What's that smell in Auckland?

VOLCANIC GAS AND ACID RAIN FROM POSSIBLE FUTURE AUCKLAND VOLCANIC FIELD ERUPTIONS: WHAT TO EXPECT AND WHAT TO DO

DEVORA
FACT SHEET 05
Interesting volcanic facts from the DEtermining VOlcanic Risk in Auckland (DEVORA) Project

A future eruption of the Auckland Volcanic Field will cause a range of impacts on air quality.
Magma contains dissolved gases. When the Auckland Volcanic Field next erupts (which is unlikely within your lifetime), basaltic magma will rise towards the Earth's surface. As the magma rises, pressure decreases, gases form bubbles, continue to rise, and are eventually released into the atmosphere. For basaltic magmas, the main volcanic gas released is water, which is visible as a steam plume, followed by sulfur dioxide (SO_2) and carbon dioxide (CO_2) with lesser amounts of hydrogen sulfide (H_2S), carbon monoxide (CO), hydrogen chloride (HCl) and hydrogen fluoride (HF). Of these, sulfur dioxide (SO_2) is likely to cause the most health and environmental impacts. These gases will travel downwind. At any location, gas concentrations will depend on the amount released by the volcano, the distance from the source, and the wind speed and direction.

ACID RAIN
Acid rain is rain that has been acidified by falling through airborne volcanic gases and particles. Close to a volcanic vent, rain could have acidity similar to freshly squeezed lemon juice (pH 2). Acid rain can irritate your skin and eyes, damage plants and accelerate the rusting of metal surfaces.

Lava + seawater = LAZE
If lava flows into seawater, it reacts vigorously to generate acidic steam plumes ('laze') laden with HCl gas and volcanic glass particles. These plumes may be a health hazard.

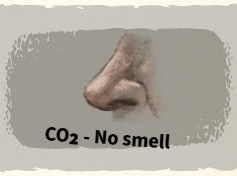
WHAT'S MAKING MY EYES STING?
The main health hazard from a new AVF eruption is likely to be SO_2 gas. When this gas contacts the moist surfaces of your eyes, nose and throat it forms sulfuric acid (H_2SO_4), which acts as a severe irritant. Asthmatics are particularly sensitive to SO_2. As SO2 travels away from the volcano, it reacts in the atmosphere to form tiny acidic particles and droplets. This forms a visible haze in downwind areas, known as 'vog'. Health effects of vog are generally similar to SO_2

Symptoms of SO_2 exposure include:
- eye, nose, throat and/or skin irritation
- a cough
- chest tightness
- shortness of breath
- a headache
- feeling tired, nauseous or dizzy
- worsening of asthma symptoms (wheezing)

COMBUSTION BY LAVA
Lava flows through urban areas can engulf and set fire to combustible materials such as wooden-framed buildings, roading materials and vegetation. This generates a complex, hazardous mixture of smoke, gases such as carbon monoxide and other combustion products.

HEAVY GASES
The volcanic gases CO_2 and H_2S are heavier than air, and can build up in windless, confined or low-lying areas such as basements, poorly ventilated buildings or excavation holes. These gases displace oxygen. If they accumulate to high enough concentrations, they can cause asphyxiation.

VOLCANIC GASES ARE ALL COLOURLESS (INVISIBLE) BUT HAVE DIFFERENT SMELLS...



WHAT SCIENTISTS WILL BE DOING...

Before a new eruption starts, scientists will be trying to predict when and where a new vent will appear and where a gas plume might go, using forecasting models.

Airborne particles and SO_2 gas will be monitored to assess the hazard to the public.

Scientists will also be monitoring CO_2 and H_2S in confined spaces to assess the build-up of these gases.

WHAT YOU CAN DO...

In the event of a volcanic eruption in Auckland, emergency management officials will be providing advice for your community through the media and online. Only listen to official sources of information, follow this advice carefully and be prepared to evacuate if requested.

If your neighbourhood has not been evacuated but you are affected by volcanic emissions:

-Bring pets inside and stay indoors, keeping doors and windows tightly closed.

-Minimise sources of indoor air pollution like candles and smoking. Don't use air conditioners that pull air from outside.

-If you or any household members have a respiratory or heart condition, keep relief medication handy and use as prescribed.

-Call your GP or Healthline (0800 611 116) if you are concerned about your health. If it is an emergency dial 111.