

ENVIRONMENTAL PROTECTION

9.1 PURPOSE OF REVIEW

This purpose of this review is to determine whether there is reasonable assurance that the applicant's proposed environmental protection measures will adequately protect public health and the environment and comply with the regulatory requirements of 10 CFR Parts 20, 51, and 70. In addition to the proposed protection measures, the staff should determine if the applicant needs to submit an Environmental Report for staff use in preparation of either an Environmental Assessment (EA) and Finding of No Significant Impact (FONSI) or an Environmental Impact Statement (EIS) pursuant to 10 CFR Part 51. However, the review of the applicant's Environmental Report is outside the scope of this SRP chapter and is to be conducted separately for implementation of the National Environmental Policy Act (NEPA) requirement. For additional information on Environmental Reports, the reviewer is referred to 10 CFR 51.45(b).

9.2 RESPONSIBILITY FOR REVIEW

Primary: Environmental Engineer/Scientist

Secondary: Licensing Project Manager

Supporting: Primary Reviewer of SRP Chapter 4.0
Primary Reviewer of SRP Chapter 6.0
Primary Reviewer of SRP Chapter 11
TWRS Site Representative

9.3 AREAS OF REVIEW

The review of environmental protection measures should include a review of the applicant's integrated safety analysis (ISA). The following subsections identify the areas of review for each of these components. Greater detail on each component is provided in Section 9.4, which specifies the review acceptance criteria.

The environmental review should focus on that part of the applicant's plant-wide safety program that is established to control and assess the level of radioactive and nonradioactive releases (gaseous, liquid, and solid) to the environment. Therefore, the effluent control portion of the applicant's radiation protection program, as well as effluent and environmental monitoring practices, should be reviewed. In addition, the plant-wide safety program should be reviewed to ensure that the management controls are specified to ensure that these activities meet license objectives.

To receive authorization to possess a critical quantity of special nuclear material, as defined in 10 CFR 70.4, an applicant must also perform an ISA in accordance with 10 CFR Part 70, as

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revised¹. Guidance on the ISA is covered in Chapter 3.0 of this SRP. The environmental safety review of the ISA should include a review of the identified potential accident sequences that result in radiological and nonradiological releases to the environment, as well as the controls specified by the applicant to reduce the risk of these accidents.

The review should examine the date of an application for a license to possess and use special nuclear material for processing and fuel fabrication, scrap recovery, conversion of uranium hexafluoride, or for the conduct of any other activity, which the NRC has determined pursuant to 10 CFR 51 Subpart A will significantly affect the quality of the environment, to verify that the application is submitted at least 9 months before the commencement of construction, as required by 10 CFR Part 70.21(f) and is accompanied by an Environmental Report.

Thus, environmental protection includes four main components: (1) the radiation protection program, (2) effluent and environmental monitoring, (3) the ISA, and (4) provisions for continuing assurance. The areas of review should include the following:

9.3.1 Radiation Protection

- Radiological (i.e., ALARA) goals for effluent control.
- Procedures, engineering controls, and process controls to maintain public doses ALARA
- ALARA reviews and reports to management.
- Waste minimization practices and, for new operations, facility design and operating procedures for waste minimization.

9.3.2 Effluent and Environmental Monitoring

- In-place filter testing procedures for air cleaning systems
- Known or expected concentrations of radionuclides in effluents
- Physical and chemical characteristics of radionuclides in discharges
- Discharge locations
- Environmental media to be monitored and the sample locations
- Sampling collection and analysis procedures, including the minimum detectable concentrations of radionuclides, equipment used, and calibration information
- Action levels and actions to be taken when the levels are exceeded
- Permits, including air discharge and National Pollutant Discharge and Elimination System permits
- Leak detection systems for ponds, lagoons, and tanks
- Pathways analysis methods to estimate public doses
- Recording and reporting procedures, including event notification
- Solid waste handling and disposal programs

¹ Nuclear Regulatory Commission (U.S.), Washington, D. C. "Domestic Licensing of Special Nuclear Material (10 CFR Part 70)." *Federal Register*: Vol. 64, No. 146. pp. 81338--41357. July 30, 1999.

9.3.3 Integrated Safety Analysis

- Accident sequences (and associated facility processes) which, if unmitigated, result in releases to the environment
- Likelihood and consequences of these accident sequences as they impact the public and the environment
- Controls relied on to reduce the unmitigated risk from “high” risk to an acceptable level
- Availability and reliability of controls

9.3.4 Provisions for Continuing Assurance

The provisions for continuing assurance for environmental protection at the facility include the following areas:

- Organization and Management
- Training and Qualification
- Emergency Plan
- Maintenance and Surveillance
- Audits and Assessments
- Procedures

9.4 ACCEPTANCE CRITERIA

9.4.1 Regulatory Requirements

The applicable and/or relevant requirements for environmental protection are included in the following regulations:

1. 10 CFR Part 20, specifically, radiation protection, the effluent control and treatment measures necessary to meet the dose limits and dose constraints for members of the public specified in Subparts B and D, the minimization of contamination specified in Subpart E, the survey requirements specified in Subpart F, the waste disposal requirements of Subpart K, the records requirements of Subpart L, and the reporting requirements of Subpart M.
2. 10 CFR Part 51, specifically its effluent and environmental monitoring systems that the applicant must establish to provide the information required by 10 CFR 51.60(a).
3. 10 CFR Part 70, specifically an application for a license to possess and use special nuclear material for activities the Commission has determined pursuant to 10 CFR Part 51 will significantly affect the quality of the environment will be filed at least 9 months prior to commencement of construction of the plant or facility and shall be accompanied by an Environmental Report as specified in 10 CFR 70.21(f).

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4. 10 CFR Part 70, specifically the proposed facilities and equipment and procedures, including measuring and monitoring instruments and devices and procedures for the disposal of radioactive effluents and wastes that the applicant must demonstrate are adequate to protect public health and the environment as specified 10 CFR 70.22(a)(7) and (8) and 70.23(a)(3) and (4).

9.4.2 Regulatory Guidance

The regulatory guidance for environmental protection is contained in:

1. NRC Regulatory Guide 4.15, "Quality Assurance for Radiological Monitoring Programs (Normal Operations)– Effluent Streams and the Environment."
2. NRC Regulatory Guide 4.16, "Monitoring and Reporting Radioactivity in Releases of Radioactive Materials in Liquid and Gaseous Effluents from Nuclear Fuel Processing and Fabrication Plants and Uranium Hexafluoride Production Plants."
3. NRC Regulatory Guide 4.20, "Constraint on Releases of Airborne Radioactive Materials to the Environment for Licensees Other than Power Reactors."
4. NRC Regulatory Guide 8.37, "ALARA Levels for Effluents from Materials Facilities."
5. NRC Information Notice 94-07, "Solubility Criteria for Liquid Effluent Releases to Sanitary Sewerage Under the Revised 10 CFR Part 20," January 28, 1994.
6. NRC Information Notice 94-23: "Guidance to Hazardous, Radioactive and Mixed Waste Generators on the Elements of a Waste Minimization Program," March 1994.

9.4.3 Regulatory Acceptance Criteria

The applicant's submittal should provide reasonable assurance that the review criteria below are adequately addressed and satisfied for the environmental protection measures. Some of the information may be referenced to other sections of the standard review plan, or incorporated by reference, provided an adequate summary is provided and a single reference essentially contains all of the information.

An applicant's proposed actions for environmental protection should be acceptable if they provide for effluent control as part of the radiation safety program, and effluent and environmental monitoring, in accordance with NRC technical and managerial provisions for continuing assurance.

The acceptance criteria for the radiation protection program, effluent and environmental controls and monitoring, the ISA, and provisions for continuing assurance are given in Sections 9.4.3.1, 9.4.3.2, 9.4.3.3, and 9.4.3.4, respectively.

9.4.3.1 Radiation Protection Program

The proposed radiation protection program should be acceptable from the standpoint of environmental protective measures if it satisfies the following criteria:

1. Radiological (ALARA) Goals for Effluent Control

ALARA goals are set at a modest fraction (10% to 20%) of the values in Appendix B, Table 2, Columns 1 and 2 and Table 3 and the external dose limit in 10 CFR 20.1302(b)(2)(ii), or the dose limit for members of the public, if the applicant proposes to demonstrate compliance with 10 CFR 20.1301 through a calculation of the TEDE to the individual likely to receive the highest dose. The ALARA program for effluent control should be consistent with guidance found in Regulatory Guide 8.37.

An applicant's constraint approach should be acceptable if it is consistent with guidance found in Regulatory Guide 4.20 and the applicant's description of the constraint approach provides sufficient detail to demonstrate specific application of the guidance to proposed routine operations and nonroutine operations including anticipated events.

2. Procedures, Engineering Controls, and Process Controls

The applicant describes and commits to using procedures, engineering controls, and process controls to achieve ALARA goals for effluent minimization. Common control practices include filtration, encapsulation, adsorption, containment, recycling, leakage reduction, and the storage of materials for radioactive decay. Practices for large, diffuse sources such as contaminated soils or surfaces include covers, wetting during routine operations and non-routine operations including anticipated events, and the application of stabilizers. The applicant demonstrates a commitment to reducing unnecessary dose to members of the public and releases to the environment.

3. ALARA Reviews and Reports to Management

The applicant commits to annual review of the content and implementation of the radiation protection program, which includes the ALARA effluent control program. This review includes analysis of trends in release concentrations, environmental monitoring data, and radionuclide usage, determines whether operational changes are needed to achieve the ALARA effluent goals, and evaluates all designs for system installations or modifications. The applicant also includes a commitment to report the results to senior management along with recommendations for changes in facilities or procedures that are necessary to achieve ALARA goals.

4. Waste Minimization

The application contains a description of how facility design and procedures for operation will minimize, to the extent practicable, contamination of the facility and the environment, and minimize, to the extent practicable, the generation of radioactive waste. Waste minimization programs proposed by applicants for both new and existing licenses include:

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- a. Top management support
- b. Identification of responsibilities for waste minimization activities and assessments
- c. Methods to characterize waste generation, including types and amounts, and waste management costs, including costs of regulatory compliance, paperwork, transportation, treatment, storage, disposal, etc.
- d. Periodic waste minimization assessments to identify waste minimization opportunities and solicit employee or external recommendations
- e. Provisions for technology transfer to seek and exchange technical information on waste minimization
- f. Provisions to incorporate operational experience
- g. Methods for implementation and evaluation of waste minimization recommendations

9.4.3.2 Effluent and Environmental Controls and Monitoring

9.4.3.2.1 Effluent Control and Monitoring

The applicant's effluent monitoring should be acceptable if it meets the following criteria:

1. The known or expected concentrations of radioactive materials in airborne and liquid effluents are below the limits in 10 CFR Part 20, Appendix B, Table 2 or below site specific limits established in accordance with 20.1302(c) and are ALARA.
2. All liquid and airborne effluent discharge locations are identified and monitored. Monitoring locations should be identified, and for those effluent discharge points which have input from two or more contributing sources within the facility, monitoring for each major contributing source should be considered for effective process and effluent control.

Airborne effluents from all routine operations, and non-routine operations, as well as anticipated events associated with the plant, including effluents from areas not used for processing special nuclear material such as laboratories, experimental areas, storage areas, and fuel element assembly areas, should be continuously sampled. For liquid effluents, representative samples should be taken at each release point for the determination of concentrations and quantities of radionuclides released to an unrestricted area, including discharges to sewage systems. For continuous releases, samples should be continuously collected at each release point. For batch releases, a representative sample of each batch should be collected. If periodic sampling is used in lieu of continual sampling, the applicant shows that the samples are representative of actual releases.

3. Effluents should be sampled unless the applicant has established, by periodic sampling or other means, that radioactivity in the effluent is insignificant and will remain so. In such cases, the effluent should be sampled at least quarterly to confirm that effluents are not significant. For the purposes of this SRP, an effluent is significant if the concentration averaged over a calendar quarter is equal to 10 percent or more of the appropriate concentration listed in Table 2 of Appendix B to 10 CFR Part 20.
4. Radionuclide specific analyses should be performed on selected composite samples unless (1) the gross alpha and gross beta activities are so low that individual radionuclides could

not be present in concentrations greater than 10 percent of the concentrations specified in Table 2 or 3 of Appendix B to 10 CFR Part 20, or (2) the radionuclide composition of the sample is known through operational data, such as the composition of the feed material. Monitoring reports in which estimates of quantities of individual radionuclides are based on methods other than direct measurement should include an explanation and justification of how the results were obtained.

Examples of cases in which operational data may not be adequate for the determination of radionuclide concentration are (1) plants processing uranium in which extraction, ammonium diuranate precipitation, ion exchange, or other separation processes could result in concentration of thorium isotopes (principally Th-234); (2) plants in which uranium of varying enrichments is processed; and (3) plants processing plutonium in which significant variation in the Pu-238/Pu-239 ratio among batches and the continuous in-growth of Am-241 would preclude the use of feed material data to determine the radionuclide composition of effluents.

Radionuclide analyses should be performed more frequently than usual under three circumstances: (1) at the beginning of the monitoring program until a predictable and consistent radionuclide composition in effluents is established; (2) whenever there is a significant unexplained increase in gross radioactivity in effluents; or (3) whenever a process change or other circumstance might cause a significant variation in the radionuclide composition.

5. The sample collection and analysis methods and frequencies should be appropriate for the effluent medium and the radionuclide(s) being sampled. Sampling methods ensure that representative samples are obtained by use of appropriate sampling equipment and sample collection and storage procedures. Monitoring instruments should be calibrated at least annually, or more frequently if suggested by the manufacturer.
6. The proposed action levels and actions to be taken if the levels are exceeded are appropriate. The action levels are incremental, such that each increasing action level results in a more aggressive action to assure and control effluents. A slightly higher than normal concentration of a radionuclide in effluent triggers an investigation into the cause of the increase. An action level is specified that will result in the shutdown of an operation if this level is exceeded. These action levels are selected based on the likelihood that a measured increase in concentration could indicate potential violation of the effluent limits.
7. The minimum detectable concentration (MDC) for sample analyses is not more than 5 percent of the concentration limits listed in Table 2 of Appendix B to 10 CFR Part 20. If the actual concentrations of radionuclides in samples are known to be higher than 5 percent of the 10 CFR Part 20 limits, the analysis methods need only be adequate to measure the actual concentration. However, in such cases, the MDC is low enough to accommodate fluctuations in the concentrations of the effluent and the uncertainty of the MDC.
8. The laboratory quality control (QC) procedures are adequate to support the validity of the analytical results. These QC procedures include the use of established standards such as those provided by the National Institute of Standards and Technology (NIST), as well as

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standard analytical procedures, such as those established by the National Environmental Laboratory Accreditation Conference.

9. The descriptions of applicable Federal and/or State standards for discharges and any permits issued by local, State, or Federal governments for gaseous and liquid effluents are complete and accurate.
10. If the applicant proposes to adjust the effluent concentrations in Appendix B to 10 CFR 20 in accordance with 20.1302(c) to take into account the actual physical and chemical characteristics of the effluents, the information related to aerosol size distributions, solubility, density, radioactive decay equilibrium, and chemical form is complete and accurate for the radioactive materials to justify the derivation and application of the alternative concentration limits.
11. The systems for the detection of leakage from ponds, lagoons, and tanks are adequate to detect and assure against any unplanned releases to groundwater, surface water, or soil.
12. Releases to sewer systems are controlled and maintained to meet the requirements of 10 CFR 20.2003, including (i) the material is water soluble; (ii) known or expected discharges meet the effluent limits of 10 CFR 20 Appendix B, Table 3; and (iii) the known or expected total quantity of radioactive material released into the sewer system in a year does not exceed 5 Ci (185 GBq) of ^3H , 1 Ci (37 GBq) of ^{14}C , and 1 Ci (37 GBq) of all other radioactive materials combined. Solubility is determined in accordance with the procedure described in NRC Information Notice 94-07.
13. Reporting procedures comply with the requirements of 10 CFR 70.59 and the guidance specified in Regulatory Guide 4.16. Reports of the concentrations of principal radionuclides released to unrestricted areas in liquid and gaseous effluents are provided and include the MDC for the analysis and the error for each data point.
14. If the licensee proposes to demonstrate compliance with 10 CFR 20.1301 through a calculation of the TEDE to the individual likely to receive the highest dose in accordance with 20.1302(b)(1), calculation of the TEDE by pathways analyses uses appropriate models and codes and assumptions that accurately represent the facility, the site, and the surrounding area; assumptions are reasonable; input data is accurate; all applicable pathways are considered; and the results are interpreted correctly.
15. The applicant's methods for determining the dose to the maximally exposed individual during normal facility operations and anticipated events should be acceptable if they are consistent with NCRP Report No. 123, "Screening Models for Releases of Radionuclides to Atmosphere, Surface Water, and Ground," January 1996. The applicant could use computer codes as acceptable tools for pathways analysis if the applicant is able to demonstrate that the code has undergone validation and verification to demonstrate the validity of estimates developed using the code for established input sets. Dose conversion factors used in the pathways analyses should be acceptable if they are based on the methodology described in ICRP 30, "Limits for Intakes of Radionuclides by Workers," as

reflected in Federal Guidance Report 11. If the applicant use's alternative methods then these should be considered acceptable with appropriate justification.

16. The applicant's procedures and facilities for solid and liquid waste handling, storage and monitoring result in safe management and timely disposition of the material.

9.4.3.2.2 Environmental Monitoring

The scope of the applicant's environmental monitoring should be acceptable if it is commensurate with the scope of activities at the facility and the expected impacts of routine operations and non-routine operations including anticipated events as identified in the environmental report and meets the following criteria:

1. Background and baseline concentrations of radionuclides in environmental media have been established through sampling and analysis.
2. A preoperational monitoring program is initiated prior to operation. The preoperational program should be of sufficient length to allow a sufficient data base for comparison with operational data.
3. Monitoring includes sampling and analyses for important pathways for the anticipated types of radionuclides released from the facility into the environment from routine and anticipated events during nonroutine operations, including air, surface water, groundwater, soil, sediments, and vegetation, as appropriate. Important environmental media are sampled to estimate radionuclide concentrations in important biota.
4. The description of monitoring identifies adequate and appropriate sampling locations and frequencies for each environmental medium, the frequency of sampling, and the analyses to be performed on each medium. Sampling methods ensure that representative samples are obtained by use of appropriate sampling equipment, sample collection, and sample storage procedures.
5. Monitoring procedures employ acceptable analytical methods and instrumentation to be used, and monitoring procedures and analytical methods are subject to quality controls. The applicant commits to a program of instrument maintenance and calibration appropriate to the instrumentation, as well as participation in round-robin measurement comparisons if the applicant proposes use of its own analytical laboratory for analysis of environmental samples.
6. Appropriate action levels and actions to be taken if the levels are exceeded are specified for each environmental medium and radionuclide.

Action levels are selected based upon a pathways analysis that demonstrates that below those concentrations, doses to the public will be below the limits in 10 CFR Part 20, Subpart B, and are ALARA. The action levels specify the concentrations at which an investigation would be performed and levels at which process operations would be shut down.

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7. MDCs are specified for sample analyses, and are at least as low as those selected for effluent monitoring in air and water. MDCs for sediment, soil, and vegetation are selected based upon the action levels to ensure sampling and analytical methods are sensitive and reliable enough to support application of the action levels.
8. Data analysis methods and criteria to be used for evaluating and reporting the environmental sampling results are appropriate and will indicate when an action level is being approached in time to take corrective actions.
9. The description of the status of all licenses, permits, and other approvals of plant operations required by Federal, State and local authorities is complete and accurate.
10. Environmental monitoring is adequate to assess impacts to the environment from potential radioactive and nonradioactive releases as identified in high and medium risk accident sequences in the ISA.

9.4.3.3 Integrated Safety Analysis

In accordance with 10 CFR Part 70, as revised, TWRS applicants are required to perform an ISA. The applicant's treatment of environmental protection in the ISA should be acceptable if it fulfills the following criteria:

1. The ISA summary should provide a complete list of accident sequences with potential for affecting the environment consistent with the performance requirements contained in 10 CFR Part 70, as revised.
2. The ISA should provide a reasonable estimate for the environmental effects of each accident sequence identified.
3. The ISA should use acceptable methods for estimating environmental effects from accident sequences which result in radiological releases to the environment. Acceptable methods are described in NUREG/CR-6410, "Nuclear Fuel Cycle Facility Accident Analyses Handbook." Models used for consequence analysis should be verified and validated.

9.4.3.4 Provisions for Continuing Assurance

The applicant's provisions for continuing assurance of environmental protection at its facility should be acceptable if the submittal reflects environmental protection in other portions of the application:

1. Organizational Structure (Section 2.1)
2. Emergency Plan (Chapter 8.0)
3. Maintenance and Surveillance (Section 11.2)
4. Training and Qualification (Section 11.4)
5. Audits and Assessments (Section 11.3)
6. Procedures (Section 11.9)

9.5 REVIEW PROCEDURES

9.5.1 Acceptance Review

The primary reviewer should evaluate the application to determine whether it addresses the "Areas of Review" discussed in Section 9.3, above. If significant deficiencies are identified, the applicant should be requested to submit additional material before the start of the safety evaluation.

9.5.2 Safety Evaluation

After determining that the application is acceptable for review in accordance with Section 9.5.1, above, the primary reviewer should perform a safety evaluation against the acceptance criteria described in Section 9.4. In addition, the review of renewal or amendment applications should include review of inspection reports and semi-annual effluent reports submitted in accordance with 10 CFR 70.59 to assure licensee performance in environmental protection. The safety evaluation forms the basis for staff findings, and supports the reviewers' conclusions.

The primary reviewer should review the radiation protection program. This review should be coordinated with a supporting reviewer, primary reviewer of Chapter 4.0, and should focus on the applicant's program to maintain public doses ALARA.

The primary reviewer should review the ISA. Evaluation of the ISA should be coordinated with other technical reviewers by the Project Manager for the facility (Secondary Reviewer). All accident sequences identified in the ISA that can have significant consequences due to releases to unrestricted areas, should be reviewed to determine that the list of potential accidents is complete and properly identified. This review should be supported by other reviewers of Chapter 3.0 of this SRP, particularly the primary reviewers of Chapters 4.0 and 6.0 (Supporting Reviewers).

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For renewal and amendment applications, review of environmental protection by the primary reviewer should include coordination with the TWRS Site Representative responsible for environmental protection (Supporting Reviewer).

Other supporting reviewers should confirm that provisions made in the applicant's submittal are in accordance with specified sections of the SRP. For example, the primary reviewer of Section 11.4, as a supporting reviewer, should establish that the program described by the applicant should provide reasonable assurance that environmental protection staff and management will be appropriately trained.

When the safety evaluation is complete, the primary staff reviewer, with assistance from the other reviewers, should prepare the environmental protection input for the SER as described in Section 9.6 using the acceptance criteria from Section 9.4.

9.6 EVALUATION FINDINGS

The staff reviewers should verify that the information submitted by the applicant is in accordance with 10 CFR Parts 20, 51, and 70, and that this information is consistent with the guidance in this SRP as it applies to environmental protection. In the input to the SER, the primary reviewer should document the bases for determining the adequacy of the application with respect to environmental protection, and should recommend additional license conditions in areas where the license application is not adequate. The primary reviewer should also describe the applicant's approach to ensuring the quality and reliability of the controls required for environmental protection.

Often, environmental protection is reviewed and evaluated in conjunction with the environmental report, and the environmental protection function is summarized in the EA or EIS. However, the EA or EIS does not become part of the license. Issues identified during the review should be discussed briefly in the SER, and any recommended license conditions based on the analysis in the EA or EIS should be added to the license.

If an EA and EIS were prepared for the licensing action, the date the documents were issued should be reported in the environmental safety section of the SER. If the EA resulted in a FONSI, the FONSI's publication date in the Federal Register should be included in the SER. If an EIS is prepared, the SER should include the Federal Register publication date for the Record of Decision. When applicable, the SER should also document the determination that an action meets a categorical exclusion.

The following language would be appropriate for a licensing action that required an EIS in accordance with 10 CFR 51.20.

The applicant has committed to adequate environmental protection measures. The NRC staff concludes that there is reasonable assurance that the applicant's environmental protection measures will be adequate to protect public health and the environment and comply with the regulatory requirements in 10 CFR Parts 20, 51, and 70. The bases for these conclusions are:

[State the bases for the conclusion, including any recommended license conditions.]

The NRC staff prepared an environmental impact statement (EIS) [publication date] for this licensing action as required by 10 CFR 51.20. Based on the EIS, the NRC stated in its Record of Decision [publication date in the Federal Register] that the preferred option was [state preferred option here].

9.7 REFERENCES

1. American National Standards Institute (ANSI). N13.1-1982, "Guide to Sampling Airborne Radioactive Materials in Nuclear Facilities." ANSI: New York. 1982
2. American National Standards Institute (ANSI). N42.18-1980, "Specification and Performance of On-site Instrumentation for Continuously Monitoring Radioactive Effluents." ANSI: New York. 1980.
3. National Council on Radiation Protection and Measurements (NCRP). Report No. 123 I & II, "Screening Models for Releases of Radionuclides to Atmosphere, Surface Water, and Ground." NCRP: Maryland. January 1996.
4. Nuclear Regulatory Commission (U.S.) (NRC). Information Notice 94-23, "Guidance to Hazardous, Radioactive and Mixed Waste Generators on the Elements of a Waste Minimization Program." NRC: Washington, D.C. March 25, 1994.
5. Nuclear Regulatory Commission (U.S.) (NRC). Information Notice 94-07, "Solubility Criteria for Liquid Effluent Releases to Sanitary Sewers Under the Revised 10 CFR Part 20." NRC: Washington, D.C. January 28, 1994.
6. Nuclear Regulatory Commission (U.S.) (NRC). NMSS/FCSS/Fuel Cycle Licensing Branch, Rev. 6, "Materials Licensing Procedures Manual." NRC: Washington, D.C. April 1998.
7. Nuclear Regulatory Commission (U.S.) (NRC). Regulatory Guide 4.15, Rev. 2, "Quality Assurance for Radiological Monitoring Programs (Normal Operations)–Effluent Streams and the Environment." NRC: Washington, D.C. February 1979.
8. Nuclear Regulatory Commission (U.S.) (NRC). Regulatory Guide 4.16, Rev. 2, "Monitoring and Reporting Radioactivity in Releases of Radioactive Materials in Liquid and Gaseous Effluents from Nuclear Fuel Processing and Fabrication Plants and Uranium Hexafluoride Production Plants." NRC: Washington, D.C. December 1985.
9. Nuclear Regulatory Commission (U.S.) (NRC). Regulatory Guide 4.20, "Constraint on Releases of Airborne Radioactive Materials to the Environment for Licensees other than Power Reactors." NRC: Washington, D.C. December 1996.
10. Nuclear Regulatory Commission (U.S.) (NRC). Regulatory Guide 8.37, "ALARA Levels for Effluents from Materials Facilities." NRC: Washington, D.C. July 1993.

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11. Nuclear Regulatory Commission (U.S.) (NRC). NUREG/CR-6410, "Nuclear Fuel Cycle Accident Analysis Handbook." NRC: Washington, D.C. 1998.
12. Nuclear Regulatory Commission (U.S.) (NRC). NUREG-1520 (DRAFT), "Draft Standard Review Plan for the Review of a License Application for a Fuel Cycle Facility." NRC: Washington, D.C. July 1999.