

EXPLAINER: What to do with closed nuke plant's wastewater?

April 9 2022, by Jennifer McDermott



A portion of the Pilgrim Nuclear Power Station is visible beyond houses along the coast of Cape Cod Bay, in Plymouth, Mass., March 30, 2011. Pilgrim, which closed in 2019, was a boiling water reactor. Water constantly circulated through the reactor vessel and nuclear fuel, converting it to steam to spin the turbine. The water was cooled and recirculated, picking up radioactive contamination. Credit: AP Photo/Steven Senne, File

One million gallons of radioactive water is inside a former nuclear power plant along Cape Cod Bay and it has got to go.

But where, is the vexing question, and will the state intervene as the company dismantling the plant decides?

Holtec International is considering treating the [water](#) and discharging it into the bay, drawing fierce resistance from [local residents](#), shell fishermen and politicians. Holtec is also considering evaporating the [contaminated water](#) or trucking it to a facility in another state.

The fight in Massachusetts mirrors a current, heated debate in Japan over a plan to release more than 1 million tons of treated radioactive wastewater into the ocean from the wrecked Fukushima [nuclear plant](#) in spring 2023. A massive tsunami in 2011 crashed into the plant. Three reactors melted down.

Pilgrim Nuclear Power Station in Plymouth, Massachusetts, closed in 2019 after nearly half a century providing electricity to the region. U.S. Rep. William Keating, a Democrat whose district includes the Cape, wrote to Holtec with other top Massachusetts lawmakers in January to oppose releasing water into Cape Cod Bay. He asked the U.S. Nuclear Regulatory Commission to examine its regulations.

Keating said in late March that Holtec's handling of the radioactive water could set a precedent because the U.S. decommissioning industry is in its infancy. Most U.S. nuclear plants were built between 1970 and 1990.

"If they're listening, sensitive and work with these communities, it's important," he said. "That's the message for future decommissioning sites."

Holtec has acquired closed nuclear plants across the country as part of its dismantling business, including the former Oyster Creek Generating Station in New Jersey and Indian Point Energy Center in New York. It's taking ownership of the Palisades Nuclear Plant on Lake Michigan, which is closing this year.

Pilgrim was a boiling water reactor. Water constantly circulated through the reactor vessel and nuclear fuel, converting it to steam to spin the turbine. The water was cooled and recirculated, picking up radioactive contamination.

Cape Cod is a tourist hotspot. Having radioactive water in the bay, even low levels, isn't great for marketing, said Democratic state Rep. Josh Cutler, who represents a district there. Cutler is working to pass legislation to prohibit discharging radioactive material into coastal or [inland waters](#).

Holtec said Pilgrim already discharged water into the bay for 50 years while the plant was operating and [environmental studies](#), conducted by the plant operators and now Holtec, have shown little or no [environmental impact](#). Radiological environmental reports are shared with the NRC annually.

"We are working to provide scientific data, educate the public on the reality of radiation in [everyday life](#), and working to have experts explain the true science versus the emotional fear of the unknown," spokesperson Patrick O'Brien wrote in an email in March.



Warning signs are posted near a gate to the Pilgrim Nuclear Power Station, in Plymouth, Mass., Tuesday, May 28, 2019. Pilgrim, which closed in 2019, was a boiling water reactor. Water constantly circulated through the reactor vessel and nuclear fuel, converting it to steam to spin the turbine. The water was cooled and recirculated, picking up radioactive contamination. Credit: AP Photo/Steven Senne, File

WHAT ARE HOLTEC'S OPTIONS?

Holtec could treat the water and discharge it in batches over multiple years, likely the least expensive option. Or, it could evaporate the water on site, as it says it has done with about 680,000 gallons (2,600 kiloliters) over the past two years.

Evaporating the water would be more challenging to do now because the spent [nuclear fuel](#) is in storage, and couldn't be used as a heat source. Holtec would have to use a different—likely more expensive—method that would release gas.

Or, Holtec could truck the water to an out-of-state facility, where it could be mixed with clay and buried or placed in an evaporation pond, or released into local waterways. That's what Keating wants.

Vermont Yankee Nuclear Power Station, another boiling water reactor, was shut down in Vernon, Vermont, in 2014. It's sending wastewater to disposal specialists in Texas and other states. Entergy operated and sold both Vermont Yankee and Pilgrim. NorthStar, a separate and competing corporation in the decommissioning business, is dismantling Vermont Yankee.

Nuclear plants occasionally need to dispose of water with low levels of radioactivity when they're operating, so a process to release it in batches into local waterways was developed early in the nuclear industry.

In recent years at Pilgrim, the two largest releases were in 2011, with 29 releases totaling about 325,000 gallons (1,500 kiloliters), and 2013, with 21 releases totaling about 310,000 gallons.

The water from those releases was well below the federal limits for the amount of radionuclides in millirems a person would be exposed to in a year if they ate local seafood or swam in nearby waters, according to the NRC.

NRC spokesperson for the Northeast Neil Sheehan said the limits are set very conservatively and are believed to be protective of the public and environment. He said it's important to consider the role of dilution—once the discharges mix with vast quantities of water any

radioactivity is typically not detectable.

WHY ARE PEOPLE WORRIED?

In Duxbury, Kingston and Plymouth Bays, there are 50 oyster farms—the largest concentration in the state, worth \$5.1 million last year, according to the Massachusetts Seafood Collaborative. The collaborative said dumping the water would devastate the industry, and the local economy along with it.

Diane Turco, a Harwich resident and longtime Pilgrim watchdog, questions if the water is heavily contaminated, especially from the pool that covered the stored, spent fuel for cooling and shielded workers from radiation.



A no trespassing sign is posted near the entrance to the Pilgrim Nuclear Power Station, at rear, Thursday, Feb. 28, 2019, in Plymouth, Mass. One million gallons of radioactive water is contained inside the former nuclear power plant along Cape Cod Bay. The plant's owner, Holtec International, is considering treating the water and discharging it into the bay. Local residents, shell fishermen and politicians disapprove of the plan. Credit: AP Photo/Steven Senne, File

"Isn't this a crazy idea for Holtec to use our bay as their dump? No way," she said.

Others didn't know Pilgrim's water went into the bay in previous years and they don't want it to happen again.

"We can't change that, but we can change what's happening in the future," said Cutler, the state lawmaker. "It's the first time it has ever been decommissioned, so to compare this to the past is a convenient excuse. 'Well, we did it in the past,' that sounds like my kid."

Towns on the Cape are trying to prohibit the dispersal of radioactive materials in their waters. Tribal leaders, fishermen, lobstermen and real estate agents have publicly stated their opposition as well.

Sheehan, the NRC spokesperson, said the water is not different or distinct, compared to water released during the plant's operations. Holtec would have to handle it the same way, by filtering it, putting it into a tank, analyzing the radio isotopes and calculating the environmental impacts if it was released in batches, he added.

WHO GETS THE FINAL SAY?

Holtec wouldn't need a separate approval from the NRC to discharge the water into the bay. However, Holtec would need permission from the U.S. Environmental Protection Agency if the water contained pollutants regulated by the Clean Water Act, such as dissolved metals.

If the water contained only radioactive materials regulated by the NRC, Holtec wouldn't need to ask the EPA for a permit modification, according to the EPA's water division for New England. Holtec has never given the EPA a pollutant characterization of the water associated with decommissioning, the division's director said.

Mary Lampert, of Duxbury, is on a panel created by the state to look at issues related to the Pilgrim's decommissioning. She believes the state could use its existing laws and regulations to stop the dumping and plans to press the Massachusetts attorney general to file a preliminary injunction to do so.

The attorney general's office said it's monitoring the issue and would take any Clean Water Act violations seriously.

Holtec said this week it's examining the water for possible pollutants but the lab results won't be available for awhile.

The company expects to decide what to do with the water later this year. Discharge, evaporation and some limited transportation will likely all be part of the solution, Holtec added.

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