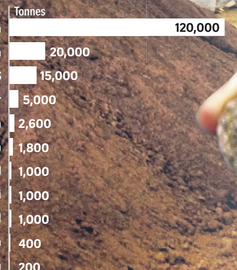
RARE EARTHS

Essential but hazardous

Rare earths are key materials in the manufacture of products ranging from mobile phones to military equipment. But the mining and refining processes are complex and damaging to the environment and health of workers and people living close by.

RARE EARTH MINING WORLDWIDE IN 2018



A bastnaesite mineral containing rare earth.

SIDE EFFECTS OF RARE EARTH MINING

- Rare earth elements coexist with radioactive elements such as uranium and thorium. Rare earth mining and milling produce long-lived radioactive waste.
- Water and airborne pollution from rare earth mining pose a threat to surrounding populations.
- Transportation of rare earths for processing poses risks of radioactive or heavy metal contamination in the event of accidents.
- Accumulated residue in open landfills poses risk of contamination in case of natural disasters such as floods.
- Radiation exposure can increase risk of cancer and cardiovascular disease.

TOXIC ELEMENTS FOUND IN RARE EARTH WASTE AND THEIR HEALTH IMPACT

Arsenic

- Long-term exposure to tainted drinking water and food can cause cancer and skin lesions.
- Arsenic is linked to cardiovascular disease and diabetes.
- In-utero and early childhood exposure to arsenic can impact cognitive development and lead to increased deaths in young adults.

Cadmium

- Cadmium is highly toxic. Exposure to it can cause cancer and damage the body's cardiovascular, renal, gastrointestinal, neurological, reproductive and respiratory systems.

Cerium

- Cerium compounds are highly toxic although initial evidence suggests the danger is limited.
- Cerium presents a fire and explosion hazard.

Chromium

- Chromium VI is a key concern in occupational safety and health because of its toxicity and designation as a human carcinogen.

Lead

- Lead is a cumulative toxicant that affects multiple body systems and harms young children.
- Lead in bone is released into the blood during pregnancy and puts developing foetuses at risk.
- There is no known level of lead exposure that is considered safe.

Manganese

- Long-term or repeated exposure to manganese may affect the lungs and central nervous system, resulting in increased susceptibility to bronchitis, pneumonitis, and neurologic and neuropsychiatric disorders.
- Animal tests show it may affect human reproduction or development.
- Men exposed to high levels of manganese in workplace air have been observed to suffer from loss of libido and sperm damage.

Nickel

- Breathing in nickel-tainted dust can cause chronic bronchitis, reduced lung function, and cancer of the lung and nasal sinus.

Thorium

- Protracted exposure to low doses of ionising radiation increases risk of death from all solid cancers.
- Breathing thorium dust may cause lung disease and pancreatic cancers.
- Thorium is radioactive and may be stored in the bone for a long time, possibly causing bone cancer.
- Thorium can decay into hazardous radioactive products, such as radium and thoron.

Uranium

- Uranium and uranium compounds are toxic and sources of ionising radiation.
- Radiation hazard occurs when uranium compounds are ingested or inhaled.
- Workers exposed to low levels of radiation from uranium decay products can develop cancer.

Source: US Geological Survey, Public Health Association of Australia, Malaysia's Ministry of Science, Technology and Innovation, The National Academies, Save Malaysia Stop Lynas, 2014 UKM Findings PHOTOS: REUTERS STRAITS TIMES GRAPHICS