



SUMMARY AUDIT REPORT

**International Cyanide Management Code (ICMC)
Recertification Audit**

*Australian Gold Reagents- Production Facility ICMC Recertification Audit-
Summary Audit Report*

Submitted to:

**International Cyanide
Management Institute (ICMI)**
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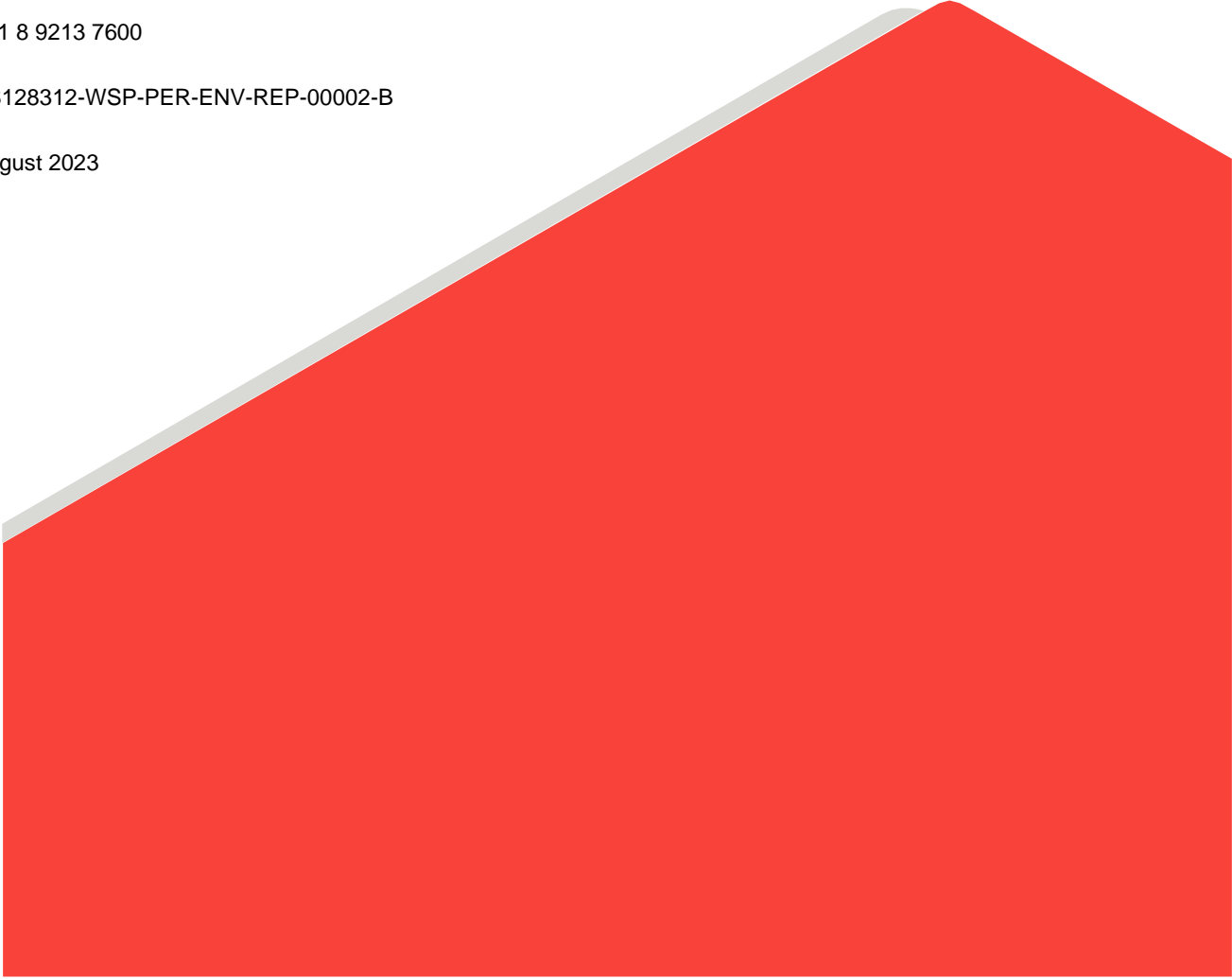
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PS128312-WSP-PER-ENV-REP-00002-B

August 2023

A large, solid red abstract shape that resembles a stylized mountain peak or a large arrow pointing upwards and to the right, occupying the bottom right portion of the page.

Distribution List

1 Copy – ICMC

1 Copy– AGR)

Summary Audit Report

Name of Production Facility: Kwinana Sodium Cyanide Facility

Name of Facility Owner: Australian Gold Reagents Pty Ltd

Name of Facility Operator: CSBP Ltd

Name of Responsible Manager: Brett Marsh, Operations Superintendent

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LOCATION DETAIL AND DESCRIPTION OF OPERATION

Australian Gold Reagents Pty Ltd

Australian Gold Reagents (AGR) is the management company of the unincorporated joint venture between CSBP Limited (CSBP) and Coogee Chemicals Pty Ltd (Coogee Chemicals). CSBP is part of the Wesfarmers Chemicals, Energy and Fertilisers Division of Wesfarmers Limited (WESCEF). CSBP is the major participant in the venture and acts as operator and sales agent for the AGR business. As the operating agent, employees of CSBP act on behalf of AGR.

CSBP and AGR are responsible for the overall management of the cyanide production facility. AGR, in its capacity as the sales agent, is the consigner and is responsible for the overall management of the sodium cyanide production activities, including the:

- Provision of cyanide safety management program
- Provision of cyanide specific training to personnel
- Provision of inspection and preventative maintenance program for cyanide infrastructure
- Tracking of shipments
- Provision of emergency response plans and resources.

Kwinana Production Facility

The AGR cyanide production facility is located within CSBP's fertiliser and chemicals complex at Kwinana, some 40 km south of Perth within the state of Western Australia. AGR produces and transports two different forms of sodium cyanide from the Kwinana production facility, namely solution and solids. Sodium cyanide solution is produced as a 30% strength liquid and solid sodium cyanide as a >97% strength white briquette.

Based on the interviews with the site personnel and site observation, there have been no significant changes since the previous ICMC audit in 2020 except the upgrade to the waste handling area.

The key elements of infrastructure at the cyanide facility are:

- Reaction facilities with three units
- Liquid cyanide storage tanks, located within an open concrete lined pit
- Sodium hydroxide tank farm
- Production facilities with three units
- A products warehouse for storage of packaged solid sodium cyanide
- Liquid cyanide loading facilities (platform and fill lines)
- Two administration buildings
- Control Centre
- Air emission treatment facilities
- Wastewater treatment facilities.

The facility operates on 8-hour shifts, 24 hours per day, seven days per week, with four production teams.

Cyanide Transportation

AGR’s production facility is the first component of the supply chain and undertakes the packaging, labelling, and securing of cyanide for road and rail transport.

The transport of both liquid and solid sodium cyanide within Western Australia is undertaken by rail and/or road along recognised dangerous goods transport routes classified by the relevant authorities. The transport network includes contracted transporters servicing Fremantle Port (for export) and various gold mining operations throughout the State.

The transport of cyanide by road and rail within Western Australia is not covered under this Production Recertification Audit; rather it is covered by AGR’s Western Australia Supply Chain, last recertified in full compliance with the Code in November 2022.

AUDITORS FINDINGS

AGR is:

- in full compliance with **The International Cyanide Management Code**
- in substantial compliance with **The International Cyanide Management Code**
- not in compliance with **The International Cyanide Management Code**

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



AUDITOR INFORMATION

Audit Company: WSP Golder
Audit Team Leader: Rudi Seebach, ICMI Lead Auditor
Email: Rudi.Seebach@wsp.com

Name and Signatures of Auditors:

The Certification Audit team was composed of:

- Mr Rudi Seebach (Lead Auditor)
- Mr Phil Ashton (Technical Specialist)
- Mr Mike Woods (Lead Auditor)

Name	Position	Signature	Date
Rudi Seebach	ICMI Lead Auditor		May 2023
Phil Ashton	Technical Specialist		May 2023

The field component of the audit was completed on 15 March 2023. The audit was undertaken by Rudi Seebach (Lead Auditor), Mike Woods (Lead Auditor) and Phil Ashton (Technical Specialist).

Michael Woods initiated and conducted most of the audit for the Australian Gold Reagents production facility as the Lead Auditor. Mike Woods resigned from WSP before the audit was complete and was therefore unavailable to complete the audit and sign the documentation.

Rudi Seebach assumed the responsibility as Lead Auditor following the resignation of Mike Woods. Rudi Seebach completed the audit and audit report as Lead Auditor and submitted the finalized audit report on behalf of WSP Golder. Rudi Seebach is an approved International Cyanide Management Institute Lead Auditor for Cyanide Code certification audits.

No potential conflicts of interest were anticipated or encountered during the Audit that necessitated the requirement for an independent Auditor.

Auditor Attestation

The field component of the Recertification Audit was undertaken on 15 March 2023.

I, Rudi Seebach 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 Recertification Audit. I further attest that the Recertification Audit was conducted in a professional manner in accordance with the International Cyanide Management Code's *Cyanide Production Verification Protocol* (CPV Protocol) and using standard and accepted practices for health, safety and environmental audits.

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APPENDIX A
 Important Information

1.0 PRINCIPLE 1 – OPERATIONS

Design, construct and operate cyanide production facilities to prevent release of cyanide

Production Practice 1.1: Design and construct cyanide production facilities consistent with sound, accepted engineering practices and quality control/quality assurance procedures.

in full compliance with

The operation is

in substantial compliance with

Production Practice 1.1

not in compliance with

Summarise the basis for this Finding/Deficiencies Identified:

The facility is in FULL COMPLIANCE with Production Practice 1.1 requiring cyanide production facilities to be designed, constructed and operated to prevent releases of cyanide.

Quality assurance and quality control QA/QC records are retained. The availability of the facility's manufacturer's design report (MDR) and other technical records have been confirmed. AGR maintains a comprehensive technical library which makes readily available a wide range of documents and records relating to the implementation of quality assurance and control programmes for the Cyanide Business.

A review of QA/QC documentation confirmed that appropriately qualified personnel are involved in the design and review process. QA/QC documentation was available and reviewed for the key infrastructure project that occurred during the audit period.

QA/QC documentation was available and reviewed for the key infrastructure project that occurred during the audit period. The materials used for construction of the cyanide production facility are compatible with the reagents used and the processes employed.

AGR adheres to international and engineering standards in the manufacturing of cyanide production facility infrastructure. These materials are recognised as being compatible for use with liquid sodium cyanide. Automatic systems, or "interlocks", to shut down production systems and prevent releases due to power outages or equipment failures are in place.

The cyanide facility areas are located within concrete pavement to minimise seepage to the subsurface. Cyanide is managed on a concrete surface that can minimise seepage to the subsurface. Cyanide storage, packaging and the handling of waste occurs in roofed buildings and on concrete floors.

The site inspection confirm concrete surfaces are maintained. The facility does employ methods to prevent the overflowing of cyanide process and storage vessels, including level indicators and high-level alarms. All the signals are indicated on the distributed control system (DCS). Process tanks have ultrasonic level monitoring and alert systems in place, linked to the DCS and routine testing of level monitoring is undertaken.

Continuous monitoring of vessel levels and alarms is displayed on the DCS in the control room. Secondary containments are provided for process and storage tanks and containments are constructed of materials that provide a competent barrier to leakage.

Bund area calculations show that areas are sized to hold a volume greater than that of the largest tank or container within the containment plus additional capacity to account for rainfall and any additional piping draining back to the tank.

Spill prevention and containment measures are provided for all cyanide solution pipelines. The site inspection confirmed that all cyanide solution pipes between containments are configured in overhead pipe in pipe or pipe in tray design. In the event of a leak, pipe trays are designed to prevent pooling and drainage mechanisms are in place that drain any solution into a contained area.

The facility stores cyanide in a manner that minimises the potential for exposure of cyanide to moisture, with adequate ventilation to prevent the build-up of hydrogen cyanide (HCN) gas, in a secure area and separately from incompatible materials. The areas where the tanks are located are provided with adequate ventilation to prevent the build-up of hydrogen cyanide gas. Access to the whole cyanide plant is controlled with perimeter security, CCTV and access control systems in place.

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

in full compliance with

The operation is in substantial compliance with **Production Practice 1.2**

not in compliance with

Summarise the basis for this Finding/Deficiencies Identified:

The facility is in FULL COMPLIANCE with Production Practice 1.2 requiring the development and implementation of plans and procedures to operate cyanide production facilities in a manner that prevents accidental releases.

The facility has developed formal procedures that describe the standard practices necessary for its safe and environmentally sound operation. The facility is a Major Hazard Facility (MHF) and there is a Safety Case that provides the basis for the safe operation of the facility. The facility has procedures that describe the standard practices necessary for its safe and environmentally sound operation.

The facility has developed formal procedures for contingencies during upsets in its activities that may result in cyanide exposures or releases. Some procedures are specific to a contingency, whilst others contain contingency measures within a standard operating procedure.

The operation does have procedures to identify when site operating practices have or will be changed from those on which the initial design and operating practices were predicated. Any engineering change to plant or equipment including modification, improvement, new plant or plant upgrade, for which design and engineering input is required is defined as a Project and is subject to a Project Authorisation process. Environmental and safety personnel are involved in the review and evaluation process for modifications prior to implementation. The procedures were applied to the recent upgrade of the waste handling area.

A comprehensive preventative maintenance (PM) system has been established in the Maintenance System. PM routines are performed daily and weekly and are carried out in accordance with the relevant maintenance procedures. Documented records are kept on hand and collected weekly by the relevant Heads of Department. The PM system generates work orders for the upkeep of infrastructure or the repair of identified faults.

Process parameters are monitored with necessary instrumentation and the instrumentation is calibrated according to manufacturer's recommendations. In situ monitoring occurs at various locations along the production cycle. Flow, temperature, pH, pressure, and process emissions are continuously monitored and data is displayed live on the DCS in the control room. Plant Operators monitor process parameters via the DCS, routine plant rounds and daily checks and tests.



Procedures are in place and are being implemented to prevent unauthorised/unregulated discharge to the environment of any cyanide solution or cyanide-contaminated water that is collected in a secondary containment area.

The facility has environmentally sound procedures for the disposal of cyanide or cyanide-contaminated solid waste. The Solid Waste Management procedure applies to all solid waste produced on site and all personnel involved in the generation, storage and disposal of solid wastes.

There are procedures in place to ensure that cyanide is packaged to a standard that will meet the requirements of the political jurisdictions through which it will pass. A site inspection confirmed that labels are attached to solid sodium cyanide with global harmonised system compliant labelling.

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

in full compliance with

The operation is in substantial compliance with **Production Practice 1.3**

not in compliance with

Summarise the basis for this Finding/Deficiencies Identified:

The facility is in FULL COMPLIANCE with Production Practice 1.3 requiring the inspection of cyanide production facilities to ensure their integrity and prevent accidental releases.

The facility conducts routine inspections of tanks, valves, pumps, pipelines, containments and other cyanide production and storage facilities. The CSBP Reliability Support Plant Inspection Section has been established to provide competent persons to perform the required inspections and to manage the Plant Inspection Processes. All completed inspections result in a detailed report and corresponding work orders (if required). Work orders are given a priority ranking and entered into JDE for tracking towards completion. JDE is a maintenance system software application used by the operation.

Inspection frequencies are sufficient to assure that equipment is functioning within design parameters. Frequencies are determined by a number of factors; statutory requirements for pressurised equipment, risk assessments and preventative maintenance routines. Risk assessments can be used to extend the time between inspections where AGR have knowledge of historical performance and operating conditions remain the same.

The facility has documented inspections that are retained. The documentation identifies specific items to be observed and includes the date of the inspection, the name of the inspector, and observed deficiencies. Inspection findings are documented via individual reports and the contents of the inspection reports contains information about the type of inspection, the name of the inspector and what the outcomes were. Inspection reports are issued to the plant/equipment owners with any recommendations included as work orders.



2.0 PRINCIPLE 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.

in full compliance with

The operation is in substantial compliance with **Production Practice 2.1**

not in compliance with

Summarise the basis for this Finding/Deficiencies Identified:

The facility is in FULL COMPLIANCE with Production Practice 2.1 requiring the facility to develop and implement procedures to protect plant personnel from exposure to cyanide.

The facility has developed formal procedures to minimise worker exposure, during normal plant operations, from receipt of raw materials through to finished product packaging and shipping.

The facility does solicit and considers worker input in developing and evaluating health and safety procedures. The facility has established a health and safety committee that meets monthly on site and there is a formalised agenda and minutes for this meeting that includes consideration of safety matters.

The site also has a structure procedural review process where the work crew review operating procedures and provide recommended changes on controls and steps. Individual departments also hold their own regular safety meetings. Every shift has its own Safety Representative and Stop (Take 5) Assessments are collected and reviewed by senior safety personnel.

The facility uses monitoring devices to confirm that controls are adequate to limit worker exposure. Personal HCN monitors are available and used in designated areas. The devices are set to alarm at 4.7 ppm.

The fixed in place gas detectors are a series of nine (9) in situ monitoring devices – five in the Solids Plant and four in the Liquids Plant these are set to alarm at 4.5 ppm.

If hydrogen cyanide gas or dust levels trigger the 4.5 ppm and 4.7 ppm alarm levels on the fixed and portable monitoring equipment personnel must leave the area to fresh air and notify the permit office/operations. Operations must then inspect the area and conduct gas testing while wearing air purifying respirators.

HCN monitoring equipment is maintained in accordance with manufacturer’s requirements. The internal Project Maintenance system prompts personnel when calibration of equipment is due. Calibration is undertaken every six months on fixed devices, with replacements occurring after 12 months.

Portable devices are bump tested daily when docked onto the docking/charging station in the control room. Monthly gas calibration tests are conducted. Hygiene data and calibration records are kept and maintained by the Hygiene department. The operation has provisions in place to retain hydrogen cyanide monitoring equipment calibration records for at least three years.

The facility has identified areas and activities where workers may be exposed to HCN gas or sodium cyanide dust and requires the use of personal protective equipment, as necessary, in these areas when these activities are being performed.

Additional PPE is needed within the solids plant packaging area (nominated as a red zone) and when performing wash out activities within other areas of the solids tower.

The red zone personnel protective equipment includes orange overalls, chemical resistant gloves, black boots/wellington boots, full faced canister mask with ABEK 1 (ABEK is a coding system for various gas/vapour threats). canister fitted or Jupiter helmet with ABEK 1 canisters, ear plugs, PVC chemical resistant sleeve protectors and personal HCN gas monitor.

The facility does have provisions to ensure that a system is used where workers can notify or communicate with other personnel for assistance, help or aid where it has determined it necessary. There is a requirement in place for anyone who wishes to enter the plant to first report to the control room. Following that there are



several provisions to ensure that a buddy system is used, or workers can otherwise notify or communicate with other personnel for assistance, help or aid where necessary.

Each work team has a supervisor that oversees the work crew and can raise the alarm verbally. Work crews are a minimum of two people plus a supervisor or team leader based in the control room. The control room has both radio contact and CCTV visuals of the personnel in the plant.

Emergency showers and eye wash facilities are alarmed and displayed electronically in the control room. If a facility is used then the corresponding icon and location will sound/flash to notify supervisors in the control room.

The facility assesses the health of employees to determine their fitness to perform their specified tasks, AGR, through its on premise medical centre assesses the health of its employees.

The *WCEF-PD-OHS-090-02 Health Surveillance and Biological Monitoring* procedure covers both pre-employment and ongoing health assessments. AGR conduct both causal and random drug and alcohol screening tests. The operation also has a pass/fail blood alcohol assessment device that is used by site security for assessment of personnel entering the site on a suspect and random basis.

The facility does have a clothing change policy or procedure for employees, contractors and visitors to areas with the potential for cyanide contamination of clothing. There is a decontamination hut used for changing into and out of PPE and for the segregation of clean and contaminated PPE. There are boot wash facilities both upon leaving the contaminated plant area and inside the decontamination hut. There are showers and hand wash facilities in the clean area.

The facility does have warning signs advising workers that cyanide is present and that, if necessary, suitable PPE must be worn. Warning signs are posted advising workers that cyanide is present and the necessary PPE that must be worn. Signage is placed at strategic locations around the facility including the front entrance to the site, entrance to sodium cyanide solution plants (SCP) 1, SCP 2, sodium cyanide solids plant (SCS) and the decontamination hut and entrance to the red/yellow PPE areas. Warning signs indicate that cyanide is present and that smoking, eating and drinking is prohibited, they also specify what PPE is required. These messages are reinforced in the Sodium Cyanide Manufacturing Facility Induction.

Personnel are prohibited from smoking, eating and drinking anywhere on site other than in the signed and designated areas. There is a designated smoking area and several designated crib rooms available for the safe storage and consumption of food and water. The facility also has several safe drinking fountains with foot-activated covers, to avoid contamination.

Signage is displayed at the main entry gate and at the access point to the production site to communicate these prohibitions. Additional signs are displayed throughout the SCP 1, SCP 2, SCS and packaging areas to prohibit smoking, eating and drinking and having open flames. A work permit and hot work certificate is required prior to any open flames being permitted.

These messages are reinforced in the *Sodium Cyanide Manufacturing Facility Induction*. This procedure is designed to outline area specific hazards and provide persons entering the facility with information necessary to orientate themselves safely within the work area.

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

in full compliance with

The operation is in substantial compliance with **Production Practice 2.2**

not in compliance with

Summarise the basis for this Finding/Deficiencies Identified:

The facility is in FULL COMPLIANCE with Production Practice 2.2 requiring the development and implementation of plans and procedures for rapid and effective response to cyanide exposure.

The facility cover the requirements for responding to a raised alarm, contacting the operator for an oxyport, providing first aid (where safe to do so), calling the 444 emergency number and how to deal with false alarms.

Showers, low-pressure eye wash stations and non-acidic fire extinguishers are located at strategic locations throughout the facility and they are inspected and tested on a regular basis. Weekly tests are conducted on the emergency wash facilities in accordance with Preventative Maintenance routines. Selected shower and eye wash facilities were tested and worked suitably and alarmed in the control room. Dry powder fire extinguishers were observed and confirmed that these are checked every 6 months by Wormald.

The facility does have water, oxygen, antidotes and a means of emergency communication readily available for use in the plant. Safety showers are located strategically.

The first-aid and emergency response equipment is stored and tested as directed by their manufacturer and replaced on a schedule that assures they will be effective when used. Personnel checks the first aid equipment weekly as part of the routine Hazard and Housekeeping self-audit system. Oxyports are maintained and tested by Australian Safety Engineers as per manufacturer's instructions. Any item that fails a test is replaced. The cyanide antidote used is hydroxocobalamin CYANOKIT and the facility stores the cyanide antidote as directed by the manufacturer specifications.

Safety data sheets and first aid procedures on cyanide safety are in the language of the workforce (English) and are available to workers at the site. All the signs and procedures are in English, which is the official language.

Storage tanks, process tanks, containers and piping that contain cyanide are labelled to alert workers and identify their contents. During the site walkover, lines observed were labelled to alert workers of their contents and direction of flow. All tanks observed were clearly labelled to alert workers of their contents.

The facility has a decontamination policy and procedures for employees, contractors and visitors leaving the areas with the potential for skin exposure to cyanide. The Sodium Cyanide Plant Risk Controls and Decontamination Processes procedure details the actions to be carried out by work personnel and visitors in the event of a potential contamination by cyanide. The procedure is supported by the Sodium Cyanide Response to Emergency Situations Procedure and the Basic Safety Rules Procedure that further details decontamination and the use of safety showers.

Workers at the site complete the AGR Cyanide Awareness training that includes information and instruction on good hygiene practices when working around chemicals. Information is provided through the site induction process.

The facility has its own on-site capability to provide first response and immediate first aid treatment but is not capable of providing higher-level medical assistance to workers exposed to cyanide. The site has a number of trained first aid responders that are based at the facility and first aid equipment located at the main office.

The facility has developed procedures to transport exposed workers to locally qualified, off-site medical facilities. The facility's medical centre does not communicate on a regular basis with local hospitals as the treating doctors can change very regularly. It does however put together robust processes to ensure that all information relating to exposure incidents travels with the patient and is available to the treating hospital. Cyanide antidote kits also travel with the exposure victim to the hospital. Procedures outline the transfer to one of two hospitals by St John Ambulance personnel (external transportation service).

The facility has alerted local hospitals, clinics, etc. of the potential need to treat patients for cyanide exposure. The operation has sought and received confirmation from the state health department on the capability of hospitals to treat a worker who may have been exposed to or poisoned by cyanide.

Procedures are in place to investigate and evaluate cyanide exposure incidents to determine if the operations programmes and procedures, to protect worker health and safety and to respond to cyanide exposures, are adequate or need to be revised. The facility has a formalised incident reporting procedure and Incident Management System, which is a computerised database for collection of incident related data.

There have been no worker exposure or release of cyanide to the environment incidents at the site.

3.0 PRINCIPLE 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.

in full compliance with

The operation is

in substantial compliance with

Production Practice 3.1

not in compliance with

Summarise the basis for this Finding/Deficiencies Identified:

The facility is in FULL COMPLIANCE with Production Practice 3.1 requiring environmental monitoring to be conducted to confirm that planned or unplanned releases of cyanide do not result in adverse impacts.

The facility does monitor for cyanide in discharges to surface water and in surface and ground water upgradient and downgradient of the site. The Licence and the facility's procedures refers to storm water that is collected and tested before release as wastewater. The Site's License, Groundwater Operating Strategy and Wastewater Sampling Procedure contain the required monitoring frequencies. These include surface and ground water upgradient and downgradient of the site.

Run-off and potential spills collected outside of bunded areas is directed to the storm water drainage system. The drainage system consists of 4 storm water sumps and all run off is diverted to one or all of these sumps. Operations test pH and cyanide concentration in the sumps before these are pumped to CSBP's containment pond. If the pH or CN concentration are out of spec then this wastewater is pumped to the tank farm for re-integration into finished product or treatment.

When required, discharge is manually commissioned to a containment pond located on CSBP's site. The treated effluent line water is pumped to the tank farm where it passes through an ammonia stripper and is then sent to an Reverse Osmosis (RO) unit. Concentrate is sent back to the Solids Plant and remaining waste liquid is sent to a cyanide destruction tank. From the destruction tank, following treatment and sampling, water is discharged to the CSBP containment pond. There is an online, *in situ* monitoring device, located at the facility boundary, through which the wastewater must pass prior to going to the containment pond.

From CSBP's containment pond, the preferred and most used method of disposal is via the Water Corporation owned Sepia Depression Ocean Outlet Landline (SDOOL). Wastewater is pumped into a nutrient stripping wetland for treatment prior to discharge. Wastewater discharged from the containment pond to the wetlands is sampled and analysed. The wetland discharges into the SDOOL, whereby CSBP's contribution accounts for approximately two percent of daily total volume discharged. The SDOOL discharges approximately four kilometres offshore from Point Peron. No exceedance of free cyanide was detected in the wastewater monitoring results.

Cyanide concentrations in groundwater at compliance points around the facility are at or below levels that are protective of identified beneficial uses of the groundwater. The Department of Water and Environmental Regulation (DWER) approved Groundwater Operating Strategy for the site outlines the requirement for quarterly sampling of groundwater from 45 bores. Results from these sampling events are compared against the applicable guidelines/standards and Non-Potable Use Guidelines are considered relevant due to extraction of groundwater for irrigation and industrial purposes on site. The Environmental Quality Criteria (EQC) guidelines are adopted due to the proximity to Cockburn Sound. Where EQC guidelines are absent, groundwater impacts are alternatively assessed by comparison with the Marine Water guidelines.

Seepage from the facility has not caused the cyanide concentration of the groundwater beneath the site to exceed that necessary to protect its beneficial use.

The operation can demonstrate that the levels of atmospheric process emissions of HCN gas or cyanide dust are limited in order to protect the health of workers and the community. The atmospheric emission limit for total cyanide as set in L6110/1990/13 is 0.58 gr/sec. Quarterly stack tests are carried out and there were no exceedances reported for the audit period.

Kwinana Sodium Cyanide Facility
Name of Facility



Signature of Lead Auditor

August 2023
Date

Monitoring is conducted at frequencies adequate to characterise the medium being monitored and to identify changes in a timely manner. The facility monitors for cyanide in discharges to surface water and in groundwater both up and down gradient of the site. Groundwater monitoring is undertaken on a biannually at key locations. Monitoring is conducted at frequencies adequate to characterise the medium being monitored and to identify changes in a timely manner.



4.0 PRINCIPLE 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 facility in a manner that minimizes the potential for cyanide exposures and releases.

in full compliance with

The operation is

in substantial compliance with

Production Practice 4.1

not in compliance with

Summarise the basis for this Finding/Deficiencies Identified:

The facility is in FULL COMPLIANCE with Production Practice 4.1 requiring employees to be trained to operate the plant in a manner that minimises the potential for cyanide exposures and releases.

The facility trains workers to understand the hazards of cyanide and refresher training is periodically conducted. Employees are required to complete a CSBP Learning Agreement upon commencement of employment. A User Guide for Sodium Cyanide Plant Training Modules identifies relevant modules and explains the competency-based training program. A Competency Management System is used to track the completion of required training modules for each individual. Refresher training in cyanide exposure is conducted annually for cyanide production workers, biennially for contractors and every four years for non-cyanide workers.

The facility does train workers in the use of PPE and has identified when and where this equipment is required. The primary training provided on PPE is through the induction process and peer to peer training process when commencing at the operation. Site signage indicates the areas where additional PPE is needed. The site inspection confirmed signage is in place detailing the PPE needed. Personnel were observed to be wearing the PPE designated for the area they were in.

The production facility is a complex chemical plant and there is a structured training program covering general safe work and environment controls for the operating environment. Workers are trained on elements of the plant by senior operators and the site trainer before being able to perform tasks. This includes training on isolations, tagging systems, confined space, and other higher risk activities on site. The worker is progressively trained using a competency-based system and signed off before they can work independently.

The Facility has a site induction programme that provides the overview of site safety rules and requirements. Workers new to the area of the plant are buddied with an experienced operators and progressively trained. Once deemed competent they can complete task independently.

The facility does provide refresher training. The inductions are periodically repeated to cover updates and changes in the operation and safe work practices.

The facility has implemented a scenario training package that covers all operating areas of the plant targeting troubleshooting and problem-solving plant operations. This system provides both refresher training and improvement identification.

The training elements necessary for each job are identified in the training materials. AGR has developed a training matrix to manage the training requirements for employees at the facility. The DCOVA (document management system) contains information on training modules and assessments as required by each area of the plant.

Externally, training is completed via registered training organisations and where practical, training is completed to a nationally recognised level of competency. Internal training is provided by CSBP/AGR personnel with adequate qualification and levels of experience for the training being provided. Training is provided on the job by supervisors and then further training and assessment is provided by trained assessors.

The Facility evaluates the effectiveness of cyanide training by testing. Evaluation questionnaires are used to evaluate the effectiveness of training. The documentation on which these evaluations have been based is filed in individual staff files. The evaluations are conducted in English, which is the official language.

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

in full compliance with

The operation is in substantial compliance with **Production Practice 4.2**

not in compliance with

Summarise the basis for this Finding/Deficiencies Identified:

The Facility is in FULL COMPLIANCE with Production Practice 4.2 requiring employees to be trained to respond to cyanide exposures and releases.

The facility trains employees in the procedures to be followed in the event that a cyanide release is discovered. The tiered induction process provides instructions and information on identifying and reporting emergencies including raising the alarm, evacuation and first aid. All workers entering the facility are provided with this training. Each Standard Operating Procedure describes the steps to be taken in the event of an emergency situation involving a release. Evidence were available and sighted of emergency response training. A mock drill exercise was sampled that included a sodium cyanide release and exposure incident.

The facility trains workers in how to respond to emergency situations involving worker exposure to cyanide. Routine drills are used to test and improve employee’s response skills. Training requirements are specified in CSBP-IF2882 (February 2020) Training Capability Matrix, which identifies that Cyanide Exposure training is mandatory for all personnel. The training is conducted both internally and externally as required, and actions are built into standard procedures.

Training records are retained throughout an individual’s employment, documenting the training they have received and including the names of the employee and the trainer, the date of training, the topics covered, and how the employee demonstrated an understanding of the training materials. Training files for workers were reviewed and contained evidence of training including course content, assessments and certificates. Where external training is conducted, certificates of attendance or attainment are retained on the individual’s file.



5.0 PRINCIPLE 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.

in full compliance with

The operation is

in substantial compliance with

Production Practice 5.1

not in compliance with

Summarise the basis for this Finding/Deficiencies Identified:

The Facility is in FULL COMPLIANCE with Production Practice 5.1 requiring a detailed emergency response plan for potential cyanide releases.

The facility has developed a series of Emergency Response Plans (ERP) and procedures are in place for the management of cyanide related emergencies. *GM-11-013-01 Kwinana Emergency Response Teams* describes the composition, training, performance standards, duties and responsibilities of the CSBP Emergency Response Teams (ERTs).

Within *GM-11-013-01* is a list of Standard Operating Procedures (SOP) that describes the steps to be taken in the event of an emergency situation involving a release.

DP-11-012-03 SCP – Response to Emergency Situations Involving Personnel outlines the first response procedures for emergencies involving personnel in the Sodium Cyanide Plant. *DP-11-015-01 Kwinana Works Muster* ensures that all personnel on the site are safely assembled and accounted for in the event of a works muster being required. *CSBP-RM-11-010-02 Management of Emergencies* details the steps taken to respond to an emergency and how the response capacity is maintained at a level that minimises the risk to people, property, the environment, business activities and company reputation.

The *Emergency Plan* does consider the potential failure scenarios appropriate for its site-specific environmental and operating circumstances. The facility is regulated as a MHF and under Western Australian legislation a safety report and safety management system has been developed for the site. *CSBP-RM-11-010-02 Management of Emergencies* states that a Quantitative Risk Assessment is used to identify the types of Major Incident Events that may arise within the greater site. The facility operates under vacuum and there is a short 10 m section of pipework prior to the absorbers where HCN is present under normal operating conditions. Pipeline breach would not result in release of HCN and the control room would detect the plant upset and commence controlled shutdown.

GM-11-013-01 Kwinana Emergency Response Teams contains a list of SOPs relating to likely emergency scenarios for the facility. The Layer of Protection Analysis also describes a series of potential emergency scenarios for the facility and provides detail on possible initiating events and the types of independent protection layers that are in place for each scenario. This document links each scenario to key supporting procedures and management plans.

The emergency procedures do describe specific response actions, as appropriate for the anticipated emergency situations, such as evacuating site personnel and potentially affected communities from the area of exposure.

CSBP-RM-11-010-02 Management of Emergencies, *GM-11-013-01 Kwinana Emergency Response Teams* and *GM-09-110-08 Transport Management Plan for Sodium Cyanide Product*, and other supporting procedures, do describe; specific response actions, as appropriate for the anticipated emergency situations, such as evacuating site personnel and potentially affected communities from the area of exposure, control of releases at their source, and containment, assessment, mitigation and future prevention of releases.

CSBP-GM-11-012-03 Sodium Cyanide Response to Emergency Situations and *DP-11-012-03 SCP Response to Emergency Situations Involving Personnel* do describe; use of cyanide antidotes and first aid measures for cyanide exposure.

Production Practice 5.2: Involve site personnel and stakeholders in the planning process. in full compliance with

The operation is

 in substantial compliance with**Production Practice 5.2** not in compliance with**Summarise the basis for this Finding/Deficiencies Identified:**

The facility is in FULL COMPLIANCE with Production Practice 5.2 requiring the Facility to involving site personnel and stakeholders in the planning process.

The Facility has involved its workforce and stakeholders in the emergency response planning process. The facility considers worker input in developing and evaluating health and safety procedures via the overarching WesCEF Communications and Consultation process.

There is a dedicated Health and Safety Committee made up of representatives from each area of the operation. Monthly meetings occur to discuss a wide range of health and safety topics such as incidents for the month, hygiene monitoring results (number of exposures), changes to standard operating procedures, ongoing safety initiatives, general business and collect feedback from personnel.

External stakeholders are considered via CSBP's ongoing involvement in the Kwinana Industries Council (KIC) and Kwinana Industries Mutual Aid (KIMA) regular meetings and discussion forums.

Potentially affected communities have been made aware of the risks associated with accidental cyanide releases, and there are forums available for ongoing communication. The facility is located within the greater Kwinana industrial area. There are no direct neighbours of a residential nature – the nearest non-industrial community is approximately 2.5-3 km to the east.

CSBP is a member of the Kwinana Industries Public Safety Liaison Group, a mutual aid group formed to provide a forum that is focussed on joint industry emergency response and public safety. Regular meetings are held and meeting minutes verify that information including statistics and emergency alerts, is provided to the public.

Local response agencies such as outside responders and medical facilities have been involved in the emergency planning and response process.

External responders include medical facilities, Department of Fire and Emergency Services (DFES), Western Australia (WA) Police and State Government regulators and Local Councils. DFES would be the primary external responder in the event of a cyanide release scenario.

KIC Member companies provide regular presentations to the public on their safety systems, operations and development works. These informative presentations are conducted at quarterly Community & Industries Forum (CIF) meetings. Representatives from external response agencies are regularly in attendance.

The facility's medical centre does not communicate on a regular basis with local hospitals as the treating doctors can change very regularly. It does however put together robust processes to ensure that all information relating to exposure incidents travels with the patient and is available to the treating hospital. Cyanide antidote kits also travel with the exposure victim to the hospital.

The facility has engaged in regular consultation and communication with stakeholders to assure that the emergency response planning and procedures address current conditions and risks.

CSBP engage in regular consultation via the KIC Mutual Aid meetings and quarterly CIF meetings. Presentations are made to the public on safety systems, operations, and development works.

Production Practice 5.3: Designate appropriate personnel and commit necessary equipment and resources for emergency response. in full compliance with

Kwinana Sodium Cyanide Facility
Name of Facility



Signature of Lead Auditor

August 2023
Date

The operation is in substantial compliance with **Production Practice 5.3**
 not in compliance with

Summarise the basis for this Finding/Deficiencies Identified:

The facility is in FULL COMPLIANCE with Production Practice 5.3 requiring designated appropriate personnel and committed equipment and resources for emergency response.

The Management of Emergencies document does designate primary and alternate emergency response coordinators who have explicit authority to commit the resources necessary to implement the plan. The WesCEF Incident Management Team (IMT) provides strategic and tactical guidance and direction to combat the incident and is responsible for the development of plans and responses. Roles and responsibilities within the IMT has been clearly defined.

Section 5.16.3 Emergency Response Teams states that CSBP ERTs are structured to align with external emergency service providers and are competent to respond to emergencies involving all of CSBP's products and facilities. It refers to GM-11-013-01 Kwinana Emergency Response Teams which provides further detail on the composition, identification of ERT members, training, performance standards and duties and responsibilities of the CSBP ERTs.

CSBP is an Accredited Emergency Responder for Sodium Cyanide and Ammonia incidents involving their products both on and off site. The Emergency Services Supervisor is responsible for developing and conducting scenario training and exercises, as well as ensuring adequate Area Wardens are trained and that each area practices the required amount of emergency exercises. The Emergency Services Support Officer is responsible for ensuring that the ERT has adequate numbers of people competent in the five core areas (respiratory protection, firefighting, HAZMAT, rope rescue and medical). Additionally the Support Officer ensures that the required regular training for the ERTs is completed.

The on-site and off-site emergency process of the emergency response plan contain necessary information for 24 hour emergency response. GM-11-013-01 Kwinana Emergency Response Teams provides further detail on the responsibilities of ERT members.

The Emergency Management Plan cover the locations of services and utility resources such as fire alarm and fire control provisions and spill containment systems. Additional emergency response equipment is available through the Kwinana Industries Mutual Aid (KIMA) group.

Operations personnel check the first aid equipment weekly as part of the routine Hazard and Housekeeping self-audit system. Stock replenishment is handled via the on-site medical facility/personnel. An inspection of the facility found equipment to be available and in serviceable condition and a full set of completed inspection records was available for review.

It is the responsibility of the Incident Controller to contact external emergency services when required. On-site medical personnel have visited the two nearby hospitals to assess their capability to treat cyanide exposure victims and speak about the requirements for treatment and decontamination.

External responders, medical facilities and other outside entities have been advised of their roles and are aware of aid requirements during an emergency response. DFES would be the primary external responder in the event of a cyanide release scenario and the Department has been involved in major response exercise drills in the past. Due to the nature of the facility, and specialised training requirements of qualified external responders, emergency response is largely self-contained and or limited to DFES, HAZMAT or other specialised agencies. Outside responders have been involved in HAZMAT response planning exercises but not cyanide specific drills within the audit period.

KIC Member companies provide regular presentations to the public on their safety systems, operations and development works. These informative presentations are conducted at quarterly CIF meetings.

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

in full compliance with

Kwinana Sodium Cyanide Facility
Name of Facility



Signature of Lead Auditor

August 2023
Date

The operation is in substantial compliance with **Production Practice 5.4**
 not in compliance with

Summarise the basis for this Finding/Deficiencies Identified:

The facility is in FULL COMPLIANCE with Production Practice 5.4 requiring development of procedures for internal and external emergency notification and reporting.

CSBP-RM-11-010-02 Management of Emergencies contains the procedural, contact and outside responder information required.

The Management of Emergencies plan identifies external emergency responders and their roles, as well as the notification of authorities, the plan refers to the process Notification of Incidents to External Authorities – Western Australia which describes the procedure for making contact. CSBP maintains a list of contacts for use during emergencies. The contact names and numbers are checked and updated in the documentation system and replaced in the Emergency Control Centre at least every twelve months by the Emergency Services Supervisor or following organisational changes.

CSBP-RM-11-010-02 Management of Emergencies contains the procedure for notifying potentially affected neighbours of an incident. CSBP Kwinana is member of the Kwinana Industries Mutual Aid (KIMA) group. Notification to neighbours is done via the KIMA two way radio system. CSBP has a number of strategically placed sirens across site to reduce the risk of sirens or notifications not being heard in the event of an emergency.

The Management of Emergencies plan addresses media enquiries. During an emergency no information is to be released about the emergency to any off-site caller without authorisation by the Corporate Communications Manager or Incident Controller. There is a Response to Media or other Enquiries During Emergencies process that must be followed.

The operation has a written procedure for notifying ICMI of any significant cyanide incidents, as defined in ICMI’s Definitions and Acronyms document. The procedure have been documented in GM-09-110-08 Transport Management Plan for Sodium Cyanide Product procedure.

Production Practice 5.5: Incorporate remediation measures and monitoring elements into response plans and account for the additional hazards of using cyanide treatment chemicals.

in full compliance with
 The operation is in substantial compliance with **Production Practice 5.5**
 not in compliance with

Summarise the basis for this Finding/Deficiencies Identified:

The facility is in FULL COMPLIANCE with Production Practice 5.5 requiring the Facility to incorporate monitoring elements that account for the additional hazards of using cyanide treatment chemicals into response plans and remediation measures.

The Emergency Plan does describe specific, appropriate remediation measures, such as recovery or neutralisation of solutions or solids, decontamination of soils or other contaminated media and management and/or disposal of spill clean-up debris, and provision of an alternate drinking water supply, as appropriate.

GM-11-013-01 Kwinana Emergency Response Teams contains a list of SOPs relating to likely emergency scenarios for the facility. These include specific and appropriate remediation measures such as 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 SOPs requiring monitoring for toxic gases to occur whilst steps to neutralise the spill are implemented are in place. They specify what treatment chemical to use and provide a guide for determining the correct quantity to apply. The end point of remediation activities is a return to baseline conditions.

The provision of an alternate drinking water source is not required based on the nature of the likely emergency scenarios.

CSBP-IF2783 Sodium Cyanide Solids/Solution Release into Water Course contains further information on underground water treatment and monitoring in line with relevant National guidelines.

GM-09-110-08 Transport Management Plan for Sodium Cyanide Product procedure details the neutralisation techniques, neutralising treatment chemicals (including that “generally, hypochlorite, ferrous sulphate and hydrogen peroxide must not be allowed to enter any natural body of surface or ground water”), and locations of neutralising agents along transport routes and the AGR Sodium Cyanide production facility in Kwinana. Neutralisation procedures and neutralisation scenarios sections in the procedure address the potential need for environmental monitoring. Sampling and testing methodologies are provided for a number of scenarios.

The facility does generally prohibit the use of chemicals to treat cyanide that has been released to surface water. AGRs standard operating procedures covering cyanide releases contain statements regarding monitoring for toxic gases during the neutralisation process.

Were a release to occur at the facility, appropriate capture and containment measures are in place and monitoring would occur as per standard operating procedures, such as CSBP-GM-13-060-23 Sodium Cyanide Process Wastewater Management Plan. Emergency procedures, includes further information on the emergency and wastewater management system and monitoring and testing requirements prior to disposal.

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

in full compliance with

The operation is in substantial compliance with **Production Practice 5.6**

not in compliance with

Summarise the basis for this Finding/Deficiencies Identified:

The facility is in FULL COMPLIANCE with Production Practice 5.6 requiring the Facility to periodically evaluate response procedures and capabilities and revise them as needed.

The *Emergency Plan* does contain provisions for periodically reviewing and evaluating the plan's adequacy and they are being implemented.

CSBP-RM-11-010-02 Management of Emergencies plan states a review frequency of every two years to ensure relevance and completeness. CSBP's electronic document management system is used to ensure when the plan is updated, reviewed or modified, all copies are automatically updated and all those on the distribution list receive notification. The Management of Emergencies plan was last reviewed and modified on 11 April 2023.

GM-09-110-08 Transport Management Plan for Sodium Cyanide Product states that the plan is reviewed at least every three years by an external auditor, or when changes to systems or procedures make it necessary. The Transport Management Plan for Sodium Cyanide Product was last reviewed and modified on 21 February 2023.

Mock emergency drills are conducted, and they are used as an effective part of the Emergency Plan evaluation process. Drill scenarios are varied and address both cyanide release and exposure type events.

The Emergency Services Support Officer ensures that ERTs are regularly practicing emergency response skills – training occurs fortnightly, and at least once per year an unplanned exercise is conducted to test their response and competencies.

The facility has provisions to evaluate plans and procedures after an emergency that required implementation of them accordingly, and for revising the plans and procedures as necessary. After each mock drill, an evaluation is organised to assess the performance and effectiveness of the mock drill, and therefore correct or improve the content of the emergency response plan or procedure if deficiencies are identified. At least one emergency drill conducted during the audit period simulated the entire emergency response process of a cyanide spill that were accompanied by a cyanide exposure to a worker at the spill location.

Detailed debrief reports were provided that includes the objectives of the drills, evaluation of execution of the plan and response procedures, whether the objectives were met and whether procedure need to be updated. No changes to response plans were identified through the drills conducted. Should there be an actual emergency situation, two processes would drive the emergency response review process. An incident investigation process which would look at preventative and mitigative controls of which emergency response measures are assessed. Secondly, the debrief process outlined for mock drills is applied to actual incidents.

6.0 IMPORTANT INFORMATION

Your attention is drawn to the document titled – “Important Information Relating to this Report”, which is included in Appendix A of this report. The statements presented in that document are intended to inform a reader of the report about its proper use. There are important limitations as to who can use the report and how it can be used. It is important that a reader of the report understands and has realistic expectations about those matters. The Important Information document does not alter the obligations Golder Associates has under the contract between it and its client.



Signature Page



Rudi Seebach (Lead Auditor)



Mr Phil Ashton (Technical Specialist)

Mr Mike Woods (Lead Auditor)

Michael Woods initiated and conducted most of the audit for the Australian Gold Reagents production facility as the Lead Auditor. Mike Woods resigned from WSP before the audit was complete and was therefore unavailable to complete the audit and sign the documentation.

Rudi Seebach assumed the responsibility as Lead Auditor following the resignation of Mike Woods. Rudi Seebach completed the audit and audit report as Lead Auditor and submitted the finalized audit report on behalf of WSP Golder. Rudi Seebach is an approved International Cyanide Management Institute Lead Auditor for Cyanide Code certification audits.

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APPENDIX A

Important Information

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The scope of Golder's Services and the period of time they relate to are determined by the Contract and are subject to restrictions and limitations set out in the Contract. If a service or other work is not expressly referred to in this Report, do not assume that it has been provided or performed. If a matter is not addressed in this Report, do not assume that any determination has been made by Golder in regards to it.

At any location relevant to the Services conditions may exist which were not detected by Golder, in particular due to the specific scope of the investigation Golder has been engaged to undertake. Conditions can only be verified at the exact location of any tests undertaken. Variations in conditions may occur between tested locations and there may be conditions which have not been revealed by the investigation and which have not therefore been taken into account in this Report.

Golder accepts no responsibility for and makes no representation as to the accuracy or completeness of the information provided to it by or on behalf of the Client or sourced from any third party. Golder has assumed that such information is correct unless otherwise stated and no responsibility is accepted by Golder for incomplete or inaccurate data supplied by its Client or any other person for whom Golder is not responsible. Golder has not taken account of matters that may have existed when the Report was prepared but which were only later disclosed to Golder.

Having regard to the matters referred to in the previous paragraphs on this page in particular, carrying out the Services has allowed Golder to form no more than an opinion as to the actual conditions at any relevant location. That opinion is necessarily constrained by the extent of the information collected by Golder or otherwise made available to Golder. Further, the passage of time may affect the accuracy, applicability or usefulness of the opinions, assessments or other information in this Report. This Report is based upon the information and other circumstances that existed and were known to Golder when the Services were performed and this Report was prepared. Golder has not considered the effect of any possible future developments including physical changes to any relevant location or changes to any laws or regulations relevant to such location.

Where permitted by the Contract, Golder may have retained subconsultants affiliated with Golder to provide some or all of the Services. However, it is Golder which remains solely responsible for the Services and there is no legal recourse against any of Golder's affiliated companies or the employees, officers or directors of any of them.

By date, or revision, the Report supersedes any prior report or other document issued by Golder dealing with any matter that is addressed in the Report.

Any uncertainty as to the extent to which this Report can be used or relied upon in any respect should be referred to Golder for clarification