

Gas concentration values – Air pollution in the vicinity of eruption sites

Children, elderly persons, pregnant women and those who suffer from underlying cardiovascular and pulmonary diseases are advised not to travel to the eruption sites if any air pollution is expected. In addition, there may be surface pollution in soil, snow and surface water due to heavy metals and the collection of fluorides (F). As a rule, surface pollution is generally in the immediate neighbourhood of the eruption site.

Further information:

SO₂ – Sulphur dioxide. An extremely toxic gas. Commonly has the same odour as fireworks.

Colourless gas, although the smell can begin to be found at 0.3–1.4 ppm and is easily noticed at values of 3 ppm and above. SO₂ forms Sulphurous acid (H₂SO₃) on contact with moisture (e.g. rain).

Pollution limits (ppm)	Health effects relating to SO ₂	Response
0–0.4	No symptoms or mild respiratory tract / eye irritation.	
0.5	Exposure limit 8 hours.	
1	Exposure limit 15 minutes.	Public evacuation at 1 ppm Gas mask from 1–10 ppm Complete evacuation at 10 ppm
1–5	Healthy individuals show respiratory symptoms on exertion or deep breathing.	
3–5	Odour is very noticeable, lung function during rest is restricted and increased resistance in respiratory tract / breathing difficulties.	
5	Significant odour, increased breathing difficulties in healthy persons.	
6	Significant odour. Irritation in eyes, nose and throat.	
10	Significant odour. Symptoms become worse, breathing difficulties and irritation in eyes, nose and throat.	
10–15	Staying within the polluted area is prohibited except for very short durations (minutes).	
20+	Paralysis or sudden death unless duration is severely limited (minutes).	

H₂S – Hydrogen sulphide – An extremely toxic gas. Colourless gas. Its odour is similar to that of hot springs or rotten eggs, although there are some who do not detect it.

Pollution limits (ppm)	Health effects relating to H ₂ S	Response
0.008–0.2	Significant odour (rotten eggs).	
5	Significant odour. Exposure limit 8 hours.	
10	Significant odour. Exposure limit 15 minutes.	Public evacuation at 10 ppm Gas mask from 10–50 ppm Complete evacuation at 50 ppm
20	Sense of smell paralysed. Can be tolerated for a short period without damage.	
20–50	Irritation in eyes.	
50	Irritation in eyes, bronchitis after long exposure.	
60	Lengthy exposure causes conjunctivitis and eye pain.	
150+	Irritation in the upper respiratory tract (100 ppm is max GasPro).	
250	Pulmonary oedema and risk of sudden death.	

CO₂ – Carbon dioxide. Odourless, colourless and toxic gas.

Pollution limit (%)	Health effects relating to CO ₂ pollution	Response
0.5	Exposure limit 8 hours.	
1	Exposure limit 15 minutes.	Evacuation to higher elevation Oxygen (O₂)
2–3	Shortness of breath, gasping.	
5	Difficulty breathing, increased sweating, increased pulse rate.	
7.5	Headache, dizziness, restlessness, shortness of breath, increased heart rate and increased blood pressure, fast pulse, muscular weakness, visual impairment.	
10	Respiratory distress, loss of hearing, nausea and vomiting, loss of consciousness within 10–15 minutes.	
15	Fatal concentration, sudden death imminent.	
30	Convulsions and loss of consciousness after a few breaths, death.	

CO – Carbon monoxide. Odourless, colourless and severely toxic gas.

Pollution limits (ppm)	Health effects	Response
25	Exposure limit 8 hours.	
50	Maximum exposure limit 15 minutes.	
>100	Can be harmful to human health.	Evacuation to higher elevation Oxygen (O₂)
>800	Dizziness, depleted consciousness, muscle pain.	
>1,600	Headache, dizziness, death within 2 hours.	

O₂ – Oxygen.

Minimum (%)	Health effects	Response
16–21	No effects.	
<16	Increased heart rate, hyperventilation and diminished attention and memory.	Evacuation The public at <20% O₂ Oxygen (O₂)
<14	Abnormal tiredness on exertion, mental instability, lack of co-ordination and decrease of judgement ability.	
<12	Extreme lack of judgement and co-ordination, vomiting, breathing difficulties that have an effect on heart function.	
<10	Vomiting, slow movement, perhaps loss of consciousness, inability to perform energetic movements or complete lack of ability to move.	
<6	Seizures, respiratory distress, cardiac arrest, spasmodic breathing, death in five minutes.	
<4	Loss of consciousness after 1–2 breaths.	

It is important to keep in mind that when pollution limits are based on the average of an eight-hour working day, the pollution concentration of each period (maximum of 15 minute periods) may not exceed the equivalent of the pollution levels in question.