

PILGRIM WATCH

What Citizens Need to Know

To: Attorney General Andrea Campbell
From: Mary E. Lampert, James B. Lampert
Date: August 7, 2024
RE: Request to Enforce State Environmental Laws

We respectfully request that you consider taking immediate steps to stop Holtec-Pilgrim, the owner of Pilgrim Nuclear Power Station (PNPS), and Holtec Decommissioning International (HDI) that is responsible for PNPS' decommissioning, from evaporating almost a million gallons of *untreated radioactively and chemically contaminated industrial wastewater into the atmosphere.*

Prevailing winds ensure that the majority of the contaminants will inevitably fall into Cape Cod Bay, threatening public health, the environment, and the region's marine-based economy.

Your office's website says the Attorney General's power and responsibilities include "Enforcing federal and state environmental laws."

Massachusetts Laws and Regulations Prohibit Holtec's Evaporation

In the June 2020 Settlement Agreement between the Commonwealth, Holtec-Pilgrim and HDI, the Holtec entities agreed:

- Holtec shall comply with Chapter 21E and the MCP as applicable. Par. 10(e).
- Holtec shall comply with all applicable environmental and human-health based standards and regulations of the Commonwealth. Par. 10(l).
- Validity. No Party to this Agreement (or any person or entity affiliated or related to a Party to this Agreement) shall assert that any provision of this Agreement (or the Agreement itself) is invalid under any federal law or any provision of the U.S. Constitution. Par. 48.

At least four (4) Massachusetts laws and two (2) DEP regulations prohibit Holtec's evaporative discharge.¹

Three of the laws (the Ocean Sanctuaries Act, the Endangered Species Act, and the Crimes Against Public Health Act) flatly prohibit any discharge of Pilgrim's waste or wastewater; none of the three has any *de minimis* exception.²

The fourth law (the Oil and Hazardous Material and Release Prevention Act) presumes that any discharge of hazardous material (defined as "any material ... which, because of its ... chemical ... or radioactive characteristics... constitutes a present or potential threat to human health, safety, welfare of the environment") will constitute irreparable harm.

DEP regulations (310 CMR) issued under the Massachusetts Clean Air Act (Ch 111, Secs 142A-142N) forbid the willful emission of radioactive material that could cause a nuisance, potentially be injurious to human or animal life, or unreasonably interferes with enjoyment of life and property or the conduct of business. (310 CMR 7.00)

DEP's surface water discharge regulations (314 CMR 3.02, 3.03 and 3.04) say that a person may discharge pollutants (defined as "any element of ... industrial or commercial waste ... into ... waters of the Commonwealth") *only* if the discharge is necessary, insignificant, and is for the express purpose of maintaining or enhancing Cape Cod Bay.

The AGO negotiated the Settlement Agreement. We see no reason that the AGO should not enforce laws and regulations with which Holtec agreed to comply.

Neither is there any excuse for DEP's refusal to exercise its authority over both chemical and radioactive contamination.

¹ A discharge can be either solid, liquid, or gaseous.

Oxford Language Dictionary, "Discharge: allow (a liquid, gas or other substance) to flow out of where it has been confined."

Miriam Webster, "Discharge: "to give outlet or vent to : **emit**"; "vehicles *discharging* exhaust fumes"

The MCP is clear that a discharge may be direct or indirect. 310 CMR 4.0006

² At NDCAP meetings, Holtec has said that particulates in the wastewater will sink to the bottom of the reactor building's pools to the sludge and eventually be transported offsite to a LLRW facility. We checked with independent experts who said this was not so. Harmful radioactive particulates, along with tritium, will be evaporatively released. See Appendix A.

A.

The Ocean Sanctuaries Act

The Attorney General’s Office worked closely with DEP in connection with deciding to deny Holtec’s 2023 application for an Amended Surface Water Permit. It, DEP and the Office of Coastal Zone Management agreed that the Massachusetts Ocean Sanctuaries Act (MGL Ch 132A, Secs. 26-53) explicitly prohibits the discharge of Pilgrim’s industrial wastewater into Cape Cod Bay. See July 18, 2024 Final Determination to Deny Holtec Application for an amended Surface Water Discharge Permit:³

Section 15 of the Ocean Sanctuaries Act says: “Except as otherwise provided in this section, the following activities shall be prohibited in an ocean sanctuary, ... (4) the dumping or discharge of commercial, municipal, domestic, or industrial wastes.

The Final Determination said:

5. Section 15 of the Act prohibits the “dumping or discharge of commercial, municipal, domestic or industrial wastes” into ocean sanctuaries. M.G.L. c. 132A, § 15(4). According to the application to modify the Permit and the definition of “wastes” at 301 CMR 27.02, the water the Facility proposes to discharge is industrial waste subject to that prohibition. The water is stored in the spent fuel pool, torus, dryer separator pit, and reactor cavity, was utilized in the Facility’s industrial operations and for decommissioning activities, is contaminated, and is now proposed to be discharged into Cape Cod Bay Ocean Sanctuary.
6. Section 16 of the Act identifies certain narrow exemptions to the Act’s prohibition against discharges into ocean sanctuaries.
7. None of the exceptions in Section 16 applies to the proposed discharge.

³ We expect Holtec to appeal the Final Determination, and to argue that the Massachusetts laws and regulations with which it agreed to comply are not “applicable” because of federal preemption.

The AGO presumably considered, and clearly rejected, that potential argument when it approved the Final Determination. Holtec’s argument would be make paragraph 48 of the Settlement Agreement meaningless. It also would be contrary to any reasonable reading of paragraphs 10(e) and 10(l).

The bottom line is clear. The AGO can and should enforce the environmental laws and regulations with which Holtec agreed to comply.

Although not necessary to the Final Determination, the Massachusetts Endangered Species Act (MGL Ch 131A), the Crimes Against Public Health Act (Ch. 270), the Oil and Hazardous Material Release Prevention Act (Ch. 21E), DEP's Air Emission Regulations (310 CMR 7) and DEP's Antidegradation Regulations (314 CMR) also prohibit both liquid and evaporative discharges of Pilgrim's contaminated water.

B. The Endangered Species Act

The second paragraph of Section 2 of the Endangered Species Act says that "Except as otherwise provided in this chapter, *no person may alter significant habitat.*"

321 CMR 10.63 says that the *discharge of wastewater and toxic or hazardous substances "shall always be considered alternations:"*

Alterations of Significant Habitat. The following categories of activities shall always be considered alterations: ... (e) discharge, storage, or disposal of solid waste, rubbish, stormwater, *wastewater*, *toxic or hazardous substances*, petroleum based products, dredged materials, or fill.

The contaminated water that Holtec is evaporating is wastewater, as the Final Determination correctly determined. It is also a hazardous substance as defined in Chapter 21E.⁴

C. The Crimes Against Public Health Act

The applicable section of this Act is (Ch 270, Section 16) is very simple. It is a criminal offense to discharge any waste in or upon coastal waters.

Whoever places, throws, deposits or discharges or whoever causes to be placed, thrown, deposited or discharged, trash, bottles or cans, refuse, rubbish, garbage, debris, scrap, waste or other material of any kind on a public highway or within 20 yards of a public highway, or on any other public land, or in or upon coastal or inland waters, as defined in section 1 of chapter 131, or within 20 yards of such waters, or on property of another, or on lands dedicated for open space purposes, including lands

⁴ In the Settlement Agreement, Holtec agreed to comply with "Chapter 21E and the MCP as applicable." Par. 10(e).

subject to conservation restrictions and agricultural preservation restrictions as defined in chapter 184, shall be punished by a fine of not more than \$5,500 for the first offense and a fine not to exceed \$15,000 for each subsequent offense; provided, however, that 50 per cent of the fine imposed shall be deposited in the conservation trust established in section 1 of chapter 132A and the court may also require that the violator remove, at his own expense, the trash, refuse, rubbish, debris or materials.

Pilgrim's contaminated water is unquestionably "waste." Cape Cod Bay is a coastal water as defined by section 1 of chapter 131: "Coastal waters", all waters of the commonwealth within the rise and fall of the tide and the marine limits of the jurisdiction of the commonwealth...."

D. Oil and Hazardous Material Release Prevention Act

This Act (Ch. 21E) says that *anyone who discharges, or threatens to release, any "hazardous material into any of the "waters of the commonwealth"* is liable to both the Commonwealth and any person damaged by the release or threat. It also says that any violation is "presumed to constitute irreparable harm to the public health, safety, welfare or the environment; " and that the " superior court department of the trial court shall have jurisdiction to enjoin violations."

Pilgrim's contaminated water is plainly a "hazardous material." As defined by the Act, "Hazardous material" includes:

"any material, in whatever form, which, because of its ... *chemical ... or radioactive* characteristics ... constitutes a present or potential threat to human health, safety, welfare, or to the environment, when improperly stored, treated, transported, disposed of, used, or otherwise managed." (Italics added)

"Waters of the commonwealth" includes "all waters within the jurisdiction of the commonwealth, including, without limitation, rivers, streams, lakes, ponds, springs, impoundments, estuaries, coastal waters and groundwaters."

If discharged into Cape Cod Bay, the chemical and radioactive materials in Pilgrim's industrial wastewater would constitute "a present or potential threat to human health, safety, welfare [and] to the environment."

Jack Priest, the head of DPH Radiation Control, told NDCAP that evaporation is "a lousy idea." Holtec International's CEO, Dr. Singh, told Senator Markey that evaporating the water using

electric heaters “will environmentally damage.” In 2022, Holtec’s Director of Governmental Affairs said, “Evaporation releases higher levels of radioactive materials due to the concentration and lack of dilution when the water becomes a gas.”

In January, the Greater Boston Physicians for Social Responsibility wrote Governor Healey and you “to express our concern regarding the potential for serious endangerment to the public’s health due to the aerosol release of radionuclides at the former Pilgrim Nuclear Power station in Plymouth, MA.”

E. Air Emission Law and Regulations

The Massachusetts Clean Air Act, Ch 111, Secs. 142A – 142N, authorizes DEP to adopt regulations to prevent pollution or contamination of the atmosphere.

DEP’s regulations, 310 CMR 7.00, say:

No person owning, leasing, or controlling the operation of any air contamination source shall willfully, negligently, or through failure to provide necessary equipment or to take necessary precautions, permit any emission from said air contamination source or sources of such quantities of air contaminants which will cause, by themselves or in conjunction with other air contaminants, a condition of air pollution. 310 CMR 7.01(1)

AIR CONTAMINANT means *any substance* or man-made physical phenomenon *in the ambient air space and includes*, but is not limited to, dust, flyash, gas, fume, mist, odor, smoke, vapor, pollen, microorganism, *radioactive material*, radiation, heat, sound, any combination thereof, or any decay or reaction product thereof.

AIR POLLUTION means the presence in the ambient air space of one or more air contaminants or combinations thereof in such concentrations and of such duration as to: (a) cause a nuisance; (b) be injurious, or be on the basis of current information, potentially injurious to human or animal life, to vegetation, or to property; or (c) unreasonably interfere with the comfortable enjoyment of life and property or the conduct of business.

Holtec’s evaporated contaminated water includes radioactive material. That water has been and is being evaporated only because Holtec refuses to use a better option, e.g., shipment to a licensed off-site low level radioactive waste (LLRW) storage site.

Holtec will argue that the amount released meets NRC standards. That does not mean that will not cause a nuisance, be potentially injurious or unreasonably interfere with the life, property or conduct of business on Cape Cod Bay.

Holtec likely will also argue that shipment of the water off-site would be prohibitively expensive and dangerous. Wrong on both counts.

In 2022, Dr. Singh told Senator Markey that shipping would cost \$20 million, but Holtec has yet to provide any support for that estimate. At the July 2024 NDCAP meeting, Holtec's representative agreed that shipping all of the remaining water would require slightly fewer than 225 truckloads. Holtec agreed to provide a per-truckload estimate. We strongly doubt the per-truckload cost will approach \$88,888.89 ($\$20,000,000/225$).

It is important to remember that *all decommissioning costs and all of Holtec's profits will come out of money that rate payers paid into the Decommissioning Fund*. Pilgrim's DTF was funded through customer contributions established when the reactor initially went online in 1972, and the fund grew through investments managed by its Trustee in New York. *Neither Holtec nor any other Pilgrim owner ever contributed a cent.*

In any event, Dr. Singh's \$20 million dollar estimated cost is dwarfed by Holtec's likely decommissioning profit – at least \$800 million dollars. See Decommissioning Handbook, pp 8, 37-38, Pilgrimwatch.org.

Holtec's suggestion that shipping the contaminated water would be dangerous is pure hypocrisy, explained only by the difference between its desire for profit and the cost of proper decommissioning.

Holtec is now decommissioning three nuclear power plants, Pilgrim, New Jersey's Oyster Creek, and Indian Point on the Hudson River north of New York City. It has safely shipped tons of solid radioactive waste from Pilgrim and Oyster Creek to existing waste disposal sites in other states.

In connection with its plans to build a spent nuclear fuel storage site in Southeastern New Mexico, Holtec assured the NRC that it will be perfectly safe to transport thousands of tons of spent nuclear fuel from all over the U.S. to that site connection with its plans to build spent nuclear fuel storage site in Southeastern New Mexico, Holtec has assured the NRC that it will be perfectly safe to transport thousands of tons of spent nuclear fuel from all over the U.S. to that

site using Holtec’s “robust and safe transport casks.” See <https://holtecinternational.com/products-and-services/hi-store-cis/>.

After Senator Markey’s May 2022 hearing in Plymouth, Dr. Singh wrote Senator Markey, saying again that there will be an “absence ... of the risk of hazardous accident” in transporting more than ten thousand canisters of spent nuclear fuel from nuclear power plants all over the US to New Mexico.

But Singh did create another strawman – environmental justice. He said that “the suggestion made in the hearing to ship the putatively labeled contaminated water to another locale runs counter to the basic tenets of environmental justice.” But environmental justice is not a viable excuse for Holtec opposing shipping wastewater to Texas.

In the same letter, Dr. Singh also said shipping tons of spent nuclear fuel to Holtec’s planned “HI-STORE CIS [in New Mexico is] the very epitome of social justice.”

Indeed, environmental justice provides strong reasons that the contaminated water should be shipped to WCS in Texas rather than keeping it indefinitely in Plymouth.

The US Census bureau shows Plymouth Country has more indigenous and citizens in poverty than Aberdeen County in Texas.⁵; and the Massachusetts Environmental Justice Map show the numbers of poor and indigenous are larger around Pilgrim Station than the rest of the county.⁶

There is a vast gap between what Holtec says when it is trying to save money and when it is looking for profit. The low level waste disposal site to which Pilgrim’s contaminated water likely will be shipped, WCS in Texas, has existed for years. Holtec has sent and will send tons of radioactive waste to it. To the best of our knowledge, Holtec has never suggested that doing so was “counter to the basic tenets of environmental justice.”

⁵ <https://www.census.gov/quickfacts/andrewscountytexas> pop estimate 2022 18, 334.

⁶ The updated Massachusetts 2020 Environmental Justice Populations Map shows specific pockets of environmental justice communities in the state such as in Plymouth and communities surrounding Cape Cod Bay. When identifying EJ Populations, the environmental justice act requires the consideration of the following demographic data for the residents of each U.S. Census block group in the Commonwealth: income level, English language proficiency, self-identified race (i.e., “minority”), or race + municipal income level. 1 The EJ Maps illustrate these data as the U.S. Census reports it, at differing levels of granularity for each of these criteria. Generally, with a few anomalies, the maps display the following data for each block group in Massachusetts: median household income level, percentage of households with limited English proficiency, and percentage of individuals who self-identify as non-white (i.e., “minority”)
<https://mass-eoeea.maps.arcgis.com/apps/webappviewer/index.html?id=1d6f63e7762a48e5930de84ed4849212>

Even if there were an accident, a spill from a truck can be cleaned up. You cannot clear up radioactivity after it has been discharged into Cape Cod Bay.

F. DEP's Surface Water Discharge Regulations

The DEP regulations governing Surface Water Discharge Permits, promulgated pursuant to the Massachusetts Clean Water act and the Federal Clean Water Act, include 314 CMR 2.00, 3.00, and 4.00.

314 CMR 3.02 defines Pollutant as *any* element or property of sewage, agricultural, *industrial or commercial waste*, runoff, leachate, heated effluent, or other matter, in whatever form and whether originating at a point or major non-point source, *which is or may be discharged, drained or otherwise introduced into any* sewerage system, treatment works or *waters of the Commonwealth*.

314 CMR 3.03 says “No person shall discharge pollutants to surface waters of the Commonwealth without a currently valid permit from the Department pursuant to M.G.L. c. 21, § 43 and 314 CMR 3.00, unless exempted in 314 CMR 3.05

314 CMR 4.04 precludes DEP from issuing a permit that would allow Holtec to discharge Pilgrim’s industrial wastewater into Cape Cod Bay:

1. Unless the discharge would be “insignificant” or Holtec demonstrates that the evaporation/discharge is necessary and that no better alternative is available, and that the evaporation/discharge will not impair existing uses or decrease water quality. (314 CMR 4.04(2) and (3)); or
2. Unless DEP determines that the discharge is “for the express purpose and intent of maintaining or enhancing [Cape Cod Bay]”

Holtec’s evaporative discharge is not “insignificant.” Neither is it necessary. Holtec’s better alternatives include transporting the contaminated water to an existing off-site radioactive waste storage facility, and storing the water in sealed containers on-site until its radioactive level has greatly decreased.

Holtec is evaporating the water because it is cheap to do so. We see no way in which DEP could

rationally conclude that Holtec’s evaporation is “for the express purpose and intent of maintaining or enhancing [Cape Cod Bay].”

Pilgrim’s Evaporated Water

Since Holtec purchased Pilgrim in 2019, Holtec has Pilgrim has evaporated over 850,000 gallons (see table below) of unfiltered and untreated radioactively and chemically contaminated industrial wastewater into the atmosphere.

At the most recent NDCAP meeting on July 22, 2024, Holtec said that 895,850 gallons of contaminated water remain. Holtec must dispose of that water by 2032, before it plans to begin demolishing the buildings in which the water now is now stored.

One major question is how rapidly the remaining water will evaporate. During the past two winters: 2022-2023 and 2023-2024, Holtec used supplemental heaters to heat the water, ostensibly to heat the reactor building. One effect of this heating was to increase the rate of evaporation relative to what would naturally occur.

As shown in the following table that Holtec sent to Ms. Lampert (but not to any other NDCAP member), it appears that about 120,000 gallons evaporated during the 2022-2023 winter heating season and about 130,000 gallons during a slightly longer 2024-2023 winter heating season. If Holtec continues to use heaters for approximately the same lengths of time going forward, it is reasonable to assume that, unless stopped, Holtec will evaporate about 125,000 gallons of Pilgrim’s contaminated water for each of the next seven years, until no water remains.⁷

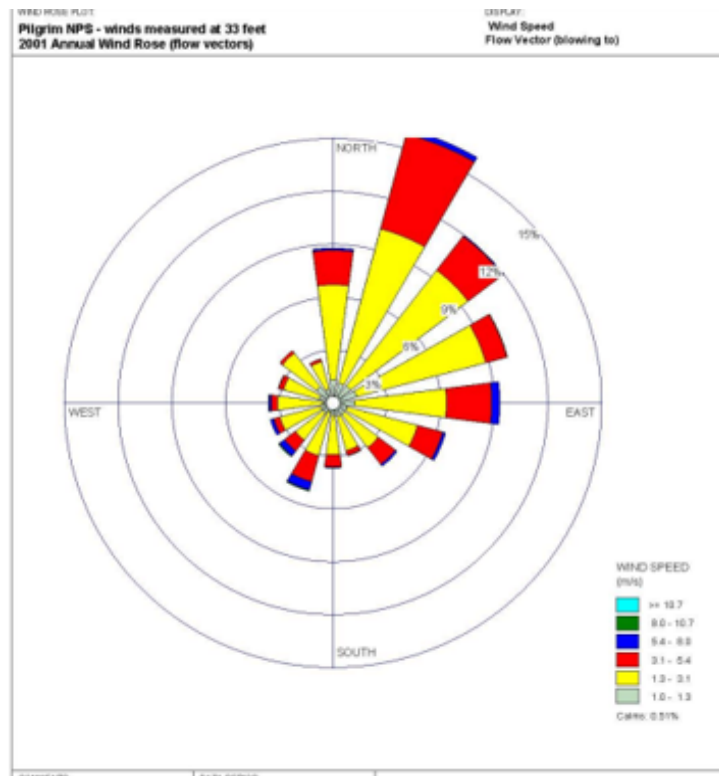
| DATE | CAVITY/SFP/DSP | TORUS | CST | REQUESTED TOTAL |
|-------------|-----------------------|--------------|------------|------------------------|
| 6/24/19 | 895,580 | 653,686 | 242,000 | 1,791,536 |
| 6/21/20 | 895,580 | 349,877 | 209,550 | 1,455,277 |
| 6/20/21 | 895,580 | 326,717 | 0 | 1,222,567 |
| 6/23/22 | 895,580 | 285,000 | 0 | 1,180,850 |
| 6/22/23 | 886,332 | 173,861 | 0 | 1,060,193 |
| 6/20/24 | 888,774 | 45,700 | 0 | 934,444 |

⁷ At the rate of 125,000 gallons a year, all of the remaining water would be evaporated in a little over 7 years, soon enough to allow building demolition sometime in 2031.

Where will Pilgrim's contaminated water go?

The majority of Pilgrim's evaporated effluents/pollutants, over 60% according to Entergy's (Pilgrim's previous owner's) experts, Kevin O'Kula and Dr. Steven Hanna,⁸ will be carried by the wind from Pilgrim to Cape Cod Bay and adjacent waters.

Entergy's meteorological experts testified that the Pilgrim 2001 wind rose, shown below, is representative of data available from other years prior to and including 2001 at Pilgrim. The wind rose shows that wind blows from Pilgrim into Cape Cod Bay the vast majority of the time. Pilgrim's more recent Pilgrim's Radioactive Effluent Release Reports show that the predominant wind direction from Pilgrim is still from the south-southwest. (See, e.g., www.nrc.gov, ML22136A258).



⁸ Exhibit No. ENT000001 Pilgrim LR Proceeding 50-293-LR, 06-848-02-LR ENT – O'Kula and Hanna Meteorological Testimony January 3, 2011 UNITED STATES OF AMERICA NUCLEAR REGULATORY COMMISSION, Before the Atomic Safety and Licensing Board Panel In the Matter of Entergy Nuclear Generation Company. Docket No. 50-293-LR Entergy Nuclear Operations, Inc.; ASLBP No. 06-848-02-LR) (Pilgrim Nuclear Power Station)) Testimony of Dr. Kevin R. O'Kula and Dr. Steven R. Hanna on Meteorological Matters Pertaining to Pilgrim Watch Contention 3, NRC Adams Library, Electronic Hearing Docket, ML No110030985. Note this was a long proceeding and there are extensive Applicant Exhibits in the NRC's Pilgrim-50-293-LR file.

During late spring and the summer months there is a wind reversal in the afternoon bringing the winds back to shore, called the sea breeze effect. This effect is a result of the land heating and becoming warmer than the sea water. The breeze does not penetrate far inland and swings from Plymouth to Scituate bringing contaminants to Plymouth, Kingston, Duxbury, Marshfield and Scituate bays and wetlands.⁹ Plymouth, Kingston and Duxbury Bay are part of the protected ocean sanctuary.

At the May 20, 2024 NDCAP meeting, Holtec's spokesman, David Noyes, agreed that the prevailing wind direction is easterly, based on ten years of data collected by Entergy. (See video at 28 min). Pilgrim's more recent Pilgrim's Radioactive Effluent Release Reports show that predominant wind direction from Pilgrim is still from the south-southwest to the east. (See, e.g., www.nrc.gov, ML22136A258).

Effluents in the evaporative releases will inevitably fall into Cape Cod Bay: "*Airborne tritium can also be subject to localized precipitation 'washout,' which has the potential to result in high concentrations in surface water, storm water, and groundwater in the immediate vicinity of the power plant.* [http://hps.ne.uiuc.edu/rets-remp/PastWorkshops/2006 2006-Abstracts.pdf](http://hps.ne.uiuc.edu/rets-remp/PastWorkshops/2006%2006-Abstracts.pdf).

In short, the easterly prevailing wind direction and the sea breeze effect assure that Cape Cod Bay and ancillary bays and wetlands will receive Pilgrim's evaporated industrial wastewater in violation of state law.

DEP's and DPH's Excuses Not to Act Do Not Hold Water

From what we have been told at NDCAP meetings, DPH's apparent position and practice is that only the NRC has any authority over Pilgrim's radioactive air emissions.

In our view, this is simply wrong. In the Settlement Agreement, Holtec gave up any right it might otherwise have had to challenge state law on the basis of preemption. DPH's position also overlooks that there would be no preemption even with the Settlement Agreement. The four Supreme Court nuclear preemption decisions are clear and consistent. The NRC does not have exclusive authority "over all things nuclear." In each of the four Supreme Court cases, the nuclear industry tried to use preemption to avoid state laws, and in all four the nuclear industry lost all. See Appendix B.

⁹ Docket 50-293, Pilgrim Watch Findings of Fact and Conclusions of Law, SAMA Remand, March 2011, Pages 17-18; NRC Library Adams, Ascension Number ML110630439; 1990 study by the Massachusetts Department of Public Health. Southeastern Massachusetts Health Study 1978-1986, Morris, M.S., Knorr, R.S., Massachusetts Department of Health, Southeastern Massachusetts Health Study, Oct., 1990. Archives of Environmental Health, Vol. 51, p266, 1996, July-Aug. #4

DEP's position is harder for us to understand.

When asked at the March 27, 2023 NDCAP meeting whether “any state law or regulation requires that a nuclear power station discharge permit not cover radioactive materials,” Mr. Pickering, DEP's NDCAP representative, said “We are not aware of any state law or regulation that requires exclusion of radioactive ones.

But at the more recent July 2024 NDCAP meeting, Mr. Pickering said that DEP has no authority over Pilgrim's radioactive air emissions.

We agree with Mr. Pickering's first statement. We also are not aware of any, and have not found any law, regulation, or even a written policy exempting Pilgrim's discharge of radioactive materials.

But his second statement, that DEP has no authority, seems flatly at odds with the laws and regulations discussed above.

Four of these, the Ocean Sanctuaries Act, the Environmental Species Act, the Crimes Against Public Health and DEP's Surface Water Discharge Regulations, prohibit the discharge of any waste or commercial and industrial waste; none exclude waste that is radioactive.

Two other laws and regulations explicitly prohibit the discharge of radioactive material. The Oil and Hazardous Material Release Prevention Act prohibits the discharge *or threat to release materials having radioactive characteristics*. DEP's Air Emission Regulations prohibit *the emission of radioactive material*.

These laws and regulations seem quite clearly to show that DEP “has [] authority over Pilgrim's radioactive air emissions.” In practice, DEP may have refused to exercise that authority,¹⁰ but we respectfully suggest that it has no rational, moral, or justifiable reason for doing so.

When asked whether DEP will “enforce the Ocean Sanctuaries Act to stop the forced evaporation

¹⁰ For example, DEP has elected NOT to prohibit emission of “Air Contaminants” (that by definition may include radioactive material) that amount to less than one ton a year. 310 CMR 7.02 “Less than a ton” may make sense for many chemical contaminants, but certainly not for radiological contaminants. Radionuclides are not measured in tons. One-millionth of a gram of plutonium, particularly if inhaled, can cause cancer. To suggest DEP can only act if a ton or more of plutonium is released is absurd on its face and is equally absurd for any other radionuclide.

of the wastewater at Pilgrim,” DEP’s Chief of Staff, Brian Ferrarese, responded “A timely question!” (email of July 19, 2024 to Diane Turco of Cape Downwinders)

Conclusion

Evaporation is occurring all day/every day, in violation of state law and posing a threat to public health, safety, and our marine-based economy. The Commonwealth’s silence and inaction is not what we expected or deserve.

We respectfully request you, as Attorney General responsible for enforcing environmental laws, to answer the “timely question” and take the actions necessary to stop Holtec from releasing its wastewater contaminants. Holtec has a safer option such as shipping the wastewater offsite, as Vermont Yankee did, or storing it on site.

Respectfully,

Mary E. Lampert

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Cc: Richard Johnston, Chief, AGO Energy & Environment Bureau
Rebecca Tepper, Secretary of Energy and Environmental Affairs
Kate Walsh, Secretary of Health and Human Services
Bonnie Heipel, DEP Commissioner,
Robbie Goldstein, DPH Commissioner
Seth Schofield, Senior Appellate Counsel, AGO Energy & Environment Bureau
Lealdon Langley, DEP, Director of Watershed Management

APPENDIX A

Independent Expert Opinions

Petros Koutrakis

Professor of Environmental Sciences – Harvard TH Chan School Public Health
Environmental Health- see <https://www.hsph.harvard.edu/profile/petros>

Koutrakis Email 04.19.24

it depends on the way they evaporate the water. If it is natural, then non volatile compounds do not evaporate. If they heat and the water boils the non volatile compounds will be aerosolized and escape.

The **thing about particulates settling is not accurate** because some of the radionuclides may be solute. The amount will depend on the acidity of the wastewater, which I do not know.

So just to clarify. Radionuclides can be solid and go to the bottom, but they can be soluble and be dissolved in the entire mixture. Depending on the volatility of the soluble radionuclides and the temperature of the water some can escape.

Sorry if this confuses you but it is a little complicated and we do not know how much goes out because we do not know the acidity and temperature of the water. However, their story is not accurate.

NOTE: See water samples-DEP splits for acidity

NOTE; Temp Water-see Jan 2024 minutes, page 3 (boiling is 212) <https://www.mass.gov/doc/approved-minutes-from-the-january-29-2024-meeting/download>

“Mr. Noyes concluded his presentation with a diagram of the building heating system for the reactor building and spent fuel pool. **He indicated that heat is being applied to the spent fuel pool to raise the temperature to 95 degrees, which has raised the temperature of the refueling floor to 60-65 degrees.** Water is then used to radiate the heat throughout the reactor building to maintain temperatures and prevent freezing.”

Marco Kaltofen

President of Boston Chemical Data Corp., Dept. of Civil and Environmental Engineering, Worcester Polytechnic Institute, Registered Professional Civil, Engineer. Dr. Kaltofen is an environmental scientist with 30 years experience in environmental, workplace and product safety investigations. His research at WPI focuses on investigations into petroleum and nuclear releases. He has provided expert testimony and consulting as a chemist and as an engineer. Dr. Kaltofen's nuclear forensics work includes experience in the US, the Middle East, Russia, India, Japan and European Union countries. He is a native Dutch speaker and holds both US and European Union (Dutch) citizenship **Bio: <https://bostonchemicaldata.com/biographies.html>**

From: Marco Kaltofen <mpkaltofen@gmail.com>

Sent: Wednesday, April 17, 2024 1:02 PM

To: Mary Lampert <mary.lampert@comcast.net>

Cc: Diane TURCO <tturco@comcast.net>

Subject: Re: Evaporation at Pilgrim- what radionuclides would be vented?

Unfortunately we are operating in an information vacuum. As far as I'm concerned, the operators are experimenting here. There is little history or engineering data to fall back on. No studies where past results can be examined. People don't normally heat up dead nuclear cores to save money on wastewater disposal.

My gravest concern is that this is an untested practice. Sure the tritium will be released into the environment faster. In addition, **ultrafine particulate matter can become airborne from the heated wastewater.** The best analogy is the salt deposits we all experience near the ocean from sea spray. Salt doesn't evaporate, but seawater aerosols can travel and, when they evaporate, deposit salt crystals in the area. Is the same thing happening at Pilgrim? It's hard to say because there's no data. **Aerosol particles from the heating process could transport highly radioactive particulates, but it's unclear if anyone is checking for this.**

Will the extra heat change the chemical form of the final radioactive sludge produced? Could it result in a chemical reaction that spreads radioactivity at the plant? Again - there's no data. Will the hot wastewater become unusually corrosive due to the high salt content as the water evaporates? (Maybe).

So no, **these materials are not too heavy to move by air. If a particle is small enough, even dense uranium can become airborne on normal air currents.** That's something engineers know for sure.

The work I'm doing along with the Harvard Chan group may be able to document this in our house dust sample, but only if the aerosols have made their way into the environment. I'd prefer a preventive approach of course.

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From: Marco Kaltofen <mpkaltofen@gmail.com>
Sent: Wednesday, April 17, 2024 2:32 PM
To: Mary Lampert <mary.lampert@comcast.net>
Subject: Re: Evaporation at Pilgrim- what radionuclides would be vented?

We can sometimes tell how old the particulates are in dust based on how many short-lived isotopes have survived. For example, recent releases will contain cesium-134 but old fallout will not.

I also forgot to mention one other isotope that can be released by heating wastewater. **Technetium-99** can combine with water to form compounds (technetium oxides) that partially evaporate in hot water. I have attached a paper in case anyone in the group wishes to read about this known problem in radioactive wastewaters. On page 10 the authors note that Tc99 can volatilize at temperatures as low as 50 degrees C.

Marco Kaltofen, PhD, PE (Civil, MA), C. NSE

Marco Kaltofen 04/29/24

Holtec fails to mention that this wastewater already has 185 +/- 4.8 pCi/mL of **cesium-137**, 13.3 +/- 0.63 pCi/mL of **cobalt-60**. That represents a very significant amount of radioactivity in the wastewater.

In addition, other radionuclides such as **technetium-99 and strontium-90** would be expected in the wastewater. Tc99 and Sr99 cannot be measured using the gamma spec method used to detect Cs137 and Co60. A separate beta test is required for these. This beta test is not included in the results given.

Marko Kaltofen 04/29/24 (reply to water temperature)

Sr90 can be produced in amounts that closely match the Cs137 produced, so this nuclide is an important source of risk.

Tc99 has the added disadvantage of being relatively volatile (evaporated readily) in warm water (120 degrees F, about the same as a hot shower).

As the water level drops, these numbers will keep going up, raising the chance of worker or community exposure.

This work should have been done at a treatment facility designed specifically for this operation, rather than having begun this on an experimental basis within the community.

Marco Kaltofen, PhD, PE (Civil, MA), C. NSE

Marco Kaltofen 04.29.24 (response water temperature)

If as Holtec says, the wastewater has been heated to 95 deg. F (about 35 deg. C) then the vapor pressure of hydrated TcO₂, also called HTcO₄, is about 3 Torr. This is about one third as volatile as kerosene at room temperature. Short answer - yes **Tc will evaporate from water at 95 deg. F.**

Marco Kaltofen, PhD, PE (Civil, MA), C. NSE

David Lochbaum

Nuclear industry, nuclear safety expert at Union Concerned Scientist, NRC, IP NDCAP panel member, now retired.

From: David Lochbaum <davelochbaum@gmail.com>

Sent: Wednesday, April 17, 2024 9:35 AM

To: Mary Lampert <mary.lampert@comcast.net>

Subject: Re: evaporation-what goes up the vent?

On Apr 16, 2024, at 8:29 PM, David Lochbaum <davelochbaum@gmail.com> wrote:

Hello Mary:

It is probably true that Noyes said that,
But what he said is simply not true.

The National Council on Radiation Protection (NCRP) - hardly a left-wing organization - studied options for disposing of radioactively contaminated water from the March 1979 accident at TMI-2. Over 2 million gallons of accident-generated wastewater needed to be disposed of. NCRP concluded that the radiation dose to the public would be 300 times higher if that water was evaporated than if that water was filtered and released to the Susquehanna River. However, political science TRUMPed actual science. The water was evaporated to the air, perhaps killing far more innocents than discharging it to the river would have kilt.

So, I have no doubt that Noyes said it. I doubt what Noyes said is true.

Thanks, Dave

Dave Lochbaum second email

Hello Mary:

How long has this chap's nose grown? Tritium is a hydrogen isotope. Tritiated water evaporates at essentially the same rate as non-tritiated water. Thus, tritiated water evaporating from the vessel or spent fuel pool will flow out the vent or stack. Because it emits a beta particle, the tritium likely will not be detected by the radiation monitors as it leaves the building. The gamma emitters will "sign out" as they leave.

I hope the chap is just clueless rather than lying. Neither is a valid excuse,

Thanks, Dave

Kevin Kamps

Radioactive Waste Specialist at Beyond Nuclear, DC

From: Kevin Kamps <kevin@beyondnuclear.org>

Sent: Wednesday, April 17, 2024 10:45 AM

To: Mary Lampert <mary.lampert@comcast.net>

Cc: Cindy Folkers <cindy@beyondnuclear.org>; Paul Gunter <paul@beyondnuclear.org>

Subject: Re: Evaporation at Pilgrim- what radionuclides would be vented?

Hi Mary,

I've cc'd my co-workers Paul and Cindy, as they may have additional insights.

Besides tritium, there are other volatile radioactive substances, including Cesium, and incredibly enough, despite its relatively heavy weight, Plutonium. Plutonium does have water soluble valence states, which officialdom had tried to deny from the Manhattan Project, but could no longer deny by the end of the 1990s, with the real world physical data coming out of the Nevada Test Site, for example.

So of course Holtec is going to deny, deny, deny.

An open question is whether or not MA state officials will simply shrug their shoulders and largely go along with whatever Holtec says? Of course that is how the NRC behaves from start to finish.

I wonder if radio-chemists like Marko Kaltofen and Michael Ketterer could provide more insights?

Kevin

APPENDIX B

Supreme Court Decisions on Preemption

The U.S. Supreme Court has decided four nuclear preemption cases. In each, the nuclear industry tried to use preemption to avoid state laws. In all four, the nuclear industry lost.

These decisions are clear: Holtec's agreement with the Commonwealth is not preempted. Even if there were no agreement, the Commonwealth would not be preempted from enforcing the Ocean Sanctuaries Act, the Endangered Species Act, Ch 21E, and all other "environmental and health-based standards and regulations of the Commonwealth."

According to the Supreme Court:

- The NRC does not have exclusive authority "over all things nuclear." The Atomic Energy Act did not preempt the entire nuclear field.
- A state law such as the OSA or Environmental Species Act is preempted only to the extent it actually conflicts with federal law; that is, when it is impossible to comply with both state and federal law. Nothing in the Atomic Energy Act or NRC regulations requires Holtec to dispose of Pilgrim's waste by discharging it into Cape Cod Bay.

Holtec has at least three other NRC-approved options for disposing of Pilgrim's contaminated water. Holtec's agreement not to discharge into Cape Cod Bay does not make it impossible for Holtec to dispose of Pilgrim's water using any of its other options.

Requiring Holtec to do what it agreed to do does not contradict any federal law or requirement.

- The NRC allowed the owner of Vermont Yankee, pursuant to its agreement with the State of Vermont, to transport VY's two (2) million gallons of contaminated water to an-offsite radioactive waste disposal facility rather than dumping it into the Connecticut River. Holtec can do so, also.
- A state law is also preempted if it "stands as an obstacle to the accomplishment of the full purposes and objectives."

Nothing in the four nuclear-preemption Supreme Court decisions indicates that would be the case here. Rather, they point in precisely the opposite direction.

The Supreme Court decisions:

- a. *Pacific Gas & Elec. Co. v. State Energy Resources Conservation and Development Comm'n*, 461 U. S. 190 (1983).

The case involved a California law prohibiting approval to build nuclear plants unless an adequate method existed for disposing of spent nuclear fuel. 461 U.S. at 197-918. The Court upheld the California law because it was enacted for economic concerns. 461 U.S. at 5, 213-216.

“The [NRC]...does not purport to exercise its authority based on economic considerations... Congress intended the States to continue to make these judgments.” (461 U.S. at 207-208).

If an “economic purpose [is]the rationale for enacting” a statute, “the statute lies outside the occupied field of safety regulation.” (461 U.S. at 212, 216).

“Congress has occupied not the broad field of "nuclear safety concerns," but only the narrower area of how a nuclear plant should be constructed and operated to protect against radiation hazards. 461 U.S. at 424 (concurring opinion)

Massachusetts laws prohibiting dumping waste into Cape Cod Bay have nothing to do with how Pilgrim should have been constructed over 50 years ago or how it should have been operated during the years that it generated electricity. What they do is protect the Commonwealth’s economic interests, and prevent devastation of the South Shore’s and Cape Cod’s marine economies.

- b. *Silkwood v. Kerr-McGee Corp.*, 464 U. S. 238 (1984).

Karen Silkwood suffered radiation injuries after a nuclear plant accident. The Court rejected Kerr-McGee’s contention that the Atomic Energy Act preempted state law authorizing the recovery of punitive damages.

“As we recently observed in *Pacific Gas & Electric Co. v. State Energy Resources Conservation & Development Comm'n*, [461 U. S. 190](#) (1983), state law can be preempted in either of two general ways. If Congress evidences an intent to occupy a given field,

any state law falling within that field is preempted. [citations omitted]. If Congress has not entirely displaced state regulation over the matter in question, state law is still preempted to the extent it actually conflicts with federal law, that is, when it is impossible to comply with both state and federal law. [citation omitted.], or where the state law stands as an obstacle to the accomplishment of the full purposes and objectives of Congress, *Hines v. Davidowitz*, [312 U. S. 52](#), [312 U. S. 67](#) (1941). *Pacific Gas & Electric, supra*, at [461 U. S. 204](#).” 464 U.S. at 248

“No doubt there is tension between the conclusion that safety regulation is the exclusive concern of the federal law and the conclusion that a State may nevertheless award damages based on its own law of liability. But as we understand what was done over the years in the legislation concerning nuclear energy, Congress intended to stand by both concepts and to tolerate whatever tension there was between them. We can do no less.” 464 U.S. at 256

“[P]reemption should not be judged on the basis that the Federal Government has so completely occupied the field of safety that state remedies are foreclosed, but on whether there is an irreconcilable conflict between the federal and state standards or whether the imposition of a state standard in a damages action would frustrate the objectives of the federal law. We perceive no such conflict or frustration in the circumstances of this case.” 464 U.S. at 256

States have long awarded damages to those injured by someone else’s actions. The OSA, Endangered Species Act, and other Massachusetts laws and regulations prevent both damage and the threat of damage from the discharge or the threat of discharge of radioactively contaminated water into Massachusetts bays.

No NRC regulation requires Pilgrim discharge any of its radioactive water into Cape Cod Bay; all they do is allow certain discharges. There is no “irreconcilable conflict” between any NRC regulations and the Massachusetts laws that would require Pilgrim to use some NRC sanctioned method - other than liquid or evaporative discharge into Cape Cod Bay - for disposing of its contaminated water.

c. English v. General Elec. Co., 496 U. S. 72 (1990).

In *English*, the Court found that a whistleblower laboratory technician’s complaint for intentional infliction of emotional distress caused by several perceived violations of nuclear-safety standards at a GE facility, including the failure of her co-workers to clean up radioactive spills in the laboratory, was not preempted.

“The real issue, then, is whether petitioner's tort claim is so related to the "radiological safety aspects involved in the . . . operation of a nuclear [facility]," *see id.* at [461 U. S. 205](#), that it falls within the preempted field. In addressing this issue, we must bear in mind that not every state law that in some remote way may affect the nuclear safety decisions made by those who build and run nuclear facilities can be said to fall within the preempted field. We have no doubt, for instance, that the application of state minimum wage and child labor laws to employees at nuclear facilities would not be preempted,

even though these laws could be said to affect tangentially some of the resource allocation decisions that might have a bearing on radiological safety. Instead, for a state law to fall within the preempted zone, it must have some direct and substantial effect on the decisions made by those who build or operate nuclear facilities concerning radiological safety levels.” 496 US at 84-85

Massachusetts laws such as the OSA, the Endangered Species Act, the Crimes Against Public Health Act, the Oil and Hazardous Material Release Prevention Act, and the Clear Air Act, have no direct or substantial effect on the nuclear safety decisions made by those who built or ran Pilgrim. or on Holtec that is decommissioning the plant. At most they may have a relatively minor effect on Holtec’s decommissioning profit

d. *Virginia Uranium, Inc. v. Warren*, 587 U.S. ____ (2019).

The Virginia law at issue prohibited uranium mining in the Commonwealth of Virginia. The Court upheld the state law, making clear that a litigant relying on preemption “must point specifically to ‘a constitutional text or a federal statute’ that does the displacing or conflicts with state law” (Slip Op., 3); and pointing out that Congress specifically amended the Atomic Energy Act to add a new Section 2021(k) “out of apparent concern that courts might (mis)read” other amendments “as prohibiting States from regulating any activity even tangentially relate to nuclear power.” (Slip Op., 5-6)

Slip Op., 3: Court has sometimes used different labels to describe the different ways in which federal statutes may displace state laws—speaking, for example, of express, field, and conflict preemption. But these categories “are not rigidly distinct.” *Crosby v. National Foreign Trade Council*, 530 U. S. 363, 372, n. 6 (2000) (internal quotation marks omitted). And at least one feature unites them: Invoking some brooding federal interest or appealing to a judicial policy preference should never be enough to win preemption of a state law; a litigant must point specifically to “a constitutional text or a federal statute” that does the displacing or conflicts with state law. [citations omitted]”

Slip Op., 5-6: Some years after the statute’s passage, Congress added a provision, currently codified in §2021, allowing the NRC to devolve certain of its regulatory powers to the States. Unsurprisingly, Congress indicated that the NRC must maintain regulatory control over especially sensitive activities like the construction of nuclear power plants. §2021(c). But under §2021(b) the NRC may now, by agreement, pass to the States some of its preexisting authorities to regulate various nuclear materials “for the protection of the public health and safety from radiation hazards.” Out of apparent concern that courts might (mis)read these new provisions as prohibiting States from regulating any activity

even tangentially related to nuclear power without first reaching an agreement with the NRC, Congress added subsection (k): “Nothing in this section [that is, §2021] shall be construed to affect the authority of any State or local agency to regulate activities for purposes other than protection against radiation hazards.” Section 2021, thus, did nothing to extend the NRC’s power to activities, like mining, historically beyond its reach. Instead, it served only to allow the NRC to share with the States some of the powers previously reserved to the federal government. Even then, the statute explained in subsection (k) that States remain free to regulate the activities discussed in §2021 for purposes other than nuclear safety without the NRC’s consent. Indeed, if anything, subsection (k) might be described as a nonpreemption clause.

Slip Op, 8: “Pacific Gas rejected a preemption challenge to a state law prohibiting the construction of new nuclear power plants. Along the way, the Court expressly dismissed the notion that §2021 establishes the federal government as “the sole regulator of all things nuclear.

The Court went on to expressly dismiss the notion that §2021 establishes the federal government as “the sole regulator of all matters nuclear.” *Id.*, at 205. *Virginia Uranium*, Slip Op, 8)