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## Tritium Fact Sheet

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- Tritium (hydrogen 3 or H-3) is an isotope of hydrogen that is radioactive, and like all hydrogen it reacts with oxygen to form water. Tritium is produced naturally in the upper atmosphere when cosmic rays strike atmospheric gases. Tritium is also produced in commercial nuclear reactors.
- Cosmic rays produce 4,000,000 curies of tritium each year; the total amount of tritium in the environment is about 70,000,000 curies.
- A picocurie (pCi) is one millionth of a millionth of a curie. The U.S. EPA's drinking water limit for tritium is 20,000 pCi per liter (pCi/L).
- The US NRC's limit for release without restrictions on use is 1,000,000 pCi/L.
- The concentration of tritium reported in a cable vault is 102,000 pCi/L. This concentration, is about 10% of the NRC limit for release without restrictions on use. We can calculate the radiation dose that results from ingesting any radioactive material from the materials physical and chemical properties. The dose from drinking an 8 ounce glass of this water would be 0.0017 mrem.
- Naturally occurring radioactive radionuclides, such as potassium-40 (K-40) in foods also results in dose, usually much higher than would result from drinking a glass of water from the cable vault. The dose from the naturally occurring K-40 in a one pound tomato is 0.015 mrem, more than eight times the dose 0.0017 mrem dose from drinking a glass of water with the tritium concentration reported in the vault.
- The concentration of tritium reported in water from monitoring well MW-15K-1A is 4,500,000 pCi/L. This concentration is about 4.5 times the NRC limit for release to unrestricted areas. The dose from drinking an 8 ounce glass of this water would be 0.072 mrem, about the same dose as from 5 pounds of tomatoes.
- The US EPA estimates that the average background radiation dose from all sources is **637 mrem** per year.

### Sources of natural and man-made background radiation and the resulting average yearly dose

	Natural		Man-made
	Radon: 200 mrem		X-rays: 320mrem
	Cosmic rays: 27 mrem		Nuclear medicine: 13 mrem
	Terrestrial: 30 mrem		Consumer products: 10 mrem
	Diet: 35 mrem		Research: 2 mrem
Totals	<b>292 mrem/year</b>		<b>345 mrem/year</b>

### Average yearly dose from the intake of naturally occurring radionuclides in diet

Carbon 14 (C-14): **Between 2 and 5 mrem** depending on caloric intake  
 Potassium 40 (K-40): **Between 10 and 25 mrem** depending upon potassium in diet

The annual dose from K-40 in various foods is:

- One banana per day: 2.6 mrem
- One 8-ounce glass of orange juice per day: 2.5 mrem
- One medium baked potato per day: 4.3 mrem
- One cup raisin bran cereal per day: 1.8 mrem
- One double hamburger per day: 2.9 mrem
- One large order of French fries per day: 4.7 mrem
- One cup cantaloupe per week: 0.4 mrem
- One cup spinach per week: 0.6 mrem
- One six-ounce halibut fillet per week: 0.7 mrem