



SUSTAINABILITY
FUTURE GROWTH

**INTERNATIONAL CYANIDE MANAGEMENT CODE
MINING OPERATIONS**

St Ives Gold Mines

**St Ives Gold Mine Recertification Audit – Summary Audit
Findings Report**

1st April 2019





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SUMMARY AUDIT REPORT

Name of Mine

St Ives Gold Mining Company Pty Ltd (SIGM)

Name of Mine Owner

Goldfields Australia Pty Ltd

Goldfields Australia Pty Ltd Name of Mine Operator

Goldfields Australia Pty Ltd

Name of Responsible Manager

Peter Bogensperger Senior Metallurgist - Operations

Address

St Ives Gold Mining Company Pty Ltd

St Ives Gold Mine

P O Box 359

Kambalda

Tel: Office: +61 8 9088 1013

Fax: +61 8 9088 1112

Email: Peter.Bogensperger@goldfields.com|

LOCATION DETAIL AND DESCRIPTION OF OPERATION

The St Ives Gold Mine is a gold mine located 20 kilometres (km) south-east of Kambalda, Western Australia. It is owned by the South African mining company Gold Fields. It is located near Lake Lefroy in the gold-producing Eastern Goldfields region of Western Australia, SIGM is around 80 kilometres south of Kalgoorlie and 630 kilometres east of Perth. Acquired from WMC Resources in 2001, this mine produces over 350,000 ounces per annum.

The mine is located on the Norseman-Wiluna Greenstone Belt, which forms part of the Yilgarn Craton in Western Australia. It is a highly mineralised granite-greenstone terrain with world-class deposits of gold and nickel.



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St Ives has produced in-excess of 10.5 million ounces of gold, with the first major gold mining expedition commencing in the mid-1980s. The continued exploration success and drilling of the mine's extensive greenfields project pipeline has consistently led to further discoveries and new mines.

It features both underground and surface mining, as well as Semi-Autogenous Grinding (SAG) Mill and Carbon In Pulp (CIP) technology, the site employs over 1,000 staff and contractors. The Lefroy site refers to the St Ives Mill Complex and associated facilities.

Australian Gold Reagents (AGR) delivers liquid sodium cyanide to SIGM

AUDITOR'S FINDING

This operation is:

- in full compliance
- in substantial compliance
- not in compliance

with the International Cyanide Management Code Mining Operations Verification Protocol. This operation has not experienced compliance problems during the previous three-year audit cycle.

Audit Company

Sustainability Pty Ltd
Suite 3, 118 Flora Terrace
North Beach, WA, 6020
AUSTRALIA

Telephone: +61 8 9246 6666
Facsimile: +61 8 9246 6660
www.sustainability.net.au

Date(s) of Audit

Inclusive of the period from 23-25th October 2018.

Technical Specialist

Tom Gibbons (Tom_G@westnet.com.au)



St Ives Gold Mine
Name of Mine

Signature of Lead Auditor

1st April 2019
Date

Audit Team Leader

Chris Coutinho (chris.coutinho@sustainability.net.au)



1st April 2019

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.



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PRINCIPLE 1 – PRODUCTION

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

Standard of Practice 1.1

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

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

Summarize the basis for this Finding/Deficiencies Identified:

Based on the finding of the audit SIGM are in FULL COMPLIANCE with Standard of Practice 1.1: Purchase cyanide from manufacturers employing appropriate practices and procedures to limit exposure of their workforce to cyanide, and to prevent releases of cyanide to the environment.

The Operation has purchased cyanide solely from Australian Gold Reagents Ltd (AGR) during the certification period. The active supply contract with AGR requires that the Production Facility be certified as compliant with the Code.

The cyanide supplied by AGR was solely in the form of 30%w/v liquid sodium cyanide within isotainers and has been produced at AGR's Production Facility in Kwinana, Western Australia.

Australian Gold Reagents Pty Ltd.'s sodium cyanide production plant in Kwinana, Australia was recertified in full compliance with the International Cyanide Management Code (Code) on 23 July 2014, and again on 03 August 2017.



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PRINCIPLE 2 – TRANSPORTATION

Protect communities and the environment during cyanide transport.

Standard of Practice 2.1

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

in full compliance with

The operation is in substantial compliance with Standard of Practice 2.1

not in compliance with

Summarize the basis for this Finding/Deficiencies Identified:

Based on the finding of the audit SIGM are in FULL COMPLIANCE with 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.

The active sodium cyanide supply contract with AGR requires that transportation be carried out via a supply chain that is compliant with this Standard of Practice.

AGR has been continuously certified as a Transporter since September 2006. SIGM forms part of AGR's West Australian Supply Chain. AGR's West Australian Supply Chain was recertified in full compliance with the Code on 13 June 2013, and again on 26 September 2016. This supply chain continues to be the sole means of cyanide transportation to SIGM, as verified over the period of certification.

Standard of Practice 2.2

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

in full compliance with

The operation is in substantial compliance with Standard of Practice 2.2

not in compliance with

Summarize the basis for this Finding/Deficiencies Identified:

Based on the finding of the audit SIGM are in FULL COMPLIANCE with Standard of Practice 2.2. Require that cyanide transporters implement appropriate emergency response plans and capabilities and employ adequate measures for cyanide management.



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SIGM utilised AGR as sole Producer and Transporter of cyanide over the certification period and contractually requires that AGR be certified under the Code. The contract designates AGR as responsible for safety, security, release prevention and emergency response.

AGR's compliance with the Code includes verification of the adequacy of emergency response plans and capabilities applicable to the transportation of cyanide to SIGM. The most recent recertification date of AGR's West Australian Supply Chain, which includes all aspects of transportation of cyanide from their Kwinana Production Facility to SIGM, is 26 September 2016.

During the audit period, AGR added a new transport contractor to its West Australian Supply Chain. AGR notified ICMI and the Operation of this change. The ICMI required that an addendum to the AGR West Australian Supply Chain be submitted to the ICMI within nine months of first use of the new transport contractor. AGR fulfilled this requirement, with the addendum being posted on the ICMI website in December 2018.

SIGM has maintained chain of custody records for cyanide supply/transportation over the certification period.



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PRINCIPLE 3 – HANDLING AND STORAGE

Protect workers and the environment during cyanide handling and storage.

Standard of Practice 3.1

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

in full compliance with

The operation is in substantial compliance with Standard of Practice 3.1

not in compliance with

Summarize the basis for this Finding/Deficiencies Identified:

Based on the finding of the audit SIGM are in FULL COMPLIANCE Standard of Practice 3.1. Design and construct unloading and storage facilities consistent with sound, accepted engineering practices, quality control/quality assurance procedures, spill prevention and spill containment measures.

SIGM receive bulk liquid deliveries 3-4 times a week with deliveries consisting of 3 Isotainers.

SIGM cyanide unloading and storage facilities have been in place since before the initial certification audit. They were designed and constructed in accordance with sound engineering practices, industry standards and statutory requirements. Changes since then have only been non-material with respect to the cyanide code.

The design has ensured that

- The facilities are located away from people and water bodies
- Access is controlled via physical barrier that only allow authorised access
- Measurement via level indicators and engineering control via the control system to prevent over filling
- Concrete is used to prevent seepage into the subsurface
- Secondary containment that provides a competent barrier to leakage and has sufficient capacity for potential events
- Separation from incompatible materials.

In the case of a loss of primary containment there is secondary containment to ensure that the consequence of the spill is mitigated.

The liquid cyanide storage tanks are enclosed tanks. The tanks and unloading line are vented via goose neck pipes. The resulting air is ventilated to atmosphere within the fenced bunded compounds greatly reducing the risk of personnel exposure to HCN gas. Access to this area is excluded via fencing and locked gates.



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The facility is inspected both internally and externally by AGR (on an annual basis) and the concrete and steel infrastructure checked on an annual basis by Extrin. Evidence demonstrated that findings were addressed in a timely and effective manner utilising a computer- based system INX.

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.

in full compliance with

The operation is in substantial compliance with Standard of Practice 3.2

not in compliance with

Summarize the basis for this Finding/Deficiencies Identified:

Based on the finding of the audit SIGM are in FULL COMPLIANCE Standard of Practice 3.2 requiring it to operate unloading, storage and mixing facilities using inspections, preventive maintenance and contingency plans to prevent or contain releases and control and respond to worker exposures.

The facilities are subject to continual inspection and maintained to ensure that their integrity has been maintained. This includes internal inspections scheduled and controlled by a computer based preventative maintenance system as well as expert annual external inspections by AGR and Extrin. The maintenance system also drives regular calibrations and detailed inspection.

Delivery is bulk liquid form. There is no handling of solid cyanide and no management of containers. The isotainers are removed from site at the completion of the unloading process. They are not removed from the truck. As such, there are no empty cyanide containers that require management. Connection points are also rinsed before and after disconnection. Delivery and unloading responsibility is shared between the supplier AGR and SIGM operation. Each have a documented system that has been developed so that they align to each other and contribute to successful safe delivery. AGRs controls are articulated within the Vehicle Operator Handbook for Sodium Cyanide Solution. SIGM operation's controls are articulated within cyanide unloading procedures and reagent unloading checklists.



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AGR has a Vehicle Operators Handbook for Sodium Cyanide Solution GM-09-110-02 and an unloading procedure that specifies the handling, loading and unloading procedures for vehicle operators at the Lefroy facilities. Lefroy has the following supporting procedures for cyanide unloading:

- CSBP Sodium Cyanide Solution Isotainer Unloading at Mine site.
- Cyanide Unloading/Delivery procedure
- Cyanide Storage Compound Access procedure
- Cyanide spill ground decontamination procedure

These documents cover the controls to prevent and to manage incidents during unloading including operation of valves and coupling, clean up of spills, use of personal protective equipment (PPE) and observation from a safe area.

Both the observer and truck driver complete an unloading checklist (SIG-PRO-FM218 Lefroy unloading checklist) detailing items to be inspected and recorded before, during and after unloading.



PRINCIPLE 4 – OPERATIONS

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

Standard of Practice 4.1

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

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

Summarize the basis for this Finding/Deficiencies Identified:

Based on the finding of the audit SIGM are in FULL COMPLIANCE is in full with Standard of Practice 4.1: Implement management and operating systems designed to protect human health and the environment including contingency planning and inspection and preventive maintenance procedures.

SIGM implements management and operating systems designed to protect human health and the environment and utilises contingency planning, inspection, and preventative maintenance systems and procedures to protect human health and the environment.

SIGM utilises an information consolidation and approval system with electronic filing and access portal for operating plans, procedures, work instructions and related documents.

SIGM utilises a Cyanide Management Plan (CMP) as a central source of information and implementation of all cyanide-related aspects of site cyanide management. The plan references a comprehensive range of operating plans, standard operating practices, work instructions, maintenance procedures, and inspection log sheets.

Cyanide procedures include: unloading and delivery procedures, multiple operating procedures for unit processes within the SIGM processing plant, Tailings Storage Facility (TSF) operation, operating and maintenance procedures for equipment, spillage and emergency response, cyanide monitoring, wildlife monitoring, spill remediation, cyanide dosing and monitoring, tank inspection, equipment flushing and decontamination, cyanide analysis, hydrogen cyanide (HCN) gas monitoring, Weak Acid Dissociable (WAD) cyanide control, and water sampling and monitoring.



Storm event management of water and solutions is documented in several management documents, including the Preparing For Significant Rainfall Events Work Instruction, Water Balance Model, TSF Tailings Management Plan, and Mine Water Capacity and Availability Model User Manual. SIGM maintains records of design criteria for cyanide facilities such as the Processing Plant and TSFs. SIGM continues to manage wildlife protection to design, regulatory and Code requirements, including the TSF technical reports and subsequent requisite operating conditions, Western Australian Government licence conditions.

SIGM conduct inspections at established frequencies that are sufficient to ensure that the cyanide facilities are functioning within design parameters.

SIGM implements a comprehensive range of appropriately documented operational and maintenance inspections to ensure safe and environmentally sound operation of cyanide facilities and retains records of these inspections. SIGM employs a focused series of monthly area inspections. Scheduled Inspections include: Crushing circuit, Grinding circuit, Leach/Pump Cell Tanks & Thickener Circuit, Elution Circuit, Goldroom, Laboratory, Reagents Area (including cyanide unloading and storage), Maintenance Workshop, and Tailings Storage Facility, Bores & Water Supply. SIGM also conduct targeted inspections at TSFs and process ponds reagents area, and multiple wildlife inspections. A range of completed inspection forms and summary reports was sighted during the audit.

Maintenance inspections are coordinated and recorded via a comprehensive preventative maintenance system. A range of cyanide-related maintenance inspections, work orders, and close-out reports was sighted during the audit. A specific piece of high strength cyanide equipment was interrogated within the preventative maintenance system, and the work inspections and actions during the audit period were found to be compliant with SIGM's internal plans, with adequate reporting and record keeping.

SIGM have contingency procedures in place for situations when a temporary closure or cessation of operation maybe necessary.

SIGM routinely inspects leak detection and collection systems. These inspections are captured within SIGM's maintenance system.

SIGM routine inspections cover the integrity of surface water diversions required to maintain water balance. These inspections are captured within SIGM's maintenance system.



SIGM utilises a formal written change management system to evaluate cyanide-related requirements for items including operating procedures, drawings, equipment and fixed plant alterations or upgrades. The system includes a Procedure, Hazard Checklist, and Change Request and Approval form, and is managed within the central electronic information system. Several randomly chosen change management items were interrogated and found to have been adequately managed and processed.

SIGM utilises contingency plans for process upsets and documents plans in multiple documents, including the Cyanide Management Plan, LeFroy Mill Area Emergency Plan, Cyanide Emergency Response Plan, Preparing For Significant Rainfall Events Work Instruction, TSF Tailings Management Plan, and Processing Escalation Procedure.

The plans address contingency procedures in the event of an upset in the water balance, when inspections and monitoring identify a deviation from design or standard operating procedures, or when a temporary closure or cessation of operations may be necessary.

The utilised Western Australia Grid electrical power, and has a back-up electrical generator for emergency purposes. Appropriate testing and maintenance records for the back-up electrical generator were sighted.

Standard of Practice 4.2

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

in full compliance with

The operation is in substantial compliance with Standard of Practice 4.2

not in compliance with

Summarize the basis for this Finding/Deficiencies Identified:

Based on the finding of the audit SIGM are in FULL COMPLIANCE with Standard of Practice 4.2: Introduce management and operating systems to minimise cyanide use, thereby limiting concentrations of cyanide in mill tailings.

SIGM utilises routine testwork systems and standard operating procedures to optimise cyanide addition rates. The Operation utilises both automatic on-line analysis and manual analysis to monitor and optimise cyanide addition rates. A range of standard tests and analysis is routinely undertaken to ensure cyanide use is minimised, including pH buffer testwork, ore leach and reagent consumption testwork and CIP circuit surveys.

Lime is added to the leach process to provide protective alkalinity, thus minimising cyanide consumption and generation of HCN gas.



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Ore sources scheduled for Processing Plant treatment are assessed for pH and cyanide reagent requirements prior to treatment and blending strategies are used to minimise cyanide consumption. SIGM has developed a comprehensive template for testing of new ore sources, which includes cyanide addition optimisation. Third party metallurgical testwork is undertaken to characterise potential new ore sources and for evaluation of leaching parameters and cyanide consumption. Several examples of both site and third-party testwork reports were sighted.

SIGM metallurgists review cyanide optimisation strategies daily to optimise leaching conditions. Parameters evaluated include: pH, free and weak acid dissociable (WAD) cyanide concentration, water salinity, residence time, dissolved oxygen concentration, slurry density, and slurry viscosity.

The SIGM has extensive process control measurement and control equipment to optimise and minimise cyanide consumption, and utilises state of the art process control modules specific to cyanide control and management.

Process personnel interviewed demonstrated a good understanding of cyanide measurement and process control and this understanding was consistent with SIGM procedures and work instructions.

Standard of Practice 4.3

Implement a comprehensive water management program to protect against unintentional releases.

in full compliance with

The operation is in substantial compliance with Standard of Practice 4.3

not in compliance with

Summarize the basis for this Finding/Deficiencies Identified:

Based on the finding of the audit SIGM are in FULL COMPLIANCE with Standard of Practice 4.3: Implement a comprehensive water management program to protect against unintentional releases.

SIGM implements water management program, key components being a Probabilistic Water Balance, Environmental Water Management Performance Standard, Preparing For Significant Rainfall Events Procedure, and Tailings Management Plan.

The water balance considers the elements listed in parts a) through i) of this protocol question in a reasonable manner and as appropriate for the facilities and environment. Ie



- The rates at which solutions are applied to leach pads and tailings that are deposited into tailings storage facilities?
- A design storm duration and storm return interval that provides a sufficient degree of probability that overtopping of the pond or impoundment can be prevented during the operational life of the facility?
- The quality of existing precipitation and evaporation data in representing actual site conditions?
- The amount of precipitation entering a pond or impoundment resulting from surface run-on from the upgradient watershed, including adjustments as necessary to account for differences in elevation and for infiltration of the runoff into the ground?
- Effects of potential freezing and thawing conditions on the accumulation of precipitation within the facility and the upgradient watershed?
- Solution losses in addition to evaporation, such as the capacity of the decant, drainage and recycling systems, allowable seepage to the subsurface, and allowable discharges to surface water?
- The effects of potential power outages or pump and other equipment failures on the draindown from a leach pad or the emergency removal of water from a facility?
- Where solution is discharged to surface waters, the capacity and on-line availability of necessary treatment, destruction or regeneration systems?
- Other aspects of facility design that can affect the water balance, such as the assumed phreatic surface in a tailings storage facility?

The Probabilistic Water Balance was developed by third-party aspects and is specific to the requirements of the Code.

The balance incorporates all major slurry and water flows between the Processing Plant and the various Tailings Storage Facilities and Pits.

Inputs to the model include the 2-year budget tonnage plan, the ore characteristics, water supply constraints and TSF / Pit survey data.

The output of the model is a numerical and graphical representation of the water sources for the mine, and the resultant TSF / Pit levels. The user can then assess when the TSF / Pits will reach capacity and ensure that the planning pipeline for TSF lifts or new in-pit deposition licences is maintained. This allows the dams to be run while always maintaining the required freeboard.



The water balance model is run by appropriately qualified personnel on a quarterly basis, with outputs entered into a Summary Report issued to the Unit Manager –Processing.

During the certification period, SIGM developed a Preparing For Significant Rainfall Events Procedure, with a stated purpose of ensuring that the management of water recovery from the surface of Tailings Storage Facilities is controlled and exposure to overtopping of the Decant Return water dams minimised.

The Tailings Management Plan provides detail on how the water balance is implemented and managed. This includes management of water dam levels at TSFs and within the Lefroy Plant, and instruction on how to manage any failure of the leak detection system.

Process ponds and impoundments are designed and operated with adequate freeboard above the maximum design storage capacity determined to be necessary from water balance calculations.

The Heap Leach Facility has ceased operation, and the surface processing facilities have been decommissioned, decontaminated, and removed from site. However, the Heap Leach ponds and associated run-off water flows continue to be monitored by SIGM

Despite the dormant nature of the Heap Leach Facility, the system continues to be managed within SIGM’s water balance and monitoring systems. The Heap Leach Solution Management Plan details procedures to manage and monitor the heap leach water balance. The heap leach ponds and pads are monitored regularly.

TSFs are managed to the Western Australia Arid Climate industry standard minimum of 300 mm freeboard.

SIGM uses Bureau of Meteorology rainfall data for the nearby town of Kambalda, some 20km SE of site. Rainfall can be updated in the water balance model for probabilistic model execution.

Borefield abstraction is monitored and reported on a monthly basis.

SIGM Operating procedures incorporate inspection and monitoring activities to implement the water balance and prevent overtopping of ponds and impoundments and unplanned discharge of cyanide solutions to the environment.

Standard of Practice 4.4

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

in full compliance with

The operation is in substantial compliance with Standard of Practice 4.4



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not in compliance with

Summarize the basis for this Finding/Deficiencies Identified:

Based on the finding of the audit SIGM are in FULL COMPLIANCE with Standard of Practice 4.4: requiring the operation to implement measures to protect birds, other wildlife and livestock from adverse effects of cyanide process solutions.

SIGM continues to employ an alternative protection strategy for birds/wildlife on the tailings facility as WAD CN concentrations of water on the dam exceeded the 50 mg/l ICMI recommended protection limit. Compliance with the recommendations of a peer reviewed technical study (M398) to support the alternative bird/wildlife protection strategy was found fully compliant with the Code during SIGM's 2013 recertification audit. The most recent recertification report (2016) found deficiencies in this audit criteria, resulting in a non-compliant finding and the subsequent issuing of a Corrective Action Plan.

SIGM fulfilled all requirements of the Corrective Action Plan to the satisfaction of the Auditor and the ICMI completeness review, and was re-certified in April 2017.

SIGM has developed a significant number of procedural, engineering and reporting changes to address deficiencies, resulting in a significant improvement in compliance with the designated operating conditions.

For the period December 30 2016 to October 22 2018, SIGM achieved compliance of 99.2% or better for all operating compliance parameters.

The raw data used to generate the SIGM compliance reports was independently analysed/calculated as part of the current audit process, and found to be in agreement with the SIGM reporting.

Exceedances and near exceedances are reported within SIGM's Incident Reporting System. During the audit period, zero exceedances occurred for daily sampling of the decant (supernatant) sample. During the same period, two (2) salinity exceedances were reported and four (4) WAD cyanide exceedances occurred for the TSF Spigot sample. It is possible that one of the salinity exceedances was due to assay error, but is included for completeness and transparency.

No wildlife fatalities were observed on any of the dates where an exceedance occurred.

Upon review of the individual incident reports for each of the exceedances, it is noted that in most cases, the parameter was brought back into compliance within 2-4 hours. The investigations do not appear to show a systemic or repetitive pattern, but individual operator error or equipment failure, with existing monitoring systems allowed rapid response to the exceedance.



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In each case, an investigation was conducted, a series of actions designated, and the actions fully implemented and signed off by the Unit Manager – Processing typically within 3 weeks of the incident occurrence.

It is further noted that SIGM has begun construction of a cyanide destruction circuit to further mitigate the possibility of future exceedances.

SIGM conducts comprehensive monitoring of wildlife activity at the TSF and other open water storage facilities in accordance with the peer reviewed technical reports that support the alternative strategy for protection of wildlife at SIGM. The operation undertakes wildlife monitoring including specific monitoring for wildlife mortalities at the TSFs and the process water ponds.

Third party scientific experts conduct quarterly diurnal wildlife monitoring and monthly acoustic bat surveys, and issue annual compliance reports.

Wildlife observation and monitoring results demonstrate that the risks to wildlife from cyanide in the TSF have not measurably changed, and wildlife visitation has reduced, likely due to the environment change from a paddock style TSF to an In-Pit TSF.

SIGM maintains fences around the perimeter of open water facilities with potential to exceed 50mg/l, and several dormant ponds with relatively low WAD CN concentrations remain fenced.

Standard of Practice 4.5

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

in full compliance with

The operation is in substantial compliance with Standard of Practice 4.5

not in compliance with

Summarize the basis for this Finding/Deficiencies Identified:

Based on the finding of the audit SIGM are in FULL COMPLIANCE with Standard of Practice 4.5 requiring the operation implement measures to protect fish and wildlife from direct and indirect discharges of cyanide process solutions to surface water.

SIGM has no direct or indirect discharges to surface water from any defined cyanide facility.



The nearest surface water is Lake Lefroy approximately 800 metres away, an ephemeral hypersaline salt lake. The baseline water quality at Lake Lefroy is hypersaline, with dominant heavy metals characteristics due to the geology of the region. Scientific studies have shown that a limited reduction in salinity could be expected during flood events. This drop in salinity is not likely to be significant enough to create a viable habitat for aquatic biota to propagate and develop new resting stages. Direct or indirect discharges of cyanide process solutions to surface waters do not occur at SIGM. Direct or indirect discharges to surface waters are governed by the SIGM's Environmental licence conditions and are currently exclusively mine ground dewatering streams. These water samples are routinely tested and found to be below 0.5mg/L WAD cyanide.

Standard of Practice 4.6

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

in full compliance with

The operation is in substantial compliance with Standard of Practice 4.6

not in compliance with

Summarize the basis for this Finding/Deficiencies Identified:

Based on the finding of the audit SIGM are in FULL COMPLIANCE with Standard of Practice 4.6 requiring the operation to Implement measures designed to manage seepage from cyanide facilities to protect the beneficial uses of ground water.

Due to the remote location and arid climate, there are no identified beneficial uses of groundwater beneath or immediately down gradient of the operation, and it has been identified by regulators that ongoing water abstraction is not considered to pose any risk in terms of groundwater water quality given the absence of beneficial users or groundwater dependent ecosystems in the region.

SIGM implements seepage management strategies, as documented within the Cyanide Management Plan and Water Management Environmental Standard.

This includes a comprehensive monitoring program using a network of monitoring bores, underdrainage, and recovery bores. SIGM continues to manage to groundwater limit of 0.5mg/l WAD CN, in accordance with licence conditions.



SIGM reports to the relevant jurisdiction, the Western Australian Government Department of Environmental Regulation, on defined monitoring locations on a quarterly basis and within their annual Environmental Report. No WAD cyanide exceedances occurred during the audit period.

SIGM reclaims dry tailings from the dormant TSF1 for the production of underground backfill, in the form of paste backfill. The paste is made up with is mine dewatering water, which is independent of the processing plant and does not contain cyanide. The reclaimed tailings are tested for WAD cyanide on a quarterly basis, under the responsibility of the SIGM EHS Hygiene Advisor.

Standard of Practice 4.7

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

in full compliance with

The operation is in substantial compliance with Standard of Practice 4.7

not in compliance with

Summarize the basis for this Finding/Deficiencies Identified:

Based on the finding of the audit SIGM are in FULL COMPLIANCE with Standard of Practice 4.7: Provide spill prevention or containment measures for process tanks and pipelines.

SIGM undertakes measures that effectively ensure adequate spill prevention and containment for unloading, storage, and process solution tanks and process solution pipelines. These include concrete secondary containment with volumes sized to hold a volume greater than that of the largest tank within the containment and any piping draining back to the tank and with additional capacity for the design storm event. Other measures include inspections and preventative maintenance works for secondary containments, detailed written spill response procedures, use of secondary containment pipeline sheaths between traversed concrete bund areas and an emergency containment pond.

The CIP process tanks have concrete ring beam foundations with no impermeable barrier between them and the ground. The Tanks have a leak detection system which is monitored quarterly. No leaks were detected during the audit period.

In addition to the monitoring bores, SIGM employs a comprehensive planned maintenance program for Cyanide Reagent Tanks and CIP process tanks, which are emptied and refurbished via inspection, sand-blasting and painted or lined/coated sequentially.

SIGM implements procedures to prevent discharge to the environment of cyanide solutions that are collected in secondary containment, as documented in the Cyanide Management Plan and in specific spill response procedures.



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Three spillage events reporting to the Emergency Catchment Pond occurred during the audit period, resulting in 10, 10 and 5 cubic metres of process tailing slurry respectively. This pond is unlined, and its designated use is for emergency catchment only. Incident investigations occurred for each spillage event, and necessary rectification actions were carried out and signed off by the Unit Manager – Processing. In each case, designated procedural environmental clean-up and decontamination was carried out. The Emergency Catchment Pond was inspected during each day of the current field audit, and found to be clean and completely empty.

Secondary containments were inspected during three separate field inspections at all SIGM cyanide facilities, and found to be clean and in good condition.

SIGM cyanide tanks and pipelines are constructed of materials compatible with cyanide and high pH conditions.

There are no cyanide pipelines that present a risk to surface water.

SIGM monitors compacted earth pads used for mill scats storage for WAD CN. All results to date have been less than 0.5mg/l WAD CN.

SIGM has no direct or indirect discharges to surface water from any defined cyanide facility.

Standard of Practice 4.8

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

in full compliance with

The operation is in substantial compliance with Standard of Practice 4.8

not in compliance with

Summarize the basis for this Finding/Deficiencies Identified:

Based on the finding of the audit SIGM are in FULL COMPLIANCE with 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.

Considering the age of the Operation, SIGM has maintained a reasonable library of original QA/QC records. It has processes to ensure that appropriate QA/QC records are obtained for new construction activities, and continues to utilise third-party expert inspections and evaluations to ensure plant integrity.



Significant newly constructed or under construction fixed plant during the audit period included Trash Screen replacement, Leviathan In-pit Tailing, Tailing Thickener concrete footings and bund Mill Deck Concrete Platform, Adsorption Tank Internal Lining, and Cyanide destruct Circuit. SIGM provided a cross-section of QA/QC documentation for these projects, including material test results, inspections and reports confirming that the design has been reviewed by appropriately qualified personnel. This documentation included compaction tests, weld tests, civil tests, concrete analysis and testing, and electrical testing.

Standard of Practice 4.9

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

in full compliance with

The operation is in substantial compliance with Standard of Practice 4.9

not in compliance with

Summarize the basis for this Finding/Deficiencies Identified:

Based on the finding of the audit SIGM are in FULL COMPLIANCE with Standard of Practice 4.9. Implement monitoring programs to evaluate the effects of cyanide use on wildlife, surface and ground water quality

SIGM implements and reviews a range of written standard monitoring procedures as summarised in the Cyanide Management Plan. These include water and groundwater monitoring, process pond and TSF monitoring, processing plant unit process area monitoring and a range of wildlife monitoring procedures and activities.

The monitoring and sampling procedures include details for sampling, handling and chain of custody for water and process solutions, including groundwater and tailings slurry.

The sampling and analytical protocols have been developed by appropriately qualified personnel and taking into consideration licensing requirements and Australian Standards for sampling and monitoring, and in accordance with the National Association of Testing Authorities (NATA) for both sampling and analysis.

The sampling procedures reference where samples are to be taken.

SIGM has incorporated effective quality control processes within its monitoring program to provide verification and reliance on monitoring results.

Monitoring frequency is based upon legislative licence conditions, expert third party advice and also upon operational learnings and Code auditing activities and recommendations.



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The referenced ground water bores are downgradient of the site. There is also water monitoring of Lake Lefroy, despite it being hypersaline.

Inspections are conducted at frequencies adequate to characterize the medium being monitored and to identify changes in a timely manner.

SIGM continues to undertake daily inspections of the tailings facility, which includes identification of wildlife activity and any observed mortalities. Wildlife observation training for SIGM personnel is conducted by third party experts and quality control processes are implemented to ensure effectiveness of the training.

Intensive third party wildlife monitoring is periodically carried out by established wildlife experts.

SIGM has no direct or indirect discharges to surface water from any defined cyanide facility.



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PRINCIPLE 5 – DECOMMISSIONING

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

Standard of Practice 5.1

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

in full compliance with

The operation is in substantial compliance with Standard of Practice 5.1

not in compliance with

Summarize the basis for this Finding/Deficiencies Identified:

Based on the finding of the audit SIGM are in FULL COMPLIANCE with Standard of Practice 5.1: Protect communities and the environment from cyanide through development and implementation of decommissioning plans for cyanide facilities.

SIGM has developed a Closure Plan and Decontamination and Decommissioning Plan. Both plans contain implementation schedules for decommissioning activities.

Cost estimates specifically for cyanide facilities are provided in the SIGM Decontamination and Decommissioning Plan.

SIGM review their Decontamination and Decommissioning Plan annually, and their Mine Closure Plan triennially.

The Heap Leach wet plant facility is no longer in production and has been decommissioned. SIGM provided detailed information on this decommissioning activity.

SIGM have complied with their review obligations within the audit period.

Standard of Practice 5.2

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

in full compliance with

The operation is in substantial compliance with Standard of Practice 5.2

not in compliance with

Summarize the basis for this Finding/Deficiencies Identified:



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Based on the finding of the audit SIGM are in FULL COMPLIANCE with Standard of Practice 5.2: Establish an assurance mechanism capable of fully funding cyanide related decommissioning activities

SIGM has developed and updates cost estimates to fully fund third party decommissioning measures as identified in its site decommissioning and closure plans.

The triennial review cycle for the SIGM Closure Plan for St Ives Gold Mine allows for review of the cost estimate for cyanide facility decommissioning and decontamination.

SIGM have complied with their review obligations within the audit period.

A financial mechanism continues to apply to SIGM under the Government of Western Australia Mining Rehabilitation Fund Act 2012. SIGM participates fully in the Government of Western Australia's Mine Rehabilitation Fund by paying annual levies that take into account the degree of disturbance on the SIGM leases.



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PRINCIPLE 6 – WORKER SAFETY

Protect workers' health and safety from exposure to cyanide.

Standard of Practice 6.1

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

in full compliance with

The operation is in substantial compliance with Standard of Practice 6.1

not in compliance with

Summarize the basis for this Finding/Deficiencies Identified:

Based on the finding of the audit SIGM are in FULL COMPLIANCE with Standard of Practice 6.1. Identify potential cyanide exposure scenarios and take measures as necessary to eliminate, reduce and control them

The operation's safety management systems are effective in identifying potential cyanide hazards and has developed effective hazard control measures. The SIGM integrated management system consists of primarily three levels of documentation, standards, procedures / Plans and work instructions. An example of this is in the area of confined space where there is a Corporate standard, a site-based procedure and risk assessments and work instructions for particular tank entries for example.

Work Instructions support cyanide related tasks including decontamination and flushing.

With respect to cyanide related risk, a cyanide management plan has been developed and implemented which refers to applicable procedures.

The systems are implemented utilising a training mechanism and to supplement the procedures and training, there is signage to remind personnel of rules and PPE for cyanide related tasks.

SIGM has a permit to work system that covers all identified critical high risks.

For maintenance activities the processing operators isolate and drain the lines, before handing over to maintenance personnel.

SIGM procedures address the use of personal protective equipment and SIGM has implemented a pre-work inspection process. Risk tools are used by workers to assess the workplace before each task in addition to the Work Instructions specific for the task.

SIGM has a Change Management Procedure for the purpose of providing a common framework for the systematic and structured management of changes at SIGM.



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SIGM actively solicits and actively considers worker input in developing and evaluating health and safety procedures. There are formalised meetings including monthly safety representative meetings and monthly crew meetings which provides a mechanism for consultation with the work force

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.

in full compliance with

The operation is in substantial compliance with Standard of Practice 6.2

not in compliance with

Summarize the basis for this Finding/Deficiencies Identified:

Based on the finding of the audit SIGM are in FULL COMPLIANCE with 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.

Access is restricted to the processing plant areas, with no one permitted to enter the processing plant area until the necessary inductions have been completed which include cyanide awareness training or they are escorted by a fully inducted person.

SIGM provides designated facilities for eating and drinking, and these activities are restricted to areas away from cyanide. Designated smoking areas are provided away from areas where cyanide is used or stored.

Showers, low-pressure eyewash stations and dry powder fire extinguishers are located at strategic locations throughout the operation and are maintained, inspected and tested on a regular basis.

SIGM has a planned maintenance repetitive work order for the showers and a contract for the inspection, maintenance and servicing of fire extinguishers across the operation.

During the site inspection showers, eye wash stations and fire extinguishers were checked and found to be in working order with relevant service tags attached and in date.

The unloading, storage, and process tanks, and piping containing cyanide is identified to alert workers of their contents, the direction of cyanide flow in pipes is designated.

SIGM implements a pipeline colour coding system. The pipework observed during the site inspection had directional indications showing the direction of flow in the pipes.



All tanks possess signage indicating the presence of cyanide including statutory HAZCHEM signage.

Material Safety Data Sheets (MSDS), first aid procedures or other informational materials on cyanide safety in the language of the workforce are available in areas where cyanide is managed. Additionally cyanide safety information is available at the unloading areas and includes information on first aid procedures.

The operation has determined the pH to minimise the evolution of HCN at its operation. This is done by the metallurgist and provided in an operating parameters document and set in the control system.

The operation does use personal monitoring devices at defined areas, to confirm that controls are adequate to limit worker exposure to hydrogen cyanide gas to 10 parts per million on an instantaneous basis and 4.7 parts per million continuously over an 8-hour period. These areas are clearly marked with signage and communicated within inductions and training.

SIGM utilises fixed 11 HCN monitors within the operation. The locations chosen have been based on risk assessment and include the trash screens, the leach tanks, the discharge to the ILR drum and the cyanide destruct plant.

The operation identified areas and activities where workers may be exposed to cyanide in excess of 10 parts per million on an instantaneous basis and 4.7 parts per million continuously over an 8-hour period and require use of personal protective equipment in these areas or when performing these activities. Signage clearly indicates areas that require this. Where there is the likelihood that the level may be above 10, the area gated and is signed as requiring a respirator to enter.

Warning signs have been placed where cyanide is used, advising workers that cyanide is present. Signs clearly indicate the requirement for PPE and the requirement for personnel monitors. Signage suggesting that that smoking, open flames and eating and drinking are not permitted were not apparent, however, this was covered in the induction and training and via the provision of locations specifically for eating, drinking and smoking.

SIGM has implemented an Accident Incident Reporting System that is used to report and record all injuries, incidents, hazards and near misses. Since the last code audit there have been no significant incidents

Standard of Practice 6.3

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

in full compliance with



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The operation is in substantial compliance with Standard of Practice 6.3
 not in compliance with

Summarize the basis for this Finding/Deficiencies Identified:

Based on the finding of the audit SIGM are in FULL COMPLIANCE Standard of Practice 6.3. Develop and implement emergency response plans and procedures to respond to worker exposure to cyanide.

SIGM does have water, oxygen, a resuscitator, antidote kits, a radio, telephone and alarm system as a means of communication of emergency notification readily available for use at cyanide unloading and storage locations and elsewhere throughout its operations

The cyanide unloading procedure requires the observer to have a two-way radio to communicate with the control room as well as pre approval from the control room. There is also a PA systems allowing personnel to raise the alarm.

There is an adequate water supply for cyanide decontamination purposes through the emergency shower system or through fire response infrastructure. The operation does have emergency oxygen equipment positioned strategically within the plant areas near where cyanide is unloaded or mixed. The oxygen equipment is subject to regular inspection and planned periodic maintenance.

SIGM inspects its first aid kits on a monthly basis with the replenishment of first aid kits facilitated by the full time onsite Emergency Services Officers (ESOs). Cyanide antidote kits are suitably stored at the onsite medical facility.

SIGM has developed specific written emergency response plans, procedures and work instructions for cyanide emergencies and exposures. The cyanide emergency response plan form part of the SIGM emergency management plan and address cyanide emergencies, exposures and environmental releases including detoxification procedures and decontamination.

SIGM does have on-site capability to provide first aid to workers exposed to cyanide. The emergency response team are the primary responders in the event of an emergency and have either occupational first aid or senior first aid training.

The site has a fully equipped ambulance with an oxygen supply and a medical treatment room.



The operation has developed procedures to transport workers exposed to cyanide to Kalgoorlie Regional Hospital. The operation has an ambulance that could be used to transport an exposed person to Kalgoorlie Regional Hospital if necessary. St Johns Ambulance service would provide backup if required. There are airstrips (Kambalda Airstrip) nearby and if required the Royal Flying Doctors Service under instruction from the Kalgoorlie regional hospital will provide transport.

The operation has formal arrangements (memorandum of understanding (MOU)) with Kalgoorlie Regional Hospital which has the resources to care for cyanide exposure cases. Kalgoorlie Regional Hospital is the main medical resource for the region and can arrange for transport of patients to Perth for further treatment if necessary (Via the RFDS).

A formal memorandum of understanding (MOU) between SIGM and the Department of fire and emergency services (DFES) is also in place.

SIGM conducts emergency drills periodically to test response procedures for various cyanide exposure scenarios. Evidence was available to demonstrate that these were conducted throughout the audit period.



PRINCIPLE 7 – EMERGENCY RESPONSE

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

Standard of Practice 7.1

Prepare detailed emergency response plans for potential cyanide releases.

in full compliance with

The operation is in substantial compliance with Standard of Practice 7.1

not in compliance with

Summarize the basis for this Finding/Deficiencies Identified:

Based on the finding of the audit SIGM are in FULL COMPLIANCE Standard of Practice 7.1. Prepare detailed emergency response plans for potential cyanide releases.

SIGM has developed an Emergency Response system to address potential accidental releases of cyanide. A specific cyanide emergency response plan has been developed to address potential accidental cyanide releases and to respond to cyanide exposures; this plan sits within the emergency management framework. The plan includes cyanide decontamination procedures, detoxification procedures and an environmental spill procedures.

The potential for failure of tailings impoundments are addressed in the operating manuals for the Tailing Storage Facilities (TSF). The TSF manual contain sections on emergency management in the event of TSF failures. SIGM's cyanide supply contracts with AGR specifies the responsibilities and response actions for transport related cyanide emergencies. SIGM has developed and implemented a cyanide transport incident response pre incident plan for scenarios that may occur once trucks are onsite. The operation continues to have a Memorandum of Understanding between SIGM and the Department of Fire and emergency Services and Kalgoorlie regional hospital that outlines the roles and responsibilities for each organisation in the event of an emergency.

SIGM plans and procedures describe specific response actions (as appropriate for the anticipated emergencies), such as clearing site personnel from the exposure area, cyanide antidote use and first aid measures.

The cyanide emergency management plan describe the actions taken and the responsibilities in the initial response and assessment of an incident and include specific instructions for cyanide related incidents. Evacuation protocols have been developed on the basis of modelled credible scenarios.



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The Cyanide Exposure Procedure details the actions to be taken when a person is suspected of cyanide poisoning. This procedure includes instructions for the use of antidote kits and first aid equipment.

Standard of Practice 7.2

Involve site personnel and stakeholders in the planning process.

in full compliance with

The operation is in substantial compliance with Standard of Practice 7.2

not in compliance with

Summarize the basis for this Finding/Deficiencies Identified:

Based on the finding of the audit SIGM are in FULL COMPLIANCE Standard of Practice 7.2. Involve site personnel and stakeholders in the planning process.

SIGM has involved its workforce and the external emergency responders in the cyanide emergency response planning process. SIGM implements a formal process for reviewing documents and communicating changes with crew members. SIGM involve local response agencies such as outside responders and medical facilities in the cyanide emergency planning and response process. The operation maintains formal agreements with key external emergency responders and hold regular meeting with these organisations.

The Local emergency committee provides a mechanism for SIGM to communicate and seek input to emergency response plans.

SIGM has engaged in consultation or communication with stakeholders to keep the Emergency Response Plan current.

SIGM also conducts monthly safety meetings where the workforce can engage in safety issues including emergency response. The Safety Representatives and the Safety representative meetings are also used for communication and consultation with the workforce

Standard of Practice 7.3

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

in full compliance with

The operation is in substantial compliance with Standard of Practice 7.3

not in compliance with



Summarize the basis for this Finding/Deficiencies Identified:

Based on the finding of the audit SIGM are in FULL COMPLIANCE with Standard of Practice 7.3. Designate appropriate personnel and commit necessary equipment and resources for emergency response.

Elements of the SIGM cyanide emergency response plan and procedures:

- Designate primary and alternate emergency response coordinators whom have explicit authority to commit the resources necessary to implement the Plan
- Identify Emergency Response Teams
- Require appropriate training for emergency responders
- Include call-out procedures and 24-hour contact information for the coordinators and response team members
- Specify the duties and responsibilities of the coordinators and team members
- List emergency response equipment, including personal protection gear, available along transportation routes and/or on-site
- Include procedures to inspect emergency response equipment to ensure its availability
- Describe the role of outside responders, medical facilities and communities in the emergency response procedures

SIGM has confirmed that outside entities included in the emergency response plan are aware of their involvement and are included as necessary in mock drills or implementation exercises. The operation through attendance at local emergency committee meetings and through direct correspondence has confirmed that agencies listed in the plan are aware of their involvement

Standard of Practice 7.4

Develop procedures for internal and external emergency notification and reporting.

in full compliance with

The operation is in substantial compliance with Standard of Practice 7.4

not in compliance with

Summarize the basis for this Finding/Deficiencies Identified:

Based on the finding of the audit SIGM are in FULL COMPLIANCE Standard of Practice 7.4. Develop procedures for internal and external emergency notification and reporting.

The SIGM emergency response framework includes procedures and contact information for notifying management, regulatory agencies, outside response providers and medical facilities of a cyanide emergency.

The SIGM emergency response framework includes procedures and contact information for notifying those communities potentially affected by a cyanide-related incident and any necessary response measures, and for communication with the media.



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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.

in full compliance with

The operation is in substantial compliance with Standard of Practice 7.5

not in compliance with

Summarize the basis for this Finding/Deficiencies Identified:

Based on the finding of the audit SIGM are in FULL COMPLIANCE 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.

The SIGM Cyanide Emergency Response Plan (CERP) describes specific remediation measures as appropriate for the likely cyanide release scenarios, and includes: Recovery or neutralisation of solutions or solids; decontamination of soils or other contaminated media, and; management and/or disposal of spill clean-up debris.

The provision of an alternate drinking water supply is not applicable to this SIGM operation.

SIGM stores a shipping container full of Ferrous sulfate (Approximately 20 tonne), kept in a location near the unloading area, accessible in the event of a spill. Work instructions define where the ferrous sulphate is stored. There is also a requirement for checking of the product prior to cyanide commencing unloading. The cyanide emergency management plan refers to the methodology for remediation, neutralisation and decontamination, in this, it refers to the level needing to fall below 10ppm for the site to be declared safe.

The SIGM CERP does prohibit the use of chemicals such as sodium hypochlorite, ferrous sulphate and hydrogen peroxide to treat cyanide that has been released into or near surface water.

The SIGM CERP does address the potential need for environmental monitoring to identify the extent and effects of a cyanide release, and includes sampling methods, parameters and, where practical, possible sampling locations.

Standard of Practice 7.6

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

in full compliance with

The operation is in substantial compliance with Standard of Practice 7.6

not in compliance with



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Summarize the basis for this Finding/Deficiencies Identified:

Based on the finding of the audit SIGM are in FULL COMPLIANCE with Standard of Practice 7.6. Periodically evaluate response procedures and capabilities and revise them as needed.

The emergency management plan specifies that emergency mock exercises will be undertaken on a regular basis and will include cyanide related emergency scenarios. The operation has scheduled and implemented the cyanide mock emergency drills. Records of mock emergency drills are maintained and improvement actions arising from the drills are tracked through to completion in INX.

SIGM does review elements of its emergency management system on a regular basis. Evidence of revisions demonstrate at least 12 monthly reviews and that consideration was given to the results of mock drills, incidents and risk assessments.



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PRINCIPLE 8 – TRAINING

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

Standard of Practice 8.1

Train workers to understand the hazards associated with cyanide use.

in full compliance with

The operation is in substantial compliance with Standard of Practice 8.1

not in compliance with

Summarize the basis for this Finding/Deficiencies Identified:

Based on the finding of the audit SIGM are in FULL COMPLIANCE Standard of Practice 8.1. Train workers and emergency response personnel to manage cyanide in a safe and environmentally protective manner.

SIGM implements the training of all personnel who may encounter cyanide in cyanide hazard recognition. Cyanide hazard training is included as part of the Mill Induction Training Program which must be completed by all persons prior to being able to access areas that may contain cyanide. All visitors must be escorted at all times by an inducted person and are not permitted to undertake work. The SIGM training package includes a knowledge assessment by the participant that is marked and signed off by a competent assessor. In addition to the mill induction for processing, operators complete the AGR cyanide awareness training that provides additional detail in cyanide use in processing. Cyanide hazard recognition refresher training is periodically conducted. The training is part of the Mill Induction that is completed every two years and the AGR cyanide awareness completed annually. The training is linked to the access control system that will prevent access to the Mill area if the training has not been completed.

SIGM training records are retained in an electronic database (sharepoint) and on hard copy files for each employee and contractor. A review of training records for workers confirmed that records are retained.

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.

in full compliance with

The operation is in substantial compliance with Standard of Practice 8.2



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not in compliance with

Summarize the basis for this Finding/Deficiencies Identified:

Based on the finding of the audit SIGM are in FULL COMPLIANCE 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.

SIGM trains workers to perform their normal production tasks, including unloading, production and maintenance, with minimum risk to worker health and safety and in a manner that prevents unplanned cyanide releases.

SIGM employees are trained prior to working with cyanide. Cyanide awareness training is included in the induction process for persons working in the processing areas, relevant contractors and maintenance personnel must also complete the induction and cyanide awareness training before working in the area. Personnel who may encounter cyanide complete the cyanide awareness and refresher training at least annually.

The SIGM operation also has a training framework for processing personnel that includes training on tasks involving cyanide. The operation's Buddies, Supervisors (Assessors) and training staff are experienced in the operation of the facility and hold Training and Assessing Qualifications as appropriate.

The training elements necessary for each SIGM job involving cyanide management are identified in training materials.

An individual cannot operate solo until they have been assessed as competent in the procedures related to cyanide tasks.

This requires them to:

- Read and understand the procedure,
- Observe the Buddy doing the task
- Doing the task under observation
- Successfully completing theory and practical assessments
- Be assessed and signed off by the Supervisor

The SIGM operation evaluates the effectiveness of cyanide training by testing, observation or other means. SIGM individuals complete a written assessment at the conclusion of the cyanide awareness and process training.

SIGM records are retained throughout an individual's employment documenting the training they receive. The records include the names of the employee and the trainer, the date of training, the topics covered, and if the employee demonstrated an understanding of the training materials.



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Standard of Practice 8.3

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

in full compliance with

The operation is in substantial compliance with Standard of Practice 8.3

not in compliance with

Summarize the basis for this Finding/Deficiencies Identified:

Based on the finding of the audit SIGM are in FULL COMPLIANCE with Standard of Practice 8.3. Train appropriate workers and personnel to respond to worker exposures and environmental releases of cyanide.

All SIGM cyanide unloading, production and maintenance personnel are trained in the procedures to be followed if cyanide is released. Response to incidents and emergency situations is covered in the induction process that all employees must complete. Cyanide specific aspects are covered in the cyanide awareness training material and via task specific procedures.

SIGM site cyanide response personnel, including unloading, production and maintenance workers, are trained in decontamination and first aid procedures. They take part in routine drills to test and improve their response skills.

SIGM Emergency Response Coordinators and members of the ERT are trained in the procedures included in the Emergency Response Plan regarding cyanide, including the use of necessary response equipment.

The SIGM operation periodically communicates with off-site Emergency Responders, such as DFES and Kalgoorlie Regional Hospital, to ensure familiarity with those elements of the Emergency Response Plan related to cyanide.

Simulated cyanide emergency drills are periodically conducted for SIGM training purposes. The operation has conducted full scale emergency drills during the audit period that have addressed both worker exposure and potential environmental release. The debrief reports and records for the emergency drills contain recommendations in relation to improving training and instruction, and demonstrate that training needs are considered in the evaluation of the exercise.

SIGM attendance records for cyanide awareness training are maintained in hard copy as well as electronically. The Emergency Response Coordinator maintains training records for the emergency response team members. A review of training records confirmed they detail the course delivered, the presenter, the date and the names of those attending.



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PRINCIPLE 9 – DIALOGUE

Engage in public consultation and disclosure.

Standard of Practice 9.1

Provide stakeholders the opportunity to communicate issues of concern.

in full compliance with

The operation is in substantial compliance with Standard of Practice 9.1

not in compliance with

Summarize the basis for this Finding/Deficiencies Identified:

Based on the finding of the audit SIGM are in FULL COMPLIANCE with Standard of Practice 9.1: Provide stakeholders the opportunity to communicate issues of concern.

SIGM is in a regional location in Western Australia and the workforce either drives in and out or lives at company camp in nearby Kambalda. The site is located approximately 20 km south-east of the nearest community, Kambalda.

SIGM provides the opportunity for stakeholders to communicate issues of concern regarding the management of cyanide, via forums such as Site Inductions, Toolbox and Safety Meetings, SIGM Family Fun Days, Community Engagement Days, and Career Open Days.

In addition to the above interactions, opportunity for communication for stakeholders exists via Gold Fields Facebook page, website, public feedback telephone number, and community feedback email address.

Site Personnel receive cyanide awareness training.

At SIGM's numerous community engagement forums, a large cyanide information Poster is on display to disseminate information concerning cyanide-related activities.

SIGM's annual Environmental Report is publically available.

Standard of Practice 9.2

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

in full compliance with

The operation is in substantial compliance with Standard of Practice 9.2

not in compliance with



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Summarize the basis for this Finding/Deficiencies Identified:

Based on the finding of the audit SIGM are in FULL COMPLIANCE with Standard of Practice 9.2. Initiate dialogue describing cyanide management procedures and responsively address identified concerns.

SIGM provide multiple opportunities to interact with stakeholders and provide them with information regarding cyanide management practices and procedures.

SIGM holds numerous community and stakeholder open days, where interaction is encouraged. At SIGM's numerous community engagement forums, a large cyanide information Poster is on display to disseminate information concerning cyanide-related activities.

In addition, stakeholders have opportunities to interact with the Operation via Gold Field's social media pages, website, and the SIGM-specific community feedback hotline and community feedback email address.

Standard of Practice 9.3

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

in full compliance with

The operation is in substantial compliance with Standard of Practice 9.3

not in compliance with

Summarize the basis for this Finding/Deficiencies Identified:

Based on the finding of the audit SIGM are in FULL COMPLIANCE with Standard of Practice 9.3. Make appropriate operational and environmental information regarding cyanide available to stakeholders.

The Gold Fields web site contains a summary of SIGM processing activities.

SIGM holds numerous community and stakeholder open days, where interaction is encouraged. At SIGM's numerous community engagement forums, a large cyanide information Poster is on display to disseminate information concerning cyanide-related activities.

There is no significant illiteracy in the local population in the region surrounding the Operation.

SIGM maintain a Gold Fields standard internal and external reporting system for incidents, including those that involve cyanide.



Cyanide incidents are reported in SIGM's Annual Environmental Report, which is publicly available.

Releases (environmental and exposures) that cause applicable limits for cyanide to be exceeded are advised to regulatory authorities as required by the safety and environment incident reporting and investigation procedure.

SIGM is required to submit an Annual Environmental Report (AER) to the regulator on an annual basis. The AER details all environmental incidents that occurred on site during the reporting period. Cyanide releases, including tailings spills are reported in the AER and this was confirmed in a review of the document. Permission from DGM was not required to access the AER. The public can access the AER through the Freedom of Information Act 1992 (FOI Act).

All mining operations within Western Australia are required to report serious occurrences and mining injuries (including cyanide exposures) to DMP on designated forms. The Mining Injury Report Form requires information to be recorded concerning the nature of the injury, part of the body injured and incident details.

It was confirmed in the interview with the SIGM Unit Manager Sustainable Development that the existing SIGM internal and external reporting system complies with the specific reporting requirements as noted in this Standard of Practice ie

- Cyanide exposure resulting in hospitalisation or fatality;
- Cyanide releases off the mine site requiring response or remediation;
- Cyanide releases on or off the mine site resulting in significant adverse effects to health or the environment;
- Cyanide releases on or off the mine site requiring reporting under applicable regulations; and
- Releases that are or that cause applicable limits for cyanide to be exceeded.





SUSTAINABILITY
FUTURE GROWTH

St Ives Gold Mine
Name of Mine

Signature of Lead Auditor

1st April 2019
Date