

OF NUCLEAR INTEREST: Clean water law and the Pilgrim Station Nuclear Power Plant

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Why was the Pilgrim Nuclear Power Station in Plymouth built on the shores of Cape Cod Bay? One word: water.

Whether a power plant burns coal or splits atoms like Pilgrim, these plants need a lot of water to make steam to run the turbines that make electricity. Pilgrim, after all, is known as a “boiling water reactor.”

In addition to a source of water, power plants also need a place to dump the heated and polluted water after it is used. For Pilgrim, the water source and the dumping ground is Cape Cod Bay.

When Pilgrim sought permission from the state in the 1970s to use Cape Cod Bay as a water source, Massachusetts mandated a “closed-cycle” system in order to avoid environmental harm that a “once-through” cooling water system would cause to the Bay. “Closed-cycle” cooling reuses cooling water by recycling it through the plant rather than using it once and discharging it back into the Bay. In this way, it acts very much like a car’s radiator system. A “closed-cycle” system can reduce power plant water withdrawals by as much as 95 to 98 percent, thereby curtailing water pollution and harm to the environment.

In the 1970s, Pilgrim’s owners successfully challenged the state’s “closed-cycle” mandate, instead installing the cheaper, “once-through” system that it has been using ever since. As recently as 2012, Pilgrim’s owner, Louisiana-based Entergy Corporation, challenged the state’s water laws claiming it could not regulate Pilgrim’s use of Cape Cod Bay. Entergy lost: Massachusetts’ highest court explicitly recognized and acknowledged the “staggering” environmental impact caused by once-through cooling water systems like the one Entergy uses at Pilgrim, and upheld the state’s ability to regulate to protect Massachusetts waters.

Entergy's once-through cooling water system at Pilgrim harms Cape Cod Bay in two ways. First, Pilgrim takes in over one half a billion gallons of seawater a day and with it comes many forms of sea life. The intake harms and often kills fish, plankton, fish eggs, larvae and other sea life by "impingement" and "entrainment." (Trapping the marine life on intake screens or sucking them through the plant's pipes.) Second, heated and polluted water is discharged at high velocity, scouring the sea floor and creating a thermal plume, sometimes covering an area up to four square miles. Many Plymouthians remember the thriving Irish moss industry on White Horse Beach that existed before Pilgrim began discharging heated, polluted water into the Bay. Recent sightings of an endangered North Atlantic Right Whale and her calf just off of Pilgrim's discharge canal have raised even more concerns about the impact of Entergy's thermal and pollution discharges.

The U.S. Environmental Protection Agency (EPA) and the Massachusetts Department of Environmental Protection (DEP) are responsible for enforcing the Clean Water Act to make sure Entergy's water use and pollution is minimized and controlled. Unfortunately, these agencies have let Entergy's Clean Water Act permit expire – the permit was last renewed in 1991, and Entergy has been operating under a special extension since 1996—almost 17 years. This permit allows the destructive "once-through" cooling water system, despite official reports showing the destruction of marine life over the past 40 years of operation.

Even before Pilgrim opened, "closed-cycle" cooling at power plants was considered to be the best available cooling water technology when it comes to environmental protection. Local groups have called upon the EPA and DEP to immediately review Entergy's Clean Water Act permit and explain why today Entergy is not required to use this better technology.

EPA and DEP recently informed local groups that they are making Entergy's Clean Water Act permit review a priority. The agency's first step will be a draft permit that EPA says will be made public in December 2013. The Clean Water Act requires the opportunity for public comment and a public hearing. The permit will then be issued in final form.

The Clean Water Act requires Entergy to use the best technology available for minimizing adverse environmental impacts. EPA and the state must impose limits on thermal discharge that protect the indigenous populations of fish, shellfish and wildlife in Cape Cod Bay. The states of New York, New Jersey, and Vermont are requiring nuclear reactors like Pilgrim to upgrade their cooling water systems to "closed-cycle" technology.

State law designates Cape Cod Bay as an “excellent habitat for fish, other aquatic life, including for their reproduction, migration, growth and other critical functions.” Entergy’s water use is not supposed to impair the Bay’s use as such an “excellent habitat.” In renewing Entergy’s Clean Water Act permit, state and federal agencies must take this in to account. When they do, it will be a chance to turn the clock back to the 1970s and try to undo some of the harm to the Bay by requiring, once again, closed-cycle cooling.

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