Sellafield Ltd

Annual Review of Environmental Performance 2025/26

Sellafield Ltd. Annual Review of Environmental Performance 2025/26

This publication outlines the variety of ways in which Sellafield Ltd. monitor our impacts on the environment, providing balanced information across a range of impact types.

1. Carbon Footprint 2025/26

Sellafield Ltd. continues work across the business to manage carbon emissions in-line with our Carbon Management Transition Plan. Our carbon footprint is measured annually and externally verified. The organisation's direct emissions (Scope 1 and 2) for the 2025/26 financial year are in the region of 160,000 tonnes of CO_2e, an estimated 44% below our Carbon Management Plan 'business as usual' trajectory. These emissions are primarily attributed to the electricity and steam used in the processing and storage of nuclear materials and waste, and for nuclear decommissioning.

In common with other businesses, Sellafield Ltd. has significant indirect emissions (Scope 3). To ensure alignment with emerging legislation and reporting standards, we are continually improving our quantification of this data. For the first time for the 2025/26 financial year, we have successfully estimated our Purchased Goods and Services emissions which make up the largest proportion of our overall Scope 3. The verified proportion of our Scope 3 emissions is now estimated to be around 380,000 tonnes CO_2e. This provides us with the most comprehensive estimation to-date for Scope 3 and supports our understanding of progress against our long-term carbon reduction targets.

2. Non-Radiological Impacts of Discharges & Monitoring of Non-Radiological Pollutants in the Environment 2025

The Installations Permit includes a requirement for a non-radiological monitoring programme. Compared to the radiological environmental monitoring programme, its scope is limited and comprises local air sampling on the Sellafield site, water sampling from the Rivers Calder and Ehen and seawater sampling from local beaches. Data are provided in the Appendix. A more comprehensive summary of non-radioactive releases to air, controlled waters, land and off-site transfers of waste is given in the Pollution Inventory supplied to the Environment Agency each year and is available from their website.

Measurements of nitrogen dioxide concentrations in air (using passive diffusion tubes) are made at five locations on the Sellafield site. Air sampling results show very low concentrations well within the UK Air Quality Standard [1].

Water samples are obtained from the Rivers Calder and Ehen at locations both upstream and downstream of the site. The downstream samples are taken above the confluence of the two rivers, and at times which minimise contamination with seawater. Seawater samples are obtained from the shoreline areas and confirm that the aqueous discharges from Sellafield are not causing the Environmental Quality Standards (EQS) and Environmental Assessment Levels (EAL) [2] to be exceeded and are therefore of negligible impact.

Sellafield Ltd. is committed to minimising the use of ozone depleting substances and fluorinated greenhouse gases and transitioning to more environmentally friendly alternatives where appropriate. Routine releases are estimated from the amounts of refrigerants used to top-up systems on site.

3. Monitoring of Sellafield's Landfill Sites 2025

The Waste Management Licences for the North Landfill Site and Calder Floodplain Landfill Extensions require that environmental monitoring be carried out in the vicinity of the two sites. The monitoring comprises water sampling from the River Calder and New Mill Beck upstream and downstream of the landfills and gas monitoring over their surfaces. The results confirm that the impact of Sellafield's landfill sites remains negligible.

4. Radiological Dose Impacts 2025

This report provides a summary of the comprehensive data that are available for inspection by members of the public on the Public Registers maintained by the Environment Agency. The full dataset is provided in the Appendix. Data on foodstuff consumption and occupancy rates were obtained from the comprehensive habit survey conducted on behalf of the environmental regulators by the Centre for Environment, Fisheries and Aquaculture (CEFAS) in 2023 [3] supplemented by an annual update of marine foodstuff consumption conducted in 2025 [4]. Supplementary data on terrestrial monitoring were obtained from the RIFE report for 2024 [5].

There were no instances of non-compliance with the numerical limits of permits regulating discharges and disposals of radioactive wastes at Sellafield in 2025. Radioactive discharges (aqueous and gaseous) were well below the permitted limits and were generally lower than those in 2024. Significant reductions in tritium, carbon-14 and krypton-85 occurred following the cessation of Magnox fuel reprocessing in July 2022. Krypton-85 was removed from the Radioactive Substances Activities (RSA) Environmental Permit for the Sellafield site on 31st March 2023.

The estimated radiological doses to members of the public are summarised in the table below. The 'representative person' concept is considered equivalent to the previously used 'critical group'. Operations at Sellafield Ltd. were estimated to give a dose of 44 µSv to the marine representative person, which is slightly lower than the dose estimated for 2024 (49 µSv). The most significant radionuclides contributing to the seafood consumption dose were plutonium-alpha and americium-241, with the environmental concentrations of these radionuclides being mostly due to historic discharges and therefore changes in dose year on year reflect natural environmental variations.

Representative person doses from operations at Sellafield (µSv)		
Pathway	**2024**	**2025**
Marine representative person (adults)		
seafood consumption	13	11
aerial pathways	1.6	1.4
external radiation from beach occupancy (marine)	34	32
Total dose to marine representative person (adults)	**49**	**44**
Terrestrial representative person (adults)		
Inhalation	0.55	0.59
external radiation from beach occupancy (terrestrial)	3.8	3.8
terrestrial foodstuff consumption	5.9	6.0
marine foodstuff consumption	0.43	0.34
direct radiation	2.9	2.7
Total dose to terrestrial representative person (adults)	**14**	**13**

The estimated dose to the terrestrial representative person due to the consumption of terrestrial foodstuffs was 6 µSv. The total dose to the terrestrial representative person was estimated as 13 µSv which is lower than the dose reported for 2024 (14 µSv).

The range of annual doses estimated above are comparable to those from the regulators' programme and consistent conclusions are made that annual doses are significantly below the legal limit of 1,000 µSv [6]. The regulators estimated that the highest total dose in 2024 to the Cumbrian coastal community near Sellafield would be 200 µSv [5]. Approximately 180 µSv of this dose was from historical discharges of naturally occurring radionuclides from the former phosphate processing plant at Whitehaven [5]. The contribution of Sellafield Ltd. to this annual dose was estimated in the regulators' report to be 18 µSv [5]. This is lower than the estimate of 44 µSv reported herein. The difference was due to the regulators assessment using data from all sources of radioactivity (dominated by non-Sellafield derived radioactivity) whereas the assessment herein applies similar data, although is specific to the past and current activities on the Sellafield site. Data applying the complete suite of profiles from the CEFAS habit surveys

[3,4] are shown in the Appendix and illustrate a similar range of doses to those discussed above.

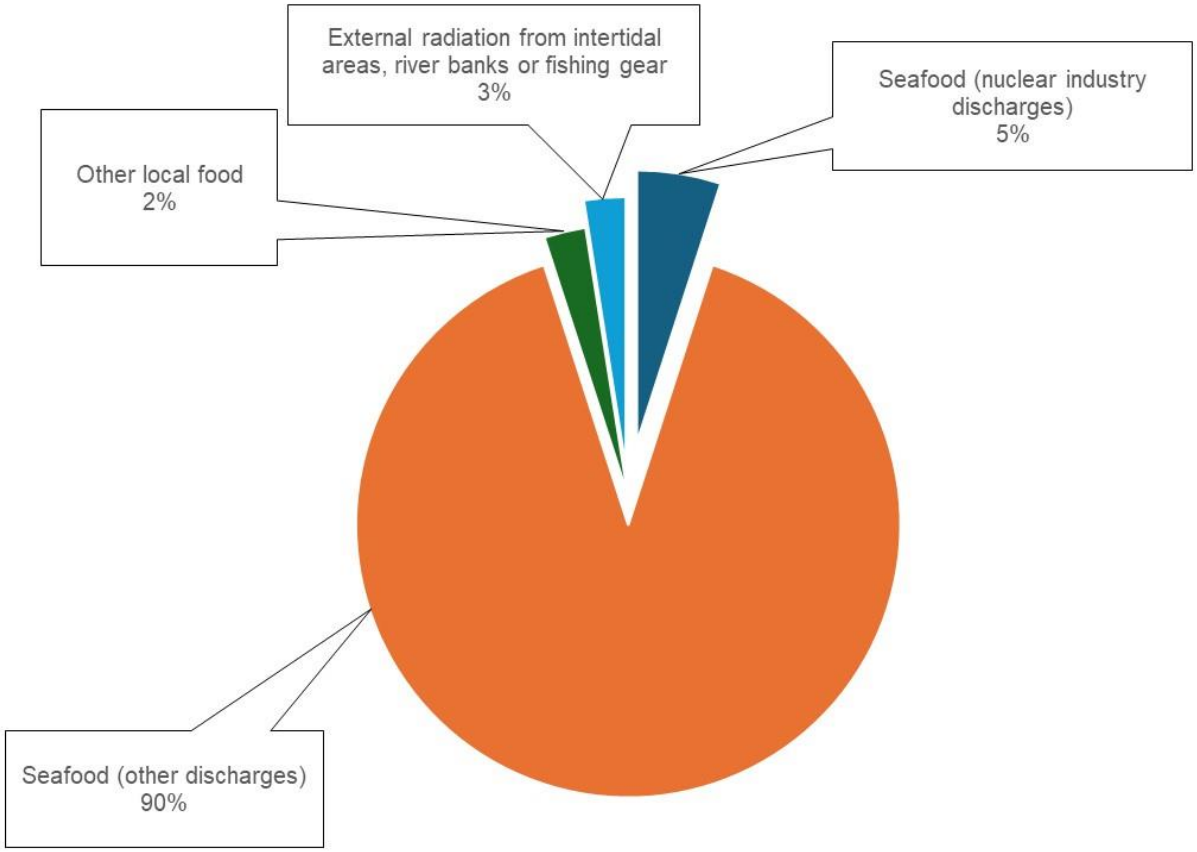


Chart showing the contribution of different sources of radioactivity to the highest total dose to the Cumbrian coastal community from man-made radioactivity from the Regulators monitoring programme for 2024 [5].

Independent environmental monitoring programmes and dose assessments are carried out and reported by other governmental agencies and research groups [7–10]. These also conclude that the public radiological doses due to operations on the Sellafield site are very low, providing confidence in the conclusions presented above.

The distributions of caesium-137 and americium-241 activities for particles and larger objects recovered by the beach monitoring programme in 2024 were within the ranges previously observed and considered in the health risk assessment associated with public beach occupancy.

Sellafield Ltd. has contributed to a number of initiatives that developed criteria for the protection of the natural environment and carried out assessments of exposure against the guidelines given in national and international publications. In 2023 the UK Health Security Agency (UKHSA) published a scientific paper on the impact of Sellafield discharges on biota [11]. They concluded that all current dose rates to marine and terrestrial biota were below the Derived Consideration Reference Level (DCRL). On the basis of work to date there is no reason to believe that radioactive discharges from Sellafield Ltd. are harming the natural environment and the dose assessments presented herein focus on the protection of human health.

The following visual is included as it is illustrative of the comparable dose impacts of Sellafield discharges versus various other sources of radiation exposure by the general public in the UK. It should be noted that Sellafield discharges would be incorporated as a small contributor of the “minor exposures” group.

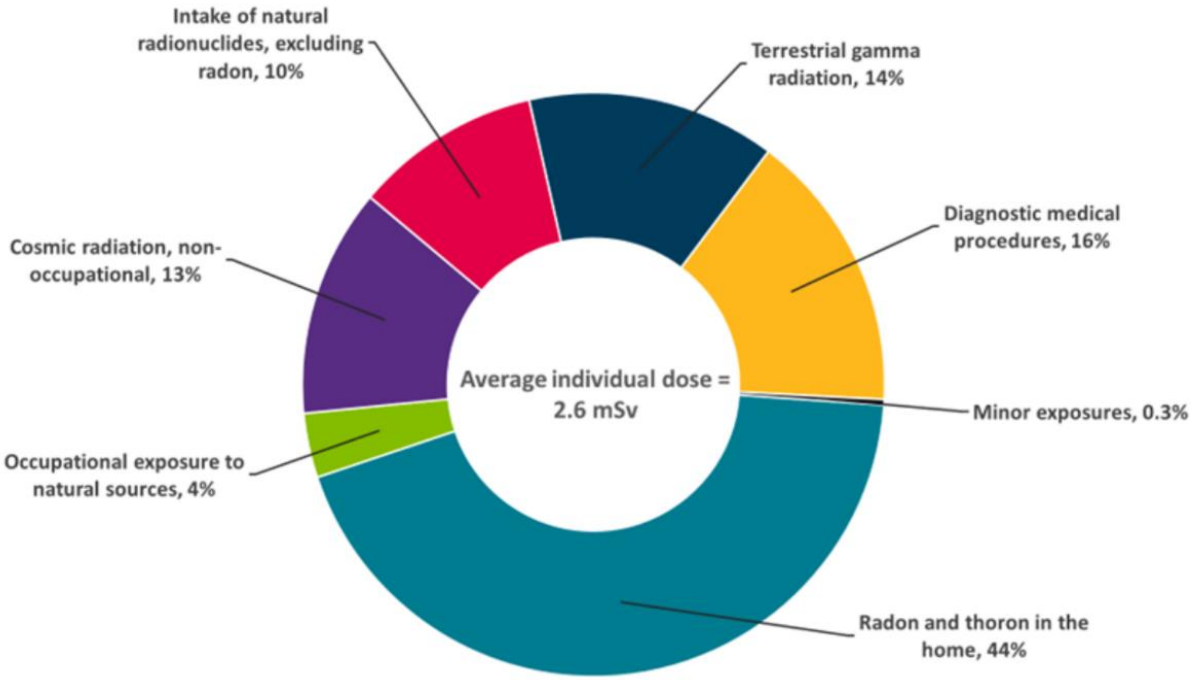


Chart showing the contribution of different sources of radioactivity to the average individual dose from all sources of radioactivity in the UK from the UK Health Security Agency [12].

The measurements in this report relate to environmental radioactivity that is mainly attributable to discharges from the Sellafield site. However, natural radioactivity makes an appreciable contribution to the reported values in some instances, and it is important to recognise that natural radioactivity is the dominant source of radiation exposure to the population as a whole, including individuals living close to nuclear establishments.

In addition, the widespread radioactive fallout from the testing of nuclear weapons and from the Chernobyl accident make small contributions to overall doses. The subject has been reviewed comprehensively by the UK Health Security Agency [12,13] and others [14]. Any corrections to account for background radiation have been noted.

In summary, the impacts of radioactivity in the environment local to Sellafield remain low, as per recent years, with only a small portion of this already low impact attributable to present operations on the site. In contrast to earlier points in the site's history, the primary value of this extensive programme of environmental monitoring (in particular with respect to radioactivity in the environment) has moved on from measuring the impacts of the site's ongoing activities to:

- providing reassurance to both the public and other stakeholders,
- demonstrating compliance with both international obligations and our EPR (Environmental Permitting Regulations) permits - which directly place requirements on our environmental monitoring programme, and
- providing reassurance monitoring to Sellafield Ltd. ourselves, by allowing the detection of any abnormal or fugitive releases to the environment.

5. Monitoring for Radioactivity in the Environment 2025

Statutory environmental monitoring programme

The statutory environmental monitoring programme provides public and stakeholder assurance that the environmental impacts of the Sellafield site are minimised according to the principles of Best Available Techniques (BAT). In terms of radiological protection, the statutory environmental monitoring programme has the following remit:

- to take account of the most important pathways of radiation exposure to the public,
- conduct appropriate sampling and analysis relevant to those pathways, and
- to combine monitoring and habits data to yield estimates of radiation doses to the public.

The results of the 2025 environmental monitoring programme are presented within the Appendix of this report alongside supplementary data published by the Food Standards Agency (from 2024) [5]. The main pathways identified by Sellafield Ltd., the Environment Agency and the Food Standards Agency as relevant to calculating radiological doses from discharges from the Sellafield site are:

- internal exposure from the high-rate consumption of seafood (particularly crustaceans and shellfish) and of local agricultural produce,
- external gamma radiation from exposed intertidal sediments, particularly the silts and muds of estuaries and harbours,
- consumption of terrestrial foodstuffs and inhalation of airborne radioactivity, and
- direct radiation from the Sellafield site.

Marine monitoring

Concentrations of radionuclides in seafoods (fish, molluscs and crustaceans) were very low and comparable to previous years data. Concentrations of radioactivity in seaweed, seawater and in sediments were broadly similar to those of recent years with variations reflecting natural processes that transport sediment along the coast.

Gamma dose rate surveys are carried out in the areas most often frequented by members of the public and the site perimeter and the surrounding district. Particular attention is paid to areas where silt or mud accumulates, such as in harbours or estuaries, where dose rates tend to be higher because of the presence of fine-grained sediments. In general, gamma dose rates are declining towards background levels and are consistent with the radioactive decay of key gamma emitting radionuclides (such as caesium-137).

Freshwater monitoring

Water samples are collected from rivers (Calder and Ehen), lakes and domestic supplies. The results are all very low and rarely above the limits of detection, except for strontium-90 which is generally present in rainwater and surface water at levels typical of those throughout the UK.

Higher strontium-90 concentrations are measured in the River Calder at Sellafield due to seepage of groundwater from site to the river. This radionuclide is thought to be present due to the historic leaks to ground and measurements have determined that elevated concentrations in the river begin to occur immediately upstream of the statutory sampling point. There is no evidence of any elevated levels of strontium-90 in any other environmental media (seawater or seafoods) and the contribution of strontium-90 to external doses is minimal. Hence, the overall public dose consequences of these elevated levels would be insignificant. Nevertheless, a watching brief will be kept on the situation to ensure that these conclusions remain valid.

Terrestrial monitoring

High volume air samplers (HVAS) are generally located close to the site perimeter and in nearby centres of population and are used to measure particulate radionuclides. Levels at all locations were generally similar to previous years.

Total deposition collectors, grass plots and soil sampling plots are located in the vicinity of each of the five high volume air samplers close to the site perimeter. Measurements were similar to those collected over recent years with total deposition, grass and soil measurements in 2025 showing elevated concentrations of caesium-137 and strontium-90 at the North Gate sampling

site which is located closer to the centre of the Sellafield site and is typically downwind of the Open Fuel Storage Ponds.

Milk results for 2025 are broadly similar to, or lower than, those observed for previous years, with many analyses reported at the limit of detection. Potatoes are collected from farms close to the site and concentrations of radioactivity were very low and typical of data from recent years.

Direct radiation

Dose rates at the site perimeter, corrected for natural radiation, averaged 0.01 μGy per hour, which is slightly elevated over natural background. Dose rates in the surrounding district were consistent with natural terrestrial background radiation and did not show a significant contribution from the Sellafield site. An assessment of the maximum theoretical direct shine offsite dose to members of the public illustrated that doses could be approximately 2.7 μSv per year to people living adjacent to the site boundary. This assessment is a slight decrease from the direct radiation dose for 2024 (2.9 μSv) due to a small reduction in the dose rate at the perimeter monitoring site closest to the nearest residential location.

Beach monitoring

The beach monitoring programme for 2025 conducted a total of 117 hectares of beach monitoring against the programme target of 105 hectares. A total of 49 particles and 3 larger objects were detected, recovered, and analysed. Of these, 47 were alpha-rich particles (where radioactivity was dominated by americium-241) and two were beta-rich particles (where radioactivity was dominated by caesium-137). Three beta-rich larger objects were recovered from Sellafield beach. Find rates and radioactive contents in 2025 did not require any form of intervention through the Environment Agency notification and intervention protocol [15]. Information on the beach monitoring programme was published in a peer-reviewed and open-access scientific paper [16].

Impacts on local groundwater

Sellafield Ltd. undertakes groundwater monitoring to characterise and monitor groundwater quality and the environmental fate of in-ground contamination across the site. The management of contaminated groundwater is underpinned by a Best Available Technique assessment with the current best option identified as characterising groundwater properties, monitoring changes in distribution and concentrations of substances and using the gathered data to develop the hydrogeological model where relevant. This has led to an objective-based programme which determines the extent of the network used, the analytes and groundwater properties to be measured, along with testing and sampling frequencies. During 2025 a review of these objectives was completed to ensure they meet the current needs of the Best Available Technique option and to optimise the sampling and analysis programme, considering new borehole installations being available adjacent to the River Calder and Magnox Swarf Storage Silo.

The groundwater monitoring network for 2025 included 254 sample points (excluding surface water sample points, e.g. beach seepages and riverbed seepages) across the site and adjacent land, targeting both bedrock (sandstone - principal aquifer) and superficial deposits (secondary aquifer). This was designed to meet the monitoring objectives and provide targeted sampling in areas of interest. Additional sample points were included to support site characterisation and ground investigations completed during 2025, data from these sample points have been incorporated into the Land Quality dataset and installations will be added to routine monitoring in the future.

The groundwater samples with the highest radiological activity concentrations were predominantly collected from monitoring wells within the Separation Area of the site. The general location of contamination remained similar to previous years, and activity concentrations observed site-wide remained similar to 2024. Radiological contamination is present in the upper and lower groundwater, particularly in the Separation Area of the site. Radiological activity

concentrations are very low in groundwater to the east of the River Calder. The distribution of non-radioactive contaminants has been consistent over time. Seawater is present in some groundwater monitoring wells closer to the coast.

The Magnox Swarf Storage Silo is the largest current source of in-ground contamination at the site. A leak was declared in late 2019 and a programme of enhanced environmental monitoring instigated. This has undergone continuous refinement based on the observed results, with the most recent iteration being embedded within the routine groundwater monitoring programme. New multi-level wells recently introduced to the monitoring programme are being used to characterise groundwater contamination, develop a three-dimensional understanding and track trends south of the facility and towards the River Calder. The resulting dataset is still emerging and will be progressively enhanced in future years. Although the movement of the leak through groundwater can be measured, the overall concentrations of radionuclides remain very low in the context of the World Health Organisation Drinking Water Guidelines. The first phase of a project to install continuous dataloggers which measure groundwater parameters for use as proxies to assess changes in contaminant concentrations and groundwater dynamics over time was completed in 2025.

6. Impacts of Solid Waste Dispositions 2025/26

Ensuring that the Best Available Technique waste route is used and diverting waste from the Low Level Waste Repository and non-radioactive waste landfills continues. The Waste Operating Unit has reduced the accumulation of waste stored on site by transferring radioactive waste to interim stores, the onsite landfill, despatched waste offsite for treatment, incineration or if there are no other routes, arranged for the waste to be consigned to the repository or non-radioactive waste landfills.

Historically, most low activity waste used to be disposed of off-site at the Low Level Waste Repository, with the remainder being diverted via other waste routes. Now most low activity waste is diverted; exceeding the target for the diversion of waste is therefore a positive outcome as it demonstrates increased volumes of waste being removed from the Sellafield site. However, the Waste Operating Unit recognises the importance of good quality forecasts to provide certainty for the supply chain, demands on resources, to inform decision making for new capability and storage requirements; improvement works are now underway in this regard.

A five year lookahead of the waste forecasts for Sellafield Ltd. is submitted annually to Nuclear Waste Services. The waste forecast is measured by the Waste Operating Unit Master Production Schedule and is updated after each period in the FY. In 2025/26 the forecasts for metallic, combustible, Very Low Level Waste and Low Level Waste were met.

In 2025/26 Sellafield Ltd had an overall recycling rate of 98%, similar to that achieved in 2024/25.

Diversion/Disposal routes	Forecast 25/26	Actual 25/26
Metallics (tonne)	750	873
Bulk Combustible (m^3)	650	699
Bagged Combustible (m^3)	1500	1750
Very Low Level Waste (Asbestos) (te)	25	34
Very Low level waste (m^3)	300	675
Low Level Waste disposal (containers)	10	10

The Waste Operating Unit also oversees the assets process which is a key part of how Sellafield Ltd. keeps items in use and supports the circular economy. Funds from the sale of the assets are put back into the Nuclear Decommissioning Authority.

7. References

[1] HMSO (2010). The Air Quality Standards Regulations. Available online at https://www.legislation.gov.uk/uksi/2010/1001/contents/made

[2] Environment Agency (2022). Risk assessments for your environmental permit. Available online at https://www.gov.uk/guidance/risk-assessments-for-your-environmental-permit

[3] Moore K.J, Greenhill B.J., Mickleburgh F.C., Limbach H.G & Clyne F.J. (2024). Radiological Habits Survey: Sellafield 2023. CEFAS Report RL 04/24, Lowestoft: Centre for Environment, Fisheries and Aquaculture Science. Available online at: https://www.cefas.co.uk/services/surveys/habits/

[4] K.J. Moore, F.J. Clyne, B.J. Greenhill and G.M. Wylie (2026). Radiological Habits Survey: Sellafield Review, 2025. CEFAS Report RL 03/26, Lowestoft: Centre for Environment, Fisheries and Aquaculture Science. Available online at: https://www.cefas.co.uk/services/surveys/habits/

[5] Environment Agency, Food Standards Agency, Food Standards Scotland, Natural Resources Wales, Northern Ireland Environment Agency and Scottish Environment Protection Agency (2025). Radioactivity in food and the environment, 2024. RIFE-30. EA, FSA, FSS, NRW, NIEA and SEPA; Preston, London, Aberdeen, Cardiff, Belfast and Stirling. Available online at: https://www.gov.uk/government/publications/radioactivity-in-food-and-the-environment-rife-reports

[6] Cmnd 2919 (1995). Review of radioactive waste management policy: Final conclusions. HMSO, London.

[7] Chaplin J. D., Christl M., Cundy A.B., Warwick P.E., Reading D.G., Bochud F., and Froidevaux P. (2022). Bioavailable actinide fluxes to the Irish Sea from Sellafield-labelled sediments. Water Research 221: 49-77.

[8] OSPAR Commission: Inside Radioactive Substances. Available online at: https://www.ospar.org/work-areas/rsc

[9] Environmental Protection Agency (Republic of Ireland) (2024). Ionising Radiation National Dose Report. Available online at: https://www.epa.ie/publications/compliance--enforcement/radiation/EPA_HIQA_Radiation_Dose_ReportV2.pdf

[10] Department of environment, food and agriculture – Government Analyst Laboratory (2024). Radioactivity monitoring Isle of Man 2023. Available online at: https://www.gov.im/media/1388319/radioactivity-monitoring-isle-of-man-2023.pdf

[11] Smith J., Anderson T. & Kliaus V. (2023). Assessment of dose rates to non-human biota from radioactive discharges from Sellafield Ltd. using PC-CREAM. Journal of Environmental Radioactivity 270.

[12] UK Health Security Agency (2025). Ionising radiation exposure of the UK population. Available online at: https://www.ukhsa-protectionservices.org.uk/UKionisingradiation/

[13] Hughes J S and Shaw K B (1996). Radiation doses from natural radiation. NRPB Report M748.

[14] Saunders P (1990). Radiation and you. Banson.

[15] Environment Agency (2020). Sellafield radioactive objects notification and intervention plan, Penrith: Environment Agency. Available online at: https://www.gov.uk/government/publications/sellafield-radioactive-objects-notification-and-intervention-plan/sellafield-radioactive-objects-notification-and-intervention-plan

[16] Newsome L and Hill R A (2025) Characteristics and occurrence of radioactive beach finds near the Sellafield site. Journal of Hazardous Materials 496. Available online at: https://doi.org/10.1016/j.jhazmat.2025.139203

Appendix Tables and Figures

Environmental Monitoring Location Figures

Figure 1. Marine environmental monitoring around Sellafield

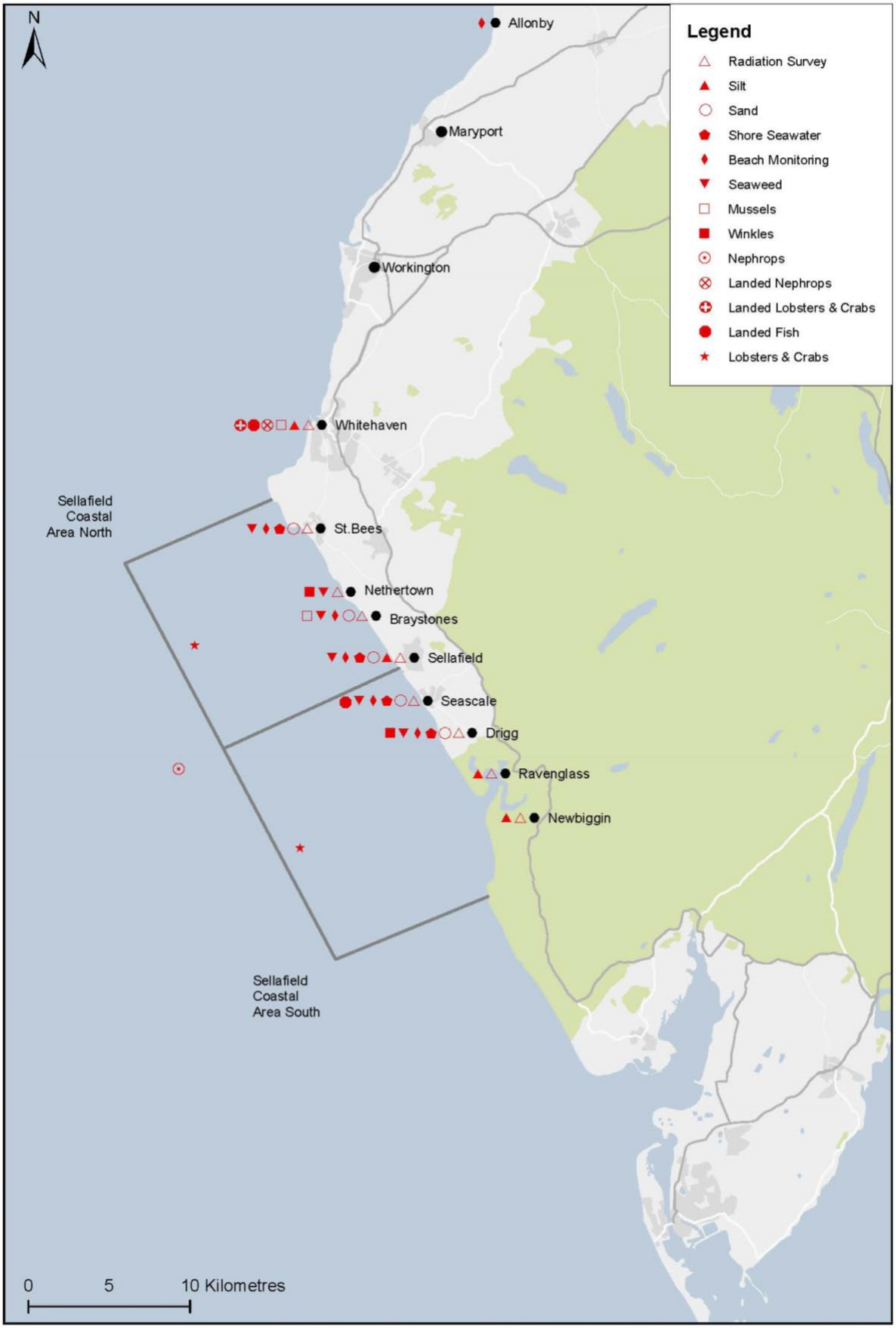


Figure 2. Terrestrial environmental monitoring around Sellafield

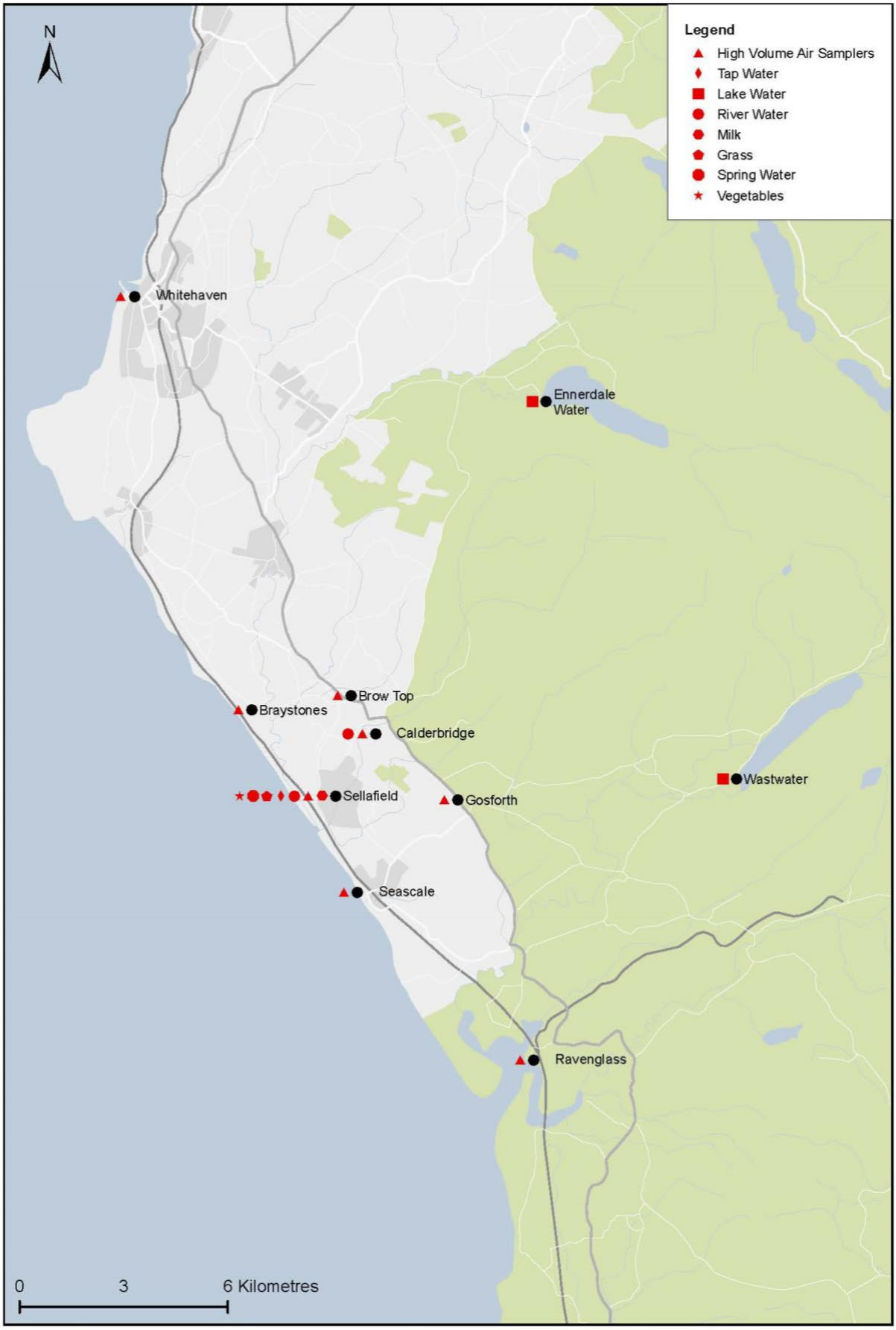
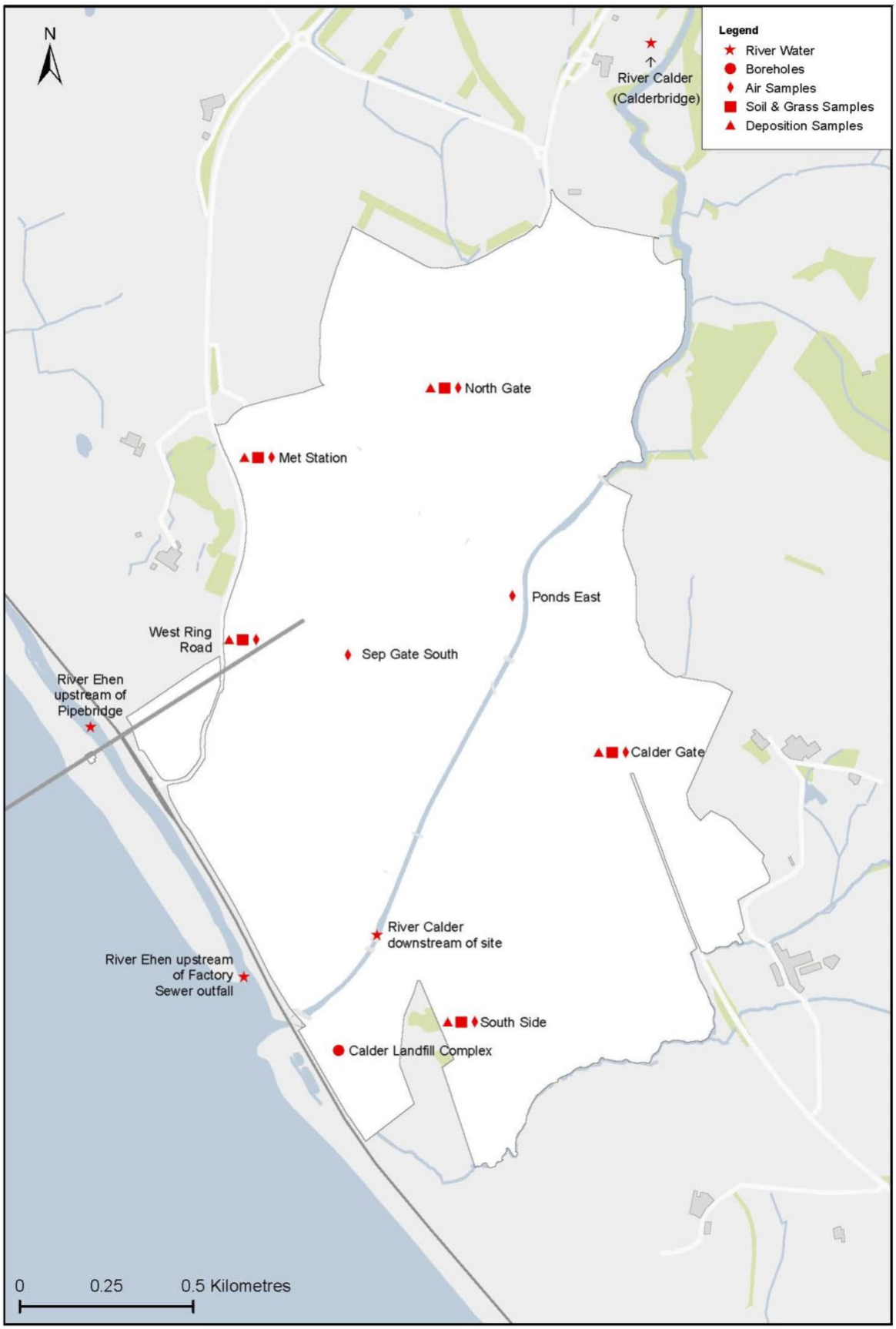


Figure 3. Environmental monitoring at the Sellafield site



Discharge Data Tables

Table 1. Radioactive discharges to the Irish Sea, 2021 – 2025

Radionuclides	Annual discharge (TBq)						Annual Limits
	2021	2022	2023	2024*	2024*[2]	2025	
Tritium	180	130	9.7	4.8	6.9	6.7	700
Carbon-14	1.3	0.85	0.10	0.07	0.07	0.08	5.1
Cobalt-60	0.01	0.01	0.01	0.01	0.01	0.01	2.5
Strontium-90	2.4	1.8	1.3	1.6	1.5	1.2	14
Technetium-99	0.48	0.35	0.07	0.13	0.13	0.04	4.5
Ruthenium-106	0.17	0.16	0.17	0.10	0.10	0.08	3.1
Iodine-129	0.02	0.02	0.02	0.008	0.006	0.004	0.32
Caesium-137	1.4	1.3	1.06	1.1	1.1	1.1	17
Plutonium-alpha	0.08	0.07	0.07	0.05	0.05	0.04	0.29
Plutonium-241	0.83	0.73	0.63	0.41	0.37	0.34	6
Americium-241	0.01	0.01	0.01	0.007	0.007	0.005	0.14
Total alpha	0.09	0.08	0.08	0.06	0.06	0.05	0.34
Total beta	7.4	6.5	5.2	4.4	4.3	3.3	63
Uranium	0.005	0.004	0.004	0.001	0.001	0.0009	0.02

Annual limits are the lower tier permit limits.
** As given in 2024 annual report *[2] Following replacement of estimates*

Table 2. Total airborne radioactive discharges, 2021 – 2025

Radionuclides	Annual discharge (GBq)					Annual Limits
	2021	2022	2023	2024	2025	
Strontium-90	0.004	0.003	0.003	0.003	0.002	0.50
Ruthenium-106	0.55	0.61	0.63	0.57	0.56	2.8
Antimony-125	0.53	0.41	0.005	-	-	30 / no limit
Iodine-129	1.8	1.8	1.3	1.2	0.78	13
Caesium-137	0.05	0.04	0.06	0.04	0.04	4.8
Plutonium-alpha	0.009	0.006	0.007	0.01	0.005	0.13
Americium-241 + Curium-242	0.009	0.009	0.010	0.02	0.01	0.084
Total alpha	0.07	0.07	0.06	0.07	0.07	0.66
Total beta	0.70	0.90	0.64	0.57	0.53	32

Annual limits are the lower tier permit limits. The limit for antimony-125, and the associated reporting requirements, were removed on 31 March 2023.

Table 3. Total airborne radioactive discharges, 2021 – 2025

Radionuclides	Annual discharge (TBq)					Annual Limits
	2021	2022	2023	2024	2025	
Tritium	39	15	0.13	0.07	0.07	170
Carbon-14	0.07	0.09	0.06	0.06	0.09	0.38
Krypton-85	4,300	2,500	7.3	-	-	70,000 / no limit

Annual limits are the lower tier permit limits. The limit for krypton-85, and the associated reporting requirements, were removed on 31 March 2023.

Table 4. Solid low level waste arisings from Sellafield, annually 2021 – 2023 and by financial year 2024 – 2026

Low level waste arisings	2021	2022	2023	2024-25	2025-26
LLW produced on site which has been reused, recycled or disposed of (m^3)	12,000	8,200	6,000	6,600	8,500
LLW metal waste recycled (te)	140	800	700	870	750
Combustible LLW treated (m^3)	2,100	2,400	1,800	2,470	2,740
LLW disposed of directly to landfill (as LLW, HV-VLLW or exempt waste but excluding waste that is out of scope of regulation) (m^3)	400	320	100	330	1,200
LLW disposed of on site (m^3)	9,300	4,000	3,200	2,200	3,790
Volume of LLW disposed of at LLWR (m^3)	80	300	600	190	200

Table 5. Non-radioactive aqueous waste discharges (kg), 2021 – 2025

Substance	Release points	2021	2022	2023	2024	2025	Annual Limit
Chromium	SIXEP, SETP, EARP	4.1	13.7	23.5	189	3.7	1,200
N as NO_2 and NO_3	SETP, EARP	590,000	311,000	244,000	143,000	69,696	4,080,000
N as NO_2 and NO_3	Thorp-C14 Removal Plant	260	55	0	0.95	4.34	26,900
Glycol	SETP, SIXEP, EARP, Lagoon	3,400	9,800	9,710	11,000	-	12,000 / no limit

The limit for glycol was removed during 2024.

Table 6. Non-radioactive gaseous waste discharges (kg), 2021 – 2025

Substance	Release points	2021	2022	2023	2024	2025	Annual Limit
Oxides of nitrogen (as NO_2)	Vitrification Test Rig	48	26	23	40.3	26	1,000
Oxides of nitrogen (as NO_2)	NNL Central Laboratory	7.3	2.2	8.8	8.7	3.5	500
Particulate matter	Fellside CHP (as PM_{10})	160	324	425	306	305	-

Table 7. Site total (including Fellside CHP plant) non-radioactive gaseous waste discharges (tonne), 2021 – 2025

Substance	2021	2022	2023	2024	2025
Oxides of nitrogen (as NO_2)	83	90	68	68	67
Carbon dioxide	137,000	156,000	125,000	150,000	133,000
Carbon monoxide	6.9	14	12	7.5	2.6
Non-Methane Volatile organic compounds	23	22	22	22	4.5
Methane	10	7.99	9.52	10.72	10.21

EA agreed carbon monoxide reporting value as discharges are significantly below reporting threshold values.

Table 8. Discharges of ozone depleting substances and fluorinated greenhouse gases (kg), 2021 – 2025

Substance	2021	2022	2023	2024	2025
R22 HCFC	-	0.5	9	7	-
R134A HFC	203	1284	130	-	64
R407C HFC	70	39	81	74	44
R404A HFC	7	2.1	0.9	5.5	0.5
R410A HFC	56	80	218	79	92

HCFCs are ozone depleting substances and HFCs are fluorinated greenhouse gases.
Note: the range of substances discharged varies each year depending on which equipment is topped up with refrigerants. No annual mass limits apply.

Table 9. Non-radioactive solid waste arisings from Sellafield, 2021 – 2025

	Non-Radioactive Waste Arisings (te)	2021	2022	2023	2024	2025
Non-Hazardous Waste Arisings	Non-hazardous waste produced on site	22,000	24,000	20,000	54,000	46,000
	Non-hazardous waste reused or recycled	21,000	24,000	20,000	54,000	46,000
	% of non-hazardous waste reused or recycled	94%	>99%	99%	>99%	>99%
Hazardous Waste Arisings	Hazardous waste produced on site	1,700	1,400	1,000	1,400	600
	Hazardous waste reused or recycled	290	135	120	140	40
	% of hazardous waste reused or recycled	17%	9.8%	11%	10%	6.6%

Whilst every effort is made to centrally record all Non-Rad waste arisings, some sub-contractors may not provide this information, so the actual quantity produced may be higher than the centrally recorded figure. Note that no annual mass limits apply.

Environmental Monitoring Data

Table 10. Radioactivity in fish (Bq kg^{-1} wet weight), 2025

Species	Location	Mean radionuclide concentration (Bq kg^{-1} wet weight)				
		Total ^{14}C	^{99}Tc	^{137}Cs	Pu(α)	^{241}Am
Cod	Seascale landed	29	<0.36	1.8	0.002	0.003
	Whitehaven landed	24	<0.35	1.3	0.002	0.004
Plaice	Seascale landed	34	0.40	1.2	0.005	0.007
	Whitehaven landed	35	0.42	0.88	0.01	0.01

Table 11. Radioactivity in molluscs (Bq kg^{-1} {wet weight}), 2025

Species	Location	Mean radionuclide concentration (Bq kg^{-1} wet weight)												
		Total Alpha	Total Beta	Total ^{14}C	^{60}Co	^{90}Sr	^{99}Tc	^{137}Cs	U(α)	Pu(α)	^{238}Pu	$^{239+240}Pu$	^{241}Pu	^{241}Am	Cm(α)
Mussel	SCAN Ave.	21	66	47	0.37	0.18	6.6	0.97	1.3	3.9	0.54	3.4	12	8.0	-
	WH Ave.	29	33	23	<0.11	0.19	6.3	0.82	2.0	2.4	0.34	2.0	7.1	5.0	-
	SCA Ave.	**25**	**50**	**35**	**<0.24**	**0.19**	**6.5**	**0.90**	**1.7**	**3.2**	**0.44**	**2.7**	**9.6**	**6.5**	**-**
Winkles	SCAN - A	-	-	85	-	-	-	-	-	-	-	-	-	-	-
	SCAN – B1	46	110	-	0.15	0.015	18	1.3	2.2	5.0	0.66	4.4	18	12	<0.05
	SCAN – B2	20	68	-	0.25	0.25	9.3	1.2	1.5	2.3	0.30	2.0	6.3	4.8	<0.08
	SCAN Ave	33	89	85	0.20	0.35	14	1.3	1.9	3.7	0.48	3.2	12	8.4	<0.07
	SCAS – A	-	-	35	-	-	-	-	-	-	-	-	-	-	-
	SCAS – B1	38	110	-	0.12	0.56	<1.0	1.2	2.8	6.2	0.95	5.2	19	12	<0.05
	SCAS – B2	17	78	-	0.14	0.36	15	1.7	2.4	3.7	0.52	3.2	11	6.2	<0.04
	SCAS Ave.	28	94	35	0.13	0.46	<8	1.5	2.6	5.0	0.74	4.2	15	9.1	<0.05
	SCA Ave.	**30**	**92**	**60**	**0.17**	**0.40**	**11**	**1.4**	**2.2**	**4.3**	**0.61**	**3.7**	**14**	**8.8**	**<0.06**

Notes: SCA – Sellafield Coastal Area; N – North, S- South, A – Annual sample, B1 – Biannual sample 1, B2 – Biannual sample 2, Ave.- Average.

Table 12. Radioactivity in crustaceans (Bq kg^{-1} wet weight), 2025

Species	Location	Mean concentration (Bq kg^{-1} {wet weight})							
		Total ^{14}C	^{90}Sr	^{99}Tc	^{129}I	^{137}Cs	U(α)	Pu(α)	^{241}Am
Edible Crab	SCA (north) - Early	49	0.04	1.7	-	0.32	0.22	0.34	0.86
	SCA (north) - Late	46	<0.04	1.1	-	0.29	0.15	0.15	0.61
	SCA (north) Average	48	<0.04	1.4	-	0.31	0.19	0.25	0.74
	SCA (south) - Early	45	<0.05	0.76	-	0.21	0.17	0.12	0.30
	SCA (south) - Late	27	<0.06	1.5	-	0.41	0.32	0.20	0.54
	SCA (south) Average	36	<0.06	1.1	-	0.31	0.25	0.16	0.42
	SCA Average	**42**	**<0.05**	**1.3**	**-**	**0.31**	**0.22**	**0.20**	**0.58**
	WL - Early	52	<0.06	2.6	-	0.28	0.20	0.31	0.83
	WL - Late	49	<0.04	0.51	-	0.27	0.09	0.11	0.65
	WL - Average	**51**	**<0.05**	**1.6**	**-**	**0.28**	**0.15**	**0.21**	**0.74**
Lobster	SCA (north) - Early	93	-	38	-	0.55	0.03	0.08	0.80
	SCA (north) - Late	54	-	33	-	0.47	0.03	0.11	1.0
	SCA (north) Average	74	-	36	-	0.51	0.03	0.10	0.90
	SCA (south) - Early	47	-	18	-	0.38	0.05	0.12	0.62
	SCA (south) - Late	23	-	17	-	0.55	0.03	0.06	0.36
	SCA (south) Average	35	-	18	-	0.47	0.04	0.09	0.49
	SCA Average	**54**	**-**	**27**	**-**	**0.49**	**0.04**	**0.09**	**0.70**
	WL – Early	42	-	20	-	0.51	0.04	0.07	0.56
	WL – Late	29	-	15	-	0.57	0.02	0.09	0.48
	WL - Average	**36**	**-**	**18**	**-**	**0.54**	**0.03**	**0.08**	**0.52**
***Nephrops* (Scampi)**	SCA – Annual	41	<0.05	-	<0.12	-	-	-	-
	SCA – Early	-	-	14	-	0.79	-	0.44	1.6
	SCA – Late[b]	-	-	7.0	-	0.58	-	0.34	0.74
	SCA Average	**41**	**<0.05**	**11**	**<0.12**	**0.69**	**-**	**0.39**	**1.2**
	WL – Annual	48	0.05	-	<0.15	-	-	-	-
	WL – Early	-	-	12	-	1.2	-	0.71	2.6
	WL – Late[b]	-	-	2.7	-	0.61	-	0.25	0.58
	WL - Average	**48**	**0.05**	**7.4**	**<0.15**	**0.91**	**-**	**0.48**	**1.6**

Notes: SCA – Sellafield coastal area; WL – Whitehaven Landed

Table 13. Radioactivity in seaweed, 2025

Species	Location	Mean concentration (Bq kg^{-1} wet weight)											
		Total α	Total β	Total ^{14}C	^{60}Co	^{90}Sr	^{99}Tc	^{106}Ru	^{129}I	^{137}Cs	U(α)	Pu(α)	^{241}Am
Fucus vesiculosis	Braystones	22	250	31	0.21	<0.17	260	<1.3	<0.43	1.6	5.4	7.5	4.1
	Drigg Barnscar	13	220	-	0.15	<0.13	130	-	<0.89	1.0	3.5	5.1	1.8
	Nethertown	15	200	-	0.16	0.18	120	-	<0.77	1.3	3.9	6.2	3.0
	Seascale Neb	44	310	27	0.22	0.55	200	<1.4	<0.48	2.9	6.4	12	9.2
Porphyra umbilicalis	Braystones	7.7	160	23	<0.05	0.07	<0.65	<0.47	<0.87	0.60	0.23	2.0	3.7
	Seascale Neb	5.2	130	23	<0.07	<0.07	0.69	<0.47	<0.78	0.49	0.27	1.5	3.6
	Sellafield	4.6	130	27	<0.07	0.05	0.51	<0.51	<0.99	0.47	0.22	1.4	3.0
	St Bees	12	130	67	0.11	<0.17	0.93	<0.52	<0.84	0.86	0.42	3.1	6.9
	St Bees - Selker (Av)	7.3	140	35	<0.07	0.09	0.69	<0.49	<0.87	0.60	0.28	2.0	4.3

Fucus vesiculosus is collected because it accumulates many radionuclides (particularly technetium-99) and is sensitive to fluctuations in their concentrations in seawater. Porphyra umbilicalis is also collected and monitored as an indicator species particularly due to its historical exposure pathway role for ruthenium-106.

Table 14. Radioactivity in coastal samples of seawater from the Irish Sea, 2025

Location		Mean concentration (Bq l^{-1})										
		Total α	Total β	^{3}H	^{90}Sr	^{99}Tc	^{129}I	^{137}Cs	U(α)	Pu(α)	^{241}Pu	^{241}Am
St Bees	filtrate	<3.1	11	<3.9	0.01	<0.03	<0.03	<0.03	0.10	0.003	<0.06	0.001
	solids	0.14	0.11	-	0.004	-	-	0.009	0.002	0.02	0.07	0.04
Sellafield	filtrate	<2.9	10	<4.4	0.02	<0.03	<0.03	0.03	0.10	0.003	<0.05	0.001
	solids	0.18	0.12	-	0.004	-	-	0.01	0.003	0.03	0.08	0.05
Seascale Neb	filtrate	<3.0	9.5	3.6	0.02	<0.03	<0.03	<0.03	0.10	0.002	<0.06	0.001
	solids	0.21	0.15	-	0.004	-	-	0.01	0.003	0.03	0.09	0.05
Drigg Barnscar	filtrate	<3.2	9.7	<5.0	0.01	<0.03	<0.03	<0.03	0.10	0.003	<0.04	0.001
	solids	0.18	0.15	-	0.004	-	-	<0.01	0.002	0.03	0.10	0.05

Table 15. Radioactivity in sediment from the West Cumbrian Coast, 2025

Location		Mean radionuclide concentration (Bq kg^{-1} dry weight)									
		Total α	Total β	^{60}Co	^{90}Sr	^{99}Tc	^{137}Cs	U-α	Pu-α	^{241}Pu	^{241}Am
Sand	St Bees	590	460	0.17	-	-	37	-	99	-	110
	Braystones	630	390	0.14	-	-	32	-	91	-	95
	Sellafield	530	390	<0.11	-	-	30	-	86	-	88
	Seascale Neb	510	500	<0.11	-	-	17	-	73	-	73
	Drigg Barnscar	430	400	<0.09	-	-	16	-	68	-	65
Silt	Ravenglass Ford	1,100	660	<1.8	16	9.8	55	46	220	490	270
	Ravenglass Garth	370	270	<1.4	0.75	3.5	18	22	100	270	110
	Ravenglass Opp Raven Villa	1,300	640	<1.7	7.0	13	62	50	260	650	350
	Eskmeals, R Esk south bank downstream of viaduct	1,800	920	<0.98	16	22	130	56	300	790	500
	Eskmeals Newbiggin Marsh	2,200	1,100	<1.2	28	33	220	54	550	1,200	970
	R Esk Muncaster Rd Bridge; Downstream	1,900	920	<1.4	37	27	180	60	390	990	790
	Whitehaven Outer Harbour (south)	590	510	<1.7	0.47	8.8	78	23	110	250	160
	Silt from R Calder	780	1,100	<1.1	13	1.8	30	54	<25	<61	<47
	Silt from R Ehen	1,100	630	<1.8	2.6	4.5	38	51	76	200	120
	Waberthwaite	1,700	820	<1.2	13	14	120	36	400	1,000	470

Table 16. Mean gamma dose rates measured in air in intertidal and other coastal areas of Cumbria, 2025

Area of survey	Description	Nature of ground	N	Mean dose rate (μGy h^{-1})
Whitehaven Harbour (north)	outer harbour	mud/silt	4	0.10
St Bees (groynes)	groynes	pebbles/rocks	1	0.16
St Bees	Seamill Lane car park	car park	1	0.14
Coulderton	grassed areas/beach bungalows	grass banks	1	0.14
Nethertown	beach	pebbles/shingle	1	0.15
Braystones	beach	pebbles/shingle	1	0.14
Sellafield Beach	beach		1	0.14
Sellafield Dunes	dunes		1	0.13
Factory Sewer	outfall	sand	4	0.13
Seascale Beach	south of pipeline	sand	4	0.12
Drigg Beach	beach	rocks / boulders / sand / shingle	1	0.13
Ravenglass	Raven Villa	rocks/sand	1	0.14
Ravenglass	small boat area	sand	1	0.13
Ravenglass	Salmon Garth (saltmarsh)	saltmarsh	1	0.13
Eskmeals Viaduct	saltmarsh	firm silt / pebbles	1	0.14
Newbiggin	saltmarsh	sand / firm silt	4	0.14
Muncaster Road Bridge	riverbank	saltmarsh	1	0.13
Hall Waberthwaite	saltmarsh	saltmarsh	1	0.15

Dose rates include contributions from natural background, typically 0.05 μGy h^{-1} over sandy areas and 0.07 μGy h^{-1} over silt.

Table 17. Mean gamma dose rates measured in air at Sellafield site perimeter, 2025

Area of survey	Number of locations	Mean dose rate (μGy h^{-1})
North	4	0.01
East	5	0.02
South	3	0.004
West	4	0.04
River Ehen	2	0.01
River Calder	12	0.001
Representative person	1	0.03
Mean annual average	-	0.02

Dose rates exclude contribution from natural background (approximately 0.06 μSv h^{-1}).

Table 18. Mean gamma dose rates measured in air in the vicinity of Sellafield, 2025

Location	Mean dose rate (μGy h^{-1})
Calderbridge	0.05
Seascale	0.04
Ravenglass	0.04
Braystones	0.05
Whitehaven	0.04
Gosforth	0.05
Brow Top	0.05

Dose rates exclude contribution from natural background (approximately 0.06 μSv h^{-1}).

Table 19. Radioactivity in air in the vicinity of Sellafield - Site Locations, 2025

Radionuclide	Mean concentration (mBq m^{-3})						
	Calder Gate	Met. Station	North Gate	West Ring Road	South Side	Ponds East	Sep Gate South
Total Alpha	0.05	0.06	0.05	0.05	0.04	-	-
Total Beta	0.29	0.22	0.32	0.29	0.27	-	-
^{90}Sr	<0.002	0.006	0.009	0.001	<0.001	-	-
^{106}Ru	<0.04	<0.04	<0.04	<0.04	<0.03	-	-
^{125}Sb	<0.01	<0.01	<0.01	<0.01	<0.01	<0.03	<0.03
^{137}Cs	0.005	0.01	0.03	<0.004	<0.003	0.04	<0.01
Pu(α)	0.0003	<0.0005	0.0004	0.0002	0.0002	0.0009	0.0004
^{241}Pu	<0.03	<0.05	<0.03	<0.03	<0.03	-	-
^{241}Am	0.0003	0.0006	0.0004	0.0003	0.0003	0.001	0.0005
^{235}U	0.00001	0.000006	0.00002	0.000009	0.00001	-	-
^{238}U	0.0003	0.00008	0.0003	0.0002	0.0003	-	-

Table 20. Radioactivity in air in the vicinity of Sellafield - Residential Locations, 2025

Radionuclide	Mean concentration (mBq m^{-3})						
	Brow Top	Braystones	Calderbridge	Gosforth	Ravenglass	Seascale	Whitehaven
^{90}Sr	0.0006	0.0002	0.0003	0.0004	0.0002	0.0007	0.0006
^{137}Cs	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004
Pu(α)	0.00006	0.0001	<0.0001	<0.0001	<0.0001	0.0009	<0.0001
^{241}Pu	<0.03	<0.04	<0.03	<0.03	<0.03	<0.02	<0.02
^{241}Am	0.0001	0.0002	0.0001	0.00008	0.0002	0.002	0.0001
^{235}U	0.000005	0.000005	0.000004	0.000007	0.000005	0.00001	0.000005
^{238}U	0.0001	0.0001	0.00008	0.0001	0.00008	0.0003	0.0001

Table 21. Radioactivity in milk from farms near Sellafield, 2025

Location	Mean concentration (Bq l^{-1})							
	Total α	Total β	Total ^{14}C	Net ^{14}C	^{90}Sr	^{129}I	^{131}I	^{137}Cs
Farm A	<0.20	38	15	<0.60	-	<0.01	<0.04	0.05
Farm B	<0.20	38	14	<0.60	-	<0.009	<0.05	<0.05
Farm C	<0.18	36	16	<0.65	0.04	<0.009	<0.04	0.12

Milk from Farm C has been used in the radiological assessment.

Table 22. Radioactivity in potatoes from farms near Sellafield, 2025

Sample	Mean concentration (Bq kg^{-1})	
	^{3}H	^{137}Cs
Potatoes - Early	<6.6	0.05
Potatoes - Late	9.1	<0.05
Potatoes - Average	<7.9	<0.05

Table 23. Radioactivity in total deposition, 2025

Location	Mean radionuclide concentration (Bq m^{-3})						
	Total α	Total β	^{3}H	^{90}Sr	^{137}Cs	Pu- α	^{241}Am
Calder Gate	26	<180	<4,700	1.4	<7.0	0.67	0.58
Met Station	29	<190	<4,700	9.7	23	0.82	0.53
North Gate	24	1,900	4,700	2,300	1,300	1.1	3.3
South Side	21	<190	<4,900	1.3	<4.8	0.40	1.2
West Ring Road	31	210	<4,700	11	<25	0.56	0.78

Table 24. Radioactivity in grass, 2025

Location	Mean concentration (Bq kg^{-1} {wet weight})							
	Total α	Total β	^{3}H	^{90}Sr	^{137}Cs	U- α	Pu- α	^{241}Am
Calder Gate	5.7	100	<8.2	1.7	4.9	0.17	0.31	0.12
Met Station	5.3	120	5.9	5.7	3.7	0.20	0.24	0.28
North Gate	5.9	160	<6.7	37	71	0.30	0.59	0.21
South Side	6.9	130	9.5	0.50	0.92	0.20	0.11	0.14
West Ring Road	8.9	130	11	1.2	3.2	0.75	0.75	0.67

Table 25. Radioactivity in soil, 2025

Location	Mean concentration (Bq kg^{-1} {wet weight})									
	Total α	Total β	^{3}H	Total ^{14}C	Net ^{14}C	^{90}Sr	^{137}Cs	U- α	Pu- α	^{241}Am
Calder Gate	600	630	<4.8	4.7	1.2	1.6	30	47	18	7.9
Met Station	790	740	3.1	5.3	0.45	8.7	160	53	96	31
North Gate	1,700	930	<5.3	7.0	2.6	47	300	63	390	46
South Side	1,100	760	<5.8	7.6	<0.30	1.7	44	60	6.6	4.9
West Ring Road	600	520	<4.6	5.0	<0.20	14	80	61	37	47

Table 26. Radioactivity in local waters, 2025

Location		Mean concentration (Bq l^{-1})							
		Total α	Total β	^{3}H	^{90}Sr	^{99}Tc	^{137}Cs	Pu(α)	Am+Cm
River water:	R. Calder at Sellafield	<0.02	0.33	<4.9	0.12	<0.03	<0.005	<0.001	-
	R. Calder at Calderbridge	0.02	0.10	<4.9	0.003	<0.03	<0.005	0.002	-
	R. Ehen, 5m upstream of Factory Sewer outfall	<0.03	0.20	<4.2	0.002	<0.02	<0.006	<0.002	-
	R. Ehen, 100m north of pipeline	<0.02	0.14	<4.7	0.002	<0.02	<0.006	<0.001	-
Lake water:	Ennerdale Water	<0.02	0.01	<4.9	0.001	-	<0.002	0.0002	-
	Wastwater	<0.02	0.07	<4.9	0.01	-	<0.002	<0.002	-
Tap water:	Sellafield	0.02	<0.08	<4.9	0.002	-	<0.006	-	-
Spring water:	Sellafield Beach (Average)	3.0	12	12	0.03	0.05	0.16	0.02	0.24
	Sellafield Beach (Maximum)	3.6	16	38	0.05	0.40	0.29	0.07	0.80

Note: Spring water data are no longer corrected for estimated seawater content

Table 27. Non-radioactive monitoring of nitrogen dioxide in air in the vicinity of Sellafield, 2025

Location	Mean concentration (µg m^{-3})
Calder Gate	4.9
Met. Station	6.0
North Gate	6.7
West Ring Road	6.6
South Side	5.7
Air Quality Limit Value (annual mean)	*40*

Table 28. Non-radioactive monitoring of pH and nitrate in river waters, 2025

Location	pH	Nitrate concentration (mg l^{-1})
River Calder - downstream of site	7.7	0.45
River Calder - upstream of site	7.3	0.45
River Ehen - upstream of Seaburn outfall	8.0	0.81
River Ehen - upstream of pipebridge	7.8	0.85
National Environmental Quality Standard	*6.0 - 9.0*	*N/A*

Table 29. Non-radioactive monitoring of coastal waters, 2025

Location	Mean concentration (mg l^{-1})	
	Nitrite	Nitrate
St Bees	<0.007	0.09
Sellafield	<0.007	0.11
Seascale Neb	<0.009	0.17
Drigg Barnscar	<0.007	0.07

Table 30. Non-radioactive monitoring of surface water around Calder Landfill Extension Segregated Area, 2025

Location	BOD (mg l^{-1})	COD (mg l^{-1})	TOC (mg l^{-1})	Dissolved O_2 (ppm)	NH_4^+ (mg l^{-1})	SO_4^{2-} (mg l^{-1})	Conductivity (µS cm^{-1})
River Calder upstream	<1.0	<8.8	2.7	11	<0.02	4.0	96
New Mill Beck upstream	<1.5	29	8.7	10	0.10	10	240
New Mill Beck overflow drain	<1.4	33	9.8	9.7	0.16	11	260
River Calder downstream	<1.0	13	3.7	11	0.05	5.3	140

New Mill Beck overflow drain only available under flood conditions.
BOD – Biological Oxygen Demand; COD – Chemical Oxygen Demand; TOC – Total Organic Carbon.

Table 31. Non-radioactive monitoring of gases on Sellafield's landfill sites, 2025

Gas spike probe monitoring	Mean concentration (% volume)		
	CH_4	CO_2	O_2
Calder Landfill Complex Boreholes	0.14	2.0	18
Calder Landfill Complex Probes	0.08	1.2	13

Beach Monitoring Data

Table 32. Beach monitoring conducted during 2025

Programme	Planned monitoring (ha)	Actual monitoring(ha)
Sellafield	52	55
Northern Beaches	32	35
Southern Beaches	16	22
Allonby	5	5
Total	**105**	**117**

Table 33. Particle and larger object beach finds recovered during 2025

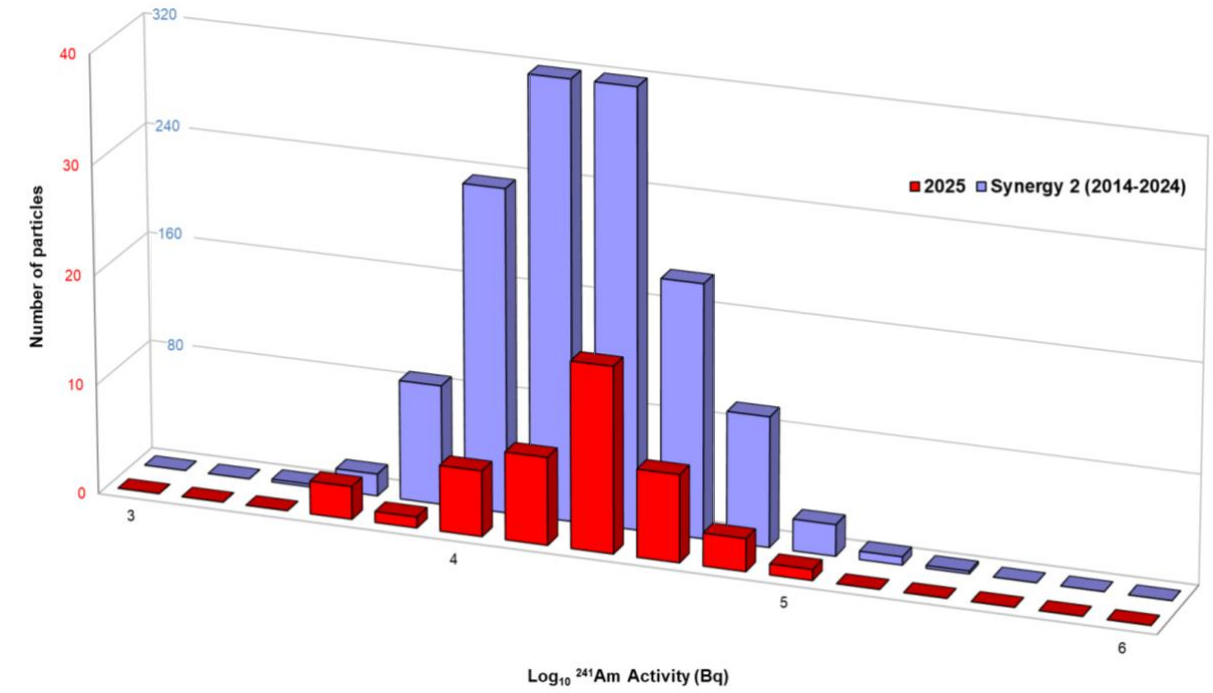
Programme	No. of particles found			No. of larger objects found			Total finds
	Alpha rich	Beta rich	Other	Alpha rich	Beta rich	Other	
Sellafield	32	2	0	0	3	0	37
Northern Beaches	15	0	0	0	0	0	15
Southern Beaches	0	0	0	0	0	0	0
Allonby	0	0	0	0	0	0	0
Total	**47**	**2**	**0**	**0**	**3**	**0**	**52**

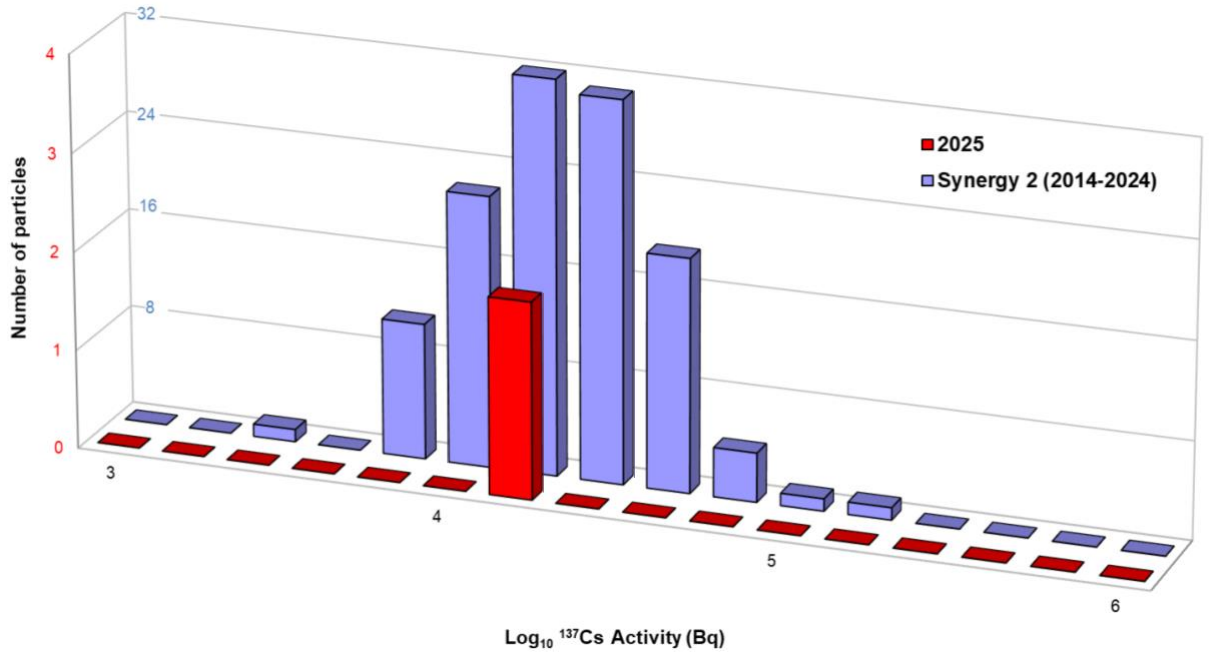
Particles are less than 2 mm in size; Larger objects are greater than 2 mm in size; "Alpha rich", higher americium-241 activity than caesium-137 activity; "Beta rich", where caesium-137 was the major radionuclide; "other" denotes the principal radionuclide is neither americium-241 activity or caesium-137, for example cobalt-60

Table 34. Total area monitored and finds by category, beach and calendar year (2021 – 2025)

Beach	Year	Area (ha)	Alpha rich particle	Beta rich particle	Beta rich larger object	Other finds
Sellafield	2021	57	24	1	4	0
	2022	55	30	2	7	1
	2023	59	51	2	3	0
	2024	56	20	4	8	0
	2024	55	32	2	3	0
Northern Beaches	2021	36	68	0	0	0
	2022	35	11	0	0	0
	2023	34	20	0	0	0
	2024	35	14	0	0	0
	2025	35	15	0	0	0
Southern Beaches	2021	24	1	0	0	0
	2022	22	5	0	0	0
	2023	22	2	0	0	0
	2024	22	4	0	0	0
	2025	22	0	0	0	0
Allonby	2021	5	0	0	0	0
	2022	5	0	0	0	0
	2023	5	3	0	0	0
	2024	5	0	0	0	0
	2025	5	0	0	0	0

Figure 4. Radioactivity of finds classified as alpha-rich particles (upper) and beta rich particles (lower) between 2014 – 2024 (shown in blue) compared to data from 2025 shown in red)





RIFE data used in the Radiological Dose Assessment

Table 35. Radioactivity in animal produce from farms near Sellafield, 2024 (data From RIFE30)

Species	Mean concentration (Bq kg^{-1} {wet weight})											
	^{3}H	Total ^{14}C	^{60}Co	^{90}Sr	^{99}Tc	^{125}Sb	^{134}Cs	^{137}Cs	^{238}Pu	$^{239+240}$Pu	^{241}Pu	^{241}Am
Bovine muscle	<25	35	<0.08	<0.044	<0.030	<0.14	<0.05	0.59	<0.00008	0.00007	<0.35	0.00041
Bovine liver	<25	30	<0.03	<0.015	<0.031	<0.06	<0.02	0.19	0.0001	0.0008	<0.36	0.00087
Bovine kidney	<25	41	<0.04	<0.049	<0.042	<0.08	<0.03	0.28	<0.0001	0.00006	<0.48	0.00033
Ovine muscle	<25	46	<0.06	<0.047	<0.028	<0.12	<0.06	0.83	<0.00004	0.0002	<0.21	0.00041
Ovine kidney/ liver	<25	37	<0.06	<0.040	<0.029	<0.11	<0.03	0.3	0.0005	0.004	<0.39	0.0041
Pheasant	<25	30	<0.08	<0.049	<0.028	<0.10	<0.05	0.14	0.00004	0.0001	<0.52	0.00025
Wood pigeon	<25	37	<0.07	<0.042	-	<0.14	<0.04	1.8	0.00006	0.0004	<0.52	0.00064
Rabbit	<25	35	<0.08	<0.050	<0.031	<0.15	<0.06	2.2	<0.00005	0.0005	<0.21	0.00082
Eggs - Chicken	<25	53	<0.07	0.042	-	<0.14	<0.08	<0.06	0.0002	0.0014	<0.26	0.00076

Measured concentrations that equal to or smaller than background value are indicated by a zero.

Table 36. Radioactivity in fruit and vegetable produce collected near Sellafield, 2024 (Data From RIFE30)

Species	Mean concentration (Bq kg^{-1} {wet weight})											
	^{3}H	Total ^{14}C	^{60}Co	^{90}Sr	^{99}Tc	^{125}Sb	^{134}Cs	^{137}Cs	^{238}Pu	$^{239+240}$Pu	^{241}Pu	^{241}Am
Potato	<7.9	25	<0.09	<0.037	<0.028	<0.15	<0.09	<0.05	0.00004	0.00026	-	0.00026
Cabbage	<25	9.1	<0.08	0.11	-	<0.14	<0.06	<0.06	0.00006	0.00028	-	0.00049
Barley	<25	110	<0.15	0.58	-	<0.41	<0.11	0.54	0.001	0.025	<0.69	0.013
Beetroot	<25	19	<0.05	0.13	-	<0.10	<0.03	<0.04	-	-	-	<0.15
Mushrooms	<25	15	<0.09	<0.042	-	<0.15	<0.06	0.42	0.007	0.046	<0.35	0.082
Apple	<25	13	<0.02	0.17	<0.028	<0.07	<0.01	0.16	0.00004	0.0002	-	0.00031
Blackberries	<25	18	<0.06	0.092	-	<0.13	<0.09	<0.09	0.00003	0.0003	-	0.00081

Radiological Dose Assessment Data Tables

The radiological dose assessment presented herein takes account of research studies carried out both nationally and internationally. In addition, the guidance of UKHSA, the National Dose Assessment Working Group (NDAWG) and the most recent dose coefficients in the International Commission for Radiological Protection (ICRP) Publication 119 are adopted where available and appropriate. In general, default values recommended by the ICRP for each radionuclide are assumed for the purpose of dose calculations unless specific studies indicate that an alternative is appropriate.

Table 37. Summary of doses associated with seafood (µSv), 2025

Radionuclide	Cod				Plaice				Lobsters				Crabs			
	Adult	Child	Infant	Foetus	Adult	Child	Infant	Foetus	Adult	Child	Infant	Foetus	Adult	Child	Infant	Foetus
Carbon-14	0.04	0.01	0.006	0.06	0.30	0.08	0.04	0.41	0.23	0.06	0.03	0.31	0.09	0.02	0.01	0.12
Cobalt-60	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Strontium-90	-	-	-	-	-	-	-	-	-	-	-	-	0.01	0.005	0.002	0.02
Technetium-99	0.002	0.001	0.0009	0.002	0.009	0.004	0.003	0.007	0.22	0.09	0.08	0.16	0.007	0.003	0.003	0.005
Ruthenium-106	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Iodine-129	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Caesium-137	0.22	0.03	0.01	0.09	0.48	0.07	0.02	0.21	0.08	0.01	0.004	0.04	0.03	0.005	0.002	0.01
Neptunium-237	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Plutonium-alpha	0.005	0.001	0.0004	0.0002	0.07	0.01	0.006	0.003	0.28	0.06	0.02	0.01	0.41	0.09	0.03	0.02
Plutonium-241	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Americium-241	0.007	0.002	0.0007	0.0001	0.06	0.01	0.006	0.0008	1.8	0.39	0.16	0.02	0.95	0.21	0.09	0.01
Curium-alpha	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	0.27	0.05	0.02	0.15	0.91	0.19	0.08	0.63	2.6	0.61	0.30	0.54	1.5	0.34	0.14	0.19

Radionuclide	Nephrops				Winkles				Mussels				Total			
	Adult	Child	Infant	Foetus	Adult	Child	Infant	Foetus	Adult	Child	Infant	Foetus	Adult	Child	Infant	Foetus
Carbon-14	0.02	0.006	0.003	0.03	0.04	0.01	0.006	0.06	0.01	0.003	0.002	0.02	0.73	0.19	0.10	1.0
Cobalt-60	-	-	-	-	0.001	0.0007	0.0004	0.0006	0.001	0.0007	0.0005	0.0006	0.002	0.001	0.0009	0.001
Strontium-90	0.003	0.001	0.0005	0.005	0.02	0.009	0.003	0.03	0.008	0.004	0.001	0.01	0.04	0.02	0.007	0.07
Technetium-99	0.01	0.006	0.005	0.01	0.01	0.005	0.005	0.009	0.006	0.002	0.002	0.004	0.26	0.11	0.10	0.20
Ruthenium-106	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.0	0.0
Iodine-129	0.03	0.009	0.003	0.01	-	-	-	-	-	-	-	-	0.03	0.009	0.003	0.01
Caesium-137	0.02	0.003	0.0008	0.008	0.03	0.005	0.002	0.01	0.02	0.003	0.0008	0.007	0.88	0.13	0.04	0.38
Neptunium-237	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.0	0.0
Plutonium-alpha	0.20	0.04	0.02	0.007	0.77	0.17	0.07	0.03	1.1	0.24	0.09	0.04	2.8	0.61	0.24	0.11
Plutonium-241	-	-	-	-	0.05	0.01	0.003	0.001	0.06	0.01	0.004	0.001	0.11	0.02	0.007	0.002
Americium-241	0.48	0.11	0.04	0.006	1.3	0.28	0.12	0.02	1.8	0.40	0.17	0.02	6.4	1.4	0.59	0.08
Curium-alpha	-	-	-	-	0.02	0.003	0.002	0.02	-	-	-	-	0.02	0.003	0.002	0.02
Total	0.76	0.17	0.07	0.08	2.2	0.49	0.20	0.18	3.0	0.67	0.27	0.11	11	2.5	1.1	1.9

Background corrected values for carbon-14 in fish, molluscs and crustaceans have been used in the assessment of radiation doses to the representative person. For these marine foodstuffs, the natural concentration of carbon-14 of 218 Bq carbon-14 per kg carbon has been taken from data published by the EA and FSA.

Table 38. Summary of doses to terrestrial representative person from terrestrial foodstuffs and inhalation (µSv), 2025

Radionuclide	Milk				Beef Muscle				Beef Offal				Sheep Muscle			
	Adult	Child	Infant	Foetus	Adult	Child	Infant	Foetus	Adult	Child	Infant	Foetus	Adult	Child	Infant	Foetus
Total tritium	-	-	-	-	0.02	0.02	0.009	0.02	0.003	0.002	0.002	0.004	0.008	0.006	0.002	0.01
Carbon-14	0.04	0.06	0.14	0.05	-	-	-	-	0.004	0.003	0.002	0.006	0.009	0.006	0.003	0.01
Cobalt-60	-	-	-	-	0.004	0.01	0.006	0.002	<0.001	<0.001	<0.001	<0.001	0.002	0.003	0.001	<0.001
Strontium-90	0.12	0.29	0.48	0.17	0.02	0.04	0.01	0.03	0.003	0.003	0.001	0.004	0.01	0.01	0.003	0.02
Technetium-99	-	-	-	-	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Ruthenium-106	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Antimony-125	-	-	-	-	0.002	0.004	0.003	<0.001	<0.001	<0.001	<0.001	<0.001	0.001	0.001	<0.001	<0.001
Iodine-129	0.09	0.19	0.26	0.04	0.004	0.007	0.002	0.002	0.002	0.002	<0.001	<0.001	0.006	0.005	0.001	0.002
Caesium-134	-	-	-	-	0.01	0.01	0.002	0.007	0.001	<0.001	<0.001	<0.001	0.009	0.003	<0.001	0.004
Caesium-137	0.15	0.13	0.19	0.06	0.12	0.09	0.02	0.05	0.008	0.004	0.001	0.004	0.09	0.03	0.008	0.04
Plutonium-alpha	-	-	-	-	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Plutonium-241	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Americium-241	-	-	-	-	0.001	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Total	0.40	0.67	1.1	0.32	0.18	0.19	0.06	0.12	0.03	0.02	0.01	0.03	0.14	0.07	0.02	0.09

Table 38. Summary of doses to terrestrial representative person from terrestrial foodstuffs and inhalation (μSv), 2025 Continued.

Radionuclide	Sheep offal				Poultry				Eggs				Game			
	Adult	Child	Infant	Foetus	Adult	Child	Infant	Foetus	Adult	Child	Infant	Foetus	Adult	Child	Infant	Foetus
Total tritium	0.003	0.002	0.002	0.004	0.01	0.008	0.006	0.02	0.009	0.009	0.02	0.01	0.006	0.006	0.002	0.009
Carbon-14	-	-	-	-	-	-	-	-	0.11	0.11	0.18	0.15	0.01	0.01	0.004	0.02
Cobalt-60	<0.001	<0.001	<0.001	<0.001	0.003	0.005	0.004	0.002	0.002	0.005	0.009	0.001	0.002	0.003	0.002	<0.001
Strontium-90	0.003	0.004	0.002	0.005	0.02	0.02	0.009	0.02	0.01	0.02	0.02	0.02	0.009	0.01	0.003	0.01
Technetium-99	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-	-	<0.001	<0.001	<0.001	<0.001
Ruthenium-106	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Antimony-125	<0.001	<0.001	<0.001	<0.001	0.001	0.001	0.001	<0.001	0.001	0.002	0.004	<0.001	<0.001	0.001	<0.001	<0.001
Iodine-129	0.002	0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.003	0.005	0.004	0.001	0.002	0.002	<0.001	<0.001
Caesium-134	0.002	<0.001	<0.001	<0.001	0.01	0.004	0.002	0.004	0.01	0.007	0.006	0.006	0.006	0.003	<0.001	0.003
Caesium-137	0.01	0.005	0.002	0.005	0.02	0.008	0.003	0.008	0.007	0.004	0.004	0.003	0.11	0.06	0.01	0.05
Plutonium-alpha	0.003	0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.003	0.003	0.003	<0.001	<0.001	<0.001	<0.001	<0.001
Plutonium-241	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Americium-241	0.002	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.001	0.001	0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Total	0.03	0.02	0.01	0.02	0.07	0.05	0.03	0.06	0.16	0.17	0.25	0.20	0.15	0.10	0.03	0.10

Radionuclide	Honey				Mushroom				Potato				Root veg.			
	Adult	Child	Infant	Foetus	Adult	Child	Infant	Foetus	Adult	Child	Infant	Foetus	Adult	Child	Infant	Foetus
Total tritium	-	-	-	-	0.003	0.002	0.002	0.005	0.02	0.02	0.009	0.02	0.04	0.03	0.05	0.06
Carbon-14	-	-	-	-	0.02	0.01	0.01	0.03	0.17	0.22	0.10	0.24	0.28	0.19	0.29	0.38
Cobalt-60	-	-	-	-	<0.001	0.001	0.001	<0.001	0.02	0.04	0.02	0.009	0.007	0.01	0.02	0.004
Strontium-90	-	-	-	-	0.004	0.004	0.002	0.006	0.06	0.11	0.03	0.09	0.16	0.17	0.18	0.24
Technetium-99	-	-	-	-	-	-	-	-	<0.001	0.002	0.001	<0.001	-	-	-	-
Ruthenium-106	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Antimony-125	-	-	-	-	<0.001	<0.001	<0.001	<0.001	0.008	0.01	0.009	0.004	0.004	0.004	0.009	0.002
Iodine-129	<0.001	0.001	0.002	<0.001	<0.001	<0.001	<0.001	<0.001	0.01	0.02	0.005	0.005	0.01	0.009	0.008	0.004
Caesium-134	-	-	-	-	0.003	0.001	<0.001	0.002	0.09	0.06	0.01	0.04	0.02	0.008	0.007	0.01
Caesium-137	-	-	-	-	0.02	0.006	0.003	0.007	0.03	0.02	0.006	0.01	0.02	0.008	0.007	0.009
Plutonium-alpha	-	-	-	-	0.04	0.02	0.01	0.002	0.004	0.004	0.001	<0.001	-	-	-	-
Plutonium-241	-	-	-	-	0.005	0.003	0.001	<0.001	-	-	-	-	-	-	-	-
Americium-241	-	-	-	-	0.05	0.03	0.02	<0.001	0.003	0.003	<0.001	<0.001	1.2	0.66	0.83	0.02
Total	0.002	0.002	0.003	0.002	0.15	0.08	0.05	0.06	0.42	0.51	0.19	0.42	1.7	1.1	1.4	0.73

Radionuclide	Green veg.				Domestic Fruit				Wild Fruit				Legumes			
	Adult	Child	Infant	Foetus	Adult	Child	Infant	Foetus	Adult	Child	Infant	Foetus	Adult	Child	Infant	Foetus
Total tritium	0.05	0.03	0.03	0.07	0.02	0.02	0.03	0.03	0.007	0.004	0.003	0.01	0.02	0.01	0.008	0.03
Carbon-14	0.34	0.21	0.21	0.47	0.06	0.06	0.07	0.08	0.04	0.02	0.02	0.06	0.12	0.06	0.05	0.16
Cobalt-60	0.02	0.03	0.03	0.01	0.001	0.003	0.005	<0.001	0.001	0.002	0.002	<0.001	0.005	0.007	0.006	0.003
Strontium-90	0.48	0.45	0.32	0.71	0.10	0.17	0.14	0.16	0.02	0.02	0.009	0.03	0.10	0.09	0.05	0.15
Technetium-99	-	-	-	-	<0.001	<0.001	0.001	<0.001	-	-	-	-	<0.001	<0.001	<0.001	<0.001
Ruthenium-106	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Antimony-125	0.01	0.01	0.02	0.006	0.002	0.002	0.004	<0.001	0.001	<0.001	<0.001	<0.001	0.004	0.003	0.003	0.002
Iodine-129	0.01	0.009	0.005	0.005	0.008	0.01	0.007	0.003	0.003	0.002	<0.001	0.001	0.006	0.004	0.002	0.002
Caesium-134	0.07	0.02	0.01	0.03	0.004	0.002	0.001	0.002	0.01	0.004	0.001	0.005	0.02	0.007	0.003	0.01
Caesium-137	0.18	0.06	0.04	0.08	0.04	0.02	0.02	0.02	0.008	0.003	0.001	0.004	0.05	0.02	0.007	0.02
Plutonium-alpha	0.15	0.07	0.06	0.006	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.06	0.02	0.01	0.002
Plutonium-241	0.07	0.04	0.02	0.002	-	-	-	-	-	-	-	-	0.01	0.006	0.003	<0.001
Americium-241	0.06	0.03	0.02	<0.001	0.001	0.001	0.001	<0.001	0.001	<0.001	<0.001	<0.001	0.14	0.06	0.04	0.002
Total	1.4	0.96	0.77	1.4	0.24	0.29	0.28	0.30	0.09	0.06	0.04	0.12	0.54	0.29	0.18	0.38

Radionuclide	Drinking water				Inhalation				Total dose			
	Adult	Child	Infant	Foetus	Adult	Child	Infant	Foetus	Adult	Child	Infant	Foetus
Total tritium	0.02	0.02	0.03	0.04	-	-	-	-	0.24	0.19	0.21	0.34
Carbon-14	-	-	-	-	-	-	-	-	1.2	0.96	1.1	1.7
Cobalt-60	-	-	-	-	-	-	-	-	0.07	0.12	0.11	0.04
Strontium-90	0.007	0.009	0.01	0.01	0.001	<0.001	<0.001	<0.001	1.1	1.4	1.3	1.7
Technetium-99	-	-	-	-	-	-	-	-	0.009	0.01	0.009	0.009
Ruthenium-106	-	-	-	-	0.01	0.009	0.008	<0.001	0.03	0.03	0.02	0.02
Antimony-125	-	-	-	-	<0.001	<0.001	<0.001	<0.001	0.04	0.04	0.06	0.03
Iodine-129	-	-	-	-	-	-	-	-	0.16	0.27	0.30	0.07
Caesium-134	-	-	-	-	-	-	-	-	0.27	0.13	0.05	0.13
Caesium-137	0.009	0.004	0.004	0.004	<0.001	<0.001	<0.001	<0.001	0.87	0.47	0.33	0.38
Plutonium-alpha	<0.001	<0.001	<0.001	<0.001	0.14	0.07	0.04	0.003	0.40	0.20	0.13	0.02
Plutonium-241	-	-	-	-	0.30	0.15	0.06	0.004	0.42	0.22	0.09	0.008
Americium-241	<0.001	<0.001	<0.001	<0.001	0.14	0.07	0.04	<0.001	1.6	0.85	0.95	0.04
Total	0.04	0.04	0.05	0.06	0.59	0.30	0.15	0.01	6.4	4.9	4.6	4.4

Doses assessed as being less than 0.001 μSv have been presented as "<0.001".
Foodstuff consumption rates used for 2025 are summarised later in this section. The two food groups assigned "high consumption rates" in 2025 were root vegetables and green vegetables.
The doses from ruthenium-106 and iodine-129in all terrestrial foodstuffs were assessed using standard modelling techniques. These are based on knowledge of the transfer of these radionuclides through the food chain. This is considered to be more realistic than using the limits of detection from the radiochemical analysis.

Table 39. Modelled concentrations of Ru-106 and I-129 in terrestrial foodstuffs (Bq kg^{-1} or Bq l^{-1}) in 2025

	Milk	Beef	Mutton	Liver	Green Veg.	Root Veg.	Fruit	Poultry	Eggs
Ru-106	2.20E-07	1.19E-04	1.73E-04	1.73E-04	7.53E-04	6.80E-06	6.57E-05	5.48E-08	4.69E-08
I-129	2.38E-03	2.53E-03	6.68E-03	6.68E-03	2.44E-03	2.31E-03	3.59E-03	1.24E-04	3.73E-03

Table 40. Summary of doses to the terrestrial representative person from seafood consumption (µSv) in 2025

Radionuclide	Adult	Child	Infant	Foetus
Carbon-14	0.08	0.02	0.01	0.11
Technetium-99	0.004	0.002	0.001	0.003
Caesium-137	0.21	0.03	0.01	0.09
Plutonium-alpha	0.02	0.005	0.002	0.0009
Americium-241	0.02	0.005	0.002	0.0003
Total	0.34	0.07	0.03	0.21

Table 41. Summary of doses to the terrestrial representative person (µSv), 2025

Pathway	Adult	Child	Infant	Foetus
Terrestrial food consumption	6.0	4.7	4.6	4.6
Marine food consumption	0.34	0.07	0.03	0.21
Inhalation	0.59	0.30	0.15	0.01
External (beach)	3.8	1.9	0.11	3.8
External (direct shine)	2.7	1.4	1.4	1.4
Total	13	8	6	10

Table 42. Representative person doses from operations at Sellafield (µSv)

Pathway	2023	2024	2025
Marine representative person (adults)			
seafood consumption	20	13	11
aerial pathways	1.6	1.6	1.4
external radiation from beach occupancy (marine)	36	34	32
Total dose to marine representative person (adults)	**58**	**49**	**44**
Terrestrial representative person (adults)			
inhalation	0.56	0.55	0.59
external radiation from beach occupancy (terrestrial)	4.3	3.8	3.8
terrestrial foodstuff consumption	5.6	5.9	6.0
marine foodstuff consumption	0.48	0.43	0.34
direct radiation	3.8	2.9	2.7
Total dose to terrestrial representative person (adults)	**15**	**14**	**13**

Table 43. Collective doses from Sellafield's discharges, 2025

Radionuclide	Collective Dose (manSv)					
	Aerial Discharges			Marine Discharges		
	UK	Europe	World	UK	Europe	World
Tritium	5.E-05	9.E-05	1.E-04	3.E-06	1.E-05	2.E-04
Carbon-14	2.E-02	9.E-02	1.E+00	2.E-02	5.E-02	5.E-01
Cobalt-60	-	-	-	7.E-04	2.E-03	2.E-03
Strontium-90	4.E-06	2.E-05	2.E-05	8.E-04	2.E-03	4.E-03
Technetium-99	-	-	-	1.E-04	3.E-04	4.E-04
Ruthenium-106	2.E-04	2.E-04	2.E-04	2.E-03	4.E-03	4.E-03
Iodine-129	3.E-02	2.E-01	2.E-01	8.E-05	2.E-04	9.E-04
Caesium-137	6.E-04	2.E-03	2.E-03	2.E-02	5.E-02	8.E-02
Plutonium-alpha	7.E-03	1.E-02	1.E-02	1.E-02	3.E-02	4.E-02
Plutonium-241	0.E+00	0.E+00	0.E+00	8.E-03	2.E-02	3.E-02
Americium-241	2.E-03	3.E-03	3.E-03	6.E-03	2.E-02	2.E-02
Total	6.E-02	3.E-01	1.E+00	6.E-02	2.E-01	7.E-01

Collective doses have been calculated, using a 500 year integration period, based on the most recent European Union (EU) methodology.

Table 44. Summary of representative person dose calculations for various age groups, 2025. (Note CEFAS habit data for 2025 were applied for adults whilst habit data from 2023 applied for other age groups as these data have not updated in subsequent CEFAS habit data reports).

Pathway	Adult Dose (microSv)			Child Dose (microSv)			Infant Dose (microSv)		
	Marine	Terrestrial	Total	Marine	Terrestrial	Total	Marine	Terrestrial	Total
Crustacean Consumers	12	1	12	1	0	1	0	0	0
Occupants for Direct Radiation	6	3	9	1	4	5	3	3	6
Egg Consumers	4	4	8	1	5	6	0	0	0
Freshwater Fish Consumers	51	8	58	0	0	0	0	0	0
Sea Fish Consumers	11	1	11	1	0	1	13	0	13
Domestic Fruit Consumers	0	3	3	3	4	7	3	3	6
Wild Fruit and Nut Consumers	0	2	3	2	4	7	2	2	3
Salt Marsh Grazed Cow Meat Consumers	22	0	22	0	0	0	0	0	0
Occupants over Saltmarsh	21	0	21	0	0	0	0	0	0
Occupants over Sediment	51	1	52	10	0	10	17	0	17
Honey Consumers	0	1	2	0	0	0	0	0	0
Consumers of Marine Plants and Algae	5	0	5	0	0	0	27	0	27
Cattle Meat Consumers	0	3	3	0	3	3	0	0	0
Game Meat Consumers	2	1	3	0	0	0	0	0	0
Poultry Meat Consumers	2	3	5	0	0	0	0	0	0
Sheep Meat Consumers	0	3	3	0	3	3	1	0	1
Wildfowl Consumers	0	0	1	0	0	0	0	0	0
Milk Consumers	0	3	3	0	0	0	0	0	0
Salt Marsh Grazed Cows' Milk Consumers	5	0	5	0	0	0	0	0	0
Mollusc Consumers	32	0	32	0	0	0	0	0	0
Mushroom Consumers	10	4	14	3	4	7	3	3	6
Occupants In Water	30	1	31	1	0	1	0	0	0
Occupants On Water	5	0	5	4	0	4	3	0	3
Local Inhabitants (0 - 0.25km)	0	5	5	0	4	4	3	3	6
Local Inhabitants (0.25 - 0.5km)	2	4	6	1	5	6	0	0	0
Local Inhabitants (0.5 - 1km)	3	4	7	0	3	3	0	0	0
Green Vegetable Consumers	5	4	8	3	4	7	0	0	0
Other Domestic Vegetable Consumers	4	5	10	3	4	7	0	0	0
Potato Consumers	2	2	4	0	0	0	0	0	0
Root Vegetable Consumers	4	5	10	2	2	4	0	0	0
Salt Marsh Grazed Sheep Meat Consumers	17	0	17	0	0	0	0	0	0

Dosimetric considerations for individual and collective doses

Data identifying the representative person and their habits by pathway have been provided by the FSA, EA and the Centre for Environment, Fisheries and Aquaculture Science (Cefas), or their predecessors, based on published survey work.

Worked example of committed effective dose calculation for a representative person

Table 45 CED received by an adult member of the seafood consuming representative person from Am-241 in winkles

	Parameter	Value	Location in report
A	Am-241 activity concentration in winkles	8.8 Bq kg^{-1}	Table 11
B	Consumption rate of winkles by adults	1.8 kg y^{-1}	Table 46
C	Committed effective dose per unit intake value for ingestion for Am-241 in Cumbrian winkle consumed by an adult	8.0E-08 Sv Bq^{-1}	Table 49

CED received by an adult member of the seafood consuming representative person from Am-241 in winkles is:
CED = A x B x C in units of Sv per year;
CED = 8.8 Bq kg^{-1} x 1.8 kg y^{-1} x 8.0E-08 Sv Bq^{-1} = 1.3E-06 Sv y^{-1},

This approach is repeated for all radionuclides of interest in each seafood species of interest, through the incorporation of the appropriate consumption rates and committed effective dose per unit intake values.

Care is needed in using the correct dose per unit intake values for Cumbrian winkles as a specific set of data for transuranic radionuclides are available.

Table 46. Seafood consumption rates used for dose assessments for marine discharges (2021 – 2025) average data)

Seafood	Consumption rates (kg y^{-1}) (2021 – 2025 average)		
	Representative person (Cumbria Coastal Community 2021 - 2025)	Whitehaven Commercial (1998)	Typical fish consumer
Fish:			
Cod	10.7	20	7.5
Plaice	35.5	20	7.5
Crustacea:			
Crabs	8.2	0	0
Lobsters	12.6	0	0
Nephrops	2.0	9.7	0
Molluscs:			
Winkles	1.8	0	0
Mussels	1.4	0	0

Data for the representative person (Cumbria Coastal Community) are taken from CEFAS, 2025. Radiological Habits Survey: Sellafield Review, 2025. All other consumption rates are from RIFE-29.

Table 47. Consumption rates of representative person consumers associated with aerial discharges

Foodstuff	Consumption rate (kg y^{-1})		
	Adult	Child	Infant
milk	95	110	130
beef	15	15	3
beef liver	2.75	1.5	0.5
mutton	8	4	0.8
mutton liver	2.75	1.5	0.5
poultry	10	5.5	2
game	6	4	0.8
fish (cod + plaice)	15	3	0.75
leafy vegetables	45	20	10
potatoes	50	45	10
root vegetables	40	20	15
legumes	20	8	3
domestic fruit	20	15	9
wild fruit	7	3	1
mushrooms	3	1.5	0.6
honey	2.5	2	2
eggs	8.5	6.5	5

Root vegetables and green vegetables are set to above average consumption rates for 2025. Adult consumption rates are used for the calculation of foetal doses.

Table 48. Parameters for calculation of drinking water and plume inhalation doses

	Adult	Child	Infant
Occupancy (%)	100%	100%	100%
Breathing rate (m^3 a^{-1})	9,860	5,600	1,900
Drinking Water (l a^{-1})	600	350	260

Adult parameters are used for the calculation of foetal doses.

Table 49. Committed effective doses per unit intake for ingestion

Radionuclide	f_1	Dose per unit intake (Sv Bq^{-1})			
		Foetus	1 year old	10 year old	Adult
H-3 organic	1E+00	6.3E-11	1.2E-10	5.7E-11	4.2E-11
C-14	1E+00	8.0E-10	1.6E-09	8.0E-10	5.8E-10
Co-60	1E-01	1.9E-09	2.7E-08	1.1E-08	3.4E-09
Sr-90	3E-01	4.6E-08	9.3E-08	6.6E-08	3.1E-08
Zr-95	1E-02	7.6E-10	8.8E-09	3.0E-09	1.5E-09
Nb-95	1E-02	3.7E-10	3.2E-09	1.1E-09	5.8E-10
Tc-99	5E-01	4.6E-10	4.8E-09	1.3E-09	6.4E-10
Ru-106	5E-02	3.8E-10	4.9E-08	1.5E-08	7.0E-09
Ag-110m	5E-02	2.1E-09	1.4E-08	5.2E-09	2.8E-09
Sb-125	1E-01	4.7E-10	6.1E-09	2.1E-09	1.1E-09
I-129	1E+00	4.4E-08	2.2E-07	1.9E-07	1.1E-07
I-131	1E+00	2.3E-08	1.8E-07	5.2E-08	2.2E-08
Cs-134	1E+00	8.7E-09	1.6E-08	1.4E-08	1.9E-08
Cs-137	1E+00	5.7E-09	1.2E-08	1.0E-08	1.3E-08
U-234	2E-02	1.5E-08	1.3E-07	7.4E-08	4.9E-08
U-235	2E-02	1.4E-08	1.3E-07	7.1E-08	4.7E-08
U-238	2E-02	1.3E-08	1.5E-07	7.5E-08	4.8E-08
Np-237	5E-04	3.6E-09	2.1E-07	1.1E-07	1.1E-07
Pu-238	5E-04	9.0E-09	4.0E-07	2.4E-07	2.3E-07
Pu-239	5E-04	9.5E-09	4.2E-07	2.7E-07	2.5E-07
Pu-240	5E-04	9.5E-09	4.2E-07	2.7E-07	2.5E-07
Pu-241	5E-04	1.1E-10	5.7E-09	5.1E-09	4.8E-09
Am-241	5E-04	2.7E-09	3.7E-07	2.2E-07	2.0E-07
Cm-242	5E-04	4.7E-10	7.6E-08	2.4E-08	1.2E-08
Cm-243	5E-04	1.5E-07	3.3E-07	1.6E-07	1.5E-07
Cm-244	5E-04	2.2E-09	2.9E-07	1.4E-07	1.2E-07
Pu-238 (winkle only)	2E-04	3.6E-09	1.6E-07	9.6E-08	9.2E-08
Pu-239 (winkle only)	2E-04	3.8E-09	1.7E-07	1.1E-07	1.0E-07
Pu-240 (winkle only)	2E-04	3.8E-09	1.7E-07	1.1E-07	1.0E-07
Pu-241 (winkle only)	2E-04	4.4E-11	2.3E-09	2.0E-09	1.9E-09
Am-241 (winkle only)	2E-04	1.1E-09	1.5E-07	8.8E-08	8.0E-08

Table 50. Committed effective doses per unit intake for inhalation

Radionuclide	Lung absorption type	f_1	Dose per unit intake (Sv Bq^{-1})				Basis for choice of lung absorption type
			Foetus	1 year old	10 year old	Adult	
H-3 organic	V	1E+00	6.3E-11	1.1E-10	5.5E-11	4.1E-11	Organically bound
C-14	M	1E-01	6.6E-11	6.6E-09	2.8E-09	2.0E-09	ICRP default
Co-60	M	1E-01	1.2E-09	3.4E-08	1.5E-08	1.0E-08	ICRP default
Sr-90	M	1E-01	1.0E-08	1.2E-07	5.4E-08	3.8E-08	ICRP default
Zr-95	M	2E-03	4.6E-10	2.1E-08	9.0E-09	6.3E-09	ICRP default
Nb-95	M	1E-02	1.6E-10	5.2E-09	2.2E-09	1.5E-09	ICRP default
Tc-99	M	1E-01	8.3E-11	1.3E-08	5.7E-09	4.0E-09	ICRP default
Ru-106	M	5E-02	4.1E-10	1.1E-07	4.1E-08	2.8E-08	ICRP default
Ag-110m	M	5E-02	1.5E-09	2.8E-08	1.2E-08	7.6E-09	ICRP default
Sb-125	M	1E-02	2.6E-10	1.6E-08	6.8E-09	4.8E-09	ICRP default
I-129	F	1E+00	1.5E-08	8.6E-08	6.7E-08	3.6E-08	ICRP default
I-131	F	1E+00	8.1E-09	7.2E-08	1.9E-08	7.4E-09	ICRP default
Cs-134	F	1E+00	3.0E-09	7.3E-09	5.3E-09	6.6E-09	ICRP default
Cs-137	F	1E+00	2.0E-09	5.4E-09	3.7E-09	4.6E-09	ICRP default
U-234	M	2E-02	4.9E-08	1.1E-05	4.8E-06	3.5E-06	ICRP default
U-235	M	2E-02	4.5E-08	1.0E-05	4.3E-06	3.1E-06	ICRP default
U-238	M	2E-02	4.4E-08	9.4E-06	4.0E-06	2.9E-06	ICRP default
Pu-238	M	5E-04	1.1E-06	7.4E-05	4.4E-05	4.6E-05	ICRP default
Pu-239	M	5E-04	1.2E-06	7.7E-05	4.8E-05	5.0E-05	ICRP default
Pu-240	M	5E-04	1.2E-06	7.7E-05	4.8E-05	5.0E-05	ICRP default
Pu-241	M	5E-04	1.4E-08	9.7E-07	8.3E-07	9.0E-07	ICRP default
Am-241	M	5E-04	3.2E-07	6.9E-05	4.0E-05	4.2E-05	ICRP default
Cm-242	M	5E-04	5.1E-08	1.8E-05	7.3E-06	5.2E-06	ICRP default
Cm-243	M	5E-04	3.1E-05	6.1E-05	3.1E-05	3.1E-05	ICRP default
Cm-244	M	5E-04	2.6E-07	5.7E-05	2.7E-05	2.7E-05	ICRP default

Table 51. Collective dose commitment (man Sv per Bq discharged, integrated to 500 years): atmospheric discharges

Radionuclide	UK	EU	World
H-3	6.7E-16	1.2E-15	1.5E-15
C-14	2.0E-13	1.0E-12	1.3E-11
Kr-85	4.3E-18	1.5E-17	2.6E-16
Sr-90	1.9E-12	8.8E-12	8.8E-12
Ru-106	3.1E-13	4.2E-13	4.2E-13
Sb-125	1.2E-13	1.7E-13	1.7E-13
I-129	4.5E-11	2.1E-10	2.9E-10
I-131	7.8E-13	4.8E-13	4.8E-13
Cs-137	1.8E-12	6.1E-12	6.1E-12
Pu-239 & Pu-240	1.7E-10	2.4E-10	2.4E-10
Pu-241	3.0E-12	4.4E-12	4.4E-12
Am-241	1.4E-10	2.0E-10	2.0E-10

EU is defined as the population of the EU12 member states, 360 million

Table 52. Collective dose commitment (man Sv per Bq discharged, integrated to 500 years): liquid discharges

Radionuclide	UK	EU	World
H-3	4.6E-19	1.9E-18	3.5E-17
C-14	2.0E-13	6.6E-13	6.8E-12
Co-60	6.7E-14	1.9E-13	2.4E-13
Sr-90	7.0E-16	1.8E-15	3.0E-15
Zr-95	7.3E-17	1.5E-16	1.6E-16
Nb-95	1.7E-17	3.5E-17	3.8E-17
Tc-99	2.5E-15	7.6E-15	9.5E-15
Ru-106	1.9E-14	5.1E-14	5.6E-14
I-129	1.9E-14	5.7E-14	2.2E-13
Cs-134	1.3E-14	3.0E-14	4.6E-14
Cs-137	1.6E-14	4.1E-14	7.1E-14
Ce-144	6.9E-17	1.8E-16	2.0E-16
Pu-239 & Pu-240	3.0E-13	8.4E-13	9.8E-13
Pu-241	2.5E-14	7.1E-14	7.9E-14
Am-241	1.3E-12	3.6E-12	3.9E-12
Cm-242	2.3E-15	6.1E-15	6.8E-15
Cm-243 & Cm-244	4.3E-14	1.1E-13	1.2E-13

The collective dose factors include the contribution from the first decay product where appropriate.
EU is defined as the population of the EU12 member states, 360 million

gov.uk/sellafieldltd