SUMMARY AUDIT REPORT

International Cyanide Management Code Recertification Audit

Australian Gold Reagents (AGR), Production Facility

Submitted to:

International Cyanide Management Institute (ICMI)

1400 I Street, NW Suite 550

WASHINGTON DC 20005

UNITED STATES OF AMERICA

Michelle Chatfield

Audit Coordinator, CSBP
Kwinana Beach Road
PO Box 345 Kwinana WA 6966

Submitted by:

Golder Associates Pty Ltd

Level 3, 1 Havelock Street, West Perth, Western Australia 6005, Australia

+61 8 9213 7600

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APPENDICES

APPENDIX A
Important Information

1.0 INTRODUCTION

1.1 Operational Information

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:	Jason Thompson, Process Superintendent – Sodium Cyanide
Address:	CSBP Kwinana Beach Road PO Box 345 Kwinana WA 6966
State/Province:	Western Australia
Country:	Australia
Email:	mchatfield@wescef.com.au

1.2 AGR

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.

1.3 Kwinana Production Facility

The AGR's 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 2016 except replacement of the electric furnace on the dry process in 2018 as well as auxiliary equipment.

The infrastructure at the cyanide facility mainly comprises:

- 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.

1.4 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 October 2019.

1.5 Auditors Findings and Attestation

AGR is:	☒ **in full compliance with**	**The International Cyanide Management Code**
	☐ in substantial compliance with	
	☐ not in compliance with	
Audit Company:	Golder Associates Pty Ltd	
Audit Team Leader:	Edward Clerk Exemplar Global (105995)	
Email:	eclerk@golder.com.au	

Cintellate recorded incidents indicated that there have been no cyanide related incidents resulting in worker exposure that required medical treatment, or releases of cyanide bearing material into the environment during the audit period.

Name and Signatures of Auditors:

Name	Position	Signature	Date
Ed Clerk	Lead Auditor and Technical Specialist		September 2020
Craig Currie	Auditor		September 2020

1.6 Dates of Audit

The field component of the audit was undertaken on 31 March 2020. The audit was undertaken by Ed Clerk (Lead Auditor and Technical Specialist) and Craig Currie (Auditor).

I, Ed Clerk, 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 members of the audit team meet the applicable criteria established by the International Cyanide Management Institute for Code Verification Auditors.

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

2.0 PRINCIPLES

2.1 Principle 1 – Operations

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

2.1.1 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**	
AGR is	☐ in substantial compliance with	**Production Practice 1.1**
	☐ not in compliance with	

Summarise the basis for this Finding/Deficiencies Identified:

AGR 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 control and quality assurance (QC/QA) records are retained. The availability of the facility's design, construction and commissioning project data, 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.

Quality assurance and quality control (QA/QC) programs have been implemented during construction of cyanide production facilities and storage facilities. Records were reviewed for three key infrastructure projects that were constructed during the audit period. Project initiation documentation, project authorisation documentation and MDRs were provided for these projects.

Records of these changes were provided for review.

Project related documents are considered controlled documents and managed via AGR's site-wide Docova system. Once a project is approved, there is a designated Responsible Officer who is tasked with progressing the project through the approval Gates.

QA/QC documentation was available and reviewed for the three key infrastructure projects and confirmed that appropriately qualified personnel are involved in the design and review process.

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. Engineering project procedures require that all items are constructed of materials suitable for the operating environment, that is 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.

Cause and Effect Diagrams, detailing the individual interlocks for the plants and their associated alarms on the distributed control system (DCS) were reviewed. These diagrams look at unwanted events/scenarios, and what is required to prevent them. The project classification system notes that risk assessment processes are conducted for modifications. These processes identify the need for systems or "interlocks" to shut down production systems and prevent releases due to power outages or equipment failures.

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.

A maintenance and upgrade project was recently completed whereby the site drainage network, throughout the cyanide production areas, was cleaned out and the concrete drains lined with stainless steel to improve drainage and minimise the risk of subsurface infiltration.

The facility does employ methods to prevent the overfilling of cyanide process and storage vessels, including level indicators and high-level alarms. All the signals are indicated on the DCS.

Process tanks have ultrasonic level monitoring and alert systems in place, linked to the DCS and routine testing of level monitoring equipment 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.

Secondary containment capacities have been designed to provide 110% of the volume of the largest 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.

Flow meters on process pipes provide continuous monitoring of both density and flow rates. Alarms and pump trips are in place and monitoring and control occurs via the DCS.

2.1.2 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**	
AGR is	☐ in substantial compliance with	**Production Practice 1.2**
	☐ not in compliance with	

Summarise the basis for this Finding/Deficiencies Identified:

AGR 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 procedures that describe the standard practices necessary for its safe and environmentally sound operation. Procedures are available to all personnel via the electronic document management system. Within a procedure, where applicable, reference is made to other relevant operating procedures for personnel to obtain further information.

The plans and procedures include information on safety protocols and environmental compliance and protection requirements. There are specific environmental procedures for waste management and cyanide process wastewater management. The facility has developed formal procedures for contingencies during upsets in its activities that may result in cyanide exposures or releases.

The has procedures to identify when site operating practices have or will be changed from those on which the initial design and operating practices were predicated and there are procedures governing change management and the review of safety and environmental concerns associated with modification project.

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 personnel are involved in the review and evaluation process for modifications prior to implementation.

Direct replacement of like for like items are excluded from the requirements of this procedure as these are classed as maintenance.

Procedures describe the processes that must be followed when implementing any substantial engineering project in any part of the organisation. These procedures exist to ensure that even commonly carried out (not excluding high risk activities) engineering projects e.g. building changes or roadworks are also subjected to a risk assessment and proper authorisation procedure, prior to the work occurring.

A comprehensive maintenance system of preventative maintenance (PM) routines has been established in the Maintenance System for plant and their associated infrastructure.

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. Independent from PM routines, statutory inspection requirements are addressed via the Plant Inspections group, a self-regulated department of certified inspectors (National and International Industry Standards). Routines for statutory and other inspections, of pressurised equipment, incinerators, cyanide containing pipes and tanks, intermediate bulk containers (IBCs) and road isocontainers are completed by plant inspections personnel.

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 document the agreed method for the efficient operation of Cyanide Plant in the areas of routine plant checks and testing. The procedures detail the monitoring and sampling methods required for operation and also the tasks associated with the daily/monthly running checks.

There are procedures that provide details for the taking of routine samples, of a wide range of parameters, from the production plants during operation; and, for the calibration of field instrumentation. Plant fitters have manufacturer's calibration recommendations available.

Calibration of control valves, pressure and safety valves and calibration instruments is handled off site via appropriately qualified personnel. In situ calibration occurs for temperature, flow and pH meters.

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.

Cyanide is stored with adequate ventilation to prevent the build-up of hydrogen cyanide gas. Liquid cyanide storage tanks are vented to atmosphere at a high level. The liquid storage tank operates under a vacuum and gases are vented to a scrubber prior to atmospheric release. The warehouse roof is vented to provide adequate ventilation during solid cyanide storage.

Solid cyanide stored on site is contained in hermetically sealed plastic bags and placed inside IBCs. Handling of solid cyanide occurs within roofed warehouses and upon sealed floors to prevent contact with moisture.

The facility is secured via the site perimeter fence and a monitored security system. The facility maintains a secure site via the use of boundary fences, CCTV monitoring and a controlled system of entry/exit, e.g. swipe card turnstiles and vehicle boom gates. All visitors must report to security to obtain an access card, which is programmed to allow entry to only selected areas, and meet their designated Site escort. The security system has the ability to account for everyone who is on site at a particular time.

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.

2.1.3 Production Practice 1.3

Inspect cyanide production facilities to ensure their integrity and prevent accidental releases.

	☒ **in full compliance with**	
AGR is	☐ in substantial compliance with	**Production Practice 1.3**
	☐ not in compliance with	

Summarise the basis for this Finding/Deficiencies Identified:

AGR 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, pipelines, containments and other cyanide production and storage facilities.

The Reliability Support Plant Inspection Section (PIS) has been established to provide competent persons to perform the required inspections and to manage the plant inspection processes.

There are plant inspection management and plant inspection scopes for all matters pertaining to inspection of pressure equipment and tanks. The procedures supplement and clarify the requirements of the Australian code for Pressure Equipment and contain the information and procedures required as per Clause 3.3 of the Standard.

There are procedures in place for the management of cyanide process wastewater, including the requirements for inspections of bunded areas. The procedures state that formal inspections are conducted by the maintenance department on an annual basis and monthly checks are conducted by the operations group during routine hazard and housekeeping inspections. The routine inspections include checks for deterioration and leakages on tanks, bunds, value, pipelines and where identified cracking or wear and tear is reported to maintenance for action.

All completed inspections result in a detailed report and corresponding work orders (if required). Work orders are given a priority ranking and entered into the sites management system for tracking towards completion.

Inspection methods are aligned to the requirements of the relevant Australian Standard. Sampled maintenance work order reports for a number of plant components were reviewed. 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 there is sufficient knowledge of historical performance and operating conditions remain the same.

Generally inspections occur every:

- Isocontainers – two yearly review external and five yearly thorough
- Tanks – inspected at commissioning and again after 12 months. After that, minimum four yearly and maximum 10 yearly (Risk assessed to determine)
- Heat exchanges – inspected at commissioning and again after 12 months. After that, minimum four yearly and maximum 10 yearly (Risk assessed to determine)
- Pipelines – two yearly review external and four yearly thorough
- Secondary containments – yearly formal inspections and monthly as part of hazard and housekeeping routines.

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 contain 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.

Work orders are given a priority ranking and entered into sites management system to be assigned and tracked until a Corrective Work Order has been issued and rectification works completed. For Priority 1 Work Orders, a shutdown is required to complete and planners are required to schedule the works. Priority 2 and 3 Work Orders do not require shutdowns and Operators and Maintenance teams work together to complete the required tasks.

The nature and date of corrective actions were noted as being documented, and records are retained.

2.2 Principle 2 – Worker Safety

Protect workers' health and safety from exposure to cyanide

2.2.1 Production Practice 2.1

Develop and implement procedures to protect plant personnel from exposure to cyanide.

	☒ **in full compliance with**	
AGR is	☐ in substantial compliance with	**Production Practice 2.1**
	☐ not in compliance with	

Summarise the basis for this Finding/Deficiencies Identified:

AGR 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, these include procedures for normal plant operations, from receipt of raw materials through to finished product packaging and shipping, including:

- A Sodium Cyanide Manufacturing facility Induction outlines the area specific hazards and provides persons entering the facility with the necessary information to orientate themselves safely in the work area. It identifies the necessary PPE and access requirements for the different plant areas.
- A Sodium Cyanide Solid Plant Risk Controls and Decontamination Processes documents the controls in place to mitigate the risks of contact with cyanide when working in the solids and packaging plants and the processes for decontaminating equipment and personnel.
- A Vehicle Operators Handbook for Sodium Cyanide manual provides information and instructions on the loading, unloading and transport of sodium cyanide. It contains comprehensive information on handling, loading and unloading procedures for both solids and solution product. Additionally there is information on documentation, emergency response procedures and road transport routes.

Other procedures for normal operating conditions include:

- Sodium Cyanide Decontamination Procedure
- Sodium Cyanide Protective Equipment Requirements
- HCN Monitoring in the Sodium Cyanide Solids Plant.

For non-routine and emergency operations there is:

- Sodium Cyanide Response to Emergency Situations
- Sodium Cyanide Emergency Exercises.

For maintenance related activities the Confined Spaces procedure specifies the requirements for ensuring the safety and health of personnel required to enter or work in confined spaces. It meets the requirements of the Australian Standard.

Other procedures for maintenance related activities include a Work Permit System and Breaking into Hazardous Pipelines procedures.

The facility has implemented procedures to review proposed process and operational changes and modifications for their potential impacts on worker health and safety.

The procedures require the use of a Project Initiation Authorisation form that prompts the assessment of safety and environmental impacts but also requires the person initiating the change to detail the present practice and proposed alteration. The form includes an assessment of impact across, but not limited to, safety, environment, plant, quality, engineering, materials and controls systems. The Project Initiation Authorisation form includes a completion checklist that requires the assessment of the implementation of the change. Process Safety personnel are required to sign off on engineering changes arising as a result of project initiations.

The facility considers worker input in developing and evaluating health and safety procedures via an overarching 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.

The monthly Personal Protection Equipment (PPE) Committee, Safety Advisors and Managers meeting provides a forum for the discussion of PPE trials, new products, operator feedback, training events and any newly identified issues/risks for personnel. Individual departments also hold their own regular safety meetings, employee's input during these meetings is used in developing and evaluating the facility's procedures.

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 mg/m^3. The types of monitoring devices include single gas detector badges (HCN), MX6 multiple gas detectors (HCN, ammonia, carbon monoxide and oxygen), MX4 dual gas detectors and fixed in place gas detectors.

The fixed in place gas detectors are a series of nine *in situ* monitoring devices. Trigger levels are set to 4.5 mg/m^3. Procedures and site maps detail their exact locations.

HCN Monitors are required when entering the red and yellow PPE operational areas and there are procedures *c*ontaining provisions for responding to emergency situations involving cyanide exposures. They cover the requirements for responding to an alarm, contacting the operator for an oxyport, providing first aid (where safe to do so), calling the emergency number and how to deal with false alarms. In the event of an alarm personnel will evacuate the area to a designated muster point and communicate with the control room. No personnel are allowed into the area whilst the alarm is activated, control room personnel will continue to monitor the alarms and try to establish the source using the DCS. Operators are to monitor the hydrogen cyanide levels in the plant until they subside below 25 ppm. At this level operators are able to enter the plant wearing the required PPE, to work with the control room to address the source. Personnel are only allowed back into the plant area once the operators have given the all clear.

There are procedures in place to minimise the risk of adverse health effects due to the exposure to hazardous atmospheres within the workplace. The procedures describe the types of gas detectors available for specific contaminants, the gas testing techniques and the requirements for device calibrations and maintenance.

Specific procedures document the controls in place to mitigate the risks of contact with cyanide when working in the solids and packaging plants and the processes for decontaminating equipment and personnel.

Hydrogen cyanide monitoring equipment is maintained in accordance with manufacturer's requirements. The operation has portable MX6 iBrid multi-gas monitors and personal gas badges (sensory and alarm device) equipment available on site and calibration records for the last 12 months were available for the monitors observed.

A qualified third party conducts routine hygiene assessments. 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. A portable device will alarm when activated if a bump test has not been completed in the previous 24-hour period.

Hygiene data and calibration records are kept and maintained by the Hygiene department.

A Monitoring Management and Control Requirements for Gas Testing Equipment procedure aims to minimise the risk of adverse health effects due to the exposure to hazardous atmospheres within the workplace. The procedure describes the types of gas detectors available for specific contaminants, the gas testing techniques and the requirements for device calibrations and maintenance.

The facility has identified areas and activities where workers may be exposed to HCN gas or sodium cyanide dust and requires the use of PPE, as necessary, in these areas when activities are being performed. There are nine *in situ* monitoring devices placed in or nearby these areas within the solids and liquids plants. Trigger levels are set to 4.5 mg/m^3. Portable MX6 iBrid multi-gas monitors and personal gas badges are also in use and trigger levels are set to 4.7 mg/m^3.

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. Other personnel (excluding fully inducted contractors) are required to be accompanied by a cyanide facility representative whilst present on site. The various job specific procedures contain more details on the minimum requirements for the buddy system and communication pathways for each specific task.

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

There is a Health Surveillance and Biological Monitoring procedure which covers both pre-employment and ongoing health assessments. The facility conducts 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.

All personnel entering the cyanide plant must carry out the below procedure:

- Proceed into clean area of the decontamination hut
- Put on correct sized orange overalls
- Put on the zone-specific PPE as per the signage in the clean area (Red or Yellow zone)
- Proceed though the clear door into the contaminated area and out into the plant area.

Detailed exit decontamination procedures are also in place. There is a 13-step Yellow Zone and 15-step Red Zone decontamination procedure.

The procedures contain detailed information on how to use and clean the decontamination hut, so as to maintain clean areas, safely decontaminate used PPE and maintain stocks of clean PPE.

The site visit confirmed that personnel working within the red/yellow PPE areas were wearing PPE and clothing in accordance with the procedure and signage displayed at the site.

The facility does have warning signs advising workers that cyanide is present and that, if necessary, suitable PPE must be worn.

There are minimum PPE requirements to enter the plant areas. 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 the plant areas and the decontamination hut and entrance to the red/yellow PPE areas.

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 production 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.

2.2.2 Production Practice 2.2

Develop and implement plans and procedures for rapid and effective response to cyanide exposure.

	☒ **in full compliance with**	
AGR is	☐ in substantial compliance with	**Production Practice 2.2**
	☐ not in compliance with	

Summarise the basis for this Finding/Deficiencies Identified:

AGR 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 has developed specific written emergency response plans for cyanide exposures which contain provisions for responding to emergency situations involving personnel exposures.

The procedures 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. The Routine Man Down Alarm and Safety Shower Checks procedure details the method for testing safety shower and eye wash stations. 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.

Dry powder fire extinguishers were observed and confirmed that these are checked every 6 months by Wormald. The facility has water, oxygen, resuscitators, antidotes and a means of communication or emergency notification readily available.

There are five Oxy-Port oxygen cylinders located throughout the facility including the plant control room, the liquids dispatch control room, decontamination hut and the operations administration office. The facility has two Cyanide Antidote Kits (CYANOKITs) which are located in the SCP control room and the decontamination hut. Trained AGR medical personnel are on call and provide 24/7 coverage for the site.

Water is available at the facility through the safety shower system, the showers are located strategically in the cyanide areas for quick access. Both telephone and radio communications are available. Additionally visual coverage is available via CCTV and emergency shower and eyewash facilities are alarmed, mapped and on display in the control room.

The facility inspects its first aid equipment regularly to assure that it is available when needed. The first-aid and emergency response equipment is stored and tested as directed by the manufacturer and replaced on a schedule that assures they will be effective when used.

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. Oxyports are maintained and tested by Australian Safety Engineers as per manufacturer's instructions. Any item that fails a test is replaced. A review of self-audit inspection checklists shows they are completed regularly and equipment observed during the audit was found to be available and in a useable condition.

Safety data sheets (SDS) and first aid procedures on cyanide safety are in the language of the workforce and are available to workers at the site. All the signs and procedures are in English, which is the official language. SDS are available in both hard copy and online through the Chemalert system. First aid information and "use of antidote" instructions are kept with each of the Cyanide Antidote Kits.

Storage tanks, containers and piping containing cyanide are identified to alert workers of their contents and the directions of flow. Vessels are identified by name and plant number and are traceable to process diagrams, systems manuals and control systems (control room). Directional signage on piping was confirmed during a tour of the facility. Packaged products are identified with the appropriate dangerous goods classifications and labelling.

The Facility has decontamination procedures and policies regarding clothing, equipment, tools, isotainers and cyanide handling areas. There is a 13-step Yellow Zone and 15-step Red Zone decontamination procedure.

Procedures contain detailed information on how to use and clean the decontamination hut, how to maintain clean areas, safely decontaminate used PPE and maintain stocks of clean PPE. Procedures also contain emergency response information in the event of cyanide exposure occurring.

The site visit confirmed that personnel working within the red/yellow PPE areas were wearing PPE and clothing in accordance with the procedures and signage displayed at the site.

The Facility has its own on-site capability to provide first aid and render initial medical assistance to workers exposed to cyanide. Designated personnel are advanced trained in first aid e.g. Site/Shift Supervisors and all Operators are trained in basic First Aid.

There are two registered nurses based in the on-site fully equipped medical centre and one doctor is also present on a rotational basis (2-3 days per week). 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 of the potential need to treat patients for cyanide exposure and is confident the hospitals have adequate capabilities to respond to such incidents.

On-site medical personnel have visited the two hospitals to assess their capability to treat cyanide exposure victims and speak about the requirements for treatment and decontamination, the medical facilities have adequate, qualified staff, equipment and expertise to respond to cyanide exposures. Initial response and administration of cyanide antidote would occur on site, followed by transfer to one of the two hospitals by St John Ambulance personnel. Cyanide Antidote Kits, which contain a treatment protocol, would accompany the patient on the way to the medical centre. In the event of an exposure incident, the Site Doctor will phone ahead to the treating hospital and notify them of the incoming patient.

Mock emergency drills are conducted periodically to test response procedures for various exposure scenarios; and lessons learnt are incorporated into response planning. An Emergency Exercises procedure is used to outline the requirements of conducting emergency exercises within the sodium cyanide business to ensure that exercises are planned, practiced and evaluated. A Site Muster procedure ensures all personnel on the site are safely assembled and accounted for in the event of a works muster/evacuation being required. All occupied buildings shall have a fire muster at least once a year, and once per year a full site muster is to be conducted.

The Sodium Cyanide Facility Scenario Exercise Form is used to gather and provide comments, feedback and suggestions from all parties involved in mock exercises to ensure that continual improvement of the emergency response process is achieved. Numerous mock scenario (training) records and an emergency drill report were provided as evidence.

Cintellate recorded incidents indicated that there have been no cyanide related incidents resulting in worker exposure that required medical treatment, or releases of cyanide bearing material into the environment during the audit period.

Procedures are in place to investigate and evaluate cyanide exposure incidents to determine if the facility's programmes and procedures, to protect worker health and safety and to respond to cyanide exposures, are adequate or need to be revised. The procedures cover the investigation, evaluation and recording of incidents. Corrective actions are devised and then tracked via the site management system.

2.3 Principle 3 – Monitoring

Conduct environmental monitoring to confirm that planned or unplanned releases of cyanide do not result in adverse impacts.

2.3.1 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**	
AGR is	☐ in substantial compliance with	**Production Practice 3.1**
	☐ not in compliance with	

Summarise the basis for this Finding/Deficiencies Identified:

AGR 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 not directly discharge to surface water under normal operating conditions.

As per the site's Operating Licence, the boundary of the facility is located at the perimeter fence between the production facility and the greater industrial facility site.

There are two wastewater streams for the facility – the treated effluent line and the stormwater, cooling tower blowdown water line. Water in the stormwater line is collected via four sumps, the sumps are tested manually prior to discharge occurring. When required, discharge is manually commissioned to a containment pond located offsite, but within the greater industrial facility bounds.

The treated effluent line water is pumped to the tank farm where it passes through an ammonia stripper and is then sent to a reverse osmosis (RO) unit. Concentrate is sent back to the 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 containment pond.

The site must adhere to Department of Water and Environmental Regulation (DWER) Operating Licence conditions which state that wastewater released from the site must meet the discharge target for cyanide of less than 1 mg/L (free cyanide). In both cases 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. Under the site's Operating Licence there are three licensed points for discharge to the environment. These are:

- A diffuser at the end of the submarine pipeline to Cockburn Sound, 300 m offshore, Free cyanide limit of 0.1 mg/L
- The Sepia Depression Ocean Outlet Line (SDOOL), 4 km offshore, Free cyanide limit of 0.1 mg/L
- An emergency beach outfall to Cockburn Sound (the emergency beach outfall is only intended to be used for the discharge of stormwater).

From the containment pond, the preferred and most used method of disposal is via the Water Corporation owned 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 the facility's contribution accounts for approximately two percent of daily total volume discharged. The SDOOL discharges approximately four kilometres offshore from Point Peron.

During the audit period:

The average daily concentration of cyanide in the discharge to the SDOOL was:

- 1 January – 31 December 2017: 0.008 mg/L Free cyanide
- 1 January – 31 December 2018: 0.008 mg/L Free cyanide
- 1 January – 31 December 2019: 0.015 mg/L Free cyanide.

As stated in the previous Audit reports, after allowing for a 50 factor dilution entering the pipeline and a 200 fold dilution entering the ocean, the requirement for less than 0.022 mg/L is being met.

During periods of high rainfall, containment pond storage capacity and maximum pump rates to the wetland and SDOOL may be exceeded and wastewater may be discharged to Cockburn Sound via the two alternative licensed discharge points – the emergency beach outfall and or the submarine pipeline.

During the Audit period, the Submarine Pipeline into Cockburn Sound was commissioned on the following occasions:

- 11 February 2017 – Free cyanide concentration 0.02 mg/L
- 12 August 2017, Free cyanide concentration 0.01 mg/L
- 3 July 2018 – Free cyanide concentration 0.01 mg/L
- 5 July 2018 – Free cyanide concentration 0.00 mg/L
- 4 July 2019 – Free cyanide concentration 0.00 mg/L
- 5 July 2019 – Free cyanide concentration 0.00 mg/L
- 11 July 2019 – Free cyanide concentration 0.00 mg/L.
- The emergency beach outfall to Cockburn Sound (from the CSBP containment pond) was used six times during the Audit period:
- 10 February 2017, Free cyanide concentration of 0.02 mg/L
- 11 February 2017, Free cyanide concentration of 0.02 mg/L
- 16 January 2018, Free cyanide concentration of 0.00 mg/L
- 17 January 2018, Free cyanide concentration of 0.01 mg/L
- 28 June 2018, Free cyanide concentration of 0.02 mg/L
- 3 July 2018, Free cyanide concentration of 0.01 mg/L.

Average Boundary Analyser Cyanide concentrations for the audit period (derived from daily averages) were:

- 2017 – 0.026 mg/l Free cyanide
- 2018 – 0.037 mg/L Free cyanide
- 2019 – 0.078 mg/L Free cyanide.

The laboratory procedure for determination of cyanide concentration, as performed in the on-site NATA accredited facility, has been provided.

By discharging into the greater CSBP site containment pond, the facility avoids having any direct discharge to the environment. Once discharged from the facility, wastewater remains contained within CSBP infrastructure and managed under their Operating Licence conditions. Under normal operating conditions no discharges to surface water occur.

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 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 following applicable guidelines and standards:

- Non-Potable Use Guidelines (NPUG) – Contaminated Sites Ground and Surface Water Chemical Screening Guidelines, Department of Health (DoH) 2014 – Free cyanide limit of 0.8 mg/L
- Environmental Quality Criteria (EQC) Reference Document for Cockburn Sound, Environmental Protection Authority (EPA) 2015 – Free cyanide limit of 0.014 mg/L
- Marine Waters (MW) – Australian Water Quality Guidelines for Fresh and Marine Water Quality, Australian and New Zealand Environment and Conservation Council and Agriculture and Resource Management Council of Australia and New Zealand (ANZECC & ARMCANZ) 2000 – Free cyanide limit of 0.007 mg/L.

The NPUG are considered relevant due to extraction of groundwater for irrigation and industrial purposes on site. The EQC guidelines are adopted due to the proximity to Cockburn Sound. The EQC guidelines are based on ANZECC & ARMCANZ (2000) and assume a 90 percent protection level. Where EQC guidelines are absent, groundwater impacts are alternatively assessed by comparison with the MW guidelines.

The above guidelines and standards were used in all sampling events during the audit period:

- 2017: Cyanide was below applicable guidelines in all bores during the reporting period. All bores monitored for free cyanide in 2017 recorded concentrations at the laboratory limit of reporting (LOR), <0.004 mg/L.
- 2018: Cyanide was below applicable guidelines in all bores during the reporting period. All bores monitored for free cyanide in 2018 recorded concentrations at the laboratory LOR, <0.004 mg/L.
- 2019: Cyanide was below the NPUG in all bores during the reporting period. All bores monitored for free cyanide in 2019 recorded concentrations at the laboratory LOR, <0.004 mg/L, with the exception of MR15S (0.023 mg/L April 2019, 0.036 mg/L May 2019) and PB13 (up to 0.04 mg/L, October 2019).

Seepage from the facility has not caused the cyanide concentration of the groundwater to exceed that necessary to protect its beneficial use. The facility is currently not engaged in remedial activity to prevent further degradation and restore beneficial uses. As noted above, the concentrations of cyanide in groundwater do not exceed the concentrations necessary to protect its beneficial use.

As per the requirements of DWER Operating Licence the facility is required to conduct groundwater monitoring in accordance with the latest DWER approved Ground Water Operating Strategy. Annual groundwater monitoring reports are prepared and submitted to regulators to indicate contours calculated from measurements and samples taken from the monitoring bores.

Additional site conditions require the facility operator to contain and recover, or absorb and dispose of, liquid resulting from spills or leaks of chemicals including fuel, oil or other hydrocarbons, whether inside or outside secondary containment compound(s).

The facility limits atmospheric process emissions of HCN gas, such that the health of workers and the community are protected. As per the DWER Operating Licence there are three allowable atmospheric discharge points under normal operating conditions, these are:

- John Zink incinerator stack on the liquids plant 1
- Maxitherm incinerator stack on the liquids plant 2
- Solids plant stack.

There are additional approved discharge points on the liquids plants for use in start-up and shut down procedures. The atmospheric emission limit for total cyanide is 0.58 g/sec. Quarterly stack tests are carried out and there were no exceedances during the audit period. In order to meet this operating condition the solids plant has a HCN wet scrubber and dust collection system, as well as a series of HCN monitors.

The liquid plant emissions are from unreacted gas and are broken down via incinerators. There is a continuous emissions monitoring system in place for the liquids plants. Accurate data must be captured for greater than 90% of the operating time in each calendar month and 95% of the operating time in an accumulated 12 calendar month period.

The facility monitors for cyanide in discharges and groundwater. There is no direct discharge to surface water. The two wastewater streams are batched, treated and only discharged when sampling shows quality criteria has been met. Wastewater is then discharged off site to the containment pond during which it passes through online autonomous analysers with quality control interlocks in place. Results indicate that cyanide concentrations are below the licence target of 1 mg/L.

The facility conducts quarterly monitoring and annual reporting, for cyanide in groundwater across 45 bores as per the commitments in the DWER approved Groundwater Operating Strategy. Groundwater bores are located both up gradient and down gradient of the site. Monitoring is conducted at frequencies adequate to characterise the medium being monitored. The monitoring frequencies of surface (waste) water, groundwater and atmospheric emissions are carried out in accordance with licensing requirements. Sampling frequencies have thereby been deemed adequate by the appropriate regulatory bodies. These frequencies are:

- Wastewater: batch tested prior to discharge, as required, and online autonomous analysers. Daily sampling (24 hr composite) of discharges via the SDOOL or Cockburn Sound submarine pipeline and emergency beach outfall.
- Groundwater: quarterly sampling events
- Atmospheric emissions: quarterly stack testing events and online continuous monitoring for liquids plants.

2.4 Principle 4 – Training

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

2.4.1 Production Practice 4.1

Train employees to operate the plant in a manner that minimises the potential for cyanide exposures and releases.

	☒ **in full compliance with**	
AGR 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 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.

Induction training covers topics such as:

- Cyanide identification
- Cyanide hazards
- Cyanide exposure.

Refresher training in cyanide exposure is conducted annually for cyanide production workers, biennially for contractors and every four years for non-cyanide workers.

Induction delivery methods consist of video and reading material, questionnaires and walk around scripts. There are self-paced, group classrooms, individual and online delivery methods.

A Training Capability Matrix contains, and tracks completion of, mandatory and non-mandatory training activities/courses for Operations, Dispatch, Maintenance and Leaders and Support personnel. It specifies refresher frequencies and covers categories such as:

- Inductions e.g. initial site specific and area inductions.
- Critical Safety Training e.g. Permits to work, cyanide exposure, breathing apparatus and initial first aid.
- High Risk Work Licences e.g. Rigging and dogging, electrical, forklift and boiler.
- Technical Training e.g. Liquid and solid dispatch, environmental and maintenance.

- CSBP Organisational Training e.g. Responsible Officer/Accountable Person and diversity and equality.
- Systems Training e.g. HAZOP process and CSBP systems such as JDE, DOCOVA, Chemalert and Cintellate.

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 the primary identification method is through site signage. PPE requirements are also detailed in the task specific procedures.

The Cyanide Manufacturing Facility Induction outlines the area specific hazards and provides persons entering the facility with the necessary information to orientate themselves safely in the work area. It identifies the necessary PPE (Section 5) and access requirements for the different plant areas.

The facility has identified and documented when and where PPE is required:

- Yellow Zone: Solids Plant, Clad Tower and Dispatch facility. Required equipment is as follows: HCN detectors, Orange hard hat, mono-goggles, orange laboratory coat/overalls, chemical resistant gloves, black boots/wellington boots, P2 dust mask, ear plugs and a personal HCN gas monitor, individually carried or by the group.
- Red Zone: Solids Dispatch facility. Required equipment is as follows: HCN detectors, Orange hard hat, cotton hoods (if not wearing Jupiter type helmet, orange overalls, chemical resistant gloves, black boots/wellington boots, fall faced canister mask with ABEK 1 canister fitted of Jupiter helmet with ABEK 1 canisters, ear plugs, Kevlar chemical resistant sleeve protectors and personal HCN gas monitor.

Training material requires personnel to locate and explain usage requirements for equipment such as Self-Contained Breathing Apparatus (SCBA), Oxy Vivas and cyanide antidote kits.

The facility trains workers so that they may perform their normal production tasks with minimum risk to worker health and safety and in a manner that prevents unplanned cyanide releases.

Sodium Cyanide Manufacturing Facility (SCMF) Certificate IV in Process Plant Operations (Liquid, Solids and Process Plant Technology) details the training requirements that must be met in order to achieve competency in, and subsequently perform duties as, a Process Plant Operator. There are 26 units of competency (five core and 21 elective) that must be completed and signed off by a competent person. Training modules and competencies are aligned to industry recognised certificate levels as outlined in the Australian Quality Training Framework.

The document management system contains the necessary information on training modules and assessments as required by each area of the plant.

A Learning Agreement records confirm the completion of necessary training elements as per role requirements. Training records were observed confirming that training had been conducted in accordance with the training matrix.

The training elements necessary for each job are identified in the training materials.

The facility has developed a training matrix to manage the training requirements for employees. The training matrix details:

- The training that is required to be undertaken
- The frequency at which each of the training modules is to be conducted (re-conducted)

- A record of training undertaken by specific personnel.

The document management system contains information on training modules and assessments as required by each area of the plant. The training modules provide detailed information on the operation of the plant and this is supported by the operating procedures and both are used in the training of operators.

Training is provided by appropriately qualified personnel. 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 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. Where external training providers are used a registered training organisations is used and where practical, training is completed to a nationally recognised level of competency.

Employees are trained prior to allowing them to work with cyanide. Workers must complete the corporate and area training before being allowed to perform work. The training is provided through a series of comprehensive site and specific work area inductions along with the completion of specific training modules as per role requirements and set out in the training matrix.

New employees are teamed with an experienced operator and are not permitted to work unsupervised until an area supervisor is satisfied that the person can complete the necessary tasks safely and in accordance with required procedures.

The facility evaluates the effectiveness of cyanide training by testing and regular observation. Evaluation is carried out following the completion of a training module. The evaluation process typically involves a combination of written, oral tests and demonstration of practical tasks to assess the employee's level of understanding and or skill.

In addition to the structured training process to initially develop worker competencies and skills regular procedural reviews and observations are completed via a Job Cycle Check (JCC) Procedure. The purpose of the JCC is to:

- Assess if a procedure is current and up to date
- Identify the need for changes in plant, procedure or practices
- Identify training needs
- Ensure consistency in operations across shifts.

2.4.2 Production Practice 4.2

Train employees to respond to cyanide exposures and releases.

	☒ **in full compliance with**	
AGR is	☐ in substantial compliance with	**Production Practice 4.2**
	☐ not in compliance with	

Summarise the basis for this Finding/Deficiencies Identified:

AGR 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.

An Emergency Exercises Guide outlines the requirements of conducting emergency exercises and ensuring they are planned, practiced and evaluated for effectiveness. It states that exercises shall be completed as per the Emergency Exercise Schedule and upon completion evaluation is to be completed via a Scenario Exercise Form which is kept on record.

Response procedures for emergency situations involving personnel outline the first response process for emergencies and cyanide releases in the Cyanide Plant. An Emergency Response Teams Guide describes the composition, training, performance standards, duties and responsibilities of the Emergency Response Teams (ERT).

Each Standard Operating Procedure describes the steps to be taken in the event of an emergency situation involving a release. They follow a standardised format and address items such as:

- Securing the area
- Advising the relevant personnel
- Wearing the appropriate PPE
- Containment methods
- Preventative actions
- Neutralising techniques
- Monitoring
- Decontamination
- Post incident analysis.

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 the 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 operating procedures.

Procedures are available to all personnel via the document management system.

The facility has conducted numerous scenario exercises during the audit period. These exercises are documented and the reports includes a review of the drill along with any identified corrective actions which are tracked to completion.

Cyanide Facility Scenario Exercises completed during the audit period include:

- A Cyanide Man Down Exercise
- A Liquid Flange Failure Exercise.

Emergency drills are evaluated from a training aspect to determine if personnel have the knowledge and skills required for effective response and training procedures are revised where deficiencies are identified.

An Emergency Exercises Guide is used to outline the requirements of conducting emergency exercises within the sodium cyanide business to ensure that exercises are planned, practiced and evaluated.

The Guide details the evaluation and record keeping requirements following the completion of an emergency exercise. There is an evaluation process used to obtain comments, feedback and suggestions from all parties involved in the exercise with the aim of ensuring continual improvement of the exercise process.

Records of the exercise and the evaluation process are supplied to administration and safety personnel for record retention.

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 matrixes are used to maintain records of completed courses and schedule dates for refresher training.

2.5 Principle 5 – Emergency Response

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

2.5.1 Production Practice 5.1

Prepare detailed emergency response plans for potential cyanide releases.

	☒ **in full compliance with**	
AGR is	☐ in substantial compliance with	**Production Practice 5.1**
	☐ not in compliance with	

Summarise the basis for this Finding/Deficiencies Identified:

AGR 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.

Plans describe the composition, training, performance standards, duties and responsibilities of the Emergency Response Teams (ERT).

The facility has developed a list of Standard Operating Procedures (SOP) that describe the steps to be taken in the event of an emergency situation involving a release, these include:

- Sodium Cyanide Solids/Solution Release into Water Course
- Standard Operating Procedure – Solid Cyanide Release
- Standard Operating Procedure – Sodium Cyanide Solution Release
- Standard Operating Procedure – Toxic Gas/Fume Release
- Standard Operating Procedure – Hazardous Material Spill.

Various plans and procedures covers aspects such as the first response procedures for emergencies involving personnel in the Sodium Cyanide Plant; emergency mustering of all site personnel; 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 facility has developed a Transport Management Plan that details the procedures to be adopted to avoid incidents, and actions required during all phases of emergency response management associated with the transport of both sodium cyanide solution and solids.

The Plans and Procedures consider the potential failure scenarios appropriate for the site specific environmental and operating circumstances.

The facility is regulated as a Major Hazard Facility (MHF) and under Western Australian legislation a safety report and safety management system has been developed for the site. A Quantitative Risk Assessment (QRA) is used to identify the types of Major Incident Events (MIE) that may arise within the greater site.

The ERT plan contains a list of SOPs relating to likely emergency scenarios for the facility. Each SOP describes the steps to be taken in the event of an emergency situation of that nature.

The Layer of Protection Analysis (LOPA) 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 (IPL) that are in place for each scenario. This document links each scenario to key supporting procedures and management plans.

The Transport Management Plan also includes scenario information and cyanide neutralisation procedures for a variety of incidents that may occur during road or rail transportation of product.

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.

Plans and Procedures describe items such as:

- 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.
- Containment, assessment, mitigation and future prevention of releases.

Whilst additional response procedures describe the use of cyanide antidotes and first aid measures for cyanide exposure.

2.5.2 Production Practice 5.2

Involve site personnel and stakeholders in the planning process.

	☒ **in full compliance with**	
AGR is	☐ in substantial compliance with	**Production Practice 5.2**
	☐ not in compliance with	

Summarise the basis for this Finding/Deficiencies Identified:

AGR 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 an overarching 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 the operation's ongoing involvement in the Kwinana Industries Council (KIC) and Kwinana Industries Mutual Aid (KIMA) regular meetings and discussion forums.

Emergency management plans provide for post incident investigation and reporting. Any corrective actions arising from the Post Incident Analysis (PIA) process are captured and tracked to completion.

A Transport Management Plan for Cyanide Product provides procedural information for the reporting of incidents and near-misses during the transportation of product. This allows for the investigation of events and causes, and the identification and tracking of follow-up corrective actions that may arise.

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.

The operation is a member of the Kwinana Industries Public Safety Liaison Group (KIPS), 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.

Community safety documentation contains the necessary information on the major hazard facilities in operation, what to do in an emergency situation, the facility's emergency response capabilities and also provides a means for concerned community members to receive regular updates via email.

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), WA Police and State Government regulators and Local Councils. DFES would be the primary external responder in the event of a cyanide release.

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.

KIMA was set up through the KIC in conjunction with a range of key stakeholders including:

- Department of Fire and Emergency Services (DFES)
- Western Australian (WA) Police
- State Government regulatory authorities
- Local Councils
- Community representatives.

The KIMA committee is a voluntary working group of technical specialists from the KIC member companies who share emergency response expertise, manpower and resources in the event of a major emergency. KIMA comprises KIC's full member companies who are subject to the Explosives and Dangerous Goods regulations and require a Total Hazard Control Plan.

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.

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 Kwinana Industries Council (KIC) Mutual Aid meetings and quarterly Community and Industries Forum (CIF) meetings. Presentations are made to the public on safety systems, operations and development works.

2.5.3 Production Practice 5.3

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

	☒ **in full compliance with**	
AGR is	☐ in substantial compliance with	**Production Practice 5.3**
	☐ not in compliance with	

Summarise the basis for this Finding/Deficiencies Identified:

AGR 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 designates primary and alternate emergency response coordinators who have explicit authority to commit the resources necessary to implement the plan. The Plan states that the authority resides with either the Crisis Management Team (CMT) or the Incident Management Team (IMT). The CMT manages the post-incident affairs such as consequences of injury, damage to the environment or property. The IMT provides strategic and tactical guidance and direction to combat the incident and is responsible for the development of plans and responses.

The Emergency Response Teams document states that ERTs are structured to align with external emergency service providers and are competent to respond to emergencies involving all products and facilities. It provides further detail on the composition, training, performance standards and duties and responsibilities of the ERTs.

Emergency exercise and training documentation states the requirements for new employees, employees working in hazardous or high risk areas and the role and responsibilities of the Emergency Services Supervisor and Emergency Services Support Officer.

The facility operator 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 Plans include the necessary call out information for on- and offsite emergencies and specifies the duties and responsibilities of the coordinators and team members including:

- WesCEF Crisis Management and Incident Management Teams
- Operations Officer
- Planning Officer
- Communications Officer
- Muster Officer
- Emergency Response Teams
- First Responders
- Emergency Security Providers.

The Plan contains information on the location of First Aid Stations and designated First Aid Officers. There is an equipped first aid clinic on site with professional medical personnel available during day shift and on call. Further information on PPE is contained within supporting SOPs.

The facility has a well-equipped Emergency Response Centre (ERC) to deal with incidents that are likely to occur. There are four principal vehicles to respond to on-site or off-site incidents, these are:

- 6 tonne truck – HAZMAT response vehicle
- 3 tonne truck – support vehicle
- Fire appliance
- Patient transport vehicle.

An additional 4 x4 land cruiser and an ammonia pumping trailer are also available for off-site emergency response.

The Plans and supporting procedures 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.

It is the responsibility of the Operations Officer to manage the movement of emergency response equipment and reallocate resources or personnel in line with strategies, whilst the ERT members are responsible for the maintenance of all issued equipment and equipment is to be returned upon personnel leaving the team.

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.

outside responders may include:

- Department of Fire and Emergency Services (DFES)
- West Australian Police

- Kwinana Industries Council.

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.

Management of emergencies documentation 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.

The operator is a member of the Kwinana Industries Mutual Aid (KIMA) group, a mutual aid group formed to provide a forum which was focussed on joint industry emergency response and public safety.

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.

KIMA was set up through the Kwinana Industries Council in conjunction with a range of key stakeholders including:

- Department of Fire and Emergency Services (DFES)
- WA Police
- State Government regulatory authorities
- Local Councils
- Community representatives.

Exercises to test the response and capability of the on-site ERT were conducted during the audit period. These exercises were designed to test the ERTs in the response and resolution of a major chemical spill with life involvement and the response to a cyanide exposure incident.

2.5.4 Production Practice 5.4

Develop procedures for internal and external emergency notification and reporting.

	☒ **in full compliance with**	
AGR 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.

Management of Emergencies documentation 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.

The operator 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 (ECC) at least every twelve months by the Emergency Services Supervisor or following organisational changes. The procedure for notifying potentially affected neighbours of an incident is also provided.

The facility is member of the Kwinana Industries Mutual Aid (KIMA) group. Notification to neighbours is done via the KIMA two-way radio system.

There are 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 Management of Emergencies plan states it is the responsibility of the Communications Officer to manage communications with Government Regulators, emergency services and other Kwinana industries.

2.5.5 Production Practice 5.5

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

	☒ **in full compliance with**	
AGR is	☐ in substantial compliance with	**Production Practice 5.5**
	☐ not in compliance with	

Summarise the basis for this Finding/Deficiencies Identified:

AGR 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 Response Teams plan contains a list of Standard Operating Procedures (SOP) 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.

Each SOP describes the steps to be taken in the event of an emergency situation of that nature, these include:

- Sodium Cyanide Solids/Solution Release into Water Course
- SOP – Solid Cyanide Release
- SOP – Cleaning up Acid Spills
- SOP – Hazardous Material Spill
- SOP – Sodium Cyanide Solution Release
- SOP – Toxic Gas/Fume Release.

Each SOP follows a standardised format and contains information on:

- Establishing a command post and securing the area
- Advising the appropriate personnel
- Applying the appropriate PPE
- Setting up decontamination and containment measures
- Preventing products entering drains or waterways
- Neutralisation techniques
- Monitoring for toxic gases
- Removal and correct disposal of contaminated soil or other material
- Decontamination
- Arranging post incident analysis.

Each SOP details the recovery of solution and solids and where these materials should be disposed of; namely, off-site disposal at an approved location for contaminated solids, such as soils; and recovery via pumping into a tank for solutions.

The SOPs require monitoring for toxic gases to occur whilst steps to neutralise the spill are implemented. 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.

Supporting procedures contain further information on underground water treatment and monitoring in line with relevant National guidelines. The Transport Management Plan 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. 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.

The Transport Management Plan states “whilst some unique situations may exist where it is acceptable to add neutralising agents to water sources, generally, hypochlorite and ferrous sulphate must not be allowed to enter any natural body of surface or ground water.”

The SOPs state “generally, hypochlorite, ferrous sulphate and hydrogen peroxide must not be allowed to enter any natural body of surface or ground water.” The plans and procedures address the potential need for environmental monitoring and where practical include methodologies and parameters.

Neutralisation Procedures and Neutralisation Scenarios within the Transport Management Plan address the potential need for environmental monitoring.

SOPs 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 the applicable SOPs, contingency/emergency procedures include further information on the emergency and wastewater management system and monitoring and testing requirements prior to disposal.

2.5.6 Production Practice 5.6

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

	☒ **in full compliance with**	
AGR is	☐ in substantial compliance with	**Production Practice 5.6**
	☐ not in compliance with	

Summarise the basis for this Finding/Deficiencies Identified:

AGR 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 Transport Management Plan is reviewed at least every two years, or when changes to systems or procedures make it necessary. The biennial review is initiated via document control system.

Internal audits of the plan are scheduled, performed and reported on in compliance with Internal Auditing of Management Systems and Internal Audit Methodology.

The Management of Emergencies plan states the review frequency is every two years to ensure relevance and completeness. The 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 plan was last reviewed and modified on 21 November 2019

Mock emergency drills are conducted periodically as a part of emergency planning evaluation processes.

Documentation states that mock emergency drills are to be conducted periodically as part of the ongoing emergency management and response evaluation process. Incident Management Team training is to include at least two scenarios each year that involve mustering of personnel on site. Once a year, a full site muster is to be conducted.

The Emergency Services Supervisor is responsible for ensuring that each area of operation has at least one fire drill per year per occupied building and that there is a site emergency muster at least once per year. These are managed through the annual Building Evacuation Schedule.

Furthermore, 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.

Briefing notes are produced at the end of each mock drill. The notes typically detail:

- Background
- Scenario
- Synopsis
- What went wrong
- What went right
- Recommendations
- Documented corrective actions are tracked to completion.

The briefing notes are used to amend plans and procedures where appropriate.

The operation was able to provide evidence of drills and also response to emergency situations that occurred during the audit period.

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.

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 meet 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.

3.0 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

Golder Associates Pty Ltd

Craig Currie

Environmental Consultant

Ed Clerk

Principal, Mining Environment Division Leader

CC_EWC/MW/ds

A.B.N. 64 006 107 857

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APPENDIX A

Important Information

The document ("Report") to which this page is attached and which this page forms a part of, has been issued by Golder Associates Pty Ltd ("Golder") subject to the important limitations and other qualifications set out below.

This Report constitutes or is part of services ("Services") provided by Golder to its client ("Client") under and subject to a contract between Golder and its Client ("Contract"). The contents of this page are not intended to and do not alter Golder's obligations (including any limits on those obligations) to its Client under the Contract.

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This Report has been prepared in the context of the circumstances and purposes referred to in, or derived from, the Contract and Golder accepts no responsibility for use of the Report, in whole or in part, in any other context or circumstance or for any other purpose.

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.

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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.

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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

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