INTERNATIONAL CYANIDE MANAGEMENT INSTITUTE

Gold Mining Operations

Summary Certification Audit Report

Newmont Golden Ridge Ltd.
Akyem Gold Mine
Ghana

13h – 17th October 2014

Name of Operation:	Akyem Gold Mine
Name of Operation Owner:	Newmont Ghana Gold Limited
Name of Operation Operator:	Newmont Golden Ridge Limited
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Location detail and description of operation:

The Akyem Gold Mine (NGRL) is a major mining operation owned and operated by the Newmont Gold Corporation. Akyem is a green-field, open-pit gold mining operation located within the Eastern Region of Ghana and 120 kilometers northwest of the capital city of Accra.

The mine currently operates one large open pit. Mining is conducted using large scale conventional hard rock drill and blast open pit methodology. Run of Mine (ROM) ore is trucked from the pits using CAT 785 DT's and is then crushed using a gyratory crusher with the crushed product being conveyed via a 1.8km overland conveyor to the live stockpile.

The process plant consists of a large conventional SAG and Ball Mill in closed circuit configuration with an annual production rate of >8mt. The rest of the Process Plant consists of a carbon-in-leach circuit with cyanidation followed by elution and refining for gold doré recovery.

Tailings remaining after completion of the processing and precious metals recovery are conveyed by pipeline to a counter-current decantation (CCD) plant where the tailings are rinsed with decant return water to reduce WAD cyanide concentrations to less than 50ppm WAD cyanide prior to final disposal. After the CCD circuit, the tailings are transferred via a lined tailings trench, to an engineered, lined tailings storage facility (TSF) for permanent disposal.

Tailings water is recovered from a decant pond, and recycled back to the process facilities for re-use. The entire process and tailings facilities are designed as a zero-discharge operation.

Sodium cyanide is supplied to the mine by Orica from its Yarwun manufacturing plant in Queensland, Australia. Cyanide is transported to the Akyem site using the state-of-the art cyanide sparge process, this new methodology makes use of purpose built sparge isotainers and provides a safer, secure and more efficient operation than the older more conventional cyanide delivery methods.

Sparging is a closed circuit mixing process that passes pH-adjusted water from a mixing tank through the isotainer in a continuous circuit until the required concentration of liquid cyanide is achieved. On completion of the sparging process, the liquid cyanide is transferred from the mixing tank to a dedicated storage tank, ready for delivery by pipeline to the process plant. All pipelines used for the transfer of cyanide to the process plant or within the process plant are either double-piped or installed above containment facilities to prevent the escape of leaks or spills to the surrounding surface.

The cyanide mixing facility at Akyem is specifically designed to handle the bulk sparging operations.

Auditor's Finding

This operation is

X in full compliance

☐ in substantial compliance

☐ not in compliance

with the International Cyanide Management Code.

Audit Company: Eagle Environmental

Audit Team Leader: Arend Hoogervorst

E-mail: arend@eagleenv.co.za

Names and Signatures of Other Auditors:

Name : Dawid M. L Viljoen Signature _____ Date: 18/2/2015

Dates of Audit: 13th – 17th October 2014

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

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

Akyem Gold Mine

Facility

Signature of Lead Auditor

19/2/15

Date

Auditor's Findings

1. PRODUCTION: Encourage responsible cyanide manufacturing by purchasing from manufacturers who operate in a safe and environmentally protective manner.

Standard of Practice1.1: 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.

X in full compliance with

The operation is □ in substantial compliance with **Standard of Practice 1.1**

□ not in compliance with

Basis for this Finding/Deficiencies Identified:
There is a Sodium Cyanide Supply Agreement between Orica and Newmont Akyem Mine commencing 1 May 2013 and expiring 14 October 2014. This has been extended by a Variation Agreement to 31 December 2014. A further Change agreement is in place covering the period 1 January 2015 – 31 March 2015.Akyem is currently out on tender for supply and transport of cyanide. Orica's Yarwun facility, which supplies the sodium cyanide, was fully recertified as a producer on 29th October 2013. The Orica cyanide bag to bulk facility in Tarkwa, Ghana, is operated by Barbex Technical Services on behalf of Orica and is classified as a production facility. The facility was recertified on 21st October 2014. Solid briquette cyanide is purchased directly from the producer, Orica, and the shipped sea containers from Orica are unloaded and the briquettes repacked in isotainers in the Orica cyanide bag-to-bulk facility.

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

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

X in full compliance with

The operation is □ in substantial compliance with **Standard of Practice 2.1**

□ not in compliance with

Basis for this Finding/Deficiencies Identified:
The Sodium Cyanide Supply (and transport) Agreement between producer, Orica, and Newmont Akyem commenced on 1st May 2013 and expired on 14th October 2014, but was extended, by Variation Agreement, to 31st December 2014. A further Change agreement is in place covering the period 1 January 2015 – 31 March 2015. Akyem is currently out on tender for the supply and transport of cyanide. The contract covers labelling, the responsibilities and requirements for transport, packaging, safety, security, unloading, emergency response (spills prevention and clean-up), route evaluation and assessments, training, community liaison, emergency response resource access and availability. Responsibilities are clearly delineated between Akyem and Orica.

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

X in full compliance with

The operation is □ in substantial compliance with Standard of Practice 2.2

□ not in compliance with

Basis for this Finding/Deficiencies Identified:
The Contract requires that the seller shall comply with the ICMI Code production and transportation principles and standards of practice as published and amended from time to time by ICMI. Chain of custody documentation was sighted by the auditors. According to the ICMI, the audit for the Orica Australian supply chain from Yarwun to Brisbane was The audit for the Orica Australian supply chain from Yarwun to Brisbane was certified in full compliance with the Cyanide Code on 26th January 2015.
The Orica West Africa Supply chain from Brisbane to Tema and Takoradi, Ghana, was certified on September 05, 2014. Barbex, the transporter in the West Africa Supply Chain, withdrew as a transport signatory on 13 June 2014. However, the replacement transporter, Stellar Logistics, was pre-operationally certified as an ICMI transporter on 6th March 2014. Stellar Logistics delivered its first sparge isotainer of cyanide briquettes on 6th June 2014. An operational audit was undertaken in August 2014. ICMI has accepted Stellar Logistics' operational audit report as complete and will announce its full certification upon receipt of the final audit documents.

3. HANDLING AND STORAGE: Protect workers and the environment during cyanide handling and storage.

Standard of Practice 3.1: Design and construct unloading, storage and mixing facilities consistent with sound, accepted engineering practices, quality

control/quality assurance procedures, spill prevention and spill containment measures.

X in full compliance with

The operation is □ in substantial compliance with **Standard of Practice 3.1**

□ not in compliance with

Basis for this Finding/Deficiencies Identified:
No solid cyanide is stored on site as a sparge process is used to transport solid cyanide to the site and to make up liquid cyanide. The cyanide offloading sparging and storage facility was designed and constructed by a professional engineering and design company. Design and construction has been completed to conform to cyanide producer specifications for a reagent area and which also complies with the engineering practices required in Ghana. The cyanide sparging and storage tanks are equipped with ventilation pipes at the top. The cyanide producer supplied an engineering review document which was taken into account during design and construction. The cyanide sparge and storage tank foundations were constructed to include an impermeable HDPE layer beneath oil-impregnated sand on top to bed the tank base in. There are also leak detection pipes in the tank foundation walls. The sparge isotainer parking area slopes towards the cyanide sparge and storage bund to drain any spillage into the bund. Level elements, low and high level alarms, and interlocks to automatic valves and pump motors are indicated for both the cyanide sparging and the cyanide storage tanks in the Cyanide Sparging Control Philosophy document. The operation is fully automated as per the make-up procedure. There are no incompatible materials nearby and the cyanide tanks share the bund with the caustic tank. The bund area is constructed of concrete, no cracks were observed and the bund was empty.
The cyanide sparging and storage tanks are installed within a security area of the plant with full access control. The plant is situated inside the greater mine security area with access control gates.

Standard of Practice 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.

X in full compliance with

The operation is □ in substantial compliance with **Standard of Practice 3.2**

□ not in compliance with

Basis for this Finding/Deficiencies Identified:
No solid cyanide is received directly from the supplier in boxes. Cyanide is delivered in an isotainer by truck and cyanide sparging takes place on site next to the cyanide sparging and storage section, with the isotainer being returned to the supplier. The sparging procedure is detailed, spelling out PPE requirements, and clearly sequenced to prevent and manage spillages and accidental releases. Members of the Mine Emergency Response Team are present during the sparging operation and provide for emergency response in case of any health or environmental emergencies arising from the sparging operation.

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

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

X in full compliance with

The operation is □ in substantial compliance with **Standard of Practice 4.1**

□ not in compliance with

Basis for this Finding/Deficiencies Identified:
The Standard Task Procedure inventory contains 84 process and 29 maintenance procedures, with 60 cyanide specific procedures. The Tailings Storage Facility (TSF) operating parameters (freeboard, design storm event and WAD cyanide concentrations) are contained in the Lycopodium Tailings Storage Facility Operating and Monitoring Guidelines, and the Akyem Operations Management Plan. Shiftly, daily, weekly, and monthly inspections are conducted by Operations, Maintenance and TSF staff.
The major operation risk for an unintentional release is the overtopping of the plant Events Pond into the adjacent storm water diversion trench which leads to the raw water pond containing aquatic life. The Events Pond is operated at minimum level to accommodate the design parameters and prevent overtopping. Alarms will sound at different levels and the plant is stopped when the pond reaches 52% of capacity.
A SAP Planned Maintenance System (PMS) is in place and has been functioning since the commissioning of the plant in September 2013. An emergency power system, consisting of seven standby diesel generators and maintained as per the SAP PMS system, is in place, with priority emergency units listed in the logic system prioritising the emergency power distribution within the CITECT control system. The critical units to prevent overtopping of the Events Pond include the events pond pumps and the residue pumps.

The plant has a change management procedure covering health, safety and environment in place although there were no change management examples available due to the recent commissioning of the plant.

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

X in full compliance with

The operation is

□ in substantial compliance **with Standard of Practice 4.2**

□ not in compliance with

□ not subject to

Basis for this Finding/Deficiencies Identified:
The ore sources that are being treated in the Akyem mill includes an Oxide ore (consisting of Oxide Mafic and Oxide Greywacke ores), followed by a deeper Primary ore body (consisting of primary Mafic and primary Greywacke ores). Newmont undertook a comprehensive program of ore characterisation tests on drill hole composites of the different ore bodies. The tests included variability tests, cyanide optimisation tests and process optimisation tests. The latest report, Akyem Project 2009 Oxide & Primary Ore Leach Tests Interim Report, covered tests on four primary composites and seven oxide composites. The sample locations are known and can thus be used to predict the cyanide consumption of the ore type. Samples from the oxide ore chemical analyses all showed higher copper, nickel and zinc values, all of the metals that would form WAD cyanide complexes and will impact on WAD cyanide values in the tailings, as well as having an increased cyanide consumption in the leach.
The process plant was started in September 2013 and process optimisation took place. There is a Cyanide Control And Optimization Strategy in place. Cyanide addition was optimised and terminal cyanide is determined by the ore received. Bottle roll tests are conducted including WAD cyanide measurement at the CCD overflow. The current ore mix is constant but the higher cyanide consumed by the deeper ore body is anticipated in 2016. Weekly meetings are held with the Mining Department and the Geologists to determine the planned production for the following week.
The plant has been in operation since Sept 2013 and is currently optimising the automatic control system. It is thus too soon to consider other control strategies. An OCM 5000 on-line cyanide analyser is used to control an automatic dosing valve to tank CIL 1 or 2. Manual titrations are used to check the on-line analyser results and if the difference is more than 10 ppm, action is taken. Cyanide can be controlled manually in case the on line unit is down for maintenance or repairs.

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

X in full compliance with

The operation is □ in substantial compliance with **Standard of Practice 4.3**

□ not in compliance with

Basis for this Finding/Deficiencies Identified:
The Mine uses a mine-wide GoldSim probabilistic water balance model which includes the TSF, Process Plant, Water Storage Dam, Sediment Control Structures 1, 2, 3, and 5, Waste dumps, Pits, and Potable water. The model is updated to August 2014 and the latest Water Balance Model report was reviewed.
The model includes variation in rainfall events and the TSF is operated using a 1:100 year 24 hour storm event. The models used historic rainfall data from the Obuasi weather station from 1981-2003, and the latest climate data from the site's current weather station and TSF rainfall gauge. Site precipitation data is used to update the Water Balance model quarterly. With regard to other solutions losses, no discharge to surface water takes place, the TSF and the events pond are fully lined with HDPE. TSF daily, weekly and monthly inspections and quarterly reviews are conducted. Daily pond inspections, CCTV camera and ultrasonic level indicators showing on the CITECT control system are in use, level alarms are set and independent local alarms are also used. The design freeboard of the events pond is specified in the Events Pond standard operating procedure which states that the Event Pond must be operated at the lowest possible level specifying freeboard parameters and alarms. Raw water and process water ponds are operated to accommodate the design rainfall events.

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

X in full compliance with

The operation is □ in substantial compliance with **Standard of Practice 4.4**

□ not in compliance with

Basis for this Finding/Deficiencies Identified:
The Gold Plant was commissioned and the process optimised at the end of 2013. The TSF compliance point is sampled twice per shift manually with a sample being taken from the delivery line valve at the TSF T-junction. Initial data from January to September 2014 was reviewed and only one value exceeded the 50mg/l WAD cyanide limit. An investigation was completed and concluded that the value could have been as a result of an isolated contamination or analyses issue. The TSF compliance point samples are all below 50 mg/l WAD cyanide in a range between 20 and 40mg/l and thus no restrictive measures are required. However, the TSF is separately fenced. The plant process pond may contain values higher than 50 mg/l WAD cyanide and is covered with bird balls to

restrict access by wildlife and livestock. The process water pond is situated inside the process plant fence with no access by wildlife. No wildlife mortalities related to cyanide have been observed since the plant start-up, thus indicating that the TSF slurry concentration of less than 50mg/l WAD cyanide is effective in preventing any significant wildlife mortalities.

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

X in full compliance with

The operation is in substantial compliance with **Standard of Practice 4.5**

 not in compliance with

Basis for this Finding/Deficiencies Identified:
No direct discharge to surface water takes place. The nearest river is the Mamang river, approximately 3 km away from the TSF. Samples are taken up-stream and downstream of the river (All were found to be below limits of detection of 0.003mg/l). These samples have been taken from January 2014 to the present.

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

X in full compliance with

The operation is in substantial compliance with **Standard of Practice 4.6**

 not in compliance with

Basis for this Finding/Deficiencies Identified
The TSF is fully lined with a HDPE synthetic liner and secondary under drains have been installed under the liner. Monitoring wells are placed below and around the TSF, and these boreholes are sampled for groundwater cyanide contents. The TSF is also equipped with under drains returning TSF seepage to the process water circuit. Finger drains are installed to dewater the TSF walls.
The process plant is equipped with concrete bunds and spill ways to prevent seepage. Process water ponds and events ponds are fully lined to prevent seepage. Leak detection and recovery systems are installed on the process water and Event Ponds, pond liners and leak detection systems are inspected as part of the operational inspections.
The potential beneficial uses for groundwater include drinking water and the Ghana Water Authority standards for ground water cyanide levels of 0.07 mg/l free cyanide are used. The results since January 2014 from nine shallow and nine deep boreholes all indicate cyanide below the limits of detection (0.003 mg/l).

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

X in full compliance with

The operation is □ in substantial compliance with **Standard of Practice 4.7**

□ not in compliance with

Basis for this Finding/Deficiencies Identified:
All tanks are placed on ring beams equipped with an impermeable HDPE layer underneath the oil impregnated sand on top to bed the tank base. All cyanide solution containing tanks are placed on concrete spillage containment areas which drain to the events pond. Reagent strength cyanide storage tanks are placed in a concrete bund. All secondary containments are sized to hold a volume greater than that of the largest tank within the containment and any piping draining back to the tank, with additional capacity for the design storm event. The plant is designed with sump pumps in all the secondary containments returning any spillage back to the process.
The reagent strength cyanide lines, as well as the sparge area bund sump pump line, are above containment areas or are equipped with a pipe-in-pipe secondary containment where they cross open soil. The whole TSF pipeline is installed inside a HDPE-lined trench draining back, either to the events pond in the plant or the TSF. All cyanide tanks and pipelines are constructed of materials that are compatible with cyanide and high pH conditions.

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

X in full compliance with

The operation is □ in substantial compliance with **Standard of Practice 4.8**

□ not in compliance with

Basis for this Finding/Deficiencies Identified:
Lycopodium, the design and construction company gave the following commitment:
" …Throughout the entire construction phase, all contractors will follow the Lycopodium comprehensive QA/QC process. QA/QC documentation will be signed off by qualified personnel, and turnover packages will be provided to Newmont upon hand over of facilities which will contain all QA/QC records for the entire project…" The Akyem Project Quality Management Plan, covering all facets of the QA/QC for the whole project, including the TSF and the process plant, was sighted and the QA/QC records contained in the Project Data room were sampled. These were found to cover

requirements, including suitability of materials, soil suitability and compaction, moisture content, and geo-membrane liner and weld tests. A handover process was followed including all systems and sub systems of the project. Each system has a handover package book containing a transfer of custody letter from Lycopodium to Newmont. Supporting each system is a work book containing the QC data pack, including all the records following on from the QA/QC manual requirements. Sign-offs were by QA/QC inspectors, Newmont Systems Owner, Engineering Manager, Project Manager, Construction Manager, Field Engineering Manager, QA/QC Manager, Pre-operations Manager, and the Newmont Project Manager.

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

X in full compliance with

The operation is in substantial compliance with **Standard of Practice 4.9**

 not in compliance with

Basis for this Finding/Deficiencies Identified:
Groundwater and surface water sampling procedures and TSF monitoring procedures are in place. Sampling and analytical protocols were developed by the Environmental Department under their manager, an M.Sc. Geological Engineering (hydrogeological options) graduate, and the TSF monitoring procedure was developed by a qualified metallurgical superintendent. Sampling points are identified on a sampling map. The procedures include how and where samples should be taken, reference to field sampling sheets, sample preservation techniques, chain of custody procedures and which cyanide species are to be analysed. Boreholes are placed and sampled upstream and downstream of the plant. Boreholes are sampled monthly, surface waters monthly, and daily wildlife mortality inspections take place. Wildlife inspections form part of the daily checklist of the TSF operator. No cyanide-related wildlife mortalities were recorded since the plant was commissioned.

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

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

X in full compliance with

The operation is in substantial compliance with **Standard of Practice 5.1**

□ not in compliance with

Basis for this Finding/Deficiencies Identified:
A reclamation and closure plan, which includes cyanide decommissioning procedures, is in place. A decommissioning schedule is included in the plan and covers all process components from Mill to the TSF. Review is required every 3 years.

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

X in full compliance with

The operation is □ in substantial compliance with **Standard of Practice 5.2**

□ not in compliance with

Basis for this Finding/Deficiencies Identified:
The closure costs include treatment plant costs covering the individual sections in the circuit under a heading demolition / detoxification cost. The total provision under the line item is US$ 5.764m. Newmont generates closures cost estimates internally, applicable to the use of third party contractors. The closure cost estimate is reviewed annually. The closure costs are covered by a cash deposit jointly for Newmont and Ghana EPA (Environmental Protection Agency) and a letter of credit with JP Morgan Chase Bank for USD 39m dated 11 Sept 2011 and annually renewable unless otherwise notified.

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

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

X in full compliance with

The operation is □ in substantial compliance with **Standard of Practice 6.1**

□ not in compliance with

Basis for this Finding/Deficiencies Identified:
The Standard Task Procedure inventory contains 84 process and 29 maintenance procedures, with 60 cyanide specific procedures. The Tailings Storage Facility (TSF) operating parameters (freeboard, design storm event and WAD cyanide concentrations) are contained in the Lycopodium Tailings Storage Facility Operating and Monitoring Guidelines, and the Akyem Operations Management Plan. Shiftly, daily, weekly, and monthly inspections are conducted by Operations, Maintenance and TSF staff. All

procedures include the requirements for PPE, hazard classification and pre-work inspection requirements.
Procedures, when revised, are circulated for comment to the operations. Daily and shiftly toolbox meetings are used for worker input into safety related issues. Personal interaction on Mine electronic on-line system, Cintellate, documents safety and health issues incidents or concerns. Monthly Site-wide Health and Safety meeting are held and include open forum discussion on safety concerns. A change management procedure, "Risk Opportunity and Change Management", is in place but the site has been commissioned for too short a period to have generated any change management experiences, according to staff interviewed.

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

X in full compliance with

The operation is □ in substantial compliance with **Standard of Practice 6.2**

□ not in compliance with

Basis for this Finding/Deficiencies Identified:
The cyanide sparging control document requires that the pH of the solution used for cyanide sparging is at least 12, adjusted by the addition of sodium hydroxide from the sodium hydroxide mixing and storage tank by running the caustic metering pump for 2 minutes. This requirement is to minimise the generation of HCN gas during sparging.
The pH in the leach is controlled at 10.5. A weekly Akyem control parameters form is issued to the control room to set CITECT operating parameters settings, including the CIL pH min 10.5, max 10.8, with set point 10.6.
Ten fixed HCN gas monitors are installed at the sparging area, milling area, cyclones, the CIL (2), carbon screen, acid wash column, CCD feed hopper area, CCD 1, and the tails tank (2). There are 15 Personal HCN gas monitors in use which are issued to individuals where required. The Emergency Response Team (ERT) uses three HCN gas monitors.
A baseline gas survey was undertaken, areas and activities were identified and fixed HCN gas monitors were installed, with personal monitors used during activities where workers may be exposed to cyanide gas in excess of 10 ppm on an instantaneous basis. This includes during cyanide sparging operations, confined space entry, working on cyanide equipment. Fixed monitors are maintained as per the PMS SAP schedules with personal monitors being calibrated monthly on site and serviced and calibrated annually by the manufacturer. The Akyem Mine has trained and certificated staff to do the on-site calibrations. The calibration records register was reviewed and sampled.
On-going inspections and checks are also used to monitor and check facilities and emergency response equipment functioning and checklists. Safety equipment such as safety showers, low pressure eye wash stations, and fire extinguishers are numerous and adequately signposted. Adequate warning signs advising workers that cyanide was

present and that smoking, open flames and eating and drinking are not allowed were noted. Induction training includes the information that all slurries and process solutions on the plant may contain cyanide.
Reagent strength cyanide pipes are labelled as "cyanide" with flow direction indicated on the pipes. Plant cyanide solution pipes are labelled process water and process slurry with flow direction indicated. Process tanks are all labelled.
MSDSs were sighted at the cyanide sparging area and the control room and an MSDS is included in the sparging procedures. English is the working language for the site as well as the official national language and used in operational documentation. Accident and incident reporting and investigation procedures, based upon the site safety reporting requirements, were found to be in place and effective. Formal employee interviews were used to check awareness and sensitivity to health and safety measures and the response from employees and contractors alike, was found to be appropriate and acceptable.

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

X in full compliance with

The operation is in substantial compliance with **Standard of Practice 6.3**

 not in compliance with

Basis for this Finding/Deficiencies Identified:
The mine has water and oxygen available at the Sparge section, CIL Laboratory and the Process Control room. Resuscitator sets are available at the ERT room just outside of the plant. 5g Cyanokit antidote kits are available at the Mine Clinic. The primary mode of communication used is radios. First aid equipment on the plant is inspected by the Clinic Paramedic. The three available cyanide antidote kits kept in the clinic were inspected and found to be current, and stored in the pharmacy at a consistent 22°C via the air-conditioning system (manufacturers recommendation is storage not above 25°C). The pharmacist is responsible for the timeous replacement of the antidote. The mine has a fully trained Emergency Response Team and a clinic to respond to cyanide emergencies. The ISOS (medical service provider, International SOS) clinic is equipped to handle cyanide patients and is on the camp site close to the process plant. The clinic is staffed by three Medical Doctors and a Paramedic with a nurse and a pharmacist available on 24 hour call. The ISOS Protocol covers the cyanide emergency medical response. The ISOS local on-site clinic provides for primary response and is staffed with qualified and cyanide trained Doctors and Paramedics, and has cyanide emergency equipment and expertise in the treatment of cyanide emergencies. The protocol makes provision for Evacuation to a Tertiary Hospital. "…Due to the availability of expertise and equipment; the regular training undertaken and the availability of antidote; patients should be managed locally as far as possible. The site Chief Medical Officer in consultation with the Regional Medical Director will make the decision on evacuation to a higher centre. All evacuated patients will be accompanied by a trained medical staff (member)." The

protocol further requires that a medical bag accompany the patient which includes the cyanide treatment protocol, cyanide antidote and cyanide PPE. The Komfo Anokye Teaching Hospital, a part of Kwame Nkruma University of Science and Technology, is prepared to accept cyanide patients from Akyem to its ICU.
Cyanide mandown and spill drills have been conducted on site and reports including observations, an activity log, photographs and recommendations were sighted.

7. EMERGENCY RESPONSE Protect communities and the environment through the development of emergency response strategies and capabilities.

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

X in full compliance with

The operation is
- □ in substantial compliance with **Standard of Practice 7.1**
- □ not in compliance with

Basis for this Finding/Deficiencies Identified:
There is a mine-wide Akyem Emergency Management Plan (EMP) in place, which cover the mine, process plant and TSF. The plan covers the full range of cyanide emergency scenarios likely to be experienced on site, including the control of releases at their source as well as release containment, assessment, mitigation and the prevention of future releases. The Orica cyanide supply and transport contract refers to transport emergencies and the Stellar Logistics (an ICMI certified transporter), emergency plan for the transportation of sodium cyanide was reviewed.
The EMP covers general evacuation, and process site personnel evacuation. Clearing potentially affected communities from the area of exposure is covered under the Community Notification and Evacuation Procedure. Use of cyanide antidotes and first aid measures for cyanide exposure are covered in the Plan and in the ISOS SOS Ghana Cyanide Management Protocol technical document. All incidents are investigated as per the Akyem incident reporting/ incident investigation procedure.

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

X in full compliance with

The operation is
- □ in substantial compliance with **Standard of Practice 7.2**
- □ not in compliance with

Basis for this Finding/Deficiencies Identified:
The workforce was not involved in the development of the EMP as this plan was developed by specialists for the dedicated Emergency Response Team. They are, however, involved in mock drills and exercises where input is gathered through post mortems and de-briefs.
The surrounding communities are not directly involved in the EMP but are given presentations on cyanide awareness and cyanide emergencies. Ghana national fire service regional commanders conducted a familiarisation visit and reviewed the EMP in June 2014 and a presentation was given in August 2014 on cyanide awareness to the members of the national ambulance service and the district branch of the national fire service. Newmont staff were involved in the validation team for the district disaster management plan for the Biren North District Assembly dated November 2012. Drills are used to involve clinic, ERT, ambulance and paramedic staff in planning and review processes.

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

X in full compliance with

The operation is
- □ in substantial compliance with **Standard of Practice 7.3**
- □ not in compliance with

Basis for this Finding/Deficiencies Identified:
A dedicated, full time, Emergency Response Team (ERT) is in place and available. The Team has clear duties, roles and responsibilities which are included in the EMP. Appropriate training is defined and described in the Plan, as are contact details. The Akyem emergency profile (inventory) lists emergency equipment and the dedicated fulltime ERT Captain is responsible for equipment inspections. Drills involving relevant stakeholders ensure that roles and responsibilities are understood and clearly implemented.

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

X in full compliance with

The operation is
- □ in substantial compliance with **Standard of Practice 7.4**
- □ not in compliance with

Basis for this Finding/Deficiencies Identified:
The Akyem EMP covers notification requirements to the regulatory agencies, management and the media. The community evacuation procedure covers community

and media communication. The Rapid Response Checklist includes a rapid respond checklist for the community relations advisor.

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

X in full compliance with

The operation is □ in substantial compliance with **Standard of Practice 7.5**

□ not in compliance with

Basis for this Finding/Deficiencies Identified:
The EMP refers to chemical spill and gas releases, includes solutions, soils, and disposal of spill clean-up debris, and neutralization of cyanide bearing solution slurry using ferrous sulphate. It also refers to recovery and disposal of spillages as appropriate to the site-specific identified scenarios. Alternate water supply is covered in the EMP, as needed. The procedure, Neutralization of Cyanide Bearing Solution slurry using Ferrous Sulphate, covers the prohibition of use of treatment chemicals being released into surface water. An Emergency sampling procedure is in place and linked to the sampling point plans.

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

X in full compliance with

The operation is □ in substantial compliance with **Standard of Practice 7.6**

□ not in compliance with

Basis for this Finding/Deficiencies Identified:
The Plan is required to be reviewed annually, following incidents and emergency drills or when new information regarding cyanide becomes available. As the site is very new, there is limited evidence of changes to procedures and plans as a result of drills.

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

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

X in full compliance with

The operation is □ in substantial compliance with **Standard of Practice 8.1**

□ not in compliance with

Basis for this Finding/Deficiencies Identified:
All personnel that may encounter cyanide receive the Akyem process safety / security induction training, as well as the cyanide training module. This includes plant employees, security staff, contractors and TSF staff. The training includes all requirements in terms of cyanide hazard recognition. Refresher training is done annually according to a schedule. Training records are kept both in the training matrix and as hardcopies. The records are kept for the employee's work period and at least 10 years after his or her departure. The training matrix includes a system which flags automatically when training is due or expired.

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

X in full compliance with

The operation is □ in substantial compliance with **Standard of Practice 8.2**

□ not in compliance with

Basis for this Finding/Deficiencies Identified:
A STP (Standard Task Procedure) tracker matrix system is in place and training includes all production tasks from crushing to TSF. All the STPs include the required PPE, pre-work inspections, and preparations. The matrix contains the names and task training required for the production staff for each job as per the above matrix, thus covering the training elements.
After receiving induction and cyanide awareness training, the employee receives the STP theoretical training in the training centre. The Employee is then sent on to the plant and receives on-the-job training by his/her supervisor for the specific task. A job assessment is undertaken after 3 months by the Trainer and employee's supervisor. The employee is not allowed to work unsupervised during this period. Following successful competency assessment, the employee is then allowed to work unsupervised, doing the task as per the STP he/she was trained for. All the operators and supervisors were pre-trained and assessed at the Newmont Ghana Gold Ahafo Gold plant (which is a similar design to the Akyem Gold Plant), before the commissioning of the Akyem Plant in Sept 2013.
The Trainer is a qualified workplace Trainer and Assessor and has a degree in Metallurgy. Training records are kept electronically in the training matrix and as hard copies. Records will be kept for at least 10 years after the employee leaves the workplace.

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

X in full compliance with

The operation is □ in substantial compliance with **Standard of Practice 8.3**

□ not in compliance with

Basis for this Finding/Deficiencies Identified:
Employees are trained during the induction, refresher and cyanide awareness training in the procedures to follow during cyanide releases. Refresher training is undertaken annually. The Mine uses a dedicated emergency response team and the plant personnel are trained in raising the alarm. The Emergency Response Team (ERT) is trained in the procedures to follow when cyanide is released. The ERT training calendar 2014 includes topics such as cyanide first aid treatment, first aid respiratory problems and management, scene control and safety, decontamination, protection and decontamination, cyanide awareness, ventilation procedures, donning and doffing, SCBA training, chemical suits, reagent areas, HAZMAT, confined space rescue, medic training.
Drills are used to train plant staff, the ERT and clinic staff in the emergency response plan. Annual induction and refresher training includes cyanide awareness / Orica training, and the ERT receives ongoing practical and theory training. Evidence of emergency cyanide drills was sighted. The process training officer is involved in all cyanide related drills. The ERT captain maintains all ERT training records and other records are kept at L & D (Learning and Development).

9. DIALOGUE: Engage in public consultation and disclosure.

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

X in full compliance with

The operation is □ in substantial compliance with **Standard of Practice 9.1**

□ not in compliance with

Basis for this Finding/Deficiencies Identified:
Dialogue meetings or "one-on-one's" are two-way dialogue sessions involving both dissemination of information and the answering of questions on cyanide. Surrounding communities, as well as Communities along the transport route from Akyem to Nkawkaw, were identified and mapped. Site key communities were identified as Adausena, Afosu, Hweakwae, Mamanso, New Abirem, Ntronang, Old Abirem, Yayaaso,

and Adjenua. The villages along the route of the cyanide transport from Abepotia to Bedaneagya have also been identified. Other stakeholder groups identified are religious leaders, executives of youth groups of the communities, schools (headmasters and social studies teachers), women's groups, soccer team leaders, community announcers, social responsibility forum, sustainable development committees.
Presentations were given to the identified communities and stakeholder groups before the commissioning of the mine (Aug 2013) to prepare the members for the coming events and specifically, information on cyanide and its transportation management plan was presented. Meetings were held with Religious Leaders (8 August 2014) and Graduate Youth (1 August 2014) where various cyanide related questions on normal and emergency situations were raised and subsequent discussions held. These were documented for further use and evaluation. The Community Affairs Department has regular two way contact with stakeholders on a wide range of issues (including cyanide) relating to the mine and communicates concerns to management, as they arise.
Communication consists of PowerPoint presentations, and pictures. Explanation in Twi (the local language) is used for illiterate people. Sighted enlarged pictures used in Twi presentations to illustrate explanations.

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

X in full compliance with

The operation is in substantial compliance with **Standard of Practice 9.2**

 not in compliance with

Basis for this Finding/Deficiencies Identified:
Dialogue meetings or "one-on-one's" are two-way dialogue sessions involving both dissemination of information and the answering of questions on cyanide. Surrounding communities, as well as Communities along the transport route from Akyem to Nkawkaw, were identified and mapped. Site key communities were identified as Adausena, Afosu, Hweakwae, Mamanso, New Abirem, Ntronang, Old Abirem, Yayaaso, and Adjenua. The villages along the route of the cyanide transport from Abepotia to Bedaneagya have also been identified. Other stakeholder groups identified are religious leaders, executives of youth groups of the communities, schools (headmasters and social studies teachers), women's groups, soccer team leaders, community announcers, social responsibility forum, sustainable development committees.
Presentations were given to the identified communities and stakeholder groups before the commissioning of the mine (Aug 2013) to prepare the members for the coming events and specifically, information on cyanide and its transportation management plan was presented. Meetings were held with Religious Leaders (8 August 2014) and Graduate Youth (1 August 2014) where various cyanide related questions on normal and emergency situations were raised and subsequent discussions held. These were documented for further use and evaluation. The Community Affairs Department has

regular two way contact with stakeholders on a wide range of issues (including cyanide) relating to the mine and communicates concerns to management, as they arise.
Communication consists of PowerPoint presentations, and pictures. Explanation in Twi (the local language) is used for illiterate people. Sighted enlarged pictures used in Twi presentations to illustrate explanations.

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

X in full compliance with

The operation is

□ in substantial compliance with **Standard of Practice 9.3**

□ not in compliance with

Basis for this Finding/Deficiencies Identified:
Copies of PowerPoint presentations are made available, on request, during meetings. A document, "Summary of potential impacts and typical mitigation for comment by stakeholders April 2008" was used to communicate with stakeholders. Presentations were given to the identified communities and stakeholder groups before the commissioning of the mine (Aug 2013) to prepare the members for the coming events and specific information on cyanide and its transportation management plan was presented.
Verbal presentations in Twi, using key speaking points from English material, are used for communication with illiterate community members. Approximately 60% of the local communities are illiterate. Presentations include the use of enlarged colour pictures and posters to reinforce speaking points. A video on such a presentation was reviewed.
Newmont globally reports specifically on the Cyanide Code on the Newmont global website. The Newmont sustainability annual report under, 2013 cyanide code reporting, includes categories for incidents of cyanide exposure resulting in hospitalisation, incidents where releases off-site required response or remediation, incidents where releases on or off the mine site resulted in significant adverse effects to health. Website reference:- http://sustainabilityreport.newmont.com/environmental-cyanide.php.