



August 2012

## INTERNATIONAL CYANIDE MANAGEMENT CODE CERTIFICATION AUDIT

# Newcrest Mining Ltd - Telfer Gold-Copper Mine Certification Audit Summary Audit Report

**Submitted to:**

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

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REPORT

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## **SUMMARY AUDIT REPORT FOR OPERATIONAL GOLD MINES**

**Name of Mine:** Telfer Gold Mine  
**Name of Mine Owner:** Newcrest Mining Limited  
**Name of Mine Operator:** Newcrest Telfer Gold Mine  
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### **LOCATION DETAIL AND DESCRIPTION OF OPERATION:**

Newcrest is Australia's largest gold producer and one of the world's top ten gold mining companies by production, reserves and market capitalisation. Headquartered in Melbourne, Australia, the Company has around 5100 employees and long-term contractors.

The origins of Newcrest date back to 1966, when Newcrest Mining Limited established an Australian subsidiary, Newcrest Australia Limited. In 1990, Newcrest 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 Newcrest Australia Limited.

Newcrest owns and operates six mines including Telfer. Two of these are located in Australia. These include Cadia Valley (Hill and Ridgeway), New South Wales and Telfer in the Pilbara region of Western Australia. Newcrest also has the Lihir and Hidden Valley Gold Operations in Papua New Guinea, Gosowong in Indonesia and the Bonikro operation in Côte d'Ivoire.


Newcrest's exploration is predominantly in Australia, however, internationally Newcrest are currently exploring in the USA and Peru.

Telfer is owned 100% by Newcrest. Telfer is located in north-west Western Australia in the Pilbara region in the Great Sandy Desert in the Paterson Province, approximately 450 km east-south-east of Port Hedland.

Telfer was the founding project for Newcrest Australia Limited after its discovery in 1971 and became the cornerstone of Newcrest following its creation in 1990. The original gold mine operated from 1977 to 2000 and produced almost six million ounces of gold. Telfer was redeveloped and opened in July 2005.

Telfer consists of an open pit mine and underground mining. The Telfer concentrator comprises a dual train comminution circuit followed by flotation and a carbon-in-leach (CIL) circuit. The two processing trains contain two stage grinding circuits each comprising a 15 MW SAG mill and 13 MW ball mill. Both streams contain a gravity gold recovery circuit. Approximately 40% of the gold at Telfer is produced as doré which is smelted on site. Following the gravity recovery circuit ore with:

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- A relatively low pyrite content is treated in a conventional single stage flotation circuit to produce gold-copper concentrate, or
- A higher pyrite content is treated via a sequential flotation process. The first stage is a conventional copper flotation with depression of pyrite to produce a gold-copper concentrate. Tails from the first stage are refloated to produce a pyrite-gold concentrate which is leached with cyanide in a conventional CIL circuit to recover the remaining gold as doré.

The gold-copper concentrate is trucked to Port Hedland for shipping to smelters, primarily in the East Asia region.

The Certification Audit was undertaken in accordance with ICMI's October 2009 version of the *Gold Mining Operations Verification Protocol* (the Protocol) and with reference to ICMI's *Auditor Guidance for Use of the Gold Mining Operations Verification Protocol* (Auditor Guidance) published October 2009. The Auditor Guidance was used to interpret the Protocol questions and help evaluate whether the risk management strategies being implemented at the operation conform to the Code's nine Principles and thirty-one Standards of Practice. The operation's flotation and grinding circuit where cyanide is used for the purpose of depressing pyrite as part of the copper circuit was excluded from the scope of this audit.

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**SUMMARY AUDIT REPORT  
AUDITORS FINDINGS**

The Newcrest Telfer Gold Mine is:

in full compliance with

in substantial compliance with

not in compliance with

**The International  
Cyanide Management  
Code**

**Audit Company:** Golder Associates  
**Audit Team Leader:** Edward Clerk, RABQSA International (14544)  
**Email:** eclerk@golder.com.au

**Name and Signatures of Other Auditors:**

Name	Position	Signature	Date
Edward Clerk	Lead Auditor and Technical Specialist		1 August 2012
Michael Woods	Auditor		1 August 2012
Rachel Beasley	Auditor		1 August 2012

**Dates of Audit:**

The Certification Audit was undertaken over three days (nine person-days) between 26 September 2011 and 29 September 2011. A second Certification Audit site visit was conducted over two days between 24 November 2011 and 25 November 2011.

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

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

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## **PRINCIPLE 1 – PRODUCTION**

### **Encourage Responsible Cyanide Manufacturing by Purchasing from Manufacturers that Operate in a Safe and Environmentally Protective Manner**

**Standard of Practice 1.1:** Purchase cyanide from manufacturers employing appropriate practices and procedures to limit exposure of their workforce to cyanide, and to prevent releases of cyanide to the environment.

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:**


Telfer is in FULL COMPLIANCE with Standard of Practice 1.1, requiring the operation 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.

Telfer purchases its sodium cyanide (cyanide) from Orica Australia Pty Ltd (Orica) under a Goods Contract that requires Orica to *provide cyanide that has produced at a production facility that has been certified as being in compliance with the Code.*

Orica was recertified as being fully compliant with the Code on 17 March 2010.

A review of delivery documents provided no evidence to suggest that Telfer receives bulk delivery of cyanide from any other producer.

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**PRINCIPLE 2 – TRANSPORTATION**

**Protect Communities and the Environment During Cyanide Transport**

**Standard of Practice 2.1:** Establish clear lines of responsibility for safety, security, release prevention, training and emergency response in written agreements with producers, distributors and transporters.

in full compliance with

The operation is

in substantial compliance with

**Standard of Practice 2.1**

not in compliance with

**Summarise the basis for this Finding/Deficiencies Identified:**

Telfer is in FULL COMPLIANCE with Standard of Practice 2.1, requiring that the operation establish clear lines of responsibility for safety, security, release prevention, training and emergency response in written agreements with producers, distributors and transporters.

Telfer’s Goods Contract with its cyanide producer (and transporter) designates responsibility for the transportation-related responsibilities identified by the Code.

The text of the Goods Contract does not specifically document all of the transportation responsibilities (a to l) listed in Standard of Practice 2.1 (question 1 and 2) in the Gold Mining Verification Protocol. Despite this the Australian Supply Chain of Orica, the cyanide transporter, was certified under the Code on 5 October 2010. The Certification Audit of the cyanide transport activities assures that the designation of responsibilities during transport has been adequately addressed.

**Standard of Practice 2.2:** Require that cyanide transporters implement appropriate emergency response plans and capabilities and employ adequate measures for cyanide management.

in full compliance with

The operation is

in substantial compliance with

**Standard of Practice 2.2**

not in compliance with


**Summarise the basis for this Finding/Deficiencies Identified:**

Telfer is in FULL COMPLIANCE with Standard of Practice 2.2, requiring that cyanide transporters implement appropriate emergency response plans and capabilities and employ adequate measures for cyanide management.

Telfer’s Goods Contract with its cyanide producer (and transporter) requires that the transporter be certified under the Code. The Australian Supply Chain of Orica, the cyanide transporter, was certified under the Code on 5 October 2010.

The operation has chain of custody records identifying all elements of the supply chain (producer and transporter) that handle the cyanide brought to its site.

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**PRINCIPLE 3 – HANDLING AND STORAGE**

**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**

**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:**

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

Facilities for unloading and storing cyanide have been designed and constructed in accordance with sound and accepted engineering practices for these facilities. A signed As-built Drawing for Dump Leach 5 was provided as evidence indicating that the cyanide unloading and storing facilities at have been designed and constructed in accordance with sound and accepted engineering practices.

Telfer commissioned Como Engineers Pty Ltd (Como Engineers) to conduct a Fit For Service Review Report for Cyanide Storage and Handling Facilities. The scope of the report included the cyanide unloading, mixing and storage facilities at Area 7 sparging facility and Dump Leach 5. An extensive data package was provided to the Auditors in February 2012. The package contained evidence in the form of completed change management requests, emails, photographs and other documents confirming that all the actions identified in the Fit For Service Review Report had been addressed.


Unloading and Storage Areas are located away from people and surface waters. Telfer has assessed the distances from Dump Leach 5 and Stage 7 sparging facility to the nearest permanent surface water body (Oakover River) , nearest residential location (Telfer Village) and nearest work office. Based on the distances recorded, it was advised that the operation has not considered it necessary to evaluate the potential for releases to surface water and/or human exposure.

The Stage 7 sparging facility has been designed and constructed such that cyanide is unloaded on a concrete surface. The surface has also been designed and constructed to drain any unplanned spillage or hose up solution to the secondary containment bund which serves cyanide mixing and storage. Liquid cyanide is not unloaded at Dump Leach 5.

Telfer uses level indicators and high-level alarms to prevent the overfilling of cyanide storage tanks. At the Stage 7 sparging facility, the Dissolution Tank and Storage Tank is fitted with two independent level sensors both with high and high-high level alarms. Both level sensors are linked to the distributed control system (DCS). At the Dump Leach 5, the mixing tank and storage tank has a level indicator with a high and high-high alarm that is linked to a separate DCS.

Cyanide mixing and storage tanks are located on a concrete or other surface that can prevent seepage to the subsurface. A site inspection and review of a signed As-built Drawing indicated that the cyanide mixing and storage tanks at Dump Leach 5 and the Stage 7 sparging facility are located on a concrete or other

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surface that can prevent seepage to the subsurface. The mixing and storage tanks at Dump Leach 5 have been designed and constructed to sit on concrete slab footings and at Stage 7 sparging facility have been designed and constructed to sit on concrete plinths.

An inspection of the secondary containment for cyanide storage and mixing tanks indicated that it was constructed of materials that provide a competent barrier to leakage. Both the Dump Leach 5 and the Stage 7 sparging facility secondary containments have been designed and constructed with concrete and appeared to be in good condition at the time of the audit.

The storage tanks at Dump Leach 5 and Stage 7 sparging facility are installed in the open and are vented to atmosphere at elevated locations away from occupied areas. Solid cyanide contained within sparge isotanks for the Stage 7 sparging facility is stored in an open air locked compound. Solid cyanide contained within sea containers for the Dump Leach 5 facility is stored in the open within the locked compound for the facility. HCN gas accumulates within the containers whilst they are locked closed. A procedure is in place to vent the containers before entry to remove boxes.

Cyanide boxes are stored within locked shipping containers and sparge isocontainers that prevent contact with water.

Access to the Stage 7 sparging facility is prevented though storing the sparge isocontainers in both a fenced compound; by the wire seals fitted to the valves by Orica; and on the security of the filling port (manhole) closures, which require tools and equipment to open them.

Access to Dump Leach 5 is prevented by storage in wooden boxes within sea containers. Liquid reagent is stored in a storage tank. Both the sea containers and the storage tank are located within a fenced compound that is locked when personnel are not in attendance.

Cyanide sparge containers are stored separate from all other materials in a secured enclosure before they are placed in the standby positions adjoining the bunded area. The standby positions are hydraulically separate from areas where incompatible materials are handled. The cyanide mixing and storage tanks are located within bunding that keeps them separate from other facilities.

**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:**

Telfer 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.

Telfer prevents the empty cyanide containers from being used for any purpose other than holding cyanide. Empty sparge containers are returned to Orica for reuse and empty cyanide boxes are of in the Telfer landfill. The Landfill is classed as a Category II waste facility that is authorised to accept 16 mg total cyanide per kilogram of waste.

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The *Cyanide Mixing at the Dump Leach Reagent Area* procedure notes that following cyanide mixing activities, plastic bags and liners are to be rinsed with water three times. The effluent is collected in the mixing tank containment sump and pumped to the intermediate pond. Rinsed bags placed back into the empty cyanide boxes for transportation to the Telfer landfill.

The Sparge from Cyanide Isotainers to Storage Tanks procedure requires Reagents Operators or Mill Operators to complete the Sparging Checklist which prescribes the cleaning of residue from around the isocontainer valves.

Two procedures have been developed covering the destuffing of the container and mixing and storing cyanide. The *Unloading Reagents from Containers* procedure details the steps necessary to safely and correctly destuff a cyanide container and transport cyanide boxes to the Reagent Mixing Area. The *Mixes Sodium Cyanide Solution* procedure details the steps necessary to safely and correctly mix a batch of sodium cyanide solution at the cyanide mixing facility in the Reagent Mixing Area.

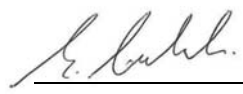
The mixing tank can only mix one box at a time and the storage tank cannot store multiple mix batches. Consequently only one cyanide box is removed from the container for each mix. The removal is detailed in the *Unloading Reagents from Containers* procedure and is conducted by a licensed and trained forklift driver.

Cyanide boxes are stacked two high within locked shipping containers. The Cyanide boxes were placed in the container by the cyanide supplier.

Section 8 of the *Mixes Sodium Cyanide Solution* competency assessment notes that the sump pump should be started immediately in the event that a spill occurs in the bund. The area is also hosed down upon completion of the job.

Section 1 of the *Mixes Sodium Cyanide Solution* competency assessment requires the mixing operation to be observed remotely. An initial check is made to ensure that the closed circuit television (CCTV) system is working and that an operator is available to observe the CCTV during the mixing operation.

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**PRINCIPLE 4 – OPERATIONS**

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

**Standard of Practice 4.1: Implement management and operating systems designed to protect human health and the environment 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:**

Telfer 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 areas of the operation that involve cyanide solutions greater than 0.5 mg/L WAD cyanide.

The operation has developed Safe Working Procedures (SWPs) for common tasks and uses Job Safety and Environmental Analysis (JSEA) tool for assessing and documenting steps and controls for non routine activities. The JSEA process is also used as an assessment tool to evaluate low level changes in the management of change process.

The operation has plans and procedures that identify the assumptions and parameters on which the facility design was based and applicable regulatory requirements as necessary to prevent or control cyanide releases and exposures consistent with applicable requirements. The assumptions and parameters on which the facility design was based and any applicable regulatory requirements are documented in the documented change management procedures for new works. The documents include:


- A risk assessment
- Detailed design drawings
- Pre-commissioning checklist
- Completion checklist
- As-built drawings with notes on specification requirements.

Important operating parameters are documented and explained in the SWPs, training manuals, operator log sheets, operating manuals and cyanide management plans.

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.

The SWPs identify the hazards associated with each task and the steps required to complete it safely. The SWPs have been developed for common tasks and use a JSEA tool for assessing and documenting steps and controls for non routine activities.

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The SWPs support a number of management plans and training manuals that have been developed for key operational areas, including unloading, mixing and storage facilities, leach plant, dump leach, SART, cyanide destruction, water management, and tailings impoundments. The Cyanide Management Plans, also in turn, refer to risk assessments, relevant SWPs, checklists and maintenance checks.

The *Change Management* procedure outlines the principles and process for use at Telfer to manage proposed temporary, permanent or emergency changes involving administrative, physical, operational or organisational modifications, alterations or substitutions to a system, a process, plant or equipment. The purpose of this procedure is to define the processes and/or path to be followed when a change/modification is required. Initially, any proposed change/modification should entail a full scope of the change/modification for relevant Managerial review and approval. A change/modification can be initiated by anyone who has identified a tangible reason for change or modification.

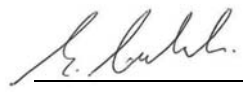
The operation has developed formal cyanide management documents that address contingency procedures for situations when inspections and monitoring identify a deviation from design or standard operating procedures. The operation has developed a Cyanide Emergency Response Plan (CERP) that addresses potential accidental releases of cyanide. This plan is dedicated to responding to cyanide emergencies. The CERP sits beneath the overarching Emergency Management Plan (EMP), which regulates the management of all emergencies involving the site.

The operation does inspect cyanide facilities on an established frequency sufficient to assure and document that they are functioning within design parameters. All process pumps, pipes, valves and tanks are registered within SAP. Specific maintenance tasks and associated frequencies have been assigned for each item. Documented inspections for cyanide facilities are conducted by maintenance personnel. In addition to documented inspections, daily inspections are conducted by plant personnel. These inspections are not documented. A Job Notification is, however raised for deficiencies identified during inspections conducted by maintenance and process plant personnel.

Evidence was available to demonstrate that the operation inspects all the required items at unloading, storage, mixing and process areas as follows:

- a) *Tanks holding cyanide solutions for structural integrity and signs of corrosion and leakage.* Telfer engaged engineering consultants ALS Global to conduct a process plant tank inspection in 2011 and develop a tank condition monitoring program. This program was integrated into SAP. In addition to scheduled maintenance inspections, all tanks are checked daily (external) by operators
- b) Telfer inspects secondary containments for their integrity, the presence of fluids and their available capacity, and to ensure that any drains are closed to prevent accidental releases to the environment. No valves are locked. This is conducted daily as part of routine operator checks. The checks are documented at Dump Leach 5 but not at the Stage 7 facility.
- c) One leak detection bore extends beneath the Dump Leach 5 process ponds. Dump Leach 5 process operators are required to check this bore daily as part of the daily operator checks for the presence of cyanide solution. Included in the operator check is the requirement to walk the solution perimeter drains checking for water beneath the liner indicating leaks. Groundwater monitoring bores are installed around the perimeter of the Dump Leach 5 and TSF and are monitored every three months.
- d) All process pumps, pipes, valves and tanks are registered within SAP. Specific maintenance tasks and associated frequencies have been assigned for each item. Maintenance personnel undertake weekly documented checks and operators conduct daily checks.
- e) Freeboards for the TSF and polishing ponds are inspected on a daily basis to confirm that they are still within the design limits.

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Inspections 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. All documentation reviewed contained the name of the inspector, the reviewer of the inspection form, and the date of the inspection. The field forms document deficiencies and include a description of the deficiency and immediate corrective action. Work Notification are created from the identified corrective actions and sent to the Maintenance Planners who then create a Work Order to rectify the identified deficiency.

Preventive maintenance programmes are implemented and activities documented to ensure that equipment and devices function as necessary for safe cyanide management. Telfer has determined what equipment is critical in preventing releases and exposures. SAP software is used to administer schedules, requirements and records of routine preventive maintenance activities. A review of preventative maintenance schedules of cyanide critical equipment confirmed that preventative maintenance inspection reports had been developed and scheduled for all cyanide critical equipment.

The operation does have necessary emergency power resources to operate pumps and other equipment to prevent unintentional releases and exposures in the event its primary source of power is interrupted. The operation generates its own primary power. Backup emergency power is supplied from diesel generators in the event that the primary power source is interrupted.

**Standard of Practice 4.2: Introduce management and operating systems to minimise 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:**


Telfer is in FULL COMPLIANCE with Standard of Practice 4.2, requiring that the operation limit the use of cyanide to that optimal for economic recovery of gold so that the waste tailings material has as low a cyanide concentration as practical.

Telfer conducts a programme to determine appropriate cyanide addition rates in the mill and evaluates and adjusts addition rates as necessary when ore types or processing practices change cyanide requirements. A monthly diagnostic leach study is undertaken and reported. Bottle rolls are undertaken quarterly.

Telfer has evaluated various control strategies for cyanide additions. The original design of Telfer was based on an intensive cyanide leach however based on known experience of successful leaching conditions used at other gold and copper mines, Telfer has moved to running with lower cyanide levels.

Telfer has implemented a strategy to control its cyanide addition. The CIL Cyanide Addition Guide is a chart that assists operators to identify optimum cyanide concentrations based on the results of copper assays. The Cyantist free cyanide analyser is used to control cyanide dosing to CIL tanks 25 and 27 on a shared basis, each tank is analysed twice per hour. The two concentration controllers are cascaded to their respective flow controllers to adjust the set point flow of cyanide reagent to the respective tanks.

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**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:**


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

Telfer has developed a probabilistic water balance model to ensure compliance with the ICMC. The model can run both deterministic and probabilistic scenarios. The Telfer water balance model can be considered probabilistic, as it takes into account variability and extremes in rainfall. The model can run Monte Carlo simulations, which means the entire system is simulated a large number of times (e.g. >1000 times), where each simulation is equally likely. The results of each independent realisation are assembled into probability distributions of possible outcomes.

The water balance model considers some of the following in a reasonable manner and as appropriate for the facilities and environment.

- The rates at which solutions are applied to leach pads and tailings. The model utilises the irrigation rate ( $m^3/m^2$ ) on Dump Leach Pad 5 (Dump Leach 5), as well as the top and base areas of the Dump Leach 5 and the percentage of the top area leached. The water balance considers the rate at which tailings are deposited onto the TSF.
- A design storm duration and storm return interval that provides a sufficient degree of probability that overtopping of the pond or impoundment can be prevented during the operational life of the facility. The base case deterministic scenario to be employed is assuming that a 1 in 100 years, 72 hour extreme storm event occurs during the future 24 months. The model also assumes that it occurs during the wettest year on record with a pump failure.
- The quality of existing precipitation and evaporation data in representing actual site conditions. The design storm was defined from a recent review of precipitation Intensity-Frequency-Duration data issued from Bureau of Meteorology
- TSF7 is a paddock style water management facility with no upgradient catchment areas. Ponds A and B catchments are considered in the water balance model. For Dump Leach 5, leached/infiltrated water from Dump Leach 5 Leach Pads is considered, along with the area of Dump Leach 5.
- Freezing and thawing is not applicable to the climate at Telfer.
- The total seepage rate from the bulk tailings to the groundwater system has been determined by estimating tailings properties, and also by comparison with seepage rates observed in similar conditions elsewhere. Both seepage and infiltration rates were calculated according to Darcy's Law. Evaporation is considered for all facilities. For Dump Leach 5, irrigation rates are considered as this is an outflow. All other facilities are lined with HDPE liners, and thus seepage is not considered.
- The model does consider pump failures, as the water balance model has a facility for the maximum volume on a particular day or days to be reduced or set to zero, to account for the influence of pump failures.

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- No solution is discharged to surface waters at Telfer.

The Dump Leach 5 Pump Area Manual includes a requirement to check pond levels. The TSF manual does not include a requirement to monitor the decant pond levels. Only facilities that contain process solutions are included in the water balance model, and therefore only these are checked.

The TSF operating manual discusses the freeboard requirements, but not that it should be monitored. The daily checks include freeboard checks (freeboard to pool > 500 mm).

Ponds and impoundments are designed and operated with adequate freeboard above the maximum design storage capacity determined to be necessary from water balance calculations. It is a statutory requirement to maintain adequate freeboard in the TSF. The freeboard requirements are specified by the Department of Mines and Petroleum (DMP) and the Department of Environment and Conservation. These requirements are contained in the Cyanide Management Plan.

A Storm Pond Assessment determined that the Dump Leach 5 had a catchment area of 68 ha, and perimeter drains had a catchment area of 4 ha. Including the ponds areas, the catchment is 78 ha, with an overall runoff coefficient of 0.55. The conclusion of the assessment determined that there is sufficient stormwater capacity within the existing pond system to contain the runoff generated from the design storm. The operation does measure on-site precipitation and evaporation on a daily basis.

Telfer collects climate information from the BoM station located at the mine site. These data are recorded daily.

The water balance manual recommends that the model is run a certain frequency for predictive, monitoring and calibration runs. These frequencies were confirmed by the Environmental Superintendent, however, since the water balance model was new at the time of audit, these runs had not been conducted. The water balance model will also act as a tool to ensure that any proposed change to the tailings management system will not increase the risk of unintentional discharge from the facilities to an unacceptable level.

**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:**


Telfer 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 has implemented measures to restrict access by wildlife to open waters where WAD cyanide exceeds 50 mg/L WAD cyanide.

The site has 15 open waters that could be considered cyanide facilities. Of these cyanide facilities, only irrigation ponding on Dump Leach 5 and Dump Leach 5 Pregnant, Intermediate and Barren process ponds have the potential to contain WAD cyanide levels above 50 mg/L.

There was no visible ponding on Dump Leach 5 at the time of the site visit. The ponding is managed by the *Eliminate Ponding on the Pad Surface* procedure. If ponding is discovered, the irrigation is switched off in the area to allow the area to dry out. The log sheets include a check for ponding, and the checks are carried out every four hours. Wildlife checks are carried out twice daily, at 0600 and 1800 at Dump Leach 5.

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At Dump Leach 5, reagent cyanide is added to the irrigation line rather than the ponds, resulting in the Pregnant, Intermediate and Barren ponds being operated below 50 mg/L WAD cyanide. There is however potential for the WAD cyanide levels to increase above 50 mg/L during upset conditions involving backflows from the Dump Leach 5 irrigation line into the ponds during shutdowns and pump failures. The sites operating licence requires the Pregnant, Intermediate and Barren ponds to be netted to restrict access by wildlife. During the Certification Audit, minor deficiencies were noted with the netting, which were rectified. However a storm event in January 2012 destroyed the repaired netting and damaged the supporting infrastructure. Telfer engaged a contractor to install a replacement net system, which was completed in July 2012. There were no bird deaths associated with cyanide ingestion during this period.

The leach facilities discharge solution at approximately 200 mg/L WAD cyanide. However, ponding does not occur regularly and is managed sufficiently to be low risk.

Maintaining a WAD cyanide concentration of 50 mg/l or less in open water appears to be effective in preventing significant wildlife mortality. There has not been any cyanide wildlife mortalities recorded during 2010 and 2011.

The operation does apply leach solutions in a manner designed to avoid significant ponding on the heap surface and limit overspray of solution off the heap liner. Additionally, Telfer has an *Eliminate Ponding on the Pad Surface* procedure that describes methods to eliminate ponding.

No ponding was observed during the site inspection.

**Standard of Practice 4.5: Implement measures to protect fish and wildlife from direct or 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**

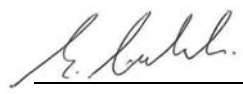
not in compliance with

**Summarise the basis for this Finding/Deficiencies Identified:**

Telfer 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.

Telfer does not have direct or indirect discharges to surface water. The nearest permanent water body to Telfer is the Oakover River, 140 km to the west.

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**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:**

Telfer 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.

Telfer has implemented preventative maintenance and monitoring measures to manage seepage to protect the beneficial uses of the groundwater beneath and/or immediately downgradient of the operation. All ponds and Dump Leach 5 are lined with HDPE liner to prevent seepage, with the exception being TSF7, which is lined with low permeability material.

WAD cyanide (at levels established by the applicable jurisdiction) in groundwater are at compliance point below or downgradient of the facility at or below levels that are protective of identified beneficial uses of groundwater. Seepage is also monitored through the groundwater bores surrounding the mine site.

The beneficial uses of groundwater have been established and authorised by the regulatory authority. Telfer has a groundwater extraction licence (Licence to Take Water) which states the Telfer is authorised a number of purposes. The Licence to Take Water states that Telfer shall comply with the *Water Supply Operating Strategy Mine Operations*. This document limits WAD cyanide levels at compliance points to <0.5 mg/L WAD cyanide.

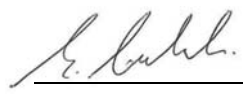
The operation's *Cyanide Management Plan* states that in accordance with Department of Environment and Conservation Licence, water samples are collected and analysed on a quarterly basis from key observation and production bores located around the TSF and Dump Leach 5. WAD cyanide concentrations are required to be below 0.5 mg/L. Bores surrounding the process plant are also monitored for cyanide.

A review of the groundwater monitoring data indicated that WAD cyanide levels were below 0.5 mg/L.

The operation does not use mill tailings as underground backfill.

Seepage from the operation has not caused cyanide concentrations of groundwater to rise above levels protective of beneficial use.

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**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:**

Telfer 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 cyanide unloading, storage, mixing and process solution tanks. Telfer has installed 17 lysimeter-type tank leak detection systems in the ring beam foundations of CIL, elution and SART tanks. With the exception of the 17 process solution tanks identified above all cyanide unloading, storage, mixing and process solution tanks are located within competent secondary containment. As-built drawings for the Stage 7 sparging facility indicates solid concrete plinths beneath the mixing and storage tanks.

Telfer undertook an assessment of containment volumes for all cyanide unloading, storage, mixing and process tanks. The available volume was then compared to the required volume that was calculated on a number of requirements. The assessment identified a number of deficiencies which were addressed during a capital works program and now all secondary containments for cyanide unloading, storage, mixing and process tanks are appropriately sized.

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.

All sumps have dedicated pumps and piping to return all water to the production process. No sumps are pumped to the environment or outside of the contained plant.


The operation does not have cyanide process tanks without secondary containment.

Telfer undertook an assessment of spill prevention or containment measures for all cyanide process solution pipelines. The calculations identified a number of deficiencies and a series of corrective works were initiated. All cyanide solution pipes now have spill prevention or containment measures installed to collect leaks and prevent releases to the environment.

The nearest permanent surface water is the Oakover River located approximately 140 km to the west. Based on this distance, it was concluded that pipelines do not present a risk to surface water.

Cyanide tanks and pipelines are constructed of materials compatible with cyanide and high pH conditions. Materials used include carbon steel and high-density polyethylene, which are well recognised for their suitability. In the CIL circuit, tanks are lined with a glass flake epoxy which has been used for over 5 years since it was included in the technical specification when it was approved for construction in 2003.

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**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:**


Telfer 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.

Quality control and quality assurance programmes have been implemented to varying to varying degrees during construction of new cyanide facilities and modifications to existing facilities, including cyanide unloading, storage, mixing facilities and other cyanide facilities. Evidence was not made available to enable a finding to be made through answering 4.8.1-4.8.4. Where there is no available quality control and quality assurance documentation or as-built certification for cyanide facility construction, the Auditor Guidance allows for an appropriately qualified person to inspect those elements of the facility involving cyanide and issue a report concluding that its continued operation within established parameters will protect against cyanide exposures and releases.

Telfer commissioned Como Engineers Pty Ltd (Como Engineers) to conduct a Fit For Service Review Report for Cyanide Storage and Handling Facilities. The report was specifically focused only on the areas of the Telfer that were listed in the scope of works document supplied to Como Engineers, and all comments are in relation to either solid sodium cyanide, liquid sodium cyanide solution or those areas of the plant where cyanide is in solution in any amount, concentration or form. The report specified 57 Mandatory Requirements and 57 Best Practice Requirements. A data package was provided to the Auditors in February 2012. The package contained evidence in the form of change management requests, emails, photographs and other documents confirming that all the actions identified in the Fit For Service Review Report had been addressed.

In addition to the cyanide facilities included within the scope of the Como Engineers Report, the Tailings storage facility was observed as it was not considered within the report. Coffey conducted a Technical Audit of TSF7 in 2010. The audit and report was completed by an appropriately qualified engineer. Two recommendations were made and Telfer has provided evidence in the form of revised documents and operating strategies satisfying the recommendations contained within the Coffey Technical Audit.

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**Standard of Practice 4.9: Implement monitoring programs to evaluate the effects of cyanide use on wildlife, 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:**

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

The operation has written standard procedures for monitoring activities for cyanide sampling, groundwater sampling, wildlife observations and monitoring and soil sampling which were prepared by the previous Environmental Superintendent who had a scientific based university degree.

The procedures contain information on how and where samples should be taken, sample preservation techniques, chain of custody procedures, shipping instructions and cyanide species to be analysed. Information relating to species to be sampled, frequency, bottle types, preparation, preservation and transportation of samples, as well as Chain of Custody information and QA/QC are included in the procedures.

Telfer provides a *Weather and Environmental Conditions* and *Comments* section on the sampling field sheets in which sampling conditions can be recorded. The auditor sighted a sampling field sheet from October 2011, the *Weather and Environmental Conditions* section had been completed.


The operation does not have a direct discharge to surface water. Telfer monitors groundwater surrounding the TSF and Dump Leach 5 quarterly. These would also capture any seepage from the plant.

The Cyanide Management Plan states that an Ornithology monitoring programme has been developed by Donato Environmental Services (Donato). The Dump Leach Operator stated that the TSF and Dump Leach 5 daily checks use the *Wildlife Monitoring Procedure* developed by Donato.

The auditor sighted completed check sheets for TSF7 and Dump Leach 5 for September 2011, and these showed that wildlife was being observed for and recorded. Telfer has not experienced wildlife mortality in relation to cyanide. It was advised that in the event of a mortality it is reported to the Environmental Department, who investigates and documents the event.

Monitoring is undertaken at frequencies adequate to characterise the medium being monitored and to identify changes in a timely manner. Monitoring frequencies are relevant to the area being sampled. Groundwater monitoring bores are sampled every three months for WAD cyanide; Decant and tails line are sampled every week for WAD cyanide; TSF decant is monitored every week for WAD cyanide; The Dump Leach 5 ponds are sampled every month for total cyanide, free cyanide and WAD cyanide samples; Freeboard in TSF7 and Dump Leach 5 ponds are monitored three times daily; and wildlife mortality observations are undertaken twice daily at the Dump Leach 5 ponds and pad, and weekly at TSF7.

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**PRINCIPLE 5 – DECOMMISSIONING**

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

**Standard of Practice 5.1: Plan and implement procedures for effective decommissioning of cyanide facilities to protect human health, wildlife and livestock.**

in full compliance with

The operation is

in substantial compliance with

**Standard of Practice 5.1**

not in compliance with

**Summarise the basis for this Finding/Deficiencies Identified:**

Telfer 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.

Newcrest has developed a *Cyanide Facilities Decommissioning Plan* for Telfer.

The *Cyanide Facilities Decommissioning Plan* contains an implementation schedule for decommissioning activities that commences three years prior to closure and concludes 12 months post-closure.

The operation reviews its decommissioning procedures for cyanide facilities during the life of the operation and revises them as needed. Telfer reviews the *Cyanide Facilities Decommissioning Plan* annually.

The *Cyanide Facilities Decommissioning Plan* is dated less than a year prior to the Certification Audit and consequently has not yet been revised.

**Standard of Practice 5.2: Establish an assurance mechanism capable of fully funding cyanide related decommissioning activities.**

in full compliance with

The operation is

in substantial compliance with

**Standard of Practice 5.2**

not in compliance with


**Summarise the basis for this Finding/Deficiencies Identified:**

Telfer 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.

Telfer has developed an estimate of the cost to fully fund third party implementation of the cyanide-related decommissioning measures as identified in its *Cyanide Facilities Decommissioning Plan*. The Schedule of Rates were reviewed by an independent consultant and determined to be suitable for a third party to undertake the works for those rates.

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.

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The Western Australian Department of Mines and Petroleum (DMP) has established a financial assurance for closure. The DMP has an Unconditional Performance Bond (UPB) system under Section 84 of the *Mining Act 1978*. The UPB is a contract between the minister and a third party of a financial standing acceptable to the Minister providing that third party to pay a sum of money to the Minister on his request following the failure of tenement holders to meet the previously agreed environmental conditions.

The UPB on the leases containing cyanide facilities is not sufficient to cover the decommissioning costs provided in the cost estimate. In response, Newcrest engaged an independent auditor to show that Newcrest's operations have sufficient financial strength to fulfil its closure obligations. The audit reviewed Newcrest's Financial Report, which was prepared in accordance with Australian Accounting Standards and the *Corporations Act 2001*.

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**PRINCIPLE 6 – WORKER SAFETY**

**Protect Workers’ Health and Safety from Exposure to Cyanide**

**Standard of Practice 6.1: Identify potential cyanide exposure scenarios and take measures as necessary to eliminate, reduce and control them.**

in full compliance with

The operation is

in substantial compliance with

**Standard of Practice 6.1**

not in compliance with

**Summarise the basis for this Finding/Deficiencies Identified:**

Telfer 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 unloading, mixing, plant operations, entry into confined spaces, and equipment decontamination prior to maintenance should be conducted to minimise worker exposure. The procedures identify the hazards associated with each task and the steps required to complete it safely. These procedures are provided to relevant personnel, who are required to be assessed competent against each procedure before they can undertake them unsupervised.

The operation has procedures to review proposed process and operational changes and modifications for their potential impacts on worker health and safety, and incorporate the necessary worker protection measures. The *Change Management* procedure outlines the principles and process for use within the operation to manage proposed temporary, permanent or emergency changes involving administrative, physical, operational or organisational modifications, alterations or substitutions to a system, a process, plant or equipment.

The operation does solicit and actively considers worker input in developing and evaluating health and safety procedures. The work crews use the JSEA process to provide feedback on the procedures and the SWPs, the comments are reviewed by the processing trainer and the procedures are amended as needed and re-issued. This is the primary mechanism for soliciting and considering worker input for procedures

The Cyanide Code Champion also stated that Newcrest have a policy of encouraging their workforce to comment and provide feedback on their systems, policies, procedures and work environment. This is achieved through daily toolbox meetings, monthly safety committee meetings and daily maintenance, mill and supply meetings.

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**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:**

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

The operation has adopted a minimum pH of 9.5 based on Orica guidance and MSDS. The operations CIL circuit is operated at a pH of 10.5-10.8 which is appropriate for limiting the evolution of HCN gas during mixing and production activities. The operation monitors pH levels regularly including the pH of feedwater. Due to the alkalinity of the water and the nature of the ore, little lime addition is required.

Where the potential exists for significant cyanide exposure, the operation uses both fixed and personal monitoring devices to confirm that controls are adequate to limit worker exposure to HCN gas. However, in order to further reduce the risk of worker exposure to HCN gas, the operation has installed fixed HCN monitors.

The operation has identified activities 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 mixing
- Maintenance work in the reagent area
- Replacing the cyanide pump

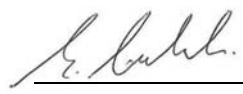
These activities require the following PPE:

- Portable HCN monitor
- Full length chemical resistant suit with hood
- Full face mask with canister
- Elbow length rubber gloves
- Gumboots.

Portable and fixed HCN monitors are maintained, tested and calibrated as per manufacturer requirements. All fixed monitors are calibrated annually by and external provider to the manufacturer's Service Manuals, Calibration Procedures and Quality Procedures Manual. One year's worth of calibration certificates was sighted by the Auditor.

Warning signs in English have been placed where cyanide is used, advising workers that cyanide is present and the necessary suitable PPE that must be worn. No smoking signs are posted throughout the mill area.

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In addition, the Mill Plant Induction, which is given to all personnel required to work unescorted in the area, states the requirements.

Showers, low-pressure eyewash stations and dry-powder fire extinguishers are strategically located throughout the operation in the cyanide areas. The fire extinguishers are inspected monthly and the showers weekly. Records of fire extinguisher inspections are maintained by the Emergency Response Team (ERT). The Process Department inspect the showers.

The operations *Pipe Labelling Procedure* states that the following means to alert workers to the content of cyanide bearing tanks and pipes are used on-site:


- Labelling of all cyanide tanks and lines (10%-30% NaCN) with lilac labels, indicating the direction of flow (as per Australian Standard 1345 Identification of the contents of piping, conduits and ducts).
- Signs (in English) stating "Cyanide Present, Please treat all vessels and lines as though they may contain cyanide" installed in various areas throughout the mill.
- Ore Processing Induction training highlights to inductees that:  
*"All slurry materials and water from the grinding circuit to the detoxification and Gold room contains a certain amount of cyanide."*

MSDS, first aid procedures and informational materials on cyanide safety were available in the language of the workforce in areas where cyanide is managed. MSDS are located in the mill control room, mixing area and available on the intranet.

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. Telfer has an incident reporting and investigation procedure used for all incidents resulting in:

- Injury or illness
- Environmental impact
- Community impact
- Equipment damage/process loss
- A near miss.

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**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:**

Telfer 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.

The operation has the necessary response and communication equipment readily available for use at cyanide unloading, storage and mixing locations.

The operation has the following response equipment available to respond to worker exposures:

- Oxygen – located in the mill control room, site clinic, ERT kit and Ambulance
- Cyanokits – located in the site medical clinic
- Two ambulances
- Personal protection and response equipment
- Safety showers located throughout the mill
- HAZMAT trailer (spill response/decontamination)
- Fire fighting equipment and hydrants
- Responder bags.

Safety showers are located throughout the mill.


Evidence was observed to show that 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.

The operation has five cyanokits securely stored at the medical centre and available in an emergency. Medical staff in the clinic inspect the cyanokits on the following frequencies:

- Daily for the emergency trolley
- Weekly for the portable cyanide exposure bag
- Monthly as part of a stock take for those kits in storage.

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

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The Cyanide Emergency Response Plan has the following response information regarding exposures, which is utilised by the ERT:

- PPE requirements
- Cyanide Poisoning Procedure
- Decontamination.

The operation does have its own on-site capability to provide first aid or medical assistance to workers exposed to cyanide.

The operation has a fully stocked medical centre with defibrillator, oxygen, cyanokits and two ambulances. The clinic is staffed with professional nurses and paramedic staff with support of off-site doctors via video or phone conferencing.

The operation has on-site capabilities to treat all cyanide exposures. As such, patients are unlikely to require transfer off site to other medical facilities. However, in the event that this is required, it is coordinated by the medical centre using the Royal Flying Doctor Service (RFDS).


The operation has developed a site specific cyanide emergency response plan (CERP) that is part of the overall emergency response plan for the site. The operation commissioned a third party to conduct training on the cyanide emergency response plan and the training consisted of formal class room training and practical simulation exercises.

The practical training undertaken during May 2011 was delivered with three scenarios:

- 1) Person down after suspected cyanide skin contamination
- 2) Table top scenario with container crane inadvertently interacting with the pipe racks between the SART plant and the reagent storage area; and
- 3) Live simulation with container crane inadvertently interacting with the pipe racks between the SART plant and the reagent storage area

Personnel from various departments (including ERT, medical and processing team members) were involved in the cyanide spill drills, whilst management personnel were involved in the desktop drill.

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**PRINCIPLE 7 – EMERGENCY RESPONSE**

**Protect Communities and the Environment through the Development of Emergency Response Strategies and Capabilities**

**Standard of Practice 7.1: Prepare detailed emergency response plans for potential cyanide releases.**

**in full compliance with**

The operation is

in substantial compliance with

**Standard of Practice 7.1**

not in compliance with

**Summarise the basis for this Finding/Deficiencies Identified:**

Telfer is in FULL COMPLIANCE with Standard of Practice 7.1 requiring an operation develop and implement emergency response plans and procedures to respond to worker exposure to cyanide.

The operation has developed a CERP that addresses potential accidental releases of cyanide.

This plan is dedicated to responding to cyanide emergencies. The CERP sits beneath the overarching EMP, which regulates the management of all emergencies involving the site.


The CERP does consider the potential cyanide failure scenarios appropriate for its site-specific environmental and operating circumstances. The CERP outlines general responses to cyanide releases and also has specific response information, including flow diagrams for different scenarios.

The information provided details the response actions of ERT personnel and considers on-site transportation emergencies. The CERP does describe specific response actions (as appropriate for the anticipated emergency situations) such as clearing site personnel and potentially affected communities from the area of exposure, use of cyanide antidotes and first aid measures.

Appendix A of the CERP outlines how the alarm for a cyanide emergency is raised internally. Appendix A then refers to the Evacuation Procedure for the evacuation of site personnel.

The site is remote from the nearest established community and the processing plant is several kilometres from the accommodation village which is the closest residential use to the mine site. The local Martu community have been consulted but the plausible scenario review does not anticipate emergencies affecting off site communities. The CERP does link with the Emergency Management Plan and the Emergency management Team (EMT) leader assesses the need to escalate the event to Crisis Status which involves wider communication.

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**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:**

Telfer is in FULL COMPLIANCE with Standard of Practice 7.2 requiring an operation develop and implement emergency response plans and procedures to respond to worker exposure to cyanide.

The operation has issued a newsletters to the workforce and local communities that describes what cyanide is, what the Code is, what emergency response training has been undertaken and what the operation is doing to prevent incidents. The flyer contains contact information for various personnel working with regard to cyanide management and encourages the reader to contact them if they have an issue or question regarding cyanide use at Telfer.

The operation is located in a remote area of Western Australia with the nearest regional centres with emergency services located over 300 km away and accordingly there are no outside responders (e.g. fire brigades) that would conceivably be involved in a response.

The operation has made contract with the RFDS in relation to patient transfer should a cyanide exposure occur. RFDS would provide medical evacuation of the patient to the nearest regional hospital (Port Headland). There are no external responders with a designated role in the CERP other than the RFDS for medical evacuation.

The CERP has been recently developed and the operation has used the existing mechanisms in place for consultation and communication with the local indigenous community.

**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:**

Telfer is in FULL COMPLIANCE with Standard of Practice 7.3 requiring an operation develop and implement emergency response plans and procedures to respond to worker exposure to cyanide.

The elements of the CERP and procedures do:

- Designate primary and alternate emergency response coordinators who have explicit authority to commit the resources necessary to implement the plan. The EMP designates the General Manager as the EMT Leader or a suitable/appointed Department Head as an alternate if the General Manager is unavailable.
- Identify emergency response teams. The CERP identifies several teams that would be involved with potential emergencies. The Crisis Management Team, EMT and the ERT under the control of the On Scene Commander.

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- Require appropriate training for emergency responders. Table 4 in Section 4.2 of the CERP details the training requirements for medical personnel and EMT and ERT members.
- Include call-out procedures and 24-hour contact information for the coordinators and response team members. The CERP and EMP include emergency call-out procedures and contact information.
- Specify the duties and responsibilities of the coordinators and team members. Duties and responsibilities are outlined in Section 4.0 of the EMP for all EMT members and Section 1.4 of the CERP for the ERT members and ERT Captain.
- List emergency response equipment, including personal protection gear, available along transportation routes and/or on site. Section 4.3 of the CERP lists the equipment that should be available for emergency response
- Include procedures to inspect emergency response equipment to ensure its availability. ERT equipment inspection frequencies have been entered into the site's event management software (Cintellate).
- Describe the role of outside responders, medical facilities and communities in the emergency response procedures. The only external responder detailed within the plan is the RFDS to provide medical evacuation by air. Due to the remote location, no other response actions by external parties are envisaged.

The only external responder detailed within the plan is the RFDS to provide medical evacuation by air. Due to the remote location, no other response actions by external parties are envisaged. The operation has made contact with the RFDS by email to confirm response for medical evacuation if needed.

**Standard of Practice 7.4: Develop procedures for internal and external emergency notification and reporting.**

in full compliance with

The operation is

in substantial compliance with

**Standard of Practice 7.4**

not in compliance with


**Summarise the basis for this Finding/Deficiencies Identified:**

Telfer is in FULL COMPLIANCE with Standard of Practice 7.4 requiring an operation develop and implement emergency response plans and procedures to respond to worker exposure to cyanide.

The operations emergency documentation includes procedures and contact information for notifying management, regulatory agencies, outside response providers and medical facilities of the cyanide emergency.

In the event of an emergency, personnel are instructed to raise the alarm via the emergency radio channel or the emergency phone number. These contact points are manned 24 hours a day by the Control Centre members, who assess what facets of emergency response are required. The ERT Captain is then required to attend the scene and undertake immediate containment and life saving actions and serve as the On Scene Commander (OSC) if one has not been appointed. The OSC contacts the EMT Leader (General Manager or appointed Department Head) and provides a briefing on the status of the emergency. A decision will then be made on whether the EMT requires activation. The EMT has personnel responsible for internal and external communication.

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The EMT is responsible for internal and external communication. The Telfer operation is a remote location and there are not communities that would need to undertake response actions for the plausible event scenarios investigated for the site.

The operation has mechanisms in place for communicating with indigenous owners of the area and communication with the media would be managed through the CMT.

**Standard of Practice 7.5: Incorporate in response plans and remediation measures monitoring elements that account for the additional hazards of using cyanide treatment chemicals.**

in full compliance with

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

not in compliance with

**Summarise the basis for this Finding/Deficiencies Identified:**

Telfer is in FULL COMPLIANCE with Standard of Practice 7.5 requiring an operation develop and implement emergency response plans and procedures to respond to worker exposure to cyanide.

The emergency response documentation does describe specific remediation measures for:

- Recovery or neutralisation of solutions and solids
- Decontamination of soils and other contaminated media
- Management and/or disposal of spill clean-up debris
- Provision of an alternate drinking water supply.

The CERP prohibits the use of chemicals to treat cyanide that has been released into surface water. Section 6.4 of the CERP states:

*Do not attempt to treat NaCN spills to any natural water supply. Treatment of cyanide spills to water should not be attempted. .*

The CERP allows the use of sodium hypochlorite to neutralise spills to soil. However, it prohibits the use of this chemical or other neutralising agents in surface drainage areas.

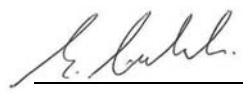
The CERP addresses the potential need for environmental monitoring to identify the extent and effects of a cyanide release. Section 8.4 of the CERP states that:

*Reactive environmental monitoring is performed to determine the extent and severity of contamination, where a release to the environment has occurred due to an emergency situation.*

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

- Water sampling
- Sediment (i.e. riverine) sampling
- Bioaccumulation sampling
- Toxicity sampling (including tailings).

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**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:**

Telfer is in FULL COMPLIANCE with Standard of Practice 7.6 requiring an operation develop and implement emergency response plans and procedures to respond to worker exposure to cyanide.

Section 1.0 of the CERP states:

*This Plan will be reviewed every 12 months and/or where there is a trigger event or incident that requires that to occur.*

Section 1.2 of the CERP states:

*The OHS Superintendent is responsible for maintaining and updating the Telfer CERP. This includes training applicable site personnel in various roles in Cyanide Emergency Response.*


Also, the operation has revised it several times as part of the fine tuning process. The operation uses desktop exercises and mock drills as part of the consultation process to keep the plan current. The document is yet to come up for annual review.

The operation conducted a number of cyanide exposure drills as part of its emergency response plan evaluation process in May 2011. Two practical drills and one desktop scenarios were undertaken during the training program.

These drills involved the processing personnel, management and the ERT responding to an exposure at the processing plant and removal of the patient to the clinic for treatment. The exercises were facilitated by a third party consultant that provided a summary report

The CERP has a requirement for review following its activation for a cyanide related emergency.

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**PRINCIPLE 8 – TRAINING**

**Train Workers and Emergency Response Personnel to Manage Cyanide in a Safe and Environmentally Protective Manner**

**Standard of Practice 8.1: Train workers to understand the hazards associated with cyanide use.**

**in full compliance with**

The operation is  in substantial compliance with **Standard of Practice 8.1**

not in compliance with

**Summarise the basis for this Finding/Deficiencies Identified:**

Telfer is in FULL COMPLIANCE with Standard of Practice 8.1 requiring an operation develop and implement emergency response plans and procedures to respond to worker exposure to cyanide.

The operation does train all personnel who may encounter cyanide in cyanide hazard recognition. The site includes Sodium Cyanide Awareness training in the induction package and this is required to be allowed to work in the processing area. The training material covers cyanide hazard and management topics.

The Processing Trainer maintains a spreadsheet based training matrix which shows personnel have completed cyanide awareness training. A review of randomly selected personnel files confirmed personnel had completed the training and the matrix was reflective of training status on the site. At the time of audit, these training records were being transferred to an electronic database.


Short term visitors do not receive Cyanide Awareness Training. However, they cannot enter cyanide areas, such as the mill, unescorted.

Cyanide hazard recognition refresher training is periodically conducted. The operation has established a two year refresher cycle for the Cyanide Awareness Training and Reagent Training Program. This is documented within the Training Matrix and the majority of the personnel on the site completed the training in 2011.

The operation is in the process of transferring records to a training database that will prompt for refreshers. The processing trainer currently manages the training matrix and manually reviews training status across processing and maintenance.

Training records have been retained. The Auditor viewed certificates and attendance records.

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**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:**

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

New starters are complete a general induction that provides information on safety and the environment including hazard and risk assessment tools (JHA etc). Personnel that work in the processing plant undertake an area specific induction that includes cyanide awareness and reagent awareness. The inductions provide information on the hazards and controls in place at the operation. This training includes a practical cyanide exposure exercise and orientation tour of the processing plant. Maintenance personnel complete the same induction training and processing personnel.

Once process workers have completed the inductions they are teamed with an experience operator and provided on the job training. Supervisors in the processing plant have experience and qualifications in work place assessment and training. Workers are trained and assessed on standard work procedures including unloading, mixing and production tasks.

The training elements necessary for each job involving cyanide are identified in training material.

Along with step by step task information contained within each procedure, each procedure has a corresponding assessment that lists the key training elements that each worker must be found competent in. Shift Supervisors, who are qualified trainers, use this list to mark off competence before signing off that the worker can complete that task unaccompanied. All Shift Supervisors have undergone Training for Trainers at a certified external training establishment.


All personnel undergo Sodium Cyanide Awareness training prior to the commencement of work. They are required to undergo refresher training every two years.

The operations training system does require the evaluation of cyanide training effectiveness by testing and observation. New starters are assessed and observed against each relevant procedure by the Shift Supervisor. If deemed competent in a procedure by the Shift Supervisor, new starters can then work unaccompanied on that task.

Records 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. Training is based on formal competency training which requires this information to be recorded. The processing trainer maintains hard copy files of training records and a random sample of training files showed that records are retained.

The operation was in the process of transferring training records to an electronic database.

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**Standard of Practice 8.3: Train appropriate workers and personnel to respond to worker exposures and environmental releases of cyanide.**

**in full compliance with**

The operation is  in substantial compliance with **Standard of Practice 8.3**

not in compliance with

**Summarise the basis for this Finding/Deficiencies Identified:**

Telfer is in FULL COMPLIANCE with Standard of Practice 8.3 requiring an operation develop and implement emergency response plans and procedures to respond to worker exposure to cyanide.

Cyanide unloading, mixing, production and maintenance personnel are trained in the procedures to be followed if cyanide is released. This is conducted during induction and refresher training and includes a practical cyanide exposure exercise.

The operation has developed SWPs for response to cyanide spills and has developed at CERP. All personnel working in the processing area complete the cyanide awareness training which includes information on actions to take if cyanide is released.

All personnel also 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 is the main combat team in relation to emergency response with support of experience personnel in the area of the emergency. A training consultant has been engaged to provide training in cyanide emergency response. This training includes use of emergency equipment, first aid and mock drills using the procedures detailed within the CERP. The training scenarios included worker exposure and release of cyanide from a pipeline from a container crane interaction. These drills were conducted as part of training provided by external emergency response trainers and summarised in a report.

In addition, ERT members also receive frequent skills training through weekly in-house training.

The operation is located in a remote area of Western Australia with the nearest regional centres with emergency services located over 300 km away and accordingly there are no outside responders (e.g. fire brigades) that would conceivably be involved in a response.


The operation has made contract with the RFDS in relation to patient transfer should a cyanide exposure occur. RFDS would provide medical evacuation of the patient to the nearest regional hospital (Port Headland).

The cyanide emergency drills that have been conducted by the operation, as part of CERP training, were evaluated from a training perspective by the consultant. At the time of audit, 70 personnel on-site had completed the training rolled out in May 2011.

In addition to the CERP based drills the Processing Trainer also conducts were exposure exercises as part of the processing induction which is evaluated to assess if personnel have the knowledge and can demonstrate appropriate response actions.

ERT training attendance sheets, documenting the training, name of trainer and trainee, the date, topics covered and the how an understanding was demonstrated have been kept for review by the Auditor.

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**PRINCIPLE 9 – DIALOGUE**

**Engage in Public Consultation and Disclosure**

**Standard of Practice 9.1: Provide stakeholders the opportunity to communicate issues of concern.**

in full compliance with

The operation is

in substantial compliance with

**Standard of Practice 9.1**

not in compliance with

**Summarise the basis for this Finding/Deficiencies Identified:**

Telfer is in FULL COMPLIANCE with Standard of Practice 9.1 requiring an operation to provide opportunity for stakeholders to communicate issues of concern regarding the management of cyanide.

Telfer provides phone numbers, addresses, facsimiles and email addresses on its website, [www.newcrest.com.au](http://www.newcrest.com.au). The Newcrest Sustainability Report contains a name for the Newcrest’s Head of Environment, along with an address and email address.

The *Kujungkarrini* newsletter is distributed to members of the Martu community, which contains a mobile number and email address of the Community Relations Team. The website linked the newsletter, <http://www.kujungkarrini.com.au>, contains a contact page with the phone and facsimile numbers of Telfer’s community relations team.

The *Telfer Tattler* newsletter is distributed to Telfer staff and contains phone numbers of the editorial team, including the Manager – Support Services. The newsletters also provide the web address for the ICMC.

Telfer has also held a community presentation for the Martu elders, in which the community could ask questions and raise concerns. A member of the community emailed the Manager – Support Services (who gave the presentation) requesting a copy of the presentation and the ICMC article that was in both newsletters.

Morning toolbox meetings are held at Telfer in which site personnel can raise issues regarding cyanide.

**Standard of Practice 9.2: Initiate dialogue describing cyanide management procedures and responsively address identified concerns.**

in full compliance with

The operation is

in substantial compliance with

**Standard of Practice 9.2**

not in compliance with


**Summarise the basis for this Finding/Deficiencies Identified:**

Telfer is in FULL COMPLIANCE with Standard of Practice 9.2 requiring an operation to initiate dialogue describing cyanide management procedures and responsively addressing identified concerns.

Telfer has created opportunities for the operation to interact with stakeholders and provide them with information regarding cyanide management practices and procedures.

At an operational level, Telfer has developed the following opportunities to communicate to internal and external stakeholders (as discussed in 9.1.1):

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- Cyanide awareness training for employees that may be at risk to exposure.
- Regular toolbox meetings where cyanide issues are discussed and raised by site personnel.
- www.newcrest.com.au
- *Telfer Tattler* Newsletter
- *Kujungkarrini* Newsletter
- Community Presentation.

Telfer distributes two newsletters to local communities and employees, for which Edition 14, Winter 2011 (*Kujungkarrini*), Edition 34, 2<sup>nd</sup> Quarter 2011 (*Telfer Tattler*) contain articles about Telfer seeking Certification under the ICMC.

**Standard of Practice 9.3: Make appropriate operational and environmental information regarding cyanide available to stakeholders.**

in full compliance with

The operation is

in substantial compliance with

**Standard of Practice 9.3**

not in compliance with

**Summarise the basis for this Finding/Deficiencies Identified:**

Telfer is in FULL COMPLIANCE with Standard of Practice 9.3 requiring an operation make appropriate operational and environmental information regarding cyanide to stakeholders.

Telfer has developed written descriptions of how their activities are conducted and how cyanide is managed. The Edition 14, Winter 2011 (*Kujungkarrini*) and Edition 34, 2<sup>nd</sup> Quarter 2011 (*Telfer Tattler*) describe what Telfer is doing to reduce the risks of cyanide exposure and how the operation is preventing impacts of cyanide on the environment.

Based on the isolated nature of Telfer, and discussions with the Manager – Support Services, it was considered that the illiterate proportion of the local population did not constitute a significant percentage. Consequently, verbal dissemination of material was not considered warranted. However, Telfer do present to local communities, and have provided a presentation on the cyanide code.

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


Newcrest has an *Incident Reporting and Investigation* procedure that applies to all sites. Newcrest also has a *Community Notification of Cyanide Incident* procedure that details that Telfer must make publically available information related to any confirmed cyanide incidents both on and off the mine site.

The information shall be made available via appropriate methods such as the Newcrest website, *Telfer Tattler*, *Kunjugkarrini* newsletter and *Kunjugkarrini* website.

Telfer is required by law to report cyanide incidents to the DMP in its Annual Environmental Report, which can be requested by the public from the DMP.

Newcrest produces sustainability reports and this includes spills and incidents that occur at Telfer. The *Newcrest Sustainability Report* lists all companywide incidents as a total figure. This report is available on the Newcrest website.

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## Report Signature Page

**GOLDER ASSOCIATES PTY LTD**

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# **APPENDIX A**

## **Limitations**





## LIMITATIONS

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