

RE: 書面による意見提出  
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We (the undersigned) thank METI for the opportunity to comment on the proposal to dump radioactive water from the Fukushima nuclear meltdowns into the Pacific Ocean.

We strongly oppose dumping the contaminated water from the ruined Fukushima reactors into the Pacific Ocean or into waters that flow into the ocean. Contrary to some statements, releasing the contaminated water would not help overcome “reputational damage” that Japan has suffered from the ongoing nuclear catastrophe, but would instead make matters worse.

The one million tons of tank waters remain contaminated with a number of radionuclides, and more than 70% of the tanks exceed regulatory standards. As approximately 170 tons of contaminated waters are created each day, yet more will have to eventually be dumped into the ocean with no predictable end in sight.

Present in the water currently is about 860 trillion Bq of tritium, which is of special concern because so many in the industry *mistakenly* think it is safe. For a long time, research has shown it is not. There have been increases in childhood leukemia around facilities that regularly release tritium into the surrounding environment. Further, promises to test for tritium will do little to allay consumer concerns since tritium is basically undetectable in foodstuffs.

“...as an isotope of hydrogen (the cell’s most ubiquitous element), tritium can be incorporated into essentially all portions of the living machinery...” -- R. Lowry Dobson MD, PhD: The toxicity of tritium 1979

Tritium exists naturally at no more than 1 Bq per liter in surface and groundwaters. Tritium is naturally occurring as are many poisons. Just because a poison is natural doesn’t mean it is acceptable to create more of it and then discharge it into the environment. Tritium possesses a number of properties that make it unusually hazardous. It can be difficult to detect with common instruments and nearly impossible to detect inside food without destructive testing. It has a number of pathways to humans – including as radioactive water – because it replaces the stable hydrogen in the water molecule, becoming more radiotoxic than tritium alone. Its hazardous life is about 120 years. In practical terms, biota will have the same concentration of tritium in their bodies as the tritium concentration in the atmosphere where they live since it is inhaled, ingested, and absorbed through the skin. This tritiated water becomes organically bound inside an organism, becoming yet more radiotoxic. In this form, it can reside in the body for years where it has a relatively high ability to cause damage.

Most studies indicate that tritium can produce typical radiogenic impacts including cancer, genetic effects, developmental abnormalities and reproductive effects, mutations, tumors and cell death. Tritiated water caused irreversible loss of female germ cells in both mice and monkeys even at low concentrations. Tritium from tritiated water can become incorporated into

DNA, the molecular basis of heredity and life for organisms. DNA is especially sensitive to radiation, and tritium produces complex DNA double strand breaks that are difficult to repair. Tritium can cross the placental barrier and stay in fetal oocytes, meaning that if a pregnant woman's female fetus is exposed to tritium, the fetus's offspring will have been exposed to the tritium's radiation and risk. Additionally, radioactive isotopes incorporated within a woman's body pose an in-utero risk 4-5 times greater than an external exposure would pose to her developing fetus; and tritium concentrates in fetal tissue at twice the amount it does in maternal tissue.

Proponents of dumping the contaminated water have [cited](#) the reprocessing facility La Hague in France as an example of safely dumping tritium into surrounding waters. To the contrary, research [shows](#) "...some convincing evidence... of a causal role for environmental radiation exposure" in childhood leukemia among those that used local beaches, and ate seafood caught near La Hague. Childhood [leukemias](#) and congenital malformations are also higher around other normally operating nuclear facilities that regularly release tritium. Some of this tritium [shows up](#) in drinking water.

Tritiated water vapor emissions would result in higher environmental concentrations than water discharges and therefore result in the highest collective doses, and most danger, possible. Proposing this as a "dumping" method could be a cynical attempt to force those who oppose ocean dumping to allow it anyway, as the least worst of two bad (and unnecessary) options. Chairman Nozaki of the Fukushima Prefecture Federation of Fisheries Associations, has expressed opposition to the dumping of contaminated water into the Pacific, as have local fishermen.

Instead of dumping the water into the ocean, experts recommend considering a variety of on-land storage options for the contaminated water (which is continuing to accumulate) such as solidification and storage in large tanks until the tritium has decayed – 120 years or so. This, in combination with filtering to continue to remove the additional radionuclides, is much better than releasing the contamination into the environment. Releasing more contamination to the environment would not only risk the reputation of Japan and international perceptions of its ability to address the ongoing nuclear catastrophe, but it would also risk the health of people who live locally and those who consume the seafood caught there.

Thank you for consideration of these comments.

References: <https://www.ianfairlie.org/news/should-tepco-japanese-government-dump-tritium-contaminated-water-from-fukushima-into-the-sea/>

<https://www.ianfairlie.org/news/the-hazards-of-tritium/>

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[http://static1.1.sqspcdn.com/static/f/356082/26211376/1431107993237/LeakFirst\\_ReportLater\\_BeyondNuclear\\_March2015.pdf?token=PP0iAGJAhy8wm19eyG5sd%2FLibyQ%3D](http://static1.1.sqspcdn.com/static/f/356082/26211376/1431107993237/LeakFirst_ReportLater_BeyondNuclear_March2015.pdf?token=PP0iAGJAhy8wm19eyG5sd%2FLibyQ%3D)

Sincerely,

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