



## **NUCLEAR REGULATORY COMMISSION**

**[Docket No. 50-223; NRC-2018-0053]**

**University of Massachusetts Lowell; University of Massachusetts Lowell Research Reactor**

**AGENCY:** Nuclear Regulatory Commission.

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

**SUMMARY:** The U.S. Nuclear Regulatory Commission (NRC) is considering renewal of Facility Operating License No. R-125, held by the University of Massachusetts Lowell (UML, the licensee), which would authorize continued operation of the UML Research Reactor (UMLRR) at a maximum steady-state thermal power of 1.0 megawatt (MW). The UMLRR is a plate-type-fueled research reactor located on the campus of UML, in Lowell, Middlesex County, Massachusetts. If approved, the renewed license would authorize UML to continue to operate the UMLRR for an additional 20 years from the date of issuance of the renewed license. The NRC has prepared this environmental assessment (EA) and finding of no significant impact (FONSI) to consider the impacts associated with the renewal of the operating license.

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

**ADDRESSES:** Please refer to Docket ID **NRC-2018-0053** 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 Website:** Go to <https://www.regulations.gov> and search for Docket ID **NRC-2018-0053**. Address questions about Docket IDs in Regulations.gov to Stacy Schumann; telephone: 301-415-0624; e-mail: [Stacy.Schumann@nrc.gov](mailto:Stacy.Schumann@nrc.gov). For technical questions, contact the individual listed in the **FOR FURTHER INFORMATION CONTACT** section of this notice.

- **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 "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](mailto:pdr.resource@nrc.gov). For the convenience of the reader, the ADAMS accession numbers are provided in a table in the "Availability of Documents" section of this notice.

- **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](mailto:pdr.resource@nrc.gov) or call 1-800-397-4209 or 302-415-4737, between 8:00 a.m. and 4:00 p.m. (ET), Monday through Friday, except Federal holidays.

**FOR FURTHER INFORMATION CONTACT:** Edward Helvenston, Office of Nuclear Reactor Regulation, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001; telephone: 301-415-4067; e-mail: [Edward.Helvenston@nrc.gov](mailto:Edward.Helvenston@nrc.gov).

**SUPPLEMENTARY INFORMATION:**

**I. Introduction**

The NRC is considering renewal of Facility Operating License No. R-125, which authorizes the licensee to operate the UMLRR, located on the campus of UML in Lowell, Middlesex County, Massachusetts, at a maximum steady-state thermal power of 1.0 MW. The renewed license would authorize continued operation of UMLRR for an additional 20 years from the date of issuance of the renewed license. UML submitted its renewal application by letter dated October 20, 2015. UML subsequently supplemented its renewal application as described under "Identification of the Proposed Action" in Section II of this notice. Therefore, as required by section 51.21 of title 10 of the *Code of Federal Regulations* (10 CFR), "Criteria for and identification of licensing and regulatory actions requiring environmental assessments," the NRC prepared this EA. Based on the results of the EA, the NRC did not identify any significant impacts from the proposed

action (i.e., license renewal) and is, therefore, issuing a FONSI in accordance with 10 CFR 51.32, "Finding of no significant impact."

## **II. Environmental Assessment**

### *Facility Site and Environs*

The UMLRR is a heterogeneous open pool non-power reactor that has been in operation since January 1975 for teaching and research purposes. The reactor is licensed to operate at a thermal power of 1.0 MW, and is located on the North Campus of UML, which includes classrooms, offices, and other facilities in an area just north of the Middlesex River.

The UMLRR is housed in a steel-reinforced concrete building. The reactor itself is situated in an open pool, which serves as part of the primary coolant loop as well as moderator, coolant, and shielding. The reactor will be fueled with uranium-silicide and uranium-aluminide low-enriched uranium fuel elements. Waste heat is dissipated via forced-convection cooling at full power, although the reactor can also be cooled via natural convection at lower power levels. A double loop coolant system transfers waste heat from the reactor to the atmosphere via the primary coolant system, heat exchanger, a secondary cooling system, and a cooling tower. Makeup water is provided through municipal water supply (city of Lowell). An Area Radiation Monitoring System continuously monitors gamma and beta radiation levels at locations in the UMLRR facility. A Stack Radiation Monitoring System continuously monitors air exiting the facility through the ventilation system exhaust stack for airborne radioactivity (gaseous and particulate). Airborne discharges are limited by the UMLRR's technical specifications to ensure that exposure to the general public will not exceed the limits of 10 CFR part 20, "Standards for Protection against Radiation."

A detailed description of the reactor can be found in the UMLRR safety analysis report (SAR) submitted by the UML with its renewal application.

### *Identification of the Proposed Action*

The proposed action would renew Facility Operating License No. R-125 for a period of 20 years from the date of issuance of the renewed license. The proposed action is in accordance with UML's application dated October 20, 2015, as supplemented by letters dated March 16, 2016, November 30, 2016, March 31, 2017, July 11, 2017, August 7, 2017, September 13, 2017, January 6, 2018, February 1, 2018, March 5, 2019, April 10, 2019, October 18, 2019, October 24, 2019, December 19, 2019, December 20, 2019, February 24, 2020, September 30, 2020, January 30, 2021, February 16, 2021, April 5, 2021, and April 20, 2021 (collectively referred to as "the renewal application"). In accordance with 10 CFR 2.109, "Effect of timely renewal application," the existing license remains in effect until the NRC takes final action on the renewal application. As described in the renewal application, UML has also requested NRC review and approval of certain facility changes, and associated changes to the license, in conjunction with the renewal of the license. These include the use of uranium-aluminide fuel elements in addition to the similar uranium-silicide elements currently in use, instrumentation and control upgrades, and re-designation of the reactor containment building as a confinement building.

#### *Need for the Proposed Action*

The proposed action is needed to allow the continued operation of the UMLRR, which is used for teaching and research to support the mission of UML, for a period of 20 years from the date of issuance of the renewed license.

#### *Environmental Impacts of the Proposed Action*

UML has requested approval of certain facility and license changes in conjunction with license renewal, as previously discussed. However, the proposed action will not require any major physical changes to the facility, or any changes that would significantly affect the operation of the facility, and the operational impacts would be similar to those that have occurred during the current license term. As discussed further, the proposed action will not have a significant environmental impact.

#### **Radiological Impacts**

## Environmental Effects of Reactor Operations

Gaseous radioactive effluents resulting from the routine operation of the UMLRR are Argon-41 (Ar-41) and Nitrogen-16 (N-16). These nuclides are released to the environment from the reactor building via an exhaust stack on the roof that combines the ventilation exhausts from both the reactor building interior and all attached systems. The UMLRR stack discharge length is 100 feet (30.5 meters) and has an airflow rate of 15,000 cubic feet (7.1 cubic meters) per minute. Because the half-life of N-16 is approximately 7 seconds, the release from the reactor stack is insignificant because most of the N-16 produced in the reactor coolant would decay before reaching the stack. Ar-41 is by far the most significant radionuclide released as a gaseous effluent during normal reactor operations. The maximum release of Ar-41 would occur from continuous operation at full power. UML measured the Ar-41 concentration to be  $2.28 \times 10^{-6}$  microcuries per milliliter exiting the exhaust stack under full power operations. The annual release of Ar-41 under these conditions would be 495 curies (Ci) per year. From this information, UML calculated the maximum annual dose to a member of the public using the ARCON96 computer code to be 14.5 millirem (mrem). This meets the 100 mrem per year (mrem/yr) dose equivalent to the maximally exposed individual in 10 CFR 20.1301, "Dose limits for individual members of the public." UML's annual reports for the 5 years of operation from 2015 through 2019 show that the maximum actual recorded release of Ar-41 was 6.27 Ci in 2015, which the report stated would result in a conservative estimated dose of 0.2 mrem/yr to a member of the public, which is well below the 100 mrem/yr limit specified in 10 CFR 20.1301. This radiation dose of 0.2 mrem/yr also demonstrates compliance with the as low as is reasonably achievable (ALARA) air emissions dose constraint of 10 mrem specified in 10 CFR 20.1101, "Radiation protection programs," paragraph (d).

Liquid radioactive wastes produced as part of the normal operation of the UMLRR are stored in the liquid radioactive waste storage room. From there they are released to the environment via the city of Lowell sanitary sewer system in accordance

with 10 CFR 20.2003, "Disposal by release into sanitary sewerage." The water is treated at the Lowell wastewater treatment facility, after which it is discharged to the Merrimack River. The annual reports for the 5 years of operation from 2015 through 2019 show that UML properly disposed of liquid radioactive waste by release into the sanitary sewer system. Based on information presented in the annual reports, radionuclide releases were within the allowable limits specified in 10 CFR part 20, Appendix B, "Annual Limits on Intake (ALIs) and Derived Air Concentrations (DACs) of Radionuclides for Occupational Exposure; Effluent Concentrations; Concentrations for Release to Sewerage," for liquid effluents.

Low-level solid radioactive waste generated from reactor operations at the UMLRR are primarily demineralizer resins, paper, disposable clothing, gloves, and other miscellaneous contaminated items. These wastes are held to allow for decay and then released for disposal as regular solid wastes if they do not exceed background activity. Otherwise, the wastes are sent to a low-level radioactive waste broker for proper disposal of the wastes containing long-lived radionuclides. The last low-level radioactive waste shipment offsite discussed in the UML annual reports was in May 2017; the shipment consisted of 106 cubic feet (3 cubic meters) of contaminated materials from the reactor as well as other UML campus labs. Once transferred, the low-level waste broker ships and disposes of the waste in accordance with all applicable regulations for radioactive materials. To comply with the Nuclear Waste Policy Act of 1982, UML has entered into a contract with the U.S. Department of Energy (DOE) that provides that DOE retains title to the fuel utilized at UMLRR and that DOE is obligated to take the fuel from the site for final disposition.

As described in Chapter 11 of the UMLRR SAR, and verified through NRC staff review of the UML annual reports for the 5 years of operation from 2015 through 2019, personnel exposures are well within the limits set by 10 CFR 20.1201, "Occupational dose limits for adults," and are ALARA in accordance with 10 CFR 20.1101(b). UML tracks exposures of personnel monitored with dosimeters, and the annual reports for the

5 years of operation from 2015 through 2019 show that the personnel doses were usually less than 10 percent of the occupational limit of 50 milliSieverts (5,000 mrem) per year. Area thermo-luminescent dosimeter monitors mounted in the control room and the reactor bay provide an additional monthly measurement of total radiation exposures at those locations. No changes in reactor operation that would lead to an increase in occupational dose are expected or proposed as a result of the proposed action.

The radiation monitoring systems associated with reactor operations at UMLRR are provided and maintained as a means of ensuring compliance with radiation limits established under 10 CFR part 20. The UMLRR radiation monitoring systems consist of area monitors, continuous air monitors, portable radiation survey instruments, personnel monitors, and stack particulate and gas monitors. The stack particulate and gas monitoring systems measure the beta-gamma activity emitted by radioactive particulates and the activity of gaseous radioactive nuclides, respectively, that are exhausted through the UMLRR exhaust stack. Perimeter monitoring at UMLRR consists of dosimeters that detect X-ray and gamma radiation.

UML conducts an environmental monitoring program to record and track the radiological impact of UMLRR operation on the surrounding unrestricted area. The environment outside the reactor building is monitored by passive optically stimulated luminescence dosimeters, which are changed out quarterly. These dosimeters are located at strategic locations in and around the Pinanski building, which is attached to the reactor building. The UML Radiation Safety Office analyzes the results to ensure that the reported doses are below 10 CFR part 20 limits, and to monitor for trends that would indicate unusual or elevated exposures. UML states that it has determined that the numbers and placement of environmental dosimeters is sufficient based upon historical data accumulated and analyzed from other dosimetry locations that were part of a previous comprehensive background study of areas around the UML campus. The renewal application provided total annual environmental monitoring dose results from 2009 through 2013 for dosimeters located in the first and third floor airlocks, and 2

locations within the Pinanski building. For each year and location, the measured doses were below 10 mrem and well below the limits to the public as required by 10 CFR part 20. Year-to-year trends in exposures are consistent between monitoring locations. Also, no correlation exists between total annual reactor operation and annual exposures measured at the monitoring locations.

Based on its review of monitoring data in the renewal application, the NRC staff concludes that operation of the UMLRR does not have any significant radiological impact on the surrounding environment. No changes in reactor operation that would affect normal off-site radiation levels are expected or proposed as a result of the proposed action. Therefore, the proposed action would not have a significant radiological impact.

#### Environmental Effects of Accidents

Accident scenarios are discussed in Chapter 13 of the UMLRR SAR. The accidents analyzed in Chapter 13 range from anticipated events to a postulated fission product release with radiological consequences that exceed those of any accident considered to be credible. This limiting accident is referred to as the maximum hypothetical accident (MHA). UML considers the uncontrolled release of the volatile gaseous fission products to be the MHA for UMLRR. This accident would involve the removal of the cladding from one side of one fuel plate while the fuel is in the reactor pool. From there, the release would continue to the reactor confinement building and into the environment. UML uses this scenario to calculate the maximum concentration of fission products that might be present in the reactor room air following the MHA. From its calculations, UML concluded that individual worker exposures from the MHA would not exceed 10 CFR part 20 dose limits and that all effluent releases to the environment resulting from the MHA would also meet 10 CFR part 20 dose limits.

Separate from this EA, the NRC staff is reviewing UML's MHA analyses of the potential radiological consequences that may result from the proposed license renewal. The results of the NRC staff's safety review will be documented in a safety evaluation report that will be made publicly available. If the NRC concludes that the radiological

consequences of the MHA are within 10 CFR part 20 dose limits, then the MHA and the proposed action would not have a significant impact with respect to the radiological consequences of the MHA.

### Conclusions

Because, in the renewal application, UML has not proposed any physical changes to the reactor facility design, or changes to facility operating conditions, that would significantly affect facility operation, there would be no changes in the types or quantities of routine effluents that may be released off site. UML has systems in place for controlling the release of radiological effluents and implements a radiation protection program to monitor personnel exposures and releases of radioactive effluents.

Accordingly, there would be no increase in routine occupational or public radiation exposure as a result of the proposed action. As previously discussed, a separate safety evaluation is being conducted by the NRC staff to determine the probability and consequences of accidents that could result from the proposed action. If the safety evaluation finds that the probability and consequences of accidents are within NRC regulatory requirements, then the proposed action would have no significant environmental impact with respect to accidents.

License renewal would not significantly change reactor operations. As previously discussed, information in the renewal application and data reported to the NRC by UML for the last 5 years of reactor operations were evaluated to determine the radiological impact of reactor operations. The NRC staff found that releases of radioactive material and personnel exposures were all well within applicable regulatory limits. Based on this evaluation, the proposed action would have no significant radiological impacts.

### Non-Radiological Impacts

The proposed action does not involve any significant change in the operation of the reactor, change in the emissions or heat load dissipated to the environment, or involve construction or other land disturbance activities. The proposed action would not result in any land use changes or increases in noise or air emissions and would not have

a significant impact on air quality, noise, or visual resources. Water is supplied through the city water utility and UML proposes no increase in water use or effluent discharge. Thus, the proposed action would not incrementally affect surface water or groundwater resources. There is no potential for the proposed action to affect aquatic or terrestrial resources, or any other environmental resource conditions. Therefore, the proposed action would have no significant non-radiological impacts.

### **Other Applicable Environmental Laws**

In addition to the National Environmental Policy Act, which requires Federal agencies to consider the environmental impacts of proposed actions, the NRC has responsibilities that are derived from other environmental laws and policy directives, which include the Endangered Species Act (ESA), Coastal Zone Management Act (CZMA), Fish and Wildlife Coordination Act (FWCA), National Historic Preservation Act (NHPA), and Executive Order 12898, "Federal Actions To Address Environmental Justice in Minority Populations and Low-Income Populations" (59 FR 7629). The following presents a summary of impacts associated with resources protected by these laws and related requirements.

#### Endangered Species Act

The ESA was enacted to prevent further decline of endangered and threatened species and restore those species and their critical habitat. Section 7 of the ESA requires Federal agencies to consult with the U.S. Fish and Wildlife Service (FWS) or National Marine Fisheries Service (NMFS) regarding actions that may affect listed species or designated critical habitats.

The NRC staff conducted a search of federally listed species and critical habitats that have the potential to occur in the vicinity of the UMLRR using the FWS's Environmental Conservation Online System. Three federally listed species occur in Middlesex County, Massachusetts: the red knot (*Calidris canutus rufa*), small whorled pogonia (*Isotria medeoloides*), and northern long-eared bat (*Myotis septentrionalis*). However, none of these species are likely to occur near the UMLRR because it is

located on the UML campus. The campus does not provide suitable habitat for federally listed species because it has been developed and in use for research and educational purposes for many decades. Additionally, operation of the UMLRR has no direct nexus to the natural environment that would otherwise affect federally listed species.

Accordingly, the proposed action would have no effect on federally listed species or critical habitats. Federal agencies are not required to consult with the FWS if they determine that an action will not affect listed species or critical habitats. Thus, the ESA does not require consultation for the proposed UMLRR license renewal, and the NRC considers its obligations under ESA Section 7 to be fulfilled for the proposed action.

#### Coastal Zone Management Act

The CZMA, in part, encourages States to preserve, protect, develop, and restore coastal resources. Applicants for Federal licenses to conduct an activity that affects any land or water use or natural resource of the coastal zone of a State must provide a certification stating that the proposed activity complies with the State's approved coastal zone management program and that the applicant will conduct activities consistent with that program.

Middlesex County, Massachusetts, does not contain any coastal zones. Because the UMLRR is not located within or near any managed coastal zones, the proposed action would not affect any coastal zones and CZMA consistency certification does not apply. Therefore, UML does not need to provide a certification under the CZMA.

#### Fish and Wildlife Coordination Act

The FWCA requires Federal agencies that license water resource development projects to consult with the FWS (or NMFS, when applicable) and the State wildlife resource agencies regarding the potential impacts of the project on fish and wildlife resources.

The proposed action does not involve any water resource development projects, including any modifications relating to impounding a body of water, damming, diverting a

stream or river, deepening a channel, irrigation, or altering a body of water for navigation or drainage. Therefore, no coordination with other agencies pursuant to the FWCA is required for the proposed action.

#### National Historic Preservation Act

The NHPA requires Federal agencies to consider the effects of their undertakings on historic properties. As stated in the Act, historic properties are any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion in the National Register of Historic Places (NRHP). The NRHP lists several historic properties in Middlesex County within 0.6 miles (1 kilometer) of the UMLRR. Operation of the UMLRR has not likely had any impact on any of these properties. The nearest historic property, which is located about 0.3 miles (0.5 kilometers) from the UMLRR, is the St. Joseph's Convent and School (National Register Listing No. 02000789). The location of this historic property is completely surrounded by development, and the view towards the UMLRR is obstructed by commercial and industrial properties. Based on this information, the proposed action would have no adverse effect on historic properties in the vicinity of the UMLRR. By letter dated November 26, 2018, the NRC staff contacted the Massachusetts State Historic Preservation Officer (SHPO) and discussed the proposed action. On January 2, 2019, the SHPO indicated concurrence with the NRC staff's determination that the proposed action would have no adverse effect on historic properties.

#### Executive Order 12898 – Environmental Justice

Executive Order 12898 directs Federal agencies to identify and address the disproportionately high and adverse human health or environmental effects of their actions on minority and low-income populations to the greatest extent practicable and permitted by law.

The environmental justice impact analysis evaluates the potential for disproportionately high and adverse human health or environmental effects on minority and low-income populations that could result from the proposed action. Such effects

may include human health, biological, cultural, economic, or social impacts. Minority and low-income populations are subsets of the general public residing around the UMLRR, and all are exposed to the same health and environmental effects generated from activities at the UMLRR.

Minority Populations in the Vicinity of the UMLRR — According to the U.S. Census Bureau's 2010 Census, approximately 31 percent of the total population (approximately 505,000 individuals) residing within a 10-mile (16-kilometer) radius of the UMLRR identified themselves as minorities. The largest minority populations were Hispanic, Latino, or Spanish origin of any race (approximately 90,000 or 18 percent) followed by Asian (approximately 43,000 or 8.5 percent). According to the 2010 Census, 23.5 percent of the Middlesex County population identified themselves as minorities, with persons of Asian and Hispanic, Latino, or Spanish origin of any race comprising the largest minority populations (9.3 percent and 6.5 percent, respectively). According to the U.S. Census Bureau's 2019 American Community Survey 1-year Estimates, the minority population of Middlesex County, as a percent of the total population, had increased to about 30 percent.

Low-Income Populations in the Vicinity of the UMLRR — According to the U.S. Census Bureau's 2015–2019 American Community Survey 5-Year Estimates, approximately 54,000 persons and 10,000 families (approximately 10 and 7 percent, respectively) residing within a 10-mile (16-kilometer) radius of the UMLRR were identified as living below the Federal poverty threshold. The 2019 Federal poverty threshold was \$26,172 for a family of four.

According to the U.S. Census Bureau's 2019 American Community Survey Census 1-Year Estimates, the median household income for Massachusetts was \$85,843 while approximately 6 percent of families and 9 percent of the State population were found to be living below the Federal poverty threshold. Middlesex County had a higher median household income average (\$107,056) and a lower percentage of families (4 percent) and persons (7 percent) living below the poverty level.

Impact Analysis — Potential impacts to minority and low-income populations would mostly consist of radiological effects; however, radiation doses from continued operations associated with the license renewal are expected to continue at current levels and would be well below regulatory limits.

Based on this information and the analysis of human health and environmental impacts presented in this EA, the proposed license renewal action would not have disproportionately high and adverse human health or environmental effects on minority and low-income populations residing near the UMLRR.

#### *Environmental Impacts of the Alternatives to the Proposed Action*

As an alternative to license renewal, the NRC considered denying the proposed action (i.e., the “no-action” alternative). If the NRC denied the renewal application, reactor operations would cease, and decommissioning would be required sooner than if a renewed license were issued. The NRC notes that, even with a renewed license, UMLRR will eventually be decommissioned, at which time the environmental effects of decommissioning would occur. Decommissioning would be conducted in accordance with an NRC-approved decommissioning plan, which would require a separate environmental review under 10 CFR 51.21. Cessation of reactor operations would reduce or eliminate radioactive effluents. However, as previously discussed in this EA, radioactive effluents from reactor operations constitute a small fraction of the applicable regulatory limits. Therefore, the environmental impacts of license renewal and the denial of the renewal application would be similar. In addition, denying the renewal application would eliminate the benefits of teaching, research, and services provided by the UMLRR.

#### *Alternative Use of Resources*

There are no unresolved conflicts concerning alternative uses of available resources under the proposed action. Further, the proposed action does not involve the use of any different resources or significant quantities of resources beyond those previously considered in the renewal of Facility Operating License No. R-125 for the

UMLRR in November 1985, which previously renewed the UMLRR license for a period of 30 years.

*Agencies and Persons Consulted*

As discussed previously, the NRC staff consulted with the Massachusetts SHPO regarding the proposed action. Additionally, in accordance with NRC policy, the NRC staff consulted with the Commonwealth of Massachusetts Liaison Officer on March 17 and March 26, 2021, regarding the environmental impact of the proposed action, and explained the environmental reviews and forwarded a draft of this EA. On April 20, 2021, the Commonwealth of Massachusetts official indicated, by electronic mail, that they had no comments regarding the proposed action.

**III. Finding of No Significant Impact**

The NRC is considering renewal of Facility Operating License No. R-125, held by UML, which would authorize the continued operation of the UMLRR for an additional 20 years from the date of issuance of the renewed license.

On the basis of the EA included in Section II of this notice and incorporated by reference in this finding, the NRC concludes that the proposed action will not have a significant effect on the quality of the human environment, and will not significantly affect the environment surrounding the UMLRR. This is because the proposed action will result in no significant radiological impacts from continued operations as the types or quantities of effluents that may be released off site would not change. No changes in land use would occur or increases in noise or air emissions. Continued operations under the proposed action would have no significant impacts on air quality, noise, visual resources, surface water or groundwater resources, terrestrial or aquatic resources, or on any other environmental resource conditions. Additionally, the proposed action would have no effect on federally listed species or designated critical habitats, would not affect historic properties, and would not result in environmental justice impacts. Therefore, the NRC concludes that the proposed action will not have a significant effect on the quality

of the human environment. Accordingly, the NRC has determined not to prepare an environmental impact statement for the proposed action.

The NRC considered information provided in UML's application, as supplemented, and the review of related environmental documents. Section IV of this notice lists the documents related to the proposed action and includes information on the availability of these documents.

#### **IV. Availability of Documents**

The following table identifies the references cited in this document and related to the NRC's FONSI. Documents with an ADAMS accession number are available for public inspection online through ADAMS at <https://www.nrc.gov/reading-rm/adams.html>.

<b>DOCUMENT</b>	<b>ADAMS ACCESSION NO.</b>
University of Massachusetts Lowell, Request for Renewal of Facility Operating License R-125 and SAR, dated October 20, 2015	ML16042A015 (Package)
University of Massachusetts Lowell, Submittal of Revision 2 to Operator Requalification Program, dated March 16, 2016	ML16076A405 (Package)
University of Massachusetts Lowell, Response to NRC Request for Additional Information Regarding the Operator Requalification Program for License Renewal and Submittal of Revision 3 to Operator Requalification Program, dated November 30, 2016	ML16335A327 (Package)
University of Massachusetts Lowell, Response to NRC Request for Additional Information for License Renewal, dated March 31, 2017	ML17090A348 (Package)
University of Massachusetts Lowell, Response to NRC Request for Additional Information Regarding Financial Qualifications for License Renewal, dated July 11, 2017	ML17192A428 (Package)
University of Massachusetts Lowell, Response to NRC Request for Additional Information Regarding the Physical Security Plan for License Renewal and Submittal of Revision 8 to Physical Security Plan, dated August 7, 2017	ML17222A071
University of Massachusetts Lowell, Submittal of Revision 9 to Physical Security Plan, dated September 13, 2017	ML17261A211
University of Massachusetts Lowell, Response to NRC Request for Additional Information for License Renewal, dated January 6, 2018	ML18006A003 (Package)
University of Massachusetts Lowell, Additional Clarifying Information for License Renewal, dated February 1, 2018	ML18032A534 (Package)
University of Massachusetts Lowell, Response to NRC Request for Additional Information Primarily Related to Technical Specifications, dated March 5, 2019	ML19064B373 (Package)

<b>DOCUMENT</b>	<b>ADAMS ACCESSION NO.</b>
University of Massachusetts Lowell, Submittal of Revised SAR Section 7.4.1.2, dated April 10, 2019	ML19100A273
University of Massachusetts Lowell, Response to NRC Request for Additional Information Primary Related to Instrumentation and Controls, dated October 18, 2019	ML19291C293
University of Massachusetts Lowell, Supplement to October 18, 2019, Response to NRC Request for Additional Information, dated October 24, 2019	ML19297F433
University of Massachusetts Lowell, Second Supplement to October 18, 2019, Response to NRC Request for Additional Information, dated December 19, 2019	ML19353C523
University of Massachusetts Lowell, Supplement to December 19, 2019, Letter, dated December 20, 2019	ML19354A610
University of Massachusetts Lowell, Response to Items 7.4.c and 7.5.a from NRC Request for Additional Information Primarily Related to Instrumentation and Controls, dated February 24, 2020	ML20055F604
University of Massachusetts Lowell, Supplemental Information Provided in Response to Audit, dated September 30, 2020	ML20274A248 (Package)
University of Massachusetts Lowell, Supplemental Information Provided in Response to Audit, dated January 30, 2021	ML21030A004 (Package)
University of Massachusetts Lowell, Supplemental Information Provided in Response to Audit, dated February 16, 2021	ML21047A245
University of Massachusetts Lowell, Request for Additional Language in Proposed License Conditions, dated April 5, 2021	ML21095A245
University of Massachusetts Lowell, Review of Renewal License Conditions, dated April 20, 2021	ML21110A053
University of Massachusetts Lowell, 2015-2016 Annual Operating Report, dated August 11, 2016	ML16224A326
University of Massachusetts Lowell, 2016-2017 Annual Operating Report, dated July 28, 2017	ML17209A491
University of Massachusetts Lowell, 2017-2018 Annual Operating Report, dated August 15, 2018	ML18227A980 (Package)

<b>DOCUMENT</b>	<b>ADAMS ACCESSION NO.</b>
University of Massachusetts Lowell, 2018-2019 Annual Operating Report, dated August 30, 2019	ML19248C113 (Package)
University of Massachusetts Lowell, 2019-2020 Annual Operating Report, dated August 25, 2020	ML20238C002
U.S. Fish and Wildlife Service, Endangered Species Consultations Frequently Asked Questions, dated July 15, 2013	ML16120A505
U.S. Nuclear Regulatory Commission, Letter to Massachusetts State Historic Preservation Officer, dated November 26, 2018	ML18320A135 (Package)
Massachusetts Historical Commission, Massachusetts State Historical Preservation Officer Concurrence, dated January 2, 2019	ML19011A400
Massachusetts Emergency Management Agency, Electronic Mail Indicating No Comments, dated April 20, 2021	ML21111A358

Dated: July 30, 2021.

For the Nuclear Regulatory Commission.

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[FR Doc. 2021-16590 Filed: 8/3/2021 8:45 am; Publication Date: 8/4/2021]