

Golder Associates Pty Ltd

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1 June 2007

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International Cyanide Management Institute (ICMI)
1200 G Street, NW, Suite 800
WASHINGTON DC 20005
United States of America

Attention: Mr Norm Greenwald

Dear Sir

**ORICA AUSTRALIA PTY LTD
YARWUN SODIUM CYANIDE PRODUCTION FACILITY, QLD AUSTRALIA
CORRECTIVE ACTION IMPLEMENTATION VERIFICATION**

BACKGROUND

Orica's Yarwun sodium cyanide production facility, which is located approximately 8 km by road from Gladstone, Queensland, commenced operations in 1989 and is engaged in the manufacture of cyanide (both solid and liquid forms), ammonium nitrate, nitric acid, chlorine, sodium hydroxide, sodium hypochlorite, hydrochloric acid and expanded polystyrene balls. The cyanide manufactured at this facility is used in gold mining operations within Australia, Asia, Africa and South America.

CORRECTIVE ACTION PLAN

The *Yarwun Sodium Cyanide Production Facility Detailed Audit Report* (Golder Associates 2006) identified the following Production Practices as being 'substantially compliant with the *International Cyanide Management Code For the Manufacture, Transport, and Use of Cyanide In the Production of Gold* (Code):

- Production Practice 1.1: Design and construct cyanide production facilities consistent with sound, accepted engineering practices and quality control/quality assurance procedures.
- Production Practice 1.2: Develop and implement plans and procedures to operate cyanide production facilities in a manner that prevents accidental releases.
- Production Practice 1.3: Inspect cyanide production facilities to ensure their integrity and prevent accidental releases.
- Production Practice 2.1: Develop and implement procedures to protect plant personnel from exposure to cyanide.

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

Golder, as the auditor of the site is required to verify full implementation of the *Yarwun Sodium Cyanide Production Facility Corrective Action Plan* (Golder Associates 2006) (Corrective Action Plan) and report the results to the International Cyanide Management Institute no later than 30 days after the established corrective action date. The corrective action date for full implementation of the Corrective Action Plan was determined to be the final date listed within the Corrective Action Plan, *i.e.* 1 October 2007.

VERIFICATION OF CORRECTIVE ACTIONS

A review of the evidence presented by Orica supporting the full implementation of the Corrective Action Plan was conducted by Golder in May 2007. The review verified that Orica had fully implemented the Corrective Action Plan and this letter is formal notification of this verification to the International Cyanide Management Institute within the specified timeframe.

The following sections detail:

- the original deficiencies observed;
- the corrective actions proposed by Orica within the Corrective Action Plan; and
- a statement that the required evidence was observed and the Yarwun Cyanide Production Facility is fully compliant with the Production Practice and Element noted.

Corrective Action 1.1.5

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

Element 5: Is cyanide managed on a concrete or other surface that can minimise seepage *to the subsurface*?

Deficiencies

The following deficiencies were noted within the *Yarwun Sodium Cyanide Production Facility Detailed Audit Report* (Golder Associates 2006):

- Whilst there is an extensive concrete surface, there are cracks in the concrete that cause doubt as to whether the concrete can minimise seepage to the subsurface.
- The Solids Dissolving Tank is set in the ground without an impermeable surface between it and the ground.
- Whilst the perimeter drain is reported to be lined over concrete, it is also reported that the lining material has spalled from the concrete in parts.

Corrective Action

Corrective actions necessary to bring the operation into “full compliance” have been identified as:

- Concrete surface to be repaired or coated to eliminate cracks in the surface. The repairs will be to a standard to restore the integrity of the impermeable surface.
- A second skin will be installed on the solids dissolving tank to provide double containment. The gap between the containment layers will be able to be sampled for possible leaks from the storage tank.
- Undertake a review of lining within the perimeter drain and repair or replace defected lining.

Evidence Observed

A report dated 31 May 2007 was submitted to Golder Associates detailing the actions taken by Orica to achieve full compliance with the Corrective Action Plan. Based on the evidence observed within the report it can be confirmed that the Yarwun Sodium Cyanide Facility is now in ‘full compliance’ with Element 5 of Production Practice 1.1. The report provided sufficient evidence to show:

- The concrete surface on the ground floor of the Sodium Cyanide Facility has been repaired to restore the integrity of the surface. Photographs were attached in Appendix A of the report.
- A ‘second skin’ was installed on the solids dissolving tank during the Sodium Cyanide Facility shutdown during May 2007. Engineering drawings of the new design and photographs of installation were attached in Appendix A of the report.
- A review was undertaken to assess lining quality within the perimeter drain and repairs of defective lining carried out where required. Photographs of the repaired sections were attached in Appendix A of the report.

Corrective Action Plan 1.1.8

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

Element 8: Are spill prevention or containment measures provided for all cyanide solution pipelines?

Deficiencies

The following deficiency was noted within the *Yarwun Sodium Cyanide Production Facility Detailed Audit Report* (Golder Associates 2006):

- Spill prevention or containment measures are not provided for underground drainage pipes that link the cut-off drain around the facility to the effluent pit.

Corrective Action

Corrective actions necessary to bring the operation into “full compliance” have been identified as:

- Perform an underground drainage review with aim of providing appropriate containment.
- Implement changes identified within review.

Evidence Observed

A report dated 31 May 2007 was submitted to Golder Associates detailing the actions taken by Orica to achieve full compliance with the Corrective Action Plan. Based on the evidence observed within the report it can be confirmed that the Yarwun Sodium Cyanide Facility is now in ‘full compliance’ with Element 8 of Production Practice 1.1. The report stated review of the underground drainage line leading to the effluent sump 603 had been conducted by Tony Lumley (Bechtel), Ray Hobbs, John Kolesky and Tony Evans (Orica). Input was also obtained from Pradip Parghi, an independent consultant formerly of Orica who designed the drains.

Included within the review was a risk assessment of the drains. It was noted that the drains are designed to be self-draining, and as such are not normally subject to any hydrostatic head of retained cyanide-bearing liquor. Passage of liquor through the drains will be momentary, as wash liquor traverses them to the treatment sump. The combined effect of low pressure and short duration makes the likelihood of loss of containment of cyanide to ground small, unless the integrity of the pipes is significantly compromised.

Alternatives to the existing drainage arrangements were considered and included:

- Double lining the pipes, however this was rejected on the grounds of impracticality due to depth and intervening underground and above ground services.
- Replacing the pipes with an above ground trench, however this was rejected on the grounds that it would require intermediate pits and pumps to overcome the fall at the point where the pipes commence.
- Eliminating the pipes with interceptor pits and overhead pipes was the most feasible option, but it was likely to introduce more risk of loss of containment than it avoided, through the added failure opportunities of pumps and instrumentation.

The changes implemented based on the review included:

- Engaging a contractor to purge and evacuate the drains of accumulated debris.
- Hydraulically testing the lines using inflatable plugs to confirm integrity.
- Implementing a Planned Maintenance regime in the Trident work order system to maintain the drains in a clear condition.

Examples of the Hydraulic Test Records were attached in Appendix B of the report.

Corrective Action Plan 1.2.4

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

Element 4: Are preventive maintenance programs implemented and activities documented for equipment and devices necessary for cyanide production and handling?

Deficiencies

The following deficiency was noted within the *Yarwun Sodium Cyanide Production Facility Detailed Audit Report* (Golder Associates 2006):

- Orica has identified that cyanide solution pipelines pose sufficient risk, however they are not included within a preventative maintenance programme.

Corrective Action

Corrective actions necessary to bring the operation into “full compliance” have been identified as:

- Develop a preventative maintenance programme for the regular monitoring of Critical Duty Pipelines.
- Implement the preventative maintenance programme.

Evidence Observed

A report dated 31 May 2007 was submitted to Golder Associates detailing the actions taken by Orica to achieve full compliance with the Corrective Action Plan. Based on the evidence observed within the report, it can be confirmed that the Yarwun Sodium Cyanide Facility is now in ‘full compliance’ with Element 4 of Production Practice 1.2.

Orica has identified a number of critical duty pipelines within the Sodium Cyanide Facility. A Risk Based Inspection (RBI) review was been undertaken according to AS 3788/AP I580 & AP I581 to determine appropriate timing and methodology for routine monitoring of these pipelines to ensure adequate engineering integrity. This review was been done in conjunction with external consultants specialising in this field (Rexsan).

Preventative Maintenance routines were entered into the Sodium Cyanide Facility’s maintenance management system, where work orders for the routines are both displayed and printed at the required frequency to ensure the work is undertaken.

Results of the Preventative Maintenance reports are included in the Critical Pipeline Register.

The RBI assessment system looked at all significant impacts on the pipeline and also considered known inspection results and previous incidents in determining required maintenance strategies. A review of operating parameters outside of normal operating conditions was also taken into consideration. Key information includes, but is not limited to: pressure, temperature, fluid flow (velocity), fluid material, materials of construction, pipe schedule and pipe configuration and layout.

Common tests undertaken as part of the preventative maintenance routine are:

- Ultrasonic thickness testing.

- Visual inspection of lagging integrity.
- Crack detection on high stress areas of SS pipe/tank (both internal and under lagging as required) including welds.
- Physical assessment of condition of supports, hangers and brackets.
- Visual inspection for pipe joint leaks.
- Condition of painting systems (where applicable).

Examples of preventative maintenance records were attached in Appendix C of the report.

Corrective Action Plan 1.3.1

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

Element 1: Does the facility conduct routine inspections of tanks, valves, pipelines, containments and other cyanide production and storage facilities, including:

- a) Tanks holding cyanide solutions for structural integrity and signs of corrosion and leakage?
- b) Secondary containments for their integrity, the presence of fluids and their available capacity, and to ensure that any drains are closed and, if necessary, locked, to prevent accidental releases to the environment?
- c) Pipelines, pumps and valves for deterioration and leakage?

Deficiencies

The following deficiency was noted within the *Yarwun Sodium Cyanide Production Facility Detailed Audit Report* (Golder Associates 2006):

- The facility does not conduct routine inspections of tanks, valves, pipelines, containments and other cyanide production and storage facilities, including:
 - a) Tanks holding cyanide solutions for structural integrity and signs of corrosion and leakage.
 - c) Pipelines and valves for deterioration and leakage.

Corrective Action

Corrective actions necessary to bring the operation into “full compliance” have been identified as:

- Develop a preventative maintenance programme for the regular monitoring of Critical Duty Tanks and Pipelines.
- Implement the preventative maintenance programme.

Evidence Observed

A report dated 31 May 2007 was submitted to Golder Associates detailing the actions taken by Orica to achieve full compliance with the Corrective Action Plan. Based on the evidence observed within the report it can be confirmed that the Yarwun Sodium Cyanide Facility is now in ‘full compliance’ with Element 1 of Production Practice 1.3.

Orica has identified a number of critical duty pipelines within the Sodium Cyanide Facility. A Risk Based Inspection (RBI) review was been undertaken according to AS 3788/AP I580 & AP I581 to determine appropriate timing and methodology for routine monitoring of these pipelines to ensure adequate engineering integrity. This review has been done in conjunction with external consultants specialising in this field.

Preventative Maintenance routines were entered into the Sodium Cyanide Facility's maintenance management system, where work orders for the routines are displayed and printed from at the required frequency to ensure the work is undertaken.

Results of the Preventative Maintenance reports are included in the Critical Pipeline Register.

The RBI assessment system looked at all significant impacts on the pipeline and also considered known inspection results and previous incidents in determining required maintenance strategies. A review of operating parameters outside of normal operating conditions was also taken into consideration. Key information includes, but is not limited to: pressure, temperature, fluid flow (velocity), fluid material, materials of construction, pipe schedule and pipe configuration and layout.

Common tests undertaken as part of the preventative maintenance routine are:

- Ultrasonic thickness testing
- Visual inspection of lagging integrity
- Crack detection on high stress areas of SS pipe/tank (both internal and under lagging as required) including welds
- Physical assessment of condition of supports, hangers and brackets
- Visual inspection for pipe joint leaks
- Condition of painting systems (where applicable)

Examples of preventative maintenance records were attached in Appendix C of the report.

Corrective Action Plan 2.1.10

Production Practice 2.1: Develop and implement procedures to protect plant personnel from exposure to cyanide.

Element 10: Are there warning signs advising workers that cyanide is present and that, if necessary, suitable personal protective equipment must be worn?

Deficiencies

The following deficiency was noted within the *Yarwun Sodium Cyanide Production Facility Detailed Audit Report* (Golder Associates 2006):

- The location and content of the vast majority of signs observed during inspections of the Site appeared adequate, however a number of signs observed within the Cyanide Plant were faded and difficult to read, as a result the facility was considered partially compliant with this requirement.

Corrective Action

Corrective actions necessary to bring the operation into “full compliance” have been identified as:

- Identify signage requirements.
- Install updated signage throughout the plant.

Evidence Observed

A report dated 31 May 2007 was submitted to Golder Associates detailing the actions taken by Orica to achieve full compliance with the Corrective Action Plan. Based on the evidence observed within the report it can be confirmed that the Yarwun Sodium Cyanide Facility is now in ‘full compliance’ with Element 10 of Production Practice 2.1.

Signage requirements were identified, purchased and installed based on a formal signage review conducted by Orica. Examples of replaced signage were attached in Appendix D of the report.

Corrective Action Plan 2.2.6

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

Element 6: Are storage tanks, process tanks, containers and piping containing cyanide identified to alert workers of their contents? Is the direction of cyanide flow in pipes designated?

Deficiencies

The following deficiency was noted within the *Yarwun Sodium Cyanide Production Facility Detailed Audit Report* (Golder Associates 2006):

- Storage tanks, process tanks, containers and piping containing cyanide were noted as not being consistently labelled within the Cyanide Plant to alert workers of their contents and the direction of flow. The one exception included the recently installed Second Back End, which appeared appropriately labelled.

Corrective Action

Corrective actions necessary to bring the operation into “full compliance” have been identified as:

- Identify label requirements.
- Install updated signage throughout the plant.

Evidence Observed

A report dated 31 May 2007 was submitted to Golder Associates detailing the actions taken by Orica to achieve full compliance with the Corrective Action Plan. Based on the evidence observed within the report it can be confirmed that the Yarwun Sodium Cyanide Facility is now in ‘full compliance’ with Element 6 of Production Practice 2.2.

Labelling requirements were identified, purchased and installed based on a formal labelling review conducted by Orica. Examples of replaced labels were attached in Appendix D of the report.

STATEMENT OF COMPLIANCE

Based on the evidence observed, I am satisfied that Orica have fully implemented the Corrective Action Plan submitted to the ICMI and consequently the Yarwun Sodium Cyanide Production Facility is in 'full compliance' with the *International Cyanide Management Code For the Manufacture, Transport, and Use of Cyanide In the Production of Gold*.

Should you require any additional information, please do not hesitate to contact me.

Yours faithfully

GOLDER ASSOCIATES PTY LTD



Edward Clerk
RAB/QSA 020778, CEnvP, ICMI Lead Auditor

Manager Mining Environmental Services Group

Attachments: A - Corrective Action Plan Verification Statement

Hard copy to follow by mail: Yes No

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ATTACHMENT A
CORRECTIVE ACTION PLAN VERIFICATION STATEMENT

**SUMMARY AUDIT REPORT
FOR CYANIDE PRODUCTION OPERATIONS**

Name of Cyanide Production Facility: Yarwun Sodium Cyanide Production Facility
Name of Facility Owner: Orica Australia Pty Ltd
Name of Facility Operator: Orica Australia Pty Ltd
Name of Responsible Manager: Robert Mossop, Yarwun Site Manager
Address: Reid Road via Gladstone, Gladstone
State/Province: Queensland
Country: Australia
Telephone: +61 7 49763500
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E-Mail: robert.mossop@orica.com
Audit Company: Golder Associates Pty Ltd
1 Havelock Street
West Perth, Western Australia, 6005
AUSTRALIA
Audit Team Leader: Edward Clerk, CEnvP, RABQSA Cert No. 020778
Email: eclerk@golder.com.au

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 the Corrective Action Plan dated November 2006 has been fully implemented and Orica Australia's Yarwun Sodium Cyanide Production Facility is:

- in full compliance with
 in substantial compliance with
 not in compliance with

**The International
Cyanide Management
Code**



Edward Clerk
Audit Team Leader



Signature of Lead Auditor
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