



# **CERTIFICATE OF REGISTRATION**

**IN TERMS OF THE NATIONAL NUCLEAR REGULATOR ACT, 1999 (ACT NO. 47 OF 1999)**

## **CERTIFICATE OF REGISTRATION NO. COR-37**

Certificate of Registration No. COR-37, is hereby granted by the National Nuclear Regulator (hereinafter referred to as the NNR) in terms of section 22 of the above Act

to

**HARMONY GOLD MINING COMPANY LIMITED**

Registration number:	05/38232/06
Registered address :	P O Box 1 Glen Harmony 9435

(hereinafter referred to as the holder)

subject to the terms and conditions set out herein.

**PART 1**

**AUTHORISATION CONDITIONS**

**1.1 SCOPE**

- 1.1.1 The holder is authorised to carry out activities associated with radioactive material as set out, and on the site as identified, in section 2.1 of this Authorisation.

**1.2 HAZARD ASSESSMENT**

- 1.2.1 Assessments, approved by the NNR, shall be conducted by the holder in respect of all the operations and activities involving radioactive material as set out in section 2.1 of this Authorisation and which could give rise to a risk of nuclear damage. The assessments must identify and quantify all potential radiation hazards:

1.2.1.1 to persons employed at or visiting the site  
and

1.2.1.2 to members of the public.

- 1.2.2 Details of any proposed modification to existing facilities or amendment of any procedure or construction of any facility, which may have an effect on the risk of nuclear damage and which has not been addressed by the hazard assessments identified in section 2.2 of this Authorisation, together with a quantitative assessment of its impact on the risk of nuclear damage, shall be submitted to the NNR by the holder. Such proposals shall be approved by the NNR before being implemented.

**1.3 OPERATIONAL LIMITATIONS**

- 1.3.1 The limitations pertaining to normal operations and listed in section 2.3.1 of this authorisation shall be adhered to.
- 1.3.2 No activities involving the demolition or disposal of any plant used for the processing of radioactive material shall be undertaken prior to approval by the NNR of the radiation hazard assessment and the radiation protection programme for such activities.

## **1.4 OPERATIONAL RADIATION PROTECTION**

### **1.4.1 WORKFORCE**

- 1.4.1.1 A radiation protection programme for underground workers shall be implemented and submitted to the NNR. The programme shall:
  - 1.4.1.1.1 Embody all aspects as required by NNR documents RD-006: "Requirements for the Control of Radiation Hazards: Mining and Minerals Processing", and RD-011: "Requirements for Medical Surveillance and Control of Persons Occupationally Exposed to Radiation: Mining and Minerals Processing", in the revisions specified in section 2.4.1.
  - 1.4.1.1.2 Ensure and demonstrate that radiation doses to persons employed at the site and to visitors to the site are in compliance with the radiation dose limitation system set down in the NNR document RD-010: "Requirements for Radiation Dose Limitation: Mining and Minerals Processing", in the revision specified in section 2.4.1 of this authorisation.
  - 1.4.1.1.3 Include individual monitoring for all workers at V2 shaft.
- 1.4.1.2 A radiation protection programme for surface workers shall be implemented and submitted to the NNR for approval in accordance with condition 1.10.1 of this authorisation. The programme shall:
  - 1.4.1.2.1 Embody all aspects as required by NNR documents RD-006: "Requirements for the Control of Radiation Hazards: Mining and Minerals Processing", and RD-011: "Requirements for Medical Surveillance and Control of Persons Occupationally Exposed to Radiation: Mining and Minerals Processing", in the revisions specified in section 2.4.1.
  - 1.4.1.2.2 Ensure and demonstrate that radiation doses to persons employed at the site and to visitors to the site are in compliance with the radiation dose limitation system set down in the NNR document RD-010: "Requirements for Radiation Dose Limitation: Mining and Minerals Processing", in the revision specified in section 2.4.1 of this authorisation.
- 1.4.1.3 In addition the reporting requirements specified in the NNR document RD-006: "Requirements for the Control of Radiation Hazards: Mining and Minerals Processing", the holder shall submit to the NNR a monthly report on the doses received by workers at V2 shaft not later than one month after the end of the monitoring period.
- 1.4.1.4 The provisions contained in the revision of documents listed in section 2.4.1 of this authorisation and submitted in terms of condition 1.4.1.1 and 1.4.1.2 of this authorisation, shall be adhered to.



## **1.4.2 PUBLIC**

- 1.4.2.1 Based on the results of the assessments referred to in clause 1.2.1, programmes embodying all aspects as required by NNR document RD-007: "Requirements for Control over Radioactive Effluent Discharges and Environmental Surveillance: Mining and Minerals Processing", in the revision specified in section 2.4.2 of this Authorisation, must be established and be submitted to the NNR for approval. These must ensure and demonstrate that radiation doses to members of the public are in compliance with the radiation dose limitation system set down in the NNR document RD-010: "Requirements for Radiation Dose Limitation: Mining and Minerals Processing", in the revision specified in section 2.4.1 of this Authorisation. The programmes, as approved by the NNR, shall be implemented by the holder.
- 1.4.2.2 The provisions contained in the revision of documents listed in section 2.4.2 of this authorisation and submitted in terms of condition 1.4.2.1 of this authorisation, shall be adhered to.

## **1.5 RADIOACTIVE WASTE**

- 1.5.1 A radioactive waste management programme embodying all the requirements contained in NNR document RD-004: "Requirements for Radioactive Waste Management: Mining and Minerals Processing", in the revision specified in section 2.5 of this Authorisation, shall be established and submitted to the NNR for approval.
- 1.5.2 The provisions contained in the revision of documents listed in section 2.5 of this Authorisation and submitted in terms of condition 1.5.1 of this Authorisation, shall be adhered to.

## **1.6 TRANSPORTATION**

- 1.6.1 Transportation of radioactive material or of any equipment or objects contained with radioactive material off the site or on roads which are accessible to the public must be carried out in terms of the provisions of the Regulations for the Safe Transport of Radioactive Material of the International Atomic Energy Agency in the revision specified in section 2.6 of this Authorisation.
- 1.6.2 An annual report shall be submitted to the NNR detailing the number of consignments made during the preceding year, the radioactive content per consignment, the nature of the packaging and the names of the consignees.

- 1.6.3 The provisions contained in the revision of documents listed in section 2.6 of this authorisation and submitted in regard to condition 1.6.1 of this authorisation, shall be adhered to.

## **1.7 PHYSICAL SECURITY**

- 1.7.1 A physical security system, approved by the NNR, which will prevent unauthorised access to areas containing radioactive material and will prevent the unauthorised removal of such material, shall be in place.
- 1.7.2 The provisions contained in the revision of documents listed in section 2.7 of this authorisation and submitted in terms of condition 1.7.1 of this authorisation, shall be adhered to.

## **1.8 OCCURRENCES**

- 1.8.1 An occurrence reporting mechanism, approved by the NNR shall be established which will ensure that occurrences, including incidents and accidents as defined in the National Nuclear Regulator Act (Act No 47 of 1999), and as identified in the NNR document RD-012: "Notification Requirements for Occurrences: Mining and Minerals Processing", in the revision specified in section 2.8 of this Authorisation, are reported to the NNR by the holder in accordance with the provisions of that document and as specified by NNR document RD-009: "Verbal Emergency Communication with the National Nuclear Regulator: Mining and Minerals Processing", in the revision specified in section 2.8 of this authorisation.
- 1.8.2 An emergency plan, approved by the NNR, shall be established to make provision for any occurrence involving radioactive material which gives rise to, or has the potential to give rise to, an unplanned exposure to radiation in excess of the respective annual effective dose limits for persons employed on the site, visitors to the site, and members of the public. This plan shall comply with the requirements contained in NNR document RD-008: "Requirements for Emergency Preparedness: Mining and Minerals Processing", in the revision specified in section 2.8 of this authorisation.
- 1.8.3 The provisions contained in the revision of documents listed in section 2.8 of this Authorisation and submitted in terms of condition 1.8.1 and 1.8.2, shall be adhered to.

## **1.9 QUALITY MANAGEMENT**

- 1.9.1 All activities carried out within the scope of this authorisation shall be subject to the requirements contained in the NNR document RD-005: "Quality Management Requirements for Activities Involving Radioactive Material: Mining

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and Minerals Processing", in the revision specified in section 2.9 of this authorisation.

- 1.9.2 The provisions contained in the revision of documents listed in section 2.9 of this authorisation and submitted in terms of condition 1.9.1 of this authorisation, shall be adhered to.

**1.10 SCHEDULE**

- 1.10.1 The programme, scheduling the achievement of compliance with the conditions of this authorisation, as set out in section 2.10 shall be adhered to.

This Certificate of Registration is effective from the date of issue.

Issued at Centurion on the *18<sup>th</sup>* day of *March* 2003.



**L B ZONDO**  
**CHIEF EXECUTIVE OFFICER**



**PART 2**

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**DOCUMENT CONTROL TABLE**  
**11 February 2003**

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2.1	1	X												
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2.7	1	X												
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SECTION	PAGE	REVISION
2.10	1	0



## **SECTION 2.1: SCOPE**

### **2.1.1 The Authorised site is:**

The surface areas as coloured as per the legend on the diagrams headed "MINPLAN 2", "MINPLAN 3" and "MINPLAN 6" annexed to Controlled Copy 1 and Controlled Copy NNR of this authorisation.

and

The underground areas as demarcated with the lines:

DA1,DA2,DA3,DA4,MU1,MU3,MU10,MR2,MR3,MR1,LR1,LR2,LR3,HF1,OV1,O  
V2,OV3,OV4,SL1,VK2,OW1,MS39,MS1 and MS2 on the diagram headed  
"MINPLAN 1" annexed to Controlled Copy 1 and Controlled Copy NNR of this  
authorisation.

JH101,KP2,JH107,SP1,E,JH103,JH102 and JH108 on the diagram headed  
"MINPLAN 4" annexed to Controlled Copy 1 and Controlled Copy NNR of this  
authorisation.

OV1,OV2,GP2,GP1,WG3,WG2,ML5,ML4,ML3,ML2,ML1,SS3,SS2,SS1,DB5,D  
B4,DB2,DB1,LR3,LR4,LR40,LR37 and HF1 on the diagram headed : "MINPLAN  
5" annexed to Controlled Copy 1 and Controlled Copy NNR of this authorisation.

### **2.1.2 The holder may, subject to the conditions in part 1 of this authorisation, use, possess, produce, store, and process radioactive material at and convey, cause to be conveyed and dispose of radioactive material from the site.**

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**SECTION 2.2: HAZARD ASSESSMENT**

2.2.1	AAQ/92-16		Decommissioning of the Virginia Acid Plant of Harmony Gold Mining Co. Ltd. Part 1: Report on the Predemolition Survey
2.2.2	AAQ/92-12		Decommissioning of the Harmony Acid Plant of Harmony Gold Mining Co. Ltd. Part 1: Report on the Predemolition Survey
2.2.3	BNS/REP01/93		Proposals for the Demolition and Disposal of Disused Uranium Plant at Harmony for Harmony Gold Mining Co. Ltd
2.2.4	BNS/REP2/93		Proposals for the Demolition and Disposal of Disused Uranium Plants at Virginia and Merriespruit for Harmony Gold Mining Co. Ltd
2.2.5	53A0031	(Rev 0)	Screening Survey and Hazard Assessment at the Mini Plant Millbuilding
2.2.6	53A0031	(Rev 0)	Pre-demolition Screening Survey and Hazard Assessment at the Gold Plant Millbuilding
2.2.7	REPROC22C	(Rev 0)	Prospective Hazard Assessment for Re-processing of Slimes Dam Number 22C for the Purpose of Removing Residual Gold
2.2.8	22CLIME	(Rev 0)	Prospective Hazard Assessment for Construction of a New Lime Plant at 22C Slimes Dam Reclamation Site
2.2.9	HAS-HGM-01/1	(Rev 2)	Summary from the Hazard Assessment previously done at the Virginia Acid and Flotation Plants and subsequent Measurements made at these Plants and Lime Plant of Harmony Gold Mining Co. Ltd

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2.2.10	INH/AV2#	(Rev 0)	Interim Report on Underground Radiation Hazards at V2 Shaft
2.2.11	FILTHAZ.HGM	(Rev 0)	Pre-Decontamination Radiation Surveys and Hazard Assessments of Filtration Plants
2.2.12	AOSAOSHAZ.HGM	(Rev 0)	Hazard Assessment Procedure
2.2.13	AOSSHAZ.HGM	(Rev 0)	Summary of Hazard Assessment Procedure
2.2.14	CENTRAL GOLD PLANT	(Rev 0)	Hazard Assessment – Surface Recovery Operations
2.2.15	SURHAZV1	(Rev 0)	Assessment of Radiation Hazards to the Surface Workforce: Virginia 1 Shaft
2.2.16	SURHAZV2	(Rev 0)	Hazard Assessment Summary at Virginia 2 Shaft
2.2.17	SURHAZH2	(Rev 0)	Methodology for the Assessment of Radiation Hazards to the Surface Workforce: Harmony 2 Shaft
2.2.18	SURHAZMM4	(Rev 0)	Assessment of Radiation Hazards to the Surface Workforce: Masimong 4 Shaft
2.2.19	SURHAZH4	(Rev 0)	Assessment of the Radiation Hazards to the Surface Workforce: Harmony 4 Shaft
2.2.20	SURHAZM3	(Rev 0)	Assessment of the Radiation Hazards to the Surface Workforce: Merriespruit 3 Shaft
2.2.21		(Rev 0)	Hazard Assessment on Tailings Dams
2.2.22		(Rev 0)	Assessment of the Radiation Hazards to the Surface Workforce: Unisel Shaft



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2.2.23		(Rev 0)	Assessment of the Radiation Hazards to the Surface Workforce: Saaiplaas 3 Shaft
2.2.24	53A0408	(Rev 0)	Hazard Assessment Surface Recovery Operation: Virginia Gold Plant
2.2.25	SURHAZH3	(Rev 0)	Assessment of Radiation Hazards to the Surface Workforce: Harmony 3 Shaft
2.2.26	SURHAZM1	(Rev 0)	Assessment of Radiation Hazards to the Surface Workforce: Merriespruit 1 Shaft
2.2.27	SURHAZMM5	(Rev 0)	Assessment of Radiation Hazards to the Surface Workforce: Masimong 5

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**SECTION 2.3.: OPERATIONAL LIMITATIONS**

- 2.3.1 Radioactive waste with a specific alpha (U-238, U-234, Th-230, Ra-226, Po-210, Th-232 and Th-228) activity exceeding 1000 Bq/g shall be stored in a facility approved by the NNR.
- 2.3.2 No processing of the Virginia No. 25 Slimes Dam shall be undertaken
- 2.3.3 No processing of the Virginia No. 27 Calcine Dam shall be undertaken

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**SECTION 2.4.1: RADIATION PROTECTION PROGRAMME - WORKFORCE**

2.4.1.1	RD-006	(Rev 0)	Requirements for the Control of Radiation Hazards: Mining and Minerals Processing.
2.4.1.2	RD-010	(Rev 0)	Requirements for Radiation Dose Limitation: Mining and Minerals Processing.
2.4.1.3	RD-011	(Rev 0)	Requirements for Medical Surveillance and Control of Persons Occupationally Exposed to Radiation: Mining and Minerals Processing.
2.4.1.4	53A0017		Interim Procedures for the Removal of the Concrete Floor from the Harmony #3 Plant Mill Building
2.4.1.5	ADUPROC	(Rev 0)	Procedure to Decontaminate ADU Filter Drums and Components
2.4.1.6	RPP-HGM-01	(Rev 2)	Radiation Protection Programme for the Demolition of the Virginia Acid, Flotation and Lime Plants of Harmony Gold Mining Co. Ltd
2.4.1.7	PCP-HGM-01/3	(Rev 2)	Personnel Control Procedure for the Demolition of the Virginia Acid, Flotation and Lime Plants of Harmony Gold Mining Co. Ltd
2.4.1.8	AEC-HGM-01/4	(Rev 2)	Access and Egress Control Procedure for the Demolition of the Virginia Acid, Flotation and Lime Plants of Harmony Gold Mining Co. Ltd
2.4.1.9	HAP-HGM-01/7	(Rev 2)	Hazard Assessment Procedure for the Demolition of the Virginia Acid, Flotation and Lime Plants of Harmony Gold Mining Co. Ltd



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2.4.1.10	CSP-HGM-01/10	(Rev 2)	Closure Survey Procedure for the Rehabilitation of the Virginia Acid, Flotation and Lime Plant Sites of Harmony Gold Mining Co. Ltd
2.4.1.11	MEDURV	(Rev 0)	Interim Programme for Medical Surveillance and Control of Persons Occupationally Exposed to Radiation
2.4.1.12	P-MILL	(Rev 1)	Operational Radiation Protection – Extension of Demolition Activities in the Millbuilding and Surrounding Areas and Activities in the Mini Plant
2.4.1.13	SHR-HGM-01/1	(Rev 1)	Procedure for the Shredding of Surface Contaminated PVC Piping and Rubber at Plastic Stroebelewis C.C. No 18 Van Der Bijl Street Produkta Hennenman
2.4.1.14	RADPROV2#	(Rev 0)	Strategy and Schedule for the Implementation of Radiation Protection at V2 Shaft
2.4.1.15	AOSRPP.HGM	(Rev 0)	Radiation Protection Programme
2.4.1.16	AOSAEP.HGM	(Rev 1)	Access Egress Procedure
2.4.1.17	RADSTAFF	(Rev 0)	Requirements for the Radiation Protection Function for Mining and Minerals Processing Facilities – Harmony Gold Mining Company Limited
2.4.1.18	MEDSURV	(Rev 0)	Medical Surveillance and Control of Persons Occupationally Exposed to Radiation
2.4.1.19		(Rev 0)	Demolition of the Saaiplaas Reduction Plant: Harmony Gold Mining Company Limited

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2.4.1.20	(Rev 0)	Demolition Merriespruit Reduction Plant: Harmony Gold Mining Company Limited
2.4.1.21 RADSTAFF	(Rev 0)	Requirements for the Radiation Protection Function for Mining and Minerals Processing Facilities

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**SECTION 2.4.2: RADIATION PROTECTION PROGRAMME - PUBLIC**

- |         |           |         |   |
|---------|-----------|---------|---|
| 2.4.2.1 | RD-007    | (Rev 0) | Requirements for the Control over Radioactive Effluent Discharges and Environmental Surveillance: Mining and Minerals Processing. |
| 2.4.2.2 | REFURBISH | (Rev 2) | Procedure for Control over Items leaving authorised Mining and Minerals Processing Sites – Items to be Refurbished or Repaired    |



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**SECTION 2.5: RADIOACTIVE WASTE**

2.5.1	RD-004	(Rev 0)	Requirements for Radioactive Waste Management: Mining and Minerals Processing.
2.5.2	WASHPROC	(Rev 0)	Procedure for the Washing of potentially Radioactively Contaminated Items
2.5.3	WMP-HGM-01/2	(Rev 3)	Waste Management Procedure for Demolition of the Virginia Acid, Flotation and Lime Plants of Harmony Gold Mining Company Limited
2.5.4	DEC-HGM-01/8	(Rev 3)	Decontamination Procedure for the Radioactively Contaminated Items for the Demolition of the Virginia Acid, Flotation and Lime Plants of Harmony Gold Mining Company Limited
2.5.5	AOSDEC.HGM	(Rev 1)	Decontamination Procedure
2.5.6	AOSWAS.HGM	(Rev 0)	Waste Management Procedure
2.5.7	AOSADU.HGM	(Rev 1)	Precipitation Plant Decontamination Procedure
2.5.8	SCRAPMET	(Rev 1)	Procedure for the Release of Scrap Metal from Mining and Minerals Processing

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**SECTION 2.6: TRANSPORTATION**

2.6.1 TS-R-1 (ST-1, Revised)

Regulations for the Safe Transport of  
Radioactive Material 1996 Edition  
(Revised).

2.6.2 AOSTRANS.HGM (Rev 0)

Waste Transport Procedure

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2 AOSSEC.HGM (Rev 0) Physical Security Procedure

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- 2 AOSSEC.HGM (Rev 0) Physical Security Procedure





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**SECTION 2.8: OCCURRENCES**

2.8.1	RD-012	(Rev 0)	Notification Requirements for Occurrences: Mining and Minerals Processing.
2.8.2	RD-009	(Rev 0)	Verbal Communication with the National Nuclear Regulator: Mining and Minerals Processing.
2.8.3	RD-008	(Rev 0)	Requirements for Emergency Preparedness: Mining and Minerals Processing.
2.8.4	NOP-HGM-01/5	(Rev 2)	Notification Procedure for the Demolition of the Virginia Acid, Flotation and Lime Plants of Harmony Gold Mining Company Limited
2.8.5	OCCUR	(Rev 1)	Reporting of Occurrences from Harmony Gold Mining Company Limited
2.8.6	AOSNOT.HGM	(Rev 0)	Notification Procedure
2.8.7	OCCUR-53OCC052	(Rev 0)	Hazard Assessment, Radiation Protection Programme and Transport Procedures for Clean-up: Occurrence 53OCC052
2.8.8	CLOSE52A	(Rev 0)	Close-out Report for Occurrences 53OCC052

**SECTION 2.9: QUALITY MANAGEMENT**

2.9.1	RD-005	(Rev 0)	Quality Management Requirements for Activities involving Radioactive Material: Mining and Minerals Processing.
2.9.2	QAL-HGM-01/9	(Rev 2)	Quality Management Procedure for the Radiation Protection Programme during the Demolition of the Virginia Acid, Flotation and Lime Plants of Harmony Gold Mining Company Limited
2.9.3	AOSQMP.HGM	(Rev 0)	Quality Management Procedure
2.9.4	QALMAN	(Rev 0)	Quality Management Programme

**SECTION 2.10: SCHEDULE**

2.10.1 SCHEDULE (Rev 9) Programme Scheduling Compliance with  
Licensing Requirements

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