Newcrest Mining Limited

International Cyanide Management Code

ICMC Recertification Audit for Newcrest Mining Limited's Lihir Gold Mine - Summary Audit Report

September 2023

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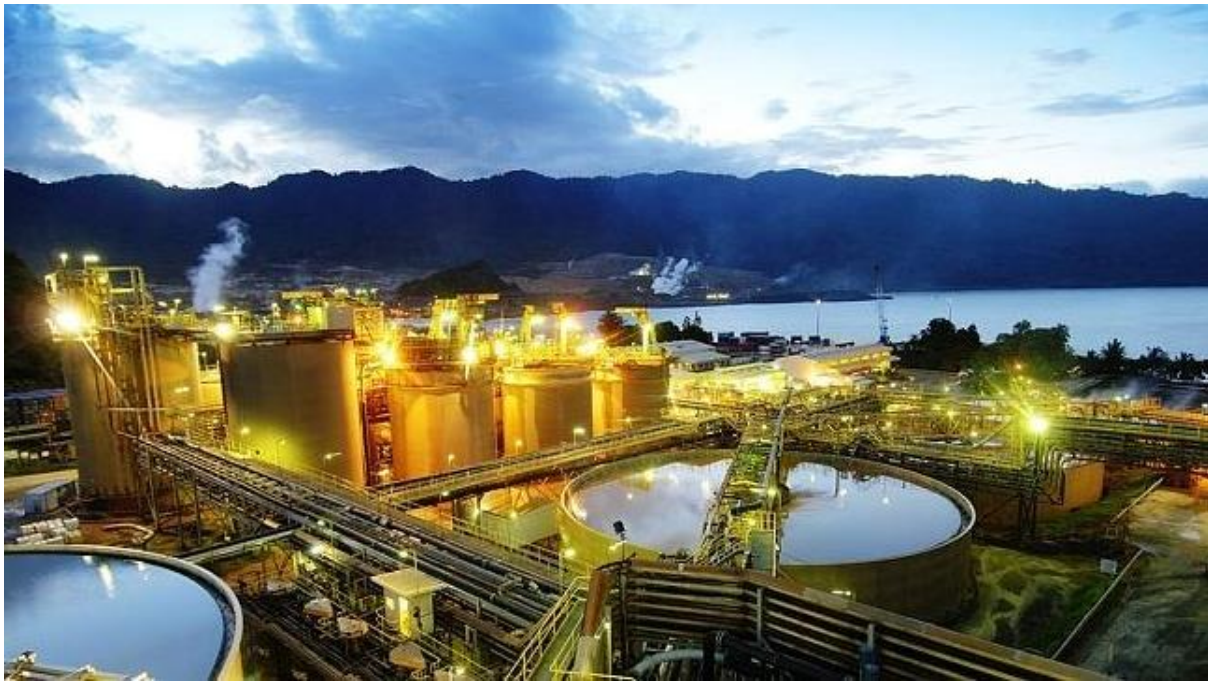

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International Cyanide Management Code
ICMC Recertification Audit for Newcrest Mining Limited's Lihir Gold Mine - Summary Audit Report

Newcrest Mining Limited

WSP
Lvl 3, Mia Yellagonga Tower 2, 5 Spring St
Perth WA 6000
PO Box 7181
Cloisters Square WA 6850

Tel: +61 8 9489 9700
Fax: +61 8 9489 9777
wsp.com

Rev	Date	Details
0	19 May 2023	First Report
1	July 2023	First revision post ICMI Completeness Review
2	September 2023	Final revision post ICMI Completeness Review

	Name	date	signature
Prepared by:	Lauren Sandon		
Reviewed & Approved by:	Ed Clerk		

WSP acknowledges that every project we work on takes place on First Peoples lands.
We recognise Aboriginal and Torres Strait Islander Peoples as the first scientists and engineers and pay our respects to Elders past and present.

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1 Summary Audit Report

1.1 For Operational Gold Mines

Name of Mine:	Lihir Gold Operation
Name of Mine Owner:	Newcrest Mining Limited (NML)
Name of Mine Operator:	Newcrest Mining Limited
Name of Responsible Manager:	Robert Gordon
Address:	Lihir Gold Limited PO Box 789, Port Moresby, NC Papua New Guinea
State/Province:	New Ireland Province
Country:	Papua New Guinea (PNG)
Telephone:	+675 7092 0100

1.2 Operation Location Detail and Description

1.2.1 Newcrest Mining Limited

Newcrest is Australia's largest gold producer headquartered in Melbourne, Australia.

The origins of Newcrest date back to 1966, when Newmont Mining Limited established an Australian subsidiary, Newmont Australia Limited. In 1990, Newmont Australia Limited acquired Australmin Holdings Ltd, and subsequently merged with BHP Gold Limited in late 1990, changing its name to Newcrest Mining Limited. The Company has been listed on the ASX since 1987 – initially as Newmont Australia Limited.

Newcrest owns and operates the following operational gold mines in Australia and PNG (Newcrest Mining Limited, 2023):

- Cadia Valley (Hill and Ridgeway), New South Wales.
- Havieron (Joint venture with Greatland Gold), Western Australia.
- Telfer in the Pilbara region of Western Australia.
- Lihir, PNG.
- Wafi-Golpu, PNG.

1.2.2 Lihir Gold Mine

As noted on Newcrest's website (https://www.newcrest.com/our-assets/lihir), the Lihir operation is on Niolam Island in the New Ireland Province of PNG, 900 kilometres north-east of Port Moresby. The operation is 100 per cent owned and operated by Lihir Gold Limited (LGL). Newcrest acquired the Lihir operation as a result of a merger with LGL by court-approved scheme of arrangement in August 2010.

The gold deposit at Lihir is within the Luise Caldera, an extinct volcanic crater that is geothermally active, and is one of the largest known gold deposits in the world. Most of the ore is refractory and is treated using pressure oxidation before the gold is recovered by a conventional leach process. Lihir produces gold doré.

Lihir is an open-pit mine comprising of two overlapping pits. The operation has designated facilities for unloading, storing and mixing of cyanide. The facilities were designed and constructed in accordance with cyanide producers' guidelines, applicable jurisdictional rules and other sound and accepted engineering practices for these facilities. Two cyanide reagent facilities are present on site and the newer facility is the primary reagent facility. Both the reagent facilities and container storage area are located away from people and surface water.

Only solid cyanide in briquette form is unloaded from bulka bags at the reagent facilities which are located within concrete secondary containment areas. Locked cyanide shipping containers are stored on an aggregated hardstand near the primary reagent facility. The containers are enclosed with security fences with access through security gates. The locked cyanide shipping containers are also stored on an interim basis on a concrete hardstand adjacent to the secondary reagent facility that is also enclosed within a security fence. Cyanide mixing and storage tanks at both facilities are secondarily contained and located on concrete surfaces that can prevent seepage to the subsurface.

Ore fed to the Lihir process plant is predominantly refractory (sulphide bearing) and requires oxidation to burn sulphur and expose the gold for recovery via cyanidation. The process flow consists of three milling circuits - Flotation Grade Operation (FGO), High Grade Operation 1 (HGO1) and High Grade Operation 2 (HGO2). Generally high grade ore is fed to one mill and then directed straight to the autoclaves where sulphides are oxidised to sulphuric acid. The other two mills receive lower grade ore which is subsequently upgraded via flotation before reporting to the autoclaves (Newcrest Mining Limited, 2020).

Acid entrained in the oxidised slurry exiting the autoclaves is washed from the slurry in a series of Counter-Current Decantation (CCD) thickeners. Washed slurry reports to the Neutralisation, Cyanidation and Adsorption (NCA) circuit where lime is added to increase slurry pH and cyanide is added to leach gold into solution. Gold in solution is adsorbed onto carbon and then recovered via elution, electrowinning and smelting processes to produce gold doré. Tails from the NCA circuit are combined with the acidic overflow from the CCD thickeners. Residual cyanide reacts with the acid to form hydrogen cyanide. Flotation tails and NCA tails are then combined and directed to the Deep Sea Tailings Placement (DSTP) system (Newcrest Mining Limited, 2020). Tails and/or process water is not recirculated to the milling circuit, therefore Weak Acid Dissociable (WAD) cyanide is not present in the milling circuit.

1.3 Auditors Findings

The Lihir Gold Mine is:

☒ in full compliance with

☐ in substantial compliance with

☐ not in compliance with

The International Cyanide Management Code

No significant cyanide incidents or cyanide exposure and releases were noted as occurring during the audit period.

1.3.1 Compliance Statement

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

1.4 Auditor Information

Audit Company: WSP Australia Pty Ltd (WSP)

Audit Team Leader: Edward Clerk (Lead Auditor and Technical Specialist)

Email: ed.clerk@wsp.com

Name and Signature of other Auditors:

Table 1.1 Name and Signature of Other Auditors

Name	Position	Signature	Date
Edward Clerk	Lead Auditor and Technical Specialist		25/5/2023
Lauren Sandon	Trainee Auditor		25/5/2023

The Recertification Audit site visit was conducted between 13 and 17 January 2023.

1.5 Auditor Attestation

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 (ICMI) and that all members of the audit team meet the applicable criteria established by the International Cyanide Management Institute for Code Verification Auditors.

I attest that this Summary Audit Report accurately describes the findings of the Recertification Audit. I further attest that the Recertification Audit was conducted in a professional manner in accordance with the International Cyanide

Lihir Gold Mine Signature of Lead Auditor Date: 27/09/2023

Management Code's Mining Operations Verification Protocol (June 2021) and using standard and accepted practices for health, safety, and environmental audits.

Lihir Gold Mine | Signature of Lead Auditor | Date: 27/09/2023

2 Principles and Standards of Practice

2.1 Principle 1 – Production and Purchase

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

2.1.1 Standard of Practice 1.1

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

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

Summarise the basis for this Finding/Deficiencies Identified:

LGL is in FULL-COMPLIANCE with Standard of Practice 1.1, requiring the operation to purchase cyanide from manufacturers employing appropriate practices and procedures to limit exposure of their workforce to cyanide, and to prevent releases of cyanide to the environment.

LGL has a Major Goods Contract (Contract) with Tongsuh Petrochemical Corporation Limited (Tongsuh). The Contract requires that the cyanide being produced at a facility that has been certified as being in compliance with the Code. Tongsuh was recertified as being in full compliance with the Code on 19 April 2023.

LGL purchases cyanide from Orica Australia Pty Ltd (Orica)as an alternate or backup supply. A contract between LGL and Orica was not observed, however Orica was recertified as being in full compliance with the Code on 17 September 2020.

In 2022, LGL purchased a limited number of containers from Hebei Chengxin Co., Ltd. (Hebei Chengxin) to trial. A contract between LGL and Hebei was not observed, however Hebei Chengxin was recertified as being in full compliance with the Code on 18 Apr 2023.

Code compliance is a prerequisite in the selection criteria used by LGL in sourcing an additional cyanide supplier.

2.2 Principle 2 – Transportation

Protect Communities and the Environment during Cyanide Transport.

2.2.1 Standard of Practice 2.1

Require that cyanide is safely managed through the entire transportation and delivery process from the production facility to the mine by use of certified transport with clear lines of responsibility for safety, security, release prevention, training and emergency response.

	☒ **in full compliance with**	
The operation is	☐ in substantial compliance with	Standard of Practice 2.1
	☐ not in compliance with	

Summarise the basis for this Finding/Deficiencies Identified:

LGL is FULL Compliance with the Standard of Practice 2.1, requiring that cyanide is safely managed through the entire transportation and delivery process from the production facility to the mine by use of certified transport with clear lines of responsibility for safety, security, release prevention, training and emergency response.

LGL has chain of custody (COC) records identifying all transporters and supply chains responsible for transporting cyanide from the producer to the operation.

The COC records formally identify:

- Tongsuh, Hebei Chengxin and Orica as the producers/exporters
- SAM IK, Bukwan Logistics and supply chain elements within China and Australia specified within the respective supply chains.
- Ports of Busan in South Korea, Port of Tianjin in China and Brisbane in Australia as the ports of loading and the Put Put wharf in Lihir as the ports of discharge
- Kyowa Shipping, Swire Shipping, and Blue Water Shipping

The COC documentation also identified cyanide quantities, identification numbers, and dates of loading. The documentation aligned with the identified supply chain elements designated by the site for the transportation of products from suppliers to the site.

LGL have provided written agreements in relation to Tongsuh in part between the operation, the cyanide producer and transporters designating responsibility for the supply of cyanide in regard to safety, security, release prevention, training and emergency response. Written agreements were not provided for other suppliers; however these suppliers were utilised as alternate or backup suppliers.

LGL is listed as a transporter under the Code with responsibility for the Lihir Gold Limited PNG Supply Chain. The components of this Supply Chain (as detailed in the Riskom International Pty Ltd ICMC (International Cyanide Management Code) transport audit report, May 2023) include (during 2020-2023):

- Tongsuh – Indirect Supply Chain. (Port Klang, Malaysia)
- Tongsuh – Direct Supply Chain. (Shipping between the Port of Busan and the Put Put Wharf at Luise Harbour, Lihir Island, PNG. This is conducted by Kyowa Shipping Co Ltd or Blue Water Shipping)
- Orica – Direct Supply Chain. (Port of Brisbane)

— Hebei Chengxin – Direct Supply Chain. (The Port of Tianjin)

— Handline and transportation of cyanide from Put Put Wharf to the NCA2 storage yard at LGL by Noram Port Services.

The intent was for Tongsuh to be the main supply chain with Orica as the alternative. The Hebei Chengxin and Tongsuh Indirect Supply Chains were used for trial purposes and are not likely to be used in the future.

LGL's Papua New Guinea Supply Chain was recertified as being fully compliant with the ICMC on 18 April 2017 and recertification is currently due to be submitted prior to 18 June 2023.

On occasion, cyanide may be purchased from Orica and thereby transported to LGL via a combination of the Orica Australia, Orica Global Marine and LGL Papua New Guinea Supply Chain. The Orica Australia and Orica Global Marine Supply Chains were recertified as being fully compliant with the Code on 4 February 2022 and 16 June 2021 respectively.

The Hebei Chengxin product was transported to the mine from the Port of Tianjin China using a combination of the Hebei Chengxin Transport Company Limited Supply Chain and the Hebei Chengxin Transport Global Ocean Supply Chain. Road transportation within China was conducted by Hebei Chengxin Transport between the production facility and the Port of Tianjin. The Port of Tianjin is covered within the Hebei Chengxin Transport Global Ocean Supply Chain. These supply chains were recertified on 18 April 2023 and 10 August 2020 respectively. From the Port of Busan, shipping to site by Blue Water Shipping is covered within the LGL Papua New Guinea Supply Chain.

2.3 Principle 3 – Handling and Storage

Protect Workers and the Environment during Cyanide Handling and Storage.

2.3.1 Standard of Practice 3.1

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

	☒ **in full compliance with**	
The operation is	☐ in substantial compliance with	Standard of Practice 3.1
	☐ not in compliance with	

Summarise the basis for this Finding/Deficiencies Identified:

LGL is in FULL COMPLIANCE with Standard of Practice 3.1, requiring that unloading, storage and mixing facilities are designed and constructed consistent with sound, accepted engineering practices, quality control/quality assurance procedures, spill prevention and spill containment measures..

Two cyanide reagent facilities are present on site. CN1 is an older facility located adjacent to the Gold Room. CN2 (Mopu) is a newer facility that is located adjacent to the Lime Plant. CN2 is the primary reagent facility..

The auditor sighted design drawings issued for construction for the mixing and storage facilities, these facilities are used for unloading, storing and mixing of cyanide. The drawings were issued by engineering consulting and construction organisations.

The site, including CN1 and CN2 is licensed by the PNG government.

Locked cyanide shipping containers are stored on an aggregate hardstand near the Lime Plant at CN2. The containers are enclosed within a security fence. In addition, the entire processing facility is located within a security fence (two metre cyclone mesh, topped with three strands of barbed wire) with access through manned security gates.

Locked cyanide shipping containers are also stored on an interim basis on a concrete hardstand adjacent to CN1 that is enclosed within a security fence (as per above), which is in turn, located within the secure processing area.

The CN1 and CN2 cyanide unloading, mixing and storage facilities are located away from people and surface waters. The closest building to CN2 that is used and occupied is the Fixed Plant Maintenance building, this facility is over 100 m away. The closest building to CN1 that is used and occupied is the Site Asset Operations Control room (SAOC)/Operations Office building, distance to this facility is approximately 140 m. No surface water bodies are nearby, the Luise Harbour is over 200 m from CN2, and the site Containment Pond is over 125 m from CN1.

Only solid cyanide contained within bulk bags and wooden boxes are unloaded at the CN1 (when operational) and CN2 mixing and storage facilities. These facilities are located within concrete bunded areas. There are methods in place to prevent the overfilling of cyanide mixing and storage tanks at CN1 and CN2.

An interlock on the water addition inflow automatically stops the water entering the mix tank at a set point value of 65%, which allows enough room to mix the required quantity of cyanide briquettes. The interlock prevents further addition of water to the tank. Following addition of the cyanide briquettes, more water is added until the interlock stops it at 85%. Mixing then occurs, when the mix is complete, the contents of mix tanks are automatically transferred to the storage tanks.

Pressure sensors record levels within the mixing and storage tanks, the information is transmitted to the distributed control system (DCS) and high, high high, low and low-low level alarms have been set. In addition to the alarms an overflow pipe allows for cyanide to overflow into the sump which pumps back into the mix tank if it is overfilled.

Transfer pumps are also engineered to trip at set levels. The level sensors within tanks are to be inspected as part of a 26-week preventative maintenance programme.

Cyanide mixing and storage tanks are located on a concrete surface that can prevent seepage to the subsurface. At both facilities the mixing and storage tanks are located within concrete, secondary containment.

At CN1, the cyanide mixing and storage tanks are situated on concrete ring beams. The perimeters of the tank bases are supported by the concrete ring beam while the inner sections of the tank base are positioned on 100 mm of oil sand, which overlies a 1.5 mm medium density polyethylene (MDPE) layer. Compacted fill is located beneath the MDPE layer. The MDPE layer forms a continuous impermeable layer beneath the tank, and it extends onto the top of the concrete ring beam. Concrete foundations underlie the facility.

At CN2, the mixing and storage tanks are located on concrete plinths.

Secondary containments for cyanide storage and mixing tanks are constructed of concrete, which provides a competent barrier to leakage. The site has a structured program in place to inspect and repair the concrete facilities.

Cyanide boxes are stored in locked shipping containers in a designated and secure cyanide area. The locked shipping containers are located outside with adequate ventilation, and stored within a secondary containment facility with bunding, perimeter drains and a sump.

An unloading procedure has been developed that requires the containers to be opened, ventilated for 5 minutes, and then checked for the presence of HCN prior to removing boxed cyanide. HCN monitors are worn at all times.

The cyanide mixing facilities are roofed, with ceiling fans, and open at the sides. Storage tanks at both CN1 and CN2; and the mixing tank at CN2, are vented to the atmosphere. Cyanide briquettes are stored in boxes inside locked shipping containers that prevent contact with water. No mixing is undertaken during wet conditions.

The box destuffing areas are roofed and the cyanide mixing and storage tanks are located within secondary containments. No mixing is undertaken during wet conditions.

The cyanide mixing and storage areas consist of a concrete apron used for forklift access and box destuffing. Secondary containment facilities adjoin the destuffing areas, and contain bag hoists, a cyanide hopper with bag splitter, mixing tanks and storage tanks. The facilities are enclosed with wire mesh and locked gates.

Cyanide was observed to be stored separately from incompatible materials. The cyanide mixing and storage facilities are dedicated facilities, and an inspection of these areas did not identify the presence of incompatible materials.

2.3.2 Standard of Practice 3.2

Operate unloading, storage and mixing facilities using inspections, preventive maintenance and contingency plans to prevent or contain releases and control and respond to worker exposures.

	☒ **in full compliance with**	
The operation is	☐ in substantial compliance with	Standard of Practice 3.2
	☐ not in compliance with	

Summarise the basis for this Finding/Deficiencies Identified:

LGL is in FULL COMPLIANCE with Standard of Practice 3.2 requiring that cyanide handling and storage facilities are operated using inspections, preventive maintenance and contingency plans to prevent or contain releases and control and respond to worker exposures.

Cyanide boxes are not re-used for any other purpose. A Risk Assessment determined that the use of the bag wash presented an unacceptable exposure risk to the operators. Bags are checked for residual cyanide and stored inside the empty wooden boxes. Empty cyanide bags and boxes are removed from the facility via a routine collection process and taken to the waste disposal facility to be burned. Chain of custody documentation is completed to track the number of boxes being transported. The box burning is conducted in an unsealed open area.

Standard Operating Procedures (SOPs) require the outsides of shipping containers to be rinsed prior to transporting back to the wharf.

The operation has developed and implemented procedures to prevent exposures and releases during cyanide unloading and mixing activities.

SOPs have been developed and outline the process for the operation of valves and couplings during tasks such as completing a mix, system start up and shut down and collecting samples of cyanide solution.

The mixing procedure describes the process of delivery of containers, destuffing containers and stacking of empty boxes to prevent rupturing.

SOPs state that empty, cleaned and marked cyanide boxes are to be stored no more than two high in preparation for removal. Shipping containers can be stacked no more than 4 high.

A complete procedure that accurately reflects the process to be followed in the event of a spill occurring during transportation or mixing is contained in the Cyanide Emergency Response Plan (CERP) and the Cyanide Spill Assessment and Response Plan (CSARP).

SOPs have been developed and outline the safety requirements requiring appropriate personal protective equipment (PPE) and the process to be followed when conducting a mix, including an observer/spotter with radio communication being physically located outside the mixing area compound.

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The cyanide makeup SOP clearly states to add carmosine dye to tanks TK2091 and TK091 during the mixing process. It is specified that this is a safety requirement for the easy detection of spills or leaks.

2.4 Principle 4 – Operation

Manage Cyanide Process Solutions and Waste Streams to Protect Human Health and the Environment.

2.4.1 Standard of Practice 4.1

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

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

Summarise the basis for this Finding/Deficiencies Identified:

LGL is in FULL COMPLIANCE with Standard of Practice 4.1, requiring that the operation implement management and operating systems designed to protect human health and the environment including contingency planning and inspection and preventive maintenance procedures.

Written management and operating plans or procedures have been developed for cyanide facilities including unloading and storage facilities, mixing, leach plants and tailings disposal.

LGL has document controlled and approved procedures on the Lihir Central Document Management System (CDMS). The documents are available electronically to the workers. The plans and procedures provide the framework for cyanide management practices on site, and cover cyanide related activities such as:

- Cyanide unloading and storage
- Mixing
- Leach plants
- Tailings disposal.

The operation does have plans or procedures that identify the assumptions and parameters on which the facility design was based and any applicable regulatory requirements as necessary to prevent or control cyanide releases and exposures consistent with applicable requirements. The key assumptions and design parameters are provided in the Cyanide Management Plan (CMP).

The Metallurgical Superintendent is accountable for setting the parameters for cyanide dosing and maintenance of levels, whilst the Superintendent of Processing (Back End) is accountable for adherence to the parameter. The Metallurgical Department sends out the parameter board on an as needed basis, and daily meetings are conducted to discuss variations from the parameters.

The operation has plans or procedures that describe the standard practices necessary for the safe and environmentally sound operation of the facility including the specific measures needed for compliance with the Code, such as inspections and preventative maintenance activities.

Preventive maintenance programmes have been developed for the site and activities documented to ensure that equipment and devices function as necessary for safe cyanide management. LGL uses the SAP maintenance

management system to manage maintenance activities, including preventative maintenance and inspections. The system generated preventative maintenance activities are conducted on-site. Cyanide alarms, detectors, pumps and tanks have been included within SAP.

In addition to specific plant work orders, maintenance general area inspections (look, listen, feel) are included as a system generated work order. Formal documented 274 Inspections are conducted weekly, and 281 inspections are conducted monthly, in cyanide related work areas. Operations undertake documented shift inspections every 12 hours. Any identified deficiency noted on the checklist is transferred to the Action List section of the Inspection form, and a work order is created in SAP, or an action entered into Clearing House Electronic Sub-register System (CHESS).

The operation has a procedure to identify when changes in a site's processes or operating practices may increase the potential for the release of cyanide and to incorporate the necessary release prevention measures. The operation has implemented a management of change (MoC) procedure. The objective of the procedure is to ensure that health, safety, environmental, community and production issues resulting from a change are identified and assessed, and control measures are implemented.

The composition of the change assessment team to complete the process hazard analysis studies shall reflect the nature and potential of the impact. It will include qualified experienced facilitator (process safety engineer) and may include specific expertise, such as specialists in engineering, human resources, health, safety and environment (HSE), contracts and commercial. The assessment team includes the change owner and change implementor. The MoC proposal form requires sign-off by the HSE department if the change involves cyanide.

The operation has cyanide management contingency procedures for situations when there is an upset in a facility's water balance, when inspections and monitoring identify a deviation from design or standard operating procedures, and/or when a temporary closure or cessation of the operation may be necessary.

The operation has a DCS that is used to monitor the operation of the facility together with in field monitoring carried out by process operators. There are a series of contingency procedures covering:

- Tails pipeline failure
- Cyanide spills or tank failure
- Site power outage
- High Weak Acid Dissociable (WAD) cyanide
- Upsets surrounding Deep Sea Tailings Placement (DSTP)
- Safe shutdown of the process plant

The operation also has a CERP that identifies emergency scenarios involving cyanide and the specific response procedure. In relation to the water balance, the operation does not use a water balance for the prevention of release. The LGL cyanide facilities are a flow through system ultimately discharging to a DSTP system.

The operation inspects cyanide facilities on an established frequency sufficient to assure and document that they are functioning within design parameters.

The operation inspections of unloading, storage, mixing and process areas as follows:

a) Tanks are registered within the SAP maintenance management system. Specific maintenance tasks and associated frequencies have been assigned for each tank.

b) Secondary containments are inspected during daily shift inspections and weekly 274 inspections. For any identified deficiency noted, a work order is created in SAP, or an action entered into CHESS.

c) The site does not have any leach pads and the HDPE lined containment pond does not have leak detection however cyanide facilities are also inspected for leaks or evidence of spills through the weekly 274 Inspections.

d) Pumps and valves are registered in SAP. Specific maintenance tasks and associated frequencies have been assigned for each item. In addition, pipelines, pumps and valves are inspected during daily shift and weekly 274 inspections.

e) The Containment Pond is used as contingency storage and does not ordinarily contain cyanide. Pond freeboard is monitored via CCTV and weekly 274 inspections; monitoring occurs more if freeboard capacity is reduced.

Inspections conducted are documented, including the date of the inspection, the name of the inspector, and any observed deficiencies. The nature and date of corrective actions are also documented, and records are maintained.

Any identified deficiency noted on the inspection checklist is transferred to the Action List section of the Inspection form, and a work order is created in SAP, or an action entered into CHESS. The inspection forms are signed by the Inspector, Supervisor, Coordinator and Superintendent.

Preventive maintenance programmes are implemented, and activities documented to ensure that equipment and devices function as necessary for safe cyanide management.

System generated preventative maintenance activities are conducted on-site. The Maintenance Plant Superintendent advised that the Maintenance Department has developed maintenance strategies for all equipment on-site based on operator experience and the original equipment manufacturer specifications. Once developed, maintenance strategies are entered into SAP the sites preventative maintenance (PM) database.

Maintenance Planners on-site are responsible for scheduling maintenance work. For each weekly maintenance plan, Maintenance Planners and Maintenance staff agree on the plan prior to discussing the implementation of the weekly plan with the Process Plant Coordinator.

Maintenance works orders are allocated at the daily pre-start meeting. A work order, and depending on the complexity of the job, may have a work pack attached (check sheets and technical instructions).

In addition to specific plant work orders, maintenance general area inspections (look, listen, feel) are included as a system general work order. These inspections include pipes, pumps, valves, and tanks within the inspection area.

The operation does have emergency power resources to operate pumps and other equipment to prevent all unintentional releases and exposures in the event its primary source of power is interrupted. The back-up power generating equipment is maintained and tested.

Primary power is supplied from a heavy fuel oil power station and a geothermal power station which is supplemented by the PNG Power Corporation. Prior to the grid power system being connected to the site in 2011, power for the operation was derived from a series of diesel-powered generators. These generators are now the backup system capable of powering the entire site. The generators are on-site and are included within the maintenance system for the site.

2.4.2 Standard of Practice 4.2

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

	☒ **in full compliance with**	
The operation is	☐ in substantial compliance with	Standard of Practice 4.2
	☐ not in compliance with	

Summarise the basis for this Finding/Deficiencies Identified:

Lihir Gold Mine | Signature of Lead Auditor | Date: 27/09/2023

LGL is in FULL COMPLIANCE with Standard of Practice 4.2, requiring that the operation introduce management and operating systems to minimize cyanide use, thereby limiting concentrations of cyanide in mill tailings.

The operation has a programme to determine appropriate cyanide addition rates in the mill and evaluate and adjust addition rates as necessary when ore types or processing practices change cyanide requirements.

Continual test work is conducted on new ore sources for the plant, this includes:

- Daily tails re-leach.
- Daily tails re-leach (with extra cyanide).
- Monthly deportment and diagnostic tests.

Free cyanide and WAD cyanide concentration is measured on six of the tanks in each Neutralisation, Cyanidation and Adsorption (NCA) circuit. There are cyanide addition points on three of the eight NCA tanks. The cyanide flowrate is measured and controlled by modulating valves. There are four cyanide analysers (Process IQ Cynoprobe v3) installed, two for each NCA train. Each analyser will automatically sample and analyse three different tanks with manual operator checks as backup.

The Metallurgical Superintendent is accountable for setting the parameters for cyanide dosing and preparation of standard solution for calibration whilst the Superintendent – Processing (Back End) is accountable for adherence to this parameter and maintenance of levels.

The operation has evaluated a number of control strategies for cyanide addition.

Depending on deviation between the analysers and operator titrations the control system will be switched between different modes to ensure the set point is maintained in the three tanks at different levels.

In addition to the control modes, there are override/interlock controls installed to override the control modes to minimise excessive cyanide usage, minimise HCN gas emission and manage WAD cyanide.

2.4.3 Standard of Practice 4.3

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

	☒ **in full compliance with**	
The operation is	☐ in substantial compliance with	Standard of Practice 4.3
	☐ not in compliance with	

Summarise the basis for this Finding/Deficiencies Identified:

LGL is in FULL COMPLIANCE with Standard of Practice 4.3, requiring that the operation implement a comprehensive water management programme to protect against unintentional releases.

The operation does not require the development of a comprehensive, probabilistic water balance.

The LGL cyanide facilities are a flow through system ultimately discharging to a DSTP system at a depth of 115 m. As no cyanide solutions are stored outside of process tanks, there is no chance of unintentional releases and a probabilistic water balance is not required to protect against this.

LGL commissioned an investigation into the need for a probabilistic water balance (PWB) to prevent unintentional releases from the operation. The study assessed short duration intense storms or daily rainfalls occurring over the longer

seasonal and annual durations and the ability for site containments to retain the events without release to the environment.

The study concluded that PWB is not necessary to prevent unintentional discharges to the environment as the site has sufficient capacity to retain the storm events. The conclusion was provisional on the ability to pump between the containment pond, which is used as contingency storage, and the DSTP. The Auditor confirmed during discussions with the Metallurgist Optimisation and through visual inspection that there is the ability to pump between the Containment Pond and the DSTP.

The site has developed a contingency procedure to manage the Containment Pond and pumping transfers. The contingency procedure includes the use of a secondary pump if required to manage the Containment Pond level and prevent overtopping, as well as monitoring of pond freeboard and environmental sampling.

There are also levels alarms on the DSTP tank and periodic inspections on the pipeline from TK2054B (tailing storage tank) to TK2055 (tailings mix tank).

As Golder was involved in the assessment of the need for a probabilistic water balance an Independent Review was completed of the ICMC Assessment of Probabilistic Water Balance Requirements report during the previous audit report. There is no change to these findings.

The independent report concurred with Golder's assessment and provided that:

"...detailed probabilistic water balance is not warranted for the Lihir Gold Mine. It is noted that the current system is essentially a "flow through" discharge to the marine environment and, on the basis of calculations by a Golder specialist, the single Containment Pond provides sufficient containment for contingency and run off, with the freeboard of 2m not being exceeded under a realistic worst-case event."

2.4.4 Standard of Practice 4.4

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

	☒ **in full compliance with**	
The operation is	☐ in substantial compliance with	Standard of Practice 4.4
	☐ not in compliance with	

Summarise the basis for this Finding/Deficiencies Identified:

LGL is in FULL COMPLIANCE with Standard of Practice 4.4, requiring that the operation implement measures to protect birds, other wildlife and livestock from adverse effects of cyanide process solutions.

The operation does not have any open waters where WAD cyanide exceeds 50 mg/L WAD cyanide. The Containment Pond is the only open water that could potentially contain a cyanide solution.

This pond is used as additional containment for the processing tanks and would not normally contain cyanide solutions in excess of 50 mg/L WAD cyanide. The pond is monitored post high rainfall events, and the operation confirmed that under normal operations the WAD cyanide levels within the Containment Pond are consistently less than 0.50 mg/L WAD CN.

The operation has a DSTP rather than a conventional TSF. The DSTP system discharges tailings at a depth of 115 m. The operation does not have heap leach facilities or solution ponds.

2.4.5 Standard of Practice 4.5

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

	☒ **in full compliance with**	
The operation is	☐ in substantial compliance with	Standard of Practice 4.5
	☐ not in compliance with	

Summarise the basis for this Finding/Deficiencies Identified:

LGL is in FULL COMPLIANCE with Standard of Practice 4.5, requiring that the operation implement measures to protect fish and wildlife from direct or indirect discharges of cyanide process solutions to surface water.

The operation has a direct discharge to surface water. The operation has been issued with a Discharge Permit by the Department of Environment and Conservation (DEC) (now Conservation and Environment Protection Authority, CEPA) (WD-L3 (191)) authorising nine water discharging points. Of these, only Discharge Point 3 (Tank TK2050) contains cyanide. Discharge Point 3 is the De-aeration tank associated with the DSTP.

The Discharge Permit has defined a mixing zone for Discharge Point Three that extends 1.8 km to the north and 2.3 km to the south of the outfall alignment.

Correspondence from the ICMI advised that the 0.5 mg/L WAD cyanide limit applied to the end of pipe discharge is not applicable where a mixing zone has been authorised by the government.

The concentration of free cyanide is less than 0.022 mg/L downstream of an established mixing zone.

The Discharge Permit has defined a mixing zone for Discharge Point 3.

Samples for WAD CN have been routinely collected from within the mixing zone and at the mixing zone boundary as part of the Lihir Environmental Management and Monitoring Program since 1997.

The operation has undertaken multiple independent peer-reviewed studies to confirm that control measures, protective mechanisms and monitoring programs are sufficient to ensure the protection of fish and wildlife in accordance with the requirements of the Code. The requirements include, completion of a study establishing the scientific basis for any alternative measures and protective mechanisms, clear and comprehensive identification of all specific management practices, control measures, monitoring programs, or other actions deemed necessary by the study's authors to ensure that these mechanisms continue to be effective in protecting fish and wildlife, and documented peer review of the study by a panel of independent experts having appropriate expertise.

Lihir submitted the studies and associated peer-review documents to the ICMI. The ICMI deemed the documents complete with respect to the Code's requirements for establishing or revising alternative measures to satisfy the Cyanide Code's Standard of Practice 4.5. The operation does not appear to have an indirect discharge to surface water.

The Containment Pond is located adjacent to the Small Boat Harbour in the greater Luise Harbour and is the only likely source for any potential indirect discharge into the Small Boat Harbour and Luise Harbour.

Three surface water monitoring locations downgradient of the Containment Pond where previously monitored and reported results between 2011 and 2019 for free cyanide consistently below the detection limit. The results, coupled with statements from environment Department Personnel, indicate the lack of an indirect discharge.

2.4.6 Standard of Practice 4.6

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

	☒ **in full compliance with**	
The operation is	☐ in substantial compliance with	Standard of Practice 4.6
	☐ not in compliance with	

Summarise the basis for this Finding/Deficiencies Identified:

LGL is in FULL COMPLIANCE with Standard of Practice 4.6, requiring the operation implement measures designed to manage seepage from cyanide facilities to protect the beneficial uses of groundwater.

LGL does not implement specific water management or other measures to manage seepage to protect groundwater beneath and/or immediately downgradient of the operation due to the limited potential sources of groundwater seepage and groundwater users. The operation has been issued with an Extraction Permit by the DEC authorising eight water extraction points.

The operation has been issued with an Extraction Permit by the DEC (WD L3 (191)) authorising eight water extraction points. Of these, only Extraction Point 4 relates to groundwater extraction and this is from the Londolovit Borefield for the purposes of supplying the Londolovit Town. The bore field is located in Londolovit Town, which is upstream of the cyanide facility.

The town of Put Put is adjacent to the process plant but, the Environment Superintendent advised that groundwater is not used within the town. Water is supplied by LGL to various distribution points within the Put Put community.

As no beneficial use exists or is designated beneath or immediately downgradient of the facility, and it was advised that there is no applicable numerical standard for protection of that use.

The operation does not use mill tailings as underground backfill as there is no underground mining activity.

2.4.7 Standard of Practice 4.7

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

	☒ **in full compliance with**	
The operation is	☐ in substantial compliance with	Standard of Practice 4.7
	☐ not in compliance with	

Summarise the basis for this Finding/Deficiencies Identified:

LGL is in FULL COMPLIANCE with Standard of Practice 4.7 requiring that the operation provide spill prevention or containment measures for process tanks and pipelines.

Spill prevention or containment measures are provided for all processing facility cyanide unloading, storage, mixing and process solution tanks.

The cyanide mixing and storage facilities (CN1 and CN2), the NCA circuits and the tailings neutralisation circuit are located within impervious concrete containments, which are equipped with sump pumps, covered concrete spoon drains and the process containment pond.

All process tanks are contained within competent secondary containment. Despite this, the operation has developed procedures for remediation of any contaminated soil such that adverse impacts on surface or groundwater are prevented.

All NCA tanks are constructed on ring beams. Tank foundations consist of a thick oiled sand pad, sitting on a 1.0mm MDPE impermeable membrane liner, which sits on compacted coronous material. The MDPE liner is fixed to the

internal concrete wall beneath the tank (forming a secondary containment layer). Despite the presence of a secondary Leak detection systems have been installed on all NCA tanks.

Secondary containments for cyanide unloading, storage, mixing and process tanks are sized to hold a volume greater than 110% of the largest tank within the containment when the process containment pond is included within the calculations.

Procedures are not required to prevent discharge to the environment of any cyanide solution or cyanide-contaminated water that is collected in the secondary containment areas of the facility.

All containment walls have sump pumps that pump process solutions and reagents back into the process and storage tanks for reprocessing or use. Sump pumps have been sized according to acceptable engineering standards.

In the event of an uncontrolled release from the NCA tanks, both circuits are designed for a controlled overflow into the lined process containment pond via the concrete lined site drainage system. The containment pond procedure is in place to manage the pond level and prevent overflow. The drains and containment pond are designed for contingency storage in abnormal or emergency circumstances and are not considered cyanide facilities.

During normal operating conditions, all process tanks are contained within competent secondary containment. Despite this, the operation has developed procedures for remediation of any contaminated soil such that adverse impacts on surface or groundwater are prevented.

The CSARP and One Page Instruction for Environmental Spill Assessment and Monitoring detail remediation measures for contaminated soil, including in-situ neutralisation and removal.

Spill prevention or containment measures are provided for all cyanide solution pipelines to collect leaks and prevent releases to the environment.

Cyanide, process solution and tails lines are secondarily contained within secondary containments, pipe-in-pipe and lined trenches.

A site inspection did not identify any cyanide pipelines that present a risk to surface water.

Cyanide tanks (including process solution tanks) and pipelines are constructed of materials compatible with cyanide and high pH conditions (HDPE, carbon steel, mild steel and stainless steel are used for all pipelines containing cyanide within the site). The leach/adsorptions tanks are made from carbon steel. The presoak tanks and elution column are made from 304 stainless steel. The cyanide mix tanks are made from carbon steel.

2.4.8 Standard of Practice 4.8

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

	☒ **in full compliance with**	
The operation is	☐ in substantial compliance with	Standard of Practice 4.8
	☐ not in compliance with	

Summarise the basis for this Finding/Deficiencies Identified:

LGL is in FULL COMPLIANCE with Standard of Practice 4.8 requiring that operations implement QA/QC procedures to confirm that cyanide facilities are constructed according to accepted engineering standards and specifications.

QA/QC programmes have been implemented during construction of all cyanide facilities and modifications to existing facilities. QA/QC documentation for all cyanide facilities was not previously available, as such LGL commissioned Worley Parsons in 2018 to undertake an engineering review of the cyanide facilities.

In 2018 LGL engaged Worley Parsons to conduct a visual inspection of the cyanide facilities (except the Gold Room), in lieu of comprehensive QA/QC records having been retained. Visual inspections were conducted, by a registered professional engineer, to assess if elements of the facility involving cyanide constituted an unacceptable risk from the point of view of structural or containment integrity.

All cyanide containing plant were found to be in good condition, with the exception of cyanide mixing tank TK091, which was identified as the only high-risk item. The review recommended replacing TK091 as a matter of priority,

because corrosion of the tank's welded seams can lead to sudden catastrophic failure as the tensile strength capacity of the welds is reduced by loss of meatal. TK 91 was replaced during the audit period.

Since the 2018 Engineering Review, a number of cyanide facilities have been modified or constructed. Modified facilities are addressed through the site's Management of Change process, while larger, new projects are completed by the Engineering Project Team. QA/QC documentation is included within completion packages for projects managed by the Engineering Projects Team. Examples of cyanide projects completed by the team include:

— CN1 Mixing Tank replacement

— New cyanide delivery line from CN1

— Corrosion works program

— Concrete works program

Completion packages for these works include appropriate QAQC documentation. An appropriately qualified person has inspected facilities involving cyanide and issued a report concluding that its continued operation within established parameters will protect against cyanide exposures and releases. .

2.4.9 Standard of Practice 4.9

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

	☒ **in full compliance with**	
The operation is	☐ in substantial compliance with	Standard of Practice 4.9
	☐ not in compliance with	

Summarise the basis for this Finding/Deficiencies Identified:

LGL is in FULL COMPLIANCE with Standard of Practice 4.9 requiring that operations implement monitoring programmes to evaluate the effects of cyanide use on wildlife, surface and groundwater quality.

The operation has developed written standard procedures for monitoring activities. The operation's Discharge Permit requires the site have in place an Environmental Management and Monitoring Program (EMMP).

The EMMP describes the site environmental management and monitoring programmes, including Amenity (meteorology, dust, sulphur emissions and noise); Surface water; Ground water; Marine; and Biodiversity.

A number of procedures have been developed to support the EMMP through the provision of specific instructions for the monitoring programmes.

All documents form part of the site's Environmental Management System (EMS), which has been ISO14001 certified. The documents are also contained within the Document Management Control System Sampling and analytical protocols have been developed by appropriately qualified personnel.

Changes to the sampling and analytical SOPs require approval from the Environmental Superintendent before they are implemented. The Auditor was advised that the Environmental Superintendent has over 15 years' experience in environmental management and mining and processing. The procedures specify how and where samples should be taken, sample preservation techniques, chain of custody procedures, shipping instructions, and cyanide species to be analysed.

All field sampling activities are recorded on forms that allow the person undertaking the sampling to comment on conditions that may influence analysis. LGL does monitor for cyanide in discharges of process water to surface water downgradient of the site.

Three surface water monitoring locations are sampled and analysed every four months. Should the presence of cyanide be identified, an environmental incident is raised in CHESS and an investigation as to potential causes undertaken.

Monitoring results to date for free cyanide were below the detection limit (0.004 mg/L). The results, coupled with statements from environment Department Personnel, indicate the lack of an indirect discharge. The operation currently monitors for cyanide in groundwater at five locations across the process plant site, on a four-monthly basis. The

Environmental Superintendent advised that groundwater flows from the plant site towards the coast. Two groundwater monitoring bores were installed between the Containment Pond and Small Boat Harbour and the results of monitoring, reportedly, have not indicated the presence of cyanide within the groundwater.

Despite the lack of areas where wildlife could contact and ingest cyanide solutions, area inspections are carried out as part of the Mining Safety Act 274 Inspection requirement. Formal, documented 274 Inspections are conducted weekly in all work areas. The inspection form prompts the inspector to note environmental issues but not specifically fauna mortalities.

The findings of the 2017 review of EMMP elements confirmed that monitoring frequencies are adequate to characterise the medium being monitored and to identify changes in a timely manner.

2.5 Principle 5 – Decommissioning

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

2.5.1 Standard of Practice 5.1

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

	☒ **in full compliance with**	
The operation is	☐ in substantial compliance with	Standard of Practice 5.1
	☐ not in compliance with	

Summarise the basis for this Finding/Deficiencies Identified:

LGL is in FULL COMPLIANCE with Standard of Practice 5.1, requiring that a decommissioning plan is developed and implemented for effective closure of cyanide facilities to protect human health, wildlife and livestock.

The operation has developed written procedures to decommission cyanide facilities at the cessation of operations.

A Cyanide Facilities Decommissioning Plan has been developed for Code compliance. It was updated in 2019 to reflect the updated costs prepared by Liberty Industrial (2019). The operation also has a Mine Closure Plan.

The Cyanide Facilities Decommissioning Plan details the decommissioning requirements for the cyanide facilities located on the LGL mining lease including the legal requirements, cyanide facility descriptions, decommissioning strategies, a decommissioning budget and schedule and the general safety requirements that will be implemented for the decommissioning process.

The plan describes activities including:

— Decontamination of equipment

— Sequential shutdown of the circuit and removal of residual cyanide

— Monitoring of contaminated rinse waters

— Dismantling of the process plant.

The plan also provides:

— A Decommissioning Schedule

— Contingency Plan/Trigger Levels

— Decommissioning Costs.

The Cyanide Facilities Decommissioning Plan does include an implementation schedule for the decommissioning activities. The implementation schedule was reviewed and the level of details considered suitable for the stage in the mine life.

The Cyanide Facilities Decommissioning Plan does require the plan to be reviewed. The implementation schedule in the Cyanide Facilities Decommissioning Plan notes that the plan will be reviewed and updated with the Mine Closure Plan (MCP) and mine closure cost estimates every five years.

2.5.2 Standard of Practice 5.2

Establish a financial assurance mechanism capable of fully funding cyanide-related decommissioning activities.

	☒ **in full compliance with**	
The operation is	☐ in substantial compliance with	Standard of Practice 5.2
	☐ not in compliance with	

Summarise the basis for this Finding/Deficiencies Identified:

LGL is in FULL COMPLIANCE with Standard of Practice 5.2, requiring that operation establish an assurance mechanism capable of fully funding cyanide related decommissioning activities.

The operation has developed an estimate of the cost to fully fund third party implementation of the cyanide related decommissioning measures as identified in the operations closure plan.

A Cyanide Facilities Decommissioning Plan has been developed for Code compliance. It was updated in 2019 to reflect the updated costs prepared by a subcontractor. The report provides a cost estimate for a third party contractor to mobilise, conduct the planned activities, and demobilise from the site. The cost is provided in $US.

LGL is not required to establish a financial mechanism approved by the applicable jurisdiction to cover the estimated costs for cyanide related decommissioning activities as identified in its decommissioning and closure strategy. The operation has established a self-insurance financial insurance mechanism, which is supported by a statement from a qualified financial auditor that it has sufficient financial strength to fulfil this obligation as demonstrated by an acceptable financial evaluation methodology.

The operation has established a process to review and update the cost estimate at least every five years and when revisions to the plan are made that effect cyanide related decommissioning activities. The implementation schedule in the Cyanide Facilities Decommissioning Plan notes that the plan will be reviewed and updated with the MCP and mine closure cost estimates every five years. Site personell advised that the cyanide facility decommissioning estimate of $3.4 million is the most recent and is expected to increase as years progress. Site acknowledge that no recent closure cost audit has been completed within one year prior to this cyanide code audit, however have committed to improve or align the cyanide facilities decommissioning or closure cost audit within one year of the next Cyanide Code Audit.

2.6 Principle 6 – Work Safety

Protect Workers' Health and Safety from Exposure to Cyanide.

2.6.1 Standard of Practice 6.1

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

	☒ **in full compliance with**	
The operation is	☐ in substantial compliance with	Standard of Practice 6.1
	☐ not in compliance with	

Summarise the basis for this Finding/Deficiencies Identified:

LGL is in FULL COMPLIANCE with Standard of Practice 6.1 requiring an operation to identify potential cyanide exposure scenarios and take measures as necessary to eliminate, reduce and control them.

The operation has developed procedures describing how cyanide related tasks such as unloading, mixing, plant operations, entry into confined spaces, and equipment decontamination prior to maintenance should be conducted to minimise worker exposure.

In addition to addressing mixing, the Cyanide Mixing Procedure address transport of the cyanide boxes from the main storage area pre and post mixing.

The operation has a confined space entry procedure that requires training of personnel and a permit to enter into a confined space. There is an overarching permit to work system that takes into account isolation processes and confined space access, a permit to work is a formal document used to ensure that appropriate controls have been implemented prior to a task commencing.

Equipment decontamination prior to maintenance is addressed in unloading and mixing SOPs via the venting of containers and gas testing atmospheres.

Procedures include risk assessment references, pre-task checklists, PPE requirements, references to linked procedures, training pre-requisites, and licence and permit requirements. The operation has a Zero 3 Tasol process for task workplace inspection and task hazard identification; and a Job Safety Analysis (JSA) process for managing task risks, the Zero 3 Tasol process is the first step in the SOPs. The procedures require, where necessary, the use of PPE and address pre-work inspections.

Procedures include risk assessment references, pre-task checklists, PPE requirements, references to linked procedures, training pre-requisites, and licence and permit requirements.

The standard PPE for the site is hi-vis long sleeve shirts, hi-vis long pants, steel capped boots, safety glasses and hard hat. Individual procedures list the additional PPE required for the task and there is signage in places advising of PPE that needs to be worn.

Pre-work inspections are addressed through the Zero 3 Tasol process where operators consider hazards in the work area prior to commencing a task. The operation also has a procedure for pre-work inspection of the cyanide mixing area. The first step in the procedures is to complete a Zero 3 Tasol which can also lead to a review or completion of a JSA where required

The site has monthly safety meetings that staff must attend. New procedures and updates on the Plant are presented at these meetings.

Regular meetings are held which have a safety focus.

Procedural documents are co-authored across departments, draft SOPs are given to the departmental supervisors to review before they are implemented, and supervisors sign off the SOPs and future changes.

Lihir Gold Mine | Signature of Lead Auditor | Date: 27/09/2023

Workers are given the opportunity to raise concerns during pre-shift safety meetings, Zero 3 Tasol discussions prior to commencing a task and toolbox talks.

The Processing Training Coordinator advised that the toolbox meeting was an information delivery meeting and that procedures were reviewed and amended by the trainers and approved by their managers. The morning prestart meetings and weekly safety meetings provide a forum for the discussion of safety and operational issues including changes to procedures. The prestart meeting also includes a review of Zero 3 Tasol completed the previous day.

The Emergency Response Team (ERT) conduct mock drills that include operational, logistics, and environment personnel where applicable. These drills are managed by ERT and are recorded in the ERT system with learnings and actions captured in CHESS.

Employees can also raise issues through their supervisor and request changes or suggest improvements to procedures at all times.

2.6.2 Standard of Practice 6.2

Operate and monitor cyanide facilities to protect worker health and safety and periodically evaluate the effectiveness of health and safety measures.

	☒ **in full compliance with**	
The operation is	☐ in substantial compliance with	Standard of Practice 6.2
	☐ not in compliance with	

Summarise the basis for this Finding/Deficiencies Identified:

LGL is in FULL COMPLIANCE with Standard of Practice 6.2 requiring Lihir Gold Mine to operate and monitor cyanide facilities to protect worker health and safety and periodically evaluates the effectiveness of health and safety measures.

The operation has determined the appropriate pH for limiting the evolution of HCN gas during mixing and production activities.

The operation has established that a pH of 9.5 or above limits the evolution of HCN gas during production activities. The CMP details that the pH setpoint target is 9.8. A low level alarm will sound at 9.0 and a high alarm at 11. The set point is controlled through the DCS, and operators are not permitted to make changes to the set points without authorisation.

The pH alarm set points are managed using DCS Software Change Form, which is prepared by the Metallurgists and signed off by the manager for the area. The process includes changes to pH. The pH is also rated to tonnes and flow rate to maintain levels with dual online pH probes on the neutralisation tanks prior to cyanide addition.

DCS alerts Control Room Operator if the pH is too low. There is then a process to follow checking the dosing systems, manual check and calibrations.

Cyanide mixing pH is controlled through the addition of caustic soda to the solution prior to the addition of sodium cyanide briquettes to maintain pH at 10.5. Where the potential exists for significant cyanide exposure, the operation uses ambient and personal monitoring devices to confirm that controls are adequate to limit worker exposure to hydrogen cyanide gas and sodium, calcium or potassium cyanide dust to 10 ppm on an instantaneous basis and 4.7 ppm continuously over an 8-hour period, as cyanide.

LGL uses ambient monitoring and has installed a number of devices on the processing plant, the NCA circuits and one in each of the cyanide mixing facilities. The devices are set to alarm at levels of 5 ppm and 10 ppm.

Fixed monitors are located within the process plant area.

All personnel entering either of the NCA circuits must wear a HCN monitor or be escorted at all times by an inducted person who is wearing a HCN monitor. Calibration is required on a quarterly basis and coloured tags are placed on each monitor after calibration to indicate the current month.

The time weighted average (TWA) provided in the Code is 4.7 ppm for an 8-hour shift, however the operation works a 12-hour shift. To support that operational controls are maintaining levels below a TWA of 4.7 ppm, the operation

appointed an independent consultant to complete a series of occupational hygiene exposure monitoring surveys – HCN was included in these surveys.

If a fixed or portable personal alarm sounds at or above 4.7 ppm HCN, yet below 10 ppm, personnel are required to stop work, make the area safe and report to their supervisor. Area checks will be conducted to confirm the HCN detection. Area checks are conducted in accordance with:

— 501-1350-OP-SOP-0053 – NCA General – Emergency Procedures

Operators remain in contact with the control room operator (CRO) to verify field readings with SAOC parameters. If operators had left the work area, return to the work area to carry out confirmation testing. If HCN levels have subsided, recommence with the task. If levels remain at or above 4.7 ppm, ensure access to the area remains restricted and report to the control room to escalate the situation.

If a fixed or portable alarm sounds at or above 10 ppm HCN, personnel are required to stop work immediately, making sure that any tools, tasks at hand etc. are left in a safe manner, and evacuate to the nearest muster area (across and up wind wherever possible) of the high HCN concentration. Personnel should then secure access to the area and advise the shift supervisor or Control Room Operator (ZeroAlpha) by two-way that a high HCN gas reading has started an evacuation. Personnel are to remain at the muster point until given clearance by the supervisor to return to work.

If HCN levels have subsided, recommence with the task. If levels remain at or above 10 ppm, ensure access to the area remains restricted and report to the control room to escalate the situation.

The operation has identified activities and areas where the exposure to harmful concentrations of cyanide is possible. For such activities, the operation has operating procedures in place that state the PPE requirements. These identified activities include:

— Sodium cyanide reagent mixing

— Work in the reagent area

— Work in the NCA 1 and 2 areas.

In addition, personal HCN monitors must be worn when entering the NCA circuit areas, CN 1 and CN 2 mixing areas and all areas of the process plant. Stationary gas detectors are mounted at fixed locations within NCA 1 and NCA 2 of the process plant.

LGL tests and maintains hydrogen cyanide monitoring equipment as directed by the manufacturer.

HCN meters are calibrated onsite by the instrumentation technicians and follow the quarterly tagging system. Evidence was provided via a Communication Sheet “Acceptable Portable HCN Monitor Onsite” which outlines a review and phase out of Honeywell branded personal HCN monitors for the MSA brand, as well as improvements to calibration record keeping.

Personal HCN Monitor calibration records were sighted by the auditor for the years 2020, 2021, 2022 and 2023.

The fixed monitors are inspected weekly for damage or build-up as part of the 247 checks. A full operational check and calibration is completed; along with an alarm sounding test and verification of the alarm settings. This is captured and managed by LGL’s SAP maintenance system.

The instrumentation team undertake weekly checks on the positional/ambient HCN monitors installed around the site and the results are noted on the works order. Warning signs have been placed where cyanide is used advising workers that cyanide is present and that smoking, open flames and eating and drinking are not allowed. The signage also stipulates the PPE that must be worn when working in the area. Signage was observed to be located at entrances to the plant areas, CN1 and CN2 mixing and storage areas and at entrance points to the leaching circuits. Signage was clear and legible.

Designated smoking areas and amenities are provided for personnel to use, located away from cyanide facilities.

In relation to eating and drinking, induction material states that eating and drinking on the processing plant is prohibited. High strength cyanide is dyed for clear identification.

The cyanide makeup SOP clearly states to add carmosine dye to tank TK2091 during the mixing process. It is specified that this is a safety requirement for the easy detection of spills or leaks. Emergency Showers, low pressure eyewash

stations and dry powder or non-acidic sodium bicarbonate fire extinguishers are located at strategic locations throughout the operation and tested on a regular basis. The auditor observed showers, eye wash stations and fire extinguishers in all cyanide areas.

Pre-operational inspection requirements are contained in the various task specific SOP's. The pre-operational check for cyanide mixing requires personnel to check emergency eye wash and shower stations are in working order prior to commencing a mix.

Routine inspections are completed via the Weekly 274 inspection process. The inspection check sheet contains prompts for visually checking and assessing the condition of fire extinguishers, safety showers and eye wash stations. The inspection sheet contains an action list which allows for the assigning responsible personnel and work order numbers (if required) for tracking to completion.

Fire extinguishers are located strategically throughout the plant and were observed to be serviced (tagged) and pressurised for use. Unloading, storage, mixing and process tanks and piping containing cyanide are identified to alert workers of their contents, and the direction of cyanide flow in pipes is designated.

There is signage on pipelines and tanks. Where labelling was in place directional indicators were observed. The lack of signage in some areas is supported through the induction and site-specific training processes. Safety Data Sheets (SDS), first aid procedures and informational materials on cyanide safety were available in the language of the workforce in areas where cyanide is managed.

Information is generally provided in English and in Pidgin (the language of the country and workforce). Signage around the plant is provided in English and in Pidgin.

SDS information is provided in English. The SDS information is provided in hard copy at the locations where cyanide is used Procedures are in place, to investigate and evaluate cyanide exposure incidents to determine if the operations programmes and procedures to protect worker health and safety, and to respond to cyanide exposures, are adequate or need revising.

The operation has an incident reporting and investigation process used for all incidents, a standalone SOP was not provided, however the process was contained in the Cyanide Emergency SOP and the CMP. All cyanide related incidents are required to be reported in CHESS. Actions specifying corrective measures taken to rectify the incident are also captured to prevent reoccurrence.

The operation uses the Incident Cause Analysis Method (ICAM) process to investigate incidents and develop actions to prevent reoccurrence. The incident details and actions are recorded in the CHESS Database. This database also provides an action tracking and escalation function for the operation. Incident classification is determined via a risk assessment, conducted as part of the incident reporting and investigation process. The department responsible for the incident facilitates the process and is required to enter the incident into CHESS. A 'sequence of events' and 'basic cause' are established, and actions developed to prevent re-occurrence.

A review of the CHESS database shows that the system has been implemented and incidents are being recorded and investigated. Incident reports and investigation outcomes are shared with the workforce through safety alerts and communicated during toolbox and safety meetings.

2.6.3 Standard of Practice 6.3

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

	☒ **in full compliance with**	
The operation is	☐ in substantial compliance with	Standard of Practice 6.3
	☐ not in compliance with	

Summarise the basis for this Finding/Deficiencies Identified:

LGL is in FULL COMPLIANCE with Standard of Practice 6.3 requiring an operation develop and implement emergency response plans and procedures to respond to worker exposure to cyanide.

Lihir Gold Mine | Signature of Lead Auditor | Date: 27/09/2023

The operation does have water, oxygen, a resuscitator, antidote kits and a radio, telephone, alarm system or other means of communication or emergency notification readily available for use at cyanide unloading, storage and mixing locations and elsewhere.

The operation has oxygen and antidote kits located at the Medical Clinic and in the site 4WD ambulance. The Medical Clinic is located between the processing plant and the wharf and is within the processing plant operational area. The Clinic is permanently staffed with two medical personnel, and it has a single bed. The Clinic is run by ISOS who also run the island's hospital.

There is a fire system installed at the process plant and extinguishers are located strategically throughout the plant. Hydrants were observed around the plant and the operation has fire tenders with a full time Emergency Response Team (ERT).

The operators were observed to be wearing radios and this is the primary means of notifying an emergency, there is also a telephone and Public Announcement (PA) system for alerting workers.

Emergency showers are installed at strategic locations on the plant.

The operation also has emergency oxygen, resuscitator and rescue equipment in the form of Oxy-Viva kits stored the cyanide storage and mixing area (in the Cyanide Spill Container) and ERT. Training in the use of the Oxy-Viva kits has been rolled out to relevant site personnel.

The operation does inspect its first aid equipment regularly to ensure that it is available when needed, and materials are stored and/or tested as directed by their manufacturer

There are routine checklists for emergency response equipment, and these are completed on a regular basis.

Cyanide antidote kits are stored as directed by the manufacturer at the Medical Clinic (managed by ISOS) in a cyanide box with PPE for the clinic personnel and instructions for use. Two full kits were observed with items within their respective expiry dates. If additional medical support is required, the Lihir Medical Centre also stores cyanide kits.

The onsite clinic also maintains a store of first aid equipment and regularly checks supplies and equipment.

The ERT undertake weekly checks of the site ambulance that is based at the Medical Clinic including emergency oxygen equipment and trauma kits.

The operation has developed specific written emergency response plans and procedures to respond to cyanide exposures.

The operation has developed the following plans which all have a role in emergency response:

- CMP
- CERP
- CSARP
- International SOS Management of Cyanide Poisoning

Based on the role, each plan details the relevant response. The response for the ERT is to give initial first aid which is detailed in the CERP. The management of a patient with cyanide exposure is the responsibility of the onsite medic. The response procedure Management of Cyanide Poisoning is stored in the clinic with the Cyanokit.

The operation has its own on-site capability to provide first aid and medical assistance to workers exposed to cyanide.

The Medical Clinic is staffed 24-hours a day with two people per day shift. The site medic also has 24-hour access to a Doctor through ISOS. If required, patients can be provided initial emergency response treatment and stabilised in the clinic.

If additional medical support is required, the Lihir Medical Centre and located in the town of Londolovit is equipped to support the clinic with cyanide specific treatments. Both medical facilities are aware that cyanide is used onsite, and they utilise the same procedures for managing cyanide exposures.

The site ERT is the primary responder for worker exposure incidents and would undertake the recovery and decontamination of a worker who had been exposed to cyanide, should they not be capable themselves. The ERT are trained in emergency first aid and HAZMAT response.

An exposed worker would be treated by the site medic at the scene or at the on-site clinic and then transported via 4WD ambulance to the island's hospital or to the operations-controlled airstrip for evacuation

The operation has developed a medical treatment protocol that outlines the process to treat major injuries.

The Emergency Response Coordinator advised that the worker once decontaminated and treated by the site medic would be transferred to the island's hospital and then medical facilities in Australia by aircraft if required. ISOS would make the arrangements for medical evacuation of the patient.

2.7 Principle 7 – Emergency Response

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

2.7.1 Standard of Practice 7.1

Prepare detailed emergency response plans for potential cyanide releases.

	☒ **in full compliance with**	
The operation is	☐ in substantial compliance with	Standard of Practice 7.1
	☐ not in compliance with	

Summarise the basis for this Finding/Deficiencies Identified:

LGL is in FULL COMPLIANCE with Standard of Practice 7.1 requiring an operation prepare detailed emergency response plans for potential cyanide releases.

The operation has developed the plans which all have a role in emergency response and address potential accidental releases of cyanide.

The CERP and CSARP combined address plausible release scenarios at LGL and address the response and roles of ERT and Process Department.

The operation's emergency documentation does consider the potential cyanide failure scenarios appropriate for its site-specific environmental and operating circumstances.

The plans have been based on following the stages of an incident, incident and notification; initial response and assessment; respond; recover; and closure. A Failure Modes and Effects Analysis identified the below key plausible scenarios:

- Fire during transport
- Spillage of solid CN briquettes during transport and handling
- CN1 or CN2 Reagent strength CN solution tank or pipe leak
- CN1 or CN2 Reagent strength CN solution mixing or storage tank catastrophic failure
- NCA1 or NCA2 Process strength tank or pipe leak on (Carbon-in-leach) CIL circuit
- NCA1 or NCA2 Process strength CIL tank catastrophic failure
- Spillage of process solution onto unsealed surface due to CIL circuit overflow
- Elevated HCN levels onto of NCA tanks (up to 30 ppm)
- Containment Pond spillage/overtop event
- Tails line pipe leak
- Tails discharge circuit, catastrophic tank, or pipe failure
- Power failure to sea water pumps
- High HCN build up in confined spaces

These scenarios above resulted a plausible incidence scenario assessment which included transport accidents, pond overtopping, power outages and mechanical failures (i.e., pump failures, engineering, natural disasters, circuit blockages).

The emergency documentation considers both on-site transportation emergencies and the physical form of cyanide. The site receives cyanide in solid form in bulk bags within wooden boxes. Off-site Transport emergencies are managed under the Code certified transporters emergency management plan. However, the emergency document addresses release scenarios resulting from transport accidents onsite.

The emergency documentation details response actions (as appropriate for the anticipated emergency situations) such as clearing site personnel from the area of exposure, use of cyanide antidotes and first aid measures. The DSTP Emergency Response Plan highlights external stakeholder communication including communities. Lihirian community is updated via formal notice, local radio and key verbal communication with regard to:

— Background information on the nature, extent and impact (if any) of spill, and what steps Lihir is undertaking to control and mitigate

— Information prepared by Processing and Environment Departments and forwarded to Community Relations Department for distribution.

The CSARP provides response actions for the first onsite, including evacuation, alerting ERT and incident management (including the containment, assessment, mitigation and prevention of future releases)..

The CERP provides response actions for ERT personnel, specifically for first aid response and cyanide poisoning. Additional information for medical professional on the treatment of cyanide poisoning, specifically the application of the antidote, is provided in the procedure International SOS Management of Cyanide Poisoning.

The plan does link with the Crisis Emergency Management System (CEMS) Manual which guides the internal and external emergency communication. A cyanide incident would trigger an Emergency Management Team CEMS manual. The CEMS contains the different roles and responsibilities for each member. The communication of a cyanide emergency would involve the Environment, Community Relations, External Affairs and Government Relations teams.

The CEMS manual also contains a Severity Matrix which presents the notification and escalation “thresholds” of potentially damaging events. The matrix provides a description of the potential types and/or outcomes of events, a measurement of severity and the teams that would potentially be involved for each. Each outcome has been rated against Newcrest’s response priority acronym, known as ‘P’eople. ’E’nvironment. 'A’ssets. ’R’eputation. ’L’ivelihood.

Any significant community impacts / community casualties or fatalities / impact on Newcrest’s reputation and business wide social license to operate are delegated to the Emergency Management Team (EMT) and Crisis Management Team (CMT). It is the role of the EMT Community leader to provide the EMT with information and advice on aspects of the emergency concerning community relations, including indigenous and local community issues.

The Cyanide Spill Assessment and Response Plan do highlight on the potential cause and preventive/mitigation measures to control potential spillage and leaks of sodium cyanide from the site facilities.

2.7.2 Standard of Practice 7.2

Involve site personnel and stakeholders in the planning process.

	☒ **in full compliance with**	
The operation is	☐ in substantial compliance with	Standard of Practice 7.2
	☐ not in compliance with	

Summarise the basis for this Finding/Deficiencies Identified:

LGL is in FULL COMPLIANCE with Standard of Practice 7.2, requiring an operation involve site personnel and stakeholders in the planning process.

The operation has involved its workforce in the cyanide emergency response planning process. This was undertaken during the initial development of the plan which has not had material changes since its inception.

The operation has in place mechanisms to consult with its workforce who are the main stakeholders for cyanide related emergencies.

The external community has not been involved in the emergency response planning, however the communication of a cyanide emergency, which would affect the local community would involve the Environment, Community Relations, External Affairs and Government Relations teams.

The operation has ongoing dialogue with the local community and landowners. There are no cyanide emergency scenarios that require operation to present information to the communities. However, the operation does communicate with the communities generally on cyanide management and spill response.

LGL is located on an island to the northeast of the Papua New Guinea mainland and all emergency response is facilitated by the operation and on-site ERT.

The operation uses the services of ISOS for their on-site Medical Clinic and ISOS also manage the island's hospital.

The operation is reliant upon ISOS for higher level medical support including the administration of cyanide antidotes. ISOS have their own procedures for treatment of cyanide that integrate with the site. The operation has contacted Cairns Base Hospital.

The operation does engage in consultation or communication with stakeholders to keep the Emergency Response planning current. The main stakeholder for the operation is its workforce and the operation engages through mock exercises and safety meetings where revisions to procedures and plans are discussed and implemented.

There are no external responders with a designated role in the CERP other than the ISOS personnel at the town hospital.

2.7.3 Standard of Practice 7.3

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

	☒ **in full compliance with**	
The operation is	☐ in substantial compliance with	Standard of Practice 7.3
	☐ not in compliance with	

Summarise the basis for this Finding/Deficiencies Identified:

LGL is in FULL COMPLIANCE with Standard of Practice 7.3 requiring an operation designate appropriate personnel and commit necessary equipment and resources for emergency response.

- The emergency documentation states that the ultimate responsibility for emergency response at NML lies with the General Manager (GM). The plan provides a flowchart of responsible parties for the Emergency Management Organization comprising of the Emergency Response Teams (ERT), Incident Management Team (IMT), and Emergency Management Team (EMT) at site and a Crisis Management Team (CMT) in Melbourne. The EMT Leader will retain overall control of the event and the entire site/operation.
- The CERP and the Cyanide Spill Assessment and Response Plan outline the equipment, personnel and other resources allocated to the emergency response. The operation has an on-site ERT comprised of full-time personnel.
- The emergency documentation details training requirements for the ERT (CERP) and the process personnel (CSARP).
- There is an emergency 24-hour control room and contact information is included in emergency management documentation. The Incident Management Team is activated by the Security Control Room. Security Control will determine the most appropriate Incident Management Team to respond and instigate a group trunk call immediately. The group trunk call will notify all personnel on that listing and advise them of the IMT activation. Notified personnel must then attend the Incident Management Team response room as soon as possible.
- The duties and responsibilities of ERT Coordinators and Team Members are addressed in the CERP and supporting emergency management documentation.
- The emergency documentation lists PPE and containment equipment.

— The operation has procedures to inspect the emergency response equipment to ensure its availability.

— The role of Chief Medical Officer and Mine Site Clinic Medical Officer is defined in the CERP.

The operation has confirmed that outside entities included in the CERP are aware of their involvement and are included as necessary in mock drills or implementation exercises.

LGL is a remote site and there are no external responders that would be involved in the on-site response. The operation does have links with external medical facilities. The operation uses ISOS for its Medical Clinic and ISOS also run the island's hospital.

The operation has historically contacted Cairns Base Hospital who have acknowledged that they will accept cyanide patients from the site.

The CERP states that external parties, such as ISOS, are to be considered in mock drills.

2.7.4 Standard of Practice 7.4

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

	☒ **in full compliance with**	
The operation is	☐ in substantial compliance with	Standard of Practice 7.4
	☐ not in compliance with	

Summarise the basis for this Finding/Deficiencies Identified:

LGL is in FULL COMPLIANCE with Standard of Practice 7.4 requiring the development of procedures for internal and external emergency notification and reporting.

The emergency documentation does include procedures and contact information for notifying management, ERT, medical officers and cyanide suppliers. Regulatory agencies would be addressed through the CEMS.

All emergency calls are received by the site security control office under the call sign "zero alpha". This office is manned 24 hours a day. Security then activates the relevant emergency response group based on where an incident is located and its severity.

The Emergency Response Team attend the scene and undertake immediate containment and response actions; the ERT Leader may request support of the Incident Management Team (IMT) in the case of larger or more complex incidents. The IMT Leader serves as the On Scene Commander (OSC). The OSC contacts the EMT Leader (GM or appointed Department Head) and provides a briefing on the status of the emergency. A decision is made on whether the EMT requires activation.

Emergency management documentation contains procedures and contact information for notifying potentially affected communities of the cyanide related incident and any necessary response measures, including communication with the media.

A cyanide incident would trigger an Emergency Management Team CEMS manual. The CEMS contains the different roles and responsibilities for each member. The communication of a cyanide emergency would involve the Environment, Community Relations, External Affairs and Government Relations teams.

If required, the EMT determine the stakeholders affected and are responsible for arranging and approving communication with them. The EMT Leader communicates or authorises communication to outside groups following consultation with Legal and External Affairs members of the EMT.

LGL has drafted a procedure for notifying ICMI of cyanide incidents and advised the auditor that they have reported the one significant issue to have occurred since the previous audit.

2.7.5 Standard of Practice 7.5

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

☒ **in full compliance with**

The operation is ☐ in substantial compliance with Standard of Practice 7.5

☐ not in compliance with

Summarise the basis for this Finding/Deficiencies Identified:

LGL is in FULL COMPLIANCE with Standard of Practice 7.5, requiring an operation develop procedures for internal and external emergency notification and reporting.

The emergency documentation does address all the required items:

- The CERP and CSARP detail the use of neutralising chemicals and equipment decontamination in conjunction with the Environment Department who refer to the Environmental Spill Assessment and Monitoring One Page Instruction. This document advises that confirmation of neutralisation methods are to be sought from the manufacturer as outlined on the SDS to ensure best practise remediation is followed.
- Material management, sampling parameters and disposal methods are detailed and require consultation with the Environment Department who will then review as per the Environmental Spill Assessment and Monitoring procedure as well as liaising with the supplier for clean-up and disposal advice if required. Considerations are made for disposal to the DSTP or landfill and sampling of the material for clearance to these areas.
- The CMP states that Provision of an alternate water supply is not applicable as the cyanide release scenarios at the site will not impact on water sources consumed by the workforce or community. There are no plausible release scenarios that could impact community water supply.

The emergency documents do prohibit the use of chemicals to treat cyanide that has been released into surface water. This has been addressed in the CERP, CSARP, CMP and SWI Environmental Spill Assessment and Monitoring.

The emergency documentation addresses the potential need for environmental monitoring to identify the extent and effects of a cyanide release.

The both the CERP and CSARP defers to the environment department in the response to determines sampling requirements, specifically the Environmental Management and Monitoring Programs 2019-2022.

Monitoring is performed by members of the Environmental Department who have been suitably trained in the sampling and monitoring procedures involved. Such monitoring includes:

- WAD cyanide concentrations in soil.
- WAD cyanide concentrations in liquid discharges.
- Free cyanide concentrations in water bodies below the mixing zone of a spill.

Sampling locations are not stipulated, as they are incident dependent.

The environmental monitoring procedures provide methodologies and sample preparation, preservation and shipment information.

2.7.6 Standard of Practice 7.6

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

☒ **in full compliance with**

The operation is ☐ in substantial compliance with Standard of Practice 7.6

☐ not in compliance with

Summarise the basis for this Finding/Deficiencies Identified:

LGL is in FULL COMPLIANCE with Standard of Practice 7.6 requiring an operation periodically evaluate response procedures and capabilities and revise them as needed.

The operation does review and evaluate the cyanide related elements of its emergency response plan for adequacy on a regular basis.

The emergency documentation includes requirements to review every two years or when there has been an event or incident that requires a review to occur. This includes findings from mock drills and changes to cyanide facilities or operations at LGL that change the incident scenarios.

The operation does conduct mock cyanide emergency drills periodically as part of the emergency management evaluation process.

Emergency documentation required that the processing department will run a minimum of two mock exercises per year, one desktop and one practical. Additionally, the ERT team will also schedule a minimum of two cyanide related incidents per year. The CERP also states that the scenarios and mock drills will consider external parties, such as ISOS, and ensure that they are included in these drills to ensure their systems are tested for adequacy.

The operation has undertaken various cyanide emergency response exercises to test cyanide response.

Provisions are in place to evaluate and revise the emergency response plan after any cyanide related emergency requiring its implementation.

2.8 Principle 8 – Training

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

2.8.1 Standard of Practice 8.1

Train workers to understand the hazards associated with cyanide use.

	☒ **in full compliance with**	
The operation is	☐ in substantial compliance with	Standard of Practice 8.1
	☐ not in compliance with	

Summarise the basis for this Finding/Deficiencies Identified:

LGL is in FULL COMPLIANCE with Standard of Practice 8.1 requiring that an operation trains its workers to understand the hazards associated with cyanide use.

The Lihir Cyanide Code Governance Committee conducted a risk assessment to determine the which personnel require the training (~1693 personnel) and was determined as the following:

— Anyone who works in or has an office in the Process Plant.

— External to the Process Plant – the Waste Management Team, the Social Performance Delivery Team and all Health, Safety, Environment and Security (HSES) Clinic Team.

Cyanide awareness is initially covered through the Process Plant General Safety and Cyanide Awareness induction as part of a series of onboarding inductions, which all personnel need to complete. Generally onboarding inductions are completed over two days. Once on site, further detailed training is provided e.g., Process Chemical Area inductions for all personnel prior to them being allowed to work in high risk areas.

There are up to 11 general competencies that must be met prior to a person attempting more task/role specific ones.

The cyanide awareness training provides information on cyanide hazards, locations, exposure pathways, symptoms and emergency response procedures.

Short term visitors do not receive Cyanide Awareness Training. However, they cannot enter cyanide areas, such as processing plant or NCA circuits, unescorted.

The operation has in-house trainers that provide information and instruction on cyanide hazards.

Cyanide hazard recognition refresher training is periodically conducted. The operation has established a twelve-month refresher cycle for the Cyanide Awareness Training Program.

Training records have been retained. The operation has an electronic database (LMS) that provides training profiles for individuals and their specific roles, the system holds training records against an individual. Additionally, hard copy files of completed training competencies are also maintained on site.

A review of training records for personnel across processing and maintenance revealed that records are maintained, and training is completed in accordance with the schedule. LGL has committed to reaching the target of > 90% completion by the end of July 2023.

2.8.2 Standard of Practice 8.2

Train appropriate personnel to operate the facility according to systems and procedures that protect human health, the community and the environment.

	☒ **in full compliance with**	
The operation is	☐ in substantial compliance with	Standard of Practice 8.2
	☐ not in compliance with	

Summarise the basis for this Finding/Deficiencies Identified:

LGL is in FULL COMPLIANCE with Standard of Practice 8.2 requiring that an operation trains appropriate personnel to operate the facility according to systems and procedures that protect human health, the community and the environment.

The operation does train workers to perform their normal production tasks, including unloading, mixing, production and maintenance, with minimum risk to worker health and safety and in a manner that prevents unplanned cyanide releases.

The training framework is based on the Australian Qualification Framework for Resource Processing and the organisation uses an Australian based company as their Registered Training Organisation (RTO).

The training is provided by a team of trainers that have qualifications in training and experience and qualifications in operating a processing plant.

A new starter undertakes site inductions, Process Plant General Safety and Cyanide Awareness. Short term visitors do not receive any Cyanide Awareness Training; however, they must be always escorted and cannot enter cyanide areas without the escort.

Further detailed training is required to be completed prior to being allowed to work in high risk areas. Employees are trained prior to working with cyanide. The mill employees are assessed by the trainer prior to undertaking tasks without direct supervision.

There are up to 11 general competencies that must be met prior to a person attempting more task/role specific ones.

The isolation and permit to work procedures are key elements in the prevention of unplanned cyanide releases for maintenance activities and the operation has established a competency based training system for personnel which requires successful completion of progressive modules prior to an individual being permitted to complete tasks on the plant.

The operation has a structured training programme and training for cyanide related tasks is included in induction materials, procedures and training manuals. The material is supported by procedures that describe how the task is to be performed and the controls needed for the task. Along with step by step task information, each procedure details required competencies that a worker must hold in order to complete the task. Shift Supervisors use this list to assess individual's capabilities before signing off that the worker can complete the task unaccompanied.

There is a skills matrix that details what competencies an individual must hold.

Refresher training on cyanide management is provided to ensure employees continue to perform their jobs in a safe and environmentally protective manner.

The operation has established a twelve-month refresher cycle for the Cyanide Awareness Training Program. The operation has an electronic database – LMS, for managing training. Supervisors receive notifications when refresher training is required for their personnel.

Training materials and records shows that the refresher training specific to cyanide related work tasks are provided. ERT are the responders for high-risk emergencies events, and they undertake regular skills training which includes:

- Extraction equipment
- Self-contained breathing apparatus
- Oxy-Viva
- Fire Fighting

— Chemical hazard suit

— Decontamination and first aid.

The operation does evaluate the effectiveness of cyanide training by testing and observation.

The operation uses written knowledge assessments, completed by the participant at the completion of the training session. Handle, Store and Use Cyanide and Process Chemical Induction are tested via written questionnaires.

Task specific training is assessed by way of a buddy system, in field assessments, written assessment and demonstration. The training framework for process operators is based on the Australian Qualification Framework for Resource Processing.

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

The process operator files are maintained in both electronic copy in the LMS and hard copy in the Process Training office. The training needs analysis is updated by the process trainers.

The Maintenance Department is a RTO for apprenticeships and competency training is provided by the Maintenance Trainer. Training records are maintained in the department files.

The emergency response team training records are maintained in the ERT office and there is a safety training log book that details the trainer, topic and attendees. The training modules for the ERT are now based on Industrial Emergency Response and competencies are retained on file.

2.8.3 Standard of Practice 8.3

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

	☒ **in full compliance with**	
The operation is	☐ in substantial compliance with	Standard of Practice 8.3
	☐ not in compliance with	

Summarise the basis for this Finding/Deficiencies Identified:

LGL is in FULL COMPLIANCE with Standard of Practice 8.3 requiring an operation train appropriate workers and personnel to respond to worker exposures and environmental releases of cyanide.

Cyanide unloading, mixing, production and maintenance personnel are trained in the procedures to be followed if cyanide is released.

The operation has developed SOPs for response to cyanide spills and as well as emergency documentation. All personnel working in the processing area complete the cyanide awareness training, followed by further area specific training, which includes information on actions to take if cyanide is released in their work area. Mock drills are undertaken specifically for process personnel involved in a cyanide spill.

All personnel receive instruction and training on emergency response and raising the alarm. The primary response actions for processing and maintenance personnel are to raise the alarm and evacuate the area.

The ERT are responsible for emergency response, along with the support of experienced personnel in the area of the emergency. The ERT members have completed HAZMAT training in accordance with Australian Training Qualifications Framework.

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

The ERT receive more advanced training in decontamination and first aid and generally facilitate the drills to test and improve skills. The ERT train daily and this training includes response to chemical incidents.

The ERT are the primary responders and undertake regular skills training which includes:

— Extraction equipment
— Self-contained breathing apparatus
— Oxy-Viva
— Fire fighting
— Chemical hazard suit.

The operation has the in-house capacity to provide first aid training to workers. Decontamination and first aid response is covered in training materials and SOPs.

Emergency documentation required that the processing department will run a minimum of two mock exercises per year, one desktop and one practical. Additionally, the ERT team will also schedule a minimum of two cyanide related incidents per year. The CERP also states that the scenarios and mock drills will consider external parties, such as ISOS, and ensure that they are included in these drills to ensure their systems are tested for adequacy.

The operation has undertaken various cyanide emergency response exercise to test cyanide response. Drill reports were observed, and actions were placed into CHESS.

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

The ERT have regular training in both the theory and practical aspects of emergency response. General response to chemical incidents is covered through HAZMAT and Industrial Emergency Response training, which are nationally recognised programs; site specific training and equipment use is undertaken through practical training and mock exercises.

The operation has made off-site emergency responders familiar with related elements of the emergency documentation to the extent that is necessary. The operation is located in a remote area and accordingly there are no outside responders (e.g., fire brigades or ambulances) that would conceivably be involved in a response.

The operation has its own ERT which is equipped with ambulance and firefighting equipment. The operation also has a close working relationship with ISOS, which provide staff for the on-site Medical Clinic and run the island's hospital. ISOS have protocols for the treatment of cyanide patients.

From discussions with site personnel, it is unlikely that off-site response, other than ISOS, would not be needed for cyanide related emergencies.

The operation has also contacted Cairns Base Hospital in Queensland who responded in writing advising that they are willing to accept cyanide patients.

Refresher training for response to cyanide exposures and releases is regularly conducted. The cyanide awareness training that is completed every eighteen-months contains training on basic response procedures to exposures and releases.

The ERT receive refresher training on chemical incident response through HAZMAT and Industrial Emergency Response training modules, which include practical skill components. This training addresses some elements of cyanide response for the site.

ERT members receive periodic training in cyanide emergency response. The ERT team complete regular skills training though this is not cyanide specific, it does include response to cyanide incidents and HAZMAT response generally.

Simulated cyanide emergency drills are periodically conducted for training purposes and they cover both worker exposures and environmental releases. Cyanide emergency drills are evaluated from a training perspective to determine if personnel have the knowledge and skills required for effective response.

The emergency documentation includes requirements to review every two years or when there has been an event or incident that requires a review to occur. This includes findings from mock drills and changes to cyanide facilities or operations at LGL that change the incident scenarios.

Records are retained documenting the cyanide training, 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.

For task related training, new employees are trained individually by the processing trainers together with on the job instruction by experienced buddies. Once the employee has attained the skills and is able to perform the tasks the employee is assessed by the trainers in the theory and practical components of the task. Once the employee is able to

demonstrate competence, the evaluation record is signed off and entered into the Training Needs Analysis, LMS and a hard copy placed on file, maintained in the process training department.

The Handle, Store and Use Cyanide and Process Chemical Induction training is provided by the Processing Trainers and the names of the employee, date of training and topic is recorded on the front of the knowledge assessment sheets. The knowledge assessment is the demonstration of understanding the training material.

Lihir Gold Mine | Signature of Lead Auditor | Date: 27/09/2023

2.9 Principle 9 – Dialogue and Disclosure

Engage in Public Consultation and Disclosure.

2.9.1 Standard of Practice 9.1

Promote dialogue with stakeholders regarding cyanide management and responsibly address identified concerns.

	☒ **in full compliance with**	
The operation is	☐ in substantial compliance with	Standard of Practice 9.1
	☐ not in compliance with	

Summarise the basis for this Finding/Deficiencies Identified:

LGL is in FULL COMPLIANCE with Standard of Practice 9.1 requiring an operation to promote dialogue with stakeholders regarding cyanide management and responsibly address identified concerns.

The operation undertakes community consultation and activities that provide its external stakeholders opportunities to communicate issues of concern via the following:

- A dedicated phone line for community contact, with phone number to call in public areas
- Open door policy and manned reception desk at the Londolovit town offices
- LGL Grievance Handling and Resolution Process
- Monthly community and stakeholder meetings

The community relations office is open from 9.00 am to 4.00 pm daily with the exception of Friday where it is open from 1:00 pm to 4:00 pm.

The LGL Social Performance Grievance Procedure applies to all stakeholders of the operation. It provides additional direct avenues for community engagement around grievances, including the ability to:

- Meet directly with LGL Community Relations staff, or Grievance Officers at Belisi Haus in Londolovit town centre
- Communicate by telephone, email, fax, or letter to LGL
- Communicate via community forums or other means.

The operation meets with community leaders on a monthly basis and concerns regarding operations can also be raised at these meetings.

2.9.2 Standard of Practice 9.2

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

	☒ **in full compliance with**	
The operation is	☐ in substantial compliance with	Standard of Practice 9.2
	☐ not in compliance with	

Summarise the basis for this Finding/Deficiencies Identified:

LGL is in FULL COMPLIANCE with Standard of Practice 9.2 requiring an operation make appropriate operational and environmental information regarding cyanide to stakeholders.

The operation has developed written descriptions of how its activities are conducted and how cyanide is managed, which are available to communities and other stakeholders.

Written management plans and procedures have been developed for cyanide facilities. The plans and procedures provide the framework for cyanide management practices on site and are available to LGL employees.

The operation has also developed cyanide fact sheets, presentations and a mini version of the Cyanide Management Procedure for dissemination to communities and other stakeholders during community engagement activities. LGL also provides written information via the community notice board, located at the Community Relations Office in the town centre.

The operation has disseminated information on cyanide in verbal form where a significant percentage of the location population is illiterate.

The operation has a number of mechanisms in place to disseminate verbal information on cyanide, including the monthly meetings with community leaders, the community radio station and during presentations to high school students and parents. Inclusion of verbal cyanide information will also be included in the mine tour and during the village "Wokabout" tours, where a considerable proportion of the population is illiterate.

The community radio station has a weekly health programme where information on cyanide is disseminated. The signal is received throughout the island the local Tok Pisin language is used to deliver messages to the communities.

The operation has mechanisms implemented to make information publicly available on cyanide release or exposure incidents, where applicable.

The Lihir Operations Papua New Guinea Emergency Management Team Plan contains a list of triggers that would result in the formation of the EMT; cyanide releases outside of primary bunded areas, life threatening injuries and fatalities are included as such triggers.

The CEMS provides guidelines on the actions that need to be taken to manage the incident, including reporting requirements. The CEMS defines the roles and responsibilities of various Newcrest/LGL departments in the event of an emergency. The CEMS manual also contains a Severity Matrix which presents the notification and escalation "thresholds" of potentially damaging events. The matrix provides a description of the potential types and/or outcomes of events, a measurement of severity and the teams that would potentially be involved for each. Each outcome has been rated against Newcrest's response priority acronym, known as P.E.A.R.L. which must be reflected in any response:

— People – protect the health, safety and wellbeing of those involved or affected (e.g. first responders, emergency response teams, impacted employees and contractors and affected communities) including impact minimisation and recovery.

— Environment – protect, preserve and restore the environment.

— Assets – repair property and process damage and offset production losses to the extent practical.

— Reputation – preserve and, where possible, enhance Newcrest's reputation.

Livelihood – return to safe operating conditions as quickly as possible

The Community Relations, Media and Environment Department is responsible for:

— Communicating with Government, public affairs groups and other external organisations on the implications of the event

— Providing prepared community updates for circulation via media and Community Relations Officers

— Preparing public release material to be used for media advice.

The government reporting requirement is for a phone call to be made to the Conservation and Environment Protection Authority (CEPA) about the incident, followed by a formal letter.

To date, no such cyanide related incidents have resulted in the formation of the Emergency Management Team or the requirement to share incident information.

3 Limitations

Your attention is drawn to the document titled – "Limitations statement", 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. This document has been prepared exclusively for internal use by Antipa Minerals Limited and is not a public facing document.

The Limitations statement document does not alter the obligations WSP has under the contract between it and its client.

Lihir Gold Mine | Signature of Lead Auditor | Date: 27/09/2023

Limitations

Appendix A

Limitation Statement

This Report is provided by WSP Australia Pty Limited (*WSP*) for Newcrest Mining Limited (*Client*) in response to specific instructions from the Client and in accordance with WSP's proposal dated 16th May 2022 and agreement with the Client dated 25th May 2022 (*Agreement*).

PERMITTED PURPOSE

This Report is provided by WSP for the purpose described in the Agreement and no responsibility is accepted by WSP for the use of the Report in whole or in part, for any other purpose (*Permitted Purpose*).

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The services undertaken by WSP in preparing this Report were limited to those specifically detailed in the Report and are subject to the scope, qualifications, assumptions and limitations set out in the Report or otherwise communicated to the Client.

Except as otherwise stated in the Report and to the extent that statements, opinions, facts, conclusion and / or recommendations in the Report (*Conclusions*) are based in whole or in part on information provided by the Client and other parties identified in the report (*Information)*, those Conclusions are based on assumptions by WSP of the reliability, adequacy, accuracy and completeness of the Information and have not been verified. WSP accepts no responsibility for the Information.

WSP has prepared the Report without regard to any special interest of any person other than the Client when undertaking the services described in the Agreement or in preparing the Report.

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