

# Nuclear Decommissioning Citizens Advisory Panel

10 January 2021

Dear Governor Baker,

The Nuclear Decommissioning Citizens Advisory Panel (NDCAP) has completed, and is attaching herewith, its 4th Annual Report for a period of 15 months, from September 2020 to December 2021.

During this time, Holtec has made considerable progress with respect to decommissioning the Pilgrim Power Station. The most significant benchmark was the day that the last fuel laden dry cask traveled up to the ISFSI pad and was laid in place on December 13th. It is generally agreed that in the short term the safest scenario is for the spent fuel to have been placed in the dry casks on the hill overlooking Cape Cod Bay. However, it is NDCAP's hope, along with the town of Plymouth, that the federal government will succeed in establishing a safe repository for this and all of the Nation's spent nuclear fuel. However, nothing is proceeding quickly on this front and the Department of Energy just embarked on a new consent-based siting effort. It is now more important than ever that our elected state officials engage with our federal delegation to communicate how dire the need for action is.

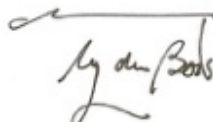
With fuel rod removal now complete, NDCAP's primary challenge for 2022 will be the final disposition of roughly a million gallons of radioactive water remaining in the system. Holtec has a number of options to address this issue. They have committed to taking this year to develop a plan and to not take any action with this water until 2023 at the earliest.

NDCAP appreciates your attention to this issue. The last outcome the Commonwealth needs is for this radioactive material to damage the resources of Cape Cod Bay. The Bay is a unique ecosystem that contributes thousands of sustainable jobs to the Massachusetts economy. The last thing we should be doing is jeopardizing that. Please take a look at the visuals on reverse of this letter. The Commonwealth's agencies are essential contributors to the work of NDCAP and we believe their help will be critical in solving this problem.

Sincerely,



John T. Mahoney, Chair



Pine duBois, Vice-chair

Cc: Senator Michael J. Barrett, Chair Joint Committee TUE  
Representative Jeffrey N. Roy, Chair Joint Committee TUE



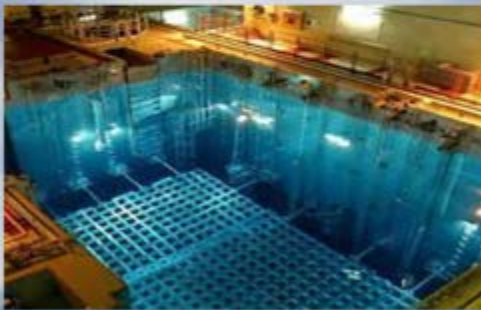


NDCAP 2022 Challenge for Holtec is how to properly dispose of contaminated water previously used to cool spent fuel and reactor components on site.

Some filtration is possible. How much radiation can the environment tolerate without jeopardizing the living resources of Cape Cod Bay?

Cape Cod Bay Ocean Sanctuary is recognized by the Commonwealth as an important area for endangered species and as nursery habitat to sustain the globally important fishing grounds of Stellwagen Bank and the greater area of the Gulf of Maine.

## Pilgrim Nuclear Power Station



Spent fuel pool & decommissioning water  
Destination?

Holtec  
Pilgrim

Saquis Point

Cape Cod Bay Ocean Sanctuary ~ Nursery for the Gulf of Maine



**2020-2021**

**Report to the Governor  
& Energy Committees of the General Court**

Pilgrim Nuclear Decommissioning Citizens Advisory Panel  
Plymouth, Massachusetts

**Pilgrim Decommissioning**



**Fuel Campaign September 27, 2021 (picture)  
Completed December 13, 2021**

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## LIST OF ABBREVIATIONS

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AGO/AG	Attorney General Office
ALARA	As Low As Reasonably Achievable
CRDM	Control Rod Drive Mechanism
CDI	Comprehensive Decommissioning International
DEP	Department of Environmental Protection
DPH	Department of Public Health
DOE	Department of Energy (Federal)
DOT	Department of Transportation (Federal)
DTF	Decommissioning Trust Fund
EEA	Executive Office of Energy and Environmental Affairs
EPZ	Emergency Planning Zone
HDI	Holtec Decommissioning International
ISFSI	Independent Spent Fuel Storage Installation
IWG	Interagency Work Group
MARSSIM	Multi-Agency Radiation Survey and Site Investigation Manual
MCP	Massachusetts Contingency Plan
MEMA	Massachusetts Emergency Management Agency
NDCAP	Nuclear Decommissioning Citizens Advisory Panel
NPDES	National Pollution Discharge Elimination System (permit)
NRC	Nuclear Regulatory Commission
NUREG	Nuclear Regulation
PACTV	Plymouth Area Cable Television
PFAS	Per- and polyfluoroalkyl substances
PNPS	Pilgrim Nuclear Power Station
PSDAR	Post Shutdown Decommissioning Activities Report
Rad	Radioactive
WCS	Waste Control Specialists

### Contributors to the Report

Rich Grassie  
Pine duBois  
Patrick O'Brien  
David Noyes  
Seth Pickering  
Reviewed by Members of the NDCAP Panel

## EXECUTIVE SUMMARY

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The events and related NDCAP activities covered in this Annual Report are intended to advise the governor, the general court, the agencies of the commonwealth, and the public on issues related to the decommissioning of the PNPS, pursuant to Section 14 of Chapter 188 of the Acts of 2016. This Report covers 15-months from September 1, 2020 into December 2021.

By December 9, 2021 all used nuclear fuel rod assemblies were removed from the spent fuel pool and transferred to dry casks for storage. The last remaining fuel laden cask was transported via the haul path to the upper ISFSI on December 13, with a total of 62 casks containing all the fuel used over ~46 years of operation. As the “fuel campaign” wrapped up, discussion continued regarding safety issues relating to the Holtec designed concrete casks and interior steel canisters, vulnerability to sabotage, and the final disposition of the water that had contained the radioactive fuel rods and components of the nuclear operating system. Through multiple public communications Holtec has established that a final treatment and disposal plan for that water will be determined during 2022, with no disposal during the year. There is significant public concern that radioactive water would harm the ecosystem of Cape Cod Bay. We anticipate substantive discussion in the coming months relating to disposal options for roughly a million gallons of contaminated water that remains within the Pilgrim plant systems. EPA and NRC have jurisdiction over effluent discharges under federal laws and regulations, and DEP and DPH have jurisdiction under State Water Quality Standards and the AG’s Memorandum of Agreement with Holtec. Cape Cod Bay is an Ocean Sanctuary and must be protected as such.

The on-site workforce was reduced following shut down in 2019 to approximately 140 employees serving the related companies working on-site. As a result of progress achieved to date, including the demolition of buildings, transportation off site of hazardous waste, and successfully moving the fuel within secure containment at the upper ISFSI, the workforce will be reduced further in January 2022 to about 40 or 50 employees. This smaller team will continue dismantling buildings and infrastructure, as well as test for and remove on-site contaminants. Sea level rise and changing climate conditions will require continual monitoring and progress in decommissioning. Further discussion is needed to thoroughly consider reuse options and any redevelopment of the site.

As of December 2021, Massachusetts State Agencies have yet to provide their comments in response to the Environmental Site Assessment Work Plan produced for Holtec by its consultant ERM and released on May 26, 2021. The Site Assessment and Work Plan is required by the Settlement Agreement and sets forth minimum requirements for demolition, on-site management, regrading, and reseedling of the site.

A Decommissioning Trust Fund (DTF) was established pursuant to NRC regulations, and funded with contributions from ratepayers when Pilgrim began operations in 1972 and grew including investments over the years. It is the only source of money to pay for decommissioning. The fund is controlled by Pilgrim's current licensees, Holtec-Pilgrim LLC. and Holtec Decommissioning International LLC. The DTF is the source of funds relied on to fully decommission and restore the Pilgrim site and, as allowed by the NRC, provide security for the spent fuel stored at the ISFSI for as long as it is in Plymouth. Holtec plans to complete decommissioning and site restoration by 2062. While the federal Department of Energy was to have provided a permanent repository for the waste fuel, no such location is approved to date, creating uncertainty regarding the sufficiency of the DTF to completely clean and restore the Pilgrim site. Decommissioning Trust Fund Balance as of the end of December 2020 as presented by Holtec at the May, 2021 meeting<sup>1</sup>

Total Trust Fund Balance as of 12/31/2020: \$881 million

Total estimate to complete decommissioning is \$824 million (in 2020 dollars)

Total estimate for the ISFSI is \$4.324 million

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<sup>1</sup> Holtec submittal to NRC in March 2021, see enclosure 2 for Pilgrim in 9 pages: available <https://adamswebsearch2.nrc.gov/webSearch2/main.jsp?AccessionNumber=ML21090A336>)



## **NDCAP PANEL MEMBERS 2020/2021**

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### **Chair**

**John T. Mahoney**, Plymouth Nuclear Matters Committee  
Appointed by the Plymouth Select Board

### **Vice Chair**

**Pine duBois**, Public member  
Appointed by the Speaker of the House

### **Members**

**Sean G. Mullin**, Chair NDCAP 2017 - July 24, 2021 (Resigned)  
Appointed by the Minority Leader of the Senate

**Kevin O'Reilly**, Vice-Chair NDCAP 2017 - September 20, 2021 (Resigned)  
Appointed by the Speaker of the House

**Robert Jones**, ex officio. Deputy Chief of Staff  
Designee of the Secretary of Health and Human Services

**Seth Pickering** ex officio. Deputy Regional Director MA DEP-SERO  
Replaced David Johnson (retired June 2021),  
Designee of the Secretary of Energy and Environmental Affairs

**Robert Hayden**, ex officio. Commissioner DPU  
Designee of the Commissioner Public Utilities

**Mary Lampert**, Public member  
Designee of the Senate President

**Susan Whitaker**, ex officio. Regional Director, Office of Business Development  
Designee of the Secretary of Housing and Economic Development

**Richard Quintal**, Selectman (Appointed November 2020)  
Representative of the Town of Plymouth  
Appointed by the Plymouth Select Board

**Jack Priest**, ex officio. Director, MA DPH Radiation Control Program  
Appointed by the Department of Public Health

**Amy Naples**, Exec. Director, Plymouth Area Chamber of Commerce  
Appointed by the President of the Senate

**Mary Waldron**, Exec. Director OCPC  
Appointed by the Old Colony Planning Council

**Richard Rothstein**, Representative of the Town of Plymouth (Resigned July 25, 2021)  
Appointed by the Plymouth Select Board

**Henrietta Consentino**, Representative of the Town of Plymouth  
Appointed by the Plymouth Select Board effective October 26, 2021 to replace Rich Rothstein

**John G. Flores** (Resigned October 1, 2021)  
Appointed by the Governor

**David C. Nichols**, Public member  
Appointed by the Governor

**Richard Grassie**, Public member  
Appointed by the Minority Leader of the House (Resigned effective December 31, 2021)

**Patrick O'Brien**, CDI Senior Manager, Communications and Government Affairs  
Appointed by Owner of the Pilgrim Nuclear Power Station

**John Moylan**, Site Vice-President  
Appointed by Owner of the Pilgrim Nuclear Power Station

**Paul D. Smith**  
Representative of the Utility Workers Union of America, UWUA, Local 369

**John L. Viveiros**, Technical Hazards Unit Supervisor  
Replaced **Samantha Phillips**, Director (November 22, 2021)  
Massachusetts Emergency Management Agency

**Vacancies Require Immediate Action**

Governor Appointee to replace John Flores  
Senate Minority Leader to replace Sean Mullin  
House Speaker to replace Kevin O'Reilly  
House Minority Leader to replace Rich Grassie

## STATUTORY AUTHORITY AND KEY ISSUES FOR 2020/20

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The Nuclear Decommissioning Citizens Advisory Panel (NDCAP) was established pursuant to Chapter 188 of the Acts of 2016 § 14, to “advise the governor, the general court, the agencies of the commonwealth, and the public on issues related to the decommissioning of the Pilgrim Nuclear Power Station (PNPS), with a written report being provided annually to the governor and to the energy committees of the General Court.” The first meeting of NDCAP was in May 2017.

The NDCAP continued to explore, discuss and communicate information and involve citizens on a broad range of topics and subject matter areas during its fourth year. The Panel met monthly through March 2021, and then proceeded to a bi-monthly schedule. Generally, the Panel was concerned with topics relative to spent fuel management; reviewing historical site assessment and the site assessment work plan; the demolition of building structures; sufficiency of the decommissioning trust fund; NRC Regulatory Exemptions, terminating licensee responsibility for offsite emergency planning and reducing amount of licensees liability insurance; the authority of federal, state and local parties; and the Panel’s administrative issues, especially efforts to amend the NDCAP enabling legislation regarding voting so that motion’s made could in fact pass. Currently the Panel cannot vote on recommendations without an affirmative majority vote of all members present at a meeting. Because the membership includes so many government agencies and company employees, abstentions are frequent and routinely cause motions to fail for lack of an affirmative majority. The Panel’s list of topics, questions, observations and recommendations that were discussed and communicated during 2020-2021 include:

- PNPS Decommissioning Trust Fund
- Construction of barrier and security systems for the upper ISFSI pad
- Initial and Amended Environmental Site Assessment and Work Plan by ERM for Holtec
- Receipt of Multi-Purpose Casks and Hi-STORM casks and concrete pours on site
- Environmental Issues, including hazardous materials
- Removal of MET tower, auxiliary buildings, tanks, and transport off site
- RAD Monitoring in place and across regional communities
- Emergency Planning, Current EPZ and Impact of Plant Closure/Decommissioning
- Existing and proposed NRC Decommissioning regulations
- Radioactive and hazardous waste materials testing and analysis (buildings, soils, groundwater), storage, handling and transfer off site truck to rail
- Community Involvement and concerns
- Public Safety, including emergency preparedness, environmental monitoring and local public safety response to decommissioned site, including Plymouth Police and Fire
- Dry Cask Storage systems, technologies, and monitoring
- The transfer of fuel assemblies from the spent fuel pool into dry casks and transport to the upper ISFSI pad
- Federal, State, and local government authority and possible roles
- Long-term storage and options for nuclear waste management regionally

- Non-compliance events/issues relative to asbestos and discharge of stormwater
- AG Settlement agreement and Non-compliance with barge ramp investigation<sup>2</sup>
- Panel Administration, including community involvement, documents, and annual report
- Progress and updates on decommissioning and site clean up

## **MEETING SCHEDULE AND PRIORITIES FOR 2020-2021**

In performing its functions during the reporting period, the NDCAP held ten meetings during this reporting period from September 2020, through December 2021.

In-person meetings and virtual meetings are coordinated with our local Plymouth Area Community Television (PACTV), which normally broadcasts NDCAP meetings and provides video recordings via YouTube. The Covid-19 pandemic continued throughout the reporting period with virtual meetings only until September 27, 2021, when hybrid meetings were provided from Plymouth Town Hall for September and November meeting. Recordings of all meetings, approved minutes and supporting materials are provided on the Mass.gov website:

<https://www.mass.gov/orgs/nuclear-decommissioning-citizens-advisory-panel>.

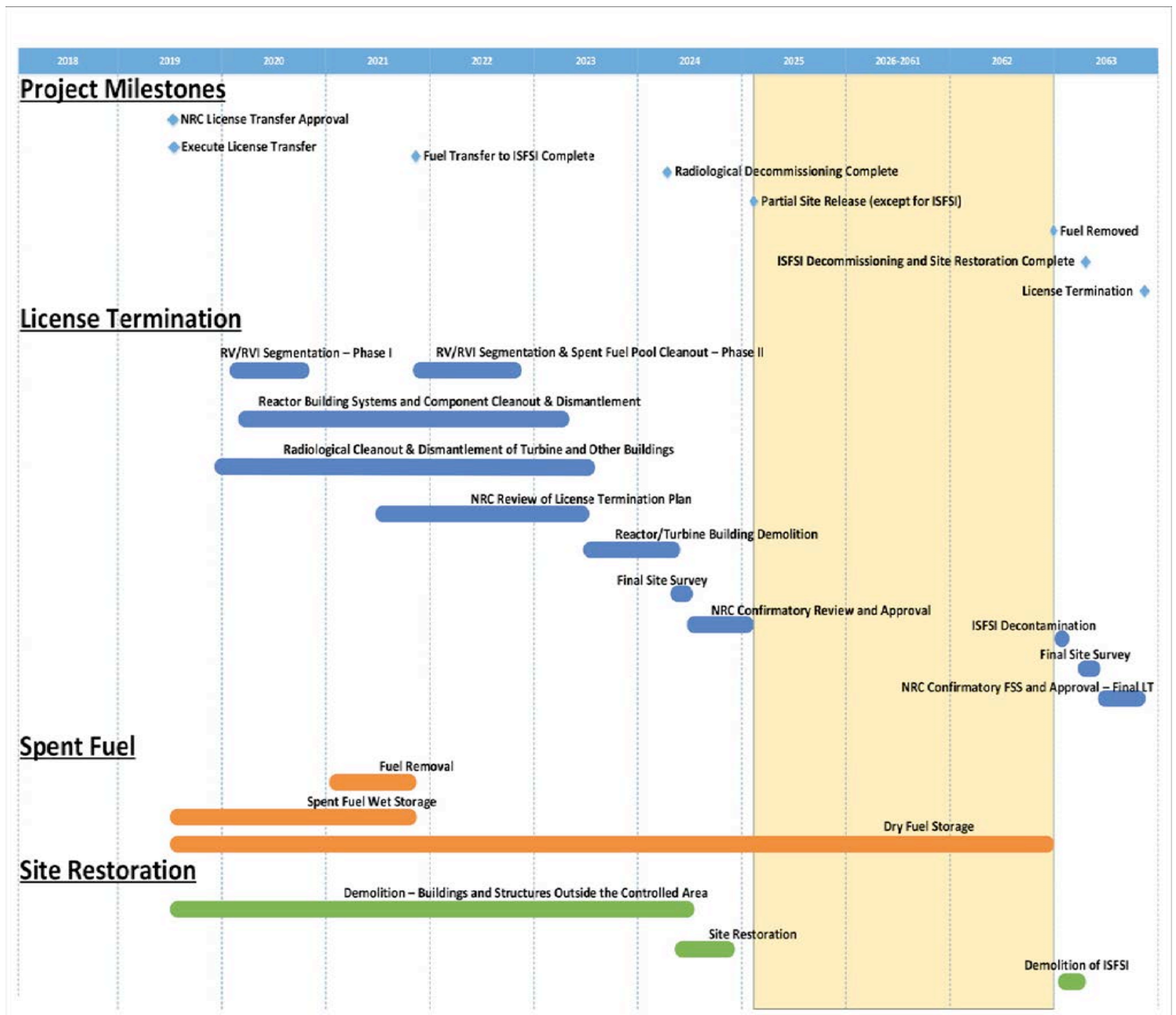
**The Meetings for this reporting period are summarized in Appendix 1.**

Of significant interest to the Panel and the public are (i) safe storage of spent nuclear fuel so long as it remains on the Pilgrim site, (ii) ensuring that the Pilgrim site is properly cleaned and remediated, and (iii) the on-going status and sufficiency of the Decommissioning Trust Fund (DTF) and the process of accounting for monies contained therein during various phases of decommissioning, and how the costs of storing the dry casks of spent nuclear fuel could impact the fund.

The NRC has allowed Holtec and other nuclear power plant owners to use the DTF for spent fuel/dry cask storage management and site restoration costs. This is an expansion of the original intended use of the Fund that was limited to decommissioning costs, that is, the removal of radioactive implements and contamination on nuclear power plant sites. The expansion of use is considered necessary due to the failure of the U.S. to establish an approved, acceptable and safe for a million years long-term storage location for the materials.

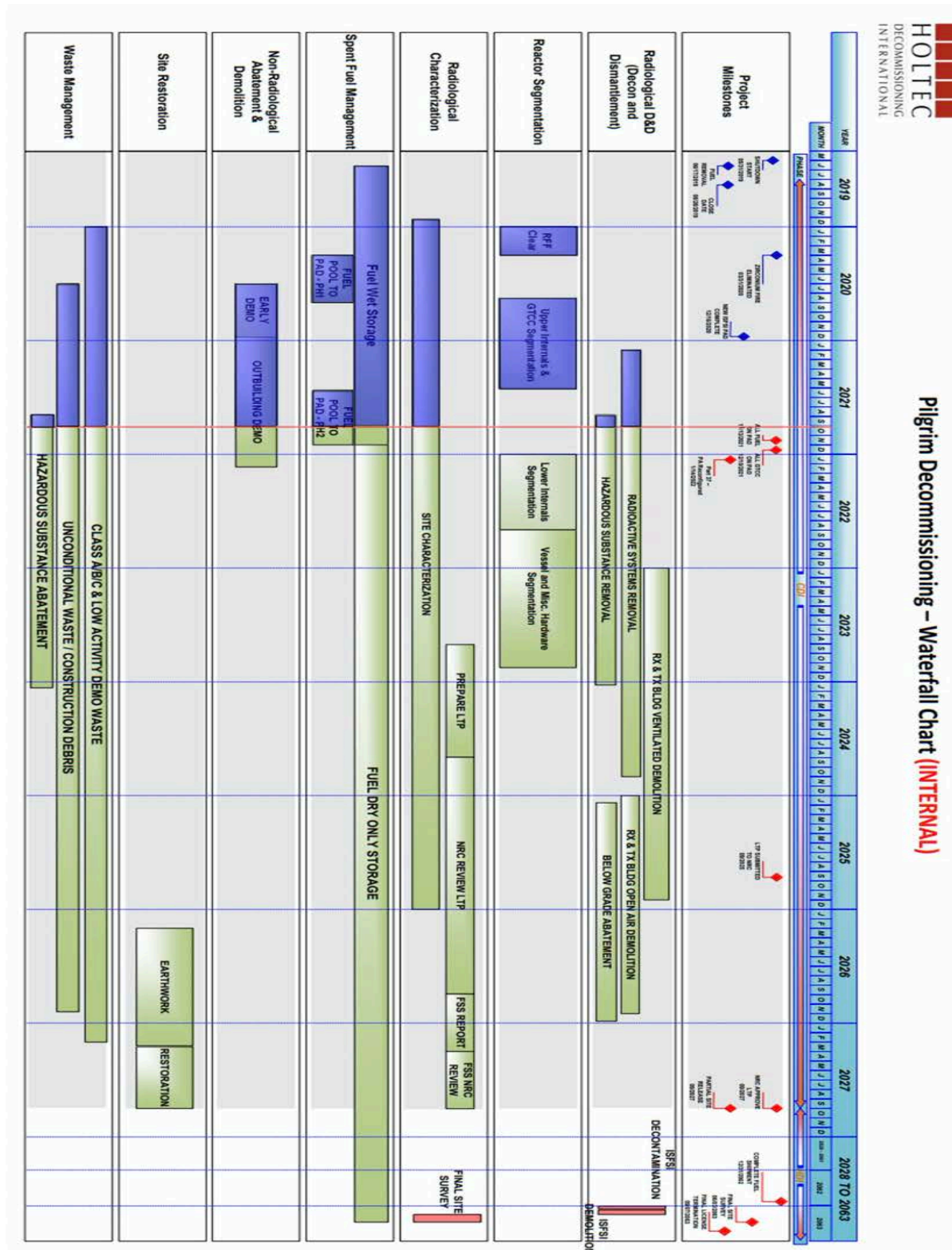
## MAJOR MILESTONES AND ACTIVITIES AT THE PILGRIM SITE AS REPORTED BY HOLTEC CDI

The two charts following, prepared by Holtec/CDI depict: first, the overall Pilgrim decommissioning schedule per the Holtec/CDI PSDAR; and second, the latest Holtec/CDI decommissioning milestone chart showing progress made as of November 22, 2021. The first chart, the PNPS Decommissioning Schedule, provides a project timeline that presents the general project schedule and milestones for decommissioning, including spent fuel storage and licensing.





The second schedule, below, depicts progress made during the period from September 2020 through September 2021. It summarizes major milestones associated with the schedule by month as reported by Holtec/CDI for the remainder of the annual reporting period through December 2021, with anticipated decommissioning tasks out to 2063.

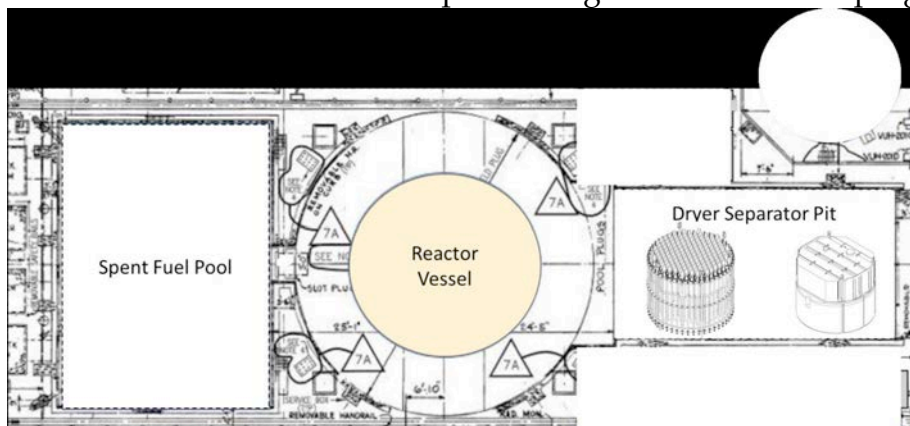


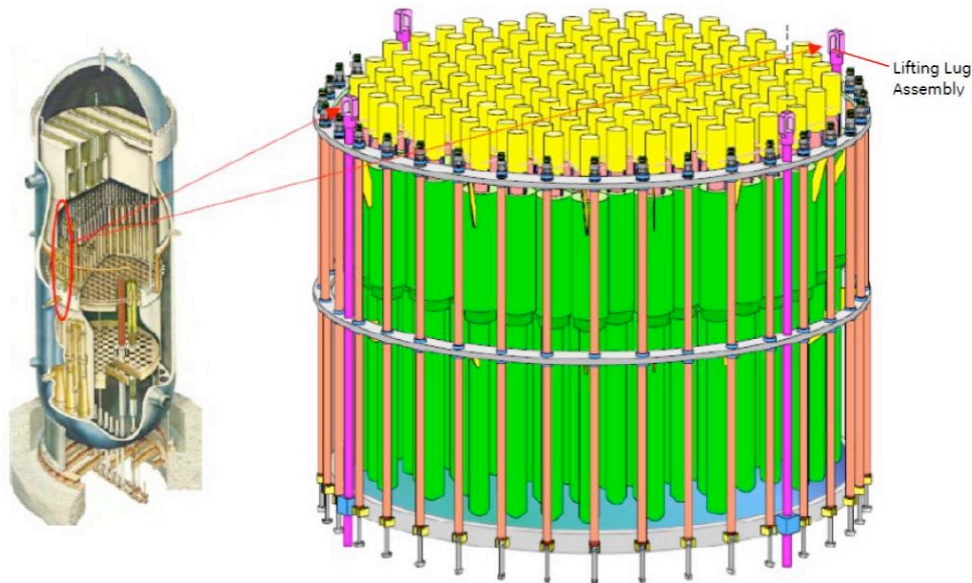
The following are key monthly decommissioning milestones as reported by Holtec/CDI during NDCAP meetings for the period:

September 2020: Preparation was underway for the reactor vessel internal segmentation along with Tooling installation in the dryer separator pit. All cutting was conducted underwater. Lessons learned from Oyster Creek and the industry nationwide was incorporated into the planning. Additionally, the Main Stack was prepared to be removed to accommodate the new upper ISFSI haul path from the lower protected area to allow for a path and fuel movement to new upper ISFSI pad. The 160' Met Tower is back up to the primary 220' tower and is no longer needed. Holtec worked closely with DEP and DPH on proposed work plan and permitting, with Town permits in hand. For Waste Management, Lego-like cement blocks were placed for temporary staging of contained Class B & C waste from Reactor Vessel internals before final disposition. In addition, the site of the Former S 110 buildings was demolished late Summer/ early Fall with completion finalized in the fourth quarter of 2020. Finally, HI STORM acquisition and placement preparations got underway for the Spring 2021 fuel campaign involving arrival Casks on site as well as concrete pours for dry cask storage underway.

November 2020: Work got underway for reactor vessel internal segmentation. Tooling was installed in the dryer separator pit, while flood up of the cavity completed two weeks ago, and cutting began. Again, lessons learned from Oyster Creek and the industry were incorporated in planning. The K1 Building was demolished. The Main Stack was removed to accommodate the new haul path and fuel movement to new upper ISFSI pad and the 160' Met Tower was demolished. Holtec closely coordinated with DEP and DPH on work plans and permitting. Demolition of the Change Shack and Gas Bottle Storage Area was completed to enhance site accessibility during Decom. Holtec also coordinated closely with Plymouth Fire department by conducting a drill on site. As a result of Panel questions regarding the Holtec cannisters, it was clarified that the dry storage system used at Pilgrim is the HI STORM 100 system. Its Warranty is 25 years for Design, Material, and Workmanship while as the owner of Pilgrim, Holtec is responsible to ensure cask performance and compliance with NRC regulations, regardless of any warranty length on the system.

January 2021: As part of reactor vessel internals segmentation, the Steam Dryer Segmentation was completed in December and the Steam Separator segmentation was in progress.





The Top Guide (GTCC) was scheduled for segmentation. The first of four Class A Waste boxes containing Steam Dryer segments was shipped to WCS in Texas on January 15 & 16. Class A Waste box shipments will continue through Q1 and Q2 2021. In the location of previously demolished S 110 Butler building location, Reactor Vessel Internals containing Class B/C Waste Staging Area was ready to receive containers. The Initial Staging was to begin in February 2021. The newly constructed upper ISFSI adjacent to Rocky Hill Road was completed and turned over to Holtec CDI. In addition, the new ISFSI Vehicle Barrier System was completed. Thirty-four Fuel Casks were to be loaded for the Final Fuel Campaign beginning in the Spring of 2021. A shared plan was developed with DEP for removal of twelve Soil Absorption Systems, part of the wastewater treatment system, to provide room for added perimeter plantings to screen the new ISFSI from Rocky Hill Road.

Planned Outbuilding & Tank Demolition for 2021 included:

- Exterior Storage Tank demolitions to include Fire Water Storage Tank (1 of 2) Q1 2021, Demin Tank (1 of 1) Q1 2021, and Condensate Storage Tank (2 of 2) Q2 2021.
- Condenser Bay to include Start Internal Demolition Q2 2021
- Hydraulic Control Unit removal from Reactor Building including Removal plan and Tagging Complete with East side HCU removal scheduled to be complete by 01/31
- Access Control Building involving relocation of people and equipment in progress, with reconnect of systems also in progress and building demolition in February
- Rigging Loft empty out complete, surveys complete, gapping complete and demolition scheduled for February
- Old Exec Admin Building empty out in progress, engineering structural analysis in progress, internal Demolition scheduled for Q1 2021 and external Demolition scheduled for Q2 2021

February 2021: Work continued on Separator, 154 Upper Riser Tubes Segmented, and Lower Riser Tube Segmentation was in Process. The Top Guide was ready For Segmentation once Separator is Complete. Work continued on waste box shipments to Texas through Q2, five containers shipped so far. Removed overhead 345kv Transmission lines from Main Transformer to the Switchyard. Work performed by Eversource safely and error-free.

Outbuilding & Tank Demolition work was in progress, to include:

- Exterior Storage Tank demolition to include Fire Water Storage Tank (1 of 2) – Q1 2021, Demin Tank (1 of 1) – Q1 2021, and Condensate Storage Tank (2 of 2) – Q2 2021
- Condenser Bay to include Internal Demolition – Q2 2021
- Hydraulic Control Unit removal from Reactor Building with East side HCU removal completed
- Access Control Building relocated people and equipment, survey and empty out completed and demolition scheduled for March 2021, pending permits
- Rigging Loft was emptied out, surveys were completed, gapping completed, and demolition scheduled for late February, pending permits
- Old Exec Admin Building was emptied out and demolition complete, engineering structural analysis was completed, with demolition scheduled for May, pending permits

March 2021: As part of reactor segmentation, the steam separator was completed, the top guide made ready for segmentation. Reactor vessel internal parts segmentation continued involving feedwater spargers, core spray piping and shroud repair assembly removal. The Rigging Loft was demolished and the Outbuilding & Tank demolition progress continued. Regarding Waste Shipping and Staging, the first B/C waste box was staged in designated waste area, seven Class A waste containers were shipped to Texas waste facility for disposal, shipping of refuel floor shield blocks was underway, cleaning out of old administrative areas for future demolition was accomplished, and scrap metal, rack, and cabinet removal from warehouse was in progress. The fuel campaign was initiated with plans for 2021 to fill thirty-four casks from the spent fuel pool, thus removing all fuel from the spent fuel pool, and preparation/mobilization to begin in May, fuel loading in June 2021, and all fuel from both the lower and upper pads and GTCC Containers scheduled to be on Upper Fuel Pad by January 2022.

May 2021: Demolition was completed on the Fire Water Storage Tank 'B', the Demin Water Tank Prepped for Demolition, and the Condensate Storage Tanks Scheduled for 3rd Qtr 2021. In terms of demolition and segmentation, the small trailer for the former Met Tower was demolished, the K-4 Building demo was scheduled for June Awaiting Permit, the Old Admin Building gapping was in progress, asbestos abatement scheduled for June, demolition in July, and for the Main Warehouse and O&M Building staff was relocated to the ESB, the RCA Checkpoint relocating inside building, the warehouse internals were ongoing, and security modifications were made to accommodate building removal. Additional work on reactor segmentation and demolition involved greater-than-class C waste (Top Guide, Mid-Core Shroud) staged for loading in Non-Fuel Waste Container after fuel campaign, the Jet-Pump Segmentation scheduled for August, and waste reduction work continued in the Dryer-



Separator Pit ahead of fuel campaign. Waste shipped to date included: 10 Class A Reactor Vessel Internal Shipments, 4 Dry Active Waste “C” Vans disposed, 36 Concrete Shield Blocks in transit on rail, five Type “B” containers loaded with Reactor Vessel Internal (B/C) Waste staged for shipping in Shielded Vaults, and Condenser Bay Internal Waste Shipments by truck-to-rail. Continued training and education was conducted for local communities at the request of Chiefs two days, both Kingston and Duxbury Fire received overviews and site tours, and the Plymouth County Technical Rescue Team scheduled later.



Map of Non-rad sample locations and exceedances from the ERM Amended Site Assessment 5/26/21

July 2021: Completed K-4 Building demolition. Next demolition scheduled for 2021:

- Access Building – 3rd Quarter
- Old Executive Admin Building – 3rd Quarter
- Main Warehouse – 3rd and 4th Quarter
- O&M Building – 4th Quarter
- Air-Off Gas Building – Gapping Underway
- South End of Turbine Building – Gapping Underway

Waste Reduction Work Continued in the Dryer-Separator Pit During Fuel Campaign – Separator Lower Riser Tube Crushing. Radioactive waste shipments scheduled this quarter:

- D & D Dry Active Waste – Low Activity rad waste – 4 x Seavans in rail transit to WCS COMPLETE
- Rx bldg. concrete shield blocks Rail shipment – off loaded at WCS COMPLETE
- Next Rail shipment for removal of remaining shield blocks
- Class B Resin shipment
- Class A Filter shipment
- Class A Reactor Segmentation shipments – Q1 2022

Shipped to Facility – WCS, Texas – To Date (2021):



- 10 x Type A container Rx Seg shipments (Class A waste) disposed
- 5 x DAW shipments (10 x 20' C Vans) disposed
- 36 x concrete shield blocks (6 x ~105-ton capacity gondolas)
- 3 x DAW with Asbestos containing material (3 x 40' C Vans)

September 2021: The 2021 Fuel Campaign continued with Cask 17 of 34 completed for this campaign, 45 of 62 total casks loaded. Cask 18 loading underway in pool while 14 Casks have been transported to the upper ISFSI pad. Fuel Campaign On-Track to be Completed in November as Scheduled, all HI-STORM 100 systems on site. Greater-than-Class C Non-fuel Waste Containers (2) on Schedule, to Follow Fuel Campaign in December. Regarding demolition, out building demolition planning (Projected Demolition) included:

- FFD/Medical Building - October/November
- Air Off Gas - Building Internals removed - October
- Stand by Emergency Power Diesel Building - November
- Old Exec Admin Building - November
- Main Warehouse - Demolition - December
- O&M Building - Demolition - December
- Two-Story Buter Building - January 2022

Segmentation complete on following:

- Shield Blocks and Drywell head
- CRDM removal
- Steam Dryer & Separator
- Feedwater spargers & Core spray piping
- Shroud repair assembly
- Top Guide (GTCC) - Staged for NFWC loading
- Upper Core Shroud Ring (B/C)
- Mid Core Shroud Ring (GTCC) - Staged for NFWC loading

Segmentation in vessel to include:

- Thermal Sleeve removal (GE developing tooling)
- Fuel Support Casting 10/07
- Instrument Dry Tube removal & plug installation
- Lower Core Plate vacuuming

Dryer Separator Pit (DSP) Activity included:

- Crush 154 Riser tubes - Through October
- Currently 29/ 154 completed.

Spent Fuel Pool racks demo:

- Packaging and disposal transport -after Loadout of GTCC

Radioactive Waste Shipments - 3rd Quarter:


- Rx bldg. concrete shield blocks Rail shipment - off loaded at WCS COMPLETE
- Rail shipment of remaining shield blocks COMPLETE
- Class B Resin shipment COMPLETE
- Class A Filter shipment - Q4 2021
- Class A Reactor Segmentation shipments - Q1 2022

Shipped to Facility – WCS, Texas – To Date (2021):


- 10 x Type A container Rx Seg shipments (Class A waste) disposed
- 11 x DAW shipments (22 x 20' C Vans) disposed
- 49 x concrete shield blocks (9 x ~105-ton capacity gondolas) 3 x DAW with Asbestos containing material (3 x 40' C Vans)


Site Assessment continued with collection of soil samples and installation of seven (7) new groundwater wells on Main Parcel. In the Licensed perimeter area four new groundwater wells with installed and soil samples and water samples were also collected.

### November 2021:



- Cask 31 of 34 completed for this campaign, 59 of 62 total casks loaded
- Cask loading will resume after the Thanksgiving Holiday
- 47 Casks have been transported to the upper ISFSI pad
- Fuel Campaign On-Track to be Completed by December 10, all HI-STORM 100 systems on site
- Greater-than-Class C Non-fuel Waste Containers (3) on Schedule, to Follow Fuel Campaign





- Out Buildings including Medical Building and O&M demolition planned for early December, and the old Exec Admin building and the Two-story Butler building abatement and demo planned for early 2022
- Reactor segmentation completed include the shield blocks, removal of the CRDM, steam dryer & separator, feedwater spargers and core spray piping, Shroud repair assembly and Ring, and GTCC Top Guide and Mid Core Shroud staged for loading off-site. Characterization of fuel support castings completed
- In Vessel lower plate vacuuming in process, plug installation following instrument tube removal and development of tooling by GE for Thermal Sleeve removal underway
- 95 of 154 Riser tube were crushed and boxed to B/C waste
- Spent Fuel pool racks to be packaged for off-site disposal following removal of GTCC waste

### Environmental

Holtec reported a violation of its NPDES Permit to EPA and DEP following the release of 7250 gallons of rain and groundwater from an underground cable vault to a storm sewer. This was the result of storm flooding an electrical vault being worked on in a building. No apparent sheen or visible contamination was evident. Testing is being performed.

Radiological Draft Report for the sampling and analysis for Q4, 2021 was being reviewed. All drilling for new wells was complete and development was 80% complete. All sampling was completed

### Staffing

A job fair was held on November 16 in anticipation of staffing reduction coming in January, 2022.

## **NUCLEAR DECOMMISSIONING TRUST FUND BALANCE REPORTED BY HOLTEC/CDI IN MARCH 2021**

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On March 31, 2021, Holtec Decommissioning International Reported on the Status of Decommissioning Funding for Reactors and Independent Spent Fuel Storage Installations. Actual costs and re-imbursements are from August 27, 2019-December 31, 2020. The Nuclear Decommissioning Trust (NDT) fund balance on December 31, 2020 was (\$881 million). Also included was an estimate of remaining costs to decommission Pilgrim from January 1, 2020 through final license termination targeted for 2063 (including spent fuel management and site restoration costs). Finally, a revised milestone schedule reflecting work completed and schedule for remaining work was included.

Pilgrim decommissioning cost and schedule impacts included:

- Schedule improvement in the fuel on pad date
- Optimization of work activities – focused on efficiency and effectiveness
  - Site security modifications enhancing site security and also reducing unnecessary expenses
  - Accomplishing demolition of non-rad impacted structures
  - Pulling up critical demolition planning, prep, building cleanout etc.
  - Established a waste disposal contract to improve dismantlement, demolition and waste disposal efficiency and lower overall decommissioning estimated costs

Increased 2020 actual costs are offset by efficiencies and subsequent decreases in cost estimates for later years.

## Current Decommissioning Fund Balance

The Pilgrim Nuclear Decommissioning Trust fund balance as of December 31, 2020 was \$881M. This amount represents the market value of the fund as of December 31, 2020 net of any material current income tax liability on realized gains, interest, dividends and other income of the trust. No additional amounts remain to be collected. The trust fund amount is the total available for decommissioning including costs of license termination, decommissioning, spent fuel management, and site restoration activities. HDI received an exemption from 10 CFR 50.82(a)(8)(i)(A) to allow the Pilgrim Trust fund to be used for site spent fuel management and site restoration costs.<sup>3</sup>

The current detailed site-specific Independent Spent Fuel Storage Installation (ISFSI) decommissioning cost estimate is \$4.324M (2020 dollars). The ISFSI estimated costs are based on the estimated costs provided in the HDI Revised PSDAR/DCE.

The following graphic shows the total estimated decommissioning cost to completion for Pilgrim, an additional chart is provided in Appendix #2

Total Estimate to Complete Decommissioning (Millions of Dollars)						
Including Actual Expenditures						
	2020 Submission			2021 Submission		
	Actual Costs Transition to 12/31/2019	Estimate to Complete 1/1/2020 to Final License Termination	Total Decommissioning Cost Estimate including Actual Expenditures to date	Actual Costs Transition to 12/31/2019	Estimate to Complete 1/1/2020 to Final License Termination	Total Decommissioning Cost Estimate including Actual Expenditures to date
<b>Pilgrim</b>	101	1031	1132	277	824	1101

## NUCLEAR FUEL CAMPAIGN

### Current State of Rad Waste at Pilgrim

#### Spent Nuclear Fuel

On December 9, 2021 the final fuel assembly from the spent fuel pool was loaded into the last Muti-Purpose Canister. This MPC was loaded into the Hi-Storm dry cask for transport up the haul path to the new, upper Independent Spent Fuel Storage (ISFSI) pad on Monday December 13, 2021, successfully completing the 2-year fuel campaign. All of the 4,114 fuel

<sup>3</sup> <https://www.nrc.gov/docs/ML1919/ML19192A086.pdf>

assemblies used at Pilgrim since operation began in 1972 are stored in 62 Holtec HI-Storm 100 systems.

## Waste Transportation and Handling

In addition to the fuel campaign, other portions of contaminated building materials were packaged following dismantling, and were shipped off-site by truck and rail.

Summarized below and in the table at right materials were sent to the Facility operated by Waste Control Specialists WCS, Texas – To Date (2021)

- 10 x Type A container Rx Seg shipments (Class A waste) disposed
- 14 x DAW shipments (28 x 20' C Vans) disposed
- 49 x concrete shield blocks (9 x ~105-ton capacity gondolas)
- 3 x DAW with asbestos containing material (3 x 40' C Vans)

Month	Weight, lbs	Disposal, ft3
January	27,852	2,651
February	51,434	3,711
March	427,208	3,393
April	623,431	4,735
May	181,242	11,189
June	75,780	5,683
July	65,180	5,828
August	561,910	6,522
September	77,850	4,831
October	39,057	3,464
November	54,308	4,004
December (to date)	36,619	4,800+
YTD	2,221,867	60,806

## CURRENT ISFSI SITE STATUS

The transfer of SNF to the ISFSI was critical to keeping the Pilgrim decommissioning project on schedule. From the beginning of operations in 1972, spent fuel was stored in the spent fuel pool (SFP), inside of the reactor building, until Pilgrim ceased operating at the end of May, 2019 and the fuel met the dry storage criteria for time in the pool. During 2020 and early 2021 fuel assemblies were packaged and moved to the lower ISFSI. (map below) Segmenting, removing and packaging the Reactor Vessel Internals (RVI) and Reactor Presser Vessel (RPV) was also critical to keeping the project on schedule. The RVI highly activated core grid segments are expected to generate most of the GTCC waste. The



Holtec/CDI decommissioning approach was to segment the RVI and RPV in parallel with the spent fuel cooling period, to shorten the overall decommissioning schedule.

To accommodate fuel movement from the pool to the ISFSI, the RVI and RPV segmentation were performed in two (2) phases. The first phase started shortly after the license transfer and included segmenting and packaging the highly activated core grid segments into the dry storage casks used for GTCC waste. When the spent fuel cooling period was met, the packaging and transfer of spent fuel from the SFP to the lower ISFSI began. Following completion of the spent fuel to dry storage movement, the RVI segmentation resumed, followed by RPV segmentation. The GTCC waste generated during segmentation activities were placed in dry storage canisters and transported away from the reactor building and stored at the ISFSI.

During the fuel campaign conducted between 2020 and 2021 the lower ISFSI pad within the existing Protected Area had seventeen (17) loaded Holtec System 100 Multi-Purpose Canisters (MPCs), almost all with 68 fuel assemblies (1,156 total), from the previous year. Once the uphill pad was completed in the summer of 2021, all the casks, including the 17 currently loaded casks on the lower ISFSI, were moved to the new, uphill ISFSI. The finished ISFSI contains a total of 4,114 spent fuel assemblies placed in a total of 62 casks. The GTCC waste will be stored in at least 2 additional canisters.

**The Pilgrim Site Plan** (next page) shows the site with the original ISFSI pad within the protected area, along with the upper ISFSI before construction during 2020-2021.

The overall plan for the upper ISFSI on Rocky Hill Road is shown in the second image, below the 2019 site plan. Rocky Hill Road is shown on the left, running along the tree line; the septic field is in the lawn area; the wastewater plant are the buildings at the top toward the right. The ISFSI is surrounded by concrete vehicle barrier about 4ft high and includes the dark green security building and circular casks on the Pad, over what is the former helicopter landing spot. The fine borderlines are the double chain-link security fence. The Training and observation building is on the bottom right of the illustration.

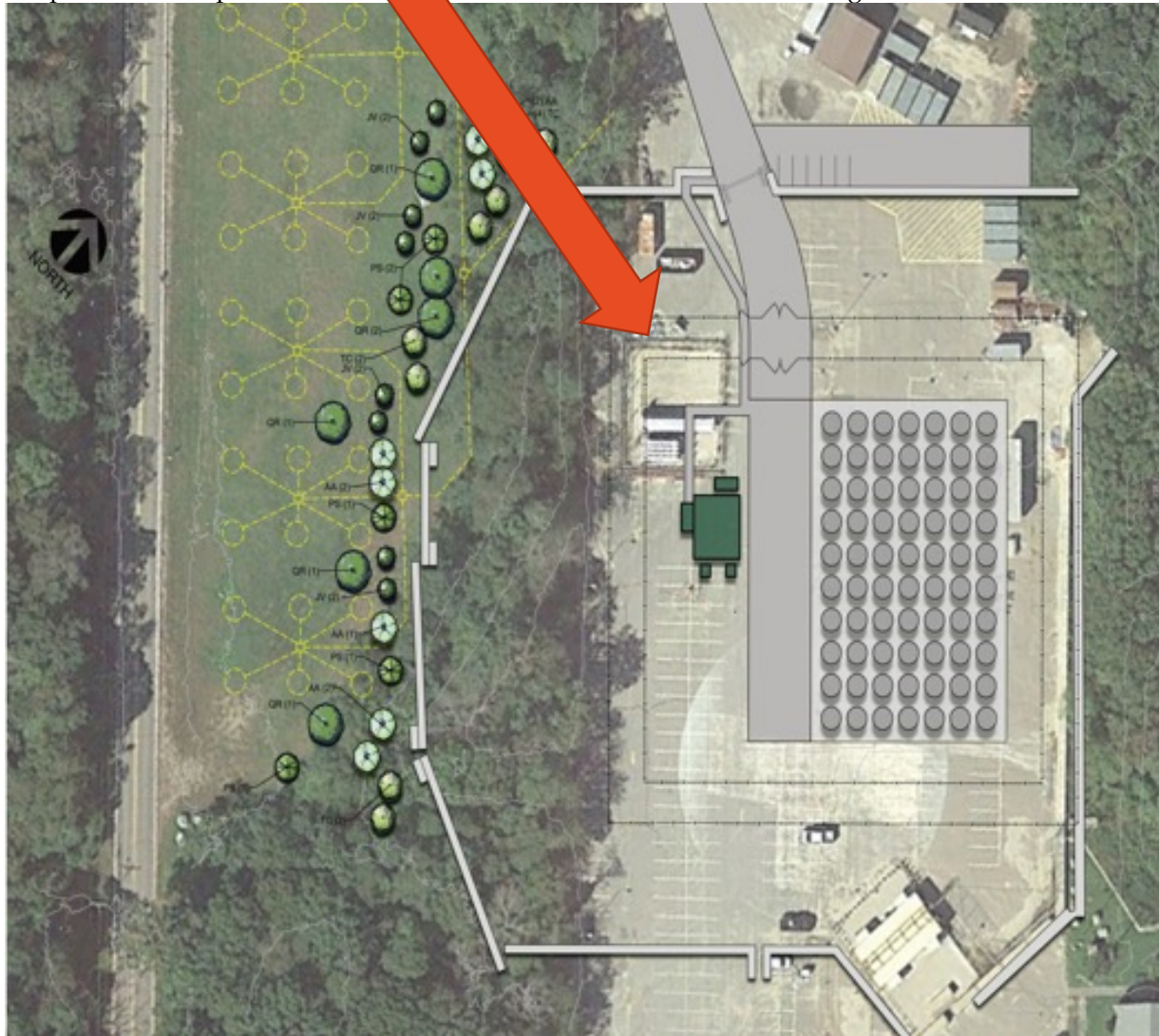
The final fuel campaign began in Spring 2021 and was complete December 13, 2021.

The former lower ISFSI inside the Plant Protected Area was located 8 m (25.5 feet) above mean sea level, ~200 feet from shore and barely above today's flood zone. The new ISFSI adjacent to Rocky Hill Road is located 23 m (75 feet) above mean sea level, and approximately 500 feet from the coast.



Proposed Landscape Plan, below

Above: Google Earth 2020



## **PUBLIC CONCERNS ABOUT THE ISFSI**

Holtec's exterior storage ISFSI facility will contain thousands of tons of the most toxic, long lasting, nasty substance on earth, using manufactured dry casks which will be stored in Plymouth, MA for an unknown period of time unless a repository elsewhere is identified and transportation issues resolved. The NDCAP has reviewed and citizens have expressed concerns over the following issues relative to nuclear waste storage in Plymouth:

- The NRC seems relatively reluctant to provide meaningful oversight. The NRC only licenses and approves acceptable storage casks, not the location of spent nuclear spent fuel on site. Off-site nuclear waste storage is governed by the US Department of Energy (DOE), including transportation. Holtec taps the DTF for expenses relative to ISFSI management.
- Cask design, durability and methods for long term storage have been questioned as severely deficient by members of the public, and various organizations.
  - There is general concern about containment of radioactivity,
  - what constitutes adequate monitoring, instantaneously, including accident analysis, aging management program associated with dry casks, and comprehensive monitoring of the ISFSI over time.
  - The NDCAP has not heard directly from DOE about this issue in the past year
- There remains concern that Holtec warranty for the casks is limited, unsecured and insufficient over the expected time of the ISFSI residing in Plymouth which Holtec has scheduled to end in 2063, but which could be much longer. In response, Holtec maintains that because it is the manufacturer of the casks, the owner of Pilgrim, and in the business of dry cask storage, it will always be responsible for the integrity of the casks. Panel members and the public have questioned this and are troubled by the absence of an approved viable alternative plan, especially if the DTF becomes exhausted.
- Current plans indicate that Holtec will do the inspecting, monitoring, or repairing of casks/canisters for the duration of storage. At present, this inspection and monitoring will be accomplished by onsite security personnel using manual monitoring means.
- While there is research and various technological advances, there is no standard for monitoring, inspecting, or approved method for repairing cracked casks at any known level of oversight.
- The new ISFSI storage site adjacent to Rocky Hill Road is being secured using some of the most effective security technologies and devices known. The day to day issues associated with a high security site manned by a full time 24/7 security force troubles some public that believe these security forces will have little capability other than to monitor, report and defend against an on-site attack, an accident, or detection of radiological problems. Cask monitoring functions will require regular patrols within the cask staging pad, and there is concern that severe weather and other impediments will degrade the monitoring capability intended in the ISFSI design.
- No interim or long-term storage site has final approval that would allow high level waste from Pilgrim to be moved to designated federally licensed nuclear waste repository. Late in 2021, DOE announced another effort to locate a consent-based nuclear waste storage site.



- In 2020, the NRC continued its regulatory review of ISFSI Security intending new Rulemaking to cover dry cask storage both inside and outside of security perimeters at the Nation's nuclear stations. The proposed new rules will establish a risk-informed and performance-based structure to update security regulations based on comments from the industry and the public to change from its "design basis threat" (DBT) for radiological sabotage to a dose-based approach. This issue can be followed on the NRC website: <https://www.nrc.gov/about-nrc/radiation/related-info/isfsi-security.html>
- The DTF (decommissioning trust fund) is the only source of funds for the decommissioning and clean-up of the Pilgrim site. The Settlement Agreement between the State AG and Holtec addresses many concerns regarding who will be responsible, and for how long, if the DTF is exhausted before release of the site occurs.

## INTERAGENCY WORKING GROUP (IWG) UPDATE

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Since 2018, the Baker-Polito Administration, through the Executive Office of Energy and Environmental Affairs, has led an interagency work group (IWG) consisting of all relevant state agencies involved in the Pilgrim decommissioning effort. The IWG was formed to provide technical assistance to the Massachusetts Attorney General's (AG's) office and to keep the public apprised of developments through the Nuclear Decommissioning Citizen Advisory Panel (NDCAP) established by Section 14 of Chapter 188 of the Acts of 2016. On June 17, 2020, the AG's office and Administration reached a Settlement Agreement (Agreement) with Holtec Pilgrim, LLC, and Holtec Decommissioning International LLC (Holtec) to resolve a petition the Commonwealth filed with the Nuclear Regulatory Commission (NRC) to challenge an application to transfer Pilgrim's federal license from Entergy Nuclear Operations, Inc., and Entergy Nuclear Generation Company to Holtec. The Agreement also resolved two lawsuits the Commonwealth filed (September 2019 and January 2020) to challenge the NRC's approval of the license transfer application, and several administrative challenges Holtec filed to challenge conditions in the January 2020 state water quality discharge permit for the plant. During this reporting period (September 2020 to December 2021), the IWG worked closely with the NDCAP to further decommissioning efforts in accordance with the Agreement and played a significant role in monitoring and assessing the Site Assessment and Characterization efforts of Holtec and its contractors from ERM. Here is a link to the Agreement:

<https://www.mass.gov/doc/pilgrim-settlement-agreement/download>

### Financial Assurances

The Agreement establishes a robust set of financial assurances and related reporting mechanisms to ensure that sufficient funds will be available to safely dismantle the nuclear power plant, clean up radiological and non-radiological contamination, restore the site, and manage spent nuclear fuel onsite until it is transported out of the state. Under the terms of the Agreement, Holtec must maintain at least \$193 million in funds until it completes most of the cleanup and site restoration work and, after that point, \$38.4 million in funds until the spent

nuclear fuel is removed from the site. The \$193 million will ensure funds are available to cover future cost increases and unforeseen contingencies such as project delays and contamination identified as the decommissioning proceeds, and the \$38.4 million will ensure that funds are available to cover the costs to transport the spent nuclear fuel out of state and clean up the land where the spent nuclear fuel will be stored. Holtec is also required to obtain \$30 million in pollution liability insurance and secure performance bonds for certain contracts. The Agreement requires Holtec to provide monthly reports to the state in order to monitor the progress of the work at the plant and to foresee any financial issues.

### **Cleanup Requirements**

The Agreement requires Holtec to comply with the Massachusetts Department of Public Health (DPH) and the Massachusetts Department of Environmental Protection (MassDEP) strict cleanup standards when it comes to radiological and non-radiological oil and hazardous materials. This includes oil and polychlorinated biphenyl (PCBs) from previous plant operations and asbestos in structures to be demolished at the site. MassDEP and DPH are overseeing the cleanup work to ensure that public health and environment are protected.

To advance the cleanup work, the Agreement required Holtec to submit to DPH and MassDEP an initial environmental site assessment (ESA) of the property to determine the types of contamination that exist at the property and where any contamination may be located. Holtec submitted an amended ESA in May of 2021. DPH and MassDEP have reviewed the amended ESA and will be providing comment on that document through the Attorney General's Office. These DPH and MassDEP comments will be incorporated into an ESA Report. As DPH and MassDEP have discussed with Holtec, the environmental assessment is an iterative process that will continue throughout the decommissioning of the facility. Using DPH and MassDEP comments, the next version of the ESA will establish clear guidelines for the demolition, removal and decontamination of structures, including radiologically contaminated structures at the site. To aid in that effort, the Agreement secures future funding for DPH so that it can continue environmental radiological monitoring outside of the plant's boundary. The Agreement ensures that the property is cleaned up to a level that will allow for its future unrestricted reuse to benefit surrounding local communities, including the Town of Plymouth. During this reporting period (September 2020 to December 2021), MassDEP issued a Notice of Responsibility (NOR) to Holtec in relation to a release of PFAS and other contaminants at the former Pilgrim nuclear plant, and a Notice of Non-Compliance (NON) in relation to regulatory violations during asbestos abatement work at the former Pilgrim nuclear plant. MassDEP has coordinated with Holtec on appropriate response actions. The AG's office also sent Holtec a letter of non-compliance with paragraph 24 of the Agreement, which required Holtec to undertake commercially reasonable efforts to evaluate the barge shipment of solid, hazardous and low-level radioactive waste and, in any event, to submit a radioactive waste management plan for review and approval by MEMA, DPH, and DEP. State agencies are reviewing Holtec's response to the non-compliance letter.

### **Public Safety**

The Agreement includes specific emergency preparedness requirements to protect the public in the event of a radiological emergency at the site. To further those requirements, the



Massachusetts Emergency Management Agency (MEMA) will receive continued funding each year to perform the necessary emergency preparedness functions until the risks are decreased. Without the Agreement, most of the existing emergency preparedness requirements and related funding for MEMA would have been eliminated because the NRC determined that the facility is exempt from federal emergency planning requirements and eliminated the requirement to maintain a ten-mile emergency planning zone (EPZ) around the site perimeter. To further enhance public safety, the Agreement also requires Holtec to implement cybersecurity measures to limit threats that could compromise plant systems designed to safely secure plant assets such as the spent nuclear fuel that will remain stored onsite. These requirements are not currently required by the NRC. During this reporting period (September 2020 to December 2021), MEMA continued to meet regularly with local public safety officials to coordinate emergency preparedness requirements of the Agreement.

## **PILGRIM SITE ASSESSMENT & CHARACTERIZATION**

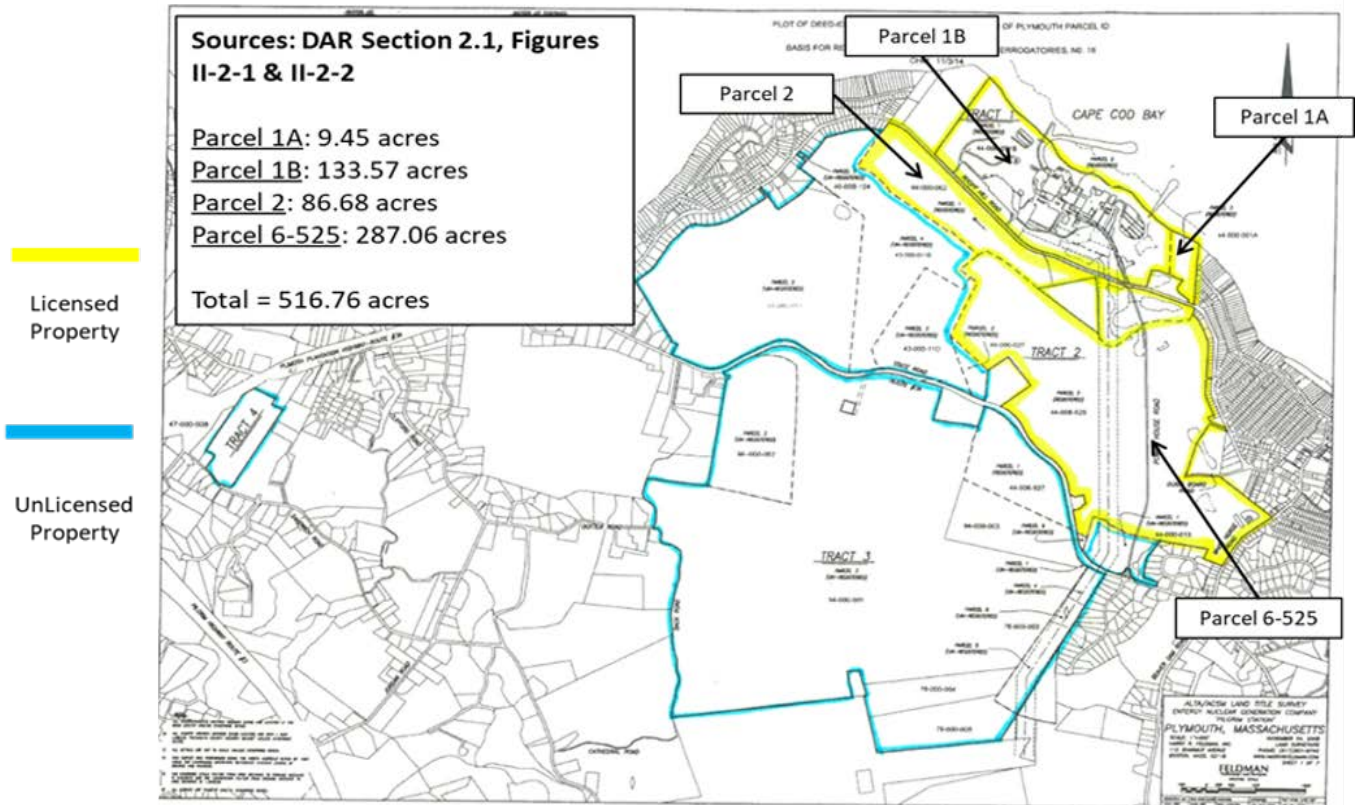
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The Purpose of Site Characterization effort is to identify what residual contaminants, both radiological and non-radiological, reside in groundwater, soil, and other surfaces based on facility activities that may need remediation when compared to appropriate state and federal standards. The Environmental Site Assessment (ESA) Work Plan, as defined in the Settlement Agreement Between the Commonwealth of Massachusetts and Holtec Pilgrim, LLC and Holtec Decommissioning International, LLC regarding the Pilgrim Nuclear Power station, Plymouth Massachusetts dated June 16, 2020, was developed using applicable federal and Commonwealth of Massachusetts requirements and guidance including:

- NRC NUREG 1575 MARSSIM (Multi-Agency Radiation Survey and Site Investigation Manual)
- US EPA Toxic Substance Control Act (TSCA) 40 CFR 761
- Resource Conservation and Recovery Act (RCRA)
- Massachusetts Contingent Plan (MCP) 310 CMR 40.0000
- Massachusetts Department of Environmental Protection (MDEP) regulations

The characterization process needs to be comprehensive and thorough to determine risks, define nature and extent of contamination, and select proper methods for abatement/remediation. This information: supports the strategy of Prompt DECON (with the current schedule predicting Partial Site Release in September 2027), provides input to the License Termination Plan (LTP), and Final Status Survey (FSS) development and implementation and a Permanent Solution Statement. The process is iterative in that all data received supports future planning and execution of activities.

The initial phases of Site Characterization are intended to screen the 516.76 acres of facility's licensed property (Parcels 1A, 1B, 2, and 6-525) for radiological and non-radiological impacts.



In October 2020, Holtec Decommissioning International's Licensed Site Professional (LSP), Environmental Resource Management (ERM) submitted an initial Environmental Site Assessment Work Plan which included a commitment to amend the plan based on initial surface, soil, and groundwater sampling and analysis of the facility industrial area (Parcel 1B) that was in progress at that time. This "Phase 1" sampling and analysis were completed in December 2020. Phase 1 identified no radiologically reportable conditions based on federal and state requirements and no unexpected indications. These samples identified the following Massachusetts Contingency Plan (MCP) non-radiological Reportable Conditions that were reported to the MassDEP in April of 2021.

Media	Compound	RCGW-1	Exceedance	Location
Groundwater	PFAS6	20 ng/L	37.66 ng/L	MW-201
	PFAS6	20 ng/L	32.03 ng/L	HA-6
	Arsenic	0.01 mg/L	0.013 mg/L	MW-216
	Arsenic	0.01 mg/L	0.02 mg/L	DP0603
	Arsenic	0.01 mg/L	0.035 mg/L	DP0604
	Arsenic	0.01 mg/L	0.032 mg/L	DP0616
	Vanadium	0.03 mg/L	0.0366 mg/L	HA-6
	Vanadium	0.03 mg/L	0.123 mg/L	DP0603
	Vanadium	0.03 mg/L	0.245 mg/L	DP0604
	Vanadium	0.03 mg/L	0.128 mg/L	DP0616
	Lead	0.01 mg/L	<0.01 mg/L	MW-4R
	Lead	0.01 mg/L	0.102 mg/L	DP0603
	Lead	0.01 mg/L	0.227 mg/L	DP0604
	Lead	0.01 mg/L	0.014 mg/L	DP0605
	Lead	0.01 mg/L	0.265 mg/L	DP0619
	Antimony	0.01 mg/L	<0.04 mg/L	DP0619
	Beryllium	0.004 mg/L	0.0057 mg/L	DP0603
	Beryllium	0.004 mg/L	0.0186 mg/L	DP0604
	Beryllium	0.004 mg/L	0.009 mg/L	DP0619
	Cadmium	0.004 mg/L	0.007 mg/L	DP0604
	Cadmium	0.004 mg/L	0.005 mg/L	DP0619
	Cadmium	0.004 mg/L	<0.004 mg/L	DP0603
	Cadmium	0.004 mg/L	<0.004 mg/L	DP0605
	Nickel	0.1 mg/L	0.187 mg/L	DP0604
	Nickel	0.1 mg/L	0.114 mg/L	DP0619
	Thallium	0.002 mg/L	0.0029 mg/L	DP0604
	Thallium	0.002 mg/L	<0.01 mg/L	DP0619
Soil	Perfluorodecanoic acid (PFDA)	0.0003 mg/kg	<0.000933 mg/kg	DP0105
	Perfluoroheptanoic acid (PFHpA)	0.0005 mg/kg	<0.000933 mg/kg	DP0105
	Perfluorohexanesulfonic acid (PFHxS)	0.0003 mg/kg	<0.000933 mg/kg	DP0105
	Perfluorononanoic Acid (PFNA)	0.00032 mg/kg	<0.000933 mg/kg	DP0105
	Perfluorooctanoic Acid (PFOA)	0.00072 mg/kg	<0.000933 mg/kg	DP0105

The Amended Environmental Site Assessment Work Plan was submitted to the Commonwealth on May 28, 2021 which included provisions for additional non-radiological samples (Phase 1A) in the Parcel 1B industrial area to support additional analysis and understanding of the Phase 1 results and to perform initial radiological and non-radiological scoping in Parcels 1A, 2, and 6-525 (Phase 2). The Phase 2 radiological sampling was completed in August. The Phases 1A and 2 non-radiological sampling activities were completed in November. Effective December 23, 2021, Phases 1A and 2 results are under review by the licensee and LSP.

LSP assessment is that the Pilgrim site, at this early stage of characterization, indicates only low levels of non-radiological contaminants compared to other similar industrial facilities. Discovery and assessment will continue as on-site building and structures are removed.

## Appendix 1

### MEETING HIGHLIGHTS (FROM NDCAP MINUTES)

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The following Meeting Highlights are taken from the Meeting Minutes section of the NDCAP web site: <https://www.mass.gov/orgs/nuclear-decommissioning-citizens-advisory-panel>

#### September 2020 Meeting

The Vice Chair read from a letter from Secretary Kathleen Theoharides responding to requests made by the NDCAP in 2020 for additional resources to assist with oversight of Pilgrim decommissioning. The Secretary states that the Executive Office of Energy and Environmental Affairs (EEA) will continue to support the NDCAP website and take minutes for NDCAP meetings, however, there is no funding available for the NDCAP. Further she states that the interagency working group (IWG) will continue to work with NDCAP and respond to requests for information as appropriate.

**DECOMMISSIONING UPDATE:** Holtec’s representative provided a 20-minute overview of project activities at the Pilgrim. A power point presentation was shown. The presentation was preceded by the representative indicating that Holtec/CDI is working through Pilgrim site characterization and has finished the fuel campaign with all 11 casks loaded, and with 28 total in the lower pad. The next fuel campaign will begin in spring 2021, when fuel will be moved from the current pad to the upper pad. NDCAP members asked about whether monitoring data will be made available. Holtec commented that the settlement agreement allows for demolition of towers while decommissioning is ongoing. He agreed it would be appropriate to characterize the waste and appropriately dispose of it. Demo of the monitoring tower is one of the first substantial demolition projects that will happen, so the state intends to work with Holtec to determine how the tower will come down and how waste will be characterized and monitored once it comes down. Further discussion followed regarding the storage and handling of waste. Holtec stated that there are approved containers to be used. There are movable blocks that have caps on the top to shield the containers from radiation. The current demo phase is to get out in front of the demolition activity so that the state can use this relatively low-risk demolition activity to “test drive” the pre-characterization of demolition activities, including monitoring and screening for waste deposition.

Regarding the haul road and other structures, Holtec stated that the new pad site is done and that the security building is in process, as well as the ground around the security building. Holtec committed to completion of a visual wall and is also considering options to remove portions of the wastewater treatment facility (leaching pits) to provide more room to allow planting further away from the wall.



**INTERAGENCY WORKING GROUP (“IWG”) UPDATE:** Mr. Johnston indicated that the state met with CDI in August under the settlement agreement. Subsequent to the meeting, Mr. Priest and Mr. Johnston have continued to coordinate including meeting on site and going over plans and additional site visit to discuss the vehicle barrier. The next deliverable is the site assessment plan due on Oct 14. MEMA will reconvene the Pilgrim working groups on public safety, meeting quarterly beginning on October 21. This will revolve around emergency management planning. DPU was able to confirm that there were no conditions on the sale of the Pilgrim plant to Holtec from its predecessor, Entergy, which would outlast the transaction. There is currently no regulatory authority at DPU because Holtec is not an energy generating company. A question was asked about the switch yard on the site, which was transferred or sold to Eversource, specifically asked how this structure fits into the state’s oversight since it will not be taken down. Mr. Johnston indicated that the switch yard still plays a role for the electric grid. The parties acknowledged in the settlement agreement that Holtec CDI had leased equipment out to a third party.

**PUBLIC COMMENT AND QUESTIONS:** A question was asked whether the casks will be made weapon proof, and whether Holtec would be prohibited from transporting waste to the southwest because of the risks of travel. Holtec responded that casks are made of NRC approved designs. Testing involved shots fired at the casks. Holtec responded to a procurement (RFP) to do consolidated interim storage. A competitor is considering a site in Texas. Should one of these options come to fruition, Holtec would move the fuel. Another commenter (Diane Turco) noted that the Governor of New Mexico has rejected the proposal for interim storage, and gathered over 30,000 signatures from citizens indicating that they do not want waste stored there. There is no consent to site waste in New Mexico, meaning that it will stay in MA for a long time. The commenter asked how Holtec is monitoring for leaks. Holtec commented that there are daily checks by operations of canister integrity. The settlement agreement with the state also requires monitoring to be in place. Mr. Priest confirmed that there are daily temperature checks provided to MEMA, which would be indicative of problems with the casks. DPH has no concerns about how Holtec is performing monitoring for dry casks currently. A commenter asked about the role of this panel. He noted that the panel already has a “repository” in the form of the NDCAP website. The commenter requested that the website contain significant materials that are provided by the public. Another commenter noted that the role of the panel is clear; it is to talk about the decommissioning process. The initial site assessment plan is due on October 14. After that, the state will make recommendations and then Holtec has 30 days to put the plan into place. This is the most important topic for the next meeting. Another commented that the question is how this panel would get information that it needs to be able to inform the Governor and the public that there has been a full and complete site assessment and that what has been done by the licensee complies with the requirements of the June 16 agreement. The Lamperts sent a 11-page memorandum about what the settlement requires and what has to be done for site assessment. He (James L.) believes the panel is unable to understand the settlement based on the short reports received at NDCAP meetings.



## October 2020 Meeting

**ISO-NE REGIONAL UPDATE:** Mr. Eric Johnson, Director of External Affairs for ISO New England, attended to give a presentation on the ISO-NE regional grid. Mr. Johnson discussed the system fuel mix, the role of the ISO, and transmission issues. A power point presentation was shown. ISO-NE's authority is derived from the Federal Energy Regulatory Commission

(FERC). Mr. Johnson explained that ISO's responsibility is to be the reliability coordinator under the North American Electric Reliability Corp., independent of all companies participating in energy markets; also, he explained that ISO is neutral when it comes to technologies. ISO does not own any generation or transmission assets. A question was asked whether the high voltage line from Pilgrim is still being used. Mr. Johnson stated that lines continue to be operated by transmission owners and are still providing a pathway for energy to move around the region, they are just not taking injections from a retired plant.

**DECOMMISSIONING UPDATE:** Holtec provided a monthly update of project activities at Pilgrim which showed the schedule for project activities. He explained that his team is working through site characterization and will have a report due at the end of March 2021. They are also working through the protected areas (PA) construction for the ISFSI pad, which is scheduled to be done in December. He also explained that his team is about to start segmentation of the reactor vessel internals greater than Class C. They are also working on waste management.

**INTERAGENCY WORKING GROUP ("IWG") UPDATE:** Mr. Johnston provided an update on the vehicle barrier and the Oct 14 site assessment. Mr. Paul Locke, DEP Assistant Commissioner of the Bureau of Waste Site Cleanup, attended as a guest. Mr. Johnston stated that many people at DEP are supporting the decommissioning work being done. Mr. Locke's program is focused on the cleanup and release of oil/hazardous materials. This is a well-developed program which has been in place for several decades and addresses predominantly non-radioactive material. As further updates, Mr. Johnston stated that Holtec has been providing information for various proposals for the visual screening/vehicle barrier. Holtec is working with DEP to strike a balance between robustness of planting with maintaining the functioning of the soil absorption system.

**PUBLIC COMMENT AND QUESTIONS:** James Lampert, an audience member, had several comments. Mr. Lampert's first comment was about the initial site assessment plan. He noted the report released today is heavily based on what the HSA says and is not sure if the HSA deals with all issues. If there are high level radio nuclides in Duxbury and parts of Plymouth, there needs to be more sampling in a larger area than the plant itself. Diane Turco asked Mr. O'Brien whether the aging management plan was received from the

NRC. Turco wrapped up her comment by mentioning that she hopes the panel will take close look at how waste is being stored and asked whether MEMA has plans to expand the emergency planning zone. Ms. Phillips stated that as the EPZ was eliminated with the plant closure, we now use the Commonwealth's "all hazards emergency management plans. Ms. Turco stated that MEMA had previously rejected an "all hazards" plan as adequate. Ms. Phillips asked for clarification and after reiterating the MEMA process in 2019, stated there is no formal EPZ. Ms. Turco asked that one regarding "radiological emergencies" be established. Ms. Lampert stated that MA has explained that the all hazards plan was insufficient and referenced language in NRC Commissioner Barron's dissent. She believes it is MEMA's responsibility to adjust an all hazards plan to make it more responsive in the event of radiological disaster.

## November 2020 Meeting

**PRESENTATION OF ENVIRONMENTAL SITE ASSESSMENT:** Mr. Drobinski and Mr. Daly from ERM presented the Environmental Site Assessment (ESA) Work Plan, which was presented as a power point presentation. Mr. Drobinski and Mr. Daly provide a summary of their professional training and prior experience with nuclear decommissioning. Both are licensed site professionals (LSPs) and trained as geologists. Mr. Drobinski gave an overview of the initial ESA work plan framework that was developed under the Settlement Agreement reached between Holtec and the Commonwealth. Mr. Drobinski explained that site characterization is a dynamic and iterative process. The plan is based on standard (MARSSIM) site assessment protocols. The plan will be reviewed and commented on by Commonwealth agencies, including DEP and DPH. The plan may be refined over time, and the changes will be reported to the Commonwealth. Any releases will be reported pursuant to state and federal requirements, including those under Mass. Gen. L. c. 21E. A report will be prepared summarizing activities and next steps. Supplemental information has already been provided to DEP and DPH to augment the initial work plan. LSPs will be monitoring all activities to ensure compliance with legal requirements. Mr. Daly then provided a high-level overview of the criteria that are part of the initial ESA work plan.

**DECOMMISSIONING UPDATE:** Mr. O'Brien provided a site cleanup update, showing a detailed timeline of each activity. He showed the timeline of activities and mentioned that the company has moved on to reactor vessel internal segmentation work. He showed pictures of the tool being used under water. Holtec has taken lessons from work performed at Oyster Creek. Mr. O'Brien went over demolition activities, including the planned main stack removal scheduled for November 18 and the 160' met tower removal which occurred on November 9. The change shack demolition occurred on November 6-8, and the gas bottle storage area removal is scheduled for November 17.

**INTERAGENCY WORK GROUP (IWG) REPORT:** David Johnston provided a very brief update, explaining that Holtec will have a final ESA work plan with an implementation schedule based on comments provided by the state. Holtec will have 30 days to respond

once final written comments are provided. The implementation schedule will be iterative, but the final ESA work plan will have the intended schedule included. Regarding met tower and stack demolition activities, MassDEP asbestos expert was on site and will provide the results of the expert's inspection. Ms. Phillips provided a MEMA update, stating that the MEMA and Holtec continue to meet with emergency management leaders from the communities as required by the settlement agreement with the Commonwealth. Ms. Phillips noted that the communities were not aware of the updates being provided by Holtec at NDCAP meetings, so this information should be made available going forward. Also, training opportunities and awareness of fire protection plan should be provided to surrounding fire chiefs other than Plymouth. These meetings will continue to convene quarterly, and the same group will participate in desk top exercises and drills going forward.

**PUBLIC COMMENTS AND QUESTIONS:** Mr. Mahoney introduced Nolan O'Brien from Senator Markey's office. Mr. O'Brien is the Senator's regional director for the South Shore, Cape and the Islands. He indicated that he would be happy to make sure Senator Markey is part of future conversations, especially about federal legislation. Ms. duBois requested that Senator Markey join a future NDCAP meeting, and Mr. O'Brien agreed to request the Senator's attendance in 2021. Ms. Turco asked if during an earthquake the spent fuel pool could sustain any damage. Patrick O'Brien said he will confirm but the pool was designed for the largest earthquake. Ms. Turco inquired several more times about the possible condition of the fuel pool after an earthquake. She commented that earthquake risk may be greater than previously understood. James Lampert indicated that he was disappointed with the original ERM report and had previously provided comments. He urged NDCAP to find a way to make all information publicly accessible that can be made available legally, so that there are further opportunities for the public to provide comments that may be useful to the company and the state. Mr. Lampert stated that the level of commentary would be better if the public had more time to respond. Mr. Lampert asked a clarifying question about "the boneyard" – the waste area referenced earlier by Mr. O'Brien – asking if it was the same site where chemical waste had also been dumped decades ago. Mr. O'Brien confirmed that this is the same area. Mr. Lampert looks forward to receiving information that would enable the public to provide comments on a final plan that will be approved by the state.

## January 2021 Meeting

**DECOMMISSIONING UPDATE:** As presented by Mr. O'Brien, Holtec is now in the site characterization stage, has completed "PA" construction, and is in the middle of reactor vessel internal segmentation. Holtec has been working on steam dryer and steam separator segmentation. Mr. Noyes explained that both are designed to remove moisture from the steam before it exits the reactor vessel on its way to turbine. Class A waste will be shipped by flat-bed truck to Texas in U.S. DOT-approved shipping containers. Notification is required with state and local communities as needed. Four Class A waste boxes left the site last week, and Holtec will continue to ship in Q1/Q2 of 2021. Holtec is creating a staging area for Class B/C waste; the waste boxes will remain in the staging

area until shipping. Mr. Moylan stated that “Greater than Class C” (GTCC) waste will go onto the ISFSFI pad in “non-fuel” containers that are similar to the spent fuel canisters. Mr. O’Brien continued that construction of the new ISFSI pad is complete, and that the vehicle barrier system has also been constructed. Thirty-four fuel casks will be loaded beginning in the spring.

**SITE CHARACTERIZATION:** Mr. Lawson provided a status of site characterization work, showing the Phase 1 zone. Mr. Lawson provided an overview of initial sampling conducted from Oct 6 to Dec 23, 2020. He indicated that there are opportunities for split samples. The process is iterative as samples and surveys of newly exposed areas are added. Mr. Lawson showed a map showing licensed and unlicensed property boundaries. There is a centrally located triangular portion of land that is owned by the Town of Plymouth and is not part of the licensed area. Mr. Johnston stated that transparency was discussed with Holtec. Even though the state views data on the share drive, it is discussing with Holtec ways to make the information more accessible. He indicated that it is incumbent on Holtec to give more thought on how to make information accessible to the public. The state is committed to coming up with a way to accomplish this. Regarding split samples, Mr. Priest stated that Holtec and DPH are working on an agreement that would lay out the number, volumes, methods of transport, etc., of the samples. It will also address how to cross-index the samples across laboratories so that DPH can do a comparative evaluation. Holtec has provided some samples already to the state radiation laboratory. DPH expects to have the evaluation reviewed and approved by the end of February.

**INTERAGENCY WORK GROUP (IWG) REPORT:** Mr. Johnston stated that there is not much more to add beyond the discussion to date and asked for questions. Mr. Martin provided an overview of the MCP process, stating that there are many options for responses. For certain materials, the owner can take immediate measures to respond. Otherwise, after notification, the owner can classify the site and take comprehensive response actions up to 5 years from notification. Mr. Johnston stated the HSA is the jumping-off point for contaminants of concern as it will indicate what is stored on site and the history of releases notified in the past. Holtec will want to look at areas where there is a reasonable likelihood of contaminants being spilled or released. It will then start sampling to look for a suite of chemicals within the same family. There is no fixed list of contaminants of concern, but we have very good idea of what they may be based on the HSA.

**PUBLIC COMMENTS AND QUESTIONS:** An individual from the Vineyard Times asked what the firefighting response would look like if a fire were to break out in the canister. The reporter asked what Holtec’s role would be in fighting the fire and what the scale of the plume would be. Mr. O’Brien stated that he had sent the reporter a set of slides that were used in NY to describe how the Holtec HIGH-STORM 100’s are built. They are made of concrete and steel so there is no combustible material. They are built to withstand brush fires around the canister and testing analyzed the effect of external fires including crashing of an F-16 into the canister. He stated that the Town of Plymouth is the first responder in

the case of a fire inside the reactor building. Holtec's on-site staff would work with the Town for any incident of that nature.

## February 2021 Meeting

**DECOMMISSIONING UPDATE:** Mr. O'Brien provided an update of work since the January 2021 meeting. Holtec continues to work on vessel internals segmentations; 154 of upper riser tubes have been segmented, and lower riser tube segmentation is in process, in addition to other work. Mr. O'Brien noted the largest development in last month was the removal by Eversource of overhead 345kV Transmission lines from the main transformer to the switchyard on February 17th. Mr. O'Brien also discussed with the panel Holtec's progress with outbuilding and tank demolition, providing a granular update of progress on the components of outbuilding and tank, such as the exterior storage tank demolitions, condenser bay, and hydraulic control unit removal, in addition to several buildings. Mr. O'Brien flagged that they will be beginning removing all fuel from the spent fuel pool this year. Mr. O'Brien also provided a site characterization timeline update. A final review is expected on March 31st, with LSP amendment of ESA Work Plan expected on May 31st. Mr. O'Brien then provided an updated of Holtec's fuel campaign. Thirty-four casks (all fuel from the spent fuel pool) will be removed in the campaign. Preparation and mobilization will begin in May, fuel loading is planned for June, with all fuel and GTCC Containers to be on fuel pad by January 2022. Lastly, Mr. Noyes provided an update of 2020 NRC inspection activities.

**INTERAGENCY WORK GROUP (IWG) UPDATE:** Mr. Johnston gave a brief IWG update, noting he expects more in March in several specific areas. Mr. Johnston said he hopes to have more on split sampling in March as well. Ms. Lampert asked Mr. Johnston to clarify what he meant by "split." Mr. Johnston clarified that IWG has not fully determined how they will treat split samples yet. Ms. Lampert asked if they will do independent samples. Mr. Johnston explained the process, noting independent samples are possible if needed. Ms. Lampert expressed that she hopes forthcoming March report is comprehensive.

**FUTURE MEETINGS:** Mr. Mahoney raised the next agenda item of moving to a schedule of one NDCAP meeting every other month to improve efficiency of work and reduce organizational burden for the state. Mr. Mahoney asked for comment. Ms. duBois discussed the projected timetable for LSP report. The merits of the proposal were discussed and several panel members expressed support for this proposal.

## March 2021 Meeting

**DECOMMISSIONING UPDATE:** (Reactor segmentation) Mr. O'Brien began his update of Holtec's progress by explaining that the steam separator segmentation had been completed since the last meeting. Mr. O'Brien went through several demolition-related item updates, including the rigging loft (completed) and the outbuilding tank demolition. Components of the outbuilding area are slated for demolition in April or later in Q2. Mr.



O'Brien then gave an outline of the waste shipping and staging timeline, highlighting the upcoming fuel campaign, which will begin in May. All waste containers are scheduled to be on the fuel pad by January 2022. Finally, Mr. O'Brien noted the annual upcoming NRC submittal. Mr. Drobinksi provided an update of site characterization. ERM has reviewed and commented on the Phase I report and is waiting for the final version. Ms. duBois asked Mr. O'Brien to explain at a future meeting how dosimeters in the cask area are being handled. Mr. O'Brien said he would.

**INTERAGENCY WORK GROUP (IWG) UPDATE:** Mr. Johnston gave an overview of the IWG schedule and process, explaining that they are including members from the Massachusetts DEP Bureau of Air and Waste for demolition work and asbestos abatement. Mr. Johnston explained that he and his team have been going out every two weeks and most recently looked at work done on the reactor building and the "fitness for duty" building (Holtec typically refers to this structure as an "access authorization" building in its slides), looking at the structural integrity of the roof and providing technical assistance on what should be in the nontraditional work plan for that abatement. Mr. Johnston explained that this type of work would continue as long as demolitions continue. Mr. Martin continued the IWG update and explained his inspections and what his team is doing to determine whether groundwater has been impacted by hazardous material.

**NRC OVERVIEW:** Mr. McKirgan, Chief of the Storage and Transportation Licensing Branch for the Nuclear Regulatory Commission (NRC) gave an overview of NRC's functions and roles, opening by explaining how NRC is an independent regulator responsible for safety, security, and environmental protection, but does not set nuclear policy or promote the nuclear power industry. Mr. McKirgan emphasized that NRC is technical and safety-based organization and that it is currently conducting two reviews regarding the consolidated interim storage facility (CISF) applications: A Safety and Environmental Review and an Adjudicatory Hearing Process. Mr. McKirgan explained the different oversight roles NRC has as it pertains to decommissioning and explained its chain of command. Mr. McKirgan started discussing the license application for a potential facility in New Mexico for waste storage. Mr. McKirgan then provided an overview of NRC's decision process for CISF Licensing, showing a flow chart. Mr. McKirgan then explained NRC's spent fuel transportation responsibilities.

**PUBLIC COMMENT:** Kate Walker, calling in from California (near San Onofre Nuclear Power Plant) flagged alleged safety issues with Holtec's stainless steel containers in California, claiming that NRC "has so far refused to investigate" the problem. Ms. Walker suggested Massachusetts inspect the conditions of Holtec's cannisters. Kevin Kamps, a radioactive waste specialist from the nonprofit "Beyond Nuclear," added details to NRC's presentation, noting that several families live within miles of one of the sites, and a family of ranchers does graze on one of the sites and are opposed to the site. He noted that NRC invokes environmental justice but in reality he believes it has a poor record of delivering. Leona Morgan, resident of New Mexico, co-founder of the "Nuclear Issues Study Group," and a member of the Navajo Nation called in to explain that her state has been overburdened by the uranium industry and explained that the group she represents has

been opposing Holtec since its inception and noted opposition from New Mexico public entities and figures [presumably to Holtec's proposed facility]. Ms. Morgan strongly encouraged the audience to "take responsibility for the waste that is in your control right now" and to understand that when waste is removed from Massachusetts it is headed to overburdened communities that have a history of exploitation from the industry. Ms. Morgan closed by offering resources to NDCAP to learn more about how these communities may be impacted by waste from Pilgrim.

## May 2021 Meeting

**DECOMMISSIONING UPDATE:** Mr. O'Brien provided an update of activities at the site and showed a power point presentation. Mr. O'Brien stated that Holtec had submitted an annual trust fund update with the NRC, which was shared with the NDCAP. Mr. O'Brien also provided an update on project schedule. The final fuel campaign will begin in June, and is scheduled to finish in November, after which the site will move to dry cask storage only. Holtec's eventual goal is completing site restoration activities in 2026-27. Mr. O'Brien provided an overview of key elements of the NRC submittal. A total of \$881 million is the updated balance in the trust fund. The schedule for placing spent fuel on the ISFSI pad has been pushed up, based on learnings from Oyster Creek where the fuel campaign has been completed. Mr. O'Brien indicated that actual costs versus estimates for the period from August 27, 2019 (when Holtec took over) to December 31, 2020 are higher because much of the work was pulled forward. Actual costs for this period increased from an initial estimate (reflected in the 2020 NRC submission) of \$100 million to \$277 million because work was pulled forward. However, \$824 million is the estimate of costs needed from January 1, 2021 to the end of decommissioning, which is a decrease from the prior estimate of \$1.031 billion. The total estimate of decommissioning costs is \$1.101 billion, which is a decrease from the prior estimate of \$1.132 billion. Mr. O'Brien reiterated that Holtec is gearing up for the final fuel campaign scheduled for June. High-storm and MPC dry casks will be brought on site. The Oyster Creek site finished its fuel campaign in record time. Each batch of spent fuel must be tested to ensure that required specifications are met.

**SITE CHARACTERIZATION:** Mr. Daly from ERM presented an overview of the amended environmental site assessment work plan, which will be submitted to the state for review under the settlement agreement terms. A total of 149 radiological soil samples were analyzed, and 82 samples were analyzed for non-radiological constituents. Additional groundwater samples were collected, and six additional monitoring wells were installed. The results are broken up into radiological and non-radiological components, with radiological analysis following the MARSSIM process and non-radiological analysis following the Massachusetts Contingency Plan (MCP) process. The second part of the amended work plan describes forward-looking activities related to the continued iterative site characterization process. There are work plans to collect more samples to fill data gaps, and ten more monitoring wells will be installed. Twenty-three wells were originally in place; six were added, and an additional ten are scheduled to be installed. Mr. Daly

summarized key findings from the first phase of site characterization north of Rocky Hill Road. A map was shown with survey areas following the MARSSIM approach and showing preliminary classifications based on data obtained from the first phase of site characterization activities. An additional slide showing all non-radiological results that were above reportable concentrations was shown; these exceedances were communicated on April 21 to DEP under the MCP program. The reported exceedances included PFAS and various other metals. Holtec believes that some of the exceedances are attributable to how samples were collected as drilling down to the groundwater table could cause suspended sediments and turbidity. All metals will formally start to work their way through the Phase 1/2/3 program under the MCP, so that the source and nature of metals can be identified and remediation work conducted as necessary.

**INTERAGENCY WORK GROUP (IWG) REPORT:** Mr. Johnston stated that the IWG has been focusing on environmental site assessment. DPH and DEP continue to meet regularly with Holtec and are expecting to have the submittal of the work plan by end of May. When it is received, the state will provide comments through the Attorney General's Office, and then Holtec will have 30 days to respond. This is an iterative process, and will be going on for quite some time. Buildings and other impediments limit completeness of the work that is possible, and force the process to be iterative and ongoing throughout decommissioning process.

**DISCUSSION OF PHYSICAL AND OPERATIONAL SECURITY DURING AND AFTER DECOMMISSIONING:** Mr. Grassie presented a power point with Pilgrim ISFSI security observations. Mr. Grassie indicated that he conducted a general security audit of the Pilgrim plant in response to questions posed by Town of Plymouth officials. Mr. Grassie has conducted security audits and security designs for nuclear sites. The power point presentation offers observations, based on Mr. Grassie's professional experience and judgment. Mr. Grassie stated that he did not get inside ISFSI, but met with Holtec officials who were forthcoming and transparent with the exception of not disclosing confidential information. Security design is based on a risk-based approach that assesses threats and risks, and provides an integrated security program both physically and electronically. The focus is on control and mitigation. The threat here is radiological sabotage from a violent external assault. Mr. Grassie indicated that the Pilgrim security design is very extensive with elements like: personnel; barriers; communications; monitoring; and display are part of the ISFSI. Mr. Grassie's final observation was that security at Pilgrim is consistent with requirements and considered adequate/strong based on a risk informed and performance-based approach contained in ISFSI security rulemaking.

## July 2021 Meeting

**DECOMMISSIONING UPDATE:** Demolition and segmentation work is continuing, as are waste reduction and waste management activities. Holtec is proceeding to the final fuel campaign. NRC was on-site and will observe the "dry run" of transport from the lower ISFSI to the upper ISFSI pad. Holtec anticipates completion before the end of November,

after which Greater Than Class C (“GTCC”) waste containers will be conveyed to the upper ISFSI pad.

Site Characterization: ERM provided an update on the iterative site characterization work that is ongoing. The official Notice of Responsibility (NOR) was issued by DEP in June 2021 regarding exceedances of soil and groundwater standards. This brings the site into the M.G.L. c. 21E Massachusetts Contingency Plan (MCP) program. DPH also has requested split sampling for specific locations for radiological contamination.

**INTERAGENCY WORK GROUP (IWG) REPORT:** DEP and DPH are in the process of reviewing the revised environmental site assessment work plan provided by Holtec. The agencies are coordinating with AGO to provide a formal response. Holtec will then have 30 days after receiving comments to revise the work plan. Mr. Pickering could not provide a firm timeframe for when review would be complete. In addition, DEP and DPH continue to meet regularly with Holtec to discuss the cleanup effort and decommissioning work. Biweekly meetings are also occurring with the asbestos section of DEP. MEMA is continuing to attend monthly meetings with local public safety officials, and remains the official point of contact for the NRC.

**DUXBURY SITE VISIT:** A site visit was conducted by the Duxbury Board of Selectmen and Nuclear Matters Committee. The group was impressed with the professionalism and cordiality of the Holtec personnel who accompanied the group.

**PUBLIC COMMENTS AND QUESTIONS:** A commenter from the League of Women Voters raised concerns about the two visitors who were able to gain access to the upper parking lot during the site visit by the Town of Duxbury. She also stated support for the idea of a neighborhood watch group. Another commenter reiterated that trespassers should not be allowed onto the property. She also asked about a request for information sent from the NRC relative to emergency planning at the Pilgrim site. A Panel member reported on her research into a group called the “Council of State Governments” (CSG)-East, which includes the Canadian provinces and Northeastern states.

## September 2021 Meeting

**LEGACY ISSUE: LONG TERM STORAGE OF SPENT FUEL:** Guests Senator Su Moran and Senator Marc Pacheco were invited to help the NDCAP address the long-term storage of spent nuclear fuel in Plymouth. In particular Sen. Pacheco was asked if, in his capacity as the Co-chair for the Environment and Energy panel of the Council of State Governments East (CSG-East), he could motivate CSG-East to address a regional solution for spent nuclear fuel. Senator Pacheco shared that as a member of the National Conference of State Legislators’ Energy Supply Taskforce he visited the French nuclear facility where spent fuel is reused. He stated that he was impressed by the French program with respect to cost, security, and safety.

Senator Pacheco emphasized the limited remaining time available to build clean energy systems to respond to climate change, and that this might challenge the ability to establish public support for a nuclear fuel reuse program. As Chair of the Council of State



Governments – East (CSG-East)’s Energy and Environmental Panel and member of the Energy Supply Taskforce for the National Conference of State Legislators, he shared that both groups are looking at all of the options available. CSG-East is working with 11 Northeastern states, Puerto Rico, Virgin Islands, and the eastern Provinces of Canada to work on climate response. One of the concerns brought up by staff at CSG-East is the limited time and significant cost of implementing a program to use spent nuclear fuel. Senator Pacheco offered to put NDCAP members in touch with former DOE Secretary and current MIT professor and leader of the Roosevelt Project, Ernest Moniz to discuss options related to nuclear energy.

**DECOMMISSIONING UPDATE:** Mr. O’Brien provided an update of activities at the Pilgrim site and showed a power point presentation. Mr. O’Brien presented Holtec’s timeline. So far, 17 of 34 casks are completed for the fuel campaign, and 45 of the 62 total casks are loaded. The Fuel Campaign is on track to be completed in November as scheduled. Since the July 26<sup>th</sup> meeting, no additional buildings have been demolished. Additional building demolition projects are planned for October, November, and December 2021. Segmentation, waste reduction, and waste management activities are ongoing.

**Site Characterization:** John Drobinski (ERM) provided an update on continued site characterization activities, including the collection of soil samples and the installation of 7 new groundwater monitoring wells. A question was asked to clarify whether there was groundwater on the site and referencing notes from the July meeting suggesting there is no groundwater. Jack Priest clarified that there is no pathway connecting the groundwater with the drinking water. Instead, the water moves into the ocean. Ms. duBois then sought to confirm that there are no drinking water wells on site. Jack Priest confirmed this. Gerard Martin then clarified that the aquifer below the site is classified as a “potential drinking water aquifer” because of its high transmissivity; however, it is to be used as a drinking water aquifer because of the site context. It is not a current drinking water source.

**INTERAGENCY WORK GROUP (IWG) REPORT:** Mr. Pickering presented an update of IWG activities. DEP and DPH have completed their review of the ESA Workplan submitted by Holtec, and will be working with the AGO to provide a formal response. When the response is available, it will be shared with the NDCAP. Mr. Pickering clarified DEP’s process for reviewing asbestos demolition notifications before the demolition begins. Mr. Pickering said DEP is working with Holtec on Response Actions related to PFAS. Gerard Martin added that Holtec has a year to complete the Response Actions, and if Holtec is not able to complete the Response Actions within the year, they must start taking Comprehensive Response Actions. The one-year date would end in Spring 2022. A question was asked about where the PFAS originated. Mr. Martin answered that this is what is under review by Holtec. It may be incidental use of some material that had PFAS in it, but it may be difficult to determine. There are several sample locations where PFAS was found. Mr. Pickering said that DEP and DPH continue to meet with Holtec on a monthly basis. DEP has provided Holtec with guidance on the planting scheme and associated adjustments to the wastewater treatment system that requires permitting.



Holtec will abandon 12 of the 36 leaching pits that serve the soil absorption system. A question was asked about whether there would be plantings in the leaching pits. Mr. Pickering responded that the leaching system is much larger than it needs to be for the current use of the site. This is where the proposed plantings would go. Holtec now has the information needed to submit a permit request for modifications to the wastewater treatment system.

## November 2021 Meeting

Minutes are not yet available for inclusion but will be uploaded to the NDCAP website where Minutes, recording of meetings and additional materials are available at:

<https://www.mass.gov/orgs/nuclear-decommissioning-citizens-advisory-panel>

## Appendix 2

## Enclosure 2

ENCLOSURE 1					
Table 1					
Holtec Decommissioning International Pilgrim Nuclear Power Station					
Summary Information as of December 31, 2020 10 CFR 50.82(a)(8)(v)-(vii)					
<b>Decommissioning Trust Fund Balance 10 CFR 50.75(f)(1) and 10 CFR 50.82(a)(8)(v)(A)</b>					
Year	Type of Trust	Fund Balance (2020 \$)			Comments
2020	Decommissioning Trust	\$881M			As of 12/31/2020; net of tax liabilities
<b>Other Financial Assurance Methods Being Relied Upon 10 CFR 50.75(f)(1) and 10 CFR 50.82(a)(8)(v)(B)</b>					
NONE					
<b>HDI Decommissioning Expenditures 10 CFR 50.82(a)(8)(v)(A) Since License Transfer</b>					
Year	License Termination	Spent Fuel Mgmt	Site Restoration	Total	Comments
2019	\$45M	\$56M	\$0M	\$101M	2019 Costs in as-Spent Dollars
2020	\$106M	\$67M	\$3M	\$175M	2020 Costs in as-Spent Dollars
Total Spent to Date	\$151M	\$123M	\$3M	\$277M	
<b>Prior Year Expenditures Variance to Total HDI Estimated Cost 10 CFR 50.82(a)(8)(v)(B)</b>					
Year	License Termination	Spent Fuel Mgmt	Site Restoration	Total	Comments
2020 Estimated	\$59M	\$66M	\$0M	\$125M	Estimate in 2019 Dollars
2020 Actuals	\$106M	\$67M	\$3M	\$175M	Variance due to project timing and optimization
<b>Remaining Decommissioning Estimated Cost 10 CFR 50.82(a)(8)(v)(B) / (vii)(B)</b>					
Year	License Termination	Spent Fuel Mgmt	Site Restoration	Total	Comments
2021	\$370M	\$417M	\$37M	\$824M	Estimated in 2020 Dollars
<b>Decommissioning Criteria Upon Which the Estimate is Based 10 CFR 50.75(f)(1) and 10 CFR 50.82(a)(8)(v)(B)</b>					
DECON					
<b>Any Modification to Method of Providing Financial Assurance 10 CFR 50.75(f)(1) and 10 CFR 50.82(a)(8)(v)(C)</b>					
NONE					
<b>Any Material Changes to Trust Agreement Since Previous Report 10 CFR 50.75(f)(1) and 10 CFR 50.82(a)(8)(v)(D)</b>					
No material changes. See item (H) in Enclosure 2					
<b>Need for Additional Financial Assurance 10 CFR 50.75(f)(1) and 10 CFR 50.82(a)(8)(v)(C)</b>					
NONE					