

Sellafield Particles in the Environment Update 2022

1 Progress and areas monitored

During 2022 a total area of 117 ha of the beaches along the Cumbrian coast were monitored against a programme target of 105 ha. A total of 49 particles and 7 larger objects¹ were detected, recovered and analysed, details are given in Table 1. The 2022 monitoring programme included an additional 0.85 ha of monitoring in January 2022 to support the response to an elevated reading on filter change (02/12/2021), no finds were detected or recovered during this survey.

Strandline surveys of the upper beach between Drigg and St. Bees were completed in March and September with no beach finds being reported. Further details of the programme can be found in the annual report series².

2 Find rates

Average find rates were compared with find rates over the last two calendar years in Table 2 and the last four years in Figure 1. For clarity of presentation, the find rates in Table 2 were rounded to the nearest significant figure.

Table 2 and Figure 1 shows that Alpha-rich particle³, Beta-rich particle and Beta-rich larger object find rates at Sellafield beach are all comparable with the average find rates from previous years. Alpha-rich particle find rates at Northern beaches and Southern beaches were comparable with those measured at these areas in recent years.

Find rates in 2022 did not require any form of notification or intervention through the Environment Agency's Sellafield radioactive objects notification and intervention plan⁴.

3 Find activities

Figure 2 shows the activities of Alpha-rich particles, Beta-rich particles and Beta-rich larger objects were comparable to the activities measured since May 2014 (when the current version of the monitoring equipment was introduced).

None of the finds recovered in 2022 required characterisation through the Environment Agency's Sellafield radioactive objects notification and intervention plan⁵.

4 Summary of programme

Table 3 presents a summary of the beach monitoring programme since it started in 2006. Overall, a total of 2707 ha of beaches have been monitored and 3488 particles and larger objects have been recovered and analysed.

5 Conclusion

The UK Health Security Agency risk assessment for radioactive particles and larger objects on West Cumbrian beaches reported that:

- "overall health risks for beach users are very low, and significantly lower than other risks that people accept when using the beaches."; and that
- "measures to control these risks are not warranted on public health grounds."

¹ "Particles" are finds < 2 mm in diameter and "larger objects" are finds \geq 2mm in diameter (includes: granules, gravel, pebbles, stones etc.)

² <https://www.gov.uk/government/collections/sellafield-ltd-environmental-and-safety-reports>

³ "Alpha-rich" are finds with ²⁴¹Am activity greater than ¹³⁷Cs activity, "Beta-rich" are finds with ¹³⁷Cs activity greater than ²⁴¹Am activity and "Co-60 rich" are finds with positive ⁶⁰Co activity greater than the ¹³⁷Cs activity.

⁴ <https://www.gov.uk/government/publications/sellafield-radioactive-objects-notification-and-intervention-plan/sellafield-radioactive-objects-notification-and-intervention-plan>

Table 1: Beach finds in 2022

Beach location	Area covered (ha)	No. of particles found				No. of larger objects found				Total finds
		Alpha-rich	Beta-rich	Other	Not analysed	Alpha-rich	Beta-rich	Other	Not analysed	
Allonby	5	0	0	0	0	0	0	0	0	0
Northern beaches	35	11	0	0	0	0	0	0	0	11
Sellafield	55	30	2	1	0	0	7	0	0	40
Southern beaches	22	5	0	0	0	0	0	0	0	5
All	117	46	2	1	0	0	7	0	0	56

Note 1: Proportion of particles as % of total finds = 88%.

Table 2: Find per hectare and area monitored for main beach areas

Beach location	Year	Area covered (ha)	Find category & Type (finds per hectare)			
			Alpha-rich particle	Beta-rich particle	Beta-rich larger object	Other finds *
Allonby	2020	6	0	0	0	0
	2021	5	0	0	0	0
	2022	5	0	0	0	0
Northern beaches	2020	30	<1	0	0	0
	2021	36	2	0	0	0
	2022	35	<1	0	0	0
Sellafield	2020	58	<1	<0.1	<0.1	0
	2021	57	<1	<0.1	<0.1	0
	2022	55	<1	<0.1	<1	<0.1
Southern beaches	2020	19	<0.1	0	0	0
	2021	24	<0.1	0	0	0
	2022	22	<1	0	0	0

Note 2: IA - Insufficient area coverage to estimate finds rates (<10 ha).

NA - No monitoring to date.

"<1" denotes values between 0.1 and 0.99.

"<0.1" denotes values between zero and 0.099.

* - Other find relates to a single 10 kBq Co-60 rich particle detected and recovered on 17/10/2022.

Table 3: Summary of beach monitoring data since programme began in 2006.

Beach location	Area (ha)	Total		Alpha-rich		Beta-rich		Co-60 rich	
		Particle	Larger object	Particle	Larger object	Particle	Larger object	Particle	Larger object
Allonby	124	18	1	16	0	2	1	0	0
Northern beaches	904	878	0	821	0	51	0	6	0
Sellafield	999	1701	727	1362	6	330	719	9	2
Southern beaches	604	137	6	112	0	25	4	0	2
Other beaches	78	19	1	17	0	2	1	0	0
All	2707	2753	735	2328	6	410	725	15	4

Note: Northern beaches are St Bees and Braystones, Southern beaches are Seascale and Drigg. Allonby and Sellafield are included specifically. All other beaches (e.g. Whitehaven, Workington, Silecroft etc.) are incorporated into the "Other beaches" definition.

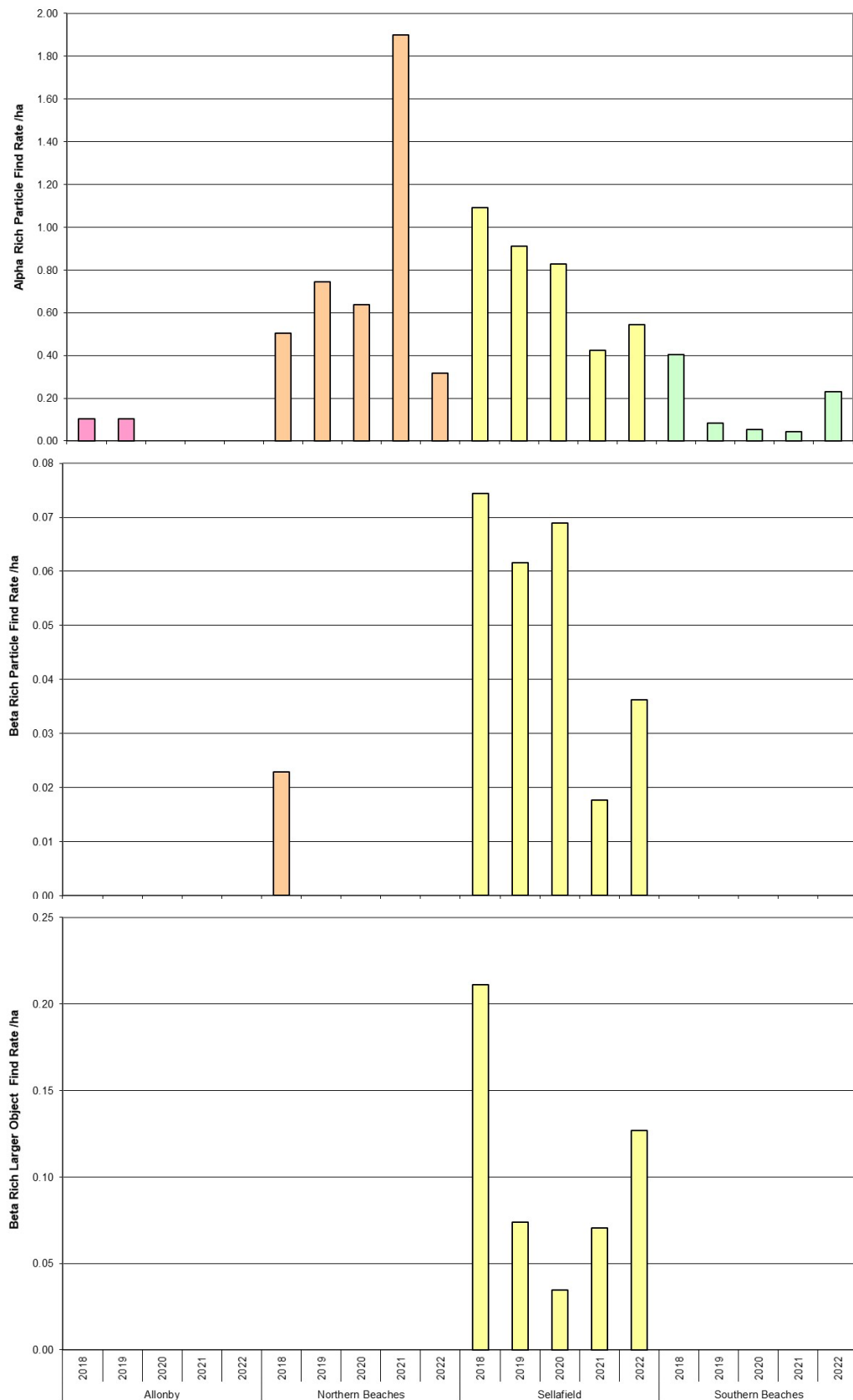
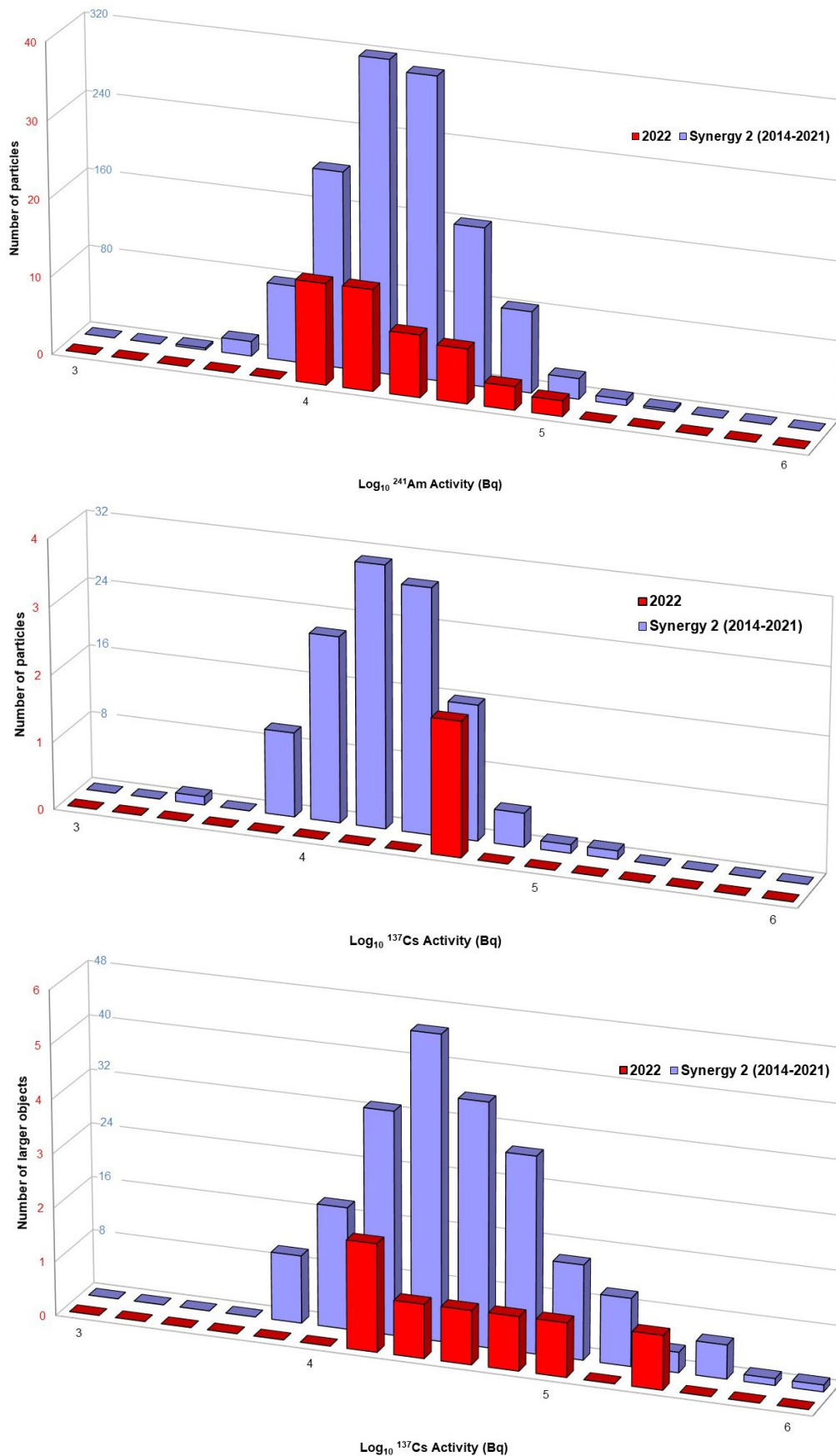


Figure 1: Find rates of Alpha-rich particles (upper), Beta-rich particles (middle) and Beta-rich larger objects (lower) between 2018 - 2022.



Note 3: Different scales used for 2022 and Synergy2 datasets.

Figure 2: Radioactivity of finds classified as Alpha-rich particles (top), beta-rich particles (middle) and beta-rich larger objects (bottom) between May 2014 - December 2021 (termed "Synergy2" and shown in blue) compared to data from 2022 (termed "2022" and shown in red).