July 2017

INTERNATIONAL CYANIDE MANAGEMENT CODE

Australian Gold Reagents Pty Ltd (AGR) Kwinana Production Facility ICMC Recertification Audit – Summary Audit Report

Submitted to:
International Cyanide Management Institute (ICMI)
1400 I Street, NW – Suite 550
WASHINGTON DC 20005
UNITED STATES OF AMERICA

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REPORT

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Distribution:

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Golder Associates

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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:	Eddie Mizera, Production Manager – Sodium Cyanide
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1.2 Description of Operations

1.2.1 Australian Gold Reagents (AGR) Pty Ltd

AGR is the management company of the unincorporated joint venture between CSBP Ltd (CSBP) and Coogee Chemicals Pty Ltd (Coogee Chemicals). CSBP, a subsidiary of Wesfarmers Ltd is the major participant in the venture and acts as both plant operator and sales agent. Coogee Chemicals is a local manufacturer and distributor of industrial chemicals.

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

1.2.2 Kwinana Production Facility

The 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.

1.3 Auditors Findings and Attestation

AGR's Production Facility 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

Cyanide exposure incidents were noted as occurring during the audit period. These are discussed within this Summary Audit Report.

Name and Signatures of Auditors:

Name	Position	Signature	Date
Ed Clerk	Lead Auditor and Technical Specialist		7 July 2017
Mike Woods	Auditor		7 July 2017

Dates of Audit

The production audit and reporting was undertaken between February and May 2017. The field component of the audit was undertaken 20-22 February 2017.

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

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

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

Summarise the basis for this Finding/Deficiencies Identified:

The operation is in FULL COMPLIANCE with Production Practice 1.1 requiring the operation design and construct cyanide production facilities consistent with sound, accepted engineering practices and quality control/quality assurance procedures.

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 were 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 Sodium Cyanide Business.

The QC/QA documentation for the original facility was assessed during the Certification Audit and found to be compliant. QC/QA records were reviewed for five key infrastructure projects that were constructed during the audit period. A review of QC/QA documentation 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.

Automatic systems, or "interlocks", to shut down production systems and prevent releases due to power outages or equipment failures are in place. A comprehensive HAZOP was conducted in 2011 to identify processes where after the introduction of general risk reduction measures, the level of residual risk remained high. These processes were then subjected to further study and a Layer of Protection Analysis to determine the appropriate safe measures and required layers of protection (interlocks). 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.

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.

Methods to prevent the overfilling of cyanide process and storage vessels are in place. Process tanks have ultrasonic level monitoring and alert systems linked to the distributed control system (DCS). Continuous monitoring of vessel levels and alarms is displayed on the DCS in the control room.

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Secondary containments are provided for process and storage tanks and containers 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 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**	
The operation is	☐ in substantial compliance with	**Production Practice 1.2**
	☐ not in compliance with	

Summarise the basis for this Finding/Deficiencies Identified:

The operation 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.

The Facility has contingency procedures for activities that may result in cyanide exposures or releases during upsets to normal operation. Some procedures are specific to a particular contingency, whilst other contingency measures are contained within a standard operating procedure.

The operation does have procedures to identify when site operating practices have or will be changed from those on which the initial design and operating practices were predicated.

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

A comprehensive maintenance system of Preventative Maintenance (PM) routines has been established. 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.

Additionally, independent from PM routines, statutory inspection requirements are addressed via the Plant Inspections group, a self-regulated department of certified inspectors. Routines for statutory and other inspections, of pressurised equipment, incinerators, cyanide containing pipes and tanks, Intermediate Bulk Containers (IBC) and road transportables 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. There is a procedure that details the monitoring and sampling methods required for sodium cyanide production and also the tasks associated with the daily/monthly running checks.

Calibration of field instrumentation is conducted in accordance with PM routines and a calibration procedure. 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.

The Facility has environmentally sound procedures to prevent unauthorised/unregulated discharge to the environment of cyanide solution or cyanide-contaminated water that is collected in a secondary containment area within the Facility.

The Facility has environmentally sound procedures for the production, storage, transport, disposal and tracking of waste associated with on-site operations. The procedures address the essential components outlined in the Department of Environment Regulation (DER) Controlled Waste Regulations.

Cyanide is stored with adequate ventilation to prevent the build-up of hydrogen cyanide gas. 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 warehouse roof is vented to provide adequate ventilation during solid cyanide storage.

The Facility is secured via the Kwinana Site perimeter fence and a monitored security system. CSBP maintains a secure site via the use of boundary fences, CCTV monitoring and a controlled system of entry/exit.

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**	
The operation is	☐ in substantial compliance with	**Production Practice 1.3**
	☐ not in compliance with	

Summarise the basis for this Finding/Deficiencies Identified:

The operation 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. There is a Reliability Support Plant Inspection Section to provide competent persons to perform the inspections and manage the Plant Inspection Process.

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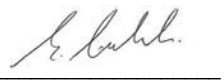
There are reference documents for the inspection of pressure equipment and tanks. The inspection methods and procedures are aligned to the requirements of the relevant Australian Standard. All completed inspections result in a detailed report and corresponding work orders (if required).

Formal inspections of bund structures are conducted by the maintenance department on an annual basis and monthly checks are conducted by the operations group during routine inspections. Identified cracking or wear and tear is reported to maintenance for action.

Inspection frequencies appear to be 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 PM routines.

Inspection findings are documented via individual reports and the contents of the inspection reports contains information about the type of inspection, the name of the inspector and what the outcomes were. Inspection reports are issued to the plant/equipment owners with any recommendations included as work orders. Work orders are given a priority ranking and tracked until a Corrective Work Order has been issued and rectification works completed.

Kwinana Sodium Cyanide Facility		7 July 2017
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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**	
The Transfer Facility is	☐ in substantial compliance with	**Production Practice 2.1**
	☐ not in compliance with	

Summarise the basis for this Finding/Deficiencies Identified:

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

The Facility has developed formal procedures to minimise worker exposure during normal plant operations, from receipt of raw materials through to product packaging and shipping, non-routine and emergency operations and maintenance related activities.

The Facility has implemented procedures to review proposed process and operational changes and modifications for their potential impacts on worker health and safety. The management of change process is covered in multiple procedures. The procedures require the use of a Project Initiation Authorisation form that prompts the assessment of safety and environmental impacts as well as 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.

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 and collect feedback from personnel. The monthly Personal Protection Equipment (PPE) Committee, Safety Advisors and Managers meeting provides another 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.

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, multiple gas detectors and fixed in place gas detectors. The fixed in place gas detectors are set to 4.5 mg/m^3.

There are procedures that cover the requirements for responding to a raised alarm. 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 monitor the alarms and try to establish the source. Operators monitor the hydrogen cyanide levels in the area until they subside to a safe level. At this point, 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.

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Hydrogen cyanide monitoring equipment is maintained in accordance with manufacturer's requirements and calibration records are available. Hygiene data and calibration records are kept and maintained by the Hygiene department.

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.

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. Each work team has a supervisor and work crews are a minimum of two people plus a 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. Non-CSBP personnel (excluding fully inducted contractors) are required to be accompanied by a CSBP representative whilst present on site.

AGR through its on premise medical centre assesses the health of its employees to determine their fitness to perform their specified tasks. There is a procedure that covers both pre-employment and ongoing health assessments. AGR conduct both causal and random drug and alcohol screening tests.

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. Detailed exit decontamination procedures exist for personnel exiting from different areas of the plant.

The Facility does have warning signs advising workers that cyanide is present and that suitable personal protective equipment must be worn. There are minimum PPE requirements to enter the plant area and additional PPE may be required where warning signs are posted. Signage is placed at strategic locations around the facility and indicates that cyanide is present and that smoking, eating and drinking is prohibited.

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.

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**	
The operation is	☐ in substantial compliance with	**Production Practice 2.2**
	☐ not in compliance with	

Summarise the basis for this Finding/Deficiencies Identified:

The operation 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. They cover the requirements for responding to a raised alarm, contacting the operator for an oxyport, providing first aid, calling the 444 emergency number and how to deal with false alarms.

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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. There is a procedure that details the method for testing safety shower and eye wash stations. Weekly tests are conducted on the emergency wash facilities in accordance with PM routines. A detailed Safety Shower and Eyewash Inspection Report was conducted to identify and rectify any non-conformances. Dry powder fire extinguishers are located throughout the Facility.

The Facility has water, oxygen, resuscitators, antidotes and a means of communication or emergency notification readily available. There are 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 which are located in the control room and the decontamination hut. Water is available through the alarmed safety shower system. Both telephone and radio communications are available and visual coverage is available via CCTV.

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 their 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 personnel. Oxyports are maintained and tested by Australian Safety Engineers as per manufacturer's instructions. Any item that fails a test is replaced.

Material Safety Data Sheets (MSDS) and first aid procedures on cyanide safety are in the language of the workforce (English) and are available to workers at the Facility. MSDS 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. 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. Detailed decontamination procedures exist in both hard copy and on the electronic document management system. Procedures contain detail 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. Decontamination information for employees, contractors and visitors is also provided during site inductions.

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 registered nurses based in the on-site fully equipped medical centre and one doctor is also present on a rotational basis.

The Facility has developed procedures to transport exposed workers to locally qualified, off-site medical facilities using external transportation services. The Facility's medical centre has 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 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 nearby hospitals to assess their capability to treat cyanide exposure victims and speak about the requirements for treatment and decontamination. AGR is confident that the medical facilities have adequate, qualified staff, equipment and expertise to respond to cyanide exposures. In the event of an exposure incident, the Site Doctor will phone ahead to the treating hospital and notify them of the incoming patient.

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Mock emergency drills are conducted periodically to test response procedures for various exposure scenarios; and lessons learnt are incorporated into response planning. There are procedures used to outline the requirements of conducting emergency exercises within the sodium cyanide business to ensure that exercises are planned, practiced and evaluated. A formal process 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.

Procedures are in place to investigate and evaluate cyanide exposure incidents to determine if the Production 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 provide for the investigation, evaluation and recording of incidents. Corrective actions are devised and then tracked via Cintellate. Several potential cyanide exposure incidents were recorded during the Audit period. These were investigated and corrective actions implemented.

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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**	
The operation is	☐ in substantial compliance with	**Production Practice 3.1**
	☐ not in compliance with	

Summarise the basis for this Finding/Deficiencies Identified:

The operation 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 operation conditions.

The boundary of the Facility is located at the perimeter fence between AGR's Facility and the greater CSBP site. There are two wastewater streams for the Facility – the treated effluent line and the stormwater, cooling and blowdown water line.

Water in the stormwater line is collected via sumps; the sumps are tested manually prior to discharge. When required, discharge is manually commissioned to an off-site containment pond.

The treated effluent line is pumped to the tank farm where it receives treatment and is then sent separated into liquid and solid (concentrate) waste. Concentrate is sent back to the Solids Plant and remaining waste liquid is sent to a final treatment tank. From the tank, following sampling, water is discharged to the off-site containment pond.

AGR adhere to an Operating Licence which states that wastewater released from the site must meet the discharge limit for cyanide of less than 1 mg/L. In both cases there is an online, *in situ* monitoring device, located at the Facility boundary.

From the containment pond, the preferred and most used method of disposal is via the Water Corporation owned Sepia Depression Ocean Outlet Line (SDOOL). Wastewater is pumped into a nearby wetland and subjected to further sampling and analysis. The wetland feeds into the SDOOL, whereby it accounts for approximately 2% of daily total volume. Water from the containment pond is eventually discharged as the Water Corporation's outfall from a municipal run facility at Woodman Point. As stated in the previous DAR (September 2013), 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 Free cyanide is being met.

Alternatively AGR can commission the Submarine Pipeline into Cockburn Sound; this is used as a contingency measure only. The Submarine Pipeline into Cockburn Sound was commissioned once on and the concentration of cyanide in the discharge batch was 0.02 mg/L Free cyanide.

An emergency beach outfall to Cockburn Sound (from the off-site containment pond) was used four times during the audit period and the concentration of cyanide was below 0.022 mg/L Free cyanide in all occurrences.

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By discharging into the greater CSBP site containment pond, the Facility avoids having any direct discharge to the environment. Once discharged from AGR's 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 Groundwater Operating Strategy for the site outlines the requirement for sampling of groundwater and results from these sampling events are compared against the identified numerical standard.

During the audit period (2014) cyanide concentrations exceeded the water quality standards in one location, (2015) cyanide was below water quality standards in all locations and (2016) cyanide was below the water quality standards in all locations. The one exceedance was investigated and subsequent results did not exceed guideline values.

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. The concentrations of cyanide in groundwater do not exceed the concentrations necessary to protect its beneficial use. As per Operating Licence requirements, AGR conduct groundwater monitoring and annual groundwater monitoring reports are submitted to regulators.

The Production Facility limits atmospheric process emissions of HCN gas, as per the requirements of the Operating Licence, such that the health of workers and the community are protected. Under normal operating conditions, the operation has three allowable atmospheric discharge points as outlined in their Operating Licence. There are additional approved discharge points on the liquids plants for use in start-up and shut down procedures. In order to meet the Operating Conditions the plant has appropriate collection systems in place and quarterly tests are carried out. There is a continuous emissions monitoring system in place and accurate data must be captured for greater than 90 percent of the operating time.

The Facility monitors for cyanide in discharges and groundwater. 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. Monitoring frequencies of surface (waste) water, groundwater and atmospheric emissions are carried out in accordance with licensing requirements.

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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**	
The operation is	☐ in substantial compliance with	**Production Practice 4.1**
	☐ not in compliance with	

Summarise the basis for this Finding/Deficiencies Identified:

The operation 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 identifies relevant modules and explains the competency based training system. A Competency Management System is used to track the completion of required training modules for each individual.

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

The Facility does train workers in the use of PPE and has identified when and where this equipment is required. The primary training provided on PPE is through the various induction processes and the primary identification method is through site signage. PPE requirements are also detailed in numerous operating procedures kept in hard copy and on the electronic document management system.

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. A training matrix contains, and tracks completion of, mandatory and non-mandatory training activities/courses for Operations, Dispatch, Maintenance and Leaders and Support personnel, it also specifies refresher frequencies. Training modules and competencies are aligned to industry recognised certificate levels as outlined in the Australian Quality Training Framework. The electronic document management system contains the necessary information on training modules and assessments as required by each area of the plant.

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

AGR has developed a training matrix to manage the training requirements for employees at the Facility. The training matrix details the training that is required to be undertaken, the frequency at which each of the training modules is to be conducted (and re-conducted) and maintains a record of training undertaken by specific personnel.

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 CSBP/AGR personnel with adequate qualification and levels of experience for the training being provided. Training is provided on the job by supervisors and then further training and assessment is provided by trained assessors. 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 being allowed to work with cyanide. 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.

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 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 and 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**	
The operation is	☐ in substantial compliance with	**Production Practice 4.2**
	☐ not in compliance with	

Summarise the basis for this Finding/Deficiencies Identified:

The operation 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.

Procedures exist that outline the first response process for emergencies involving personnel and cyanide releases in the Sodium Cyanide Plant. There are a number of standard operating procedures available in hard copy and on the electronic document management system that describe the steps to be taken in the event of an emergency situation involving a release.

AGR's Safe Person, Safe Process, Safe Place initiative also provides for regular scenario event training.

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 matrix, which identifies that Cyanide Exposure training is mandatory for all personnel. The training is conducted both internally and externally as required.

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

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The Facility has conducted numerous scenario exercises during the audit period. Exercises are documented and the report includes a review of the drill along with any identified corrective actions which are tracked to completion via Cintellate.

A major exercise to test the response and capability of both the CSBP on-site Emergency Response Teams (ERT) and its integration with the Department of Fire and Emergency Services (DFES) was conducted.

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.

Procedures are followed to ensure that exercises are planned, practiced and evaluated. 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. Records of the exercise and the evaluation process are supplied to administration and safety personnel for record retention.

Training records are kept throughout the duration of an individual's employment period. Training matrixes are used to maintain records of completed courses and schedule dates for refresher training. Confirmation of specific training attendance and completion records are also retained, these document the type of training received, the trainer's details, the date of training and the modules covered. The records indicate whether an employee demonstrated an understanding of the training materials via the completion of the post learning assessment and the record of the result – pass or fail.

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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.

The operation is

☒ **in full compliance with**

☐ in substantial compliance with **Production Practice 5.1**

☐ not in compliance with

Summarise the basis for this Finding/Deficiencies Identified:

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

There are a series of Emergency Response Plans (ERP) and procedures in place for the management of cyanide related emergencies at the Facility. There is a list of standard operating procedures that describe the steps to be taken in the event of an emergency situation involving a release. There is a First Response Procedure as well as a Transport Management Plan and an Emergency Muster Plan.

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 and under Western Australian legislation a safety report and safety management system has been developed for the site. A Quantitative Risk Assessment is used to identify the types of Major Incident Events that may arise. There are standard operating procedures relating to likely emergency scenarios for the Facility.

The various plans and supporting procedures, do describe specific response actions, as appropriate for the anticipated emergency situations, the use of cyanide antidotes and first aid measures for cyanide exposure, control of releases at their source and containment, assessment, mitigation and future prevention of releases.

2.5.2 Production Practice 5.2

Involve site personnel and stakeholders in the planning process.

The operation is

☒ **in full compliance with**

☐ in substantial compliance with **Production Practice 5.2**

☐ not in compliance with

Summarise the basis for this Finding/Deficiencies Identified:

The operation is in FULL COMPLIANCE with Production Practice 5.2 requiring the operation 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 and collect feedback from personnel.

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External stakeholders are considered via CSBP's ongoing involvement in the Kwinana Industries Council (KIC) and Kwinana Industries Public Safety Liaison Group (KIPS) regular meetings and discussion forums.

Any corrective actions arising from Post Incident Analysis (PIA) processes are entered into Cintellate and tracked to completion.

There is 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.

Communities have been made aware of the risks associated with accidental cyanide releases, and there are forums available for ongoing communication. CSBP is a member of the KIPS, a mutual aid group formed to provide a forum that is focussed on joint industry emergency response and public safety. CSBP community safety documentation contains the necessary information on the major hazard facilities in operation, what to do in an emergency situation, CSBP's emergency response capabilities and also provides a means for concerned community members to receive regular updates.

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, DFES, WA Police and State Government regulators and Local Councils. DFES would be the primary external responder in the event of a cyanide release scenario and a major exercise was held in 2014.

KIC Member companies provide regular presentations to the public on their safety systems, operations and development works. These informative presentations are conducted at quarterly Community & Industries Forum (CIF) meetings. Representatives from external response agencies are regularly in attendance. The Facility has developed procedures to transport exposed workers to locally qualified, off-site medical facilities.

The Facility has engaged in regular consultation and communication with stakeholders to assure that the emergency response planning and procedures address current conditions and risks. CSBP engage in regular consultation via the KIC quarterly CIF meetings.

2.5.3 Production Practice 5.3

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

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

Summarise the basis for this Finding/Deficiencies Identified:

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

Emergency management documentation states who the authority resides with in the event of an emergency. There are both Crisis Management Teams (CMT) and Incident Management Teams (IMT) available. CSBP ERTs are clearly identified and structured to align with external emergency service providers. Specific procedures provide further detail on the composition, training, performance standards and duties and responsibilities of the CSBP ERTs.

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CSBP is an Accredited Emergency Responder for Sodium Cyanide and Ammonia incidents involving their products both on and off site. The Emergency Services Supervisor is responsible for developing and conducting scenario training and exercises, as well as ensuring adequate Area Wardens are trained and that each area practices the required amount of emergency exercises. The Emergency Services Support Officer is responsible for ensuring that the ERT has adequate numbers of competent people.

Emergency procedures contain the necessary call out information.

The duties and responsibilities of the coordinators and team members is clearly specified in the emergency management plans and procedures. The location of First Aid Stations and First Aid Officers, PPE and emergency response equipment and resources is covered in several procedures.

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. ERT members are responsible for the maintenance of all issued equipment. 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 personnel.

The emergency management documentation states it is the responsibility of the Incident Controller to contact external emergency services when required. External providers have been clearly identified. On-site medical personnel have visited the 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. 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.

Emergency management plans and procedures identify external emergency responders and their roles as well as the procedure for making contact.

As a member of KIPS, a mutual aid group formed to provide a forum which was focussed on joint industry emergency response and public safety, and a KIC Member company, CSBP are involved in regular presentations to the public on safety systems, operations and development works.

An exercise to test the response and capability of both the CSBP on-site ERT and its integration with the DFES has been conducted. The exercise was designed to test the CSBP ERTs and DFES in the resolution of a major chemical spill with life involvement.

2.5.4 Production Practice 5.4

Develop procedures for internal and external emergency notification and reporting.

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

Summarise the basis for this Finding/Deficiencies Identified:

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

Emergency management plans and supporting procedures contain the procedural, contact and outside responder information as required.

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There is a process for the notification of incidents to external authorities which describes the procedure for making contact.

CSBP maintains a list of contacts for use during emergencies. The contact names and numbers are checked and updated in the electronic documentation system and replaced in the Emergency Control Centre (ECC) at least every twelve months.

The plan does contain a procedure for notifying potentially affected neighbours of an incident. CSBP Kwinana is member of the KIMA group. Notification to neighbours is done via the KIMA two way radio system. CSBP has a number of strategically placed sirens across site to reduce the risk of sirens or notifications not being heard in the event of an emergency.

There are procedures that address media enquiries. During an emergency no information is released 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. 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**	
The operation is	☐ in substantial compliance with	**Production Practice 5.5**
	☐ not in compliance with	

Summarise the basis for this Finding/Deficiencies Identified:

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

Emergency management documentation contains a list of standard operating procedures relating to likely emergency scenarios for the Facility. Each procedure describes the steps to be taken in the event of an emergency situation of that nature. Each standard operating procedure follows a standardised format and contains information on, amongst others, monitoring, neutralisation, containment, clean up and decontamination processes. The provision of an alternate drinking water source is not required.

Further information on underground water treatment and monitoring in line with relevant National guidelines is contained in operating procedures relating to releases into water courses. A Transport Management Plan also details the neutralisation techniques, neutralising agents and locations of neutralising agents along transport routes.

The facility does generally prohibit the use of chemicals to treat cyanide that has been released to surface water.

The standard operating procedures state that generally, hypochlorite, ferrous sulphate and hydrogen peroxide must not be allowed to enter any natural body of surface or ground water.

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On-site emergency management documentation does address the potential need for environmental monitoring to identify the extent and effects of a release. With regards to transportation, neutralisation procedures and scenarios do address the potential need for environmental monitoring. Sampling and testing methodologies are provided for a number of scenarios.

Further contingency/emergency procedure information on waste water management systems and monitoring and testing requirements prior to disposal can be found in standard operational plans and procedures.

2.5.6 Production Practice 5.6

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

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

Summarise the basis for this Finding/Deficiencies Identified:

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

The plan is reviewed at least every two years, or when changes to systems or procedures make it necessary. The biennial review is initiated via CSBP's electronic document control system. Internal audits of the plan are scheduled, performed and reported on in compliance with CSBP process of Internal Auditing of Management Systems and an Internal Audit Methodology.

CSBP's electronic document management system is used to ensure when the plan is updated, reviewed or modified, all copies are automatically updated and all those on the distribution list receive notification.

Mock emergency drills are conducted periodically as a part of emergency planning evaluation processes. There are specific procedures that state 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. 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 briefing notes are used to amend plans and procedures where appropriate.

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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.

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APPENDIX A

Important Information

IMPORTANT INFORMATION RELATING TO THIS REPORT

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.

This Report is provided for use solely by Golder's Client and persons acting on the Client's behalf, such as its professional advisers. Golder is responsible only to its Client for this Report. Golder has no responsibility to any other person who relies or makes decisions based upon this Report or who makes any other use of this Report. Golder accepts no responsibility for any loss or damage suffered by any person other than its Client as a result of any reliance upon any part of this Report, decisions made based upon this Report or any other use of it.

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.

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

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

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

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

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

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

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