



NUCLEAR REGULATORY COMMISSION

[Docket No. 50-271; NRC-2021-0103]

Vermont Yankee and US Ecology Idaho Alternate Disposal Request

AGENCY: Nuclear Regulatory Commission.

ACTION: Environmental assessment and finding of no significant impact; issuance.

SUMMARY: The U.S. Nuclear Regulatory Commission (NRC) is considering issuing an approval to NorthStar Nuclear Decommissioning Co., LLC (NorthStar, or the licensee) for alternate disposal of low-activity radioactive wastewater containing byproduct material from the Vermont Yankee Nuclear Power Station (VY) located in Vernon, Vermont. Additionally, the NRC is considering the related action of approving an exemption to US Ecology Idaho (USEI) from licensing to allow USEI to receive and possess the byproduct radioactive materials from VY without an NRC license. The NRC staff is issuing an environmental assessment (EA) and finding of no significant impact (FONSI) associated with the proposed approvals.

DATES: The EA and FONSI in this document are available on **[INSERT DATE OF PUBLICATION IN THE *FEDERAL REGISTER*]**

ADDRESSES: Please refer to Docket ID **NRC-2021-0103** when contacting the NRC about the availability of information regarding this document. You may obtain publicly available information related to this document using any of the following methods:

- **Federal Rulemaking Web Site:** Go to <https://www.regulations.gov> and search for Docket ID **NRC-2021-0103**. Address questions about Docket IDs in Regulations.gov to Stacy Schumann; telephone: 301-415-0624; email: Stacy.Schumann@nrc.gov. For technical questions, contact the individual listed in the **FOR FURTHER INFORMATION CONTACT** section of this document.

- **NRC's Agencywide Documents Access and Management System**

(ADAMS): You may obtain publicly available documents online in the ADAMS Public

Documents collection at <https://www.nrc.gov/reading-rm/adams.html>. To begin the search, select <https://www.nrc.gov/reading-rm/adams.html> and then select “Begin Web-based ADAMS Search.” For problems with ADAMS, please contact the NRC’s Public Document Room (PDR) reference staff at 1-800-397-4209, 301-415-4737, or by e-mail to pdr.resource@nrc.gov. For the convenience of the reader, instructions about obtaining materials referenced in this document are provided in the “Availability of Documents” section.

- **Attention:** The PDR, where you may examine and order copies of public documents, is currently closed. You may submit your request to the PDR via e-mail at pdr.resource@nrc.gov or call 1-800-397-4209 or 301-415-4737, between 8:00 a.m. and 4:00 p.m. (EST), Monday through Friday, except Federal holidays.

FOR FURTHER INFORMATION CONTACT: Jack D. Parrott, Office of Nuclear Material Safety and Safeguards, U.S. Nuclear Regulatory Commission, Washington, DC 20555-00001; telephone: 301-415-6634, e-mail: Jack.Parrott@nrc.gov.

SUPPLEMENTARY INFORMATION:

I. Introduction

The NRC is considering a request by NorthStar, dated May 20, 2020, as supplemented by letter dated September 21, 2020, and e-mail dated March 15, 2021, for alternate disposal of approximately 7.57 million liters (2,000,000 gallons) of low-activity radioactive wastewater containing byproduct material, from activities associated with the decommissioning process at VY, to the USEI Resource Conservation and Recovery Act (RCRA) Subtitle C hazardous and low-activity radioactive waste treatment and disposal facility located near Grand View, Idaho. Additionally, USEI requested, by letter dated May 4, 2020, an exemption from the licensing requirements of § 30.3 of title 10 of the *Code of Federal Regulations* (10 CFR) to allow USEI to receive, process, and dispose of byproduct radioactive material from VY without an NRC license. These requests were made under the alternate disposal provision contained in 10 CFR 20.2002 and the

exemption provisions in 10 CFR 30.11. This EA has been developed in accordance with the requirements of 10 CFR 51.30.

II. Environmental Assessment

Description of Proposed Action

The proposed action consists of NRC approval of NorthStar's alternate disposal request under 10 CFR 20.2002 and USEI's exemption request under 10 CFR 30.11. The proposed action arises from the decommissioning of the shutdown VY reactor facility. By letter dated January 12, 2015, Entergy Nuclear Operations, Inc. (ENO - the previous VY licensee) certified that VY had permanently ceased power operations and that all fuel had been permanently removed from the reactor vessel and placed in the spent fuel pool, thus beginning the decommissioning phase for VY.

In its May 20, 2020 letter, NorthStar requested approval for the alternative waste disposal of certain low-activity radioactive wastewater containing byproduct material (wastewater) resulting from activities associated with the VY decommissioning process. NorthStar's May 20, 2020 letter transmitted its application for alternative waste disposal, which was submitted in accordance with 10 CFR 20.2002. NorthStar's application described the processing and disposal of the wastewater at the USEI facility.

In its May 4, 2020 letter, USEI also requested an exemption from the licensing requirements of 10 CFR 30.3, pursuant to 10 CFR 30.11, for the USEI facility in Grand View, Idaho, to allow for the disposal of VY wastewater. Because the USEI facility is not licensed by the NRC, this proposed action would require the NRC to exempt USEI from the Atomic Energy Act of 1954, as amended (AEA) and NRC licensing requirements in 10 CFR Part 30 with respect to the low-activity material authorized for disposal.

This request is similar to the previous VY request for alternate disposal of 757,082 liters (200,000 gal) of low-activity radioactive wastewater to the same USEI facility in 2016 that was approved by the NRC in 2017. The primary difference between

the previous request and the request described in this EA/FONSI is the increased volume of the material to be disposed.

The USEI facility is a RCRA Subtitle C hazardous waste disposal facility permitted by the State of Idaho. The USEI site has both natural and engineered features that limit the release of any stored radioactive material into the environment. The natural features include an arid climate with an annual precipitation rate of 18.4 cm (7.4 in)/year, and an average vertical distance to groundwater below the disposal zone of 61 m (203 ft). The engineered features include the waste disposal facility covers, the liners, and the leachate monitoring systems. The wastewater would be transported by rail tanker from the VY facility in Vernon, Vermont to the USEI rail transfer facility located in Mayfield, Idaho. Upon receipt of the water at the rail transfer facility, the wastewater will be transferred to tanker trucks and transported by roadway to the stabilization facility on the USEI site where it will be solidified by mixing with clay prior to disposal.

The wastewater to be disposed consists of approximately 7.57 million liters (2,000,000 gal) of plant process and infiltration water associated with the decommissioning of VY. This water will include fission and activation products resulting from VY operations. The radionuclide concentrations in the wastewater, are described in NorthStar's submittal, and are of low activity consistent with ongoing demolition activities including reactor vessel segmentation and removal. For conservatism, the radiological concentrations in the water to be solidified are assumed by the licensee to be above the measured amount for any radionuclide that was detected and above the minimum detectable concentration for any radionuclide that was not detected.

Need for Proposed Action

The need for the proposed action is to authorize an appropriate method of disposal for surplus wastewater containing radioactive material currently stored or expected to be generated at the shutdown VY power reactor in Vernon, VT. The wastewater is generated as a result of ongoing demolition activities including reactor vessel segmentation and removal. The USEI facility in Grand View, Idaho has the

capability to receive and process the wastewater, solidify it with clay and disposed of it as a soil-like waste.

Environmental Impacts of the Proposed Action

The NRC staff has reviewed the evaluation performed by the licensee to demonstrate compliance with the 10 CFR 20.2002 alternate disposal criteria. Under these criteria, a licensee may seek NRC authorization to dispose of licensed material using procedures not otherwise authorized by NRC regulations. The licensee's application must include a description of the waste containing the licensed material, including the physical and chemical properties important to risk evaluation, and the proposed manner and conditions of disposal. The application must also include an analysis and evaluation of pertinent environmental information and the nature and location of any other potentially affected licensed and unlicensed facilities. Finally, the licensee's supporting analysis must show that the radiological doses arising from the proposed 10 CFR 20.2002 disposal will be as low as reasonably achievable and within the 10 CFR Part 20 dose limits.

Based on this analysis, NorthStar concludes that the dose equivalent for the maximally exposed individual, which includes workers involved in the transportation and placement of this waste, will not exceed "a few mrem per year." The standard of a "few [millirem per year] mrem/yr" to a member of the public is set forth in NRC Regulatory Issues Summary 2004-08, "Results of the License Termination Rule Analysis." The USEI workers are treated as members of the public because the USEI site, while permitted by the State of Idaho under RCRA to accept certain radioactive materials, is not licensed by the NRC.

The NRC staff evaluated activities and potential doses associated with waste handling and disposal as part of the review of this 10 CFR 20.2002 request. The NRC staff notes that the evaluation of the transport dose to the public is not required per the most recent revision to the "Guidance for the Reviews of Proposed Disposal Procedures and Transfers of Radioactive Material under 10 CFR 20.2002 and 10 CFR 40.13(a)."

Therefore, the NRC staff did not review the transport dose during their review of this 20.2002 request. The NRC staff evaluation is documented in a Safety Evaluation Report (SER). The NRC's SER found that the licensee's projected doses to individual USEI workers have been appropriately estimated and are demonstrated to meet the NRC's alternate disposal requirement of not more than "a few mrem/yr" to any member of the public.

The licensee also performed a radiological assessment of the potential dose to the general public from the USEI RCRA facility after its closure. They evaluated a post-closure dose to a member of the public, the intruder construction scenario, the intruder well drilling scenario, and the intruder driller occupancy scenario. The NRC guidance on the review of 20.2002 requests notes that a licensee can take credit for a thick cover to eliminate exposure scenarios involving intrusion into the waste, such as eliminating a basement excavation scenario if a cover is thicker than 3 m, because excavations are typically less than 3 m. Since the USEI cover is expected to be 6 m thick, the NRC staff concluded in the SER that the intruder construction scenario is not likely at the USEI site and that all of the other results for potential dose to the general public were not more than "a few mrem/yr." The NRC staff's independent review of the post-closure and intruder scenarios described in the SER confirmed that the maximum projected dose over a period of 1,000 years is also within "a few mrem/yr."

The proposed action and attendant exemption of the disposal site from further AEA and NRC licensing requirements will not significantly increase the probability or consequences of accidents, and there is no significant increase in occupational or public radiation exposure at the off-site disposal facility. In general, the sorts of activities associated with the proposed action at the VY facility are bounded by the environmental analyses in the NRC's "Generic Environmental Impact Statement on Decommissioning of Nuclear Facilities," NUREG-0586, Supplement 1, Volume 1 (2002) which discusses the processing of contaminated liquids, and the removal and transportation of radioactively contaminated material from decommissioning power reactor sites. This

EA incorporates by reference and tiers from NUREG-0586, Supplement 1, Volume 1. Additionally, the NRC staff determined that the proposed action (i.e., undertaking) does not involve the development or disturbance of additional land so is not the type of activity that would have the potential to cause effects on historic properties, and would have no effect on endangered or threatened species or their critical habitat not already evaluated in the Post Shutdown Decommissioning Activities Report (PSDAR) for Vermont Yankee and revised PSDAR.

Environmental Impacts of the Alternatives to the Proposed Action

As an alternative to the proposed action, the NRC staff considered the no-action alternative, under which the staff would deny the disposal request. The denial of the request would result in the wastewater being transported to a licensed low-level radioactive waste processing and disposal facility that is authorized to take this wastewater. All other factors would remain the same or similar. Therefore, the environmental impacts of the proposed action and the no-action alternative are similar, and the no-action alternative is accordingly was not further considered.

Agencies and Persons Consulted

The NRC provided a draft of this EA and draft of the NRC SER for this proposed action to the Idaho Department of Environmental Quality and the Vermont Department of Public Service for review on December 22, 2020, for a 30-day review. The State of Idaho Department of Environmental Quality (IDEQ) responded by letter dated January 12, 2021. The IDEQ had no technical comments but had one concern that the US Ecology's Site-Specific Dose Assessment methodology documents were not available for review. The State of Vermont Department of Public Service responded by letter dated January 29, 2021 and identified items for further clarification concerning the safety evaluation: 1) the dose from the cross country transportation of the contaminated wastewater from VY to the USEI facility; 2) the dose from multiple rail tank cars containing contaminated wastewater being marshalled in one location in transit or at the USEI facility; 3) the number of railcar shipments that would be needed to transport the

7.57 million liters (2,000,000 gal) of contaminated wastewater from VY to the USEI facility and the potential impact that would have on the dose estimates; and, 4) if this request would be sufficient to complete the disposal of the any remaining wastewater from VY, specifically any generated from the final decontamination of the structures containing the contaminated wastewater that might have accumulated sediments at the bottom with potentially higher activity per volume than that contained in the wastewater. These comments were addressed in the revised SER.

III. Finding of No Significant Impact

The proposed action consists of the NRC approval of NorthStar's alternate disposal request under 10 CFR 20.2002 and USEI's exemption request under 10 CFR 30.11. The NRC staff has prepared this EA in support of the proposed action. On the basis of this EA and NUREG-0586, Supplement 1, which is incorporated by reference, the NRC finds that the proposed action will not have a significant effect on the quality of the human environment, and therefore, the preparation of an environmental impact statement is not warranted. Accordingly, the NRC has determined that a FONSI is appropriate.

IV. Availability of Documents

The documents identified in the following table are available to interested persons through one or more of the following methods, as indicated.

DOCUMENT DESCRIPTION	ADAMS ACCESSION NO.
Alternate disposal request by NorthStar, dated May 20, 2020.	ML20157A123
Alternate disposal request supplement letter, dated September 21, 2020.	ML20290A492
Alternate disposal request supplement e-mail, dated March 15, 2021.	ML21075A144 (Package)
USEI request for exemption, dated May 4, 2020.	ML20174A590
Safety Evaluation Report, dated March 18, 2021.	ML21081A085
"Guidance for the Reviews of Proposed Disposal Procedures and Transfers of Radioactive Material under 10 CFR 20.2002 and 10 CFR 40.13(a)," published April 2020.	ML18296A068

ENO letter certifying cessation of power operations, dated January 12, 2015.	ML15013A426
NRC Regulatory Issues Summary 2004-08, "Results of the License Termination Rule Analysis," dated May 28, 2004.	ML041460385
NRC's "Generic Environmental Impact Statement on Decommissioning of Nuclear Facilities," NUREG-0586, Supplement 1, Volume 1.	ML023470327 (Package)
PSDAR for Vermont Yankee, dated December 19, 2014.	ML14357A110
Revised PSDAR for Vermont Yankee, dated April 6, 2017.	ML17096A394
Draft NRC EA and SER e-mail sent to the Idaho Department of Environmental Quality and the Vermont Department of Public Service on December 22, 2020.	ML21006A024
The State of Idaho Department of Environmental Quality response letter, dated January 12, 2021.	ML21028A526
The State of Vermont Department of Public Service response letter, dated January 29, 2021.	ML21032A093

Dated: May 4, 2021.

For the U.S. Nuclear Regulatory Commission.

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