



Republic of Botswana

# RADIATION PROTECTION INSPECTORATE NATIONAL DOSIMETRY LABORATORY

Private Bag BO 1, Gaborone, Botswana  
Tel: (+267) 318 8388, Fax: (+267) 395 7025  
Plot 132, Gaborone International Finance Park, Gaborone  
E-mail: [rpibots@gov.bw](mailto:rpibots@gov.bw)



## APPLICATION FOR RADIATION MONITORING SERVICE

1. INSTITUTION DETAILS					
Institution:					
Address (Delivery):			Address (Billing):		
Location:			Location:		
Telephone No:		Fax No:		Telephone No:	
				Fax No:	

2. RADIATION SAFETY OFFICER					
Name:			E-mail Address:		
Telephone No:		Mobile No:		Fax No:	

3. TYPE OF MONITORING REQUIRED					
Please tick the type of monitoring required:	Personnel – Wholebody Monitoring (WM) <input type="checkbox"/>		Personnel – Extremity monitoring (EM) <input type="checkbox"/>		Environmental / Workplace monitoring (WM) <input type="checkbox"/>
Quantities monitored:	Personal Dose equivalents to the body, Hp(10) [deep dose] and Hp(0.07) [skin dose]		Personal Dose equivalent to the extremities, Hp(0.07)		Ambient dose equivalent H*(10)
Number of monitoring badges or dosimeters required:					
Monitoring frequency	Monthly <input type="checkbox"/>	Quartely <input type="checkbox"/>	Monthly	Monthly <input type="checkbox"/>	Quartely <input type="checkbox"/>
Measurement Capabilities of the NDL	Energy range: 33 keV to 1.25 MeV (Gamma radiation and X-rays) and 230 keV to 2.2 MeV (Beta) Dose range: 0.1 mSv to 10 Sv		Energy range: 33 keV to 1.25 MeV (Gamma radiation and X-rays) and 230 keV to 2.2 MeV (Beta) Dose range: 0.1 mSv to 10 Sv		Energy range: 33 keV to 1.25 MeV (Gamma radiation and X-rays) and 230 keV to 2.2 MeV (Beta) Dose range: 0.1 mSv to 10 Sv
For Office use:	Technical capability: Yes <input type="checkbox"/> No <input type="checkbox"/>		Technical capability: Yes <input type="checkbox"/> No <input type="checkbox"/>		Technical capability: Yes <input type="checkbox"/> No <input type="checkbox"/>
	Resources available Yes <input type="checkbox"/> No <input type="checkbox"/>		Resources available Yes <input type="checkbox"/> No <input type="checkbox"/>		Resources available Yes <input type="checkbox"/> No <input type="checkbox"/>
	Institution (Customer) No.			Group:	
	Name and Signature of Officer doing assessment:			Date:	

4. DETAILS OF THE RADIATION TO BE MONITORED			
Please tick as appropriate the radiation type	Beta <input type="checkbox"/>	Gamma <input type="checkbox"/>	X-ray <input type="checkbox"/>
Please list the radiation source used			
Please indicate the radiation energy of the source	Minimum:		
	Maximum		

5. Please state the date of commencement of the monitoring service: <i>Please note that the monitoring period starts at the beginning of each month</i>	
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6. DECLARATION BY THE INSTITUTION'S DULY AUTHORIZED PERSON			
<i>Please note that the application must be accompanied by a signed agreement for the Service (AGREEMENT/02/DRP-NDL/01)</i>			
I, the undersigned, declare that the information given in this application is true and complete to the best of my knowledge. I acknowledge that the monitoring badges or dosimeters will remain the property of the NDL during the provision of the service. I accept the accompanying terms and conditions of use of the service, as well as any reasonable changes that may occur in the terms and conditions while making use of the service. I agree to pay the charges relating to the provision of the service. I authorize the NDL to provide my institution with the service.			
Name of Officer:		Position:	
Signature of the Duly Authorized Person:		Date:	



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**7. PERSONNEL RADIATION MONITORING SERVICE - WEARER REGISTRATION**

Department: _____	Section: _____
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Surname	First Name	Identification Number	Date of Birth (dd/mm/yyyy)	Gender (M / F)	Country of Origin	Occupation	*Type of Monitoring

\*Either WM (for Wholebody monitoring) or EM (for Extremity monitoring)





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## Terms and Conditions of Use of the Radiation Monitoring Service

### 1. MONITORING PERIOD

- a) The radiation monitoring services provided are: personnel (wholebody and extremity) monitoring to monitor and report doses received by workers from external exposures to ionizing radiation at the workplace and environmental monitoring to monitor the ambient radiation levels in the environment.
- b) The Radiation Monitoring Service is provided using Harshaw Thermoluminescent Dosimeter (TLD) badges for wholebody and environmental monitoring and Harshaw EXT-RAD Extremity Dosimeter assembly for extremity monitoring. The badge consists of a TLD card and holder or pouch.
- a) The badges must be used for the monitoring period indicated on the badge distribution report.
- b) In the distribution report for personnel monitoring, each wearer is allocated a badge with a unique identification number. This helps in easy identification when processing and assessing doses received by the wearers. Wearers must ensure that they wear the badges assigned to them.
- c) The Customer must ensure that wearers do not leave the institution with the badges. When not in use, all badges or dosimeters must be stored in areas where background radiation levels are low. Badges assigned to individuals in each department/section must be stored in a common place when not in use. This ensures that all badges are exchanged and returned on time at the end of each monitoring period, even in the absence of the wearer. This arrangement also reduces the possibility of badges being lost.
- d) From the time of issue, badges start accumulating background radiation. In order to keep the accumulated background radiation levels as low as possible, it is important that badges are returned to the National Dosimetry Laboratory (NDL) immediately after the exchange of badges is done.

### 2. EXCHANGE BADGES

- a) The badges for personnel (wholebody and extremity) monitoring are issued for monthly or quarterly monitoring periods where a monthly period shall be from the first to the last day of the month and quarterly period shall be from the first day of January, April, July or October to the last day of March, June, September or December respectively.
- b) The badges for environmental or workplace monitoring are issued for monthly or quarterly monitoring periods or a period of approximately 90 days..
- c) For Customers outside Gaborone and its surrounding areas, the exchange badges are dispatched **at most ten (10) days** before the start of each monitoring period.
- d) The NDL should be notified, if the badges are not received within five (5) days after the beginning of the monitoring period, otherwise receipt of the badges is assumed. Customers are advised to check with their local post offices or their courier before declaring a missing delivery.
- e) For Customers within Gaborone and its surrounding areas, the badges must be collected from the NDL at most five (5) days before the beginning of the monitoring period.

### 3. RETURN OF USED BADGES FOR ASSESSMENT OF DOSES

- a) The badges for the monitoring period that has ended should be returned to and received by the NDL for reading of exposure levels within five (5) days after the end of the monitoring period. It is the responsibility of the institution to ensure that all badges are returned to the NDL on time.
- b) Registered mail, at a cost to the Customer, is advisable when returning the badges.
- c) All badges that were issued for a specified monitoring period should be returned to the NDL after the end of that period even if they were not used.
- d) In the event of a suspected unusual dose being received by wearer(s), the NDL should be contacted **within twelve (12) hours**. In such events, the badges for the concerned wearer(s) should be returned to the NDL for rapid emergency processing.
- e) Badges returned to the NDL **more than two (2) months** after the end of the monitoring period **will not be read** of exposure levels.

### 4. LOST OR DAMAGED BADGES

- a) Badges are the property of the NDL and are only loaned to the customer, for the purpose of monitoring workers of exposures to ionizing radiation. Where badges are damaged or lost while in the care of the Customer, the Customer shall pay a replacement charge for the badges.
- b) Once received by the Customers, the badges will remain in their care until they are returned to and received by the NDL. Customers must report to the NDL, in writing, badges that have been lost or damaged as soon as possible. A used

- c) badge will be considered **"lost"** if it is not returned to and received by the NDL **within thirty (30) days** after the end of the monitoring period.
- c) Where a Customer has informed the NDL about terminating or suspending **the monitoring service**, badges will be considered **"lost"** if they are not returned to and received by the Dosimetry Laboratory **within fourteen (14) days** after the effective suspension or termination date or the end of the monitoring period, whichever comes first.
- e) In the case of **employees leaving the employ of the institution**, personnel monitoring badges must be returned to and received by the NDL **within seven (7) days** after the end of the monitoring period, otherwise they will be assumed "lost".

### 5. DOSE REPORTS

- a) The NDL shall issue monthly radiation dose reports for personnel monitoring and monthly or quarterly radiation dose reports for environmental monitoring.
- b) The reports shall be sent to the institution within fourteen (14) days after receipt of the used badges by the NDL.
- c) Special dose reports like annual dose reports are issued upon request in writing by the Customer.
- d) Doses are reported in mSv, where mSv stands for milliSieverts. The minimum reportable dose (MRD) is 0.100 mSv. MRD is the smallest dose that can be measured with reasonable accuracy. All doses below MRD are reported as zero.
- e) Personnel doses above investigation levels will be printed in bold. The investigation levels are 1 mSv and 25 mSv for Hp (10) and Hp (0.07) respectively.

### 6. AMENDMENTS, SUSPENSION AND TERMINATION OF SERVICE

- a) Once registered for the service, the service is provided indefinitely unless terminated in writing by the Customer or the period for the provision of the service has been pre-defined by the Customer.
- b) Requests for amendments in the number of badges required by the Customer, addition or deletion of wearers, workplaces or areas monitored must be done by completing the appropriate form available from the NDL.
- c) Changes in addresses or requests for suspension or termination of service must be communicated to the NDL in writing.
- d) All requests for suspension or termination of service, amendments or changes must be made **at least fifteen (15) days** before the beginning of the monitoring period in which the changes or amendments are to be effective.

### 7. CHARGES

- a) There is a monthly monitoring charge for badges issued to Customers.
- b) All badges are charged for at the time of issue and there will be no credits for badges returned unused.
- c) There is a replacement charge for lost or damaged badges.
- d) All charges listed below are subject to annual review and adjustments, if any, will take effect on 1st April of each year.
  - i. **Monitoring charge per badge: P30 per person per month**
    - For **monthly monitoring period**, charge is **P30 per person**;
    - For **quarterly monitoring period**, charge is **P90 per person**.
  - ii. **Replacement Charge for lost or damaged badge: P550**

### 8. INVOICES AND PAYMENTS

- a) An invoice for the monitoring charge is prepared and sent to the Customer when issuing badges. Charges for lost or damaged badges are included in this invoice.
- b) Invoice terms and payment options are listed in the invoice and in the **"Paying for the Radiation Monitoring Service"** flyer.
- c) Customers may opt to pay for the service in advance for up to twelve (12) months (one year).

### 9. SUSPENSION OF SERVICE

- a) The NDL reserves the right to suspend the monitoring service if invoices are not settled **within thirty (30) days** of the invoice date. After settling their overdue unpaid invoices, Customers who had been suspended due to non-payment of the invoices shall henceforth be required to pay for the service in advance.
- b) Since the monitoring of workers for exposures to ionising radiation is a legal requirement under the Radiation Protection Act of 2006, the NDL will notify the Director of the Radiation Protection Inspectorate of any suspension of the service.

These terms and conditions of use will be reviewed annually and any changes will be communicated to Customers at least thirty (30) days before the changes are effected.