

# Facts on Uranium Ore Concentrate

## What is Uranium?

Uranium is a metal like gold or lead. It is unique because its physical properties can generate incredible amounts of energy. It is a common element found in most of the Earth's rock, soils, rivers and oceans. Uranium is more abundant than gold and silver and less abundant than lead. The soil of a typical Canadian backyard likely contains about half a pound of uranium. Trace amounts of it can be found in food and in your own body.

## What is uranium ore concentrate?

Uranium ore concentrate, commonly referred to as U<sub>3</sub>O<sub>8</sub> (uranium oxide) or yellowcake, is the product created when uranium ore has been mined and milled (chemically processed). The fine powder is packaged in steel drums and shipped to refineries for further processing to prepare it for use as fuel in nuclear reactors.

## Is uranium concentrate radioactive?

Radiation from uranium ore concentrate is quite low. Although uranium is a source of ionizing radiation – electrically-charged particles called ions that generate a lot of energy - the radiation risk associated with uranium concentrate is easily managed by simple steps such as limiting the time of direct exposure to the material. Workers who work with uranium concentrate typically use gloves and a respirator for protection.

Radiation is energy that travels through space. When radiation contacts matter, it gives off some or all of its energy. People going about their everyday life receive natural background radiation.

<b>Radiation Dose (millisievert - mSv)</b>	<b>Instance</b>
0.0005 mSv	Dose per hour measured in the cab of a truck or 2m from the vehicle
0.01 mSv	Average annual dose due to air travel
0.01 mSv	Dose from dental X-ray
0.1 - 0.12 mSv	Dose from lung X-ray
1 mSv	Annual public radiation dose limit (Canada)
1.8 mSv	Average annual Canadian background dose
50 mSv	Annual Radiation dose limit for nuclear energy workers (Canada)
30 - 100 mSv	Dose for full body CAT Scan (computer axial tomography)

## Is uranium ore concentrate dangerous?

Uranium ore concentrate is a stable form of uranium. It has a very low solubility and remains stable over a wide range of conditions. Uranium ore concentrate must be handled carefully like any other industrial chemical. Like other heavy metals, uranium is toxic and should not be inhaled or ingested.

## How is uranium ore concentrate handled?

Uranium ore concentrate is generally handled the same as other heavy metals such as lead. Gloves and respirators are worn when handling the material to avoid direct contact, inhalation and ingestion.

## How do you clean up uranium ore concentrate?

Cleaning up uranium ore concentrate is similar to other industrial chemicals. The radiation and chemical risks are reduced by limiting the time of direct exposure and avoiding direct contact, inhalation and ingestion.

## What are the steps before uranium ore concentrate can be used in a nuclear reactor?

The concentrate needs to be refined further and converted to a pure, uranium dioxide powder. For most reactors, the uranium also needs to go through an enrichment stage. This is done using concentrate that has been converted to a gaseous form of uranium hexafluoride (UF<sub>6</sub>) for the enrichment process. Following enrichment, uranium is converted back to a solid uranium dioxide powder that is pressed into small pellets and put into fuel bundles which are ultimately placed inside reactors. The energy harnessed in a fuel bundle is released and used to generate electricity.