# *INTERNATIONAL CYANIDE MANAGEMENT INSTITUTE*

# *Cyanide Production Summary Certification Audit Report (Warehouse and Incinerator)*

# *AfriChem Dompim Warehouse Facility Dompim Pepesa-Western Region, Ghana*

# *17th – 19th May 2023*

***For the International Cyanide Management Code***

# SUMMARY AUDIT REPORT

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|---|---|
| Name of Cyanide Production Facility: | AfriChem Dompim Warehouse Facility |
| Name of Facility Owner: | AfriChem Ghana Limited |
| Name of Facility Operator: | AfriChem Ghana Limited |
| Name of Responsible Manager: | Mr Frank Aning |
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**Location detail and description of operation**:
The Dompim facility of AfriChem Ghana Limited is located off the Tarkwa-to-Takoradi Highway, in the Dompim Pepesa-Western Region of Ghana, approximately 15 km from Tarkwa.

The AfriChem Dompim facility's main activities are as follows: -

- Supply of chemicals and the operation of a metallurgical laboratory, and the manufacture of antiscalant and flotation chemicals for the mines.
- Dismantling of cyanide packaging waste at customer mine site by AfriChem staff.
- Arrange transport from the mine site to the AfriChem Dompim site (the transporter being an ICMI (International Cyanide Management Institute)-certified company).
- Unpack containers on site for onward incineration
- The on-site NTI (name) Warehouse was custom de-bonded in 2021. It was fully dedicated to the storage of sodium cyanide waste. In previous times, a section of the same Warehouse was used for the storage of the wastes, pending incineration).
- Incineration of cyanide packaging waste (wooden boxes, plastic sacks & rubber).

**Cyanide-related Activities**

**1. Introduction and Context**

AfriChem provides a service to gold mines to dismantle their cyanide briquette packaging (Wooden boxes, polypropylene bags, plastic outer bags), loading it into a shipping container, sealing it, and transporting it, using ICMI-certified transporters, from the Mine to the AfriChem Dompim facility. At the facility, the dismantled packaging is temporarily stored, awaiting incineration in the licensed AfriChem incinerator on site.

The current scale of operations is very small, with approximately two loads per month from one Mine coming to the site, resulting in two partial-load incinerations per month. As the current contract has expired, no incineration is taking place. There may be an increased scale of operations if additional contracts are negotiated with other gold mines that are ICMI signatories in the near future.

At present, no full cyanide boxes are stored in the NTI unbonded warehouse. However, the facility has been licensed for cyanide storage by the Ghana Environmental Protection Agency (EPA). It is reported that should the facility commence the storage of full cyanide boxes or upscale cyanide packaging handling, a change management exercise will be undertaken before this commences.

**2. Dismantling**

A team from AfriChem is dispatched to the Mine, where they disassemble the cyanide briquette boxes and pack them into containers for transport. The Mine has already rinsed and decontaminated the cyanide packaging.

**3. Transport**

Transport of the container from the Mine to the AfriChem Dompim facility is then organised with the Mine's ICMI-certified transporter, or another appropriate ICMI-certified transporter.

**4. Storage**

On arrival, the container is unloaded into the site's storage warehouse, pending incineration.

**5. Incineration**

The cyanide packing is transported, using a forklift truck, from the Warehouse to the incinerator, where it is disposed of.

**6. Ash Disposal**

Once the incineration is completed, the furnace ash and particulates are stored in appropriate containers. They would normally be disposed of at the GSR (Golden Star Resources) Wassa Mine tailings dam. AfriChem has an MoU (Memorandum of Understanding) with the Mine to dispose of hazardous waste at their tailings dam.

However, the MoU (Memorandum of Understanding) with the Wassa Mine site expired on 31 December 2020, by which time the weight of ash produced was minimal – about 300kg. New Management took over at GSR Wassa Mine and has not given an opportunity for renewal of the MoU.

Hence, a new arrangement has been made with Zeal Environmental Technologies in Takoradi, Western Region of Ghana, for disposal of the ash. Currently, the total ash

quantity is estimated to be about 500 kg. After December 2021, no waste was collected from the Mine Site.

## *Auditor's Finding*

This operation is

**X in full compliance**
in substantial compliance
not in compliance

**with the International Cyanide Management Code.**

This operation has not experienced any compliance issues or significant cyanide incidents during the previous three-year audit cycle.

Audit Company: Eagle Environmental

Audit Team Leader: Arend Hoogervorst E-mail: arend@eagleenv.co.za

Names and Signatures of Other Auditors:

| Name of Auditor | Signature of Auditor | Date |
|---|---|---|
| Arend Hoogervorst<br>Production Auditor | | 26/10/2023 |

Date of Audit: 17th – 19th May 2023

I attest that I meet the criteria for knowledge, experience and conflict of interest for Code Verification Audit Team Leader, established by the International Cyanide Management Institute and that all members of the audit team meet the applicable criteria established by the International Cyanide Management Institute for Code Verification Auditors.
I attest that this Summary Audit Report accurately describes the findings of the verification audit. I further attest that the verification audit was conducted in a professional manner in accordance with the International Cyanide Management Code Verification Protocol for Cyanide Production Operations and using standard and accepted practices for health, safety and environmental audits.

| Name of Facility | Signature of Lead Auditor | Date |
|---|---|---|
| AfriChem Dompim<br>Warehouse Facility<br>Ghana | | 26/10/2023 |

# *Audit Findings*

***1. OPERATIONS: Design, construct and operate cyanide production facilities to prevent release of cyanide.***

*Production Practice1.1: Design and construct cyanide production facilities consistent with sound, accepted engineering practices and quality control/quality assurance procedures.*

**X in full compliance with**

**The operation is** □ in substantial compliance with **Production Practice 1.1**
□ not in compliance with

*Summary of the basis for this Finding/Deficiencies Identified:*
Quality control and quality assurance programs are not available for the NTI warehouse. However, a Report on the Structural Integrity and Visual Condition Assessment at the AfriChem Process Plant at Tarkwa Wassa Dompim, by Ing. Frederick Owusu, PE-GhIE (Registration No 09697) of Arktec Consult (Inspection date 28 April 2023) indicated that there were no serious issues identified. However, It was recommended that corrosion protection be carried out over the next three years, and a follow-up inspection was recommended in three years.
The signed commissioning certificate for the MACROburn V100B Incinerator was sighted. Supporting documentation is still available and was sighted. In the above-mentioned Structural and Visual Condition Assessment, the inspecting engineer found that the incinerator structure was in good condition with no significant defects. Some corrosion was noted.
The NTI Warehouse is constructed with an impermeable concrete floor gently sloping to the centre to drain any collected liquids. The walls and roof are constructed from zinc alum sheets. The route from the NTI warehouse entrance around the side of the building to the incinerator is also all concreted. The container bringing the disassembled dry cyanide packing from the Mine is unloaded onto a concrete ramp by a forklift truck and moved into the NTI warehouse. The area in front of the incinerator is all concreted, and the forklift truck brings the dry packaging from the Warehouse to the incinerator on a defined concrete surface along the entire route to the incinerator. No solutions are disposed of in the incinerator. Construction materials are compatible with reagents used and processes employed. The incinerator is primarily constructed of mild steel, conditioned for high temperatures. This was all confirmed during the site inspection.
There are no cyanide-related production systems in place in the NTI warehouse, only storage. No interlocks or high-level alarms are necessary on the incinerator. The site backup generator is in place and comes into operation after 5 seconds, which has no impact on the incineration process and supplies power for the entire site for up to 24 hours on one tank of fuel.

The Ghana Environmental Protection Agency (EPA) issued an Authorisation valid from 1 May 2023 - 31 March 2024 to continue operating the existing 1,000 metric tons per annum mining chemicals and blending warehouse facility. The accompanying Schedule and Environmental Management Plan includes reporting water, air and waste standards. A previous EPA Environmental Permit was in place and valid from 16 December 2019 – 10 October 2022.
In the NTI Warehouse, the cyanide packaging bundle is disassembled and is stored in the Warehouse, off the floor, on pallets. The Warehouse is enclosed and protected from rain and moisture. To aid ventilation, the Warehouse has ceiling circulation fans. Each morning the warehouse doors are opened wide for air circulation and left open during working hours. The site is access controlled with 24/7 security on the site. There is a 3m perimeter wall all around the site with barbed wire topping. The perimeter is lit up after dark, and there are 12 CCTV camera locations around the site. The NTI Warehouse is a dedicated cyanide store and does not contain or store any other chemicals. This was confirmed during the site inspection.
The Ghana Environmental Protection Agency (EPA) issued an Authorisation valid from 1 May 2023 - 31 March 2024 to continue operating the existing 1,000 metric tons per annum mining chemicals and blending warehouse facility. A previous EPA Environmental Permit was in place and valid from 16 December 2019 – 10 October 2022.

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

**The operation is**
**X in full compliance with**
□ in substantial compliance with **Production Practice 1.2**
□ not in compliance with

*Summary of the basis for this Finding/Deficiencies Identified:*
The site has a cyanide-specific operating manual (AfriChem Ghana Cyanide Operational Manual), which includes six Standard Operating Procedures (SOPs) and Operational Guidelines and Requirements. The Operational Guidelines and Requirements include:- Occupational Health & Hygiene; Site safety; Inspection and audits; Health, Safety and Environmental training; Safety Data Sheets (SDSs); Incident and accident management; Notification of Significant Incidents to ICMI; Stress and Fatigue Management; Waste Management; Preventative Maintenance; Risk Management; Permit to Work; PPE (Personal protective Equipment); Clothes Change Policy; Safe Laboratory Operations; Working at Customer Mine Site; Site Visitors; Emergency Plans; and Management of Change.
Current volumes of waste cyanide packaging (1–2-part loads per month in the incinerator) are insufficient (low risk) to warrant controls for cyanide-related upsets. The original contract has expired and has not been renewed. However, the Emergency Response Plan includes contingencies for cleaning up cyanide spills. The incinerator

manufacturer's Operating Manual contains abnormal occurrences and their correct responses, e.g., overloading, wet wastes, and pre-heating.

The Visual Condition Assessment Inspection Report, July 2019, by Ing. Frederick Owusu, Civil Engineer (Reg 09697), covers the whole site, including NTI Warehouse and incinerator. No significant issues were identified affecting the Warehouse or incinerator.

There is a Management of Change (MOC) procedure, but there have been no cyanide MOCs conducted since certification, but there was a MOC conducted for "Construction of a fuel station shed', MOC Number: 23001. The MOC form has a section for "Authorisation by HSE (Health, Safety and Environment) Manager/Supervisor". It was reported in interviews that as soon as volumes of cyanide waste are anticipated to begin to increase, a change management exercise will be conducted to check readiness for normal, abnormal, and emergency events and cyanide upsets.

Planned Maintenance (PM) is currently undertaken using manual checklists. The Forklift Daily Pre-Start Checklist covering 22 operational items for 27-07-2020 (horn not working, leakage on the main cylinder and absorber damaged.) and 16-05-2023 (no faults) was sighted. The forklift Engineering Services Provider (Smith Bs Engineering & Construction Works) inspection records and repairs for the forklift were sighted.

Preventative maintenance for the CAT (proprietary name) Generator on 5 April 2023, and resealing of the side shaft cylinder, replacing of wheel hub bolts and repair of rim cracks on 2 October 2020 were reviewed. A monthly maintenance activities checklist is in place, and examples for 04-05-2020 and 05-01-2022 were sighted.

Pre-operational incinerator checklists for 10-12-2020 and 15-05-2023 were sighted. The Weekly Facility Inspection Checklist covering Office and General Yard, Laboratory, Kuffour Warehouse, NTI Warehouse, Blending and Manufacturing Area, Incinerator Area, and Equipment (Safety Showers, Fire extinguishers, HCN (Hydrogen Cyanide) Gas detectors, First Aid kit and hand and power tools) was reviewed. Completed examples for 02-03-2020 and 25-04-2023 were sighted and reviewed. The AfriChem containers used to transport cyanide waste packaging from the mine to the AfriChem site for incineration are inspected for fit for purpose. Several completed container inspection checklists dated 11-09-2021, 18-11-2021,10-12-2021, and 30-12-2021 were sampled.

No cyanide-related process parameters are in place. Although there is a detoxification plant in place, it was wet commissioned, but has never had cyanide used in it.

Currently, there is no risk of unauthorised/unregulated discharge to the environment of any cyanide solution or cyanide-contaminated water. There are no secondary containment areas in place to collect cyanide-contaminated water. Any cyanide-contaminated water that collects in the centre drainage area in the NTI warehouse would be treated as a cyanide spill and cleaned up as per Section 8.2 Spills, in the Emergency Response Plan. Cyanide wastes are disposed of in the incinerator.

The site is governed by legislation covering the management of empty cyanide packaging. The Minerals & Mining (Health & Safety and Technical Regulations, 2012 (L.I.2182), Section 228 (3)a stipulates that empty packaging must be handled as hazardous material until it is decontaminated and disposed of or destroyed. The packaging is disassembled at the mine site, and packed into a sealed and locked container for transport to the AfriChem site. The procedures covering the activities are: - Loading

of Chemicals in IBC (Intermediate Bulk Container) Box; Loading of Sodium Cyanide; Offloading of Sodium Cyanide; Empty Cyanide IBC and FIBC (Flexible Intermediate Bulk Container) Handling; and Empty Cyanide IBC and FIBC Incineration. The cyanide packaging is disassembled at the Mine by AfriChem staff and packed into AfriChem containers, and sent by road to the AfriChem site by ICMI (International Cyanide Management Institute)-certified transporter, using Ghana government-required labelling.

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

| | **X in full compliance with** | |
|---|---|---|
| The operation is | □ in substantial compliance with | **Production Practice 1.3** |
| | □ not in compliance with | |

*Summary of the basis for this Finding/Deficiencies Identified:*
Although the site contains no tanks, pipelines, containments, pumps, valves, or cyanide production and facilities, the NTI warehouse is inspected as per the Weekly Facility Inspection Checklist, as required under section 2.3. Inspections and Audit of the AfriChem Operational Manual. The incinerator is inspected using a pre-start incinerator checklist. There are no cyanide fluids on-site; only solid cyanide is managed. Based upon an evaluation of the cyanide-related activities on site, the auditor deems the inspection frequencies sufficient to ensure that equipment functions within design parameters.
The incinerator pre-task inspections and monthly maintenance inspections are adequate because the incinerator is currently only used infrequently. (One to two times per month.). Examples of completed inspection checklists were sighted. Checklists are linked to corrective action forms signed off by the supervisor and records retained.
The NTI Warehouse is constructed with an impermeable concrete floor gently sloping to the centre to drain any collected liquids. The walls and roof are constructed from zinc alum sheets. Construction materials are compatible with the reagents used and processes employed. The incinerator is primarily constructed of mild steel, conditioned for high temperatures. This was confirmed during the site inspection.

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

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

| | **X in full compliance with** | |
|---|---|---|
| The operation is | □ in substantial compliance with | **Production Practice 2.1** |
| | □ not in compliance with | |

*Summary of the basis for this Finding/Deficiencies Identified:*
The AfriChem Ghana Cyanide Operational Manual contains Operational Guidelines and Requirements and SOPs covering all operational activities on site. This includes the

disassembly of the cyanide packaging at the mine site, loading into a shipping container, organising of the transport of the container to AfriChem, unpacking of the container at AfriChem, the transport of the packing to the incinerator, the incineration of the packaging, and the safe disposal of the ash.

The Cyanide Operational Manual requires that non-routine activities shall be preceded by risk assessments. No feasible cyanide scenarios affecting maintenance have been identified at this stage of operations. Emergency operations are covered in the Emergency Response Plan. All staff are trained in carrying out risk assessments.

Interaction with workers (there are only 12 workers, in total, on the site) is done through Health and Safety meetings, tools box talks and risk assessments. For example, an operator suggested replacing the full heavy fire protection suit originally worn by the incinerator operator, with a lightweight, heat-resistant apron. This was tested and found to be effective, safe and comfortable.

The site has identified two potential cyanide gas and dust hot spot areas, the cyanide warehouse and the incinerator. Before entering the cyanide warehouse or working in the incinerator, an HCN gas monitor and full cyanide PPE (Personal Protective Equipment) must be worn. There are three Honeywell GasAlert Extreme portable HCN gas monitors on site. They are kept by the site supervisor and issued to workers, as necessary. There are three additional monitors which are unused and kept in the store in reserve. Monitors are set to alarm at 4.7 ppm and at 10 ppm. The Honeywell GasAlert Extreme portable HCN gas monitors are calibrated 6-monthly, as per the manufacturer's recommendations. The equipment comes with instructions on how to calibrate the monitors, and key staff on site are competent to calibrate the instruments. Sample calibration certificates for HCN Gas monitors were sighted and reviewed.

Currently, quantities of cyanide packaging handled and frequencies of loads delivered are very low and do not warrant using a buddy. However, when quantities increase, the buddy will be used. An SOP for a buddy system is included in section 9.7 of the AGL (AfriChem Ghana Limited) Sodium Cyanide Operational Manual. Currently, when AfriChem employees visit mines to disassemble cyanide boxes and packaging, they always work in pairs, but they are not functioning as buddies for each other. However, the driver monitors the two disassembling the packaging from a distance.

On appointment, all employees undergo a medical assessment. In the manual, Section 8.1 Occupational Health and Hygiene, Subsection 8.1.2 requires periodic health assessment, particularly prior to assuming a duty. The Operational Manual states that no eating, drinking or smoking will occur in areas where chemicals are stored.

The site has a practice of supplying overalls as a part of PPE and takes responsibility for the laundering of the overalls. Currently, the number of loads of cyanide packaging and the quantities of cyanide they contain are deemed too low to pose a risk of contamination. Abnormal occurrences would be dealt with in terms of the ERP. Clothes Change Policy is covered in Section 8.13 of the Manual.

During the site inspection, warning and instructional signs throughout the site, warning of hazards and requiring appropriate PPE in different areas, were sighted.

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

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|---|---|---|
| **The operation is** | **X in full compliance with**<br>□ in substantial compliance with<br>□ not in compliance with | **Production Practice 2.2** |

*Summary of the basis for this Finding/Deficiencies Identified:*
The AfriChem Ghana Emergency Response Plan, which includes reference to responses to cyanide abnormal and emergency conditions, was sighted and reviewed.

**Safety Showers**
There is one safety shower and eye wash station on-site adjoining the incinerator area. This is inspected weekly under the weekly facility inspection. The Weekly Facility Inspection Checklists were sighted and reviewed, including the safety shower and eye wash inspections for 15-06-2020 and 02-05-2023.

**Fire extinguishers**
On-site, there are: - 8 x 9kg, 2 x 6kg, 2 x 25kg (all dry powder) and 1 x 5kg $CO_2$ cylinder (in the office). These are inspected weekly in terms of the Weekly Facility Inspection Checklist. The fire extinguisher checks on weekly checklists of 27-012020 and 17-04-2023 were sampled and reviewed.
Fire equipment on site is serviced annually by BREX Fire Consult (fire and safety engineering service providers). Service invoices dated 26-05-2021, 04-10-2021, and 11-10-2022 showing regulatory extinguisher maintenance and fire alarm work were sampled and reviewed.

**Cyanide First Aid Equipment**
Due to low quantities of waste disposed of, containing very low amounts of cyanide, site first aid for cyanide only uses oxygen administration. Checks have indicated that the local hospital (Tarkwa Municipal Hospital) has supplies of cyanide antidote. A resuscitator is available in Emergency Response Cabin. Potable water is freely available on-site. Cell phones are used to communicate emergencies. No cyanide antidote is kept on site. First Aid kits are inspected monthly, in terms of the weekly facility inspection checklist. Checklists were sighted, including first aid kits for 10-08-2020 and 11-04-2023.
The Emergency Response Cabin is inspected monthly using the Emergency Response Cabin checklist. The Emergency Response Cabin monthly checklist dated 12-10-2020 and 08-05-2023 were sampled and reviewed.
Safety Data Sheets (SDSs) are available on-site at various locations (Laboratory, Warehouse, incinerator, office). Different versions are available, but the AGR (Australian Gold Reagents Pty Ltd., Australia) SDS (which is the cyanide supplier of the main client mine) is available. The official working language is English, but when training is given, the visual material is English, which is explained in the local language.
There are no storage tanks, process tanks, containers and piping containing cyanide on site. The site does not currently have a decontamination policy or procedure for employees, contractors and visitors leaving areas with the potential for skin exposure to cyanide, due to low levels of cyanide in packaging making the risk negligible currently. It was reported that once volumes of cyanide packaging increase, a MOC exercise will be undertaken, which is expected to prompt the initiation of a decontamination policy.

All employees are trained St John's Ambulance First Aiders. However, if a cyanide exposure were to occur, the only cyanide first aid administered would be oxygen, and an ambulance would be called to take the patient to hospital. The preferred hospital is the AngloGold Ashanti Sam Jonah Hospital, which holds cyanide antidote and services the AngloGold Ashanti Iduapriem Gold Mine, an ICMI-certified gold mine. Tarkwa Municipal Hospital also holds supplies of cyanide antidote. If a worker is exposed to cyanide, an ambulance would be called to take the patient to a hospital. Cyanide risk would be low and the patient would be showered and decontaminated on-site by the ERT (Emergency Response Team) before being dispatched to the hospital.
AfriChem has written, regarding potential cyanide patients, to the three main hospitals in the area, The AngloGold Ashanti Sam Jonah Hospital, the Dompim Community Clinic and the Tarkwa Municipal Hospital. (Copies of letters sighted.) The AngloGold Ashanti (AGA) Sam Jonah Hospital is part of the Cyanide Emergency Response Strategy of AGA Iduapriem Gold Mine, an ICMI-certified mine. The Tarkwa Municipal Hospital acknowledged receipt of the request letter. Under the circumstances of the low cyanide risk, it is deemed that this provision is adequate for AfriChem's current circumstances and provisions.
No cyanide exposure incidents or spills have occurred since the site commenced operation in 2016. Under Section 8.6, Incident and Accident Management, the Operational Manual requires all incidents and accidents to be reported and investigated.

***3. MONITORING: Ensure that process controls are protective of the environment.***

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

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| | **X in full compliance with** | |
| **The operation is** | □ in substantial compliance with | **Production Practice 3.1** |
| | □ not in compliance with | |

*Summary of the basis for this Finding/Deficiencies Identified:*
There are three monitoring points at the AfriChem Ghana (AGL) site, two are inside the property, and one is outside. There is an upstream and downstream monitoring point. Monitoring occurs monthly and is tested internally by AfriChem's metallurgical laboratory, monitoring tests for Free Cyanide. As part of its laboratory certification QA/QC processes, the laboratory submits samples to an external laboratory for verification.
AfriChem has a policy of not discharging to surface water under any circumstances. This is referred to in section 4.8, "Environmental Monitoring" of the AGL Emergency Response Plan. Before any discharge occurs, it would be pumped to a holding tank, tested, neutralised, tested again, and disposed of at the Mine Tailings Storage Facility. This has not been necessary since AfriChem commenced operations on-site in 2017. Since the last certification audit, all samples have been below the limits of detection, i.e.,

0.02 mg/l Free Cyanide. The Ghana EPA regulatory limit is 0.2 mg/l. Cyanide levels handled by the site are very low (the site handles rinsed cyanide packaging from the mines). There is no established mixing zone. Monthly samples in receiving water up and downstream have all shown free cyanide levels below the detection levels since the last certification audit. There is no identified indirect discharge to surface water which is affecting the in-stream concentration of free cyanide. There is no established mixing zone. Monthly samples in receiving water up and downstream have all shown free cyanide levels below the detection levels since the last certification audit. The jurisdiction has set a limit of 0.2 mg/free cyanide in groundwater below or downgradient of the site. It has not formally identified or notified the site of any beneficial uses of groundwater at the site. This requirement is also not specified or included in the site's EPA permit. No seepage is causing cyanide levels to exceed limits. Therefore, no remedial activity has had to be undertaken.
On a weekly basis, 10 points on the site are visited with a portable HCN monitor and checked for HCN gas levels. Particulate matter monitoring at PM 0.3 and PM 2.5 is being undertaken internally. External dust monitoring is done for PM 10 and PM 2.5. Ghana EPA GS 1236:2015 limits dictate dust limits, and the site has not exceeded these limits since the last certification audit. Given the low levels of cyanide being processed on-site and the expiry of current contracts, the frequencies are deemed adequate to characterise the medium being monitored and to identify changes in a timely manner.

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

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

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| | **X in full compliance with** | |
| **The operation is** | □ in substantial compliance with | **Production Practice 4.1** |
| | □ not in compliance with | |

*Summary of the basis for this Finding/Deficiencies Identified:*
All staff are trained in basic cyanide awareness. The training course covers: - what is cyanide, sources of cyanide, properties of cyanide, dangers of cyanide, cyanide poisoning, safe handling of cyanide, storage of cyanide, emergency response and transportation. After the training, a short quiz is given, and the pass mark is 50%.
The site provides annual theoretical training, at a minimum, in Personal Protective Equipment (PPE), including: - what it is, different types, why used, when to use, storage of PPE, maintaining PPE, provision and replacement, and duties of employees regarding PPE. This is supported by practical training. applying the lessons learnt and handling the equipment.
Section 8.4, HSE Training, in the Cyanide Operational Manual covers both HSE and task training. Section iv states that new employees will undergo task training (using the SOPs) and assessment by supervisors to confirm competency. Section v states that employees

will undergo regular job-specific training for all routine and non-routine jobs. Section vi states that training needs and requirements shall be identified in a Training Matrix. The AfriChem Training Matrix was sighted and covers all positions on-site regarding training requirements, which are: - site induction; sodium cyanide awareness; risk assessment; incident management; firefighting; SDSs; PPE; Fatigue Management; Management of Change; Emergency Response; Box dismantling; Defensive driving; Cyanide waste handling and Incineration; First Aid (every three years); Spills clean-up and decontamination; Loading and off-loading operations; and dangerous goods transport and oxygen administering, Clothing change policy, and use of safety shower. Refresher task training is undertaken annually. The Training Matrix includes modules and SOPs necessary for each job.
Training is provided by St Johns Ambulance qualified training staff and Ghana Fire Service Personnel. Where appropriate, external trainers are brought in to conduct training. HSE training is undertaken by the external SHE consultant, the Director and the Site Supervisor. Task training is undertaken by the Warehouse Manager/Site Supervisor who has worked on-site for 8 years.
Planned Task Observations (PTOs) were informally undertaken by the site supervisor and recorded in his diary. There is now a more formal documented system in section 9.8, "Planned Task Observations" of the Operational Manual. A completed PTO for "Offloading IBCs From A 20ft Container" was sighted.

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

| | **X in full compliance with** | |
|---|---|---|
| **The operation is** | □ in substantial compliance with | **Production Practice 4.2** |
| | □ not in compliance with | |
| | □ not subject to | |

*Summary of the basis for this Finding/Deficiencies Identified:*
Training in the procedures to be followed if a cyanide exposure or release occurs is covered under the Training Matrix, referring to emergency response, incident management, use of Oxy-viva medical oxygen cylinder, spill clean-up and decontamination, mock drill training, and Safety shower decontamination. Records are kept using a training attendance sheet, and these are all filed. Currently, all training records are kept in lever arch files because the size of the operation is too small to warrant individual separate filing. This will be reviewed over time. All records have been kept since the start of the operation (2012). Assessments are checked by multiple-choice quizzes.

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

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

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|---|---|---|
| | **X in full compliance with** | |
| **The operation is** | ☐ in substantial compliance with | **Production Practice 5.1** |
| | ☐ not in compliance with | |

*Summary of the basis for this Finding/Deficiencies Identified:*
The Emergency Response Plan for Sodium Cyanide Product and/or Waste includes reference to responses to cyanide abnormal and emergency conditions.
Owing to the very low levels of cyanide potentially handled and the infrequent cyanide packaging incineration exercises, the formal scenarios listed below do not necessarily apply. The primary cyanide emergency scenarios and responses identified are as follows: -

- Solid Sodium Cyanide Spill – inside a shipping container (section 7.8.1 in ERP),
- Solid Cyanide Spill – Inside Storage Facility (section 7.8.2 in ERP),
- Solid Sodium Cyanide Spill – Outside Storage Facility (section 7.8.3 in ERP),
- Shipping Container Decontamination (section 7.8.4 in ERP),
- Handling Wet Sodium Cyanide (section 7.8.5 in ERP), and
- Sodium Cyanide Spill to Waterway (section 7.8.6 in ERP.)

As there are no tanks, pipes, valves or ponds on site. The above-mentioned generic scenarios and responses meet the requirements of the site. Site evacuation is included in the Plan's Appendix 7– Site Layout and Fire Evacuation Plan, and Section 5.5.5 covers the actions of nearby community members. Only medical oxygen is administered on-site. Cyanide antidote is only administered at local hospitals and medical facilities. The control of releases at their source is covered in the Plan under section 4 – Management of Cyanide Emergency. The Plan's section 4.8, Environmental Monitoring, and the Cyanide Operational Manual's section 4.0, Management of Cyanide Emergency or Incident, and section 8.6, Incident & Accident Management, discuss containment, assessment, mitigation, and future prevention of releases.

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

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| | **X in full compliance with** | |
| **The operation is** | ☐ in substantial compliance with | **Production Practice 5.2** |
| | ☐ not in compliance with | |

*Summary of the basis for this Finding/Deficiencies Identified:*
In the Plan, Section 5.5, Nearby Community Members, describes what is expected of nearby community members. Letters dated 4 May 2023 to the District Commander of the Dompem-Pepesa Division of the Ghana Police Service, the Tarkwa Municipal Hospital, and the Presiding Member of the Dompem-Pepesa Assembly, were sighted, discussing their involvement in any emergencies on site. Section 6.2 of the Plan states that AfriChem is committed to conducting regular reviews of the Plan and inviting all parties

involved in mock drills to evaluate the effectiveness of the Plan. The section also describes the consultations with stakeholders on the Plan that were undertaken by AfriChem. If there are changes in the Plan content, these will be communicated, as appropriate, to the authorities.

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

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| | **X in full compliance with** | |
| **The operation is** | □ in substantial compliance with | **Production Practice 5.3** |
| | □ not in compliance with | |

*Summary of the basis for this Finding/Deficiencies Identified:*
In the Plan, under section 5.4. Roles & Responsibilities of AGL Personnel are detailed: -
5.4.1 Director - The Director is designated as the Emergency Response Coordinator. He has overall control and direction of the emergency and coordinates response actions. He has explicit authority to commit the necessary response resources.
5.4.2 Emergency Response Coordinator
5.4.3 Emergency Response Team Leader
5.4.4 Emergency Response Team Members
In Table 5.1, the Emergency Response Team members are listed. Section 6.1, Training, details required training. Emergency response training is mandatory and covers all emergency response procedures to ensure rapid communication of developing or ongoing emergencies and basic preliminary actions. Call-out procedures and 24-hour contact information is included in Appendix 5 - Emergency Response Action Reference Chart. Emergency contact numbers for the ERT are included in Table 5.1. Appendix 1 – Emergency Contact List, includes contact details for coordinators and stakeholders.
Appendix 4: Emergency Response Cabin Monthly Check sheet, lists all emergency response equipment available on site. Section 5.2 of the Plan, Inspection and Maintenance, describes the requirements for emergency equipment inspections and maintenance and identifies the appropriate Checklist. Under 5,2,1 – "…All items in the Emergency response container shall be inspected monthly to ensure all items are available and serviceable…." Section 5.5 - Role and Responsibilities of Support / External Personnel, describes the various roles: - 5.5.1 - Police, 5.5.2 - Fire Service, 5.5.3 - Hospitals and Medical facilities, 5.5.4 - Mine Site Emergency Response, and 5.5.5 - Nearby Community Members. The outside entities have been communicated with and are aware of their involvement.

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

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| | **X in full compliance with** | |
| **The operation is** | □ in substantial compliance with | **Production Practice 5.4** |
| | □ not in compliance with | |

*Summary of the basis for this Finding/Deficiencies Identified:*
In Section 4.3.5 Secondary Notification of the Plan, the Managing Director (MD) informs stakeholders, authorities, regulatory agencies, and affected communities using Appendix 1, Emergency Contacts List. With regard to Media Communication, Section 6.5 Media, states that only the MD and the Director are designated to speak to the media.
There have been no significant cyanide incidents that have occurred on-site since the last certification audit. Section 8.6.3, "Notification of significant incidents to ICMI", of the Operational Manual specifies reporting requirements to the ICMI, which conforms to ICMI reporting requirements.

*Production Practice 5.5: 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 | **Production Practice 5.5** |
| | □ not in compliance with | |

*Summary of the basis for this Finding/Deficiencies Identified:*
In the Plan, Section 4.7 Decontamination and Clean-up, includes dealing with contaminated PPE (4.7.3), Use of Hydrogen Peroxide (4.7.4), and Contaminated Area and Equipment (4.7.5). Section 4-9 Decontamination and remediation of soil of solid/liquid cyanide spill, describes the details of decontamination and remediation of soil and a solid/liquid cyanide spill. AfriChem has an informal agreement with a local gold Mine to dispose of small quantities of any cyanide spill waste or soil onto the TSF. The provision of an alternate drinking water supply is not likely to arise because of the small amounts of cyanide being handled and because there are no contracts for handling waste cyanide packaging at the moment. Regarding cyanide treatment chemicals, in Section 4.9, it is stated that AfriChem will not, per ICMI requirements, add cyanide treatment chemicals to a flowing or standing waterway in the event of a cyanide spill. The Plan addresses the potential need for environmental monitoring to identify the extent and effects of a release and include sampling methodologies, parameters and, where practical, possible locations in Section 4.8 – Environmental Monitoring.

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

| | **X in full compliance with** | |
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| The operation is | □ in substantial compliance with | **Production Practice 5.6** |
| | □ not in compliance with | |

*Summary of the basis for this Finding/Deficiencies Identified:*
The Plan must be reviewed at least every two years (Section 8.0) and the Operational Manual must be reviewed at least every two years (Section 10.0).

In the Plan, under Section 6.3 Mock Drills, it is stated that the Plan will be tested and evaluated using realistic simulation exercises. The scenarios are identified in Table 8.0 and include: -

- Fire at the facility;
- Fire at the cyanide storage area;
- Cyanide spills (wet and dry);
- Transport accidents,
- Cyanide spills in waterways and
- High concentrations of HCN gas in the incinerator area.

Drills are undertaken at least twice per annum, and the following drills were conducted: -

1. Cyanide Drill -20-10-2020 use of HCN gas detectors and Oxy-viva resuscitator.10 participants.
2. Cyanide Drill – 19-05-2021 – Use of emergency shower. 10 participants.
3. Cyanide Drill – 14-10-2021 – Mandown at entrance to NTI Warehouse – 7 participants.
4. Cyanide Drill – 28-03-2022 – Demonstration of wearing full cyanide PPE. 8 Participants.
5. Cyanide Drill – 28-09-2022 – Removal of full PPE after cyanide emergency. 12 participants.
6. Cyanide Drill – 28-04-2023 – Spill of Cyanide incinerator ash. 7 participants.

The Plan, Section 7.8 – Cyanide Emergencies, details the procedural responses to the different cyanide emergency scenarios.

The Plan, in Section 8.0 – Follow Up and Review, requires follow-up and review after drills. The Cyanide Operational Manual, in Section 10.0, Follow-up and Review, also requires the review of its contents.

It has not been necessary to revise the Plan or the Manual after any emergency that required its implementation because there were no emergencies. Drills have also not resulted in the need for revision.