Eskom	ADMINISTRATIVE PROCEDURE	Allocation Centre 38A	Reference Number KAA-597	Rev 9
NNR: NO No.:	ENVIRONMENTAL SURVEILLANCE PROGRAMME			PAGE 1

KORC	ACCESS	IMPORTANCE CATEGORY	NEXT REVIEW DATE	DATE AUTHORISED
NO	Nuclear Restricted	NSA	2026-11-30	2023-11-30

COMPILED / REVISED	REVIEWED	AUTHORISED
(sgd) G MAKAPELA	(sgd) G VISSER	(sgd) K GOVENDER
G MAKAPELA	G VISSER	K GOVENDER
HEAD OF ESL	HEAD OF RADIOCHEMISTRY	CHEMISTRY MANAGER
DATE 2023-11-30	**DATE** 2023-11-30	**DATE** 2023-11-30

THIS PROCEDURE HAS BEEN SEEN AND ACCEPTED BY:

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FCA	ALARA REVIEW	SUPERSEDES
PROTECTION	NO	KAA-597, Rev 8 dd. 2021-08-17 FULL REVIEW

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1.0 PURPOSE

1.1 To describe the process and define the responsibilities for the implementation of the Environmental Surveillance Programme.

2.0 SCOPE

2.1 Applicable to the implementation of the Environmental Surveillance Programme as required by the Eskom Standard, 238-47.

3.0 DEFINITIONS AND ABBREVIATIONS

3.1 Definitions

N/A

3.2 Abbreviations

3.2.1 **CNLG** – Corporate Nuclear Licensing Group

3.2.2 **CR** – Condition Report

3.2.3 **ESL** – Environmental Surveillance Laboratory

3.2.4 **KNLD** – Koeberg Nuclear Licensing Department

3.2.5 **NNR** – National Nuclear Regulator

3.2.6 **NSA** – Nuclear Safety Assurance

3.2.7 **RP** – Radiation Protection

3.2.8 **SRER** – Refer to 240-143501787

3.2.9 **TD & RM** – Technical Documentation and Records Management

4.0 REFERENCES

4.1 Referenced Documents

4.1.1 335-2, Rev 6: Koeberg Nuclear Power Station Management Manual

4.1.2 KAA-500, Rev 14: The Process for Controlled Documents

4.1.3 KSA-011, Rev 14: The Requirements for Controlled Documents

4.1.4 KSC-003, Rev 7: The Chemistry Programme

4.2 Applicable Documents

4.2.1 238-47: Radiological Environmental Surveillance Requirements

4.2.2 238-54: Radiation Protection Licensing Requirements for Koeberg Nuclear Power Station

4.2.3 240-143501787: Koeberg Nuclear Power Station Licensing Processes

4.2.4 KGC-LUC-005: ESL Land Use Census Guide

4.2.5 KGC-RQC: Implementation of the Radiochemistry Quality Control Programme

4.2.6 KLA-005: Koeberg Event Classification and Reporting Criteria Listing

4.2.7 KWC-AD-001: Management and Control of Chemistry Records

4.2.8 KWC-RC-004: ESL Sampling Procedure

4.2.9 KWH-G-010: Composite Release Calculation

5.0 RESPONSIBILITIES

5.1 The Chemistry Manager is responsible for the implementation of the Environmental Surveillance Programme in accordance with the NNR requirements, relevant Eskom standards and site procedures.

5.2 The Chemistry Group is responsible for the execution of the programme that must include:

5.2.1 Monitoring the environment for radionuclides of possible Koeberg origin through the analysis of environmental samples that monitor the exposure pathways.

5.2.2 Monitoring direct radiation through the deployment of radiation dosemeters.

5.2.3 Performing an annual land use census, the results of which must be included in the annual ESL report.

5.2.4 Producing three quarterly ESL reports and an annual report (which will include the results for the fourth quarter). The report shall include the following:

5.2.4.1 A list of all the results exceeding the minimum detectable activities of nuclides considered to be of origin from Koeberg.

5.2.4.2 Tabulated results, summaries, interpretations and statistical evaluation of the results of the surveillance programme for the reporting period (where justified), including comparison with pre-operational studies, previous environmental surveillance reports and an assessment of the observed impacts of the station operation on the environment. Graphical representation of the applicable results should be provided to indicate developing trends or tendencies and/or where the nature of the amount of information warrants such representation.

NOTE 1: *If the detected activity exceeds the reporting levels listed in 238-47, the report must provide an analysis of the problem and a planned course of action to alleviate the problem.*

NOTE 2: *In the event that some results are not available for inclusion in the report, the report must be submitted noting the reasons for the omission and the results must be submitted in the next report.*

5.2.4.3 Sampling methods, size and physical characteristics of each sample type, sample preparation methods, analytical methods, measuring equipment used, where these differ from existing procedures, and a map of all sampling locations keyed to a table giving distances and directions from Unit 1 reactor, if these vary from the existing sampling locations.

5.2.4.4 The results of the inter-laboratory comparison programme, as required in accordance with KGC-RQC.

5.2.5 The annual report is to be submitted to the NNR, prior to April 1st of the following year. The quarterly reports are to be submitted to the NNR on a quarterly basis, following the process of generating and approving these reports.

5.2.6 Chemistry will submit the final draft to licensing by 25th March each year.

5.2.7 Chemistry will submit the ESL quarterly and annual report to TD&RM for achiving.

NOTE: *Any deviation from the programme must be reported in accordance with 238-47.*

5.3 The Radiation Protection Manager is responsible for the provision of the support services by the Radiation Protection Group as required for the Environmental Surveillance Programme.

5.4 The Radiation Protection Group is responsible for the following:

5.4.1 Reviewing reported results and official reports of the Environmental Surveillance Programme.

5.4.2 Determining the committed dose to the critical group based on the results in the ESL report for the period of interest.

5.4.3 Determining any required changes to the sampling and analysis programme.

5.4.4 Investigating all incidents, evaluating the impact and/or effects and recommending any additional sampling requirements.

5.4.5 Refer to the Work Flow Responsibility Matrix (Appendix 1) for all other responsibilities.

5.5 The Emergency Management Manager is responsible for the provision of calculated annual average ground level χ / Q values for each of the 12 wind-rose sectors.

6.0 PROCESS

6.1 Refer to the Work Flow Responsibility Matrix (Appendix 1).

6.2 Refer to KLA-005 for the reporting levels of the Melkbos Sewage Sludge.

6.3 Any abnormal event must be reported in the quarterly and annual reports.

7.0 RECORDS

7.1 The Quarterly and Annual Reports must be retained as permanent records according to the Chemistry Quality Records List.

8.0 ATTACHMENTS

Appendix 1 – Work Flow Responsibility Matrix – Implementation of the Environmental Surveillance Programme

Appendix 2 – Justification

WORK FLOW RESPONSIBILITY MATRIX	**APPENDIX 1: IMPLEMENTATION OF THE ENVIRONMENTAL SURVEILLANCE PROGRAMME**

R – Responsible
A – Approve
F – File
• – Outside Matrix Scope
Y/N or N/Y – Decision
C – Concur
I – Informed
S – Service
[ ] – Mandatory Requirement
( ) – As Appropriate/Required
Flow Path:
Main Flow Secondary Flow

ACTIVITIES	1	2 CNLG	3	4 CHEMISTRY	5	6 RP	7	8	9	10	11	12	**NOTES & REFERENCES**
A. ENVIRONMENTAL SURVEILLANCE													
1. Collect, prepare and analyse the sample.				[R]									As specified in 238-47.
2. Any radioactivity detected other than naturally occurring radionuclides.				Y/N									Go to activity 12.
3. Resample / reanalyse to confirm the result.				(R)									Required only if the detected activity is unexpected or out of trend. Where resampling is impractical, the original sample must be reanalysed.
4. Is the result greater than or equal to: - 10% of the reporting level specified in 238-47, OR - the reporting level for Melkbos Sewage Sludge in KLA-005.				Y/N									CRs should be raised for unexpected radionuclides or radioactivity levels. Go to activity 12.
5. Raise a CR as soon as possible.				[R]									- For exceeding 238-47 reporting levels, include requirements to notify the NNR in the CR. - For Melkbos Sewage Sludge raise a CR within 5 days. Refer to KLA-005. - Sampling of 6 SEU: Refer to KWH-G-010 6.1.1 (4).
6. Investigate the event and quantify the radiological impact, if necessary.						[R]							
7. Submit an investigation report to the NNR.						[R]							An investigation report need not be submitted for Melkbos Sewage Sludge. Refer to 238-54 Annex A.
8. Inform Chemistry of the results of the investigation and actions required, if any.				[I]		[R]							

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R – Responsible A – Approve F – File • – Outside Matrix Scope Y/N or N/Y – Decision C – Concur I – Informed S – Service [ ] – Mandatory Requirement ( ) – As Appropriate/Required Flow Path: Main Flow Secondary Flow	**ORGANISATION / FUNCTION**												**NOTES & REFERENCES**
		CNLG		CHEMISTRY		RP							
ACTIVITIES	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	
9. Implement any sampling and analysis requirements required by the investigation.				[R]									
10. Implement any other actions required by the investigation.						[R]							Related to effluent release management.
11. Forward the completed investigation to Chemistry.						[R]							
12. File the results.				[R]									Refer to KWC-AD-001.

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Flow Path:
Main Flow Secondary Flow

ACTIVITIES	1	2 CNLG	3	4 CHEMISTRY	5	6 RP	7	8 NSA	9	10	11	12	**NOTES & REFERENCES**
B. QUARTERLY REPORT													
1. Prepare a Quarterly Report.				[R]									At the end of the first, second and third quarters only. The last quarter is included in the Annual Report. Include the close-outs of any occurrences raised.
2. Review.				(S)		(S)		(S)					
3. Evaluate the report and add any interpretations, and dose evaluations.						[R]							
4. Forward the report to KNLD.				[R]									
5. Forward the report to the NNR.		[R]											Refer to 240-143501787.
6. Forward the report to TD & RM.				[R]									
C. ANNUAL REPORT													
1. Compile an Annual Report.				[R]									Include the results of the Quarterly Reports and the close-outs of any occurrences raised during the fourth quarter.
2. Review.				(S)		(S)		(S)					
3. Evaluate the report and add any interpretations and dose evaluations.						[R]							
4. Forward the report to KNLD.				[R]									
5. Forward the report to the NNR.		[R]											Refer to 240-143501787.
6. Forward the report to TD & RM.				[R]									

WORK FLOW RESPONSIBILITY MATRIX	**APPENDIX 1: IMPLEMENTATION OF THE ENVIRONMENTAL SURVEILLANCE PROGRAMME**

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		CNLG		CHEMISTRY		RP							
ACTIVITIES	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	
D. ANNUAL LAND USE CENSUS													
1. Perform an annual land use census.				[R]									Include results in the Annual Report.
2. Has a change in land use within 10 km been identified?				Y/N									No further action required.
3. Inform RP.				[R]									
4. Evaluate the annual average ground level χ/Q at the sector in which the new location is found.						[R]							
5. Is the annual dose average ground level χ/Q for the sector in which the location is found greater than that of the original sampling location? Inform Chemistry.				[I]		Y/N							Retain the original sampling location.
6. Submit an SRER to the NNR proposing the new sampling location.						[R]							Refer to 240-143501787.
7. With NNR approval, amend the programme to include the new sampling location.						[R]							
8. Implement the sampling programme with the new identified location.				[R]									

APPENDIX 2

JUSTIFICATION

Revision 6

1. Full scheduled review required to bring the procedure up to date.

Revision 7

1. Full scheduled review.
2. Problem Notification changed to Condition Report.

Revision 8

1. Scheduled review.
2. Close-out of CR-104924-007 CA, CR-122972-001 CA, CA 104691-001 CA.

Revision 9

1. Close-out of CR 138214-001CA