen and amyl-nitrite. The training includes a written test.

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

The operation is: ■ in full compliance
in substantial compliance
not in compliance…with Standard of Practice 8.2.

Describe the basis for the Finding/Deficiencies Identified:

All new employees received orientation training consisting of a minimum of 24 hours orientation training as per MSHA requirements and which includes health and safety, workplace orientation and cyanide hazard elements. Training records are retained electronically by the Health and Safety Data Coordinator. Employees also received workplace orientation training specific to their activities and includes aspects such as cyanide awareness, response, process information, hydrogen cyanide monitor and alarm operation, location of cyanide safety equipment.

Further training is provided by the Mill Trainer and Supervisors on operating procedures include both general procedures applicable to all site areas as well as those specific to a particular task. The SOP is used as a record of training and is signed by both the Supervisor and trainee. Employees also instructed on the use of cyanide task observation sheets, and area inspections which are carried out within work areas. Training records are also retained on a spreadsheet by the Mill Trainer and a hardcopy file. Training is provided by the suitably qualified Mill Maintenance Trainer, Mill Operations Trainer and Supervisors on specific tasks. Supervisors are considered qualified to provide training on the basis of experience.

Any changes to standard operating procedures, including those to cyanide related tasks, are reviewed and conveyed at shift safety meetings. Employees also undergo training on SOP changes which is recorded on revision acknowledgment forms which are retained by the Mill Maintenance Manager.

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Following new hire orientation and cyanide refresher training, employees complete a written exam to demonstrate understanding of the material. Verbal tests of understanding are undertaken for task training as well as signing the relevant standard operating procedure to indicate understanding.

Employee activities and task competence is monitored with the use of Cyanide Task Observation Forms with supervisors completing at least one task observation monthly. This generally translates to 4 task observations per month for each of the four shift crews. The findings of cyanide observations forms are tracked by the Mill Maintenance Trainer. Task observation forms are also utilized at the heap leach facility.

Training records are retained throughout employment history and are retained by the Health and Safety Data Coordinator and electronically on both the site data server and on a data management system. Specific task training records are retained by the Mill Maintenance Trainer. Each training record contains the date, subject covered and is signed by both the trainer and trainee.

8.3 Train appropriate workers and personnel to respond to worker exposures and environmental releases of cyanide.

The operation is:  ■ in full compliance
                ■ in substantial compliance
                ■ not in compliance…with Standard of Practice 8.3.

Describe the basis for the Finding/Deficiencies Identified:

New employees and receive cyanide awareness training which includes emergency response, the function of hydrogen cyanide gas monitors and alarms, recognition of cyanide exposure symptoms, cyanide exposure first aid, the role and operation of rescue equipment, and actions to be taken in the event of a cyanide spill including sampling. Annual refresher training including cyanide awareness, emergency and evacuation procedures, and rescue equipment is provided.

Operators within the Mill are provided with site specific hazard training including cyanide awareness, hydrogen cyanide monitoring and emergency procedures. Standard Operating Procedures for cyanide related operations provide procedures in the event of cyanide release. Task specific training is provided to personnel on these SOPs with the SOPs themselves used as training material. Sign off on these procedures is required by both trainer and trainee with records maintained by the Mill Maintenance Manager.

FGMI operate a dedicated emergency response team with ERT members attending monthly emergency response training sessions which include cyanide first aid topics. Regular mock emergency drills including cyanide release and exposure scenarios are carried out to test the effectiveness of training and emergency response procedures and plans.

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FGMI regularly hold emergency response drills including scenarios for cyanide releases. The drills and scenarios are intended to test the Emergency Response Plan as well as the EMQ Crises and Emergency System. Performance during emergency situations or during drill scenarios are reviewed and assessed for effectiveness, weaknesses, emergency response program improvements and minimization of environmental impacts. Observations are recorded on an Emergency Response Critique Tracking Form with opportunities for improvement tracked and included in subsequent training events.

9. **DIALOGUE** Engage in public consultation and disclosure.

*Standards of Practice*

9.1 **Provide stakeholders the opportunity to communicate issues of concern.**

The operation is:  ■ in full compliance  
               in substantial compliance  
               not in compliance…with Standard of Practice 9.1.

*Describe the basis for the Finding/Deficiencies Identified:*

FGMI through the External Affairs Manager provides the opportunity to stakeholders to communicate issues of concern regarding the operation by offering school and public tours to the mine and process plant, opportunities to watch videos, participation in annual meetings with stakeholders in Fairbanks; and attending town meetings. Any information requests or complaints relating to mine operations are generally logged with the External Affairs Manager. FGMI report that requests relating to cyanide management have been infrequent and primarily management through mine tours.

9.2 **Initiate dialogue describing cyanide management procedures and responsively address identified concerns.**

The operation is:  ■ in full compliance  
               in substantial compliance  
               not in compliance…with Standard of Practice 9.2.

*Describe the basis for the Finding/Deficiencies Identified:*

Opportunities for stakeholder engagement is primarily provided through mine tours provided to a range of stakeholders such as regulators, educational institutions, schools, Native Regional Corporations, and other interested parties. During such tours mine information including cyanide management is readily made available to tour groups. In addition, contact information for further enquiries is made available.
Both the ERP and EMQ require interaction with regulators and emergency response services including regional responders, Steese Ambulance Services and Fairbanks Memorial Hospital.

Other cyanide related information provided to employees includes information booklets and pamphlets including a booklet published by Dupont describing the symptoms of cyanide poisoning; and rescue and first aid procedures. A separate booklet “The Facts about Sodium Cyanide” is also provided to staff and contains details of safeguards, shipping and handling and waste disposal.

FGMI provide information related to mine activities in an Annual Activities Report which is published on the Kinross and Department of Natural Resources web sites and provided to local, state and federal regulators.

9.3 Make appropriate operational and environmental information regarding cyanide available to stakeholders.

The operation is: ■ in full compliance
     in substantial compliance
     not in compliance…with Standard of Practice 9.3.

Describe the basis for the Finding/Deficiencies Identified:

Materials developed by FGMI with descriptions on how their activities are conducted and how cyanide is managed includes a brochure providing a very general discussion of the chemical leaching process, and the purposes of the cyanide code; a 3-page handout describing how cyanide is managed and its use in the process; a fact sheet for 2014 tours, a tour guidebook, that provides health and safety information, facts about gold mining, mining process, site history, gold production and aspects and environmental management; a video presenting the mine and process plant process showing how cyanide is used. These materials are made freely available to site visitors.

FGMI prepares and discloses Annual Activity reports which are publically available on the Alaska Department of Natural Resources web page (http://dnr.alaska.gov/mlw/mining/largemine/fortknox/annualmeetings.cfm) and report on mine activities including any cyanide related releases or incidents. The reports comply with the Waste management permit and the Amended and Restated Mill Site Lease.

FGMI has had three reportable releases since the 2011 recertification audit:

- A cyanide release on 20 July 2013 as a result of a barren solution spill on the heap leach facility resulting in impact to a storm drainage ditch. The release resulted from a break in a barren solution distribution pipe and was captured within the mine’s TSF with no offsite release. Soil sampling identified no cyanide above the Alaskan soil cleanup levels and therefore no further remediation steps were undertaken. To prevent reoccurrence, the barren solution pipeline header was reconfigured to point away from the containment edge so that future leaks...
would be directed towards the center of the heap leach pad. A copy of the final spill report was provided to ADEC in August 2013.

- In August 2012 a cyanide spill occurred at the HLP and flowed onto two nearby access roads. The event required a response and clean up action, as well as notification to ADEC. Sampling at the cleaned area showed values of WAD cyanide below the ADEC cleanup threshold. No offsite releases were recorded.

- On 5 July 2012, the mine discovered 48 bird mortalities associated with swallow nests located beneath the upper-housed deck of Leach Tank #1. The mortalities were as a result of a leaking cyanide solution pipeline, which resulted in solution draining through the floor of the upper deck and into nests. The pipework was subsequently repaired and the incident reported to ADEC, ADFG (Alaska Department of Fish and Game) and USFWS (US Fish and Wildlife Service). Subsequent to the incident, FGMI placed replicas of raptors within the framework of the heap leach tank, which has proven successful at deterring construction of further swallow nests.