

***INTERNATIONAL CYANIDE  
MANAGEMENT INSTITUTE***

***Cyanide Code Compliance Audit  
Gold Mining Operations***

***Summary Audit Report***

***AngloGold Ashanti  
Noligwa Gold Plant Vaal River***

***5<sup>th</sup> – 9<sup>th</sup> March & 23<sup>rd</sup> – 26<sup>th</sup> April 2007***



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Name of Operation: AngloGold Ashanti Noligwa Gold Plant Vaal River

Name of Operation Owner: AngloGold Ashanti Africa Underground Region Metallurgy

Name of Operation Operator: AngloGold Ashanti Africa Underground Region Metallurgy

Name of Responsible Manager: Michael Smithers, Plant Manager

Address: Private Bag X 5010  
Vaal Reef  
North West Province  
South Africa  
2621

State/Province: North West Province

Country: South Africa

Telephone: +27 18 478 8652

Fax: +27 18 478 8699

E-Mail: [msmithers@anglogoldashanti.com](mailto:msmithers@anglogoldashanti.com)

**Location detail and description of operation:**

AngloGold Ashanti Noligwa Gold Plant is situated in the North West Province of South Africa, approximately 22 km south east of Klerksdorp near Orkney.

Noligwa plant was commissioned in 1971 and treats approximately 200 000 tons per month of reef material from the Great Noligwa and Moab Khutsong mines. Following milling in two run-of-mine mills, the slurry is thickened before being pumped to the uranium section for uranium extraction.

The uranium plant residue at pH 1.5 -2.5 is returned to the gold plant where it is neutralised with lime in the neutralisation section. The pH neutralisation occurs in stages to pH 7.5, pH 9.5 and final pH 10.5 respectively in air agitated pachucas. The neutralised slurry at pH 10.5 is pumped to the leach section for cyanide addition and gold extraction.



Liquid sodium cyanide is added to the leach feed slurry with cyanide dosing control being achieved by means of an on-line auto titrator integrated into a dosing control loop linked to the dry tonnage feed to the leach section. Gold leaching takes place in a series of mechanically agitated tanks and air agitated pachucas.

The dissolved gold in the leached slurry is recovered onto activated carbon in the CIP (carbon in pulp) section consisting of eight mechanically agitated adsorption tanks. The gold loaded carbon is screened out of the slurry before being washed and transferred to the elution circuit.

In the elution circuit the carbon is washed with a hot caustic solution to strip the gold back into solution following which the gold bearing solution passes through the electrowinning section where the gold is plated onto stainless steel cathodes and smelted to produce gold bullion for refining.

The slurry exiting the adsorption section is pumped to the floatation plant where the material is acidified and conditioned prior to floatation for pyrite recovery. Backfill material for use as underground support is produced from the neutralised floatation residue material. The initial acidification and subsequent floatation process effectively destroys the residual cyanide in the material used to produce the backfill. The neutralised floatation residue material not taken for backfill production is pumped to the final residue stream exiting the plant to the Mispah TSF.

Low grade waste rock is also treated in the Noligwa gold plant through the low grade Mispah milling and recovery circuit. Following run-of-mine milling, the slurry is subjected to a cyanide leach followed by gold adsorption in a carousel operated CIP plant. Cyanide dosing control to the Mispah leach circuit is achieved by means of an on-line cyanide titrator integrated into a control loop linked to the dry tonnage feed. The loaded carbon from the CIP circuit is treated in the elution section for final recovery of gold in the electrowinning cells. The CIP residue material joins the final residue stream reporting to the Mispah TSF from where the recovered water is recycled back to the mills.



***Auditor's Finding***

**This operation is**

☐ in full compliance

**X in substantial compliance \*(see below)**

☐ not in compliance

with the International Cyanide Management Code.

\* The Corrective Action Plan to bring an operation in substantial compliance into full compliance must be enclosed with this Summary Audit Report. The plan must be fully implemented within one year of the date of this audit.

Audit Company: Eagle Environmental

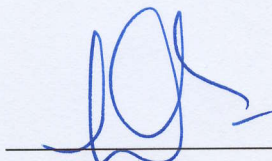
Audit Team Leader: Arend Hoogervorst

E-mail: [arend@eagleenv.co.za](mailto:arend@eagleenv.co.za)

Names and Signatures of Other Auditors:

Name : Dawid M. L Viljoen

Signature



Date: 12/7/07.

Dates of Audit: 5<sup>th</sup> – 9<sup>th</sup> March & 23<sup>rd</sup> – 26<sup>th</sup> April 2007

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.

AngloGold Ashanti  
Noligwa Gold Plant Vaal River

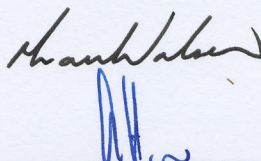
Facility

Signature of Lead Auditor

Date

13/7/07

Certified/notarized:-



**MARYKE VAN WALSEM**  
COMMISSIONER OF OATHS  
PRACTISING ATTORNEY, RSA  
28 OLD MAIN ROAD, HILLCREST  
KWAZULU-NATAL

AGA Noligwa Gold Plant

Signature of Lead Auditor

11<sup>th</sup> July 2007



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*Auditor's Findings*

**1. PRODUCTION: Encourage responsible cyanide manufacturing by purchasing from manufacturers who 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      X in substantial compliance with Standard of Practice 1.1**

☐ not in compliance with

*Basis for this Finding/Deficiencies Identified:*

The plant's cyanide manufacturer, Sasol Polymers, is a ICMI Code Signatory and has undergone an compliance audit which resulted in a substantial compliance finding. This prevents the Noligwa Gold Plant from achieving full compliance with this Standard of Practice. The Sasol Corrective Action Plan is expected to be complied with, and thus enabling full ICMI compliance, by the end of the third quarter of 2007.

The supply contract stipulates that the producer must be a signatory to the ICMI and must be ICMI compliant.

**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.*

**X in full compliance with**

**The operation is      ☐ in substantial compliance with Standard of Practice 2.1**

☐ not in compliance with



*Basis for this Finding/Deficiencies Identified:*

The supply and transport contract stipulates that the transporter must be a signatory to the ICMI and must be ICMI Code compliant. The transporter, Sasol Infrachem SILog, is a ICMI signatory and has been audited by an independent third party auditor and was found to be ICMI transportation compliant on 8<sup>th</sup> March 2007. Clearly identified lines of communication and responsibility exist between the producer, transporter and operation and evidence of training, full integrated drills, and liaison was sighted.

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

**X in full compliance with**

**The operation is**

☐ in substantial compliance with **Standard of Practice 2.2**

☐ not in compliance with

*Basis for this Finding/Deficiencies Identified:*

The supply and transport contract stipulates that the transporter must be a signatory to the ICMI and must be ICMI Code compliant. The transporter, Sasol Infrachem SILog, is a ICMI signatory and has been audited by an independent third party auditor and was found to be ICMI transportation compliant on 8<sup>th</sup> March 2007. Emergency response plans were sighted along with evidence of adequate capabilities, training and resources.

**3. HANDLING AND STORAGE: Protect workers and the environment during cyanide 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

*Basis for this Finding/Deficiencies Identified:*

The operation only manages liquid cyanide and no mixing or handling of solid cyanide is done on site. Original drawings and design documentation for unloading and storage were sighted which clearly indicated that facilities were designed for effective cyanide



management and control. Drawings were signed off by appropriately qualified and competent engineers and subsequent modifications were also appropriately signed off. The unloading and storage areas are within security areas to minimise human exposure, located on concrete bunded areas to prevent seepage and contain any leakage, and are clearly separated from incompatible materials. All storage tanks are equipped with level indicators and high level alarms which sound at the storage area and repeat in the control room. The level measuring and alarm systems are also included on CMMIS, the computerized preventative maintenance systems.

*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.*

**X in full compliance with**

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

*Basis for this Finding/Deficiencies Identified:*

The site utilizes only liquid cyanide which is delivered in bulk tankers and off-loaded into storage tanks. The off-loading procedure is thorough and detailed and includes sequenced instructions on coupling, uncoupling and valve operation. The driver and off-loader use the "buddy" system to optimise safety and safe handling. The off loading procedure was developed in consultation with the transporter. The offloading process was subject to a risk assessment which guided contingency plans for normal and abnormal activities. PPE requirements are included in procedures, as are spill responses. Off-loading checklists were sighted and interviews conducted which confirmed cyanide awareness and competency. All reagent cyanide facilities are covered in the CMMIS (Computer Maintenance Management Information) computerized preventative maintenance system, with maintenance frequencies having been determined by Failure Mode Evaluation Critical Analysis (FMECA). Regular documented inspections are undertaken by shift staff and these are supported by regular legal inspections by safety officers and management.

**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 utilizing contingency planning and inspection and preventive maintenance procedures.*



**X in full compliance with**

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

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

The site has 71 procedures which integrated health, safety, environment and emergency management activities and plans. The systems (including OSHAS 18001 and ISO 14001) were reviewed and tested and shown to be effective and integrate well. TSF facilities managed externally were also reviewed and checked and systems and procedures found to be effective. Annual technical inspections of the TSF facilities are undertaken by a professional geotechnical engineer to ensure integrity and safety. Change management procedures are in place and are currently being upgraded to improve response and sensitivity. The site has no cyanide regeneration and disposal systems and no heap leach operations.

Regular laboratory testing is undertaken to optimize cyanide consumption against design parameters and changes in ore feed. Regular reviews and checks of the site and regional water balance are undertaken to ensure that water movement within the system is optimized and cyanide risk minimized.

Various types of inspection were in place and undertaken on a shiftly basis, in addition to legal inspections and management inspections. Preventative maintenance and inspection was controlled by a Computer Maintenance Management Information (CMMIS) electronic system. Routine inspection reports and checklist were sampled and employees interviewed to check the effectiveness of systems. Good communications was found to be in place between the operation and the central facilities and service groups. (Environmental management, water management, risk assessment, TSF management)

*Standard of Practice 4.2: Introduce management and operating systems to minimize cyanide use, thereby limiting concentrations of cyanide in mill tailings.*

**X in full compliance with**

**The operation is** ☐ in substantial compliance with **Standard of Practice 4.2**  
☐ not in compliance with  
☐ not subject to

*Basis for this Finding/Deficiencies Identified:*

The corporate strategy is to evaluate feed mix, conduct laboratory diagnostic leach programs and make additional changes based on results from laboratory tests. Original



test work, modeling and simulation for cyanide consumption documentation was sighted, along with the programs in place to evaluate ore changes, and implement changes where necessary. Cyanide addition is automated using the TAC 2000 system (auto cyanide titrator). Any changes in cyanide set points must be formally documented and authorized by the Plant Manager. Procedures are in place to guide cyanide addition and pH management. The broad strategy is to control cyanide at the plant, thereby minimizing cyanide risks on the TSFs.

*Standard of Practice 4.3: Implement a comprehensive water management program to protect against unintentional releases.*

**X in full compliance with**

**The operation is**

☐ in substantial compliance with **Standard of Practice 4.3**

☐ not in compliance with

*Basis for this Finding/Deficiencies Identified:*

Water balances are in place for the Vaal River central water management system and TSF. TSF Operations manage the reservoirs used by the site. The site has procedures in place for controlling reservoir levels to prevent unintentional releases. An interlinked system to balance water usage for all the sites linked to the system was reviewed and interviews with the Vaal River Water Manager, TSF Manager and Noligwa Gold Plant Manager confirmed that effective control and communication systems were in place. Daily communication on dam levels, TSF deposition, plant operating conditions and rainfall provide up to date information to manage and minimise the potential for releases. Proactive work is in place to increase the Vaal River water system's capacity to cope with certain rainfall conditions.

*Standard of Practice 4.4: Implement measures to protect birds, other wildlife and livestock from adverse effects of cyanide process solutions.*

**X in full compliance with**

**The operation is**

☐ in substantial compliance with **Standard of Practice 4.4**

☐ not in compliance with

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

The reservoirs on the site experience WAD cyanide levels significantly below 50 ppm. (A random check during the audit showed levels of 16.8 ppm WAD.) The Vaal River TSF has experienced no WAD cyanide levels above 50 ppm since the signing of the ICMI Code. Neither areas have experienced any cyanide related bird, or wildlife



mortalities. MINTEK studies and sample analyses were sighted which confirm the above. Linked plants have procedures in place to warn TSF management in the event of high WAD cyanide coming through the system but this has not yet occurred. Studies by the North West University have been undertaken to understand bird behaviour on the TSF and final results are expected in October 2007. The preliminary results, and the associated bird observation training given to operational staff, have begun to help gain a better understanding of bird presence on the TSFs.

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

**X in full compliance with**

**The operation is**

- ☒ in substantial compliance with **Standard of Practice 4.5**  
☐ not in compliance with

*Basis for this Finding/Deficiencies Identified:*

The site has no direct or indirect discharges to surface water.

*Standard of Practice 4.6: Implement measures designed to manage seepage from cyanide facilities to protect the beneficial uses of ground water.*

**X in full compliance with**

**The operation is**

- ☒ in substantial compliance with **Standard of Practice 4.6**  
☐ not in compliance with

*Basis for this Finding/Deficiencies Identified*

The site has no potential for seepage as its design includes hard surfaces for all areas, clean/dirty water separation, storm water impoundments and cutoff trenches. The Vaal River TSF has well fields installed to dewater the river bank and long term groundwater sampling by MINTEK has indicated no detectable, or "at limits of detection", cyanide. All borehole water from the dewatering wells is returned to the plants. No formally identified beneficial users of groundwater exist or have been identified by the jurisdictional authorities. The authorities' approach is targeted at other water quality parameters and there is no focus on cyanide. The site has a strong focus on backfill quality but as the feed to the backfill plant originates from low pH float tails, all free and WAD cyanide is destroyed.



*Practice 4.7: Provide spill prevention or containment measures for process tanks and pipelines.*

**X in full compliance with**

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

*Basis for this Finding/Deficiencies Identified:*

Spill prevention is primarily managed through the use of procedures, preventative maintenance and training. The site's design includes bunding and containment for all cyanide tankage and piping in the plant. Solutions and liquids in secondary containment are pumped back into the circuit and all secondary containment areas are maintained empty. Procedures were also sighted which manage cyanide spillages, leaks, decontamination and transferring spillage from cyanide sumps. Bunding capacity all meets the ICMI Code requirements and this was confirmed by site inspection and review of plans and drawings available. Procedures were sighted covering containment dam inspection, water management, and flooding management. TSF pipelines outside of the site are subject to spill prevention systems and form part of a pipe maintenance and monitoring programme (CMMIS) which includes thickness testing. The pipelines are also regularly inspected by the "Pipe patrol" and checked frequently by artisans.

*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.*

**X in full compliance with**

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

*Basis for this Finding/Deficiencies Identified:*

The Mispah Project Data Book, complete with drawings, specifications, compliance checks, quality control documents and signed off inspection certificates was sighted. Quality control and quality assurance records have been checked and contractor quality control systems and procedures confirmed. All projects are conducted under the auspices of certified ISO 9001:2000 systems controls. Professional Engineers' inspection documentation and reports were sighted and qualifications and competency of the individuals were checked and confirmed. Project hand-over certificates and Engineer's Reports relating to quality controls and integrity checks were sampled and checked. TSF facilities have annual reports which test performance against the TSF Code of Practice



operational guidelines (legal requirement) signed off by a Professional Geotechnical Engineer. As not all documentation for the site was available, a Professional Engineer's inspection was undertaken, subsequent corrective actions implemented, resulting in the Professional Engineer's sign-off for the facility "fit for purpose". This documentation was scrutinized and checked and confirmed by site inspection.

*Standard of Practice 4.9: Implement monitoring programs to evaluate the effects of cyanide use on wildlife, surface and ground water quality.*

**X in full compliance with**

**The operation is**

☐ in substantial compliance with **Standard of Practice 4.9**

☐ not in compliance with

*Basis for this Finding/Deficiencies Identified:*

Monitoring programs are in place to sample both surface and groundwater for cyanide. These are prioritised through broad based studies conducted by MINTEK to ensure that most appropriate areas are checked. Wildlife observations are correlated with studies conducted by the University of the North West and bird identification training programmes for monitors and inspectors have been introduced to add value to mortality observations. Monitoring and inspections (including checks for bird mortalities and bird species on the TSFs) are guided by appropriate procedures and guidelines.

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

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

**X in full compliance with**

**The operation is**

☐ in substantial compliance with **Standard of Practice 5.1**

☐ not in compliance with

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

The site is covered by an organization-wide, corporate level Closure Plan which is updated regularly and costs updated annually. Specific procedures are in place covering decontamination and removal of cyanide contaminated or redundant equipment. Planning and costing is supplemented by actual cyanide facility decommissioning experience.



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

**X in full compliance with**

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

*Basis for this Finding/Deficiencies Identified:*

Plans and funding of cyanide decommissioning activities are a requirement of the Minerals and Petroleum Resources Development Act and these plans and the latest cost estimates and details of financial provisions were sighted. Planning and costing is supplemented by actual cyanide facility decommissioning experience of an old AngloGold Ashanti plant (WAFU), using costs from the contractors involved.

**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 or control them.*

**X in full compliance with**

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

*Basis for this Finding/Deficiencies Identified:*

There is a full and detailed set of procedures in place and functional which covers the minimising of worker exposure to cyanide during all cyanide-related tasks. Appropriate PPE is specified in procedures for all cyanide-related tasks. All procedures were developed from HAZOPs and risk assessments and reflect responses to normal and abnormal conditions. Risk assessments, procedural and process HAZOPs are in place and regularly revised, or undertaken, for new or changed scenarios and circumstances. Site procedures were extensively checked through examination and interview and records relating to HAZOPs checked for worker input and involvement. Checks and balances are in place through worker involvement in HAZOPs, through consultations in Health & Safety Committee meetings and during Green Area meetings. Change management procedures are in place which test the consequences of modifications on worker health and safety and examples of projects subject to the change management process were reviewed. Newly introduced corporate change management procedures broaden the scope of the change analysis and will provide added assurance.



*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.*

**X in full compliance with**

**The operation is**

☐ in substantial compliance with **Standard of Practice 6.2**

☐ not in compliance with

*Basis for this Finding/Deficiencies Identified:*

Instrumentation functional specification pH control is set at 10.5 with interlock to Cyanide pumps activated at pH 10.4, and alarms at >pH 10.5. Personal and fixed monitoring devices (Mini-warns, PAC IIIs, and Polytrons) are used to check cyanide exposure levels and are prescribed by procedure in many routine and non-routine activities. Calibration of this equipment exceeds the frequency required by the manufacturers. "Hot spots" have been identified and clearly demarcated and procedures indicate PPE required, personal monitoring that needs to be carried and precautions that must be observed. On-going inspections and checks are also used to monitor and check facilities and emergency response equipment functioning. Safety equipment such as safety showers, eye washes, fire extinguishers and mandown alarms are numerous and well signposted. Effective and numerous warning signs and equipment marking is in place which not only warn of hazards but also inform on PPE, control access and supplement good safety practices. Change management procedures used at the plant and the TSF ensure that on-going process and operational changes are checked for impact upon worker health and safety. Change management procedures were reviewed and change implementations checked. Employee interviews were used to check awareness and sensitivity to health and safety measures. Accident and incident reporting and investigation procedures were found to be in place and effective although the absence of cyanide incidents made checking of this area of reporting difficult.

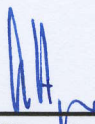
*Standard of Practice 6.3: Develop and implement emergency response plans and procedures to respond to worker exposure to cyanide.*

**X in full compliance with**

**The operation is**

☐ in substantial compliance with **Standard of Practice 6.3**

☐ not in compliance with





*Basis for this Finding/Deficiencies Identified:*

An emergency preparedness plan and cyanide emergency procedures are in place covering the site and the TSF facilities. The plan includes responses to scenarios identified on site via a emergency scenarios assessment HAZOP. The scope of the plan includes site-based responses and includes provision for evacuation of patients by ambulance to an identified nearby hospital. A fully equipped emergency room with first aid equipment, antidotes, medical oxygen and BA sets is in place. A fully equipped cyanide emergency trailer is on permanent standby on site for use outside the site perimeter. Equipment is regularly checked and tested and mock drills are held on site and in conjunction with external stakeholders. Interviews confirmed employee knowledge of cyanide hazards, and emergency response.

**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.*

**X in full compliance with**

**The operation is**

☐ in substantial compliance with **Standard of Practice 7.1**

☐ not in compliance with

*Basis for this Finding/Deficiencies Identified:*

The site has used a HAZOP study to developed site-specific emergency scenarios and responses. The emergency preparedness plan combines procedural responses and emergency provisions to deal with the various scenarios. These are regularly reviewed in the light of changes, mock drill learning points and employee feedback. There is a mutual aid agreement in place to cover emergency response which may involve the cyanide transporter and the associated use of the cyanide emergency trailer. The circumstances of such response are covered in procedures and via the route risk assessments developed by the transporter.

*Standard of Practice 7.2: Involve site personnel and stakeholders in the planning process.*

**X in full compliance with**

**The operation is**

☐ in substantial compliance with **Standard of Practice 7.2**



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☐ not in compliance with

*Basis for this Finding/Deficiencies Identified:*

Representatives of the workforce were involved in the HAZOP Study to develop the emergency scenarios and response in the emergency response plan and procedures. Workplace Green Areas meetings and Health and Safety Committee meetings are used to communicate developments and changes in all cyanide activities, including emergency response. Communication and involvement with the adjoining mine is handled by the corporate Sustainable Development department. Meetings have been held with the local business community and presentations have been given to schools regarding the dangers of cyanide and TSFs. Presentation materials and documentation on the communications was sighted. There is close, on-going liaison with the cyanide producer and transporter (Sasol) on emergency response, drills, and learning points from drills.

*Standard of Practice 7.3: Designate appropriate personnel and commit necessary equipment and resources for emergency response.*

**X in full compliance with**

**The operation is**

☐ in substantial compliance with **Standard of Practice 7.3**

☐ not in compliance with

*Basis for this Finding/Deficiencies Identified:*

The Emergency Preparedness Plan details clear duties, roles and responsibilities for the various emergency scenarios. Shift management are empowered to call upon appropriate resources via the management chain of command structure. The Plan cross references appropriate procedures which guide availability and use of resources and appropriate response. Emergency equipment lists were checked and site inspections confirmed availability and readiness. The Plan includes extensive contact references (telephone, cell phone, etc) of internal and external resources for the various scenarios, particularly with detail where external resources and skills might be needed. Emergency Team members were checked and training records and assessments showed the individuals to be well prepared and well equipped for cyanide emergencies. Periodic full scale Drills involving internal and external stakeholders ensure that roles and responsibilities are understood and clearly implemented.

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

**X in full compliance with**

**The operation is**

☐ in substantial compliance with **Standard of Practice 7.4**



☐ not in compliance with

*Basis for this Finding/Deficiencies Identified:*

The Emergency Preparedness Plan includes cross references to procedures for appropriate emergency notification and reporting and the call-out procedure and contact information lists which are updated regularly. Media communication is done centrally via a formal, centralised procedure. An emergency decision tree and event classification process ensures that internal and external notification and reporting is undertaken, consistent with the severity of the emergency. Contact details for neighbours were sighted.

*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.*

**X in full compliance with**

**The operation is**

☐ in substantial compliance with **Standard of Practice 7.5**

☐ not in compliance with

*Basis for this Finding/Deficiencies Identified:*

The Emergency Preparedness Plan cross-references to detailed and specialised procedures which cover clean-up and remediation relating to releases, pipeline failures and spills, as appropriate to the site-specific identified scenarios. Use of neutralization processes and materials is well covered, as is disposal of contaminated materials. Sampling procedures cover remediation issues and assessing risk. There are also cross references to the centralized environmental procedures which form part of the Environmental Management System.


*Standard of Practice 7.6: Periodically evaluate response procedures and capabilities and revise them as needed.*

**X in full compliance with**

**The operation is**

☐ in substantial compliance with **Standard of Practice 7.6**

☐ not in compliance with





*Basis for this Finding/Deficiencies Identified:*

The current Emergency Preparedness Plan was sighted, along with the previous Plan which it replaced, and reports and records of interactions and briefings on the changes. Evidence was sighted of learning points emerging from fire, lightening and cyanide man down drills (particularly relating to external drills including the hospital). The Plan includes the requirement for a least annual review, plus additional circumstances such as after a cyanide incident, or if mock drills suggest the need for change.

**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.*

**X in full compliance with**

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

*Basis for this Finding/Deficiencies Identified:*

Detailed checks were made on the centralized cyanide training and refresher programs and the training centre and facilities used to train employees in cyanide hazards and first aid. This training and the training centre is accredited by the MQA (Mining Qualifications Authority). These were cross-checked with plant records and seventeen randomly selected employees were checked in interviews on their understanding of cyanide hazards, first aid and emergency response. Identified employees and Emergency Team members receive advanced cyanide training at the accredited Sasol Training Academy which includes modules in search and rescue, rescue in confined spaces, and advanced cyanide first aid. Competency is tested using written assessments, oral questioning, and on-the-job observation.

*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.*

**X in full compliance with**

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



*Basis for this Finding/Deficiencies Identified:*

Site Training is conducted by the centralised Training Department in accordance with the South African National Unit Standard Met-G136 LG “Handle Liquid Cyanide Safely in a Metallurgical Plant” and the AngloGold Ashanti Cyanide Safe Handling Guidelines. Formal assessments of performance are conducted by assessors to check competency and understanding using PDAs (Personal Digital Assistants). Training for engineering maintenance staff includes cyanide training and specialised training is provided for Cyanide Off-loaders and the Emergency Response Team. Refresher training is provided 6 monthly and 12 monthly, depending upon worker category.

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

**X in full compliance with**

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

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

All employees receive basic cyanide training which includes raising the alarm and protecting themselves. The Emergency Response Team receives advanced cyanide training which includes incident command and confined space rescue. Periodic mock drills are undertaken and training personnel attend these drills and formally evaluate response and performance. Training records were checked to confirm attendance and successful completion.

**9. DIALOGUE: Engage in public consultation and disclosure.**

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

**X in full compliance with**

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

*Basis for this Finding/Deficiencies Identified:*

Evidence of meetings held with the local communities where cyanide was discussed specifically, was sighted. The communities were given the opportunity to raise issues and ask questions. Regular meetings are held with local emergency services to brief them on



current situations and changes. These meetings are facilitated by division management on behalf of the various gold plants. Presentation material and meeting minutes were sighted with neighboring mine staff, corporate support staff, and local authorities. Employee consultation is via Health & Safety meetings, union representatives and full-time Health & Safety Representatives.

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

**X in full compliance with**

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

*Basis for this Finding/Deficiencies Identified:*

AngloGold Ashanti Central Services, on behalf of the plant, initiated discussions with local emergency services, fire and rescue on hazardous chemicals, transportation procedures, risk assessments and cyanide management. This is also done in liaison with discussions held by the cyanide producer and transporter, Sasol, with emergency services.

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

**X in full compliance with**

**The operation is** ☐ in substantial compliance with **Standard of Practice 9.3**  
☐ not in compliance with

*Basis for this Finding/Deficiencies Identified:*

Various newsletters, articles, posters and placards covering cyanide management, dangers of Tailings Storage Facilities, pipelines, and information on the ICMI which have been made available to the public and specific interest groups were sighted. Information on cyanide exposures and releases is available on the company website, reported to Department of Minerals and Energy (legal requirement), and the Department of Water Affairs and Forestry (information reported to Government Departments is publicly available).