

Environmental Radioactivity Report

2012/13

Disclaimer

The purpose of this publication is to inform discussion and assist policy development. The opinions expressed in the publication do not necessarily reflect the official views of the Ministry of Health.

The Ministry of Health makes no warranty, expressed or implied, nor assumes any legal liability or responsibility for the accuracy, correctness, completeness or use of the information or data in this publication. Further, the Ministry of Health shall not be liable for any loss or damage arising directly or indirectly from the information or data presented in this publication.

The Ministry of Health welcomes comments and suggestions about this publication.

Citation: Ministry of Health. 2014. *Environmental Radioactivity Report 2012/13*.
Wellington: Ministry of Health.

Published in September 2014
by the Ministry of Health
PO Box 5013, Wellington 6145, New Zealand

ISBN 978-0-478-40212-4 (online)
HP 5585

This document is available at www.health.govt.nz



MANATŪ HAUORA

Summary

Samples were analysed for radioactivity from the following locations:

- Atmosphere – Kaitaia, Chatham Island, Rarotonga and Baring Head
- Rainwater – Hokitika and Kaitoke
- Milk powder – Waikato, Taranaki and Westland.

Full details of the program are available on the Ministry of Health’s website.

Any artificial radioactivity continued to be at levels that are below detection limits in many cases and significantly below levels that would give rise to health concerns. No significant change in the radioactivity status of the environment occurred during the period.

No radioactive contamination from the Fukushima Daiichi nuclear accident was observed in the New Zealand environment.

Results

Atmosphere

Air samples were collected daily from Kaitaia, Chatham Island and Rarotonga and analysed by high-resolution gamma spectrometry. Concentrations of artificial radionuclides were below detection limits, which were in the range of 1 to 5 $\mu\text{Bq}/\text{m}^3$ for I-131, Cs-134 and Cs-137. Results for the non-artificially produced radionuclides Be-7 and Pb-212 are reproduced in Table 1.

Table 1: Annual average concentrations of Be-7 and Pb-212

Sampling site	Be-7 ($\mu\text{Bq}/\text{m}^3$)	Pb-212 (mBq/m^3)
Kaitaia	3951 \pm 83	12.34 \pm 0.56
Chatham Island	3364 \pm 81	6.74 \pm 0.22
Rarotonga	3784 \pm 77	59.4 \pm 2.1

Samples were also collected at Baring Head and analysed for the presence of C-14. This confirmed the continuing trend of reducing $\Delta^{14}\text{C}$ values in the atmosphere.

Rainwater

Samples were collected weekly from Hokitika and analysed for total beta-activity concentration using a liquid scintillation counter and for artificial nuclides using gamma spectrometry. Be-7 measurements were used as a quality control for the performance of the sampling system.

No artificial radionuclides were detected. The deposition of beta emitters was 422 ± 15 Bq/m² with 3600 mm of rainfall. The average weekly deposition was 6.4 ± 1.3 Bq/m². This radioactivity is almost entirely due to naturally occurring radionuclides such as K-40 and Pb-210.

Samples were also collected at Kaitoke and analysed for H-3. Observed monthly concentrations have not deviated from the regular background seasonal pattern.

Milk powder

Dairy milk powders were collected from Waikato, Taranaki and Westland. These were analysed monthly for I-131, Cs-134 and Cs-137 by gamma spectrometry. Cs-137 was the only detectable artificial radionuclide.

Table 2: Annual average Cs-137 concentrations in milk powder

Region	Cs-137 (Bq/kg)
Waikato	0.49 ± 0.18
Taranaki	0.86 ± 0.24
Westland	0.28 ± 0.13