

Fact sheet

Radiation



RZ Resources is dedicated to ensuring the Copi Project delivers long-term value to our communities in Wentworth, Broken Hill, and beyond for decades to come.

Our top priorities are the health and safety of our team, local landholders, and the broader community. Some of the responses to our EIS have raised questions about radiation levels associated with the extraction of monazite products. The information below provides an overview of radiation, the naturally occurring radiation onsite, and how we will carefully and responsibly manage this material.

Monazite will account for only 0.8% of 3% of the heavy mineral concentrate (HMC) mined at Copi, with the remaining 99.2% comprising zircon, rutile, leucoxene, ilmenite, and xenotime.

What is radiation?

Radiation occurs when a source emits energy and travels through a medium, such as air, until it is absorbed by matter. There are two basic types of radiation:

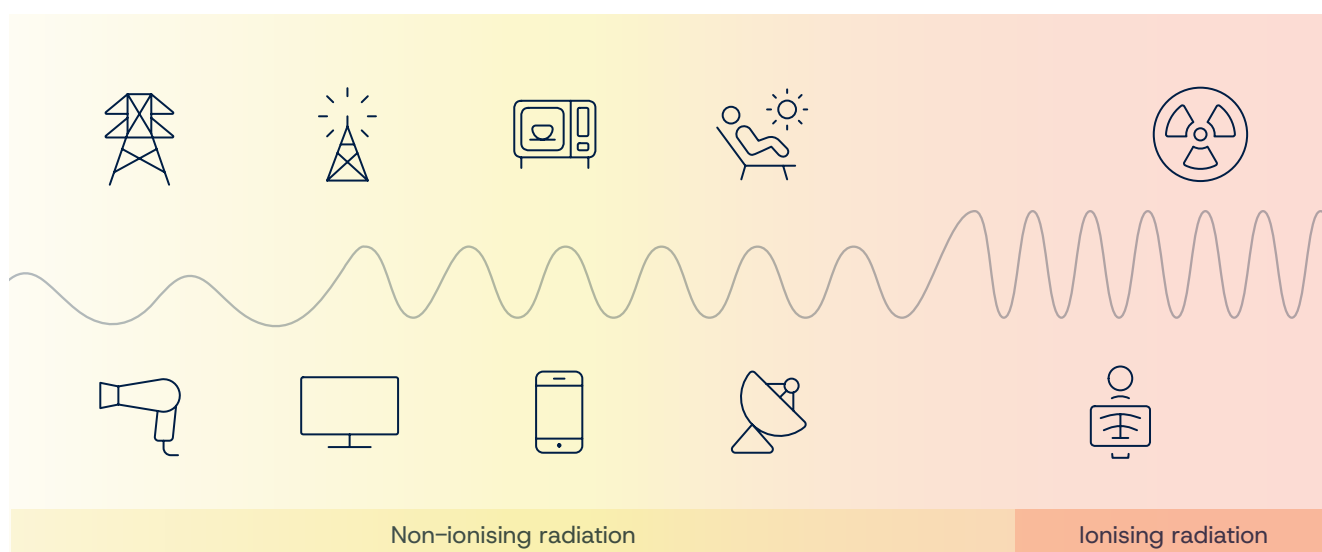
Non-ionising radiation

Ionising radiation

Non-ionising vs ionising radiation

People use and are exposed to non-ionising radiation sources every day. This form of radiation does not carry enough energy to ionise atoms or molecules.

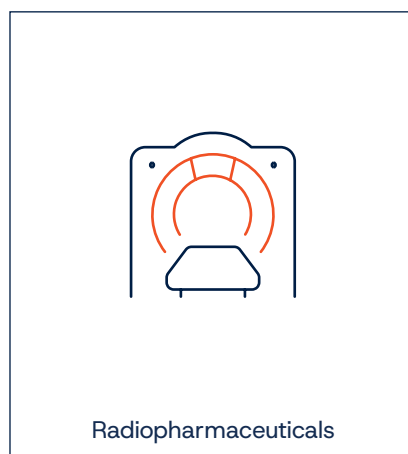
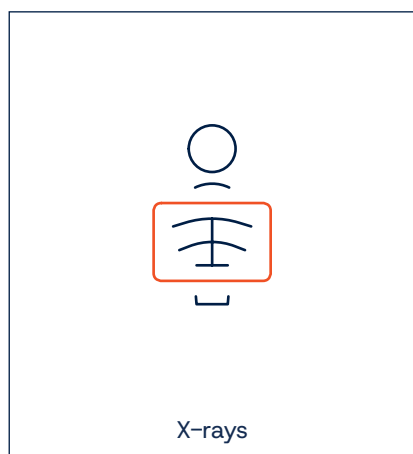
Some types of radiation have enough energy to ionise atoms; this form of radiation is called ionising radiation.



Sources of radiation

In our everyday lives, we are exposed to small amounts of ionising radiation from the environment as we carry out our normal daily activities, which is known as background radiation. We are also exposed through some medical treatments, such as x-rays, as well as on airplanes.

Other sources of ionised radiation include smoke detectors, building materials, and radiopharmaceuticals used to treat diseases like cancer.



Natural background radiation

Radiation has always been present and is all around us. Life has evolved in a world with significant levels of ionising natural background radiation, and humans have adapted to it.



Naturally occurring radiation material at Copi Mine

Natural materials such as clay, soils, rocks, water and many ores contain low-level naturally occurring radioactive material (NORM), within the grains of the minerals.

Monazite products account for less than 0.01% of the total mineral product to be mined at Copi and it is safely mined and managed at other sites around the country.

Why Monazite?

Monazite is a phosphate mineral that contains rare earth elements.

These elements play a crucial role in various applications, particularly in high-performance magnets used in electric vehicles, wind turbines, and other renewable energy technologies. These elements are the backbone of the renewable energy sector.



Mining

A wet dredge mining process will be employed for monazite extraction, mitigating the risk of dust dispersion. This method uses onsite water throughout the operation, suppressing dust formation and preventing the creation of airborne particles. Naturally occurring radioactive materials (NORM) remain at low concentrations comparable to background radiation levels during initial mining. Furthermore, monazite separation occurs at a dedicated facility after transfer from the dredge pond, further suppressing dust.

Processing

During the final processing stages, where the monazite will be concentrated and refined, radiation levels will increase above naturally occurring levels locally at the stockpile. However, this process will be confined to the indoor processing plant, which will be entirely sealed and will follow stringent, internationally accepted radiation management standards and designs that will be adopted to minimise the potential risk to human health and the environment. The management includes restricted access areas to limit exposure, production of monazite product directly into sealed 205L steel drums and complete dust control.

Transportation

Monazite products will be transported from Copi Mine to port in sealed specialised sealed drums, placed within sealed shipping containers, and only opened at the destination.

Rehabilitation

After mining, land will be rehabilitated quickly so it can return to its previous use, like grazing. Sand tails (leftover sand) will be returned to the mine and are not classified as radioactive. Monitoring will continue to ensure radiation levels are at their natural background levels.

Limits of radiation exposure

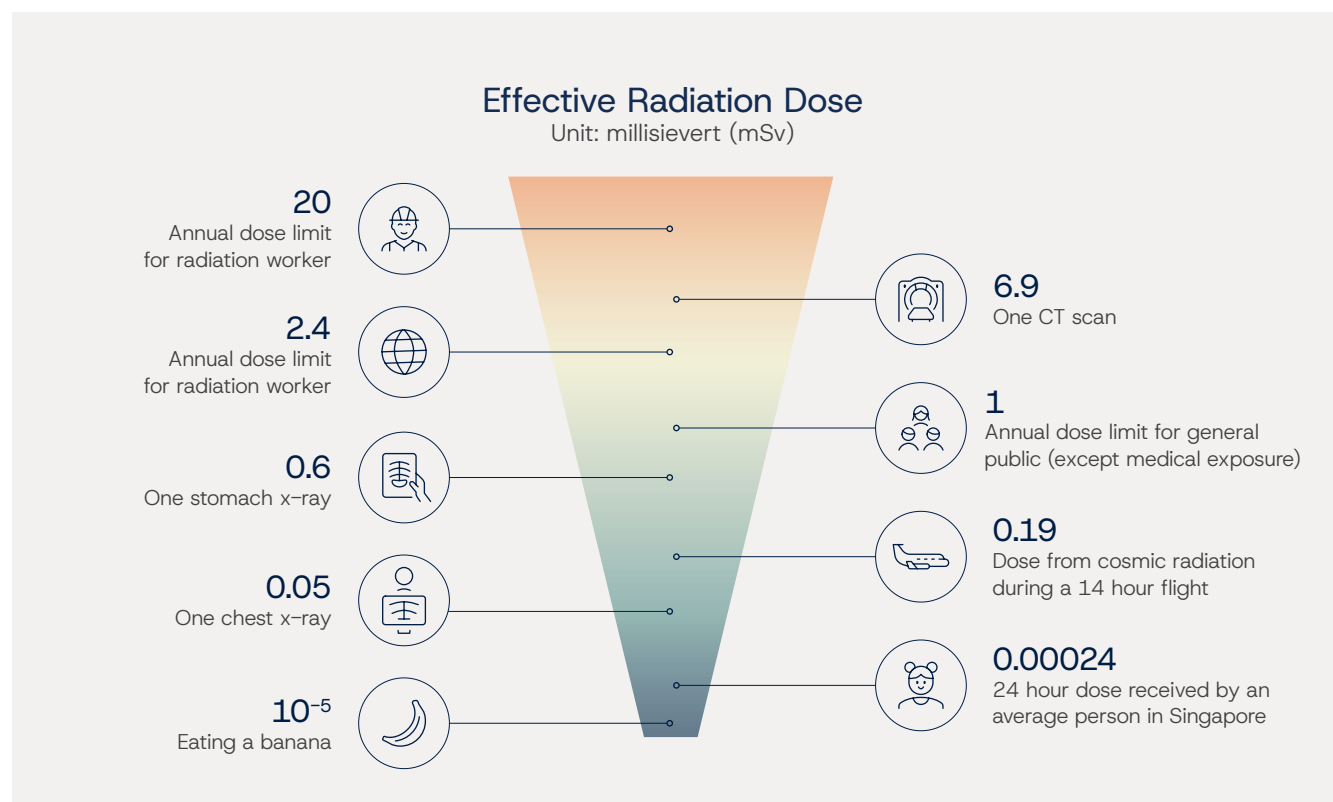
The average background radiation dose in Australia ranges from 1.5 – 1.7 mSv (millisieverts) per year from natural sources. Occupational doses in the mining and processing of mineral sands in Australia are low. The national body on radiation (ARPANSA) reports that the average exposures for workers in process plants in the Australian mineral sands industry range from 1.3 – 3.1 mSv per year, excluding background contributions.

Exposures are well below the 20 mSv per year limit for radiation workers. (Source: ARPANSA Occupational Exposure Mineral Sands).

Dose limits to the public is set at 1.0 mSv excluding background contributions. In comparison those that do receive an occupational exposure, including some doctors, nurses, radiologists and radiographers, most receive up to or around the public limit of 1 mSv per year.

0.3 mSv per year	1.5 mSv per year	1.3–3.1 mSv per year	4.0 mSv per year
Background radiation at sea level.	Average radiation dose for Australians.	Average radiation dose for dry process mineral sands worker.	Average radiation dose for crew of international airline.
7.8 mSv per year	20.0 mSv per year	100.0 mSv per year	
Average radiation dose for people in Cornwall, UK.	Max radiation dose for radiation workers in Australia.	Lowest radiation dose linked to increase risk of cancer.	

Source: Australia's Nuclear Science and Technology Organisation (ANSTO)



Radiation management plan

The Copi Radiation Management Plan (RMP) will follow the rules and standards set by the Australian Radiation Protection and Nuclear Safety Agency (ARPANSA).

Regulation

Each Australian state and territory is responsible for enforcing its respective radiation safety act and regulations.

In New South Wales, this is the Environment Protection Authority, which requires operators of mineral sands mines and processing facilities to be licensed and have an approved Radiation Management Plan (RMP) that complies with the conditions of consent. The plan includes all relevant controls for radiation protection, which must be adhered to.

The safe transport of these products is ensured by complying with relevant legislation and imposed conditions, including a safe transport code of practice.

Further information

For further information on mineral sands and radiation, we recommend you refer to the Australian Radiation Protection and Nuclear Safety Agency (ARPANSA) and Australia's Nuclear Science and Technology Organisation sites (ANSTO).

arpansa.gov.au

ansto.gov.au

Additionally, the Minerals Council of Australia has produced a document on the mineral sands industry in Australia which provides insight into mining operations and radiation management around the country.

Stay informed

For more information about the RZ Resources Copi Mine Project and to read the full Environmental Impact Statement, please visit: www.rzresources.com

Or contact us directly at: community@rzresources.com or via: 1300 618 371



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