

November 2017

ICMI GOLD MINE RECERTIFICATION AUDIT - SUMMARY AUDIT REPORT

Harmony Doornkop Gold Plant

Submitted to:

International Cyanide Management Institute,
1400 I Street, NW, Suite 550
Washington, DC 20005,
USA

Harmony Doornkop Gold Plant
South Africa

REPORT

Distribution:

1 Copy – Harmony Gold Mining (Pty) Ltd

1 Copy - ICMI

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ICMI CYANIDE RE-CERTIFICATION AUDIT - SUMMARY REPORT

1.0 SUMMARY AUDIT REPORT FOR GOLD MINING OPERATIONS

Name of Cyanide User Facility: Harmony Doornkop Plant
Name of Cyanide User Facility Owner: Harmony Gold Mining Company Ltd
Name of Cyanide User Facility Operator: Harmony Gold Mining Company Ltd
Name of Responsible Manager: Jan Roos, Plant Manager
Address: PO Box 1, Glen, Harmony 9435
Country: South Africa
Telephone: +27 (0)11 411 2501
E-Mail: Jan.Roos@harmony.co.za

2.0 LOCATION DETAIL AND DESCRIPTION OF OPERATION

The Doornkop Gold Plant is situated 15km south of Krugersdorp, next to the R558 road en route to Lenasia and 25 km west of Johannesburg in South Africa.

The gold plant consists of a milling section for grinding of ore, thickeners for dewatering (pulp for leach feed), a leach section for dissolution of gold, using liquid sodium cyanide as one of the reagents, Carbon in Pulp for adsorption of dissolved gold and a recovery section which consists of elution, electro-winning and a smelthouse. All tailings are pumped to a Tailings Storage Facility, adjacent to the plant on the northern side.

The Doornkop TSF consists of one active compartment which is raised in the upstream direction. The residue is deposited hydraulically by means of ring feed pipeline to open ended pipe deposition points along the day wall, pool wall including the wing walls both sides of the penstock and into the basin. All supernatant and storm water is decanted off the deposits through a gravity penstock that discharges into a canal draining to the return water dam located east of the TSF. From the return water dam, the water is pumped back to the plant for re-use.



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SUMMARY AUDIT REPORT

Auditors Findings

Harmony Doornkop Gold Plant is: in full compliance with **The International Cyanide Management Code**
 in substantial compliance with
 not in compliance with

Audit Company: ESC Afrika
Audit Team Leader: Ed Perry, Lead Auditor
Email: escafrika@gmail.com

Doornkop Plant has not experienced any significant cyanide incidents or compliance problems during the previous three year audit cycle.

Name of Other Auditors


Marie Schlechter, ICMI pre-certified Mine Technical Specialist


Dates of Audit

The Re-certification Audit was undertaken between 15 May 2017 and 18 May 2017.

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

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

Harmony Doornkop Gold Plant 
Name of Facility Signature of Lead Auditor 27 November 2017
Date

Harmony Doornkop Gold Plant 
Name of Facility Signature of Lead Auditor 27 November 2017
Date

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:

The operation is in full compliance with Standard of Practice 1.1 to purchase cyanide from manufacturers employing appropriate practices and procedures to limit exposure of their workforce to cyanide, and to prevent releases of cyanide to the environment.

The operation's contract with the cyanide manufacturer (Sasol Polymers) requires that the cyanide be produced at a facility that has been certified as being in compliance with the Code

Observed: Agreement for the Supply and Delivery of Sodium Cyanide between Randfontein Estates Limited and Sasol Polymers a Division of Sasol Chemical Industries Ltd, signed 31 March 2014. The agreement prior to this was similar and dated 28 January 2010.

SASOL Polymers is certified to be fully compliant with the ICMI Cyanide Code. SASOL Polymers re-certification is dated 29 March 2016 with the prior recertification being dated 7 May 2013.

Cyanide is purchased directly from the manufacturer namely Sasol Polymers South Africa.



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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:

The operation is in full compliance with Standard of Practice 2.1 to establish clear lines of responsibility for safety, security release prevention, training and emergency response in written agreements with producers, distributors and transporters.

There is a written agreement, between the operation, the cyanide producer (Sasol), and transporter (Tanker Services)

Memorandum of Agreement for the Off-loading of Liquid Sodium Cyanide between Tanker Services Food and Chemicals Division and Harmony Gold Mining Company Limited.

Dated: 12 April 2014 (signed by Tanker Services and Harmony).

These agreements designate responsibilities for the following:

- a) Packaging as required by the United Nations for international shipments and by the political jurisdiction(s) the shipment will pass through.
- b) Labelling in languages necessary to identify the material in the political jurisdiction(s) the shipment will pass through, and as required by these jurisdiction(s) and by the United Nations (for international shipments).
- c) Storage prior to shipment.
- d) Evaluation and selection of routes, including community involvement.
- e) Storage and security at ports of entry.
- f) Interim loading, storage and unloading during shipment.
- g) Transport to the operation.
- h) Unloading at the operation.
- i) Safety and maintenance of the means of transportation (e.g. aircraft, vessels, trains, etc.) throughout transport.
- j) Task and safety training for transporters and handlers throughout transport.
- k) Security throughout transport.
- l) Emergency response throughout transport.

A similar contract was signed prior to this dated 18 January 2010.

The agreement between Tanker Services and Harmony does not provide for any of the services to be subcontracted.



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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:

The operation is in full compliance with Standard of Practice 2.2 to require that cyanide transporters implement appropriate emergency response plans and capabilities and employ adequate measures for cyanide management.

The operation's contract with the cyanide transporter requires that the transporter be certified under the Code. Section 6.3 of the contract between Tanker Services and Harmony states that as Harmony Gold is a signatory to the ICMI it is compulsory for Harmony Gold to make use of an ICMI accredited transporter. Tanker Services Specialised Products Division - recertified 17 July 2015 with the prior certification dated 13 December 2011.

Chain of Custody Records state that Tanker Services delivers liquid Sodium Cyanide from the Sasol manufacturing facility in Sasolburg, South Africa directly to Harmony Doornkop Plant, South Africa.



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PRINCIPLE 3 – HANDLING AND STORAGE

Protect Workers and the Environment during Handling and Storage

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:

The operation is in full compliance with Standard of Practice 3.1 to 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.

Sodium Cyanide Bulk Storage Facility Technical Inspection Reports are conducted annually by Sasol Base Chemicals Supply Chain (Cyanide Manufacturer).

The Cyanide unloading and storage areas are located inside the Gold Plant, which has security and access control. The cyanide storage area is also fenced and locked.

Unloading and storage areas are located away from people and surface water. The cyanide storage tanks are located separately from incompatible materials such as acids, strong oxidizers and explosives. The cyanide storage tanks are fitted with ventilation pipes.

The liquid cyanide is unloaded on a concreted bunded surface. The bund is constructed to contain any spilled cyanide. Any spilled cyanide can flow back into the storage bund for the cyanide tanks from where it is pumped to the leach tanks via an automated pump. The storage tanks are constructed on a concrete plinths to prevent seepage to the subsurface.

Cyanide Off-loading Procedure Checklist (DKP 55), stipulates that off-loading cannot commence until the tank levels are less than 40% for Tank 1 & 2 (cyanide for leach) and 30% for Tank 3 (cyanide for elution). Manual dip levels are also taken to confirm the electronic tank levels and to determine when there is sufficient space for the next delivery.

Standard of Practice 3.2: Operate unloading storage and mixing facilities using inspections, preventative 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:



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The operation is in full compliance with Standard of Practice 3.2 to operate unloading storage and mixing facilities using inspections, preventative maintenance and contingency plans to prevent or contain releases and control and respond to worker exposures.

Liquid cyanide is delivered in bulk tankers and no containers are used.

Liquid cyanide is delivered in bulk tankers and no containers are used. Any residue from the outside of the tanker is washed off after off-loading and washed into the cyanide spill sump.

The operation has developed and implemented plans or procedures to prevent exposures and releases during cyanide unloading and mixing activities including the following:

DKP 55 - Liquid Cyanide Off-loading, Rev 1.1, 16 June 2014. The procedure stipulates the duties of the driver and the Customer Qualified Person in terms of operating the valves, flanges and coupling prior to and during off-loading. Procedure stipulates the PPE to be worn by both the CQP and the Driver during off-loading.

DKP 27 - Liquid Cyanide Spillage, Rev 1.1, 17 June 2014. Procedure describes the actions to be taken in the event of Cyanide spillage.

DKP 41 - The "Buddy" System, Rev 1.1, 11 June 2014.



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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 preventative 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:

The operation is in full compliance with Standard of Practice 4.1 to implement management and operating systems designed to protect human health and the environment including contingency planning and inspection and preventative maintenance procedures.

The site does not have heap leach facilities or processing ponds.

The Plant has developed 71 cyanide related operating procedures. Intasol operators of the TSF have 13 procedures.

The operation has plans or procedures that identify the assumptions and parameters to prevent or control cyanide releases and exposures consistent with applicable requirements. The following were observed:

DKP 44 - High Cyanide Levels in Residue Slime, Rev 1.1 16 June 2014. WAD cyanide readings not to exceed 50 ppm in the residue slime at all times.

Cyanide Off-loading Procedure Checklist (DKP 55), stipulates 40% for Tank 1 & 2 (cyanide for leach) and 30% for Tank 3 (cyanide for elution).

DKP 05 - Response to Low pH level, Rev 0.1, 16 July 2014. Discharge points of cyanide must always enter the process stream at a point where the pH is maintained above 9.8 and which is well ventilated.

Harmony Gold Mining Company Limited Doornkop Operations, Tailings Dams, Mandatory Code of Practice for Mine Residue Deposits, Ref No. MRD 001, Rev 04, January 2016.

Code of Practice was drawn up in accordance with the Guideline DME Reference Number DME 16/3/2/2-A1 issued by the Chief Inspector of Mines.

Freeboard: The minimum legal Freeboard must be equal to the water level rise that is caused by a 1:50 year 24 hr storm event plus an additional 800mm as specified by regulation GN 704 from the National Water Act, Act 36 of 1998.

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 following inspection records were observed:

Weekly Inspections: Shift Inspection by Shift Foreman of Cyanide Area; Cyanide Area Inspection for fitter; Weekly Cyanide Area Inspection; Cyanide Equipment Checklist and Cyanide Storage Inspection; Cyanide



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Antidote Checklist by safety officer; Slimes Dam Inspection for Met Department; Slimes Dam and RWD Inspection for fitter; Slimes Dam Pumps Inspection for electrician; inspections of the TSF;

Monthly: Cyanide Tank Inspection by fitter; and Inspections of the TSF.

Quarterly inspection of the TSF is undertaken by consultant engineers.

6 Monthly: Cyanide Pump Maintenance for fitter

The operation has a procedure to identify when changes in a site's processes or operating practices may increase the potential for the release of cyanide and to incorporate the necessary release prevention measures: DKP 4 - Change Management Directive, Rev 01. The Directive requires the initiator to record the following information: Initiate the Change request; Deviation from Standards; Evaluate the change request (risk assessment); Approve the Change request. Sign off by Plant Engineer, Metallurgical Unit Leader, Full Time Health and Safety Steward, Environmental Officer and Plant Manager.

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

DKP 11 - Emptying and Repairing a Leaking Cyanide Storage Tank, Rev 0.1, 01 06 2014.

DKP 14 - Change Pipes Inside Cyanide area and outside Cyanide area, Rev 1.1, 11 June 2014.

DKP 15 - Change Cyanide Pump, Rev 1.1, 11 June 2014.

DKP 25 - Replacing a motor on a cyanide pump, Rev 0.1, 16 July 2014.

DKP 28 - Leaking Cyanide Pipeline, Rev 0.1, 16 July 2014.

DKP 32 - Starting and Stopping a Cyanide Pump, Rev 0.1, 16 July 2014.

DKP 61 - Respond to Abnormal and Emergency Conditions, Rev 0.1, 16 July 2014.

Inspections are documented, including the date of the inspection, the name of the inspector, and any observed deficiencies. Corrective actions are documented either directly or in the form of a work request number. The work request details the nature and date of the corrective action. Records are retained.

The inspections observed all included the date of inspection, name of the inspector, observed deficiencies and records are retained. Any deficiencies that are observed are reported and a job card is created to undertake the work to correct the deficiency. If critical, increased inspections will be undertaken until the deficiency is fixed.

The planned maintenance system is computerised using DMS software. The computerised system was observed by the auditors. This system includes scheduled maintenance for operational equipment. Job cards are automatically issued for the inspections, which are then planned in Monday meetings for the coming week. Job cards are also raised where ad hoc maintenance is required by the plant inspections or observations from foremen and the control room.

The operation will prevent unintentional releases and exposures in the event its primary source of power is interrupted. The Plant has an emergency generator that powers critical parts of the plant such as the SCADA, emergency lights, and access control system. In event of power failure, the mills and thickener underflow pumps will stop, no feed to leach. Cyanide pumps only run when there is feed to Leach, controlled by the TAC



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1000. The generator is maintained as part of the planned maintenance programme and tested on a regular basis.

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:

The operation is in full compliance with Standard of Practice 4.2; introducing management and operating systems to minimise cyanide use, thereby limiting concentrations of cyanide in mill tailings.

Mined ore and waste rock is blended into one stream, which stays mainly constant. Weekly Bottle Roll Tests are conducted on the Thickener Underflow. Test confirms the required Cyanide addition rate.

Actual recovery is confirmed on a daily basis by laboratory analysis thickener underflow and residue material.

By doing weekly bottle roll test, the material received from the two shafts (Doornkop and Cook Shaft) is continuously analysed.

A daily SCADA report produced stipulating the tons milled, amount of cyanide pump, and cyanide set point for the day.

The operation has evaluated various control strategies for cyanide additions. Weekly Bottle Roll Test conducted on the Thickener Underflow confirms the required Cyanide addition rate.

The operation has implemented a strategy to control its cyanide addition. TAC 1000 receives input from SCADA - tons per hour slurry, cyanide flow rate this provides output to the cyanide pump (start or stop). It also analyses the input sample from Leach head tank and provides output - CN in Leach Head Tank.

Standard of Practice 4.3: Implement a comprehensive water management programme 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:

The operation is in full compliance with Standard of Practice 4.3 to implement a comprehensive water management programme to protect against unintentional releases.

The operation has developed a probabilistic water balance using an excel spreadsheet.

Excel based Water Balance is run by Plant once a month and includes the following information: Water inputs; Water Outputs; Imbalance; Water Catchments; Plant water inventory; and Schematic Diagram.



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The input sheet provides the following information for each input and output to the water balance including: value; Source of information; Methodology of measurement; and Reference.

The water balance takes into consideration: the amount of residue pumped to the TSF; the amount of water associated with the deposition of tailings; the amount of water from the catchment based on the precipitation received during the month; the amount interstitial water present in the TSF

The RWD level is maintained well below the Target Freeboard thereby providing sufficient storage capacity during a power outage to prevent overtopping. Any seepage from the TSF is collected by the TSF toe drains and collected by a sump which pumps the water into the RWD dam.

Doornkop Return Water Dam Operating and Maintenance Manual, Report No. 389460/1, November 2008. states the Gross Storage Capacity of the RWD is 1.6 million m³ and that the dam has been designed to contain all rainfall falling on the TSF including a 1:50 year recurrence interval 24 hour storm as required in National Regulations. Rainfall is recorded in the plant by the Environmental Department and included in the water balance on a monthly basis. Evaporation has been determined for the area and used as a constant value in the water balance.

Freezing, thawing conditions are not applicable as there are no significant snowfalls under normal conditions, which has been verified for the last 20 years.

The operating procedures incorporate inspection and monitoring activities to implement the water balance and prevent overtopping of ponds and impoundments and unplanned discharge of cyanide solutions to the environment. The level of the RWD is inspected on a weekly basis as per the planned maintenance system. The levels are reported on the Return Water Dam Level graph.

The ponds and impoundments are designed and operated with adequate freeboard above the maximum design storage capacity determined to be necessary from water balance calculations. The 1.6 Million m³ RWD is used for surge capacity. The level of the RWD is monitored on a weekly basis. Return Water Dam Level indicates the Maximum Operating Level, Actual Level, Spill Way Level and Target Freeboard and Lowest Dam Level. The Actual operating level were below the Target Freeboard.

The operation measures precipitation, compares results to design assumptions and revises operating practices as necessary. Rainfall is recorded in the plant by the Environmental Department and included in the Water Balance on a monthly basis.

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:

The operation is in full compliance with Standard of Practice 4.4 to implement measures to protect birds, other wildlife and livestock from adverse effects of cyanide process solutions

There is no heap leach currently being operated.



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There are no open waters where WAD cyanide exceeds 50 mg/L WAD cyanide therefore the operation has not needed to implement measures to restrict access by wildlife and livestock.

The operation can demonstrate that the cyanide concentration in open water i.e. Leach facilities and solution ponds, does not exceed 50 mg/L WAD cyanide.

The auditors observed Return Water Dam weekly monitoring for November 2014 to March 2017, all results were below 50 ppm WAD cyanide and the majority of the results were below 0.5 ppm.

Weekly monitoring of WAD cyanide at the deposition point for November 2014 to March 2017 was observed there was one exceedance on the 25 June 2015 with a concentration of 61 ppm WAD cyanide.

Maintaining a WAD cyanide concentration of 50 mg/l or less in open water is effective in preventing significant wildlife mortality as no wildlife mortalities have been recorded in the last 3 years.

Intasol undertake daily inspections of the TSF this includes Wildlife Mortality Rate. No wildlife mortalities were recorded in the past 3 years, indicating that the current cyanide levels appeared to be effective in preventing significant wildlife mortalities.

Standard of Practice 4.5: Implement measures to protect fish and wildlife from direct and indirect discharges of cyanide process solutions to surface water.

in full compliance with

The operation is

in substantial compliance with

Standard of Practice 4.5

not in compliance with

Summarise the basis for this Finding/Deficiencies Identified:

The operation is in full compliance with Standard of Practice 4.5 to implement a comprehensive water management programme to protect against unintentional releases.

There are no direct or indirect discharges to surface water.

WAD monitoring data was observed for the point sampled downstream of the Klipriver. Jan 2014 to Jan 2017. All values were below 0.5 ppm.

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:

The operation is in full compliance with Standard of Practice 4.6 to implement measures designed to manage seepage from cyanide facilities to protect the beneficial uses of groundwater.



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The operation implements specific water management or other measures to manage seepage to protect the beneficial uses(s) of groundwater beneath and/or immediately down-gradient of the operation.

The TSF has been designed with toe drains. The water from the toe drains are collected by a pump and pumped to the RWD. The water at the top of the dam is drained via the penstock to the RWD.

There is no numerical standard established by the applicable jurisdiction for WAD cyanide or any other species of cyanide in groundwater, therefore there are no compliance points below or down gradient of the gold plants or tailings facilities. Groundwater monitoring is conducted at 7 groundwater monitoring points all results are below 0.5 ppm WAD cyanide.

No backfill is used.

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:

The operation is in full compliance with Standard of Practice 4.7 to 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. Cyanide storage tanks are located on concrete plinths. Off-loading, storage, leach, backfill and residue tanks are all in secondary containment. All bunds are concrete and fitted with sumps and pumps. Any spillage at the off-loading area runs down the cyanide storage tank bund from where it is pumped to the leach.

Secondary containments for cyanide storage tanks and CIP are sized to hold a volume greater than that of the largest tank within the containment and any piping draining back to the tank, and with additional capacity for the design storm event.

The auditors observed the bund volume calculations and all bunds are adequately sized.

Procedures are in place and are being implemented to prevent discharge to the environment or any cyanide solution of cyanide-contaminated water that is collected in the secondary containment area. The cyanide sump pump returns the spillage to the leach circuit in the leach feed, Leach sump pump return spillage to leach, CIP sump pumps return spillage to CIP tanks, Residue sump pump returns spillage to residue tank, and trench pump returns water and any spillage from around the Plant to the CIP tanks. No tanks are without secondary containment.

Spill prevention or containment measures are provided for all cyanide process solution pipelines to collect leaks and prevent releases to the environment. All reagent strength pipelines run over concrete areas. Some pipelines have been placed in launders. Weekly inspections are undertaken on the pipelines.

The TSF pipeline from the plant to the TSF is contained by means of an earth trench. The pipeline is steel with an HDPE liner. Weekly pipeline inspections are done on the TSF pipeline by the Plant. Intasol undertake daily inspections of the TSF this includes the tailings pipeline.



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There are no areas where cyanide pipelines present a risk to surface.

Cyanide tanks and pipelines are constructed of materials compatible with cyanide and high pH conditions. Tanks are constructed of Mild Steel. The cyanide dosing line is polypropylene and the TSF pipelines are steel and HDPE.

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:

The operation is in full compliance with Standard of Practice 4.8 to implement quality control/quality assurance procedures to confirm that cyanide facilities are constructed according to accepted engineering standards and specifications

Previous audits have not observed any quality control or quality assurance programs due to the age of the Plant. The Plant therefore relies on inspections. Since last recertification there has not been any modifications to existing facilities or any new facilities.

Thickness testing of tanks is undertaken on an annual basis by Quest Technical Services (Pty) Ltd.

Safety Audit Inspection (Structural) Report K2855, June 2014 and June 2016 by LMV (Pty) Ltd Consulting Engineers, signed off by T. Jordaan Pr Eng 920279.

The reports states that all the structural elements of the cyanide storage area, including floors, bund walls, plinths and structural steel are in good condition.

Inspections of the Plant includes the pipelines, pumps, valves and alarms. Weekly inspections of the TSF include the freeboard of the TSF and the Return Water Dam.

A quarterly inspection of the TSF is undertaken by consultant engineers this includes: H&S, Storm Water Control, Access Roads, Solution Trenches, Catchment Paddocks, Side Slopes & Benches, Wall Building and Freeboard, Penstock, Underdrains, Tailings, Pipe and Valves, Piezometers and Stability, Environmental, and Return Water Dam.

Doornkop Mine, Tailings Storage Facility, Annual Audit Report, includes: Visual Inspection, Freeboard Analysis, Life Assessment, Stability Assessment.

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



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Summarise the basis for this Finding/Deficiencies Identified:

The operation is in full compliance with Standard of Practice 4.9 to implement monitoring programs to evaluate the effects of cyanide use on wildlife, surface and groundwater quality.

The operation has developed the following written standard procedures for monitoring activities: Procedure for taking borehole samples using a bladder pump, Doc No. P022, Rev 01, 1 Feb 2014; Procedure for taking chemical samples from streams, Doc No. P017, Rev 03, 1 Jun 2016; Procedure for taking Cyanide Samples, Doc No. 091, Rev 01, 1 Nov 2012; Procedure for the Preparation and Preservation of Samples, Doc No. P023, Rev 01, 1 Nov.

Sampling and analytical protocols have been developed by appropriately qualified personnel. Procedures were developed by the external professional monitoring company - DD Science. All monitoring procedures have been signed off by Z. Suliman-Ahmed, Quality Manager and D. Dorling, Executive Manager.

The procedures specify how the samples should be taken, sample preservation techniques, chain of custody procedures, and shipping instructions.

The auditors observed the map indicating the location of the 5 surface water sampling points as well as the map indicating the 7 groundwater monitoring points. The sample log sheet indicates the analysis to be undertaken, which includes cyanide.

Sampling conditions and procedures are documented in writing.

There is no discharge of process water to surface water. However, the operation does undertake monitoring upstream and downstream in the local Klipriver. Monitoring of groundwater is also undertaken up-gradient and down-gradient of the site.

The operation inspects for and records wildlife mortalities related to contact with and ingestion of cyanide solutions. This is done on the daily inspection records for the TSF and the daily inspection records for the Plant.

Monitoring is conducted at frequencies adequate to characterise the medium being monitored and to identify changes in a timely manner. Groundwater monitoring is undertaken monthly. Surface monitoring is conducted weekly at the Klipriver and monthly at the Return Water Dam.



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 **Emergency Response Practice 5.1**

not in compliance with

Summarise the basis for this Finding/Deficiencies Identified:

The operation is in full compliance with Standard of Practice 5.1 to plan and implement procedures for effective decommissioning of cyanide facilities to protect human health, wildlife and livestock.

The operation has developed written procedures to decommission cyanide facilities at the cessation of operations. DKP 78 - Decommissioning Procedure, Rev 00, 01 October 2014. Procedure has been developed for when the operation closes and therefore require closure planning, steps to decommission and demolish the facilities.

The plan includes an implementation schedule for decommissioning activities. Page 15 of DKP 78 - Decommissioning Procedure, Sequence of Decommissioning Activities describes the decommissioning activities in sequence that would normally be required.

The operation reviews its decommissioning procedures for cyanide facilities during the life of the operation and revises them as needed. Page 14 of DKP 7 - Decommissioning procedure states that the decommissioning and closure schedule must be reviewed as follows: whenever there is a change in the operation that affects decommissioning; whenever there is a change in planned decommissioning techniques or measures; and at least every five years.

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:

The operation is in full compliance with Standard of Practice 5.2 to establish an assurance mechanism capable of fully funding cyanide related decommissioning activities.

The operation has developed an estimate of the cost to fully fund third party implementation of the cyanide-related decommissioning measures as identified in its site decommissioning or closure plan: Harmony Group Environmental Liability Assessment - Closure Cost Report FS30/5/1/2/2/82MR, prepared by Digby Wells Environmental, May 2016.



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Section 10 of the report address Cyanide Decontamination. This states the amount that has been set aside in the closure cost for the cleaning and removal of sodium cyanide systems based on a quote from Cyanide Cleaning Specialist.

The Closure Cost Assessment for Doornkop Gold Mine is reviewed and updated annually. The operation has established a financial mechanism approved by the applicable jurisdiction to cover the estimated costs for cyanide-related decommissioning activities as identified in its decommissioning and closure strategy. The trust fund is audited annually by PWC.



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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 measure 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:

The operation is in full compliance with Standard of Practice 6.1 to identify potential cyanide exposure scenarios and take measure as necessary to eliminate, reduce and control them.

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

The procedures require, where necessary, the use of personal protective equipment and address pre-work inspections.

The operation implements procedures to review proposed process and operational changes and modifications for their potential impacts on worker health and safety, and incorporates the necessary worker protection measures.

DKP 4 - Change Management Directive, Rev 01. The Directive requires the initiator to record the following information: Initiate the Change request; Deviation from Standards; Evaluate the change request (risk assessment); Approve the Change request.

The operation solicits and actively considers worker input in developing and evaluating health and safety procedures.

The weekly Health and Safety Meetings are held and used to obtain input into procedures and discuss any changes to existing procedures.

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

The operation is in full compliance with Standard of Practice 6.2 to operate and monitor cyanide facilities to protect worker health and safety and periodically evaluate the effectiveness of health and safety measures.

The operation has determined the appropriate pH for limiting the evolution of HCN gas during mixing and production activities. The pH is kept at approximately 10.5. If the low pH alarm sounds, (pH 10.4), the cyanide addition pump will stop and the lock out system applied. If the pH drops to 10.0 or lower, the area is evacuated.



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When the pH returns to normal (10.4+), the alarm will stop sounding. The pH is monitored regularly to ensure that the pH remains above 10.4.

Where the potential exists for significant cyanide exposure, the operation uses fixed and personal monitoring devices to confirm that controls are adequate to limit worker exposure to HCN gas and sodium, calcium or potassium cyanide dust to 10 ppm on an instantaneous basis and 4.7 ppm continuously over an 8-hour period, as cyanide. There are 3 fixed and 7 personal monitors.

The operation has identified areas and activities where workers may be exposed to cyanide in excess of 10 ppm on an instantaneous basis and 4.7 ppm continuously over an 8-hour period, and require use of personal protective equipment in these areas or when performing these activities. If the alarm sounds the area will be vacated and subsequently tested before being declared safe for re-entry.

The hotspot surveys are undertaken at the following locations: Cyanide Off-loading area; Leach Tank no 6; CIP Tank 1; Penstock; Return Dam feed pipe; Tailings dam feed pipe from shaft.

Hydrogen cyanide monitoring equipment is maintained, tested and calibrated as directed by the manufacturer, and records are retained for at least one year. All equipment was calibrated at the time of the audit.

Warning signs has been placed at areas where cyanide is used advising workers that cyanide is present, and that no smoking, open flames and eating and drinking are not allowed. This was observed during the site visit. PPE requirements are also stipulated at all of these areas.

Showers, low pressure eye wash stations and dry powder or non-acidic sodium bicarbonate fire extinguishers are located at strategic locations throughout the operation and are maintained, inspected and tested on a weekly basis by the Shift Foreman. Maintenance is undertaken through the planned maintenance system.

Unloading, storage, mixing and process tanks and piping containing cyanide are identified to alert workers of their contents, and the direction of cyanide flow in pipes is identified.

MSDS, first aid procedures or other informational materials on cyanide safety in the language of the workforce is available in areas where cyanide is managed.

Procedures are in place and being implemented to investigate and evaluate cyanide exposure incidents to determine if the operation's programs and procedures to protect worker health and safety, and to respond to cyanide exposures, are adequate or in need of revising.

No cyanide exposure incidents occurred in the last 3 years.

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:

The operation is in full compliance with Standard of Practice 6.3 to develop and implement emergency The operation has water, oxygen, a resuscitator, antidote kits (Tripac-Cyano and Sodium Thiosulphate solution), radios, cell phone, and alarmed safety showers readily available for use at unloading, storage and mixing



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locations and elsewhere in the plant. There are first aid cabinets at strategic locations in the Plant and the TSF containing appropriate PPE, oxygen and antidote for use in a cyanide emergency.

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

The operation inspects its first aid equipment regularly to ensure that it is available when needed, and materials such as cyanide antidotes are stored as directed by their manufacturer and replaced to ensure that they will be effective when needed.

The operation has developed specific written emergency response plans and procedures to respond to cyanide exposures including the following:

DKPI-011 - Doornkop Gold Plant, Emergency Response Plan, Rev 6, May 2017.

DKP 01 - Liquid Cyanide Off-Loading-Emergency in Off-loading situation, Rev 00, 06 July 2014.

DKP 07 - When man down alarm is sounded, Rev 1.1, 17 June 2014.

DKP 09 - Cyanide First Aid Treatment, Rev 1.1, 13 June 2014.

DKP 19 - Cyanide related accidents or incidents, Rev 1.1, 15 June 2014.

The operation has its own on-site capability to provide first aid or medical assistance to workers exposed to cyanide. All plant personnel and fixed term contractors have been trained in Cyanide First Aid and is therefore able to respond to a cyanide emergency

The operation has developed procedures to transport workers exposed to cyanide to locally available qualified medical facilities. DKP 42 - Ambulance Entry in the event of an emergency, Rev 0.1, 25 May 2014. Netcare 911 is used to transport patients from the Plant to Lenmed Hospital (10 km from the Plant). This is stated in the contract with Lenmed (23 Jan 2013).

The operation has made formalised agreements with local hospitals, clinics, etc., so that these providers are aware of the potential to treat patients for cyanide exposure. Contract with Lenmed Hospital (Randfontein) 23 Jan 2013.

The operation is confident that the medical facility has adequate, qualified staff, equipment and expertise to respond to a cyanide incident

Mock emergency drills are undertaken at least once a year. These drills are undertaken on different scenarios.

These reports included drill preparation, response by first aiders, response by ambulance service, response by hospital, follow up meeting, and further comments. The two drills in 2017 were full chain drills involving paramedics and the hospital.



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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:

The operation is in full compliance with Standard of Practice 7.1 to prepare detailed emergency response plans for potential cyanide releases.

The operation has developed an Emergency Response Plan to address potential releases of cyanide that may occur on site or may otherwise require response including the following:

DKPI-011 - Doornkop Gold Plant Emergency Response Plan, Rev 6, May 2017.

Intasol Tailings: ITS-EPP - Emergency Preparedness Plan, rev 01, 1 December 2016.

The Plans consider the potential cyanide failure scenarios appropriate for its site-specific environmental and operating circumstances, including the following, as applicable.

- Catastrophic release of hydrogen cyanide from storage or process facilities;
- Transportation accidents;
- Releases during unloading and mixing;
- Releases during fires and explosions;
- Pipe, valve and tank ruptures;
- Overtopping of ponds and impoundments;
- Power outages and pump failures;
- Uncontrolled seepage;
- Failure of cyanide treatment, destruction or recovery systems (not applicable as no cyanide treatment undertaken); and
- Failure of tailings impoundments, heap leach facilities and other cyanide facilities.

Tanker Services are responsible for transportation related emergencies and are a fully ICMI certified transportation company.

The Plan 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 for cyanide exposure, control of releases at their source, and containment, assessment, mitigation and future prevention of releases. The patient is supported with oxygen until the ambulance arrives which is estimated from full chain drills to be 10 minutes.



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In the event of an emergency incident an investigation is undertaken to ensure the prevention of future releases.

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:

The operation is in full compliance with Standard of Practice 7.2 to involving site personnel and stakeholders in the planning process.

The operation has involved its workforce and stakeholders, including potentially affected communities, in the cyanide emergency response planning.

The operation has made potentially affected communities aware of the nature of the risks associated with accidental cyanide releases, and consulted with them directly regarding appropriate communications and response.

The operation has involved local response agencies such as outside responders and medical facilities in the cyanide emergency planning and response process. Training is provided to the paramedics and the nursing staff at the hospital by Harmony. Employees, ambulance and hospital have been involved in the emergency drills. This was observed for the two drills undertaken in 2017

The operation engages in consultation/ communication with stakeholders to keep the Emergency Response Plan current

The Full Time Health and Safety Representative and Fulltime Shaft Steward are involved in the compilation and updating of the ERP. Both signed off on the latest revision of the ERP.

Plant personnel spoke to the West Rand Disaster Management Department to discuss their involvement during emergency situations. Minutes of various meetings with NUM, Councillors and local communities were involved allowing them opportunities to discuss the ERP

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:

The operation is in full compliance with Standard of Practice 7.3 to designate appropriate personnel and commit necessary equipment and resources for emergency response.



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The cyanide related elements of the Emergency Response Plan designate appropriate personnel and commit necessary equipment and resources including the following.

All staff are trained in the response to cyanide emergencies and cyanide first aid. All Plant employees receive cyanide induction and first aid training. Employees that come into contact with cyanide received additional training from Sasol.

ERP Section 4 In the Event of an Emergency states that the first person must contact the Supervisor or Control Room. Section 5 states the actions of the Met Plant Operations Control Centre. Cyanide Poisoning First Aid treatment states the roles of the 1st, 2nd, 3rd and 4th person arriving at the incident. The ERP contains a list of emergency contact numbers.

The operation has confirmed that outside entities included in the Emergency Response Plan are aware of their involvement and are included as necessary in mock drills or implementation exercises?

Training is provided to the paramedics and the nursing staff at the hospital by Harmony. Cyanide. Employees, ambulance and hospital have been involved in the emergency drills. This was observed for the two drills undertaken in 2017.

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:

The operation is in full compliance with Standard of Practice 7.4 to develop procedures for internal and external emergency notification and reporting.

The Plans include procedures and contact information for notifying management, regulatory agencies, outside response providers and medical facilities of the cyanide emergency including the following:

The Control Room will use the Emergency Telephone Numbers list to contact the relevant employee or emergency responders. Section 8. P14 of the ERP contains a detailed flow diagram of who to contact in the event of the different emergency situations, including management, regulatory agencies, outside responders and medical facilities.

The Plan includes procedures and contact information for notifying potentially affected communities of the cyanide-related incident and any necessary response measures and for communications with the media.

Section 5. Page 8 of the ERP states that employees will not disclose any information to the press or public. Only the HR Manager in consultation with Senior Management may release information.

The ERP stipulates that the Police will evacuate the area should the community be affected i.e. failure of the TSF.



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

in full compliance with

The operation is

in substantial compliance with

Standard of Practice 7.5

not in compliance with

Summarise the basis for this Finding/Deficiencies Identified:

The operation is in full compliance with Standard of Practice 7.5 to incorporate in response plans and remediation measures monitoring elements that account for the additional hazards of using cyanide treatment chemicals.

The Plan describes specific remediation measures as appropriate for the likely cyanide release scenarios. This includes the following:

Emergency Response Plan: Section 25 - management of liquid cyanide spillage; Section 34 - Procedure for Cyanide Monitoring of Borehole Water, Soil Sampling, Containment of Spillage, and Treatment of Spillage; Section 35 - Procedure for Cyanide Monitoring of Surface Water.

DKP 27 - Liquid Cyanide Spillage, Rev 1.1, 17 June 2014.

Section 35 - Procedure for Cyanide Monitoring of Surface Water.

Provision of an alternate drinking water supply is not applicable as no rivers are in close proximity to the TSF or plant.

The Plan prohibits the use of chemicals such as sodium hypochlorite, ferrous sulphate and hydrogen peroxide to treat cyanide that has been released into surface water

DKP 33 - Use of Ferrous Sulphate, Rev 0.1, 07 November 2014.

The Plan addresses the potential need for environmental monitoring to identify the extent and effects of a cyanide release, and include sampling methodologies, parameters and, where practical, possible sampling locations

Emergency Ground and Surface Water Sampling is detailed in the ERP.

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:

The operation is in full compliance with Standard of Practice 7.6 to periodically evaluate response procedures and capabilities and revise them as needed.



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The operation reviews and evaluates the cyanide-related elements of its Emergency Response Plan for adequacy on a regular basis.

Since July 2010, the ERP has been reviewed 6 times with the last revision being May 2017. The ERP is reviewed when change in the management or operational controls occurs.

Mock emergency drills are conducted periodically to test response procedures for various cyanide exposure scenarios, and lessons learnt from the drills are incorporated into response planning.

Section 3.4 of the ERP requires that regular emergency drills be conducted to achieve a high level of compliance. Drills must be evaluated in order to identify possible shortfalls and the need for improvement on existing standard procedures.

Mock emergency drills are undertaken at least once a year. These drills are undertaken on different scenarios.

Provisions are in place to evaluate and revise the Emergency Response Plan after any cyanide-related emergency requiring its implementation

No cyanide emergencies have occurred in the last 3 years.

Section 3.5 of the ERP stipulates that the emergency procedures and related standard procedures, training manuals and control measures must be reviewed after a major event or changes in the legislation.



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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:

The operation is in full compliance with Standard of Practice 8.1 to train workers to understand the hazards associated with cyanide use.

Cyanide induction video, which includes cyanide first aid, is presented to all employees and contractors.

A training matrix is used showing all the employees with the dates on when the initial and refresher training was undertaken.

The E-Learning System is used by all employees. It is a computer based system where the employee or contractor will work through the modules until completed. Employees must achieve a 100% pass rate

All employees and contractors undertake the two cyanide related training modules, Handling Cyanide Safety in a Metallurgical Plant, Cyanide First Aid Training. In addition, all chemical handlers and artisans coming into contact with cyanide must undertake the following training: Sasol Chemicals Base Chemicals - Sodium Cyanide Solution Safety Awareness Session.

Refresher Cyanide Induction Training is conducted annually after employees return from annual leave. Training records are retained for 40 years.

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:

The operation is in full compliance with Standard of Practice 8.2 to train appropriate personnel to operate the facility according to systems and procedures that protect human health, the community and the environment.

Cyanide induction video, which includes cyanide first aid, is presented to all employees and contractors.

A training matrix is used showing all the employees with the dates on when the initial and refresher training was undertaken.



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The E-Learning System is used by all employees. It is a computer based system where the employee or contractor will work through the modules until completed. Must achieve a 100% pass rate

All employees and contractors undertake the two cyanide related training modules, Handling Cyanide Safety in a Metallurgical Plant, Cyanide First Aid Training.

Refresher Cyanide Induction Training is conducted annually after employees return from annual leave and through Planned Task Observation assessments.

In addition, all employees are tested on the Procedures that they use in the course of their work through PTOs.

Each of the plant procedures has been written in a planned task observation format, that the elements necessary for each job have been identified and stipulated and can be assessed during training and observation.

Training is conducted by Richard Mathise - Training Assessor. Their training qualifications were observed.

The various section foremen are competent to conduct PTO assessments due to their experience.

Training records are retained for 40 years 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 and understanding of the training materials.

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:

The operation is in full compliance with Standard of Practice 8.3 to train appropriate workers and personnel to respond to worker exposures and environmental releases of cyanide.

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

All employees and contractors are trained on how to respond to cyanide emergencies by means of the cyanide video presented at the induction and refresher training. All employees, and contractors are required to attend the induction program during which a comprehensive video is shown detailing the dangers associated with cyanide as well as the first aid measures in the event of an exposure.

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

E-learning is used for First Time induction and yearly refresher.

All employees including Intasol, who manage the TSF, must undertake e-learning modules including the two cyanide modules:

- Handling Cyanide Safely
-



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- Cyanide First Training. (Detailed Video showing step by step Cyanide First Aid.)

These require a 100% pass rate.

In addition, all chemical handlers and artisans coming into contact with cyanide must undertake the following training: Sasol Chemicals Base Chemicals - Sodium Cyanide Solution Safety Awareness Session.

This training is further reinforced through undertaking mock emergency drills periodically conducted for training purposes covering both worker exposures and environmental releases. The two drills in 2017 were full chain drills involving paramedics and the hospital.

Emergency Response Co-ordinators and members of the Emergency Response Team are trained in the procedures included in the Emergency Response Plan regarding cyanide, including the use of necessary response equipment.

The operation has made off-site Emergency Responders, such as community members, local responders and medical providers, familiar with those elements of the Emergency Response Plan related to cyanide. Training is provided to the paramedics and the nursing staff at the hospital by Harmony.

Cyanide emergency drills are evaluated from a training perspective to determine if personnel have the knowledge and skills required for effective response. All mock drills are evaluated afterwards to identify short comings. If refresher training is stipulated as a requirement, it is communicated to the Training Assessor.

Training records are retained for 40 years 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 and understanding of the training materials.



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PRINCIPLE 9 – DIALOGUE

Engage in Public Consultation and Disclosure

Standard of Practice 9.1: Provide stakeholders with 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:

The operation is in full compliance with Standard of Practice 9.1 to provide stakeholders with the opportunity to communicate issues of concern.

The operation provides the opportunity for stakeholders to communicate issues of concern regarding the management of cyanide. This includes numerous meetings with various stakeholders including; Plant Management, Councillors, National Union of Mineworkers, Community representatives, South African Police Service, and the Youth Forum.

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:

The operation is in full compliance with Standard of Practice 9.2 to initiate dialogue describing cyanide management procedures and responsively address identified concerns.

There are opportunities for the operation to interact with stakeholders and provide them with information regarding cyanide management practices and procedures.

Doornkop Gold Plant arranged the following meetings to provide information regarding the management of Cyanide at the plant:

Doornkop Weekly Safety, Health, Environment and Production Meetings; and

Environmental & Safety Awareness Campaign at local schools.

Training is provided to the paramedics and the nursing staff at the hospital by Harmony.



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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:

The operation is in full compliance with Standard of Practice 9.3 to make appropriate operational and environmental information regarding cyanide available to stakeholders.

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

Before each school visit a presentation is given to the teachers to present to them the level of information that will be presented to the children. Including the presentation in hard copy.

Training is provided to the paramedics and the nursing staff at the hospital by Harmony. Cyanide Awareness Training on 22 March 2017 for paramedics (Netcare 911). Cyanide Awareness Induction Training 21 February 2017 for casualty staff. This includes written descriptions of how cyanide is managed.

The operation has disseminated information on cyanide in verbal form where a significant percentage of the local population is illiterate. The information sessions were held verbally in English and the local language at the Primary Schools. The information sessions at the Secondary Schools were done verbally and by means of a presentation in English and the local language.

There have been no incidents of cyanide exposure in the last 3 years.

There have been no cyanide releases of the mine site in the past 3 years.

Section 5. Page 8 of the ERP states that employees will not disclose any information to the press or public. Only the HR Manager in consultation with Senior Management may release information.

Incidents involving cyanide releases or exposure incidents will be handled via Corporate Communications Department. Newsflashes are distributed within the Company via e-mail. Incidents are reported to the Department of Mineral Resources (DMR) by mine management. The DMR reports selectively on repeated or critical incidents. Information on significant cyanide exposures are made available, after appropriate investigations in the Integrated Annual Report.



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Ed Perry
Lead Auditor



Marie Schlechter
Gold Mine Auditor

Date: 27 November 2017



