OR Annual report 2022

Appendices

Atmospheric concentrations of H_2S in populated areas and regulatory limits

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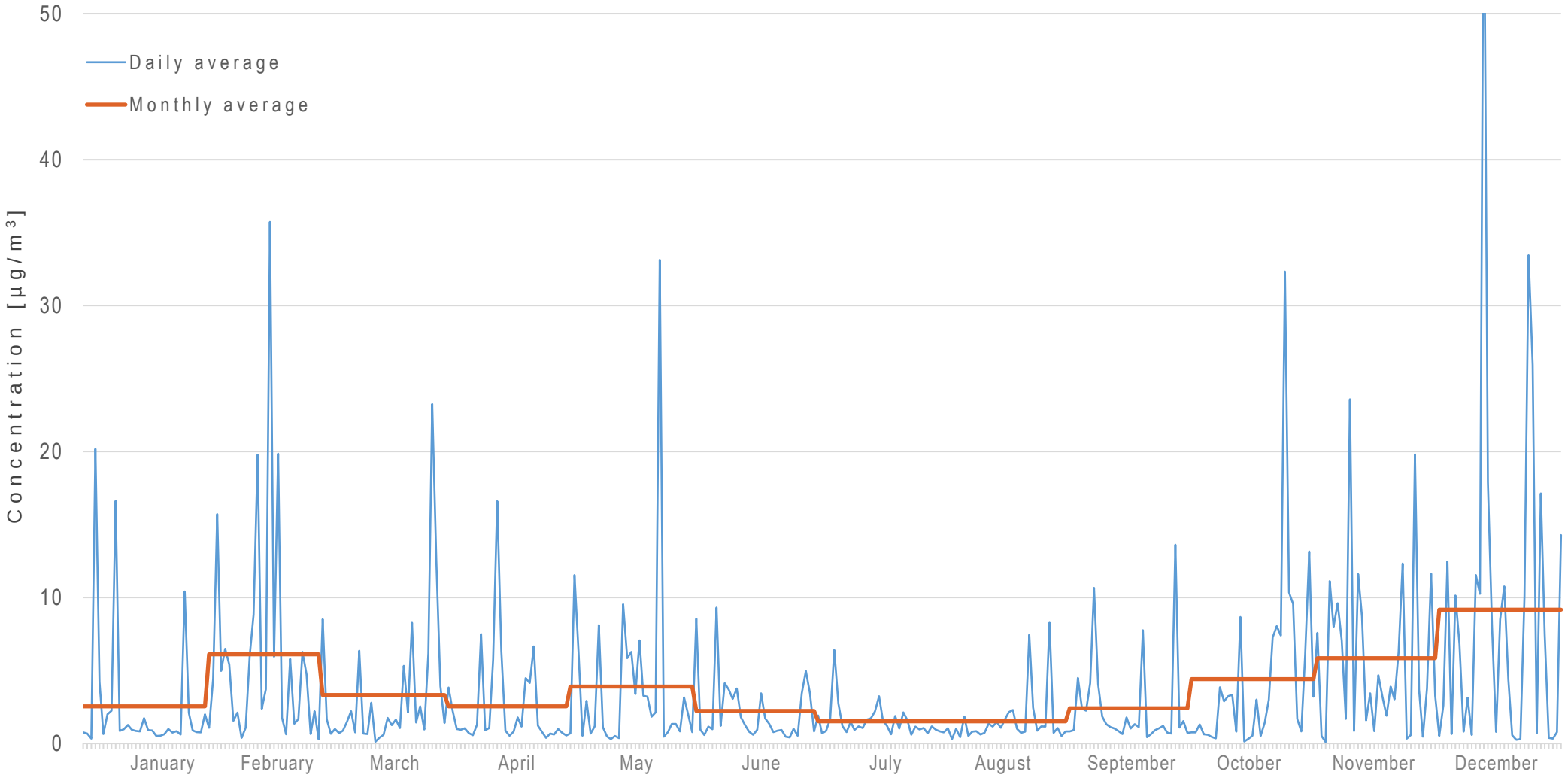
Cover photo: Sigurður Ólafur Sigurðsson

Atmospheric concentration of hydrogen sulphide (H2S) in Nordlingaholt, Hveragerdi, Laekjarbotnar and Ulfarsardalur 2022

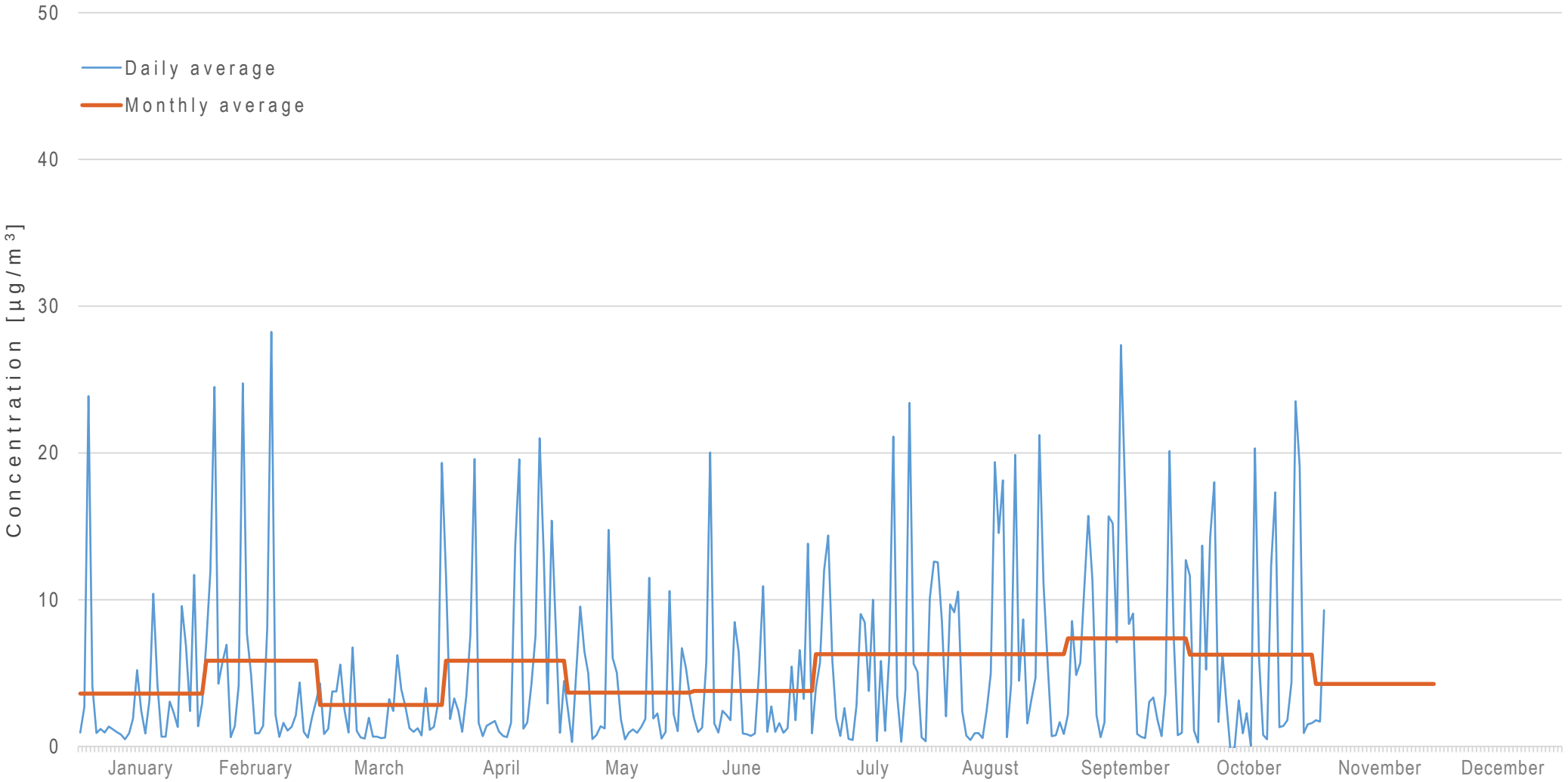
The figures show the daily and monthly averages of the measured concentration of hydrogen sulphide in the atmosphere.

Nordlingaholt

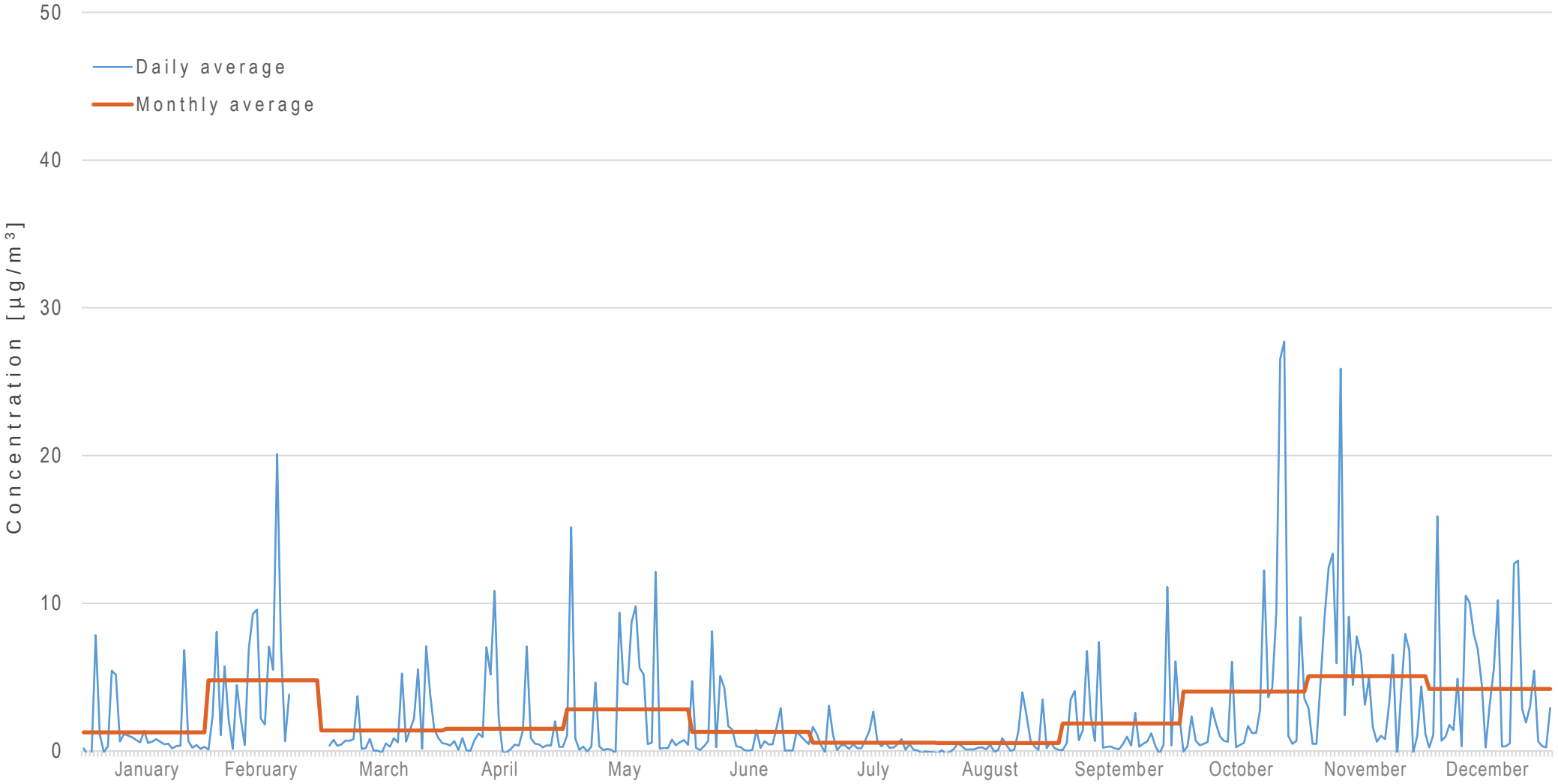


Hveragerdi

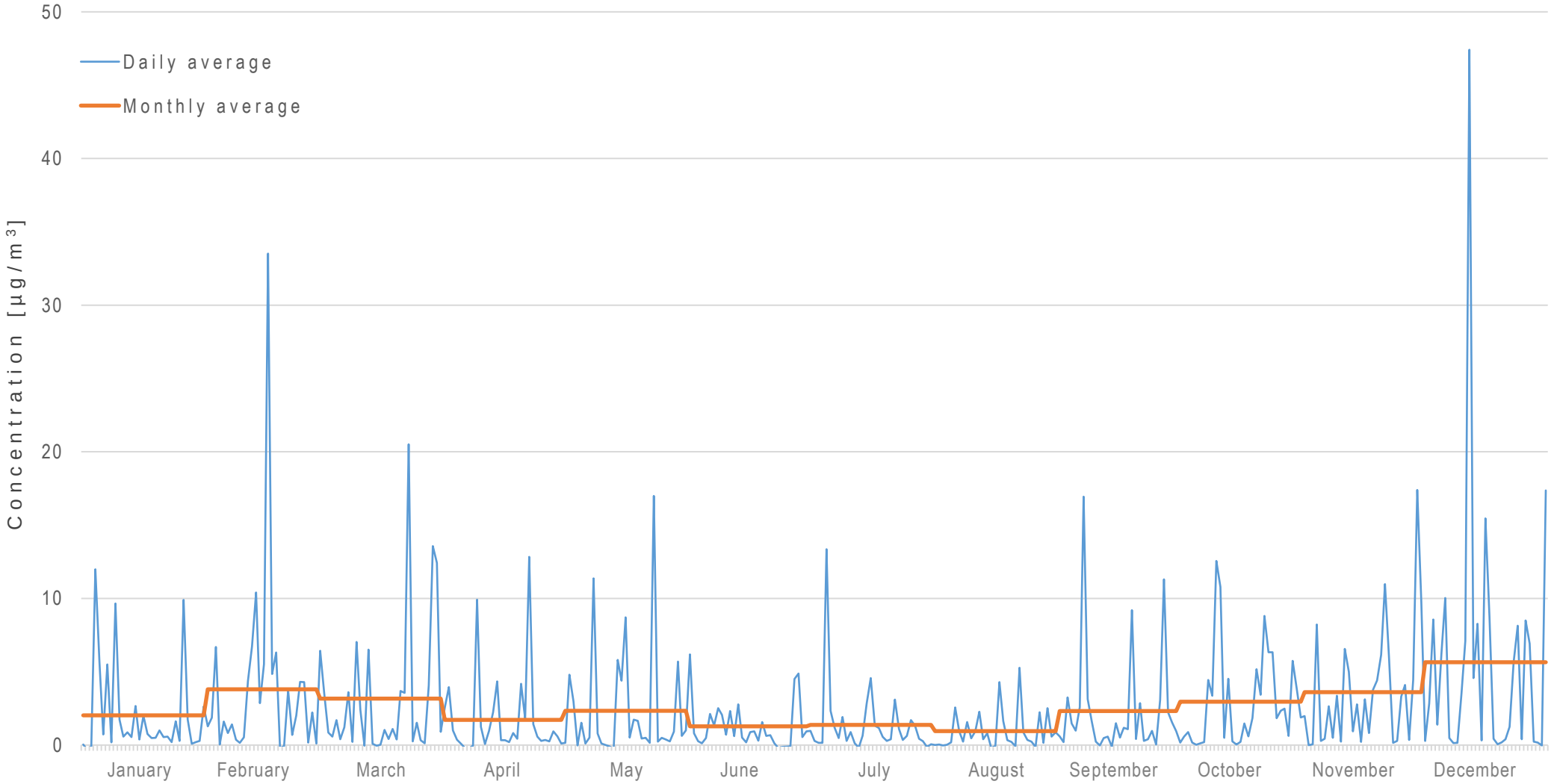
The gas meter in Hveragerdi malfunctioned on November 3rd and no data was logged after that time.



Laekjarbotnar



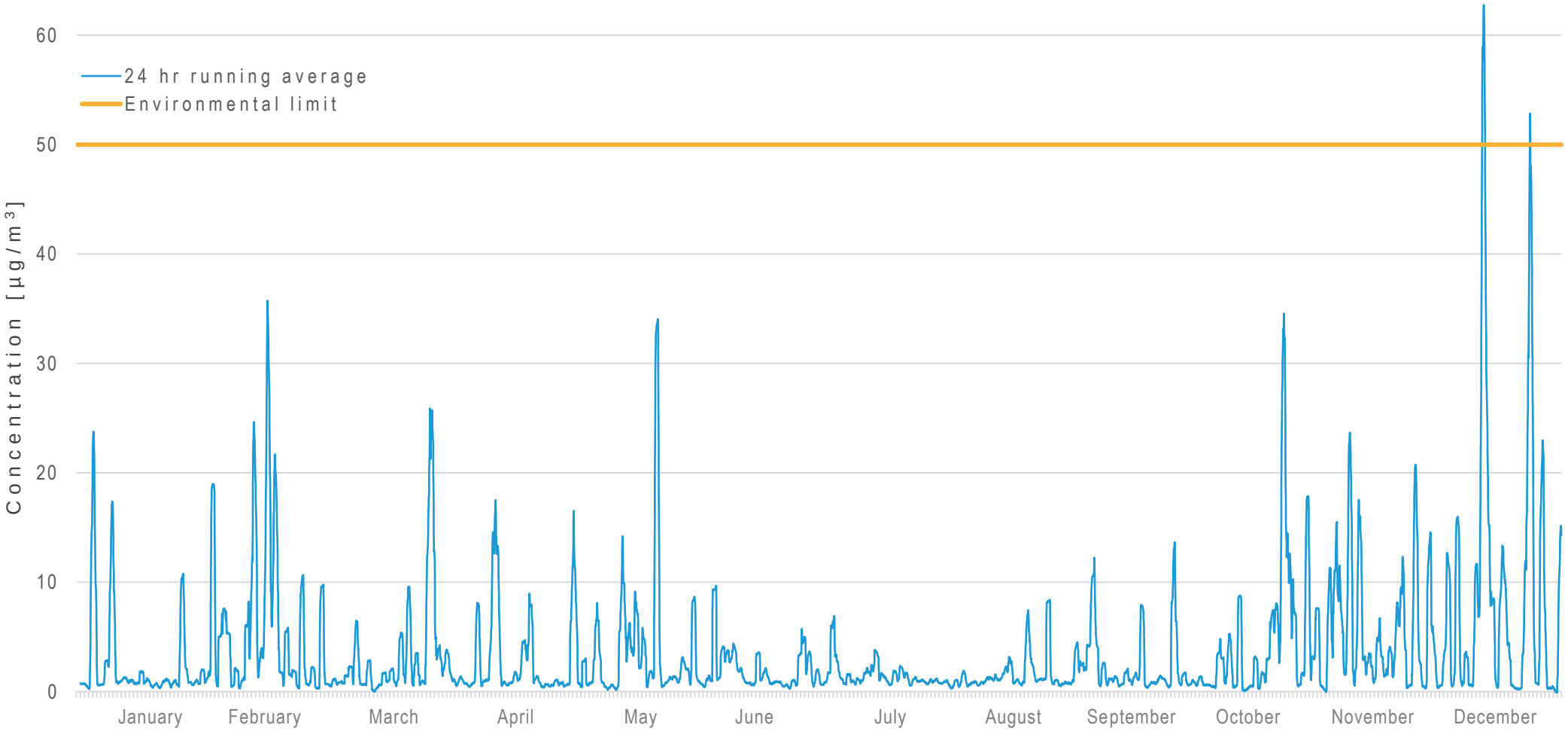
Ulfarsardalur



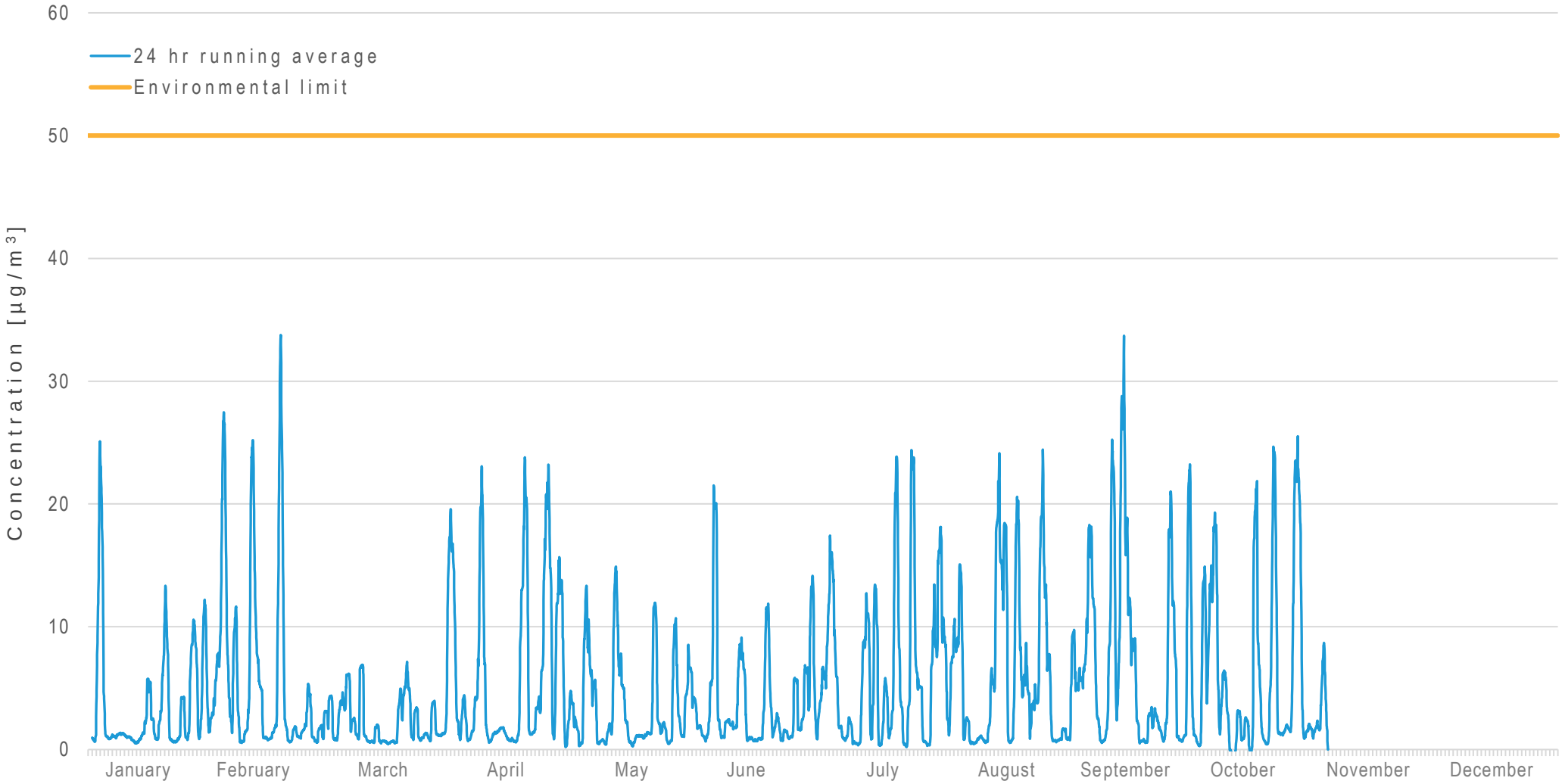
Atmospheric concentration of hydrogen sulphide (H_2S) in Nordlingaholt, Hveragerdi, Laekjarbotnar and Ulfarsardalur 2022

In 2022 the atmospheric concentrations of hydrogen sulphide (H_2S) did not exceed environmental limits. Capture and reinjection of hydrogen sulphide from Hellisheidi power plant was successful and about 72% of all hydrogen sulphide produced at Hellisheidi was reinjected. The total amount of hydrogen sulphide emitted by the Nesjavellir and Hellisheidi power plants was 8.8 thousand tonnes in 2022.

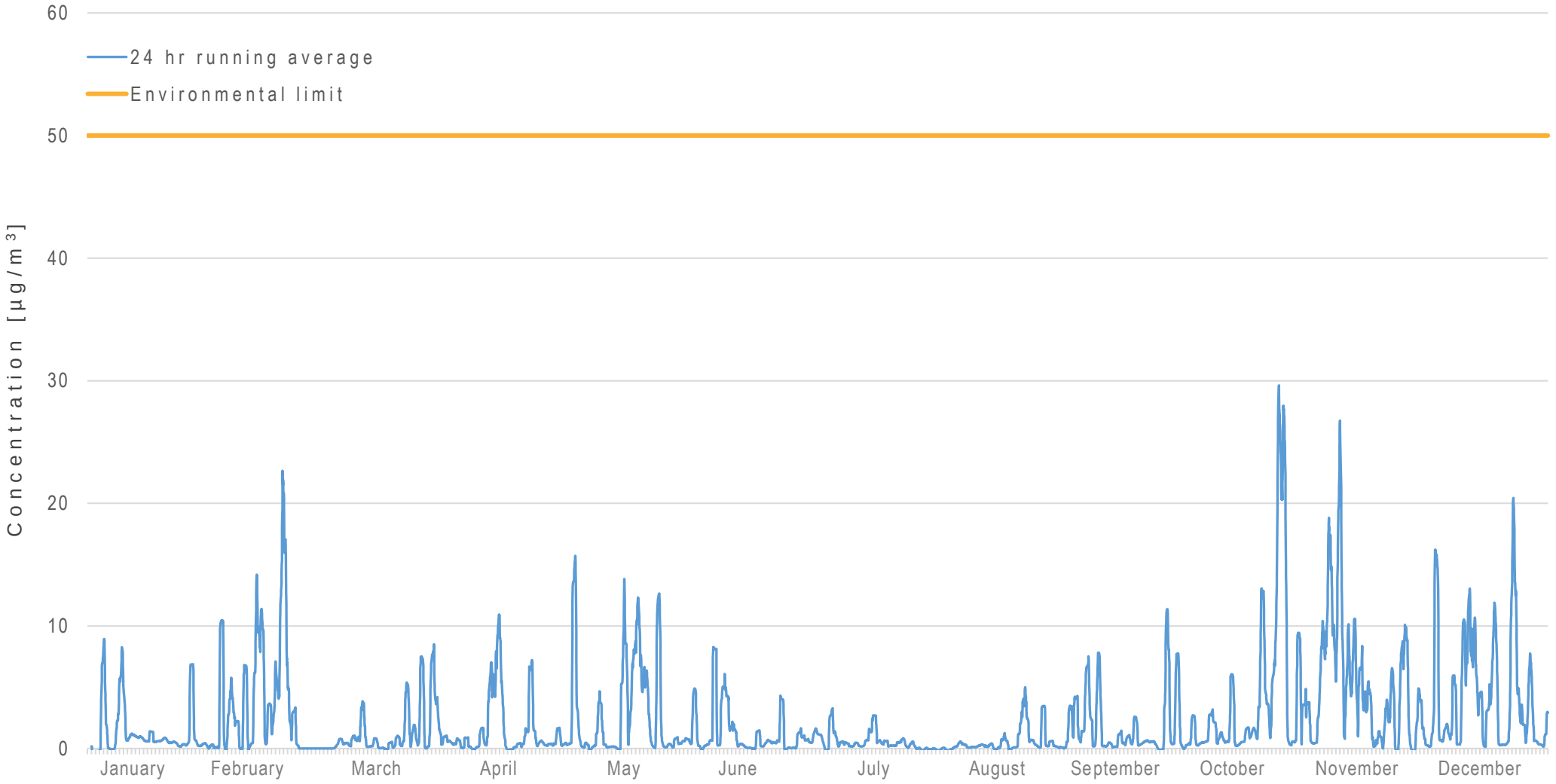
Nordlingaholt



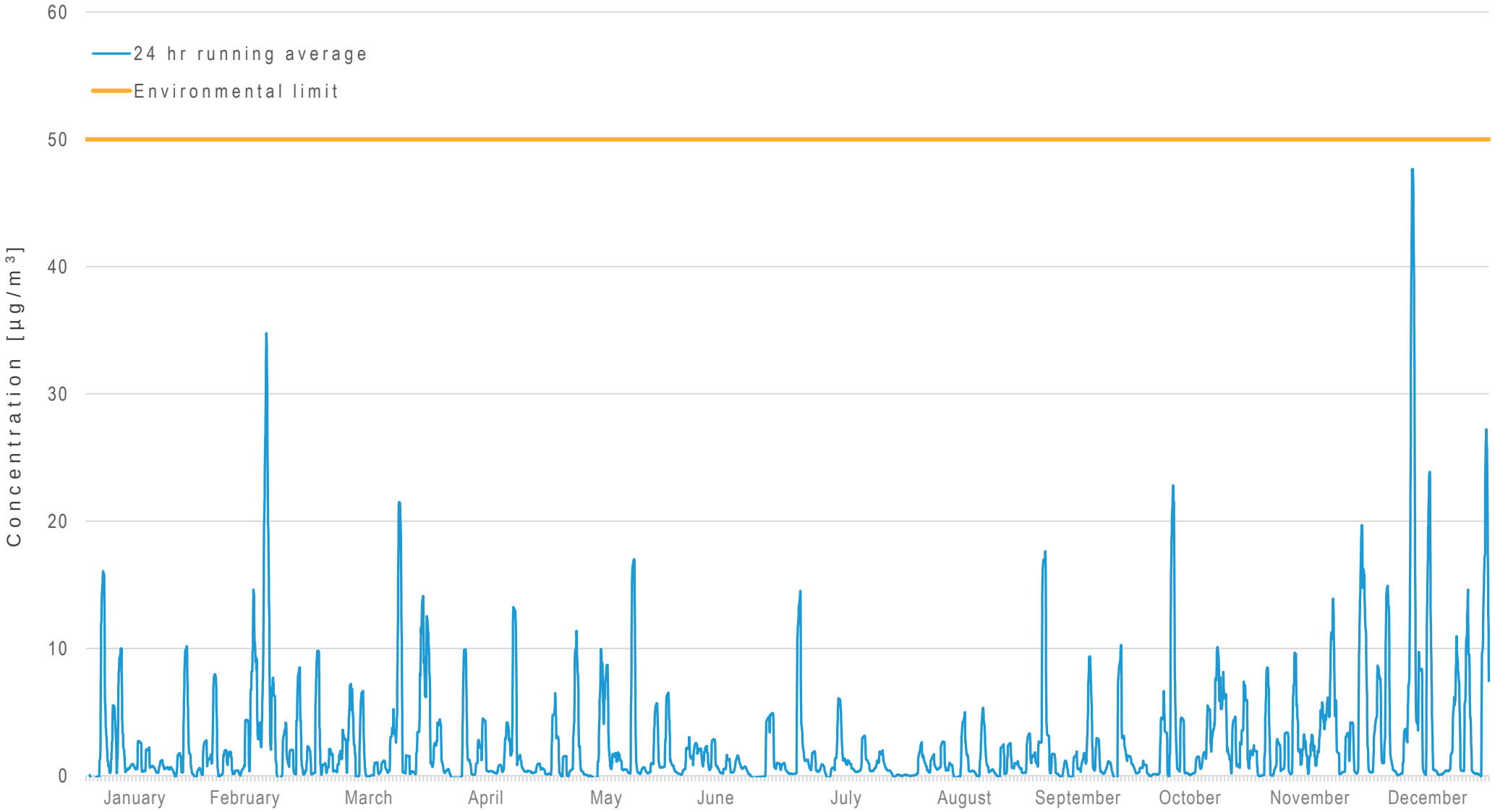
Hveragerdi


60
50
40
30
20
10
0
24 hr running average
Environmental limit
Concentration [µg/m³]
January
February
March
April
May
June
July
August
September
October
November
December

Laekjarbotnar



Ulfarsardalur



30 highest hourly averages for the atmospheric concentration of hydrogen sulphide in Hveragerdi, Nordlingaholt, Laekjabotnar and Ulfarsardalur

The table shows the 30 highest hourly averages for atmospheric concentrations of hydrogen sulphide in Hveragerdi, Nordlingaholt, Laekjarbotnar and Ulfarsardalur in 2022 and their timing.

Hveragerdi Finnmork 1a		Nordlingaholt Nordlingabraut 1	
Concentration [µg/m³]	Date & time	Concentration [µg/m³]	Date & time
131	17.10.2022 09:00	113	29.11.2022 00:00
125	14.9.2022 07:00	110	12.12.2022 09:00
95	27.10.2022 10:00	105	23.5.2022 06:00
94	17.10.2022 08:00	101	12.12.2022 07:00
93	30.7.2022 23:00	98	12.12.2022 13:00
93	16.8.2022 07:00	96	29.3.2022 03:00
91	29.6.2022 05:00	94	3.2.2022 01:00
86	5.6.2022 05:00	94	12.12.2022 10:00
84	14.9.2022 12:00	93	6.6.2022 08:00
82	16.2.2022 23:00	92	12.12.2022 11:00
80	11.9.2022 23:00	92	23.5.2022 04:00
79	15.7.2022 02:00	92	23.5.2022 01:00
78	3.1.2022 19:00	90	24.12.2022 03:00
74	5.6.2022 06:00	89	23.12.2022 01:00
72	4.7.2022 05:00	87	23.5.2022 00:00
72	17.2.2022 07:00	86	16.2.2022 17:00
72	24.7.2022 06:00	86	24.12.2022 01:00
71	14.8.2022 09:00	84	24.12.2022 00:00
71	14.8.2022 08:00	84	24.10.2022 04:00
71	31.7.2022 00:00	84	27.8.2022 09:00
70	20.7.2022 05:00	83	12.12.2022 12:00
70	15.8.2022 05:00	82	23.5.2022 03:00
68	24.7.2022 05:00	81	12.12.2022 08:00
68	15.9.2022 00:00	81	26.12.2022 16:00
68	24.4.2022 02:00	77	13.2.2022 10:00
67	28.10.2022 03:00	77	23.12.2022 19:00
66	25.8.2022 03:00	75	26.12.2022 17:00
66	30.9.2022 20:00	75	16.2.2022 18:00
65	3.2.2022 02:00	73	12.12.2022 14:00
64	3.1.2022 16:00	72	12.12.2022 06:00

Laekjarbotnar at Waldorfskoli		Ulfarsardalur at Lambhagi	
Concentration [µg/m³]	Date & time	Concentration [µg/m³]	Date & time
90	3.12.2022 15:00	135	12.12.2022 15:00
84	26.10.2022 10:00	117	7.9.2022 09:00
79	9.11.2022 09:00	101	12.12.2022 16:00
78	18.2.2022 18:00	94	5.7.2022 10:00
74	6.6.2022 06:00	91	12.12.2022 17:00
68	2.5.2022 05:00	88	10.10.2022 23:00
67	18.2.2022 15:00	86	7.9.2022 10:00
65	3.12.2022 16:00	82	28.11.2022 23:00
65	3.12.2022 14:00	82	12.12.2022 21:00
62	18.2.2022 03:00	81	1.3.2022 20:00
60	9.11.2022 08:00	80	12.12.2022 11:00
58	3.12.2022 01:00	78	27.9.2022 03:00
58	23.5.2022 06:00	77	16.12.2022 16:00
58	3.12.2022 00:00	76	10.10.2022 22:00
56	2.5.2022 04:00	74	12.12.2022 18:00
56	26.10.2022 18:00	71	4.1.2022 20:00
55	6.6.2022 05:00	69	23.3.2022 04:00
55	2.5.2022 03:00	68	16.12.2022 18:00
55	22.12.2022 16:00	65	16.2.2022 10:00
55	25.10.2022 08:00	65	31.12.2022 00:00
53	13.2.2022 06:00	65	5.7.2022 11:00
52	21.10.2022 07:00	63	16.2.2022 08:00
52	26.10.2022 19:00	63	12.12.2022 20:00
51	11.12.2022 23:00	63	16.2.2022 21:00
51	23.12.2022 06:00	61	5.12.2022 23:00
50	26.10.2022 15:00	60	23.3.2022 10:00
49	25.10.2022 07:00	60	10.10.2022 21:00
49	23.5.2022 05:00	59	12.12.2022 19:00
49	25.3.2022 04:00	59	18.2.2022 08:00
48	26.10.2022 11:00	59	16.2.2022 07:00

Comparison between regulatory limits of hydrogen sulphide in µg/m^3 and ppm

According the regulation no. 514/2010 regarding the Concentration of Hydrogen Sulphide in the Atmosphere, environmental limits are set at 50 µg/m^3, based on the maximum daily running 24-hour average. The concentrations may exceed those limits three times per annum. Other environmental limits are that the maximum annual average shall be 5 µg/m^3 and the environmental authorities shall be notified when the concentration measured exceeds 150 µg/m^3 for three consecutive hours. Regulation no. 514/2010 does not apply to the industrial areas of the Hellisheidi and Nesjavellir geothermal power plants. There Regulation no. 390/2009 on Pollution Limits and Methods to Reduce Pollution in Workplaces applies. The pollution limit in a work environment is 7,000 µg/m^3 and depends on the average of an eight-hour workday, and 14,000 µg/m^3 when based on the average over a 15-minute period.

µg/m^3	ppm	Comments
5	0.0039	Maximum annual average
7-15	0.0054 – 0.012	Odour threshold
50	0.039	Maximum daily average
150	0.12	Notification limits (three continuous hours)
7,000	5.41	Limit in a work environment for an eight-hour workday
14,000	10.8	Limit in a work environment for a fifteen-minute period
>14,000	>10.8	Irritation in airway, sense of smell fades and other symptoms. **GET OUT OF THE SITUATION**.