Australian Government

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Upper Hunter Shire Council
Attn: Grahame Wilson
135 Liverpool St
Scone NSW 2337

25th November 2024

Dear Grahame,

Please find enclosed a draft report for radioactivity analyses performed on 5 water samples received 10/05/2024 – 09/08/2024. The ANSTO project code for these samples is 2024em0004. Please quote this number in any further correspondence regarding these results.

Please contact me if you have any queries regarding your results.

Yours sincerely,

Alicea Gedz
Senior Scientist, Environmental Monitoring
Phone: 02 9717 9897
Email: age@ansto.gov.au

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Certificate of Analysis

Client Organisation:	Upper Hunter Shire Council
Contact:	Grahame Wilson
Number of Samples Received:	5
ANSTO Project Number:	2024em0004

Methods

I-4558 Determination of Gross Alpha and Gross Beta Radioactivity in Waters – Thick Source Method

This method is based on the following ISO standards:
9696:2017 Water quality – Gross alpha activity – Test method using thick source
9697:2018 Water quality – Gross beta activity – Test method using thick source

I-8236 Determination of Gamma Activity in Environmental Samples
I-3775 Inorganic: Thermo Fisher iCAP 7600 ICPAES Analysis
I-2806 ERMC Manganese dioxide co-precipitation
I-3333 ERMC Uranium and Thorium chemical isolation using UTEVA resin
I-3338 ERMC Cerium fluoride alpha source preparation
I-3330 ERMC Radium chemical isolation
I-3321 ERMC Operation of Ortec Alpha Spectrometers

QA/QC:
Determined activities are referenced against known standards. Detector background counts were taken between sample counting.
The ANSTO Environmental Monitoring Laboratory and Low-level Radiochemistry Laboratory are benchmarked against international standards and regularly participate in relevant national and international proficiency exercises.

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Results

Table 1. RADIOACTIVITY IN WATER

Sample Description	Client ID	ANSTO ID	Date Sampled	Radioactivity (Bq/L)					
				Gross Alpha	Calculated ^{40}K	Gross Beta (^{40}K Corrected)	^{210}Po	^{226}Ra	^{228}Ra
MacKenzie St	1	C0992	8/05/2024	0.79 ± 0.06	1.69	0.46 ± 0.01	< 0.004	0.28 ± 0.02	0.359 ± 0.122
Langley St	2	C0993	8/05/2024	0.59 ± 0.05	1.54	0.54 ± 0.01	< 0.002	0.17 ± 0.02	< 0.353
Collins St	3	C0994	8/05/2024	0.68 ± 0.05	1.40	0.38 ± 0.01	< 0.002	0.16 ± 0.01	0.366 ± 0.103
Raw MacKenzie St Bore Water	R01	C1011	8/08/2024	0.96 ± 0.08	1.69	1.67 ± 0.03	< 0.002	0.23 ± 0.02	0.577 ± 0.123
Treated MacKenzie St Bore Water	T01	C1012	8/08/2024	0.48 ± 0.05	1.65	0.42 ± 0.01	< 0.001	0.18 ± 0.02	0.312 ± 0.104

Sample Description	Client ID	ANSTO ID	Date Sampled	Radioactivity (Bq/L)				
				^{228}Th	^{230}Th	^{232}Th	^{234}U	^{238}U
MacKenzie St	1	C0992	8/05/2024	< 0.004	< 0.001	< 0.001	< 0.001	< 0.001
Langley St	2	C0993	8/05/2024	< 0.003	< 0.001	< 0.001	< 0.001	< 0.001
Collins St	3	C0994	8/05/2024	< 0.003	< 0.001	< 0.001	< 0.001	< 0.001
Raw MacKenzie St Bore Water	R01	C1011	8/08/2024	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Treated MacKenzie St Bore Water	T01	C1012	8/08/2024	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001

Note:
The sum of the alpha emitting isotopes was found to be significantly lower than the gross alpha measurement for all bores. This was attributed to ingrowth of natural Radon isotopes during the initial gross alpha analysis, as a result of the presence of Uranium and Thorium decay chain products.

Report prepared by:

Alicea Gedz
25/11/2024

Report checked by:

Tom Loosz
26/11/2024