

Environmental Review Guidance for Licensing Actions Associated with NMSS Programs

**Draft Report
For Interim Use and Comment**

**U.S. Nuclear Regulatory Commission
Office of Nuclear Material Safety and Safeguards
Washington, DC 20555-0001**



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Environmental Review Guidance for Licensing Actions Associated with NMSS Programs

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ABSTRACT

This guidance document provides general procedures for the environmental review of licensing actions regulated by the Office of Nuclear Material Safety and Safeguards (NMSS). Divisions within NMSS and their Regional counterparts may have supplemental guidance that is specific to facilities they regulate. Although the main focus of this guidance is the NRC staff's environmental review process, it also contains related information which applicants and licensees may find useful. Chapter 1 provides a summary and overview of the guidance. This chapter briefly discusses whether an applicant or licensee's request is a categorical exclusion or whether the staff needs to prepare an environmental assessment (EA) or environmental impact statement (EIS), early planning for an EA or EIS, and methods of using previous environmental analyses related to the proposed action. Chapter 2 discusses the categorical exclusions and the basis of their use. Chapter 3 discusses the EA process, including preparation and content of the EA, agencies to be consulted, and preparation of the Finding of No Significant Impact. Chapter 4 discusses the process of preparing an EIS, from developing a project plan through scoping, consultations and public meetings, to preparing the Record of Decision. Chapter 5 discusses the content of the EIS, and Chapter 6 discusses environmental information that should be considered by applicants and licensees in preparing their environmental report.

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ACRONYMS/ABBREVIATIONS

ADAMS	Agencywide Documents Access and Management System
ALARA	As low as is reasonably achievable
BLM	U.S. Bureau of Land Management
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CATX	Categorical exclusion
DEIS	Draft Environmental Impact Statement
DOE	U.S. Department of Energy
DOI	U.S. Department of Interior
DWM	Division of Waste Management (NRC)
EA	Environmental Assessment
EIS	Environmental Impact Statement
EPA	U.S. Environmental Protection Agency
EPAB	Environmental and Performance Assessment Branch (NRC)
ER	Environmental Report
FEIS	Final Environmental Impact Statement
FONSI	Finding of No Significant Impact
FRN	<i>Federal Register</i> Notice
FWS	U.S. Fish and Wildlife Service
GEIS	Generic Environmental Impact Statement
MOU	Memorandum of Understanding
NAGPRA	Native American Graves Protection and Repatriation Act
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NMFS	National Marine Fisheries Service
NMSS	Office of Nuclear Material Safety and Safeguards (NRC)
NOI	Notice of intent
NPS	U.S. National Park Service
NRC	U.S. Nuclear Regulatory Commission
OGC	Office of General Counsel (NRC)
OFA	Office of Federal Activities (EPA)
RAI	Request for Additional Information
RCRA	Resource Conservation and Recovery Act

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ACRONYMS/ABBREVIATIONS

RITS	Regulatory Information Tracking System
ROD	Record of Decision
SER	Safety Evaluation Report
SHPO	State Historic Preservation Officer
TAR	Technical Assistance Request
THPO	Tribal Historic Preservation Officer
WWW	World Wide Web

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1 INTRODUCTION TO THIS GUIDANCE DOCUMENT

1.1 Introduction

The National Environmental Policy Act (NEPA) of 1969 requires Federal agencies, as part of their decision-making process, to consider the environmental impacts of actions under their jurisdiction. Both the Council on Environmental Quality (CEQ) and the U.S. Nuclear Regulatory Commission (NRC) have promulgated regulations to implement NEPA requirements. CEQ regulations are contained in the Code of Federal Regulations (CFR) at 40 CFR Parts 1500 to 1508, and NRC requirements are provided in 10 CFR Part 51.¹

To ensure consistent treatment of NEPA requirements throughout the NRC Office of Nuclear Material Safety and Safeguards (NMSS), the Environmental and Performance Assessment Branch (EPAB) has produced this document to provide general procedures for determining the level of NEPA review and documentation required for NMSS actions. **Because of broad NMSS organizational responsibilities (e.g., rulemaking, licensing of new facilities, amendments to existing licenses, and decommissioning), this document is written in general terms to accommodate the different situations and types of facilities regulated by NMSS.** Specific divisions within NMSS may have more detailed technical requirements than presented here. This document is intended to provide an overview of the NEPA process with major emphasis on preparing NEPA documents. Chapter 2 discusses categorical exclusions (CATXs), Chapter 3 discusses the environmental assessment (EA) process, Chapters 4 and 5 discuss the environmental impact statement (EIS) process, and Chapter 6 discusses environmental information that should be considered by applicants and licensees in an environmental report (ER).

This document is primarily intended to serve as guidance to NMSS staff to meet the requirements established by legislation and regulations. Although not a substitute for legislation and regulations and compliance with this document is not required, the NMSS staff is encouraged to consider this guidance when reviewing licensing actions. In a similar manner, applicants and licensees are encouraged to use Chapter 6 when preparing environmental reports for submission to the NRC. Methods different from those set out in this document will be acceptable, if they provide a basis for concluding that the NRC's regulations have been met.

This document supersedes previous environmental review guidance, including:

- NMSS Policy and Procedures Letter 1-48, Rev. 1, "Procedure for Preparing Environmental Assessments," May 31, 1995.
- NMSS Policy and Procedures Letter 1-50, Revision 3, "Environmental Justice in NEPA Documents." 2001.

¹While the NRC maintains its view that, as a matter of law, independent regulatory agencies can be bound by the CEQ NEPA regulations only insofar as those regulations are procedural or ministerial in nature, the regulations nonetheless provide useful guidance. See 49 FR 9352.

- Memorandum from Richard E. Cunningham, "Policy and Guidance Directive 84-20; Impact of Revision of 10 CFR Part 51 on Material Licensing Actions," December 5, 1984.
- Memorandum from Richard E. Cunningham, "Supplement to Policy and Guidance Directive 84-20: Impact of Revision of 10 CFR Part 51 on Material Licensing Actions," February 19, 1992.
- Memorandum from Carl J. Paperiello, "Revision 1, Supplement to Policy and Guidance Directive 84-20, Impact of Revision of 10 CFR Part 51 on Material Licensing Actions," March 9, 1994.

1.2 The Environmental Review

NEPA mandates Federal agencies to consider carefully the environmental impacts of their actions prior to making decisions that affect the environment, and to allow the public to participate in the decision process. The NEPA review (also referred to as environmental review) process is usually initiated by an application for a new license, change to an existing license, or a decommissioning plan submitted to the NRC. A flow chart illustrating the NEPA process is shown in Figure 1. Part of the NEPA process is directed by legislation and executive orders related to environmental issues. When a request for a specific action is received from an applicant/licensee, the NRC first determines whether a CATX is applicable for the proposed action. CATXs are categories of actions that the NRC, in consultation with CEQ, has determined do not individually or cumulatively have a significant effect on the environment. Criteria for identifying a CATX and a list of actions eligible for CATX are provided in 10 CFR 51.22. Categories of actions appropriate for CATX include administrative, organizational, or procedural amendments to certain types of NRC regulations, licenses, and certificates; minor changes related to application filing procedures; certain personnel and procurement activities; and activities where environmental review by NRC is excluded by statute (e.g., the Nuclear Waste Policy Act). If a CATX exists, the finding should be documented as described in Chapter 2. The proposed action is subject to no further NEPA review, but is still evaluated for compliance with NRC radiation protection regulations and other applicable regulations. Under special circumstances, the NRC may elect to conduct an environmental review even if a CATX exists [10 CFR 51.22(b)]. If no CATX applies, the NRC typically prepares an EA (10 CFR 51.21). An EA is a concise publicly available document that serves to provide sufficient evidence and analysis for determining whether to prepare an EIS or a finding of no significant impact (FONSI). If the EA supports a FONSI, the environmental review process is complete. If the EA reveals the proposed action will significantly affect the environment and cannot be mitigated, the development of an EA is discontinued and the process to develop an EIS is initiated. EAs are prepared by licensing project managers and are reviewed by an environmental project manager in EPAB.

NEPA requires that a detailed statement of the environmental impact of the proposed action and reasonable alternatives be prepared for "major Federal actions significantly affecting the quality of the human environment" [Section 102(2)(C)]. NRC implementing regulations require an EIS for proposed actions that are major Federal actions significantly affecting the quality of the human environment or involve a matter which the NRC determines should be covered by an EIS. An EIS is also prepared for actions in which an EA does not support a FONSI. An EIS is a publicly available document detailing the environmental impacts associated with the proposed action and reasonable alternatives. Except for rulemaking EISs, all NMSS EISs are prepared by the EPAB (EPAB only reviews EISs prepared in

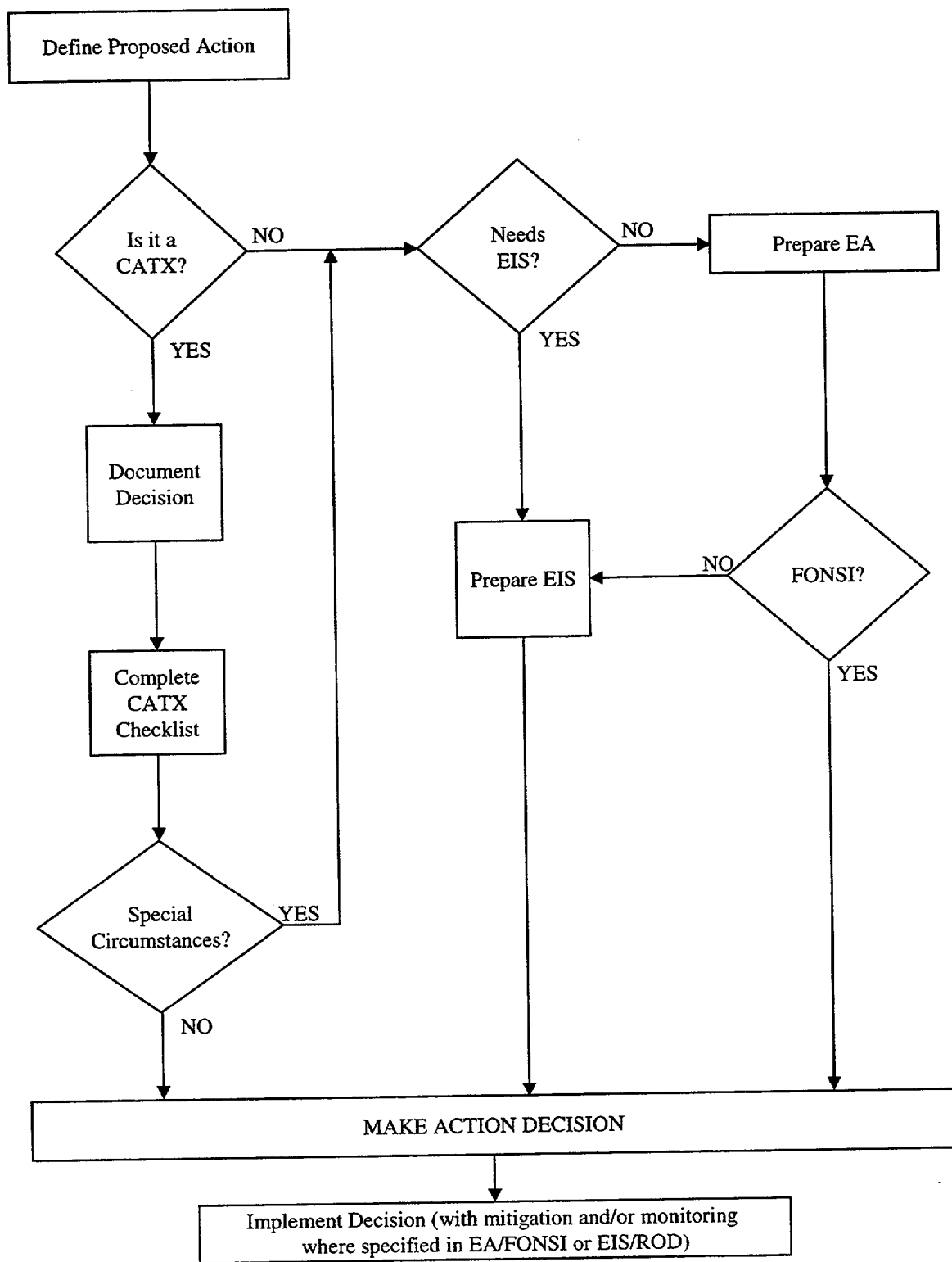


Figure 1: Flow chart showing NEPA screening process.

support of rulemaking). For NMSS, types of licensing actions that typically require an EIS are applications for construction and operation of new facilities such as uranium mills, uranium conversion plants, uranium enrichment plants, and interim spent fuel storage facilities, and decommissioning of facilities that plan to use the restricted release criteria (10 CFR 20.1403-1404) for license termination.

The focus of EAs and EISs (i.e. NEPA documents) is the environmental impacts of the proposed action. Also, NRC often typically prepares a Safety Evaluation Report (SER) to evaluate the safety of the proposed action and compliance with NRC regulations. The safety and environmental reviews are conducted in parallel. Although there is some overlap between the content of a SER and the NEPA document, the intent of the documents is different. The NEPA document usually includes a summary of the SER findings to aid in the decision process. The NEPA document does not address accident scenarios, rather it addresses the environmental impacts which would result from the accident. Accident scenarios (i.e. frequency, probability) are addressed in the SER. Much of the information describing the affected environment is also applicable to the SER (e.g., traffic patterns, demographics, geology, and meteorology) and the NRC staff should ensure consistency between the NEPA document and the SER.

1.2.1 Initiation of the Environmental Review

An environmental review may be initiated as a result of a license application, request for a licensing action, or as a result of an internal action, such as a rulemaking. Any of these activities may result in the preparation of an EA or an EIS, depending on the significance of impacts associated with the action.

Preparation of an EA for a licensing action for which a CATX does not apply is the responsibility of the licensing project manager at NRC Headquarters or in a Regional Office. All EAs prepared for NMSS actions are subject to review by EPAB. EPAB staff are prepared to assist with the various consultations with Federal and State Agencies, as discussed in Sections 3.2.9, *Agencies and Persons Consulted and Sources Used*, and 4.2.4, *Consultations and Cooperating Agencies*.

If the EA results in a FONSI, it is also the licensing project manager's responsibility to prepare the *Federal Register* notice (FRN) of the EA finding and the basis for those findings. If the EA does not result in a FONSI, the EIS process should be initiated as discussed in Chapter 4.

EPAB has the responsibility for the preparation of all EISs, with the exception of those prepared for rulemaking activities. The Rulemaking and Guidance Branch in the Division of Industrial and Medical Nuclear Safety is responsible for preparing EAs and EISs for rulemaking actions for NMSS. Procedures for EAs and EISs prepared in support of rulemakings are described in NUREG/BR-0053, *Regulations Handbook*. Related guidance documents, (i) NMSS Policy and Procedures Letter 1-63, *Procedures for Preparation and Review of Rulemaking Packages* (first issued June 11, 1998) and (ii) Management Directive 6.3, *The Rulemaking Process*, should be used in conjunction with this (NUREG-XXXX) guidance document. EPAB should be informed of any proposed rulemaking actions that will require an EIS early in the rulemaking and planning stage. EPAB is required to review all EAs and EISs prepared for rulemaking actions.

1.2.2 Early Planning

If the proposed licensing action is likely to require preparation of an EA, the licensing project manager should involve the EPAB in discussions with the applicant/licensee as early as possible to facilitate the EA review. A Technical Assistance Request (TAR) should be forwarded to EPAB requesting review. Chapter 6 provides guidance to assist the applicant/licensee in preparing an environmental report (ER) to aid the NRC in preparing the EA or EIS and complying with Section 102(2) of NEPA. The general requirements for a materials licensee/applicant ER are provided in 10 CFR 51.60.

Written requests for EPAB reviews of EAs should include the following information:

- A generalized description of the proposed action(s);
- Copy of the SER;
- Requested date for completion of EPAB's review; and
- The Regulatory Information Tracking System (RITS) number being used for the action.

The responsible licensing project manager should continue to keep the EPAB informed about significant changes and issues, new information, and meetings that are planned regarding the proposed action. The licensing project manager may wish to request assistance from EPAB in preparing correspondence to complete the consultations necessary for the preparation of an EA. In addition, the EPAB may need copies of information related to the EA (e.g., request for the proposed action, information provided by the applicant/licensee, and referenced documents used in tiering). In this case, the EPAB staff will work with the licensing project manager to identify and obtain copies of the necessary information. Depending on the circumstances of the case (e.g., scope, controversy, or expressed public interest), the licensing project manager, in consultation with EPAB, may elect to publish an initial FRN to announce the intent to complete an EA. The FRN should be brief and provide a general description of the incoming application and proposed action. This initial FRN may contain a statement of opportunity for hearing.

If it is determined that an EIS is necessary, a TAR should be forwarded to EPAB requesting the EPAB to assume responsibility for the EIS. The TAR should include the same information as suggested above in the EA TAR. EPAB will establish a separate number for preparation of an EIS. EPAB will need copies of all information related to the EIS (e.g., applicant/licensee request for the proposed action, supporting information provided by the applicant/licensee, referenced documents used in tiering, and previous site specific EAs and SERs applicable to the proposed action). At this point, EPAB will prepare a notice of intent (NOI) for the *Federal Register* to inform the public of the decision to prepare an EIS (10 CFR 51.26-27). Section 3.2.2, *Notice of Intent*, provides more information on the NOI.

Required consultations with other Federal, State, local, and tribal agencies should be identified by the environmental project manager and initiated early during the environmental review. These consultations can take a significant amount of time and may identify impacts which require further assessment.

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1.2.3 Emergency Circumstances

Under emergency circumstances, the NRC may approve a licensee's action which could result in significant environmental impacts without first observing the provisions of NEPA and 10 CFR Part 51. This situation will only occur under emergency circumstances where the health and safety of the public may be adversely affected if mitigative or remedial actions are delayed (10 CFR 51.13). In these cases, the EPAB will consult with the CEQ as soon as practicable concerning alternative NEPA arrangements.

1.3 Utilizing Existing Environmental Analyses

Existing environmental analyses should be used to evaluate impacts associated with a proposed action to the extent possible and appropriate. This approach builds on work that has already been done, avoids redundancy, and provides a coherent and logical record of the analytical and decision making process.

The staff should determine if any environmental analyses (EAs or EISs) relevant to the site or proposed action have been prepared and if any of the existing analyses adequately address the proposed action and alternatives. This review will determine if additional analyses are necessary and whether a tiered or supplemental analysis is possible.

1.3.1 Tiering

Tiering (defined in 40 CFR 1508.28) is a procedure by which more specific or more narrowly focused environmental documents can be prepared without duplicating relevant parts of previously prepared, more general, or broader documents. The new, more specific environmental document incorporates by reference the general discussions and analyses from the existing broader document and concentrates on the issues and impacts of the project which are not specifically covered in the broader document. This broader document is often referred to as a generic EIS (GEIS). The new environmental document, however, must be within the scope and conclusions of the more general environmental document to which it is tiered. Also, the decision made as a result of the more specific document does not change or modify the decision(s) of the more general document. The new environmental document must identify the document to which it is tiered and both documents must be available for public review. An example of tiering may include using a GEIS as the basis for an EA or EIS prepared for a site-specific proposed action.

Since NEPA documents prepared for rulemaking are usually generic in nature, tiering off previous documents is usually not possible. However, future applicant/licensee proposals requiring NEPA reviews will be assessed for possible tiering from a rulemaking EA or GEIS. Therefore, an initial rulemaking NEPA document, especially a GEIS, should provide ample information regarding bounding conditions and assumptions to allow future reference and tiering. An example of tiering off a rulemaking GEIS is provided in Appendix A. In this example, a checklist was developed to assist in the determination of whether NUREG-1496 (GEIS in support of the License Termination Rule), was applicable to proposed decommissioning actions.

1.3.2 Supplementing

A supplement to an existing draft EIS (DEIS) or final EIS (FEIS) is prepared when additional environmental analysis is needed [10 CFR 51.72, 51.92, and 40 CFR 1502.9(c)] as a result of new information on the proposed action or substantial changes in the proposed action that are relevant to environmental concerns.

It is not necessary to formally supplement an EA. An existing EA can be easily modified to reflect new information. For example, a modified EA could be prepared by identifying changes to an existing EA and attaching or incorporating by reference the existing EA.

1.3.3 Adopting

Adoption is another technique used to avoid redundancies in NEPA analysis. If the NRC wants to use all or part of another agency's EIS, the NRC can formally adopt the EIS in accordance with CEQ regulations (40 CFR 1506.3). For example, under the Nuclear Waste Policy Act, the NRC is required, to the extent practicable, to adopt the U.S. Department of Energy's (DOE) EIS for a proposed high-level radioactive waste geologic repository.

In those instances where the actions covered by the other agency's EIS and the NRC action are substantially the same, the NRC can adopt the EIS after recirculating the document as a FEIS. Section 4.9, *Publishing the FEIS*, provides more information on publishing the FEIS. When recirculating the FEIS, the NRC should provide information that identifies the Federal action involved. The EIS must meet the applicable NRC criteria and the NRC must prepare a separate record of decision (ROD).

In those instances where the actions covered by the other agency's EIS and the NRC proposal are not substantially the same, the NRC can adopt the EIS in part by treating the other agency's final document as part of an NRC DEIS (discussed in Section 4.4, *Publishing the DEIS*). If the other agency's EIS only partially covers a proposed action or only a portion of the other agency's EIS is adopted, the NRC must prepare a supplemental or new and separate DEIS, describing that portion of the other agency's EIS which is being adopted as well as any supplementary analysis needed. If the NRC adopts an EIS that is not final within the agency that prepared it, or if the adequacy of the EIS is the subject of judicial action that is not final, the NRC must indicate its status in the recirculated DEIS and/or FEIS (40 CFR 1506.3) and an FEIS and ROD must be prepared.

Similar procedures exist for using another agency's EA. The other agency's EA must satisfy CEQ and NRC criteria. The NRC takes full responsibility for the scope and content of any adopted EA. The NRC must prepare its own FONSI (in accordance with 10 CFR 51.32–35) and decision record. Another agency's FONSI and decision record cannot be used or adopted by the NRC.

1.3.4 Incorporating by Reference

Incorporation by reference is a technique used to avoid redundancies in analysis and to reduce the bulk of a NEPA document. Both EAs and EISs may incorporate previous analyses by reference. Materials or

analyses incorporated by reference are not limited to NEPA documents. Special technical or professional studies and analyses prepared by the NRC, other Federal, State, local agencies, tribal governments, or private interests may be incorporated by reference.

The EA or EIS should identify documents that are incorporated by reference and indicate where these references are available for public review. Relevant portions of the incorporated analysis should be referenced by page or section number and summarized in the EA or EIS. Incorporating by reference should not result in a loss of comprehension to the reader. The NEPA document must be able to stand alone and provide sufficient analysis to allow the decision maker to arrive at a conclusion. Material incorporated by reference must be reasonably available for inspection by interested persons within the time allowed for comment. Material based on proprietary data may not be incorporated by reference.

1.4 References

Code of Federal Regulations, Title 10, Chapter I–Nuclear Regulatory Commission, *Energy*, Part 51, "Environmental Protection Regulations for Domestic Licensing and Related Regulatory Functions."

Code of Federal Regulations, Title 40, *Protection of Environment*, Chapter V–Council on Environmental Quality, Parts 1500-1508.

Nuclear Regulatory Commission (U.S.) (NRC). NUREG-1496, "Generic Environmental Impact Statement in Support of Rulemaking on Radiological Criteria for License Termination of NRC-Licensed Facilities." NRC: Washington, D.C. 1997.

Nuclear Regulatory Commission (U.S.) (NRC). NUREG/BR-0053, "Regulations Handbook." NRC: Washington, D.C. 2001.

Nuclear Regulatory Commission (U.S.) (NRC). NMSS Policy and Procedures Letter 1-63 "Procedures for Preparation and Review of Rulemaking Packages." NRC: Washington, D.C. 1998.

Nuclear Regulatory Commission (U.S.) (NRC). Management Directive 6.3, "The Rulemaking Process." NRC: Washington, D.C. June 2, 2000.

2 PREPARATION AND USE OF CATEGORICAL EXCLUSIONS

The purpose of CATXs is to limit extensive NEPA analysis to major Federal actions that may significantly affect the quality of the human environment. The use of CATXs is a means of streamlining the NEPA process, saving time, effort, and taxpayer dollars.

Categorical exclusion "...means a category of actions which do not individually or cumulatively have a significant effect on the human environment and which have been found to have no such effect in procedures adopted by a Federal agency [...] and for which, therefore, neither an Environmental Assessment nor an Environmental Impact Statement is required..." (40 CFR 1508.4).

NRC regulations further describe CATXs in 10 CFR 51.22. A list of 21 categorical exclusions can be found at 10 CFR 51.22(c). Under special circumstances, the NRC may issue an EA or EIS for any action which is categorically excluded (10 CFR 51.21). Special circumstances include unresolved conflicts concerning alternative uses of available resources within the meaning of section 102(2)(E) of NEPA.

2.1 Documenting the CATX

All CATXs should be documented in some manner. This documentation provides the considerations in applying the CATX. At a minimum the CATX should be documented in the safety or technical review or a letter of response to the applicant/licensee noting which CATX applies and how it applies. For routine or simple actions the following sentence should be included in the response to the applicant/licensee or in a memo to the file:

"An environmental assessment for this action is not required, since this action is categorically excluded under 10 CFR 51.22(c)(*fill in appropriate number*)."

This chapter also provides an acceptable method of documenting a CATX via a checklist. EPAB will maintain a generic CATX checklist for use by licensing project managers. Although additions to the checklist are allowed, the four basic questions should be answered for each CATX. Appendix E contains a generic CATX checklist with instructions. This generic checklist can also be used to ensure that there are no special circumstances warranting preparation of an EA or EIS. Special circumstances are further described in Section 2.3

2.2 General CATX Guidance

On March 12, 1984, 10 CFR 51, "Licensing and Regulatory Policy and Procedures for Environmental Protection," was revised (49 FR 9352). The statement of considerations for this rule clearly notes the following licensing actions which are not covered by categorical exclusion:

- Use of radioactive tracers in field flood studies involving secondary and tertiary oil and gas recovery.

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- Performance of field studies in which licensed material is deliberately released directly into the environment for purposes of the study. The use of tracers in well-logging is specifically covered by 10 CFR 51.22(c)(14)(xi).
- Processing of source material for extraction of rare earth and other metals.
- Waste brokers who are authorized to store waste more than 180 days, or possess more than 50 curies of radioactive material.
- Any commercial waste disposal.

Sections 51.22(c)(11) and 51.22(c)(14)(xvi) provide generic categorical exclusions. The use of either CATX was addressed in a Staff Requirements Memorandum (NRC, 1984) which directed the staff to prepare:

“a written memorandum explaining why the action qualifies for the categorical exclusion (emphasis in original) selected. The written memorandum shall include a discussion of the factors listed in the selected subsections² and shall become part of the permanent docket or record relating to that action.”

This memorandum shall be signed by the appropriate Division Director and included in the license file.

2.3 Specific CATX Guidance

As stated previously, the NRC may issue an EA or EIS for any action which is categorically excluded. The applicability of some CATXs is unclear. Other CATXs have been shaped by internal guidance. The following provides consolidated guidance concerning the use of four specific CATXs.

2.3.1 CATX 10 CFR 51.22(c)(11)

This CATX deals with license amendments for fuel cycle plants, radioactive waste disposal sites, and amendments to materials licenses identified in 10 CFR 51.60(b)(1). Special circumstances in which this CATX does not apply include amendments that:

- Involve changes other than administrative, organizational, or procedural in nature; or
- Result in a change in process operations or equipment unless:
 - There is no significant change in the types or significant increase in the amounts of any effluents that may be released offsite;

²The "selected subsections" are 10 CFR 51.22(c)(9), (c)(11), or (c)(14)(xvi).

- There is no significant increase in individual or cumulative occupational radiation exposure;
- There is no significant construction impact; and
- There is no significant increase in the potential for, or consequences from, radiological accidents.

For this CATX to apply, the license amendment must involve routine and minor types of changes that do not significantly alter the previously evaluated environmental impacts associated with the licensed operation, and the amendment must not affect the scope or nature of the licensed activity. This CATX does not apply to a change in status from operation or standby to decommissioning. This CATX must be documented as described in Section 2.2.

2.3.2 CATX 10 CFR 51.22(c)(14)(v)

This CATX deals with the issuance, amendment, or renewal of materials licenses authorizing the use of radioactive materials for research and development and for educational purposes. This CATX does not apply to the five types of activities listed in Section 2.2.

In special cases, performance of field studies in which licensed material is deliberately released directly into the environment for the purposes of the study may qualify for a CATX provided that:

- All releases to the environment (e.g., air and liquid effluents, direct radiation from deposition of radioactive materials) comply with ALARA and Part 20 requirements;
- The licensee has demonstrated compliance with Part 20 requirements by setting ALARA goals for air effluents at a modest fraction of the values in 10 CFR 20 Appendix B, Table 2, Columns 1 and 2, and demonstrating that the nearest member of the general public receives no more than 10 mrem/yr from all the licensee's radioactive air effluents.
- All releases comply with applicable decommissioning requirements and current decommissioning policies.

In applying this CATX the following should be considered:

- Radioactive material used including its half-life, chemical characteristics, and solubility.
- Procedures to control and clean-up the radioactive material.
- Location, size, and length of study.
- Ability to restrict access to study area.

Research activities which may qualify for this CATX with an explanatory memorandum include:

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- Those that involve crops on small plots which were planted in a lined area and totally removed at the conclusion of the study and the study design prevented release to the environment and includes confirmatory analysis of the soil beneath the liner.
- Those that involve a small quantity of short-live material which will decay to natural background by the conclusion of the study and the study design includes confirmatory analysis of background levels.
- Those that involve tagging of animals and penning them to prevent their escape.
- Those that involve releases which are not deliberate and are recoverable, retrievable, or revocable.

For license actions that can not meet the above criteria, the licensing project manager should coordinate with EPAB to determine if an EA is needed. Examples of field studies that might require an EA include:

- Those that are not similar to normal routine research, development and educational activities.
- Those that affect endangered species.

2.3.3 CATX 10 CFR 51.22(c)(14)(xvi)

This CATX deals with any use of source, byproduct, or special nuclear material not listed in 10 CFR 51.22(c)(14)(i)-(xv) but involves quantities and forms of source, byproduct, or special nuclear material similar to those listed in 10 CFR 51.22(c)(14)(i)-(xv).

The performance of field studies in which licensed material is deliberately released directly into the environment for the purposes of the study (e.g. tagging of animals which remain in the wild, or release of radioactive material directly to the atmosphere to study dispersion characteristics or test equipment and that could not be recovered), or use of radioactive tracers involving field flood studies involving secondary or tertiary oil and gas recovery do not qualify for a CATX under 51.22(c)(14)(v), however, may qualify for a CATX under 51.22(c)(14)(xvi).

In applying this CATX the following should be considered:

- Radioactive material used including its half-life, chemical characteristics, and solubility.
- Procedures to control and clean-up the radioactive material.
- Location, size, and length of study.
- Ability to restrict access to study area.

Additional guidance regarding tracer studies can be found in "Consolidated Guidance About Materials Licenses: Program-Specific Guidance About Well Logging, Tracer, and Field Flood Study Licenses" (NUREG SR1556, Vol. 14, June 2000).

This CATX may also be used for license actions other than field studies, as appropriate.

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2.3.4 CATX 10 CFR 51.22(c)(20)

This CATX deals with the decommissioning of sites where licensed operations have been limited to the use of small quantities of short-lived material or radioactive materials in sealed sources.

Typically this CATX will be limited to the application of Type I and Type II decommissioning actions as defined in "NMSS Handbook for Decommissioning Fuel Cycle and Materials Licensees" (NUREG/BR-0241, 1996).

2.4 Consultations

CATX actions do not require EAs or EISs; they are "excluded" from higher levels of NEPA analysis. These actions may not be excluded from other Federal, State, or local environmental laws and regulations, however. Therefore, you may need to conduct additional analyses, consult with other agencies, carry out public participation activities, and prepare documentation under other applicable laws even though your proposed action is a CATX (e.g., a project to decommission a building included in or eligible for the National Register of Historic Places, (*National Register*)).

External environmental experts and agencies with jurisdiction by law or expertise, such as the U.S. Fish and Wildlife Service (FWS) and the appropriate Office of the State Historic Preservation Officer (SHPO), generally do not need to be consulted for licensing actions that qualify for a CATX.

2.5 Public Participation in CATXs

Generally, determining whether an action is a CATX requires no public participation, but if an individual or group expresses interest in the project's environmental effects, they should be kept informed of the CATX review and a copy of the completed CATX checklist (Appendix E) or other documentation should be part of the publically available information documenting the NRC decision.

2.6 The Environmental Checklist

The licensing project manager may use the checklist provided in Appendix E to document the CATX and the considerations in using the applicable CATX. Instructions for completing the checklist are also presented in Appendix E.

2.6.1 Considering Environmental Consequences

The checklist consists of four questions about the likelihood that a particular kind of environmental consequence will result from the proposed action. The licensing project manager may consult with technical staff and EPAB, as necessary.

Based on internal review, external review (where appropriate), and research, check "YES," "NO," or "NEED DATA" for each question. Attach documentation as needed to support the answer. If the "NEED DATA" box is checked, the licensing project manager may consult with the EPAB project

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1 manager about what data are needed and/or how to get it. Appendix E provides details to consider when
2 completing the checklist.

3 4 **2.6.2 Completing the Checklist**

5
6 The checklist is not complete until all "NEED DATA" issues have been resolved and all blocks are
7 checked either "YES" or "NO." Checking a single block to "YES" does not necessarily mean that an EA
8 must be prepared; it may be possible to resolve the "YES" answer in another way.

9
10 Resolve all "NEED DATA" issues and complete the checklist, attaching all supporting documentation.
11 In the "Conclusions" section, check the box corresponding to the conclusion reached. Add the names of
12 the relevant technical staff and EPAB staff below the signature blocks; then sign and date them. The
13 checklist is now complete. The checklist becomes part of the licensing file, and can be made available to
14 the public and review agencies upon request, or as needed for review under authorities other than NEPA.
15 If the licensing project manager and EPAB staff cannot agree on the conclusions, consult the OGC for
16 assistance.

17
18 The CATX checklist should not just be filed and forgotten. The licensing project manager should do
19 what is necessary to carry out the conclusions reached. If the conclusion is that further review is needed,
20 the licensing project manager should ensure this review happens. If the conclusion is that a CATX is not
21 warranted, the licensing project manager should ensure the appropriate level of analysis and
22 documentation is carried out and initiate preparation of an EA. For any activity related to an EIS, the
23 responsibility for the environmental review should be transferred to EPAB.

24 25 **2.7 References**

26
27 Code of Federal Regulations, Title 10, Chapter I–Nuclear Regulatory Commission, *Energy*, Part 51,
28 "Environmental Protection Regulations for Domestic Licensing and Related Regulatory Functions."

29
30 Code of Federal Regulations, Title 40, *Protection of Environment*, Chapter V–Council on Environmental
31 Quality, Parts 1500-1508.

32
33 Nuclear Regulatory Commission (U.S). NUREG SR 1556 Vol 14. "Consolidated Guidance About
34 Materials Licenses: Program-Specific Guidance About Well Logging, Tracer, and Field Flood Study
35 Licenses." NRC: Washington, DC. June 2000.

36
37 Nuclear Regulatory Commission (U.S). "Licensing and Regulatory Policy and Procedures for
38 Environmental Protection." Federal Register: Volume 49, pp. 9352-9378. March 12, 1984.

39
40 Nuclear Regulatory Commission (U.S). NUREG-0241. "NMSS Handbook for Decommissioning Fuel
41 Cycle and Materials Licensees." NRC: Washington, DC. December 1995.

42

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1 Nuclear Regulatory Commission (U.S). Staff Requirement Memorandum. "SECY-83-286 - Revision to
2 10 CFR Part 51 and Related Conforming Amendments - Implementation of CEQ NEPA Regulations."
3 NRC: Washington, DC. February 28, 1984.
4

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3 PREPARING AN ENVIRONMENTAL ASSESSMENT

An EA must be prepared for proposed actions that are not:

- Exempt from NEPA;
- Categorically excluded (10 CFR 51.22);
- Covered in an existing EIS or other environmental analysis; or
- Required to have an EIS prepared (10 CFR 51.21).

An EA may be prepared for any action to assist in planning and decision making (40 CFR 1501.3), but should be prepared as early in the process as possible after the license or license amendment request. The EA should provide sufficient evidence and analysis of impacts to support a determination of a finding of no significant impacts (i.e., FONSI). If an EA does not result in a FONSI, then the potential impacts from the proposed activities require the preparation of an EIS. The EA process is an interdisciplinary review of proposed actions and their impacts on all affected resources. The EA may also identify and develop appropriate mitigation measures resulting in a mitigated FONSI. The EA and any related FONSI are made available to the public. In cases when an EIS is found to be necessary, any research completed during EA preparation can be used in the preparation of the EIS. If the action under review is certain to result in significant impacts, the EA can be skipped and the environmental review to support the action should move directly to an EIS.

The EA process need not be time consuming or complicated. The level of assessment should be commensurate with the anticipated impacts and the degree of public concern. EAs are prepared by licensing project managers responsible for the action associated with the EA, with the assistance of technical staff. Staff from EPAB (environmental project manager) review all EAs prepared by NMSS staff and will be available to assist with determinations on whether an action will require an EA or EIS, especially for areas where policy is being developed. Figure 2 provides an overview of the EA process.

3.1 Environmental Assessment Development

An application or request for action is accompanied by information needed to conduct the environmental analysis. This information is usually provided in an ER submitted by the applicant/licensee. Information may also be submitted as part of the license application or amendment request, without an ER. When the environmental information is submitted, NRC staff will conduct an acceptance review of the applicant/licensee information to determine whether (i) the requested action will require an EA or EIS, and (ii) the information is complete and will support the required environmental analyses. This initial acceptance review should not be a detailed technical review; rather, the acceptance review determines if the submitted information is sufficiently complete to begin the detailed technical review. The guidance in Chapter 6, *Preparing an Environmental Report: Format and Technical Content* provides a list of topics that may be helpful in completing this preliminary assessment of the submittal.

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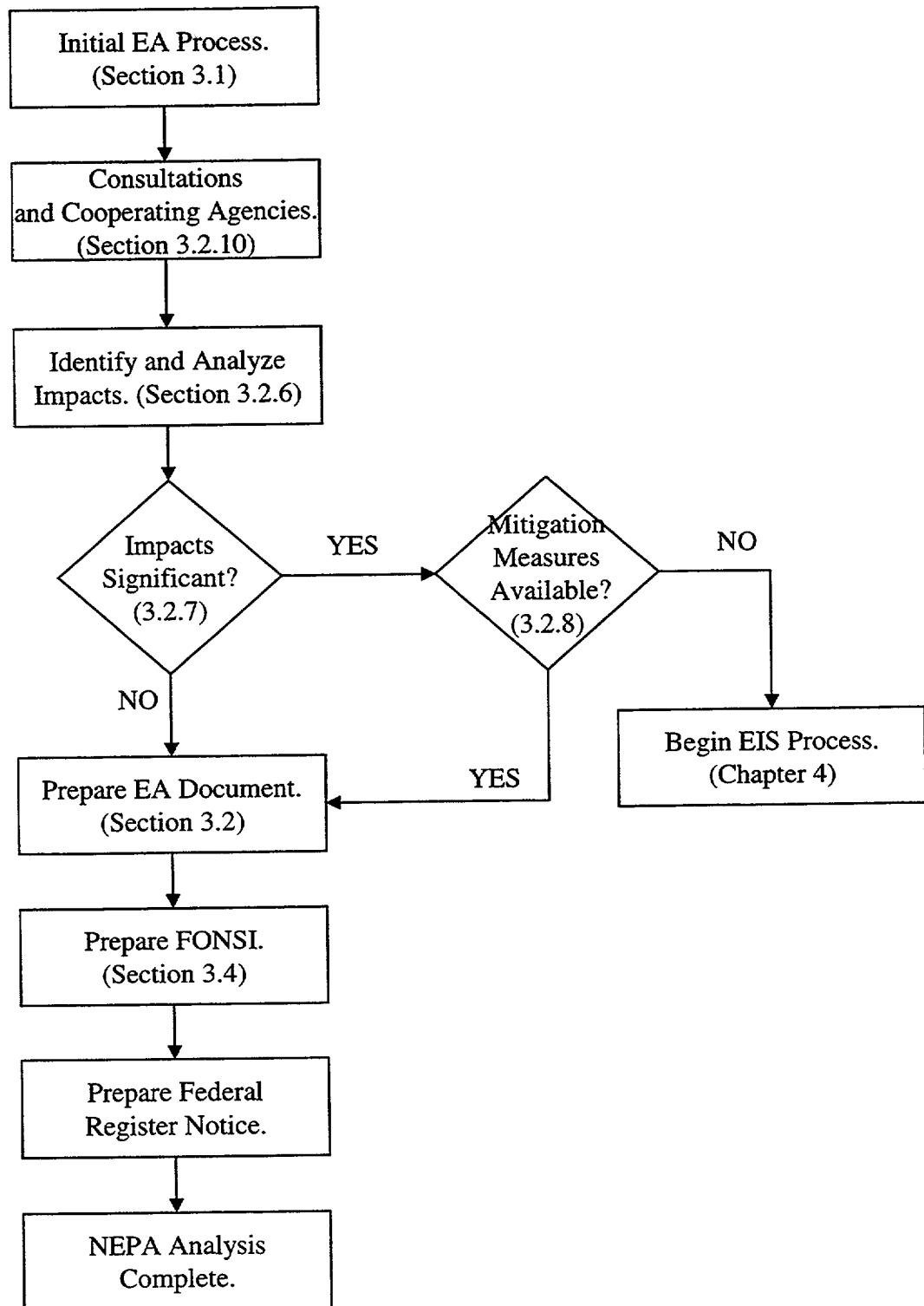


Figure 2: Major steps in the EA process.

1 The applicant/licensee should submit data, assumptions, and analyses, that support the applicant/licensee
2 conclusions. The licensing project manager should begin to develop an outline of the EA document
3 during the acceptance review in order to reveal gaps in explanations and logic that will require additional
4 information from the applicant/licensee. If the environmental information is significantly deficient, the
5 applicant/licensee should be notified by letter that deficiencies in the submittal prevent NRC from
6 beginning the review.

7
8 Once the submittal is determined to be adequate and the package is accepted for NMSS NEPA review,
9 the applicant/licensee should be notified by letter that the submittal is found acceptable for NRC to begin
10 it's review. The letter should also notify the applicant/licensee that, in the course of the detailed review,
11 the staff may identify areas where additional information is needed to complete the review. The letter
12 should also provide the applicant/licensee with a time frame for the completion of the staff's review.

13
14 Following the acceptance review, the licensing project manager and other necessary technical reviewers
15 should develop a preliminary draft of the EA. This effort assists with identification of missing and
16 unclear information, facilitates the preparation of requests to the applicant/licensee for additional
17 information (RAI), and streamlines the EA development. RAI is a term applied to additional necessary
18 information (clarifications and questions) requested of the applicant/licensee in order to complete the
19 environmental and safety review. To streamline the process, the NMSS goal is to minimize RAIs.
20 Preparation of a preliminary draft EA ensures that the necessary information is being requested. The
21 licensing project manger should consult with EPAB to determine any recent policy changes for NEPA
22 reviews that will impact the RAIs.

23
24 Related generic and site-specific EAs and/or EISs should be reviewed to determine if there is a potential
25 for tiering (Section 1.3, *Utilizing Existing Environmental Analyses*). Attention should be given to the
26 bounding conditions (both environmental and non-environmental) and related assumptions of these
27 previous analyses to determine if they apply to the new proposed action. This comparison and
28 determination should be briefly described in the EA and, for future generic use, may be documented in
29 greater detail separate from the EA. Applicable portions of existing EAs and/or EISs should be
30 incorporated by referenced to shorten the length of the EA.

31
32 An example of tiering off a generic EIS (GEIS) is provided in Appendix A. This appendix contains a
33 checklist that the licensing project manager can use to determine whether it is appropriate to tier off the
34 GEIS used for the License Termination Rulemaking (NUREG-1496). This checklist should only be used
35 for sites being released for unrestricted use and is related only to dose assessments.

36 37 **3.2 EA Format and Technical Content**

38
39 At a minimum, an EA is required (10 CFR 51.30) to include a brief discussion of (i) the purpose and
40 need for the proposed action, (ii) alternatives as required by Section 102(2)(E) of NEPA, (iii) the
41 environmental impacts of the proposed action and alternatives, and (iv) a list of agencies and persons
42 consulted and identification of sources used.

43
44 Program-specific guidance may identify additional format and content requirements or options. CEQ
45 guidance on the length of the EA suggests that EAs should be kept to 10-15 pages. Lengthy EAs may be

1 an indication that an EIS is needed (Council on Environmental Quality, 1981). An example EA is
2 provided in Appendix D.

3
4 Following is a generic outline for an EA:

- 5
- 6 • Introduction;
- 7 • Purpose and Need for the Proposed Action;
- 8 • The Proposed Action;
- 9 • Alternatives to the Proposed Action;
- 10 • Affected Environment;
- 11 • Environmental Impacts;
- 12 • Mitigation Measures (if applicable);
- 13 • Monitoring (if applicable);
- 14 • Agencies and Persons Consulted;
- 15 • Conclusion;
- 16 • List of Preparers; and
- 17 • List of References
- 18

19 **3.2.1 Introduction of the Environmental Assessment**

20
21 The introduction should include a brief description of the proposed action, how and when the proposed
22 action was submitted (e.g., license application, license amendment), and by whom the proposed action
23 was submitted. Any unique terms and phrases (e.g., cask, sealed-source, restricted release) should be
24 briefly defined as they are presented. A brief discussion of the relevant NRC regulations should be
25 included.

26 27 **3.2.2 Purpose and Need for the Proposed Action**

28
29 This section describes the applicant/licensee's purpose and need for the proposed action. Examples of
30 purpose and need could include a benefit provided if the proposed action is granted and descriptions of
31 the detriment that will be experienced without approval of the proposed action. The purpose and need
32 should not be described as a justification for the proposed action over the alternatives.

33 34 **3.2.3 The Proposed Action**

35
36 Briefly describe the proposed action, including the following:

- 37
- 38 • Identification of planned activities/phases;
- 39
- 40 • Location of proposed action;
- 41
- 42 • The duration of the proposed action (not the duration until the next license renewal), including
43 construction and operation or excavation and/or decommissioning activities, as applicable;
- 44

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- Relevant and brief descriptions of proposed activities expected to result in impacts should be described in enough detail to support the environmental impacts discussion; and
- Maps showing location, facilities, etc., as applicable.

3.2.4 Alternatives to the Proposed Action

As specified in 10 CFR 51.30(a)(ii), alternatives to the proposed action are developed in accordance with Section 102(2)(E) of NEPA. Although NEPA requirements and CEQ guidance generally address alternatives in the context of an EIS, the same information is generally applicable to an EA. Therefore, alternatives should be considered in an EA (1) if there is some identifiable environmental impact from the proposed action and (2) if an alternative to the proposed action exists with less impact to the environment. The determination that a proposed action results in a FONSI does not eliminate the need to evaluate alternatives. This is consistent with one of the goals of NEPA which is to make informed decisions.

At a minimum, the no action alternative should always be addressed. The no action alternative is a discussion of the results from a lack of action (i.e., status quo or the existing state). For example, if the proposed action is the clean-up of a site for unrestricted use, then the no action alternative is to continue to keep the material licensed and on site, without disposal. More specific guidance on alternatives for an EIS is provided in Section 5.2.

3.2.5 Affected Environment

The description of the affected environment should provide a framework for the discussion of impacts (Section 3.2.6, *Environmental Impacts*). Environmental conditions currently existing in the area that could be impacted by the proposed action should be described in this section. The geographic area studied should be identified for each resource. Maps or illustrations may help to provide a clear and concise description.

3.2.6 Environmental Impacts

The goal of this section is to determine whether there are significant impacts (radiological and non-radiological) for the proposed action and each alternative. Impacts can be direct, indirect, cumulative, long-term and short-term. Direct impacts, or effects, are caused by the action and occur at the same time and place. Indirect impacts, or effects, are caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable. A detailed definition of direct and indirect effects from 40 CFR 1508.8 states that effects include the following areas of impact: ecological; aesthetic; historical; cultural; socioeconomic; and health. Cumulative impacts are discussed in Section 3.2.6.2 of this guidance. A section on radiological dose impacts should always be provided in the EA and includes both direct and indirect radiation dose impacts to humans. Accident analysis is generally discussed in a SER. The impacts are assessed over the expected lifetime of the action and beyond, if necessary. A scientific basis should be provided; however, there are areas that require professional judgement based on the available information. Where information is incomplete or not available, this should be documented in the EA. Figure 3 provides an overview for analyzing impacts in NEPA documents.

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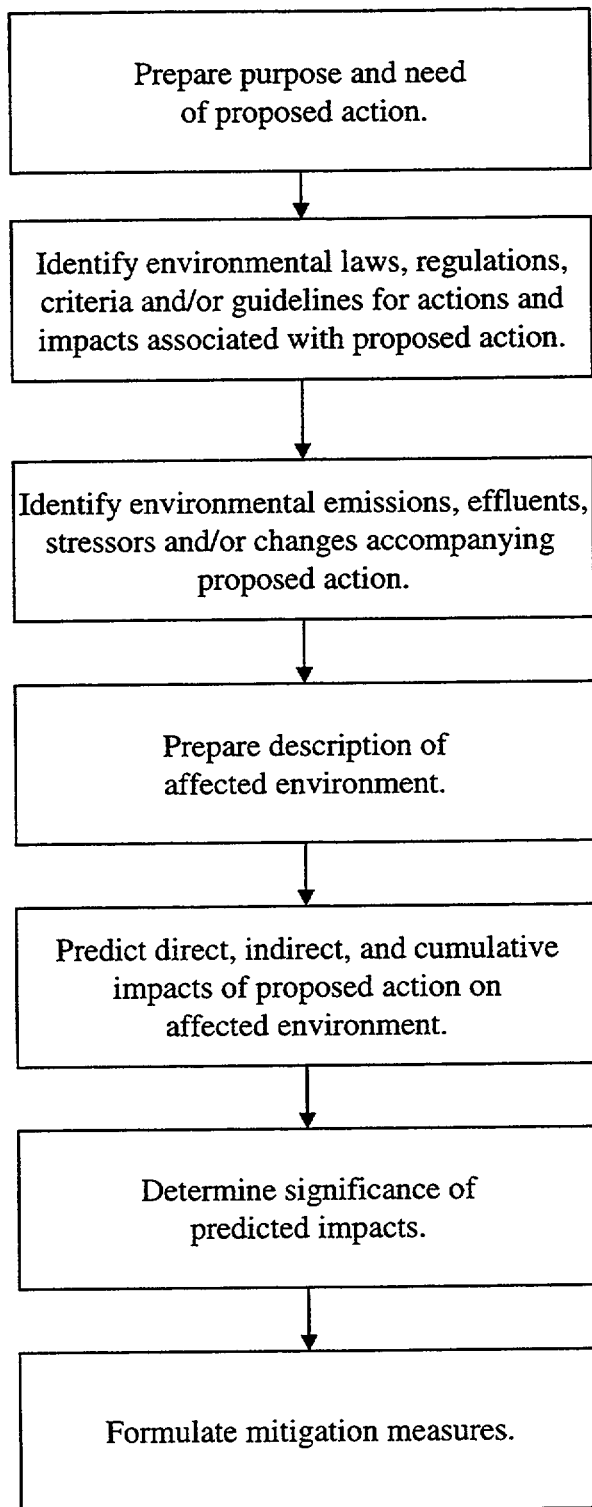


Figure 3: Identifying and analyzing impacts in NEPA documents.

Impacts resulting from each alternative should be briefly described. A table comparing the impacts may be useful. Although impacts may exist, they may not be significant, and impacts can be beneficial as well as adverse. Also, an impact that is not significant does not equate to “no impact.” Typical impacts may include, but are not limited to:

- Degradation of water quality or water supply;
- Habitat destruction;
- Increased air emissions;
- Increased noise;
- Damage or reduced access to cultural resources;
- Changes to local or regional business conditions;
- Increased competition for available resources; or
- Additional population or changing demographics.

Environmental justice reviews are not required for most NMSS EAs. Under most circumstances, no environmental justice review should be conducted where an EA is prepared. If it is determined that a particular action will have no significant environmental impact, then there is no need to consider whether the action will have disproportionately high and adverse impacts on certain populations. Consequently, an environmental justice review will not be completed for an EA where a FONSI is concluded unless special circumstances warrant the review.

3.2.6.1 Adverse Impacts

Section 102(2)(C) of NEPA requires consideration of potentially unavoidable adverse environmental impacts should the proposed action be implemented. Discuss both direct and indirect effects and their significance. Potentially adverse impacts of alternatives to the proposed action should also be considered. The discussion of adverse impacts should be thorough, yet brief. Detailed technical information may be incorporated by reference to publicly available materials such as the SER (40 CFR 1502.21). Proprietary data should not be incorporated by reference. It may also be appropriate to discuss potential mitigation measures for adverse impacts (see Section 3.2.7, *Mitigation Measures*).

Both radiological and non-radiological impacts should be discussed. Identify resources that were evaluated but an impact was not found. Impacts may result from construction, operation, and decommissioning phases. Each impacted resource (regardless of significance or size) should be identified, with a rationale provided to explain the determination that the impact(s) are significant or are not significant. The rationale may cite, for example, standards, case history, evaluations or professional judgement. Modeling or other techniques used to predict impacts should be summarized. Impacts are evaluated both onsite and offsite, as well as assessed for cumulative effects. If beneficial impacts are identified, note if a benefit to one party is not viewed as beneficial to a second party.

3.2.6.2 Cumulative Impacts

Unlike an EIS, CEQ regulations do not require an assessment of cumulative impacts in an EA. However, it is suggested that a paragraph be included in the EA that (i) defines the term “cumulative impacts,” (ii) notes the resources with anticipated environmental impacts for the proposed action, (iii) explains that

1 NRC searched for activities that could result in cumulative impacts for those resources, and (iv) states
2 whether there are significant cumulative impacts. A detailed discussion of cumulative impacts in an EIS
3 is in Section 4.2.5.2.
4

5 **3.2.6.3 Evaluation of Significance**

6
7 An EA is used to provide sufficient information for determining whether to prepare an EIS (40 CFR
8 1501.4) or FONSI (40 CFR 1508.13) on the proposed action. Impact significance determination involves
9 considering the context and intensity of the impacts. Context means that consideration should be given
10 to what the impacts are, where they will occur, how long they will last, who is affected, and the carrying
11 capacity of the affected environment. Intensity refers to the impact severity, and can be addressed by a
12 number of criteria delineated in 40 CFR 1508.27. The EA summary should be based on the following
13 considerations which were derived from 40 CFR 1508.27:
14

- 15 • Impacts can be both beneficial and adverse. Are there significant adverse impacts despite the
16 existence of beneficial impacts?
- 17
- 18 • Are there undesirable public health or safety effects?
- 19
- 20 • Are there unique characteristics of the geographic area such as proximity to historic or cultural
21 resources, park lands, prime farmlands, wetlands, wild/scenic rivers, or ecologically critical
22 areas?
- 23
- 24 • Are the impacts on the quality of the human environment controversial?
- 25
- 26 • Are the impacts on the human environment highly uncertain, or do they involve unique or
27 unknown risks?
- 28
- 29 • Does the proposed action establish a precedent for future actions with significant impacts? Does
30 it represent a decision in principle about a future consideration?
- 31
- 32 • Is the proposed action related to other actions with individually insignificant, but cumulatively
33 significant impacts? Significance exists if it is reasonable to anticipate a cumulatively significant
34 impact on the environment and cannot be avoided by terming an action temporary or by breaking
35 it down into small component parts.
- 36
- 37 • Does the proposed action adversely affect districts, sites, structures, or other objects listed in or
38 eligible for listing in the *National Register* or will the action result in significant destruction of
39 scientific, cultural, or historical resources?
- 40
- 41 • Will the proposed action adversely affect an endangered or threatened species or its habitat that
42 has been determined to be critical under the Endangered Species Act?
- 43
- 44 • Will the proposed action cause a violation of Federal, State, or local law or requirements for the
45 protection of the environment?

1 If the answer to any of these questions is yes (i.e. impact(s) are significant), then an EIS is normally
2 required. If the answer to all of these questions is no (i.e no significant impacts are identified),
3 documenting the answers to these questions can be used in the EA to prepare the FONSI (Section 3.4,
4 *Completion of the Environmental Assessment*).

5
6 The NMSS licensing project manager in coordination with management initially determines whether the
7 proposed action, taking into account reasonable mitigation, will have a significant impact on the quality
8 of the human environment. The EPAB is then requested to review the EA (Section 3.3, *Review of a*
9 *Draft Environmental Assessment Document*). If it is determined that there are no significant impacts,
10 then a FONSI is prepared as discussed in Section 3.4, *Completion of the Environmental Assessment*.

11
12 If the licensing project manager in coordination with management determines that the impacts are
13 significant, there are several options for how to proceed. The applicant/licensee may agree in writing to
14 modify the proposed action sufficiently to support a FONSI and a revised EA is prepared. It is possible
15 that the modified proposed action is represented in the alternatives investigated in the initial EA, and
16 only minor changes may be necessary. The applicant/licensee can also agree to mitigate the impacts so
17 that a FONSI can be realized. Mitigation efforts should be clearly identified in the EA document. For
18 example, license conditions and other applicant/licensee commitments may mitigate an impact to permit
19 a mitigated FONSI. If changes to the proposed action are not available or agreeable to the
20 applicant/licensee, the licensing project manager will forward the project to EPAB who will develop a
21 NOI to prepare an EIS. The information contained in the EA will form part of the background
22 information for scoping the EIS.

23 24 **3.2.7 Mitigation Measures**

25
26 Mitigation measures that could reduce adverse impacts or enhance beneficial impacts should be
27 incorporated in the proposed action to the extent feasible. These mitigation measures may assist in a
28 FONSI (discussed in Section 2.4, *Completion of Environmental Assessment*). The analysis should
29 address the anticipated effectiveness of these mitigation measures in reducing adverse impacts or
30 enhancing beneficial impacts. The staff should analyze any residual impacts or unavoidable adverse
31 impacts that may remain after mitigation measures have been applied, as well as any further impacts
32 caused by the mitigation measures themselves.

33
34 Appropriate monitoring and license requirement for mitigation measures should be identified.
35 Monitoring activities proposed to meet the intent of NEPA should be distinguished from monitoring
36 required by program-specific guidance and/or discretionary monitoring activities.

37 38 **3.2.8 Monitoring**

39
40 Any proposed monitoring should be briefly described, including the specific parameters to be monitored
41 (e.g., water quality, noise, species abundance), the frequency (e.g., continuous, once per day), and the
42 period of monitoring (e.g., during the entire duration of the site operation). The EA may form the basis
43 for subsequent license conditions on monitoring the proposed action. Monitoring is also discussed for an
44 EIS in Section 5.6, *Environmental Measurements and Monitoring Programs*.

3.2.9 Agencies and Persons Consulted and Sources Used

Consultations are a necessary and important part of developing the EA. The consultations should be initiated as soon as possible after the applicant/licensee submittal. Cooperating agencies (Section 4.2.4.2) are not common when preparing an EA; more likely, the other agencies will assume a consulting role.

Consultations and other sources of information should be documented by briefly summarizing the following information in the EA for each consultation or other contact: (i) the name of the person contacted/consulted, their title or position, and the name of the agency; (ii) the date and purpose of the consultation; (iii) a brief summary of the views or comments expressed and the staff's resolution; and (iv) references to publicly available documents containing additional information, as applicable.

The discussion in the EA can be brief if consultation does not result in comments beyond those that are in general agreement with the EA. Minor comments can be characterized as "general agreement," "no objection," or "no comment." Additional information can be included, but is not required. If there are significant comments, summarize the resolution of these comments in the EA.

3.2.10 Conclusion

The conclusion for an EA is often "no significant impact" from the proposed action (i.e., FONSI). The conclusion is summarized in the introduction, but the basis for the conclusion is provided in greater detail in this section.

3.2.11 List of Preparers

Identify the principal individuals responsible for the assessment, their professional titles, and the resources they evaluated. For example, "G. Smith, Project Manager in the Division of Waste Management, Health Physics."

3.2.12 List of References

All references used in the preparation of the EA should be listed, including those cited in the text of the EA and those that were not specifically cited but served as useful guidance during document development. Guidance in NUREG-0650 (NRC, 1999) should be useful for determining reference format.

3.2.13 Supplemental Information to Environmental Assessment Document

As appropriate, appendices can be included at the end of the EA that include information that is supportive of the findings in the EA. Publicly available information such as letters documenting consultations can be incorporated by reference in the EA.

3.3 Review of a Draft Environmental Assessment Document

The EPAB reviews all NMSS EAs as a final draft document, just prior to forwarding for State review and before the EA is finalized. Section 1.2.2 discusses the process for requesting the EPAB review. The final draft EA is provided to the State and others, as appropriate, for a 30-day comment period. The request for the State to comment should be put into ADAMS (i.e. the NRC's electronic document system) and made publicly available. After the State's 30-day comment period is complete, the EA is issued with text noting that the State was consulted along with a summary of the State's comments. If substantive changes are made to the EA as a result of the State's comments, EPAB should review the changes. A draft EA may be sent out for formal public comment in special cases where the NRC may be undecided whether to publish an EA or develop an EIS.

3.4 Completion of the Environmental Assessment

If it is determined that no significant impacts exist, a draft or final FONSI is prepared (10 CFR 51.32 to 51.35) for publication in the *Federal Register* (10 CFR 51.119). The FONSI is a statement written separately from the EA document and is the overall conclusion of the EA process when no significant impact is found. The FONSI should be approached as a stand-alone document with sufficient descriptions and summaries and is submitted as a FRN. A FONSI statement must (i) identify the proposed action, (ii) state that the NRC has determined not to prepare an EIS for the proposed action, (iii) briefly present the reasons why the proposed action will not have a significant effect on the quality of the human environment (use 40 CFR 1508.27), (iv) reference the EA, (v) note any other related environmental documents (e.g., licensee letters), (vi) state that the finding and any related environmental documents are available for public inspection and where the documents may be inspected, and (vii) formally state the FONSI. An example FONSI is included in Appendix D. The FONSI may also identify other relevant documents submitted by the licensee or other parties.

An initial FRN is published to announce that NRC received the application or amendment with an opportunity for hearing. This initial FRN should be referenced when publishing the draft or final FONSI. The FONSI may be published with the complete EA, but the general practice is to publish a FONSI that includes a summary of the EA and the location where the EA is available for public inspection.

In accordance with 10 CFR 51.35, the draft or final FONSI will be published in the FR prior to authorizing the proposed action. In addition the draft or final FONSI must be distributed in accordance with 10 CFR 51.33 and 51.119. The EA and FONSI also should be placed in ADAMS and made publicly available.

3.5 References

Code of Federal Regulations, Title 10, Chapter I–Nuclear Regulatory Commission, *Energy*, Part 51, “Environmental Protection Regulations for Domestic Licensing and Related Regulatory Functions.”

Code of Federal Regulations, Title 40, *Protection of Environment*, Chapter V–Council on Environmental Quality, Parts 1500-1508.

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1 Council on Environmental Quality (U.S.), Washington, DC. "Forty Most Asked Questions Concerning
2 CEQ's National Environmental Policy Act Regulations." *Federal Register* 46: 18026-18036. 1981.

3
4 National Environmental Policy Act, 42 U.S.C. 4331, et seq.

5
6 Nuclear Regulatory Commission (U.S.). NUREG-0650. "Preparing NUREG-Series Publications."
7 Revision 2. NRC: Washington, DC. 1999.

8
9

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4 PREPARING AN ENVIRONMENTAL IMPACT STATEMENT: PROCESS

An EIS must be prepared for proposed actions that:

- Are major Federal actions significantly affecting the quality of the human environment (10 CFR 51.20(a)(1));
- The NRC, as a matter of its discretion, has determined that an EIS should be prepared (10 CFR 51.20(a)(2));
- Are of the type listed in 10 CFR 51.20 (b); or
- Are determined to require an EIS by the NMSS manager responsible for authorizing the action, based either on the results of an EA or on other information indicating potentially significant impacts.

An EIS provides decision makers and the public with a detailed and objective evaluation of significant environmental impacts, both beneficial and adverse, likely to result from a proposed action and reasonable alternatives. In contrast to the brief analysis in an EA, the EIS includes a more detailed interdisciplinary review. The EIS provides sufficient evidence and analysis of impacts to support the final NRC action in the Record of Decision (ROD; Section 4.10). The draft and final EIS and ROD are made available to the public. Figure 4 outlines the EIS process.

For major licensing actions, as part of the NRC NEPA process, an applicant/licensee should submit information necessary for the environmental review (i.e. prepare an ER, supplement an existing ER, or attach with license application as appropriate). The NMSS staff will review this information and use it to form the basis for assessing environmental impacts of the proposed action and alternatives. Chapters 4 and 5 of this guidance discuss the EIS process and preparation of the EIS document. Applicants will find the information in Chapter 6 useful when preparing environmental reports or supplemental environmental reports in support of the proposed action (10 CFR 51.45, 51.60, 51.61, 51.62, 51.66).

4.1 Project Planning

4.1.1 EIS Team

As stated in Section 1.2.2, EPAB is assigned the responsibility for preparing NMSS EISs. EPAB will designate an EIS or environmental project manager who will form an EIS team. The EIS team should include the licensing project manager, relevant technical staff who will either prepare or review the EIS, and staff of the Office of Public Affairs and the Office of General Counsel (OGC). Also, the environmental and licensing project managers' Section Chiefs, and Licensing Assistants, and representatives of the Office of State and Tribal Programs, and the applicable Regional Office may be part of the team.

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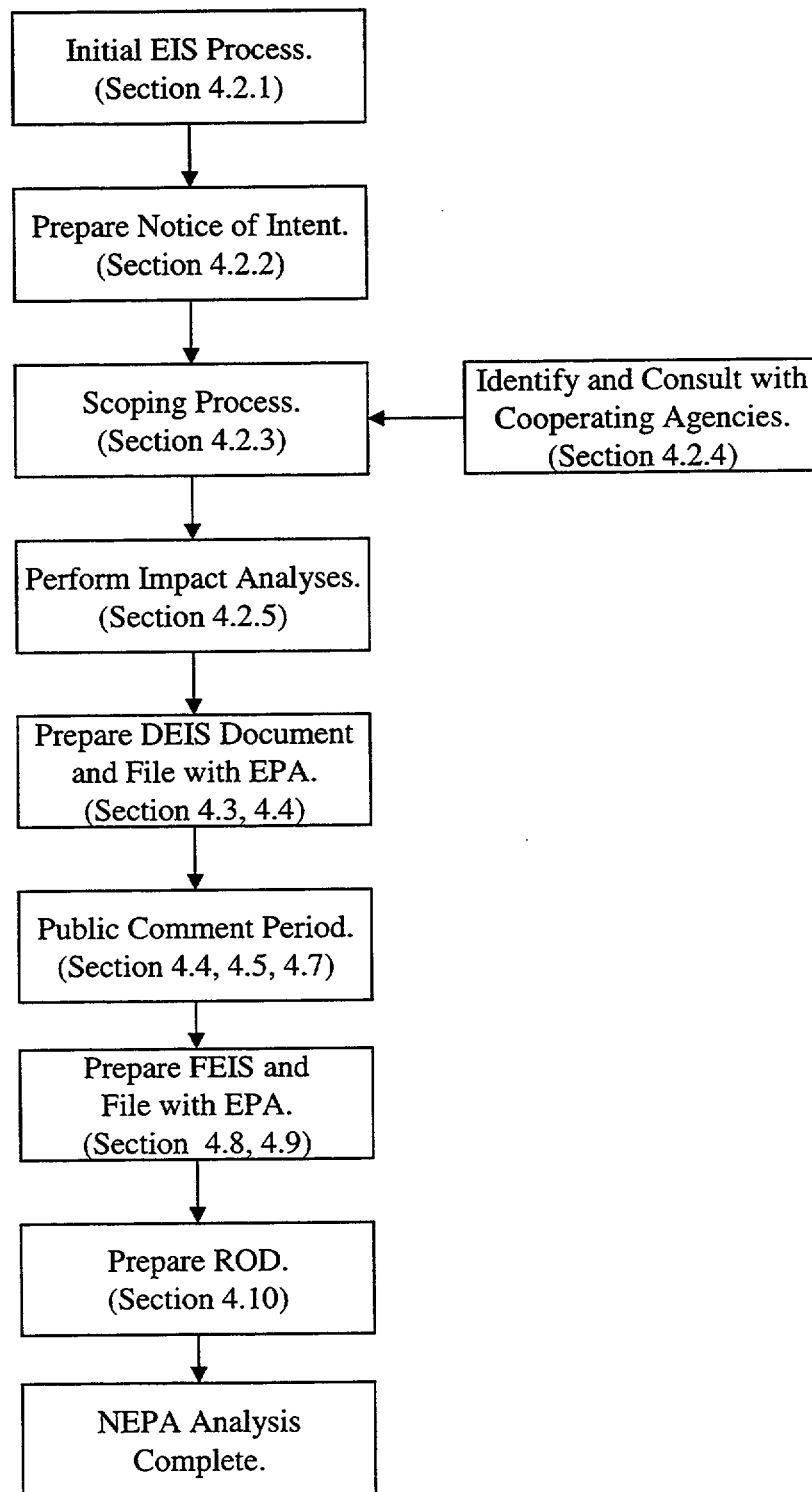


Figure 4: Major steps in the EIS process.

1 The environmental project manager, with assistance from the EIS team, will:

- 2
- 3 • Determine the preliminary scope of the EIS including:
 - 4 - developing a purpose and need statement;
 - 5 - identifying a list of preliminary alternatives; and
 - 6 - developing a list of potentially significant environmental issues.
- 7
- 8 • Prepare a project plan for the EIS process, including a preliminary schedule for preparing the
- 9 EIS.
- 10
- 11 • Assess the need for and provide a recommendation on contractor support.
- 12
- 13 • Conduct planning for the scoping process to determine:
 - 14 - the number and type of scoping meetings;
 - 15 - the locations of scoping meetings; and
 - 16 - agencies, groups, and individuals to be invited to participate.
- 17
- 18 • Identify potential cooperating agencies.
- 19
- 20 • Prepare the NOI for the FRN (see example in Appendix D).
- 21

22 **4.1.2 Project Plan**

23

24 The environmental project manager, with assistance from the EIS team, will prepare a project plan for

25 the EIS process. This plan will be used as a basis for managing the project and will be periodically

26 reviewed and modified as needed as the project proceeds. A Gantt chart describing the plan will be

27 prepared. The plan will include:

- 28
- 29 • Project purpose and background;
- 30
- 31 • A description of the principal project tasks and sub-tasks (e.g., planning, scoping, contract
- 32 acquisition, public participation, technical analyses, preparation of DEIS, etc.);
- 33
- 34 • Schedule corresponding to the tasks and sub-tasks;
- 35
- 36 • Resources in staff hours and contract support funds (preferably at the task level);
- 37
- 38 • Project organization, technical disciplines needed, and responsibilities, including responsibilities
- 39 for concurrence/approval at each phase; and
- 40
- 41 • References.
- 42
- 43

4.1.3 Contractor Support

NRC uses contractors to assist with preparation of EISs. In some cases, the EIS may be prepared principally by NMSS staff with contractors assisting staff in developing specific portions of the EIS, or a contractor may prepare most of the EIS with the oversight of the environmental project manager. Therefore, the EIS team must determine the extent to which contractor support will be required. If the team finds that NMSS staff are not available or do not possess the appropriate expertise, the staff should recommend using an outside contractor to assist in the development of those portions of the EIS for which staff does not have expertise or resources. It is the environmental project manager's responsibility to contact the NMSS Program Management, Policy Development and Analysis Staff to discuss the need for contractor support with the appropriate Technical Assistance Program Manager. To best plan and have EIS contractor support in place at the time the license amendment/application is received, the licensing project manager should coordinate with EPAB prior to the receipt of the amendment/application.

4.2 EIS Development

4.2.1 Initial EIS Development

Prior to the applicant/licensee's preparation of information needed to support the environmental review (e.g., information usually found in an ER), the licensing project manager should schedule a meeting with the applicant/licensee and the environmental project manager to discuss the proposed action and the required information. An application or request for action is accompanied by information needed to conduct the NRC's environmental review. This information is usually provided in an ER or may also be submitted as part of the license application or amendment request. When the information is submitted, NRC staff will conduct an acceptance review of the applicant/licensee information to determine whether (i) the requested action will require an EA or EIS, and (ii) the information is complete and will support the required environmental analyses. This initial acceptance review should not be a detailed technical review; rather, the acceptance review determines if the submitted information is sufficiently complete to begin technical review. The guidance in Chapter 6, *The Environmental Report: Format and Technical Content* provides a list of topics that may be helpful in completing this preliminary assessment of the submittal.

The applicant/licensee should submit data, assumptions, and analyses, that support the applicant/licensee conclusions. The environmental project manager should begin to develop an outline of the EIS during the acceptance review in order to reveal gaps in explanations and logic that will require additional information from the applicant/licensee. If the environmental information is significantly deficient, the applicant/licensee should be notified by letter that deficiencies in the submittal prevent NRC from beginning the detailed environmental review.

Once the submittal is determined to be adequate and the package is accepted for detailed review, the applicant/licensee should be notified by letter that the submittal is found acceptable for NMSS to begin an environmental review. The letter should also notify the applicant/licensee that, in the course of the detailed review, the staff may identify areas where additional information is needed to complete the

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1 review. The letter should also provide the applicant/licensee with a time frame for the completion of the
2 staff's review.

3
4 The identification of potential cooperating agencies should also be made at this time in order to allow full
5 participation in the development of the EIS. A more complete discussion of the role of cooperating
6 agencies is provided in Section 4.2.4, *Consultations and Cooperating Agencies*.

7 8 **4.2.2 Notice of Intent**

9
10 After the environmental information and application are accepted for detailed review, the environmental
11 project manager will publish the NOI (10 CFR 51.26-27) in the *Federal Register*. The NOI will indicate
12 the NRC's schedule and identify when and where the scoping meeting(s) will be held. The NOI will also
13 briefly describe the proposed action and possible alternatives, describe the proposed scoping process, and
14 state the name and address of the environmental project manager. An example is provided in Appendix
15 D.

16 17 **4.2.3 Scoping Process**

18
19 Scoping occurs early in the EIS process and provides a means by which the scope of issues to be
20 addressed related to the proposed action are identified. CEQ requirements for scoping are found at 40
21 CFR 1501.7 and NRC requirements for scoping are found at 10 CFR 51.26-29. Objectives of the scoping
22 process (10 CFR 51.29) include:

- 23
24 • Defining the scope of the proposed action that is to be the subject of the EIS;
- 25
26 • Determining the scope of the EIS and identifying alternatives and significant issues to be
27 analyzed in depth;
- 28
29 • Identifying, and eliminating from detailed study, issues that are peripheral or are not significant;
- 30
31 • Identifying any EAs and other EISs that are being or will be prepared that are related to the EIS
32 under consideration;
- 33
34 • Identifying other environmental review and consultation requirements related to the proposed
35 action;
- 36
37 • Indicating the relationship between the timing of the environmental analyses and the NRC's
38 tentative planning and decision making schedule;
- 39
40 • Identifying any additional cooperating agencies and, as appropriate, allocating assignments for
41 preparation and schedules for completion of the EIS to the NRC and any cooperating agencies;
42 and
- 43
44 • Describing the means by which the EIS will be prepared, including any contractor assistance to
45 be used.

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Potential participants in the scoping process are described in 10 CFR 51.28 and typically include:

- The applicant or petitioner for rulemaking in the case of an EIS prepared in support of a rulemaking action;
- Any person who has petitioned for leave to intervene, admitted as a party, or requested to participate in the proceeding;
- Any Federal agency which has jurisdiction by law or special expertise;
- Affected State and local agencies;
- Affected Federally recognized Indian Tribes; and
- Any other interested person.

The environmental project manager shall ensure that adequate and timely notice of scoping meetings is provided to all potentially interested parties. One of the most frequent complaints about scoping meetings is that participants were not given sufficient notice or did not hear about the meetings until the last minute. In addition to publishing the NOI in the *Federal Register*, the meetings should be announced in local or regional newspapers and/or on local radio and television stations at least one week before the meeting is to be held. The environmental project manager should consult with the NRC Office of Public Affairs for assistance with newspaper, radio, or television announcements or other avenues for public outreach.

Additional efforts to inform potentially affected groups, such as Native American tribes and minority and low-income populations, should be undertaken by requesting assistance from tribal leaders, church and community leaders, or other appropriate individuals to disseminate the information. Where such groups may be affected or have expressed concerns, allowing additional time to inform the public before the scoping meeting should be considered. For example, announcements can be included in newsletters read by these groups.

Scoping that is done before an EIS is initiated (e.g. in aid of an EA preparation) cannot substitute for the normal scoping process after publication of the NOI, unless an earlier notice stated clearly that this possibility was under consideration, and the earlier notice expressly provides that written comments on the scope of alternatives and impacts would still be considered. There are no time requirements for the scoping process (10 CFR 51.29 and 40 CFR 1501.7), however, 45 days from the NOI should be considered as a minimum length for scoping and accepting scoping comments. If scoping meetings are held, they should be scheduled to ensure that there is a sufficient comment period following the scoping meetings. Comments received after the scoping period has expired should be considered to the extent practicable but may not be able to be included in the scoping report that is issued listing the comments received.

4.2.3.1 Scoping Meetings

Although public scoping meetings are not required by CEQ's regulations, NRC policy is to hold one or more scoping meetings in the vicinity of the site(s) affected by the proposed action. The environmental project manager and the EIS team, as appropriate, should visit the site prior to the scoping meeting if they have not already done so in the past. The purpose of a site visit is to familiarize the environmental project manager and the team of technical experts who will be preparing the EIS with the site and locale. The environmental project manager may visit relevant Federal, State, and local agencies, especially potential cooperating agencies, to obtain information needed to prepare the EIS and to facilitate communication with agencies having an interest in the proposed action. The environmental project manager is responsible for coordinating meetings with the licensee and other parties.

The number of scoping meetings to be held should be determined by the types of concerns that have been identified and the amount of controversy associated with the proposed action. For example, if public interest appears to be associated primarily with activities at the site of the proposed action, it may be sufficient to hold a single scoping meeting at a location close to the site. On the other hand, if concerns are raised about transportation of radioactive materials to/from the site, or about other issues having regional or broader impacts, then scheduling scoping meetings in other locales where potential impacts have been identified may be appropriate.

There are no prescribed guidelines for conducting scoping meetings. Development of a format for the meeting should be given careful consideration by the environmental project manager and planning team. NUREG/BR-0224 and the Public Outreach Handbook (NRC, 1995) provide guidance for conducting public meetings. Management Directive 3.4 provides guidance on release of information to the public. Planning for the conduct of the scoping meeting should focus on:

- Goals of scoping;
- Procedures to be used for the meeting;
- Need to focus the discussion in the scoping meeting on:
 - receiving comments relevant to the proposed activity;
 - significant issues;
 - alternatives to be considered;
 - receiving additional information that participants in the scoping process can provide;
 - other appropriate concerns;
- Ensuring that the meeting does not become a debate on either the applicant/licensee's justification for the proposed action or the past issues or actions; and
- Use of the EIS in making a decision on the proposed action.

In planning scoping meetings, the environmental project manager, with the assistance of the Licensing Assistant, should consider the following to enhance communications:

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- 1 • Preparing handouts that explain the roles of NRC, cooperating agencies, scoping participants,
2 objectives of scoping, how the meeting is to be conducted, and some background on the proposed
3 action. These handouts can be based on information in the NOI, but it should be written in plain
4 English to facilitate communication with a broad audience.
- 5
- 6 • Determining the type of meeting format, logistics and setup of the meeting room, procedures for
7 speakers (e.g., registration, order of speaking, time allowed for each speaker), use of handouts,
8 use of public feedback forms, and court recorder.
- 9
- 10 • Holding an earlier separate meeting with local media reporters to discuss the proposed action, the
11 NEPA process, and the goals of the scoping meeting. NUREG/BR-0202, Rev.2 provides
12 guidelines for interviews with the news media.
- 13
- 14 • Conducting a poster session (i.e. open house) prior to the scoping meeting to provide an
15 opportunity for one-on-one discussions with interested parties. Ensure that the public
16 understands when comments are being formally transcribed and/or taken.
- 17
- 18 • Having the meeting transcribed to document public comments and support the preparation of the
19 scoping report.
- 20

21 Possible formats for conducting scoping meetings include, but are not limited to, the following:

- 22
- 23 • Moderator format in which the moderator opens the meeting with an introduction about the
24 purpose of the meeting and a brief discussion of the background of the proposed action, solicits
25 questions and comments from the audience, guides and focuses the discussion on relevant issues
26 and points, and summarizes the discussion at the end of the meeting.
- 27
- 28 • Panel format in which a panel of individuals responsible for the EIS and a moderator (often the
29 senior decision maker) introduce the meeting and project similar to the preceding format, but
30 with the panel addressing specific background information on NRC, the project and the decision-
31 making process, and the moderator guiding the meeting (i.e. solicits questions and comments
32 from the audience, guides and focuses the discussion on relevant issues and points, and
33 summarizes the discussion at the end of the meeting).
- 34
- 35 • Open house format in which the meeting is set up as a series of discussion stations to address
36 specific issue areas or resources of concern (e.g., public health, ecological resources,
37 socioeconomic). Attendees are encouraged to discuss their concerns with appropriate EIS team
38 experts and to write down their concerns and turn them in at the meeting. This format can
39 include a formal introduction explaining the purpose of the meeting and directing the attendees
40 to specific areas of interest. It should also include an opportunity for attendees to present oral
41 comments to the NRC and the meeting audience, usually at the end of the meeting.
- 42
- 43

4.2.3.2 Scoping Report

In addition to the oral comments gathered at scoping meetings, participants in the scoping process are provided an opportunity to submit written comments on the scope of the EIS. The scoping comment period should extend approximately 30 days after the scoping meeting is held if possible. After the scoping meeting and receipt of written comments, the environmental project manager and team will prepare a scoping report [10 CFR 51.29(b)]. This report should be a concise summary of the public comments and should include the following:

- Brief discussion of how the scoping process was conducted, including the dates, locations, and attendance at meetings;
- Discussion of the significant issues and concerns raised;
- Discussion of the alternatives to be evaluated;
- Preliminary schedule for preparing the EIS; and
- Identification of cooperating agencies who will participate in the preparation of the EIS and their roles in EIS preparation.

The environmental project manager should send a copy of the final scoping report to each participant in the scoping process or notify each participant of the availability of an electronic version of the scoping reports. In addition, the report will be included in the EIS as an appendix. The scoping process ends when the issues and alternatives to be addressed in the EIS have been clearly identified and summarized in the scoping report. However, the issues and alternatives can be revised any time before publication of the DEIS.

4.2.4 Consultations and Cooperating Agencies

4.2.4.1 Consultations

Early consultations are essential to (i) maintaining the planned schedule for completion of the EIS, (ii) gathering complete information, and (iii) identifying potentially significant impacts. Some agencies require 30 days or more to respond to consultation requests and may require additional information from NRC (e.g., photographs, maps, specialized surveys). Consultations may include a number of agencies (e.g., local, county, State, tribal, Federal) which will have information relevant to the site. At a minimum, consultations typically include the following agencies and organizations:

- State Liaison Officer or designee;
- SHPO, Federally recognized Indian Tribes, or Native Hawaiian organizations for actions with the potential to cause/have effects on historic properties; and

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- FWS and the relevant State agency for actions which may affect listed species or designated critical habitat.

The environmental project manager should document consultations and other sources of information with a brief summary providing the following information: (i) the name of the person, position, and agency consulted; (ii) the date and purpose of the consultation; (iii) a brief summary of the discussion and the staff's resolution; and (iv) references to publicly available documents containing additional information. Consultation letters should be included in an appendix to the EIS. The discussion of the consultation in the EIS should describe why the staff initiated the consultation and summarize the details of the issues and the resolution of the comments in the EIS.

4.2.4.1.1 Consultation with the State

Pursuant to 10 CFR Part 51.70(c), the staff will cooperate fully with State agencies to reduce duplication between NEPA and State and local requirements. Lists of State Liaison Officers can be found on the NRC Office of State and Tribal Programs WWW at <www.hsrdo.org/nrc/asframe.htm>. It is expected that the State Liaison Officer will coordinate consultations with other State agencies. Often, the State Liaison Officer for NRC is the head of the State agency responsible for radiation protection. Other State contacts (e.g. representatives from the State department of health or environmental quality) who are typically copied on correspondence regarding a license should also be notified of the action.

The initial consultation with the State Liaison Officer should be documented in a letter requesting the assistance of the State. This letter should indicate that the NRC expects the State Liaison Officer to identify any consultations required with other State and local agencies and issues, State acts, or State regulations that may be applicable to the action under NRC review.

Contact the NRC Regional Offices to inform them of State interaction. The Regional State Liaison Officers and Regional State Agreement Officers can be found on the NRC Office of State and Tribal Programs WWW at <www.hsrdo.org/nrc/contacts/ospstaff.htm>.

Office of State and Tribal Programs should also be made aware of State interactions. Consulting with the NRC State Liaison Officer is recommended during consultation with the State. The NRC State Liaison Officer may offer insight to recent NRC-State interactions. During significant interactions with the State, the appropriate NRC State Liaison Officer should receive copies of correspondence with the State.

4.2.4.1.2 Consultation with the State Historic Preservation Officer, Federally Recognized Indian Tribes, or Native Hawaiian Organizations

Section 106 of the National Historic Preservation Act requires the NRC staff to take into account the effects of licensing actions on historic properties, and afford the Advisory Council on Historic Preservation a reasonable opportunity to comment. The SHPO should be contacted to determine if the proposed action could impact any historic properties listed in or eligible for inclusion in the *National Register* (36 CFR 800). The SHPO review should also consider historic properties included in State or local registers or inventories and any additional important cultural, traditional, or historic properties. In areas of Native American tribal land, the Tribal Historic Preservation Officer (THPO) may act as the

1 SHPO. Lists of SHPOs and THPOs are found on the Advisory Council on Historic Preservation WWW
2 at <<http://www.achp.gov>>.

3
4 NRC can authorize the applicant to initiate consultation with the SHPO or THPO, but remains legally
5 responsible for all findings. The environmental project manager or licensing assistant should formally
6 notify the SHPO/THPO when an applicant is so authorized.

7
8 The environmental project manager should make initial contact by phone and invite the SHPO to
9 participate in the site visit. The SHPO can alert the staff to relevant State and local laws, orders,
10 ordinances, or regulations aimed at the preservation of cultural resources within the applicant's State.
11 The environmental project manager should discuss with the SHPO any organizations or individuals that
12 might be able to assist in identifying and locating archaeological and historic resources (for example,
13 university and Native American tribal archaeological and historical staffs). The SHPO will probably also
14 request that NRC consult with the State Archaeologist. The formal request to the SHPO should be in
15 writing; the SHPO customarily has 30 days to reply. Appendix D contains a sample letter to a SHPO.
16 The environmental project manager should contact the SHPO of each affected State for sites located on
17 or near State boundaries, or where impact areas pass through more than one State.

18 19 **4.2.4.1.3 Consultation with Federal and State Fish and Wildlife Agencies**

20
21 Section 7 of the Endangered Species Act (Interagency Cooperation) requires the NRC staff to ensure that
22 the licensing action is "not likely to jeopardize the continued existence of any endangered species or
23 threatened species or result in the destruction or adverse modification of the habitat of such species."
24 Threatened and endangered species must be identified to determine if construction or operation of the
25 facility could affect these species. Compliance with Section 7 of the Act requires consultation (50 CFR
26 402) with the U.S. Fish and Wildlife Service (FWS) and/or the National Marine Fisheries Service
27 (NMFS).

28
29 Procedures for conducting consultations with the FWS are contained in the Endangered Species
30 Consultation Handbook (FWS/NMFS, 1998). The environmental project manager should contact the
31 FWS by Internet, phone or letter to obtain the list of threatened or endangered species that may be
32 present near the site. Field offices can be found on the FWS WWW at <<http://www.fws.gov>> or in the
33 Endangered Species Consultation Handbook (FWS/NMFS, 1998). Appendix D contains an example of a
34 consultation letter. The FWS will coordinate with the NMFS. The applicant may request the species list;
35 however, the NRC must formally designate the applicant in writing if the applicant/licensee is to interact
36 with the FWS (FWS/NMFS, 1998).

37
38 On the basis of informal consultation with the FWS, the environmental project manager may request the
39 applicant to perform a biological assessment (50 CFR 402.12) to evaluate the potential effects of the
40 action on threatened and endangered species. The applicant/licensee prepares the biological assessment
41 (FWS/NMFS, 1998, p. 3-11). A biological assessment is necessary when a formal consultation with the
42 FWS is taking place. After the biological assessment is submitted to the FWS, the FWS will issue a
43 biological opinion which documents the FWS opinion as to whether the proposed action is likely to
44 jeopardize the continued existence of listed species or result in the destruction or adverse modification of
45 critical habitat.

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1 The State wildlife agency should be consulted about impacts to State-listed species. The responses from
2 the FWS and the State agency should be included in an appendix to the EIS.

3 4 **4.2.4.1.4 Other Consultations**

5
6 The environmental project manager should consult with other agencies that may be impacted or directly
7 involved and identify Federal and State laws that may apply to the site (Section 5.1.5, *Applicable*
8 *Regulatory Requirements, Permits, and Regional Consultations*). The staff should consult with the
9 agencies responsible for implementing these laws. Examples include sites located on or near Federally
10 controlled land (e.g. Bureau of Land Management, U.S. Army Corps of Engineers), in proximity to or
11 upstream from National Parks, in proximity to coastal areas subject to the Coastal Zone Management
12 Act, and/or designated as Resource Conservation and Recovery Act (RCRA) or Comprehensive
13 Environmental Response, Compensation, and Liability Act (CERCLA) sites by the EPA. If there is a
14 need to contact the EPA, the EPA liaison in DWM should be informed of the contact and the outcome or
15 status. Consultations with Native American Indian tribes should be conducted in a sensitive manner
16 recognizing the unique government to government relationship that exists based on Federal law and
17 treaties.

18 19 **4.2.4.2 Cooperating Agencies**

20
21 NEPA implementing regulations encourage agencies to become *cooperating agencies* [10 CFR 51.14(a)
22 and 40 CFR 1501.6, 40 CFR 1508.5]. Cooperating agencies can be Federal, State, or local agencies, or a
23 Native American tribe, if the action can affect a reservation. Frequently, other Federal and/or State
24 agencies have jurisdiction over some aspect of the proposed action. In other cases, an agency may have
25 special expertise in relation to specific environmental issues of concern, and its involvement as a
26 cooperating agency will facilitate the exchange of information and help ensure that applicable
27 requirements are met.

28
29 The environmental project manager, in consultation with the licensing project manager, identifies
30 potential cooperating agencies and requests the participation of agencies at the earliest possible time.
31 Cooperating with Federal, State, and local agencies will reduce duplication between Federal, NRC, and
32 comparable State and local requirements.

33
34 Contact potential cooperating agencies by letter to determine their interest in participating in the EIS
35 process. Once an agency expresses an interest in becoming a cooperating agency, an agreement should
36 be formalized between NRC and the agency (e.g., a letter of consent, procedural agreement, or a
37 memorandum of understanding) on the cooperating agency's role (e.g., providing information, early
38 review of draft EIS analyses, preparation of EIS sections). Appendix D contains an example of a letter
39 inviting an agency to participate in the scoping process and to become a cooperating agency as well as an
40 example of a memorandum of understanding and a letter of agreement.

41 42 **4.2.4.3 Potentially Interested or Affected Groups**

43
44 Potentially interested or affected groups, including civic, Native American, ethnic, special interest
45 groups, and local residents may have special concerns about the proposed action. Identifying those

groups and understanding their interests are effective tools for emphasizing important environmental issues and de-emphasizing less important issues. The NRC encourages enhanced public participation in agency decisions.

4.2.5 Impact Assessment

Impacts are assessed for the proposed action and each alternative for each resource described in the affected environment. Consider direct, indirect, cumulative, long-term, short-term, beneficial and negative impacts. To the extent possible, the analysis of impacts should be quantified. Where there is incomplete or unavailable information for evaluating reasonably foreseeable significant adverse impacts, follow the procedures in 40 CFR 1502.22. If an impact can not be quantified it should be described qualitatively. Beneficial impacts may also be identified but both positions should be discussed if a benefit to one party is not viewed as benefit to a second party. A scientific basis should be provided; however, it is recognized that there are areas that require professional judgement based on the available information.

4.2.5.1 Direct and Indirect Impacts

Direct impacts, or effects, are caused by the action and occur at the same time and place. Indirect impacts, or effects, are caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable. A detailed definition is provided in 40 CFR 1508.8 and describes the following areas of impact: ecological; aesthetic; historical; cultural; economic; social; and health. Both radiological and non-radiological impacts should be discussed. A section on radiological dose impacts should always be provided, including both direct and indirect radiation dose impacts to humans and environmental pathways.

Both geographic and temporal boundaries for each resource should be identified to assist with the discussion of cumulative impact analysis findings discussed below. The EIS author should focus on resource areas where there are impacts. The impacts should be assessed over the expected lifetime of the action (e.g., expected duration of the site) and beyond. Although impacts may exist, they may not be significant. Also, an impact which is not significant does not equate to "no impact." Describe the assessment of impacts from all resources, even those for which an impact was not found.

4.2.5.2 Cumulative Impacts

Cumulative impact is defined as "the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonable foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time" (40 CFR Part 1508.7).

Examples of cumulative impacts that may be considered:

- Pollutant discharges into surface water;

- Deterioration of recreational uses from loading water bodies with discharges of sediment, nutrients, or thermal effluents;
- Reduction or contamination of ground water supplies; or
- Physically segmenting a community through incremental development.

To determine cumulative impacts, the reviewer should follow the CEQ guidelines (1997). Other sources of guidance are available from EPA (1999) and the Canadian Environmental Protection Agency (1999).

In general, a cumulative impacts assessment includes the following:

- Determining which resources are affected by the proposed action;
- Identifying other past, proposed, and reasonable foreseeable future actions that either have or might affect those resources;
- Consulting with Federal, State, regional, local, and affected Native American tribal regulators;
- Identifying likely important cumulative effects;
- Describing cause and effect relationships between stresses (e.g., construction or operation of the facility) and resources;
- Identifying and evaluating potential impacts, but focusing on the most important cumulative impact issues; and
- Determining the magnitude and significance of the proposed action in the context of the cumulative impacts of other past, present and future actions.

If the cumulative impacts are significant, consider avoiding, minimizing, mitigating, or monitoring to address uncertainties.

The following information should be included in the EIS:

- Identification of relevant past, present and reasonably foreseeable future actions, in addition to the proposed action;
- Description of important cause-and-effect pathways;
- Description of significant cumulative impacts and a quantitative description of the magnitude of these impacts;
- Justification for determining that other likely cumulative impacts are not significant;

- For significant cumulative impacts, a discussion of applicant commitments or staff recommendations for actions to minimize environmental harm;
- For significant cumulative impacts, the need for monitoring to reduce uncertainties; and
- Evaluation of reasonable alternatives for cumulative impacts.

4.2.5.3 Evaluation of Significance

As stated in NEPA, the critical decision is whether the proposed action will cause “significant impacts on the quality of the human environment.”

Impact significance determination involves considering the context and intensity of the impacts. Context means that consideration should be given to what the impacts are, where they will occur, how long they will last, who is affected, and the carrying capacity of the affected environment. The EIS summary should be based on the following considerations, which were derived from 40 CFR 1508.27:

- Impacts can be both beneficial and adverse. Are there significant adverse impacts despite the existence of beneficial impacts?
- Are there undesirable public health or safety impacts?
- Does the proposed action comply with laws, regulations, or executive orders related to historic or cultural resources, park lands, prime farmlands, wetlands, wild/scenic rivers, or ecologically critical areas?
- Are the impacts on the quality of the human environment likely to be controversial?
- Are the impacts on the human environment highly uncertain, or do they involve unique or unknown risks?
- Does the proposed action establish a precedent for future actions with significant impacts? Does it represent a decision in principle about a future consideration?
- Is the proposed action related to other actions with individually insignificant, but cumulatively significant impacts?
- Does the proposed action adversely affect districts, sites, structures, or other objects listed in or eligible for listing in the *National Register* or will the action result in significant destruction of scientific, cultural, or historical resources?
- Will the proposed action adversely affect an endangered or threatened species or its habitat that has been determined to be critical under the Endangered Species Act?

- Will the proposed action cause a violation of Federal, State, or local law or requirements for the protection of the environment?
- Does the proposed action place disproportionately high and adverse human health effects on minority and low-income populations? More detail on this issue is provided in Section 5.4.11, *Environmental Justice*.

The environmental and licensing project managers in coordination with management initially determine whether the proposed action, taking into account reasonable mitigation, will have a significant impact on the quality of the human environment. Impact predictions should include comparisons to threshold levels (carrying capacity, maximum concentration limits, etc.). Similar actions, regulations, professional judgement, and public opinion or controversy may all contribute to the evaluation of the significance of the impacts related to the proposed action.

4.2.6 Request for Additional Information

Following the acceptance review, the environmental project manager or NRC contractor should develop a preliminary draft of the EIS. This effort assists with identification of missing and unclear information, facilitates the preparation of requests for additional information (RAI) which are sent to the applicant/licensee, and streamlines the EIS development. When using a contractor, the outline and draft of the alternatives chapter (Section 5.2, *Alternatives*) should be approved by NRC before the contractor develops the rest of the EIS.

RAI is a term applied to additional information (clarifications and questions) requested of the applicant/licensee in order to complete the environmental and safety reviews. The NMSS goal is to minimize RAIs to only those necessary to complete the review. Preparation of a preliminary draft EIS ensures that the necessary information is being requested. RAIs are documented in a letter to the applicant/licensee. Responses to RAIs are also in writing.

Related generic and site-specific EAs and/or EISs should be reviewed to determine if there is a potential for tiering (Section 1.3, *Utilizing Existing Environmental Analyses*) or incorporation by reference. Attention should be given to the bounding conditions (both environmental and non-environmental) and related assumptions of these previous analyses to determine if they apply to the new proposed action. This comparison and determination should be briefly described in the EIS. Applicable portions of EAs and/or EISs should be incorporated by referenced to shorten the length of the EIS.

4.2.7 Format and Content of EIS

NRC's standard format for an EIS is described in Appendix A of 10 CFR Part 51. Program-specific guidance may identify additional format and content requirements or options. The text of the EIS should normally be less than 150 pages and for proposals of unusual scope or complexity less than 300 pages. CEQ guidance is provided in 40 CFR 1502.10–1502.18 and 1502.25. An acceptable method of meeting these requirements is provided in Chapter 5, *Preparing an Environmental Impact Statement: Format and Technical Content*.

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4.3 Internal Review of Draft Environmental Impact Statement

Preliminary and final DEIS documents are reviewed by the environmental and licensing project managers, their Section Chiefs, the EIS team, Branch Chiefs, and Division Directors. The Office Director and/or Deputy Office Director may review certain NEPA documents (e.g., rulemaking EISs involving a great deal of public interest). OGC will review all EIS documents to make a determination of “no legal objection” prior to release to the public. The environmental project manager will coordinate the review. The NMSS Division Director (normally the DWM Director) responsible for preparing the EIS is the decision maker for the preferred alternative in the DEIS.

After internal review, the initial draft document will be forwarded to the State(s) and cooperating agencies for their review. The document should clearly indicate the following statements on each page: “DRAFT” and “Release of this information to the public or other interested parties is only to be made upon the express permission of the US. Nuclear Regulatory Commission.” It may be beneficial to meet with cooperating agencies to discuss the preliminary EIS.

The environmental project manager and team will revise the DEIS in response to the State and cooperating agencies comments. A courtesy final DEIS document may be provided to the State and cooperating agencies before the notice of availability is filed with EPA (Section 3.6, *EPA Review*). Reviewers should avoid inadvertent public releases of draft documents.

A preferred alternative should be designated in the DEIS (10 CFR 51.71(e)) after considering the environmental effects of the proposed action and reasonable alternatives. In lieu of designating a preferred alternative the staff may indicate that two or more alternatives remain under consideration.

4.4 Publishing the DEIS

4.4.1 Notice of Availability

The NRC must publish a FRN announcing the availability of the DEIS, FEIS, and ROD. There are no format or content requirements for a notice of availability other than those associated with the preparation of notices for publication in the *Federal Register*. In addition to announcing the availability of an EIS and the public review period, the notice of availability will identify the purpose of the EIS, describe the proposed action and alternatives, and when applicable, indicate the dates and location of public meetings. Public comments can be received by mail, email, and on the NRC website, in addition to public meetings. An example notice of availability is provided in Appendix D.

4.4.2 Distribution of DEIS

Following completion of the final DEIS, the lead agency is expected to distribute the DEIS for comment to any interested parties. The DEIS will be distributed in accordance with the provisions of 10 CFR 51.74 and 51.77, which include requirements for distribution, news releases, and the notice of availability. The DEIS is filed with the EPA’s Office of Federal Activities (OFA) who will also publish

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1 a FRN of filing. Five copies of the DEIS (including appendices) and a transmittal letter identifying the
2 name and telephone number of the environmental project manager should be addressed to:

3
4 US Environmental Protection Agency
5 Office of Federal Activities
6 EIS Filing Section
7 Mail Code 2252-A, Room 7241
8 Ariel Rios Building (South Oval Lobby)
9 1200 Pennsylvania Avenue, NW
10 Washington, DC 20460
11

12 More information on the EPA process is provided at EPA's OFA WWW at <<http://es.epa.gov/oeca/ofa>>.
13 EPA's review is described in Section 4.6.

14
15 Distribution should begin after the DEIS is transmitted to EPA for filing and review. Provide the printer
16 a copy of the distribution list for the initial distribution of DEISs. Sufficient copies must be printed and
17 available in the environmental project manager's office for distribution to those who request a copy
18 during the review period. Copies should also be available for public review in the public electronic
19 reading room. Documents incorporated by reference in the DEIS must also be available for public
20 review in the NRC public document room.

21
22 Beyond the minimum required period of 45 days (10 CFR 51.73), the time period for public comment on
23 a DEIS will be determined based on the potential for environmental harm, the extent of the proposed
24 action, any associated controversy, and external time requirements (e.g., statutory deadlines).

25 26 **4.5 Public Meetings**

27
28 Following the publication of the DEIS for public comment, the EIS team will conduct a public meeting or
29 meetings near the site of the proposed action to receive public comments. For actions, such as
30 rulemaking, that may have a national impact, it may be necessary to schedule and hold a series of public
31 meetings at a number of different locations. The following guidance applies to preparing for and
32 conducting meetings to gather public comments:

- 33
34 • Scheduling meetings—Provide the public with a reasonable opportunity to review the DEIS prior
35 to the meeting. Generally, the meeting should be held at least 30 days after the EPA notice of
36 filing. However, meetings should not be held so late in the comment period as to preclude
37 attendees from submitting written comments.
- 38
39 • Announcing meetings—Announce the dates, times, and locations in the FRN of availability for
40 the DEIS, in a press release to local media, in newspaper advertisements, on NRC's website, and
41 by other means that may be recommended by local officials or groups. Planning for the
42 meeting(s) should be completed before distributing the DEIS.
43

- 1 • Conducting meetings—Records of public meetings should be maintained, including a transcript,
2 a list of attendees (as well as addresses of attendees desiring to be added to the mailing list) and a
3 meeting summary.
- 4
- 5 • Location of meetings—Hold public meetings at a neutral location (e.g. school auditorium, hotel
6 meeting room, community center, etc.) large enough to handle the expected attendees.
- 7
- 8 • Format—The format of public meetings will vary. The environmental project manager and
9 members of the team should be prepared to give a summary of the proposed action, allowing time
10 for questions prior to gathering comments from the public.
- 11
- 12 • Cost—In budgeting for these meetings, the costs should include renting facilities and the
13 necessary equipment, hiring staff (e.g., court reporters, security), and other expenses such as
14 advertisements in the local media.
- 15
- 16 • The number of people expected to attend the proposed meeting—The number of attendees
17 should be considered when selecting the facility. Guidance is provided in Management Directive
18 3.5, *Public Attendance at Certain Meetings Involving the NRC Staff*.
- 19
- 20 • Identify the members of the EIS team who will attend the meeting, and determine their role—For
21 some meeting formats, formal presentations and/or a question and answer session may be
22 appropriate.
- 23
- 24 • A facilitator—A facilitator may be useful to establish ground rules for conducting the meeting
25 and keeping the meeting focused on the action and DEIS under review. This is especially
26 important for contentious or controversial (local or national) issues.
- 27

28 **4.6 EPA Review**

29
30 The Clean Air Act authorizes the EPA to review proposed actions by Federal agencies in accordance
31 with NEPA and to make those reviews public. Section 309 of the Clean Air Act states that the
32 Administrator [of the EPA] shall review and comment, in writing, on the environmental impact of any
33 matter relating to duties and responsibilities granted pursuant to the Act or other provisions of the
34 authority of the Administrator contained in (1) legislation proposed by any Federal department or agency
35 (2) newly authorized Federal projects for construction and any major Federal agency action (other than a
36 project for construction) to which NEPA applies and (3) proposed regulations published by any
37 department or agency of the Federal government. Written comment will be made public at the
38 conclusion of the review. If the EPA Administrator determines that any such legislation, action, or
39 regulation is unsatisfactory from the standpoint of public health welfare or environmental quality, they
40 will publish their determination and the matter will be referred to the CEQ. If the proposing or “lead”
41 agency does not make sufficient revisions in response to EPA’s review of the proposed action and the
42 project remains “environmentally unsatisfactory,” EPA may refer the matter to the CEQ for mediation.
43

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1 The EPA Administrator has delegated responsibility for these reviews to EPA's OFA and the 10 EPA
2 Regional Administrators. OFA has developed the following criteria in rating the environmental impacts
3 of a proposed action:

- 4 • **LO - Lack of Objection;**
- 5
- 6 • **EC - Environmental Concerns - Impacts identified that should be avoided. Mitigation measures**
7 **may be required.**
- 8
- 9 • **EO - Environmental Objections - Significant impacts identified. Corrective measures may**
10 **require substantial changes to the proposed action or consideration of another alternative,**
11 **including any that was either previously unaddressed or eliminated from the study, or the no**
12 **action alternative. Reasons include:**
 - 13 - violation of a Federal environmental standard;
 - 14 - violation of the Federal agency's own environmental standard;
 - 15 - violation of an EPA policy declaration;
 - 16 - potential for significant environmental degradation; or
 - 17 - precedent-setting for future actions that collectively could result in significant
 - 18 environmental impacts.
- 19
- 20 • **EU - Environmentally Unsatisfactory - Impacts identified are so severe that the action must not**
21 **proceed as proposed. If these deficiencies are not corrected in the final EIS, EPA may refer the**
22 **EIS to CEQ. Reasons include:**
 - 23 - substantial violation of a Federal environmental standard;
 - 24 - severity, duration, or geographical extent of impacts that warrant special attention; or
 - 25 - national importance, due to threat to national environmental resources or policies;
- 26
- 27
- 28
- 29

30 EPA uses the following criteria to rate the adequacy of the EIS:

- 31 • **1 - Adequate:** no further information is required for review;
- 32
- 33 • **2 - Insufficient Information:** Either more information is needed for review or other
34 alternatives should be evaluated. The identified additional
35 information or analysis should be included in the final EIS; or
- 36
- 37 • **3 - Inadequate:** Seriously lacking information or analysis to address potentially
38 significant environmental impacts. The draft EIS does not meet
39 NEPA and or Section 309 requirements. If not revised, or
40 supplemented, and provided again as a draft EIS for public
41 comment, EPA may refer the EIS to CEQ.
- 42
- 43

44 Additional information on the Section 309 process can be found at EPA's OFA WWW at
45 <<http://es.epa.gov/oeca/ofa/>>.

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4.7 Responses to Comments on the DEIS

Depending on the extent of the proposed action, the anticipated impacts, and the degree of public controversy, the number of written and oral comments received can vary. Comments may lead to modification of the proposed action or alternatives, additional impact analyses, or factual corrections. The FEIS will include responses to individual or grouped substantive comments (10 CFR 51.91).

Comments can be grouped into categories to facilitate responses. All comments must be analyzed, appropriate responses prepared, and the EIS revised as appropriate. Detailed responses should be made to comments that (i) are substantive, (ii) relate to inadequacies or inaccuracies in the analysis or methodologies used, (iii) identify new impacts or recommend reasonable new alternatives or mitigation measures, or (iv) involve substantive disagreements on interpretations of significance. Several typical types of comments and appropriate responses are discussed below.

- **Comments on Inaccuracies and Discrepancies**—Factual corrections should be made in the FEIS in response to comments that identify inaccuracies or discrepancies in factual information, data, or analyses.
- **Comments on the Adequacy of the Analysis**—Comments that express a professional disagreement with the conclusions of the analysis or assert that the analysis is inadequate may or may not lead to changes in the FEIS. Public comments may necessitate a reevaluation of analytical conclusions. If, after reevaluation, the environmental project manager believes a change is not warranted, the response should provide the rationale for that conclusion.
- **Comments That Identify New Impacts, Alternatives, or Mitigation Measures**—If public comments on a DEIS identify impacts, alternatives, or mitigation measures that were not addressed in the draft, the environmental project manager should determine if they warrant further consideration. If they do, the EIS team should determine whether the new impacts, new alternatives, or new mitigation measures should be analyzed in either the FEIS, a supplement to the DEIS, or a completely revised and recirculated DEIS. If the environmental project manager determines that the new impacts, alternatives, or mitigation measures do not warrant further analysis, the response should provide rationale for that conclusion.
- **Disagreements With Significance Determinations**—Comments may directly or indirectly question the significance or severity of impacts. A reevaluation of these analyses may be warranted and may lead to changes in the DEIS. If, after reevaluation, the environmental project manager does not think that a change is warranted, the response should provide the rationale for that conclusion.
- **Expressions of Personal Preferences**—Comments that express personal preferences or opinions on the proposal do not require a response, however, they should be summarized in the comment section of the FEIS.

4.8 Finalizing the EIS

As a result of public comments the EIS team may determine that additional information is needed from the applicant/licensee before the DEIS can be finalized. Additional RAIs should be provided to the applicant/licensee in writing with the responses to those requests also documented in a letter to the NRC. The internal review of the final FEIS is the same as the preliminary DEIS as described in Section 4.3, *Internal Review of Draft Environmental Impact Statement*.

4.9 Publishing the FEIS

After the FEIS has been reviewed and concurred with by appropriate management and staff and OGC has no legal objection, the FEIS is distributed in accordance with the provisions of 10 CFR 51.93, which includes requirements for:

- Distribution to:
 - EPA;
 - applicant or petitioner;
 - any other party to the proceeding and commenters;
 - appropriate State, regional, and metropolitan clearing houses;
- News releases; and
- Publishing FRN of availability.

The FEIS is filed with the EPA's OFA. Five copies of the FEIS (including appendices) and a transmittal letter are required. The transmittal letter should identify the name and telephone number of the environmental project manager and should be addressed to:

US Environmental Protection Agency
Office of Federal Activities
EIS Filing Section
Mail Code 2252-A, Room 7241
Ariel Rios Building (South Oval Lobby)
1200 Pennsylvania Avenue, NW
Washington, DC 20460

More information is provided at EPA's OFA website: <<http://es.epa.gov/oeca/ofa>>.

4.9.1 Abbreviated FEIS

If only minor changes are made in the DEIS in response to comments (technical, editorial, or nonsubstantive factual corrections), then an abbreviated FEIS may be prepared [10 CFR 51.91(a)(3)]. An abbreviated FEIS contains the substantive comments received on the DEIS, responses to those

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1 comments, and an errata section with modifications and corrections to the DEIS in response to
2 comments. No rewriting or reprinting of the DEIS is necessary.

3 4 **4.9.2 Full Text FEIS**

5
6 If the changes to the DEIS are major, the full-text of the FEIS should be published. The format of the
7 FEIS is the same as the DEIS, except that the FEIS includes the substantive comments on the DEIS,
8 responses to those comments, and changes in or additions to the text of the DEIS. The comments are
9 usually placed in an appendix. The FEIS may incorporate by reference the appendices of the DEIS, if
10 there are no changes to the appendices. The availability of a full-text FEIS aids subsequent use of the
11 document for tiering and supplementing purposes.

12 13 **4.10 Record of Decision**

14
15 The FEIS and SER form the basis for the NRC decision to approve or deny the applicant/licensee
16 request. The environmental project manager will prepare a concise public ROD (10 CFR 51.103) that
17 states: (i) what the decision is; (ii) all alternatives considered by the NRC and specifying the
18 alternative(s) considered to be environmentally preferable; (iii) preferences among alternatives based on
19 relevant factors; (iv) whether the NRC has taken all practicable measures within its jurisdiction to avoid
20 or minimize environmental harm from the selected alternative; and (v) summarize any license conditions
21 or monitoring programs adopted as mitigation measures, if applicable. For NRC, issuance of the license,
22 license amendment, or other authorization within the jurisdiction of the NRC such as decommissioning
23 and license termination typically constitute the ROD.

24
25 Until the ROD is issued, no action concerning the applicant/licensee proposal will be taken that could
26 have adverse environmental impacts or limit the choice of reasonable alternatives. If NRC is considering
27 an application from a non-Federal entity and is aware that the applicant is about to take an action within
28 the agency's jurisdiction that would meet either criterion (adverse effect or limiting choices), NRC will
29 promptly notify the applicant to stop the action.

30
31 The following suggested format satisfies the ROD content requirements specified in 10 CFR 51.103:

- 32
33 • **Introductory Material**—A cover sheet includes the following information, or most of this
34 information is included at the top of the first page.
- 35 - Title;
 - 36 - Docket number and name of applicant /licensee;
 - 37 - Preparing office and office location;
 - 38 - Cooperating agencies, if any;
 - 39
 - 40
 - 41
 - 42
 - 43

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- Signature and title of the responsible official, and signature and title of concurring officials, if any (signature(s) may appear on the last page of the ROD if a cover sheet is not prepared); and
- Date of signature of approving and concurring officials (this is the official date of the ROD).
- Summary—A summary is needed only if the ROD exceeds 10 pages. It should be a brief synopsis of the ROD.
- Decision [10 CFR 51.103(a)(1), 40 CFR 1505.2(a)]—A clear and concise description of the approved action should be prepared. All important aspects or details of the decision should be identified. There should be no ambiguities regarding the specifics of what is or is not being approved.
- Alternatives Including the Proposed Action [10 CFR 51.103(a)(2), 40 CFR 1505.2(b)]—Identify the alternatives considered by the NRC and specify the alternative or alternatives which were considered to be “environmentally preferable.”
- Management Considerations [10 CFR 51.103(a)(3), 40 CFR 1505.2(b)]—This section provides the rationale for the decision. Discuss factors, including national policy considerations, NRC’s statutory mission, social, economic, technical, and other pertinent considerations weighed in the decision-making process.
- Mitigation and Monitoring [10 CFR 51.103(a)(4), 40 CFR 1505.2 (c)]—Committed mitigation measures and related monitoring and enforcement activities, if any, for the selected alternative are presented here. State whether the NRC has taken all practicable measures within its jurisdiction to avoid or minimize environmental harm from the alternative selected. Measures to avoid or reduce environmental harm which were not selected should also be identified with a brief explanation of why such measures were not adopted. Mitigation and monitoring that will become part of the agency’s authorization should be included as stipulations or license conditions in the ROD (i.e., license or license amendment).
- Public Involvement—Briefly describe efforts to seek public views throughout the NEPA process.

4.11 Implementation and Monitoring

Until the ROD has been signed and for at least 30 days following the publication by the EPA of the FRN stating that the FEIS has been filed with the EPA, no action having either an adverse environmental effect or that would limit the choice of alternatives can be taken (10 CFR 51.100). Following approval of the ROD and the satisfaction of all other requirements the NRC may approve the action. The approved action must be in accordance with the decision(s) as documented in the ROD. No substantive changes may be made in the implementation of the decision without reconsideration of NEPA compliance needs.

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1 Monitoring and enforcement activities for mitigation measures are generally specified in the ROD as an
2 element of the decision. Most other monitoring activities, however, will not be specified in the ROD. A
3 monitoring plan is recommended for most actions requiring an EIS and should be developed as soon as
4 possible after approval of the ROD.

5 6 **4.12 References**

7
8 Canadian Environmental Assessment Agency, 1999, "Cumulative Effects Assessment Practitioners
9 Guide." WWW address <http://www.acee-ceaa.gc.ca/0011/0001/0004/guide_e.htm> (16 July 2001).

10
11 Code of Federal Regulations, Title 10, *Energy*, Part 51, "Environmental Protection Regulations for
12 Domestic Licensing and Related Regulatory Functions."

13
14 Code of Federal Regulations, Title 36, *Parks, Forests, and Public Property*, Part 800, "Protection of
15 Historic Properties."

16
17 Code of Federal Regulations, Title 40, *Protection of Environment*, Chapter V—Council on Environmental
18 Quality, Part 1502.25, "Environmental Review and Consultation Requirements."

19
20 Code of Federal Regulations, Title 50, *Wildlife and Fisheries*, Part 402, "Interagency Cooperation -
21 Endangered Species Act of 1973, as Amended."

22
23 Council on Environmental Quality (CEQ), Washington, DC. "Forty Most Asked Questions Concerning
24 CEQ's National Environmental Policy Act Regulations." *Federal Register* 46: 18026–18036. 1981.

25
26 Council on Environmental Quality, Washington, DC. "Considering Cumulative Effects Under the
27 National Environmental Policy Act." CEQ: Washington, DC. 1997.

28
29 Endangered Species Act, 16 USC 1531 et seq.

30
31 Environmental Protection Agency (U.S.) (EPA). "Consideration of Cumulative Impacts in EPA Review
32 of NEPA Documents." WWW address <<http://es.epa.gov/oeca/ofa/cumula.html>>. 1999.

33
34 Fish and Wildlife Service and National Marine Fisheries Service (U.S.) (USDA). "Endangered Species
35 Consultation Handbook." USDA: Washington, DC. 1998.

36
37 National Park Service (U.S.) (DOI). "How to Apply the National Register Criteria for Evaluation."
38 *Bulletin No. 15*. DOI: Washington, DC. 1991.

39
40 Nuclear Regulatory Commission (U.S.). "Guidelines for Conducting Public Meetings."
41 (NUREG/BR-0224). NRC: Washington, DC. February 1996.

42
43 Nuclear Regulatory Commission (U.S.). "Guidelines for Interviews with the News Media."
44 (NUREG/BR-0202). NRC: Washington, DC. June 2000.

45

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1 Nuclear Regulatory Commission (U.S.). "Public Outreach Handbook." NRC: Washington, DC. March
2 1995.

3
4 Nuclear Regulatory Commission (U.S.). Washington, DC. "Regulations Handbook."
5 (NUREG/BR-0053). NRC: Washington, DC. 2001.

6
7 Nuclear Regulatory Commission (U.S.). "*Management Directive 3.4, Release of Information to the*
8 *Public.*" NRC: Washington, DC.

9 **5 PREPARING AN ENVIRONMENTAL IMPACT STATEMENT:** 10 **FORMAT AND TECHNICAL CONTENT**

11
12 This chapter discusses the contents of an acceptable EIS. An acceptable EIS fulfills the goals of NEPA,
13 primarily with regard to protection, restoration, and enhancement of the environment.

14
15 This chapter follows the outline of an EIS described in 10 CFR 51 Appendix A. This EIS format is
16 generally present in all EISs. The information to be provided by the applicant/licensee is described in
17 Chapter 6, *The Environmental Report: Format and Technical Content*.

18
19 The scope of the EIS should be balanced against the credible threat to the environment posed by the
20 proposed action (e.g., facility construction, facility operation, or decommissioning). The EIS should
21 present a detailed and thorough description of each resource for the evaluation of potential impacts to the
22 environment. Every resource may not receive the same level of detailed review. This is consistent with
23 one of the goals of NEPA, which is to concentrate on the issues that are significant to the proposed action
24 and its potential environmental impacts.

25
26 In addition to the EIS, NRC typically prepares a SER to evaluate the radiological impacts of a proposed
27 action. Although there is some overlap between the content of an SER and an EIS, the intent of the
28 documents is different. Since the documents provide input to each other, they must be developed in
29 parallel. This guidance applies to licensing actions. Additional guidance for the preparation of EISs for
30 rulemaking actions is contained in NUREG/BR-0053.

31
32 The rest of this chapter is written to follow the outline of an EIS. Each of the section headings describe
33 the types of information necessary for inclusion in the EIS. It is acceptable to combine chapters to make
34 a more readable document, as long the required information is present. Following is an example table of
35 contents:

36 37 Executive Summary

38 39 Chapter 1 Introduction

- 40 1.1 Purpose of and Need for the Proposed Action
- 41 1.2 The Proposed Action
- 42 1.3 Objective of the Proposal
- 43 1.4 Scope of This Environmental Analysis
- 44 1.4.1 Issues Studied in Detail

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- 1.4.2 Issues Eliminated from Detailed Study
1.5 Applicable Regulatory Requirements, Permits, and Regional Consultations

Chapter 2 Alternatives

- 2.1 Process Used to Formulate Alternatives
- 2.2 No action Alternative
- 2.3 Proposed Alternative (Licensee's Proposed Action)
- 2.4 Other Reasonable Alternatives
- 2.5 Alternatives Considered but Eliminated
- 2.6 Comparison of the Predicted Environmental Impacts
- 2.7 Summary of Comments on the Draft Environmental Impact Statement
- 2.8 Identification of the Preferred Alternative

Chapter 3 Description of the Affected Environment

Chapter 4 Environmental Impacts

Chapter 5 Mitigation Measures

Chapter 6 Environmental Measurements and Monitoring Programs

- 6.1 Radiological Monitoring
- 6.2 Chemical Monitoring
- 6.3 Ecological Monitoring

Chapter 7 Cost-Benefit Analysis

Chapter 8 Summary of Environmental Consequences

Chapter 9 List of Preparers

Chapter 10 Distribution List

Chapter 11 List of References

Appendices

5.1 Introduction of the EIS

The most important sections of the EIS are the discussion of the purpose and need and the alternatives, because most readers will only read the executive summary and the first chapter. All important decisions should be noted in these sections. The remaining chapters and appendices are supporting information.

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5.1.1 Purpose and Need for the Proposed Action

This section explains why the proposed action is needed. The purpose and need describe the underlying need for the proposed action and should not be written merely as a justification of the proposed action, nor to alter the choice of alternatives. Another common mistake is to identify compliance with NEPA and CEQ regulations as the need. Examples of need include a benefit provided if the proposed action is granted or descriptions of the detriment that will be experienced without approval of the proposed action. In short, the need describes what will be accomplished as a result of the proposed action.

The following background information should also be provided:

- An explanation of why this action requires an EIS.
- Operating history of the facility (if not a new application).
- A list of the other alternatives considered.

5.1.2 The Proposed Action

This section should briefly describe the proposed action, including the name of the applicant/licensee, the title of the project, the location (with a map), and the schedule. Note the pertinent NRC regulations.

5.1.3 Objective of the Proposal

This section describes the desired outcome or goal of the proposal. For example, at a decommissioning site, the licensee must meet the 10 CFR Part 20, Subpart E, radiological criteria for license termination. For a new fuel cycle facility, the applicant/licensee must meet the 10 CFR Part 70 criteria.

5.1.4 Scope of This Environmental Analysis

This section describes the scoping process. The scoping process, as described in Section 4.2.3, will result in the scope of the EIS.

The following information should be included in the EIS:

- A history of the planning and scoping process for this project;
- A discussion of public concerns;
- A list of cooperating agencies and the reasons they became cooperating agencies;
- A list of other Federal, State, local, and other organizations contacted; and

- A summary of related EISs, EAs and other relevant documents, such as the SER. This summary includes mention of former EAs for the site and GEISs used in tiering.

5.1.4.1 Issues Studied in Detail

The scoping process identifies two categories of issues - those that need to be studied in detail (but do not necessarily result in significant impacts) and those that can be eliminated from detailed study because the impacts are minimal. Resources (ground water, historic properties, ecological resources, etc.) are generally the same as issues. However, a resource could be split into two issues - for example, short-term socioeconomic impacts due to construction and long-term socioeconomic impacts to land use. To make the EIS less like an encyclopedia and more issue-driven, it is recommended that the environmental analysis be separated into these two categories. This approach leads to an EIS that emphasizes the principal results of the analysis, and these two sections (5.1.4.1 and 5.1.4.2) are a summary of the conclusions regarding environmental impacts.

This section provides a summary of the issues that require more detailed study. Among these issues are those that may result in significant short- or long-term impacts. Each issue and the conclusion regarding its potential impact are described briefly (no more than a few paragraphs). A more detailed analysis of the impacts should be presented in the EIS chapter "Environmental Impacts."

5.1.4.2 Issues Eliminated from Detailed Study

This section summarizes the issues that were found to have minimal short- and long-term impacts. Each issue and the conclusion regarding its potential impact are described briefly in one or two paragraphs. If necessary, the issues eliminated from detailed study are discussed further in an appendix. The reader is referred to the appropriate EIS section in the appendix if there is further explanation.

5.1.5 Applicable Regulatory Requirements, Permits, and Regional Consultations

The staff review includes identification of applicable consultations, approvals, and authorizations (and the relevant agencies). The review should include (1) determination of the status of the consultations and/or authorizations, (2) identification of environmental concerns, and (3) evaluation of potential administrative problems that could delay or prevent agency authorization.

The staff should:

- Identify all Federal, State and local permits, licenses, approvals, and other entitlements that must be obtained in connection with the proposed action.
- Produce a summary of compliance with applicable environmental quality standards and requirements that have been imposed by Federal, State, and local agencies.

Table 1 illustrates a sample format for summarizing the list of permits, licenses, approvals, entitlements and consultations and their status. The table can be used by the reviewers to identify areas of environmental concern and determine applicant compliance with existing standards and regulations. In

some circumstances (e.g., a potential problem in State siting authorizations), the EIS author may need to prepare additional information to fully cover the subject material. If it is uncertain whether a Federal permit, license, approval, or other entitlement is necessary, the DEIS will so indicate (10 CFR 51.71(c)).

Table 1. Sample format for Federal, State, and local authorizations and consultations

Agency	Authority	Activity Covered	Status*
US. Army Corps of Engineers	Clean Water Act, Section 404	Dredge and Fill Permit	Approval to be obtained
U. S. Fish and Wildlife Service	Endangered Species Act	Biological Assessment	Undetermined at present
State Historic Preservation Office	National Historic Preservation Act	Consultation	Initial consultation complete
*This field to be filled in based on the consultations with relevant agencies.			

5.2 Alternatives

This section introduces alternatives that could also accomplish the need for the proposed action. The EIS should summarize the no action alternative, the proposed action, and the reasonable alternatives. Alternatives should be included that will avoid or minimize adverse effects upon the quality of the human environment.

All alternatives, including the no action alternative, should receive equal and objective treatment. The phrase "range of alternatives" includes all reasonable alternatives (including the no action alternative) to the proposed action, as well as those other alternatives that are eliminated from detailed study, with a brief discussion of the reasons for eliminating them. Reasonable alternatives are those alternatives that meet the proposal objectives and applicable environmental standards and are technically feasible.

The number of alternatives considered is generally small (e.g., three to five alternatives). The discussion of alternatives should include similar types of descriptions as for the proposed action. Describing the alternatives in a parallel format for presentation makes the comparisons clear to the reader. In addition to text, consider summarizing the alternatives in a table for efficiency and clarity.

As a general matter, the staff has broad discretion in consideration of alternatives in the EIS and is not limited to considering only those alternatives proposed by the applicant/licensee. However, the selection of an alternative solely because it is economically superior to the proposed action is inconsistent with past NRC practice. In general, the staff should include all reasonable alternatives to the proposed action with the purpose of identifying those that are environmentally superior (Olmstead, 1997). The environmentally preferable alternative is the alternative that offers the best combination of minimized damage to the biological/physical environment and protection of historic, cultural, and natural resources. The environmentally preferred alternative may not necessarily be the preferred or chosen alternative because of many factors, including cost/benefit analyses, mitigating factors, and legal considerations.

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1 A preferred alternative should be designated in the DEIS (10 CFR 51.71(e)) after considering the
2 environmental effects of the proposed action and reasonable alternatives. In lieu of designating a
3 preferred alternative the staff may indicate that two or more alternatives remain under consideration. The
4 NRC's preferred alternative (or the environmentally preferred alternative) may not be the same as the
5 applicant's proposed action. Additionally, the ROD must identify all alternatives including the
6 alternative or alternatives considered to be environmentally preferable (40 CFR 1505.2(b)).
7

8 **5.2.1 Process Used to Formulate Alternatives**

9

10 Briefly describe the process used to formulate alternatives - licensee submittals, public input during the
11 scoping process, interdisciplinary discussions, etc. The staff consideration of reasonable alternatives
12 should not be limited to those alternatives proposed by the applicant/licensee.
13

14 **5.2.2 No-Action Alternative**

15

16 This section describes the no action alternative along with a description of the major impacts. For the no
17 action alternative, the proposed action would not take place. This is the status-quo alternative and serves
18 as a baseline for comparing alternatives. For some actions, such as certain decommissioning actions, the
19 no action alternative may not be a reasonable option and detailed analysis of impacts is not usually
20 performed.
21

22 **5.2.3 Proposed Alternative (Licensee's Proposed Action)**

23

24 This section describes the proposed action. It should not include descriptions that are more appropriate
25 in the purpose and need section. The section should also identify the major impacts of the proposed
26 action.
27

28 **5.2.4 Other Reasonable Alternatives**

29

30 This section describes other reasonable alternatives to the proposed action and a summary of their major
31 impacts.
32

33 **5.2.5 Alternatives Considered but Eliminated**

34

35 This section summarizes the alternatives that were eliminated from detailed study, with a brief discussion
36 of the reasons for eliminating them. The section does not need to be exhaustive, but should at least
37 discuss alternatives that have been proposed in licensee documents, public meetings, and related
38 correspondence. If the no action alternative is not a reasonable option due to legal, safety, or
39 considerations, it should also be mentioned in this section.
40
41

5.2.6 Comparison of the Predicted Environmental Impacts

This section describes and compares all alternatives. Discussion of the impacts of the alternatives should be limited to a descriptive summary of the impacts to all resources. The information contained in this section should also be incorporated into a summary table.

5.2.7 Comments on the Draft Environmental Impact Statement

In the Final Environmental Impact Statement (FEIS), include a summary of the major public comments on the DEIS. Include details on the comments and responses in an appendix.

The following information should be included in the FEIS:

- Date(s):
 - DEIS was submitted to EPA
 - NOI was published in the *Federal Register*; and
 - DEIS was made available to the public.
- Methods used to publicize the availability of the DEIS.
- Schedule of public meetings held on the DEIS, including location, date, and time.
- Summary of major comments and responses.

5.2.8 Identification of the Preferred Alternative

Briefly describe and summarize the preferred alternative or alternatives. Include a brief comparison to the proposed action if it is different than the preferred alternative.

5.3 Description of the Affected Environment

The description of the affected environment focuses on baseline conditions, i.e. the status quo. The baseline conditions will be used to assess the impacts discussed in Section 5.4, *Environmental Impacts*.

The following environmental resources should be considered, as appropriate in preparing the EIS:

- Site and/or facility description;
- Land use;
- Transportation;
- Geology and soils;
- Water resources;
- Ecology;
- Meteorology, climatology, and air quality;
- Noise;

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- Historical and cultural resources;
- Visual/scenic resources;
- Socioeconomic;
- Public and occupational health; and
- Waste management.

Chapter 6, *The Environmental Report: Format and Technical Content*, provides the detailed information the applicant/licensee is to provide on the affected environment. The NRC staff should review the information provided in the ER using Chapter 6 of this guidance. The NRC reviewer should ensure that the descriptions are sufficient, with respect to relevancy, completeness, reliability, and accuracy for input to the potential impacts. When evaluating the adequacy of this material, the reviewer should consult the applicable standards and guides for this environmental review and use the site visit and/or consultations with permitting agencies to evaluate the completeness of the information provided by the applicant/licensee. These descriptions will be used in evaluating the direct, indirect, and cumulative impacts of the proposed action.

5.3.1 Site and/or Facility Description

This section describes the facility and location. The EIS should provide a detailed description of the facility's geographical location including an overview map of within 50 miles of the site, a more detailed map within 5 miles, and a map of the facility layout. The layout description should identify all buildings and pertinent features. The site features most likely impacted (or to cause impacts) by the proposed action should be described in detail. The location description will establish a geographical point of reference for other descriptive material (e.g., land and water use, local ecology, or socioeconomic).

The facility descriptions should include the nature and extent of present and proposed operations at the site, facilities that might be constructed, modified, or impacted as a result of the proposed action, summary description of the facility operations (including the types and methods of material movement from one part of the site to another), and identification of the radionuclides and hazardous materials used, including where and how they are stored, handled, and utilized. A complete description of the facility support systems (e.g., electrical power, gas supply and water supply etc.) should be provided. This section should also describe non-radiological and radiological contamination at the site/facility and provide a discussion of background radiological characteristics. Discuss any accidents that may have occurred during operation and their impacts.

5.3.2 Land Use

This section should describe existing and planned (without the proposed action) land uses for the site and vicinity. The EIS should include maps that provide locations of schools, hospitals, farming areas, and other land uses important to impact assessment. A discussion of possible conflicts between Federal, State, regional, and local (and in the case of a reservation, Native American tribal) land-use plans, policies, and controls for the site should also be included.

5.3.3 Transportation

If transportation is an important issue, it may be necessary to develop a separate section on transportation instead of incorporating this information in the land use or socioeconomic section. This section should describe transportation resources at and around the facility. The EIS should describe transportation infrastructure as it is important for considering impacts such as site workers commuting and transportation of materials. This section should describe local roads and highways, railroads, navigable rivers, and provide information on current levels of traffic.

5.3.4 Geology and Soils

The section should provide a brief summary of regional and site geology. Reference the SER for additional details. The EIS should discuss regional and local structure, the site stratigraphy, characteristics of the soil, and known mineral resources and recovery operations. This will form the basis for a description of geologic impacts (e.g., soil erosion, subsidence, and landslides) and impacts on ground water, surface water, and mineral resources.

5.3.5 Water Resources

This section describes the water resources, including surface- and ground-water hydrology, water use, and water quality. The EIS should describe the surface-water bodies and ground-water aquifers that could be affected by the proposed action and should consider both regional and site specific data. The EIS should provide a map showing the relationship of the site to major hydrogeologic systems. Describe flood plains, wetlands, streams, reservoirs, etc. The EIS should include a description of site-specific and regional data on the characteristics of surface- and ground-water quality in sufficient detail to provide the necessary data for other reviews dealing with water resources. The EIS should include a discussion of water quantity available for use and possible conflicts between Federal, State, regional, and local (and in the case of a reservation, Native American) water-use plans, policies, and controls for the site. Consumptive water uses that could affect the water quality and supply of the proposed action or that may be adversely affected by the proposed action should be identified including water source, locations of diversions and returns, amount used and seasonal use patterns, and water rights. Also, recreational, navigational, and other non-consumptive water uses including those that could be affected by offsite area construction and operation by location, activity, and amount used, and seasonal use patterns should be provided. Finally, this section should identify water uses that provide potential pathways for both radiological and non-radiological effluents including water sources, locations of diversions for consumptive uses, locations of receptors for non-consumptive uses, amount used, and seasonal use patterns.

Additional sources of information should be utilized when needed to complete the analysis. Sources include local water supply companies or agencies, river basin commissions, State agencies (e.g., water resources, fish and wildlife), Federal agencies (e.g., US. Army Corps of Engineers and the US. Geological Survey) and Native American tribal agencies. From the information gathered from these resources, compile and tabulate water uses by the categories and characteristics, but limit the analysis to consideration of past, present, and known future water uses. The EIS preparer should ensure that water-

1 use data and information are adequate to serve as a basis for assessing the impacts of proposed project
2 construction and operation on consumptive and non-consumptive water uses.

3 4 **5.3.6 Ecology**

5
6 This section describes the principal ecological (terrestrial and aquatic) features of the site and vicinity,
7 transportation corridors, and region, with emphasis on the plant and animal communities that may be
8 affected by the proposed action. This information should include transient and migratory species to
9 reflect any seasonal variations in ecological populations.

10
11 The EIS should include a description of ecological resources that could be affected (e.g. endangered,
12 threatened, and important species including estimates of their abundance) and special habitat needs (e.g.
13 cover, forage, and prey species), if the proposed action would potentially disrupt these needs. The EIS
14 should include information on the species and habitats in a table as provided by the Table 2 example.

15
16 A complete species list may be prepared as an appendix to the EIS. Additionally, a summary should be
17 provided of the consultations with appropriate Federal, State, regional, local, and Native American tribal
18 agencies, including the FWS and the State fish and wildlife agency, with details provided in an appendix.

19 20 21 **5.3.7 Meteorology, Climatology, and Air Quality**

22
23 This section should provide a detailed description of the meteorological/climatological conditions and
24 baseline air quality of the site and region around the proposed action.

25
26 The EIS should provide a description of relevant meteorological, climatological, and air quality data
27 sufficient to establish regional and local baseline conditions for the site. The information provided in
28 this section will be used in the analysis of impacts on air quality. The EIS should include:

- 29
30
 - Description of the existing regional air quality for completeness and accuracy;
 - 31
 - 32 • Air pollutants for which there are non-attainment or maintenance areas in the region; and
 - 33
 - 34 • Determination as to whether appropriate permits have been obtained.
 - 35

36 **5.3.8 Noise**

37
38 This section describes the current sources and levels of noise. This discussion should be consistent with
39 the terms concepts described in EPA (1974) and American Society for Testing and Materials (1996)
40 material. The EIS should include a comparison of the estimated sound levels to appropriate limits. The
41 EIS should provide a description of the analysis and assessment of current and historical trends, noise
42 levels, applicable sound level standards, information sources, and current practices to minimize adverse
43 noise impacts.
44

Table 2. Important species and habitats

Species	Habitat
<p><u>Rare species</u></p> <ul style="list-style-type: none"> Listed as threatened or endangered at 50 CFR 17.11 (Fish and Wildlife) or 50 CFR 17.12 (Plants). Proposed for listing as threatened or endangered, or is a candidate for listing. Listed as a threatened, endangered, or other species of concern by the State or States in which the proposed facilities are located. <p><u>Commercially or recreationally valuable species.</u></p> <p>Species that are essential to the maintenance and survival of species that are rare and commercially or recreationally valuable (as defined previously).</p> <p>Species that are critical to the structure and function of the local terrestrial and aquatic ecosystems.</p> <p>Species that may serve as biological indicators to monitor the effects of the facilities on the terrestrial and aquatic environments.</p>	<p>Wildlife sanctuaries, refuges, or preserves, if they may be adversely affected by the proposed action.</p> <p>Habitats identified by State or Federal agencies as unique, rare, or of priority for protection, if these areas may be adversely affected by the proposed action.</p> <p>Wetlands (Executive Order 11990), floodplains (Executive Order 11988), or other resources specifically protected by Federal regulations or Executive Orders, or by State regulations.</p> <p>Land areas identified as "critical habitat" for species listed as threatened or endangered by the FWS.</p>

5.3.9 Historic and Cultural Resources

Because of NEPA and Section 106 of the National Historic Preservation Act, the NRC's actions fall under 36 CFR 800, which provides regulatory guidance for identifying, evaluating, and protecting historic properties from potential adverse impacts resulting from Federal agency undertakings. Guidance from the US. National Park Service (NPS) can be found on the WWW at <http://www.cr.nps.gov/nr/publications/>.

1 The environmental project manager should consider historic, archaeological, and traditional cultural
2 resources in sufficient detail to provide the basis for subsequent analysis and assessment of possible
3 impacts. Historic and cultural resources include districts, sites, buildings, structures or objects of
4 historical, archaeological, architectural, or cultural significance. The environmental project manager
5 should be aware of results of any surveys conducted; the location and significance of any properties that
6 are listed in or eligible for inclusion in the *National Register* as a historic place; and any additional
7 information pertaining to the identification and description of historic properties that could be impacted
8 by the proposed action.

9
10 The construction, subsequent operation, and/or decommissioning of a facility could impact historic
11 properties directly (e.g., destruction or alteration of the integrity of a property) or indirectly (e.g.,
12 prohibiting access or increasing the potential for vandalism). In considering the areal extent of the
13 review, note that a facility can have a visual or audible effect on historic resources that are located some
14 distance from the proposed facility.

15
16 As discussed in Section 4.2.4.1.2, the NRC can authorize the applicant/licensee to initiate consultations
17 with the SHPO to determine if there are any historic properties listed in or eligible for inclusion in the
18 *National Register*. The review should also include historic properties included in State or local registers
19 or inventories and any additional important cultural, traditional, or historic properties. If necessary,
20 during scoping, discuss with the SHPO any organizations or individuals that might be able to assist in
21 identifying and locating archaeological and historic resources (for example, university and Native
22 American tribal archaeological and historical staffs).

23
24 If a property appears to meet the *National Register* criteria, or if it is questionable whether the criteria are
25 met, the staff should request, in writing, an opinion from the US. Department of the Interior regarding
26 the property's eligibility for inclusion in the *National Register*. The request for determination of
27 eligibility should be sent directly to the Keeper of the *National Register*, National Park Service, US.
28 Department of the Interior, Washington, D.C. 20013-7127.

29
30 The Archeology and Ethnography Program of the National Park Service is a particularly useful source of
31 expertise in the area of historic and cultural preservation and is staffed with professionals who can assist
32 the NRC staff in the environmental review and in analyzing the results of the applicant's surveys and
33 investigations.

34
35 To discourage property vandalism and scavenging, particularly in the case of archaeological sites, it may
36 be necessary to provide information to the SHPO for handling in a confidential manner. Summary
37 information, which does not include site-specific information, could be included in the EIS
38 documentation. State and tribal laws/policies addressing the handling of confidential and sensitive
39 information vary and may not coincide with Federal regulations, regardless of how the information is
40 marked by a licensee/applicant or NRC. Hence, specific requests for maintaining confidential or
41 sensitive information should be discussed with States and tribes.

42
43 Contact the Advisory Council on Historic Preservation if guidance is needed, if there are substantial
44 impacts on important properties, in the event of a disagreement, or if there are issues of concern to Indian
45 tribes or Native Hawaiian organizations.

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1 The EIS should summarize the applicant's and staff's review and include the following information:

- 2 • Historic properties listed in or eligible for inclusion in the *National Register*;
- 3 • Historic properties included in State or local registers or inventories;
- 4 • Any additional important cultural, traditional, or historic properties;
- 5 • Efforts to locate and identify previously recorded archaeological and historic sites;
- 6 • Overall results and adequacy of any surveys (archival or field) that were conducted by the
- 7 applicant; and
- 8 • A list of organizations and individuals contacted by the applicant or the staff who provided
- 9 significant information concerning the location of cultural and historic properties.
- 10
- 11
- 12
- 13
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- 15
- 16

17 **5.3.10 Visual/Scenic Resources**

18 This section describes the landscape characteristics, manmade features, and view of the proposed action

19 site.

20 The EIS should include the staff's assessment of the applicant/licensee's rating of the aesthetic and

21 scenic quality of the site in accordance with the BLM Visual Resource Inventory and Evaluation System

22 (BLM, 1984, 1986a, 1986b). Particular attention should be paid to viewsheds and likely activities in the

23 proposed action that may reduce the visual/scenic resource. This description will be used later in

24 evaluating the impacts of the proposed action and alternatives on visual/scenic resources.

25

26

27

28 **5.3.11 Socioeconomic**

29 This section describes population distribution and community characteristics within the region that are

30 likely to be affected by the proposed action and each alternative. The EIS should include descriptions of

31 relevant past and current population distributions. Both permanent and transient populations should be

32 identified. Describe low-income and minority populations. This description will be used to assess

33 impacts (including radiological impacts) on social, economic, and community resources.

34

35

36 The following information should be presented in the EIS:

- 37 • Population characteristics (e.g., ethnic groups, and population density);
- 38 • Economic trends and characteristics, including employment and income levels;
- 39 • Housing, health and social services, and educational resources;
- 40
- 41
- 42
- 43

- Area's tax structure and distribution; and
- Community attitudes and lifestyle (including organized community groups).

5.3.12 Public and Occupational Health

This section describes levels of background radiation, major sources and levels of background chemical exposure, occupational injury rates, and health effects studies performed in the region.

The EIS should include information on current background levels, historical exposure levels for actions similar to the proposed action, and a summary of any public health studies performed in the region sufficient to establish baseline information for analysis of impacts to public and worker health.

5.3.13 Waste Management

This section summarizes the historical baseline data regarding the production, handling, packaging, and shipping of waste. The EIS should discuss disposal practices for solid, hazardous, radioactive, and mixed wastes including disposal capacity. The baseline conditions will be used in the analysis of non-radiological and radiological impacts due to waste management.

5.4 Environmental Impacts

This section summarizes the known and potential impacts of the proposed action and each alternative. These impacts should consider normal operational events as well as reasonably foreseeable accidents (e.g. design basis events for Part 72 licensees, credible consequence events for Part 70 licensees). When analyzing impacts, the following environmental resources should be considered separately, and where necessary, in combination (e.g. noise impacts on wildlife, or transportation impacts on land use), as appropriate in preparing the EIS:

- Land use;
- Transportation;
- Geology and soils;
- Water resources;
- Ecology;
- Meteorology, climatology, and air quality;
- Noise;
- Historical and cultural resources;
- Visual/scenic resources;
- Socioeconomic;
- Environmental justice;
- Public and occupational health; and
- Waste management.

5.4.1 Land Use Impacts

This section should describe the impacts to land use for each alternative. The following information should be presented in the EIS:

- Long-term restrictions of land use resulting from the proposed action and long-term changes in land use of the site and vicinity;
- Short-term changes in land use of the site and vicinity;
- Restrictions or modifications of lands classified as floodplain, wetlands, or coastal zone;
- Mitigation measures for adverse impacts (e.g., earth leveling, revegetation, landscaping, cleanup and disposal of debris, erosion control structures, land management practices, stabilization of spoil piles, and stabilization of dikes on cooling lakes); and
- Prevention of current or planned mineral resources exploitation (e.g., sand and gravel, coal, oil, natural gas, or ores).

Activities (i.e., construction, operation and decommissioning) should be evaluated in sufficient detail to determine the significance of potential land-use impacts and to recommend how these impacts should be treated in the process (e.g., consideration of alternative designs or practices that would mitigate adverse environmental impacts). Assess mitigation measures to determine whether the action is adequate as proposed or that changes will be needed. Note the technical feasibility and the cost-benefit of any recommended changes (costly actions that would yield only minor environmental benefits should not be recommended).

5.4.2 Transportation Impacts

This section describes transportation impacts, both incident-free and accidents, for each alternative. The discussion of transportation impacts should include all phases of the project from any newly constructed transportation corridors or increased usage of existing corridors for construction of the project, through transportation issues during operation of the facility, to any increased transportation which may occur during decommissioning. Guidance for this review is provided in NUREG-0170, "Final Environmental Statement on the Transportation of Radioactive Material by Air and Other Modes" (NRC, 1977).

The analysis should consider transportation mode, routes, risk estimates, and impacts of transportation on the environment, including increases and decreases in usage of transportation corridors. Consider new construction that may be needed to upgrade existing or create new transportation routes and modes.

The following information should be included in the EIS:

- Transportation mode, routes, and risk estimates and impacts and their significance for each alternative;

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- Potential mitigative measures proposed to decrease the transportation impacts for each alternative including the degree that these measures are effective in mitigating the impacts for each alternative; and
- Comparison of the offsite dose consequences and resulting health effects as calculated by the applicant and those contained in the Safety Evaluation Report. Review of the dose consequence analysis including the direct, indirect, and cumulative socioeconomic impacts and the impacts to biota. The EIS author should coordinate this section with the transportation analysis conducted for the SER.

5.4.3 Geology and Soils Impacts

This section summarizes potential geological impacts, which are assessed in the staff's SER. The analysis will be incorporated by reference from the SER. Examples of geological environmental impacts include soil compaction, soil erosion, subsidence, landslides, and disruption of natural drainage patterns.

5.4.4 Water Impacts

This section describes the surface and ground water impacts from the proposed action and each alternative, including water use, and water quality. The description should include consideration of site-specific and regional data on the water-use characteristics, water quality, and hydrology of ground and surface water. The description should include an analysis and evaluation of construction, operation and decommissioning activities in sufficient detail to determine the significance of potential water impacts and to recommend how these impacts should be treated in the process (e.g., consideration of alternative designs or practices that would mitigate adverse environmental impacts). The details of these supporting analyses (e.g., actual environmental measurements, modeling assumptions and results) should be disclosed by reference or placed in an appendix to the EIS.

The analysis should consider the following:

- Changes to the hydrological system that could cause ground and surface water impacts at and near the site. The analyses of water system alterations and water-supply/water consumption comparisons should be included. These changes could include water quantity and availability, water flow, and movement patterns, and erosion, deposition, and sediment transport. All water system characteristics should be included in this analysis (e.g., all sources of water, points of discharge, and water diversions) that modify the availability of water. The analyses should include short-term and long-term effects and include discussions of flood plain alterations.
- Impacts resulting in reduced water availability. Identify the location of those water users likely to be affected, and consider adverse effects (e.g., lowered ground water table, reduced well yields, lowered surface-water levels at intake structures) to determine their impacts on individual water users or water-use areas. The reviewer should consider seasonal requirements for water and temporal variations in water availability. The reviewer should also consider the potential for an incompatibility between water availability as affected by project activities and existing and

known future water rights and allocations. The nature and extent of these future water inequalities should be identified.

- Water quality potentially impacted by modifications to the ground and surface water system or users. The analysis should consider short-term effects as well as long-term effects caused by each alternative. Alternatives should be identified that avoid adverse effects and incompatible development in the flood plain. The reviewer should identify alternative designs, construction and operational practices, or procedures that could mitigate or avoid the impacts.

The following information should be included in the EIS:

- A description of the impacts to water quality/availability in the region
- Direct, indirect, and cumulative impacts from each alternative (radiological and chemical)
- Assessments of both short- and long-term effects
- A comparison of water quality impacts to appropriate standards
- A description of the aquatic transport and diffusion characteristics relevant to the alternatives which should include references to the models used and identification of the input data considered
- A dose assessment of the radiological impacts based on sufficient aquatic transport parameters and population data
- A description of mitigative measures for water quality/availability impacts

5.4.5 Ecological Impacts

This section summarizes the ecological (terrestrial and aquatic) impacts of the proposed action and each alternative. An assessment of both onsite and offsite activities including transportation corridors should be provided. The assessment should be in sufficient detail to (i) predict and evaluate the significance of potential impacts to important species and their habitats and (ii) evaluate how these impacts should be considered in the process.

The analysis should consider activities that:

- Create obstacles to the movements of vertebrates or result in increased dispersal of invertebrate species known to be important as disease vectors or pests.
- Disturb benthic (i.e. lake, sea, or river bottom) areas. All dredged areas or areas affected by dredging may be considered as temporarily lost habitat, therefore dredging should be limited, if possible.

- 1 • Potentially increase surface run-off. Good construction practices will generally control surface
2 run-off. Where drainage courses represent an especially important resource, attention should be
3 given to measures for their protection.
4
- 5 • Involve dewatering of wetlands. Guidelines under the Federal Water Pollution Control Act
6 Amendments of 1972, the Coastal Zone Management Act of 1972, and the Marine Sanctuaries
7 Act of 1972 should be followed in evaluating the significance of dewatering on wetlands.
8 Generally, dewatering of biologically productive wetlands may be considered an adverse impact
9 that should be avoided. The percentage loss of such wetlands in the region should be considered
10 to place the loss in perspective for the licensing decision. Because of the importance of
11 wetlands, alternatives to avoid any loss of this habitat should always be considered.
12
- 13 • Involve dredge spoils and placement of fill. Drainage from dredge spoil areas should comply
14 with existing EPA guidelines. The analysis should consider whether adequate practices have
15 been provided for management of this stage of construction. Filling of biologically productive
16 wetlands should generally be avoided. Dumping of dredge spoils should be performed under the
17 cognizance of the EPA and the District Office of the US. Army Corps of Engineers.
18

19 The depth and extent of the input to the EIS should be governed by the attributes of the ecological
20 resources that could be affected and by the nature and magnitude of the expected impacts to those
21 resources.
22

23 The following information should be included in the EIS:
24

- 25 • Loss of habitat for endangered or threatened species in the context of guidelines under the
26 Endangered Species Act of 1973. Where loss of habitat for commercially or recreationally
27 important species occurs, the author should consider the effects on the harvestable crop. It
28 should generally be concluded that loss of up to 5 percent of such habitat in the site vicinity will
29 have negligible impact on the crop and need no further analysis. Where losses exceed 5 percent,
30 the reviewer should consider the loss in relation to regional abundance of these species.
31
- 32 • Practices to minimize soil erosion and the number of hectares disturbed.
33
- 34 • Clearing of vegetation from stream banks, making certain that it is limited to that necessary for
35 placement of structures or decontamination of hazardous or radiological constituents.
36
- 37 • Secondary impacts on wildlife, such as altered behavior resulting from construction noise, in
38 addition to direct impacts on animals such as loss of habitat and road kills.
39
- 40 • Lost important terrestrial and aquatic species and habitats from the viewpoints of their
41 uniqueness within the region under consideration, relative impacts, and long-term net effects.
42

5.4.6 Air Quality Impacts

This section describes the air quality impacts from the proposed action and each alternative and the atmospheric transport and diffusion processes important in determining impacts. The description should include an analysis and evaluation of construction, operation and decommissioning activities in sufficient detail to determine the significance of potential air quality impacts and to recommend how these impacts should be treated in the process (e.g., consideration of alternative designs or practices that would mitigate adverse environmental impacts). The details of this supporting analyses (e.g., actual environmental measurements, modeling assumptions and results) should be disclosed. Adverse cumulative effects of each alternative should be identified.

The analysis should utilize models and assumptions that have been approved or recognized for use in appropriate regulatory guidance for air quality monitoring and/or dose assessments. At least one annual data cycle should be used for transport and diffusion calculations. Data should be presented in the appropriate periods. For example, if emissions are continuous, annual data should be used; if emissions are intermittent, consideration should be given to the frequency and duration of the event. Data, such as averages and extremes, should be based on a period of record that represents long-term conditions in the area.

The following information should be included in the EIS:

- A description of the impacts to air quality in the region;
- Direct, indirect, and cumulative impacts from each alternative (radiological and non-radiological);
- Assessments of both short- and long-term effects (hourly and annually);
- A comparison of air quality impacts to appropriate standards;
- A description of the atmospheric transport and diffusion characteristics in the region and at the site, which should include references to the models used and identification of the input data considered;
- A dose assessment of the radiological impacts based on sufficient meteorological and population data;
- A description of visibility impacts; and
- A description of mitigative measures for air quality impacts.

5.4.7 Noise Impacts

This section describes the analysis and assessment of predicted noise levels from the proposed action and each alternative. The description should include an analysis and evaluation of construction, operation and decommissioning activities in sufficient detail to determine the significance of potential noise impacts and to recommend how these impacts should be treated in the process (e.g., consideration of alternative designs or practices that would mitigate adverse environmental impacts). Details of supporting analyses (e.g., actual environmental measurements, modeling assumptions and results) should be disclosed. Known and/or predicted adverse direct, indirect, and cumulative effects of each alternative should be identified.

If the site is remote from communities (ecological and human) and does not represent an audible intrusion, and it is found that the applicant can comply with appropriate guides and standards, these facts should be stated with only a very brief discussion noting that under these conditions noise impacts will be minimal. If the foregoing conditions are not met, or if there are no applicable standards, predicted impacts should be described along with conclusions regarding the significance of the effect on the community.

If the site is located near communities (ecological and human) and noise impacts are a potential concern, the following information should be included in the EIS:

- A comparison of the current equivalent sound levels in the vicinity of the proposed action and applicable sound level standards (from consultation with Federal, State, regional, local, and affected Native American tribal agencies) with predicted noise levels (e.g., sound contour maps) reported as L_{eq} or L_{dn} using the dBA scale;
- Major sources of noise (for locations described above), including all models, assumptions and input data;
- Proposed methods to reduce noise levels (as appropriate); and
- Estimated cumulative effects.

5.4.8 Historic and Cultural Impacts

This section describes the staff's assessment of potential impacts of proposed project activities on historic properties and cultural resources in the site and vicinity. Historic properties include districts, sites, buildings, structures, or objects of historical, archaeological, architectural, or traditional cultural significance (US. National Park Service, 1990, 1991). Because of NEPA and Section 106 of NHPA, the NRC's actions are required to fall under 36 CFR 800, which provides regulatory guidance for evaluating and protecting historic properties from potential adverse impacts resulting from Federal agency undertakings. Elements of Section 110 of NHPA require Federal agencies to manage and protect identified, eligible historic properties located on lands under their jurisdiction. A source of expertise in

1 the area of historic and cultural preservation is the Archaeology and Ethnography Program of the
2 National Park Service, Department of Interior.

3
4 The environmental project manager should consider the following:

- 5
6 • Construction and/or operation activities that could result in potential impacts to historical
7 properties or cultural properties.
- 8
9 • Proposed activities to ensure that the applicant is committed to using currently acceptable
10 practices to minimize impacts.
- 11
12 • 36 CFR 800, which describes in detail how to assess the impact of a proposed action on
13 properties that are listed in or are eligible for inclusion in the *National Register*.
- 14
15 • That there are generally two types of impacts on a resource: direct impacts (e.g., destruction
16 during excavation), and indirect impacts (e.g., visual impact, denial of access, or increased
17 potential for vandalism).
- 18
19 • Historic properties that are neither listed in nor eligible for inclusion in the *National Register* and
20 are not protected by the provisions of the NHPA, as amended, or 36 CFR 800. Consider the
21 potential impacts on these resources and measures and controls to avoid adverse impacts.
- 22
23 • Certain properties are not eligible for inclusion in the *National Register*, and assistance from the
24 SHPO/THPO, the Office of Archaeology and Historic Preservation, or other qualified individuals
25 may be necessary.
- 26
27 • Adequacy of proposed methods to mitigate any adverse impacts on these resources such as
28 alternative locations, designs, practices, or procedures that would mitigate predicted adverse
29 impacts.
- 30
31 • Cost of the recovery required by the Historic and Archaeological Preservation Act of 1974 in the
32 consideration of alternatives.
- 33
34 • Evaluations that may not justify preservation of the resource, in which case the environmental
35 project manager may request that the applicant recover archaeological, historic, architectural,
36 and cultural data related to the resource. This recovery may include recording by photographs
37 and measured drawings, archaeological excavations to uncover data and material, removal of
38 structures or salvage of architectural features, and other steps that will ensure full knowledge of
39 the lost resource. Salvaged artifacts and materials should be deposited where they are of public
40 and educational benefit.
- 41
42 • Any procedures developed by the applicant/licensee that will be used during construction in the
43 case of discovery of previously unidentified cultural resources.
- 44

- The potential for human remains to occur in the project areas should be evaluated. An inadvertent discovery of such items during construction may necessitate a work stoppage of up to 30 days and consultation under Native American Graves Protection and Repatriation Act (NAGPRA) procedures.
- The circumstances to contact the Advisory Council on Historic Preservation if guidance is needed, i.e if there are substantial impacts on important properties, in the event of a disagreement, or if there are issues of concern to Indian tribes or Native Hawaiian organizations.

The following information should be included in the EIS:

- If appropriate, a statement that properties listed in or eligible for inclusion in the *National Register* will not be affected.
- A discussion of potential impacts to properties that are listed in or eligible for inclusion in the *National Register*.
- A description of any adverse impacts on historic properties not eligible for inclusion in the *National Register*.
- A description of any measures and controls that are available to limit adverse impacts.

Evaluation of each identified impact results in one of the following determinations:

- The impact is small and mitigation is not required.
- The impact is adverse but can be mitigated by specific design or procedure modifications that the reviewer has identified and determined to be practical.
- The impact is adverse, cannot be successfully mitigated, and is of such magnitude that it should be avoided.

5.4.9 Visual/Scenic Impacts

This section describes the significant impacts on visual quality resulting from the proposed action and each alternative. Scenic qualities are impacted by surface disturbance, which creates a contrast with the natural environment. The greater the amount of ground disturbance, the greater the impact to scenic quality. The description should include an analysis and evaluation of construction, operation and decommissioning activities in sufficient detail to determine the significance of potential visual/scenic impacts and to recommend how these impacts should be treated in the process (e.g., consideration of alternative designs or practices that would mitigate adverse environmental impacts). The environmental project manager may assess the licensee's rating of aesthetic and scenic quality of the site in accordance with the BLM Visual Resource Inventory and Evaluation System (BLM, 1984, 1986a, 1986b) as appropriate.

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1 The EIS should describe the impacts of the proposed action and each alternative on the visual quality of
2 the vicinity. Significant visual quality impacts should be thoroughly described, while less-significant,
3 yet still noteworthy, impacts can be summarized. The EIS should describe how impacts could be
4 minimized. The description of mitigation measures should provide a short discussion of costs of the
5 mitigation measures.

6 7 **5.4.10 Socioeconomic Impacts**

8
9 This section describes the socioeconomic impacts within the region. Based on these descriptions, the
10 reviewer should identify and analyze project-induced changes to demographic, regional, community,
11 social, political, and economic systems.

12
13 The EIS should describe impacts from the proposed action and each alternative relative to the current and
14 predicted population distributions. Both permanent and transient populations should be considered.

15
16 The following information should be presented in the EIS:

- 17 • Impacts to population characteristics (e.g., ethnic groups, and population density);
- 18 • Impacts to economic trends and characteristics, including employment and income levels;
- 19 • Impacts to housing, health and social services, and educational resources;
- 20 • Impacts to the area's tax structure and distribution; and
- 21 • Impacts to community attitudes and lifestyle.

22 23 24 25 26 27 **5.4.11 Environmental Justice**

28
29 This section evaluates environmental impacts on low-income or minority populations by proposed
30 project activities if disproportionately high low-income or minority populations are identified. Impacts
31 that may have environmental justice implications may include health, ecological (including water quality
32 and water availability), social, cultural, economic and aesthetic.

33
34 The EIS should follow the detailed guidance provided in Appendix B. The EIS should include a
35 discussion of the methods used to identify and quantify impacts on low-income and minority
36 populations, the location and significance of any environmental impacts during construction on
37 populations that are particularly sensitive, and any additional information pertaining to mitigation. The
38 following information should be included in the EIS:

- 39 • An assessment (qualitative or quantitative, as appropriate) of the degree to which each minority
40 or low-income population is disproportionately receiving adverse human health or environmental
41 (including socioeconomic) impacts during construction, operation, or decommissioning as
42 compared with the other population in the vicinity. In addition, there should be an assessment
43
44

1 comparing the impacts with the larger overall geographic area encompassing all of the
2 alternative sites.

- 3
- 4 • An assessment (qualitative or quantitative, as appropriate) of the significance or potential
5 significance of such environmental impacts on each low-income and minority population.
6 Significance is determined by considering the disproportionate exposure, multiple-hazard, and
7 cumulative hazard conditions.
- 8
- 9 • An assessment of the degree to which each low-income and minority population is
10 disproportionately receiving any benefits compared with the entire geographic area.
- 11
- 12 • A discussion of any mitigative measures for which credit is being taken to reduce environmental
13 justice concerns.
- 14
- 15 • When alternative sites are being evaluated, the same reviews should be available for each site.
- 16
- 17 • A brief description of pathways by which any environmental impact during construction may
18 interact with cultural or economic facts that may result in disproportionate environmental
19 impacts on low-income and minority populations.
- 20

21 **5.4.12 Public and Occupational Health Impacts**

22 **5.4.12.1 Nonradiological Impacts**

23 This section describes the pathways by which non-radiological releases could be transmitted to the
24 environment and ultimately transferred to living organisms. The analysis should be based on the
25 information from Section 5.3.12, *Public and Occupational Health* to assess the potential impacts,
26 mitigation measures and cumulative effects. The analysis should consider potential pathways for the
27 transfer of nonradioactive materials from the proposed action and alternatives to the environment and
28 ultimately to living organisms. The analysis should identify all pathways necessary to calculate public
29 and occupational exposure.

30 The following information should be included in the EIS:

- 31
- 32
- 33 • A description of chemical sources (location, type, strength);
- 34
- 35 • Estimates of public and occupational exposures, a brief discussion of how the estimates were
36 calculated, and a comparison of these exposures with the requirements of 40 CFR Part 190 and
37 29 CFR Part 1900;
- 38
- 39 • Brief discussion of environmental monitoring programs to verify compliance; and
- 40
- 41 • Discussion of mitigative measures and cumulative effects and how requirements have been met.
- 42
- 43
- 44
- 45

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5.4.12.2 Radiological Impacts

This section summarizes the direct and indirect radiological impacts, mitigation measures, and cumulative impacts from each alternative. This section is divided into Sections 5.4.12.2.1, *Pathway Assessment* and 5.4.12.2.2, *Public and Occupational Exposure Impacts*.

5.4.12.2.1 Pathway Assessment

This section should describe the pathways by which radiation and radioactive releases can be transmitted to the environment and ultimately transferred to living organisms. The scope and depth of the review should include consideration of (i) the pathways by which radioactive releases can be transported to individual receptors, (ii) the location of these receptors, and (iii) the credible threat to the environment posed by the facility, action, or activity.

The following information should be included in the EIS:

- Typical pathways by which radioactive materials could be transported from the various alternatives to receptors in unrestricted areas
- Pathways identified as important for the various alternatives and a brief discussion of the staff's analysis to determine these pathways
- Nearest receptors identified by the reviewer
- Brief discussion of food production, processing, and consumption in the area
- Mitigation measures

5.4.12.2.2 Public and Occupational Exposure Impacts

This section should describe the radiation dose to humans. The staff reviewer should evaluate the baseline information (Section 4.3.11, *Public and Occupational Health*) to assess the potential impacts, mitigation measures, and cumulative impacts.

The following information should be included in the EIS:

- Description of radiation sources (location, type, strength) related to the proposed action;
- Estimates of dose to an average member of the critical group and occupational dose estimates, a brief discussion of how the estimates were calculated, a comparison of these doses with the requirements of 10 CFR Part 20, and the conclusions with respect to compliance with 10 CFR Part 20;
- Brief discussion of environmental monitoring programs to verify compliance (Section 4.5, *Environmental Measurements and Monitoring Programs*);

- Discussion of mitigative measures; and
- Comparison of the offsite dose consequences and resulting health effects for reasonably foreseeable (i.e. credible) accidents as calculated by the applicant and those contained in the Safety Evaluation Report. The EIS author should coordinate this section with the analysis conducted for the SER.

5.4.13 Waste Management Impacts

This section describes the staff's review, analysis, and evaluation of the applicant/licensee's solid, hazardous, and radioactive waste management program including the assessment of impacts resulting from storage or transportation. A discussion of mixed waste is also included in this section.

The EIS should be of sufficient depth and detail to confirm, with reasonable assurance, the quantitative impact of the waste management systems. Facility owners/operators are required by Resource Conservation and Recovery Act (RCRA) regulations to maintain sufficient information to identify their mixed wastes. The information required includes RCRA waste codes for the hazardous components, the source of the hazardous constituents, a discussion of how the waste was generated, the generation rate and volumes of mixed waste in storage, and any information used to identify mixed wastes or make determinations that the wastes are prohibited by land disposal restrictions. Each owner/operator is required (under RCRA regulations) to develop a waste-minimization plan that identifies process changes that can be made to reduce or eliminate mixed wastes, methods to minimize the volume of regulated wastes through better segregation of materials, and the substitution of nonhazardous materials.

The following information should be presented in the EIS:

- Descriptions of the sources, types, quantities, and composition of solid, hazardous, radioactive and mixed wastes expected from the proposed action
- Description of proposed waste management systems designed to collect, store, and dispose of all wastes generated by the proposed action
- Anticipated disposal plans for all wastes (i.e., transfer to an offsite waste disposal facility, treatment facility, or storage onsite).
- A waste-minimization plan that identifies process changes that can be made to reduce or eliminate waste. This should contain a description of methods to minimize the volume of waste.

5.5 Mitigation Measures

Mitigation measures that could reduce adverse impacts should be incorporated in the proposed action and alternatives (40 CFR 1502.14(f) and 1508.20). Address the anticipated effectiveness of these mitigation measures in reducing adverse impacts. Residual impacts or unavoidable adverse impacts which remain

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1 after mitigation measures have been applied should be analyzed, as well as any further impacts caused by
2 the mitigation measures themselves.

3 4 **5.6 Environmental Measurements and Monitoring Programs**

5
6 This section describes the environmental measurements and monitoring programs for the proposed
7 action. A more detailed description of the monitoring program is usually provided in the SER prepared
8 in parallel with the EIS.

9
10 Mitigation monitoring activities proposed to meet the intent of NEPA [40 CFR 1505.2(c)] should be
11 clearly distinguished from monitoring required by program-specific guidance and/or discretionary
12 monitoring activities.

13 14 **5.6.1 Radiological Monitoring**

15
16 This section describes the proposed monitoring program utilized to characterize and evaluate the
17 radiological environment, to provide data on measurable levels of radiation and radioactivity, and to
18 provide data on principal pathways of exposure to the public.

19
20 The following information should be provided in the EIS:

- 21
22 • Maps or aerial photographs of the facility with proposed monitoring and sampling locations
23 clearly identified along with effluent release points;
- 24
25 • Brief description of the monitoring program including:
26 - Number and location of sample collection points, measuring devices used, and pathway
27 sampled or measured;
28 - Sample size, sample collection frequency, and sampling duration; and
29 - Type and frequency of analysis including lower limits of detection.
- 30
31 • Principal radiological exposure pathways (Section 5.4.12.2.1, *Pathway Assessment*); and
- 32
33 • Location and characteristics of radiation sources and radioactive effluent (liquid and gaseous,
34 from Sections 5.4.4, *Water Impacts* and 5.4.6, *Air Quality Impacts*).

35 36 **5.6.2 Physiochemical Monitoring**

37
38 This section should describe the proposed monitoring program to characterize and evaluate the chemical
39 and physical environment, to provide data on measurable levels of chemicals and baselines for physical
40 parameters of importance (i.e. weather conditions).

41
42 The purpose of a chemical environmental monitoring program is to provide a basis for evaluating
43 changes in the environment from the proposed action. The baseline monitoring program should
44 characterize the environment before the proposed action so that a reasonable comparison can be made

1 after the proposed action begins. The baseline program can also be used for all or some of the
2 operational chemical environmental monitoring program.

3
4 The EIS should describe the applicant's chemical monitoring program. Two aspects of monitoring
5 should be considered:

- 6
7 • Baseline monitoring is used to support the applicant's baseline descriptions and provide
8 information for operational comparison.
- 9
10 • Operational monitoring establishes the impacts of operation of the facility and detects any
11 unexpected impacts arising from facility operation.

12
13 Each of these aspects is discussed in greater detail below.

14 Baseline Monitoring

15
16 Information from the applicant's baseline monitoring program is used to aid in the assessment of site
17 acceptability/condition and to support the staff's database to identify impacts that could result from the
18 selected alternative. Generally, data are needed on a seasonal basis and should be sufficient to
19 characterize seasonal variations throughout at least one annual cycle.

20
21
22 The environmental project manager should analyze the available data to determine that they are adequate
23 to support the environmental descriptions of Section 5.3, *Description of the Affected Environment*, and
24 the impact analyses of Section 5.4, *Environmental Impacts*. The following factors should be considered
25 in the analysis:

- 26
27 • Location and number of monitoring stations (and wells) as required to consider the following
28 factors:
 - 29 - Meteorological, soil, surface water, and ground water system characteristics in the site
30 vicinity [e.g., surface-water flow fields in the site vicinity, ground water flow
31 (e.g., saltwater intrusion)]
- 32
33 • Impact of sanitary and chemical waste-retention methods on ground water quality
 - 34 - Type of sanitary and chemical waste-retention system
 - 35 - Transient hydrological and meteorological parameters in the site vicinity
- 36
37 • Sampling frequency and times to ensure that important temporal variations (e.g., tidal variations
38 and intense rainfall) are adequately monitored

39
40 For review of onsite meteorological instrumentation, the analysis should ensure that the basic
41 meteorological parameters measured by instrumentation include wind direction and wind speed at two
42 elevations, and ambient air temperature difference between two elevations. Guidance on meteorological
43 data to be used as input to atmospheric dispersion modeling and assessment is given in Regulatory
44 Guides 1.111 (NRC, 1977) and 1.21 (NRC, 1974). Guidance on instrument types, sampling heights, and

locations is given in Regulatory Guide 1.23, Sections C.1 and C.2 (NRC, 1972). Guidance on effluent and environmental monitoring at uranium mills is given in Regulatory Guide 4.14 (NRC, 1980).

Operational Monitoring

The operational monitoring program is designed to establish the impacts of operation of the facility and to detect any unexpected impacts arising from facility operation. Operational monitoring may be required by other permitting agencies.

The environmental project manager should verify that sufficient information has been provided to adequately assess the environmental monitoring program (e.g., measuring sediment transport and floodplains or wetlands) to (i) describe the appropriate local and regional chemical characteristics, (ii) ensure environmental protection, and (iii) provide an adequate database for evaluation of the effects of facility operation.

The following information should be included in the EIS:

- Description of the results of the baseline monitoring program, including monitoring station locations and the methods, frequency, and duration of monitoring used in each case. Tables and maps should be used if appropriate.
- Intensity of sampling needed for each anticipated impact. It should be commensurate with the degree of impact expected.
- Validity of data.
- Adequacy of data measurement techniques.

5.6.3 Ecological Monitoring

This section describes the major components of the applicant's proposed ecological monitoring program. Monitoring programs should cover elements of the ecosystem for which a causal relationship between construction, operation, or decommissioning and adverse change is established or strongly suspected.

The staff reviewer should describe the applicant's ecological monitoring program. Two aspects of monitoring should be considered:

- Baseline monitoring to support the applicant's baseline descriptions and provide information for operational comparison.
- Operational monitoring to establish the impacts of operation of the facility and detect any unexpected impacts arising from facility operation.

Each of these aspects is discussed in greater detail below.

Baseline Monitoring

The program of ecological field monitoring is used to support the applicant's descriptions of the ecological environment. Baseline monitoring is needed to establish a database from which to observe potential future impacts. Generally, data are needed on a seasonal basis and should be sufficient to characterize seasonal variations throughout at least one annual cycle. Additional data may be needed on a site-specific basis.

The environmental project manager should analyze the available data to determine that they are adequate to support the environmental descriptions of Section 5.3, *Description of the Affected Environment*; and the impact analyses of Section 5.4, *Environmental Impacts*. The following factors should be considered in the analysis:

- The location and number of monitoring stations as required to consider the following factors:
 - Distribution and abundance of "important" species, habitats, and communities. Critical life history information should include parameters such as feeding areas, wintering areas, and migration routes to the extent that the proposed action is expected to affect these parameters.
 - Descriptions of any modifications that may affect the existing patterns of plant and animal communities (e.g., changing agricultural practices, development of holding ponds or reservoirs, and developing access routes).

Operational Monitoring

A program of ecological monitoring may be necessary to establish a baseline for use and evaluation of the environmental impacts of facility or site operation. It continues the studies conducted during pre-operational monitoring. An operational monitoring program may be included with an application for an operating license, and for license renewal applications. Operational monitoring programs may not be fully developed at the time of applying for a construction permit.

When evaluating the ecological monitoring programs, the following features should be considered:

- Ensure that the applicant has, to the extent feasible, described the general scope and objectives of its intended programs and has provided a tentative list of parameters that should be monitored. The application should include:
 - Duration over which the parameters will be monitored.
 - Provisions for updating the program.
- Establish whether adequate data will be provided as outlined above. If the monitoring programs are judged to be inadequate or to include unnecessary elements, the reviewer should evaluate potential additions and deletions.

- Consider the following features for the monitoring programs
 - Relationship to environmental monitoring conducted by other agencies in the vicinity of the facility or site should be described.
 - Basis and objective of each element of the monitoring program should be clearly stated, as well as its relationship to the overall environmental monitoring program.
 - If outputs of a preceding monitoring program or project demonstrate no significant impacts, then provisions to study such effects in successive monitoring programs should be reduced or deleted.
 - The program should allow for periodic modification based on the results of previous monitoring to ensure that the current monitoring effort is sufficient and justified when compared to a current assessment of the effects that the proposed action/alternative are having on the environment.
 - Intensity of sampling required for each anticipated impact should be commensurate with the degree of impact expected. The reviewer should balance the potential impacts of any sampling program against the potential benefits when making this evaluation.
- Measurement and sampling methods (e.g., sampling locations and equipment, the pattern, frequency, and duration of sampling and sample size) should be described.
- Statistical validity, including the mean, standard deviation, confidence limits, and sample size should be clearly indicated.
- If population dynamics models were used in the impact analyses, determine if sampling data are available to support the model. If not, suggest such sampling if verification of the model is necessary.

The following information should be included in the EIS:

- Intensity of sampling needed for each anticipated impact. It should be commensurate with the degree of impact expected.
- Validity of data
- Adequacy of data measurement techniques

5.7 Cost-Benefit Analysis

This section describes the major costs and benefits for each alternative. Consideration of the costs and benefits should be presented in the EIS (10 CFR 51.71). The costs and benefits should not be limited to a simple financial accounting of project costs for each alternative. Costs and benefits should also be

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discussed for qualitative subjects (i.e., environmental degradation or enhancement). Extensive or detailed analysis should be presented in an appendix to the EIS to avoid diverting attention away from primary issues such as public health and safety. The cost-benefit analysis is not simply a mathematical formula from which to justify economic parameters; other applicable qualitative factors should be discussed and weighed in the decision.

The environmental project manager should describe the costs and benefits for the proposed action and each alternative. Qualitative environmental costs and benefits can be compared to the discussion of environmental impacts within the environmental report. Standard project costs can be reviewed utilizing standard cost estimating databases. Socioeconomic costs and benefits can be reviewed and compared against similar projects as applicable. NUREG/BR-0058 (NRC, 1995a) provides guidance for determining public health and safety impact valuation. NUREG-1530 (NRC, 1995b) provides background material and information relating to NUREG/BR-0058. The reviewer should also verify that analyses were performed in accordance with appropriate cost benefit guidance. Future costs and benefits should be discounted to present worth as discussed in Economic Analysis of Federal Regulations Under Executive Order 12866 found on the WWW at <http://www.whitehouse.gov/OMB/inforeg/riaguide.html>. This site also provides general guidance on calculating costs and benefits. The methods used for discounting should be explained, and applied consistently to both costs and benefits. NUREG-1727, *NMSS Decommissioning Standard Review Plan* (NRC, 2000), provides guidance on determining costs and benefits for decommissioning projects as well as providing guidance on determining ALARA and prohibitive costs related to ALARA.

The cost benefit analysis provides input to determine the relative merits of various alternatives, however, the NRC must ultimately base its decision on public health and safety issues.

5.8 Summary of Environmental Consequences

This section should summarize any adverse environmental impacts that cannot be avoided and for which no practical means of mitigation are available, the relationship between short-term uses of the environment and the maintenance and enhancement of long-term productivity, and any irreversible or irretrievable commitments of resources which would be involved. As appropriate, this summary can be tabulated.

The environmental project manager should perform the following analysis:

- Develop a list of:
 - Unavoidable adverse environmental impacts;
 - Irreversible and irretrievable commitments of resources (those materials that would be irretrievably committed during construction, operation, and decommissioning);
 - Short- or long-term impacts (consider that occupation of land for an indefinite period represents the maximum impact on long-term productivity, unless other long-term preemptions have been identified; identify through consultation with the appropriate

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reviewers other uses of the environment that will be precluded by facility construction, operation, and decommissioning and classify these as either short-term or long-term preemptions; determine how any short-term or long-term benefits of the proposed action affect any such preemptions.);

- Procedures and practices to mitigate or avoid these impacts or commitments; and
 - Impacts or commitments that remain after all practical means to avoid or mitigate the impact have been taken.
- Categorize the identified impacts (direct, indirect, and cumulative) according to the resource (e.g., water resource).
 - The categories may be further divided into construction, operational, and decommissioning impacts, if so desired.
 - Ensure that each identified impact has been appropriately categorized. When a particular action or operation results in multiple impacts (e.g., access road construction and use may have impacts affecting land use, terrestrial ecology, and socioeconomic), ensure that the impacts are addressed in each appropriate category:
 - Determine the magnitude of the impacts (direct, indirect, and cumulative) or commitments
 - Evaluate the time scale of each impact (e.g., 4–6 months during construction, throughout the facility lifetime, indefinitely)

The EIS includes a discussion of the predicted short-term unavoidable adverse environmental impacts of each alternative and the predicted long-term environmental impacts. Short-term represents the period from start of construction to end of the proposed action, including prompt decommissioning. Long-term represents the period extending beyond the end of the proposed action. The discussion should also include an evaluation of the extent to which the proposed action will preclude options for other future use of the environment.

"Irreversible" impacts refer to commitments of environmental resources that cannot be restored. "Irretrievable" applies to material resources and will involve commitments of materials that, when used, cannot be recycled or restored for other uses by practical means.

The information from Sections 5.3, *Description of the Affected Environment*; and 5.4, *Environmental Impacts* should be summarized for this section. The following information should be listed in the EIS for the proposed action and each alternative:

- Unavoidable adverse environmental impacts;
- Irreversible and irretrievable commitment of resources;

- Short-term and long-term impacts; and
- Short-term uses of the environment and the maintenance and enhancement of long-term productivity.

For new facilities the maximum long-term impact to productivity would result if the facility is not dismantled at the end of the period of facility operation, and consequently the land occupied by the facility structures would not be available for any other use. For operating or decommissioning facilities the maximum long-term impact to productivity would occur if the restricted release criteria are used for decommissioning.

After reviewing the impacts and mitigation actions, organize these impacts by environmental categories and prepare a brief paragraph summarizing the nature and magnitude of each category of impact in sufficient detail to allow for a comparative analyses of the environmental consequences of each alternative. Table 3 should describe the nature and magnitude of each impact.

Table 3. Example of environmental impacts

Impact Category	Adverse Impacts Based on Applicant's Proposal	Actions to Mitigate Impacts	Unavoidable Adverse/ Irreversible and Irretrievable Commitments of Resources/Short- and Long-Term Impacts
Regional Setting			
Geology and Soil			
Water Resource			
Ecological			
Air Quality			
Noise			
Historic and Cultural			
Visual/Scenic			
Socioeconomic			
Environmental Justice			
Public and Occupational Health			
Waste Management			

5.9 List of Preparers

This section should contain a list of preparers and credentials who participated in producing the EIS.

5.10 Distribution List

This section should contain a list of all parties to whom the EIS was distributed.

5.11 References Cited

All references used in the preparation of the EIS should be listed, including those cited in the text of the EIS and those that were not specifically cited but served as useful guidance during document development. Guidance in NUREG-0650 (NRC, 1999) should be useful for determining reference format.

5.12 Supplemental Information of Environmental Impact Statement Document

Appendices should be included at the end of the EIS that include information that is supportive of the findings in the EIS. Examples include:

- Scoping report;
- Glossary;
- Consultation letters;
- Dose assessments;
- Issues Eliminated from detailed study; and
- Technical evaluations.

5.13 References

Code of Federal Regulations, Title 10, Chapter I–Nuclear Regulatory Commission, *Energy*, Part 51, “Environmental Protection Regulations for Domestic Licensing and Related Regulatory Functions.”

Code of Federal Regulations, Title 10, Chapter I–Nuclear Regulatory Commission, *Energy*, Part 20, “Standards for Protection Against Radiation.”

Code of Federal Regulations, Title 29, *Labor*, Part 1910, “Occupational Health and Safety Standards.”

Code of Federal Regulations, Title 40, *Protection of Environment*, Chapter V–Council on Environmental Quality, Parts 190.

Code of Federal Regulations, Title 50, *Wildlife and Fisheries*, Part 17, “Endangered and Threatened Wildlife and Plants.”

Endangered Species Act, 16 U.S.C. 1531, et seq.

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3 Executive Order 11990, as amended, "Protection of Wetlands," May 24, 1977.

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6 BLM: Washington, DC. April 1984.

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8 Bureau of Land Management (U.S.). BLM Manual Handbook H-8410-1. "Visual Resource Inventory."
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11 Bureau of Land Management (U.S.). BLM Manual Handbook H-8431-1. "Visual Resource Contrast
12 Rating." BLM: Washington, DC. January 1986b.

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31 Nuclear Regulatory Commission (U.S.). Regulatory Guide 1.145, Revision 1. "Atmospheric Dispersion
32 Models for Potential Accident Consequence Assessments at Nuclear Power Plants." NRC: Washington,
33 DC. 1982.

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38 Nuclear Regulatory Commission (U.S.). Regulatory Guide 4.13. Revision 1, "Performance, Testing, and
39 Procedure Specifications for Thermoluminescence Dosimetry: Environmental Applications." NRC:
40 Washington, DC. July 1977.

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42 Nuclear Regulatory Commission (U.S.). Regulatory Guide 4.15, Revision 1, "Quality Assumptions for
43 Radiological Monitoring Programs (Normal Operations)—Effluent Streams and the Environment." NRC:
44 Washington, DC. February 1979a.

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1 Nuclear Regulatory Commission (U.S.). Radiological Assessment Branch Technical Position, Revision
2 1, "An Acceptable Radiological Environmental Monitoring Program." NRC: Washington, DC. 1979b.

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4 Nuclear Regulatory Commission (U.S.). Regulatory Guide 4.14, Revision 1, "Radiological Effluent and
5 Environmental Monitoring at Uranium Mills." NRC: Washington, DC. April 1980.

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7 Nuclear Regulatory Commission (U.S.). NUREG-0058, "Regulatory Analysis Guidelines of the
8 U.S. Nuclear Regulatory Commission." NRC: Washington, DC. November 1995.

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10 Nuclear Regulatory Commission (U.S.). NUREG-1530, "Reassessment of NRC's Dollar Per Person-
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18

6 THE ENVIRONMENTAL REPORT: FORMAT AND TECHNICAL CONTENT

This chapter provides information on the content of the ER. This chapter also applies to supplemental ERs.

This chapter generally follows the outline of an EIS as presented in Chapter 5. The applicant/licensee may benefit from a pre-licensing meeting between the licensing project manager and the environmental project manager to discuss the information needed to support the environmental review (e.g., information normally contained in the ER). The goal of these meetings is to define the scope and detail required within the ER. Chapter 5 describes how the NRC staff uses the ER information to prepare an EIS.

The scope of the ER should be balanced against the credible threat to the environment posed by the proposed action (e.g., facility construction, facility operation, or decommissioning). **The ER should present a detailed and thorough description of each affected resource for evaluation of potential impacts to the environment. It may not be necessary for every resource to receive the same level of detailed review and every action may not require all the information discussed in this chapter. Likewise, the proposed action may present unique issues and require additional information not identified in this chapter.** This is consistent with one of the goals of NEPA, which is to concentrate on issues significant to the proposed action and their potential environmental impacts.

General ER requirements are provided in the NRC implementing regulations for NEPA (e.g., 10 CFR 51.45 for general requirements, 10 CFR 51.54 for manufacturing licenses, 10 CFR 51.60 for materials licenses and 10 CFR 51.62 for 10 CFR Part 61 disposal sites).

6.1 Introduction of the Environmental Report

The introduction should be brief, and should include a description of the proposed action, a brief summary of pertinent statutes and regulations, and a general title and location of the proposed action. Key dates and deadlines should also be listed to establish the time frame for the proposed action.

6.1.1 Purpose and Need for the Proposed Action

The ER should discuss the purpose and need for the proposed action.

6.1.2 The Proposed Action

The following information should be presented in the ER, as applicable. It may not be necessary for the evaluation of potential impacts from the proposed action to require all the information requested below:

- Regional and site area maps, including nearby towns and natural features;
- Description of the proposed action;

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- Schedule of the major steps comprising the proposed action, such as construction, operation, decommissioning (i.e., start and completion dates of major activities); and
- Relevant background information such as operating history or programmatic requirements.

6.1.3 Applicable Regulatory Requirements, Permits, and Required Consultations

For some of these consultations, NRC may designate the applicant/licensee as responsible for performing the consultation process. The following information should be presented in the ER, as applicable. It may not be necessary for the evaluation of potential impacts from the proposed action to require all the information requested below:

- Name of each consultation, review, approval, and authorization, and the applicable law, ordinance, or regulation;
- Activity to be covered by the consultation, review, approval, or authorization (e.g. permit);
- Current status of each consultation, review, approval, and authorization; and
- Potential administrative delays or other problems preventing agency consultation, review, approval, or authorization.
- Documentation of any consultation or survey conducted, such as wildlife surveys (periodic or one-time) or archaeological surveys.

6.2 Alternatives

6.2.1 Detailed Description of the Alternatives

The ER should discuss alternatives considered by the applicant/licensee. Identify the no action alternative, the proposed action, and reasonable alternatives. Discuss the technical design requirements for the proposed action and the reasonable alternatives. It is possible to have options under an alternative (e.g. the possibility of additional ground water remediation) and those options should be discussed.

6.2.1.1 No-Action Alternative

The ER identifies the no action alternative in order to provide a baseline to compare the proposed action and reasonable alternatives. The No action alternative is the status-quo. The following information should be presented in the ER, as applicable. It may not be necessary for the evaluation of potential impacts from the proposed action to require all the information requested below:

- Description of the no action alternative; and
- Summary of the major impacts should the no action alternative be chosen.

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6.2.1.2 Proposed Action

The following information should be presented in the ER, as applicable. It may not be necessary for the evaluation of potential impacts from the proposed action to require all the information requested below:

- Detailed description of the proposed action, the general project progression and pre-operational, operational, and post-operations activities, as appropriate;
- Full names of all organizations sharing ownership of the proposed action;
- The major impacts from performing the proposed action;
- Measures used to mitigate impacts;
- Restoration actions; and
- Proposed monitoring.

6.2.1.3 Reasonable Alternatives

Summarize the history and process used to formulate the reasonable alternatives. The following information should be provided for each reasonable alternative, as applicable. It may not be necessary for the evaluation of potential impacts from the proposed action to require all the information requested below:

- A description of the alternative;
- The major impacts;
- Measures used to mitigate impacts;
- Restoration and management actions; and
- Proposed monitoring.

6.2.2 Alternatives Considered but Eliminated

The following information should be presented in the ER, as applicable. It may not be necessary for the evaluation of potential impacts from the proposed action to require all the information requested below:

- Summary of alternatives not considered to be reasonable; and
- Summary of why these alternatives were eliminated from further study.

6.2.3 Cumulative Effects

Discuss any past, present, or reasonably foreseeable future actions which could result in cumulative impacts when combined with the proposed action.

6.2.4 Comparison of the Predicted Environmental Impacts

The applicant/licensee should present the impacts of the proposed action and alternatives in a summary chart or table.

6.3 Description of the Affected Environment

The following information should be presented in the ER, as applicable. It may not be necessary for the evaluation of potential impacts from the proposed action to require all the information requested below:

- Site and/or facility;
- Land use;
- Transportation;
- Geology and soils;
- Water resources;
- Ecology;
- Meteorology, climatology, and air quality;
- Noise;
- Historical and cultural resources;
- Visual/scenic resources;
- Socioeconomic;
- Environmental justice;
- Public and occupational health; and
- Waste management.

6.3.1 Site and/or Facility Description

The applicant/licensee needs to describe the current state of the site or facility. The following information should be presented in the ER, as applicable. It may not be necessary for the evaluation of potential impacts from the proposed action to require all the information requested below:

- Site location, including distance and direction from the nearest major city, nearby towns, nearby inhabitants, and landmarks, including highways, rivers, or other bodies of water;
- Facility latitude and longitude coordinates;
- Areal extent of the site and facility layout;
- The following maps which include the facility area and scale of the map:

- Sufficiently detailed map showing highways and railroad lines that cross the site;
- Aerial view or perspective drawing of the site with an indication of the facility boundary (in at least one drawing the facility site boundary should occupy about 10 percent of the view);
- Layout of facilities and other features within the site boundary with the same scale as those provided for Section 5.4, *Environmental Impacts*;
- List of buildings or areas used for chemical storage, waste management, vehicle cleaning, administration, operations and maintenance, generating electricity, health and security, parking, etc.;
- Underground storage tanks, wells, pipelines, and sewage system;
- Description of types of operations that will be conducted on the site;
- Identification of radionuclides and other hazardous materials used; and
- Summary of how materials are stored, handled, and utilized.
- Air, ground water, and surface water, monitoring stations.

6.3.2 Land Use

The applicant/licensee needs to describe land uses near the site. This section provides input to various sections including, but not limited to, Sections 6.4.1, *Land Use Impacts*; 6.4.4, *Water Resources Impacts*; 6.4.12, *Public and Occupational Health Impacts*; and 6.6, *Environmental Measurements and Monitoring Program*.

The following information should be presented in the ER, as applicable. It may not be necessary for the evaluation of potential impacts from the proposed action to require all the information requested below:

- Maps showing major land use, public, and trust land areas;
- Description of the regional setting, transportation corridors, and offsite areas;
- Land areas devoted to major uses according to US. Geological Survey land use categories;
- Information from the US. Department of Agriculture Natural Resources Conservation Service on the relative value of the facility if it involves farmland;
- Land-use plans including current, future, and proposed (those which have been formally proposed by the appropriate governing body in a written form and are being actively pursued by officials of the jurisdiction) plans;

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- Staged plans, which must go through phases of development, including those that are incomplete;
- Special land-use classifications (e.g., Native American or military reservations, wild and scenic rivers, State and national parks, national forests, designated coastal zone areas, wildlife refuges, wilderness areas, and prime and unique farmlands);
- Mineral resources (discussed in detail in Section 6.3.4, *Geology and Soils*);
- Principal agricultural products, location, and average annual yields (including growing and grazing period, fraction of daily intake from pasture, fraction of the year that leafy vegetables are grown, and amount consumed);
- Present commercial fish and invertebrate catch; and
- Unusual animals, facilities, agricultural practices, game harvests, or food processing operations.

6.3.3 Transportation

The applicant/licensee needs to describe transportation facilities at and near the site. This section provides input to various sections including, but not limited to, Sections 6.4.7, *Noise Impacts* and 6.4.12, *Public and Occupational Health Impacts*.

The following information on existing transportation corridors should be presented in the ER, as applicable. It may not be necessary for the evaluation of potential impacts from the proposed action to require all the information requested below:

- Proposed routes for transportation corridors that will be used for transportation access to and from the facility site;
- Corridor lengths, widths, and areas including:
 - Identification of offsite transportation areas by land use, size, and location;
 - Land use restricting transportation corridors contained in any easements.

6.3.4 Geology and Soils

The applicant/licensee should identify the geological, seismological, and geotechnical characteristics of the site and vicinity. This section provides input to various sections including, but not limited to, Sections 6.4.3, *Geology and Soils Impacts*; 6.4.4, *Water Resources Impacts*; 6.4.12., *Public and Occupational Health Impacts*; and 6.6, *Environmental Measurements and Monitoring Program*.

The following information should be presented in the ER, as applicable. It may not be necessary for the evaluation of potential impacts from the proposed action to require all the information requested below:

- Stratigraphy and structures, including descriptions of geological units, major structural and tectonic features (e.g., faults), and any other significant geological conditions;

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- Geotechnical investigations conducted to characterize the site;
- Characteristics of soil, including a physical description of the soil units and descriptions of features related to soils at the site and nearby;
- Analysis and evaluation of the local and regional seismicity data, volcanism, or any information that may indicate a geologic hazard at the site; and
- Known mineral resources and recovery operations.

6.3.5 Water Resources

Describe site-specific and regional data on the physical and hydrological characteristics of ground and surface water in sufficient detail to provide the basic data for the evaluation of impacts on water bodies, aquifers, aquatic ecosystems, and social and economic structures of the area. This section provides input to various sections including, but not limited to, Sections 6.4.4, *Water Resource Impacts*; 6.4.12, *Public and Occupational Health Impacts*; and 6.6, *Environmental Measurements and Monitoring Program*.

The following information should be presented in the ER, as applicable. It may not be necessary for the evaluation of potential impacts from the proposed action to require all the information requested below:

- Maps showing:
 - The spatial and temporal relationship of the site to the major surface and subsurface hydrological systems such as aquifer systems and drainage basins;
 - Surface and subsurface systems that could be affected by facility withdrawals and/or discharges (cross sections where feasible);
- Mean, range, and temporal and spatial variations of the subsurface and surface water quality characteristics including water temperature, chemical, biological, and physical characteristics typically monitored (WWW at <<http://www.epa.gov/storet>>);
- Descriptions of preexisting environmental conditions and their effects on subsurface and surface water quality (e.g., water bodies at or near the site that do not meet established water quality standards) and quantity;
- Historical and current hydrological data from non-related projects in the region or area of influence (e.g., reservoirs built and operated during the period of record; scheduled construction of dams; local drinking water, agricultural, or industrial wells), and projected data describing future trends, if available;
- Interpolated and extrapolated measurements using acceptable geostatistical techniques if data are incomplete or unavailable;

- Summary of methodology used to estimate hydrological parameters;
- Water rights and resources;
- Quantitative description of subsurface and surface water uses such as withdrawals, consumption, and returns, including but not limited to, domestic, municipal, agricultural, industrial, mining, recreation, navigation, and hydroelectric power;
- Quantitative and qualitative description of recreational, navigational, instream, and other non-consumptive water uses including the use rate with time variation;
- Descriptions of past, current, and future pollutant sources with discharges to water including locations relative to the site and the affected water bodies, and the magnitude and nature of the pollutant discharges, including spatial and temporal variations;
- Description of wetlands (WWW at <<http://www.usace.army.mil/inet/functions/cw/cecwo/reg/techbio.htm>>); and
- Summary of statutory and other legal restrictions relating to water use or specific water-body restrictions on water use imposed by Federal or State regulations.

Surface Water Characteristics for the following categories:

- Freshwater streams, lakes and impoundments, and estuaries and oceans;
- Flood frequency distributions, including levee failures;
- Flood control measures (reservoirs, levees, flood forecasting);
- Location, size, and elevation of outfall;
- Velocity distribution (horizontal and vertical) and waterbody cross section within the influence of any outfall;
- Bathymetry near any outfall;
- Estimated erosion characteristics and sediment transport for surface-water bodies and wetlands, including rate, bed, suspended load fractions, and gradation analyses;
- Description of the floodplain and its relationship to the site (WWW at <<http://www.fema.gov/mit/tsd/>>); and
- Description of the design-basis flood elevation; and, where applicable, the design-basis flood discharge.

1 Freshwater streams (for the watershed containing the site):

- 2
- 3 • Major streams, size of drainage areas, and gradient;
- 4
- 5 • Historic monthly flow information, including maximum, average-maximum, average, average-
- 6 minimum, and minimum flow;
- 7
- 8 • Historical drought stages and discharges by month, and the 7-day once-in-10-yr low flow; and
- 9
- 10 • Important short-duration flow fluctuations (e.g., diurnal release variations from peaking
- 11 operation of upstream hydroelectric project).
- 12

13 Lakes and impoundments:

- 14
- 15 • Elevation-area-capacity curves;
- 16
- 17 • Reservoir operating rules;
- 18
- 19 • Annual yield and dependability;
- 20
- 21 • Variations in inflows, outflows, water-surface elevations, and storage volumes and retention
- 22 times;
- 23
- 24 • Net loss, including evaporation and seepage;
- 25
- 26 • Current patterns, including frequency distributions of current speed, direction, and persistence;
- 27 and
- 28
- 29 • Temperature distribution (horizontal and vertical) and stratification and seasonal variations of
- 30 density-induced currents.
- 31

32 Estuaries and oceans:

- 33
- 34 • Shoreline and bottom descriptions, including seasonal variations due to sediment transport;
- 35
- 36 • Tidal current patterns (velocities and phases), range, and excursion;
- 37
- 38 • Non-tidal circulation patterns, including frequency distributions of current speed, direction, and
- 39 persistence;
- 40
- 41 • Temperature and salinity distribution (horizontal and vertical), including temporal variations;
- 42 and
- 43
- 44 • Monthly river discharge including maximum, average-maximum, average, average-minimum,
- 45 and minimum discharge and flushing characteristics (only for estuaries).

Ground water characteristics:

- Historical and seasonal trends in ground water elevation or piezometric levels;
- Piezometric contour maps, water table contour maps, and hydraulic gradients (historical, if available, and current);
- Depth to water table for unconfined aquifer systems;
- Flow travel time (ground water velocities);
- Soil properties, including permeabilities or transmissivities, storage coefficients or specific yields, total and effective porosities, clay content, and bulk densities;
- Interactions among different aquifers;
- Historical and current data from site wells (e.g. monitoring, background, corrective action, or other uses);
- Hydrostratigraphy of the site, including cross sections and hydrostratigraphic unit descriptions; and
- Qualitative description of ground water aquifers, including identification of EPA-designated sole-source aquifers (WWW at <<http://www.epa.gov/OGWDW/swp/sumssa.html>>).

6.3.6 Ecological Resources

The applicant/licensee needs to describe species types, spatial and temporal distribution, and abundance, especially as they relate to listed and endangered species and critical habitat. This section provides input to various sections including, but not limited to, Sections 6.4.5, *Ecological Resources Impacts*; 6.4.12, *Public and Occupational Health Impacts*; and 6.6, *Environmental Measurements and Monitoring Program*.

The following information should be presented in the ER, as applicable. It may not be necessary for the evaluation of potential impacts from the proposed action to require all the information requested below:

- Map(s):
 - Important terrestrial resources, habitats, and ecosystems;
 - Topographic maps of the site;
- General ecological description of the regional setting, the site, and transportation corridors;
- List and description of important species and their spatial and temporal distributions, including their relative abundance and their life histories, critical life stages, biologically significant

activities, seasonal habitat requirements and population fluctuations, food chain, and other interspecific relationships;

- List of threatened or endangered species (plants and animals) known to occur, or that could potentially occur, including their seasons of occurrence, estimates of abundance, local flight patterns, and critical habitats;
- List of major vegetation layers (e.g., over-story and under-story), their dominant species, and the relative species abundances;
- Qualitative estimate of the importance of habitat of threatened, endangered, and other important species relative to the habitat of such species throughout their entire range;
- Locations of travel corridors for important terrestrial species and alternate routes for those corridors that could potentially be blocked by use of the site;
- List of important ecological systems that are especially vulnerable to change or that contain important species habitats, such as breeding areas (e.g., nesting areas), nursery, feeding, resting, and wintering areas, or other areas of seasonally high concentrations of individuals of important species;
- Characterization of the aquatic environment (including biological, hydrological, and chemical) and identification of those factors known to influence distribution and abundance of threatened and endangered aquatic life;
- Location and value of the commercial and sport fisheries and the seasonal distribution of harvest by species;
- Key aquatic indicator organisms expected to gauge changes in the distribution and abundance of species populations that are particularly vulnerable to impacts from the proposed action;
- List of important ecological systems onsite or in the vicinity that are especially vulnerable to change or that contain important species habitats, such as breeding areas (e.g., spawning areas); nursery, feeding, and wintering areas; or other areas of seasonally high concentrations of individuals of important species;
- Relative significance of various aquatic habitats in a regional context;
- Description of current and reasonable foreseeable conditions that are indicative of ecological stresses including natural and man-made;
- Description of the status of ecological succession of biota (i.e., weed, brush, pole, and mature stages);

- Description and location of any ecological or biological studies of the site or its environs, including those that are currently in progress;
- Information on sightings of endangered or threatened species on the proposed site or in the applicable vicinity (e.g., county, tri-county area, bay area, etc.). The source of this information should be identified. Example sources may include the State Department of Natural Resources, local chapters of recognized bird-watching groups, documented field studies, and State university/college specialists. The time period in which the information was collected by these sources should be specified (e.g., during the past 5 yr of monthly observation outings).
- Documentation that the applicant has consulted with the appropriate Federal and State agencies (e.g., as required by the Fish and Wildlife Coordination Act) and affected Native American tribes; and
- Identification of other Federal and State projects within the region that are or could potentially affect the same threatened and endangered species or their habitats.

6.3.7 Meteorology, Climatology, and Air Quality

The applicant/licensee needs to characterize atmospheric transport and diffusion processes at and near the site of the proposed action. This section provides input to various sections including, but not limited to, Sections 6.4.6, *Air Quality Impacts*; 6.4.12, *Public and Occupational Health Impacts*; and 6.6, *Environmental Measurements and Monitoring Program*.

The following information should be presented in the ER, as applicable. It may not be necessary for the evaluation of potential impacts from the proposed action to require all the information requested below:

Meteorology and Climatology

- Description of the general climate of the region (e.g., climatological normals of parameters such as temperature, precipitation, and wind speed/direction);
- Discussion of the severe weather phenomena (e.g., tornadoes, hurricanes, thunderstorms, atmospheric stagnation episodes) experienced in the region with expected frequencies of occurrence and measured extremes of parameters such as temperature, precipitation, and wind speed;
- Monthly and annual air temperature and dewpoint temperature summaries (including averages, measured extremes, and diurnal range) as near as possible to the site;
- Monthly and annual summaries of precipitation, including averages and measured extremes, number of hours with precipitation, and hourly rainfall rate distribution as near as possible to the site;
- Description of the local airflow patterns and characteristics, using data collected from the onsite meteorological program or from nearby weather monitoring stations;

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- Description of the baseline air quality in the region, identifying pollutants which are in non-attainment or maintenance areas and the relationship of the site to these areas;
- Monthly and annual wind roses and wind direction persistence summaries at all heights at which data on wind characteristics are applicable centered on the site, if possible;
- Hourly averages of wind speed and direction at all heights which wind characteristics are applicable and a summary of atmospheric stability;
- Estimated monthly mixing height data, including frequency and duration of inversion conditions and methods used to provide the estimates; and
- Topographic data presentation, including a map showing detailed topographic features.

If appropriate meteorological data are not available for the site, applicable data from nearby sources may be used if sufficient justification for offsite data is provided. Information sources for the above information include:

- Onsite meteorological program data;
- National Weather Service stations, (WWW at <<http://www.nws.noaa.gov/>>);
- National Environmental Data Index, (WWW at <<http://www.nedi.gov/>>); or
- National Climatic Data Center, (WWW at <<http://www.ncdc.noaa.gov/>>).

Baseline Air Quality

- General description of regional air quality, sources of information include:
 - EPA Air Quality Subsystem Database (WWW at <<http://www.epa.gov/airs/aqs.html>>);
 - EPA Aerometric Information Retrieval System (WWW at <<http://www.epa.gov/air/data/index.html>>);
- Table comparing regional air quality parameters to National Ambient Air Quality Standards for the area, if possible;
- Air pollutants for which there are non-attainment or maintenance areas in the region and a map relating the site to these areas; and
- Local or regional emission inventory.

6.3.8 Noise

The applicant/licensee needs to characterize the noise baseline at and near the site of the proposed action. This section may require input from various sections including, but not limited to, 6.3.1, *Site and/or Facility Description*; 6.3.2, *Land Use*; 6.3.6, *Meteorology, Climatology, and Air Quality*; 6.3.10

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1 *Socioeconomic*; and provides input to various sections including, but not limited to, Section 6.4.7, *Noise*
2 *Impacts*.

3
4 The following information should be presented in the ER, as applicable. It may not be necessary for the
5 evaluation of potential impacts from the proposed action to require all the information requested below:

- 6
7 • Boundaries of the extent of the noise analysis;
- 8
9 • Distribution of people, buildings, roads, and recreational facilities that are vulnerable to noise
10 impacts by the proposed action;
- 11
12 • Current and historical noise levels at sensitive areas, as identified above, as energy equivalent
13 sound level (L_{eq}) or the day-night average sound level (L_{dn}) reported on the dBA scale;
- 14
15 • Topography and land use in the vicinity;
- 16
17 • Meteorological conditions in the vicinity;
- 18
19 • Applicable sound level standards (from consultation with Federal, State, regional, local, and
20 affected Native American tribal agencies); and
- 21
22 • Point and line sources of noise affecting current noise levels.

23 24 **6.3.9 Historic and Cultural Resources**

25
26 The applicant/licensee identifies and describes historic, archaeological, and cultural resources.
27 Resources can include districts, sites, buildings, structures, or objects. This section provides input to
28 various sections including, but not limited to, Section 6.4.8, *Historic and Cultural Resources Impacts*.

29
30 The following information should be presented in the ER, as applicable. It may not be necessary for the
31 evaluation of potential impacts from the proposed action to require all the information requested below:

- 32
33 • Extent of historical and cultural resource analyses.
- 34
35 • Known cultural resources in the area and an overview of the area's cultural setting.
- 36
37 • Archaeological or historical surveys of the proposed site, including the following:
 - 38
39 - the physical extent of the survey (if the entire site was not surveyed, the basis for
40 selecting the area to be surveyed is needed);
 - 41
42 - a brief description of the survey techniques used and the reason for the selection of the
43 survey techniques used;
 - 44
45 - the qualifications of the surveyors; and

- the findings of the survey in sufficient detail to permit a subsequent independent assessment of the impact of the proposed project on archaeological and historic resources.

- List of cultural and historic properties within the proposed actions site or within the area of potential effects. These properties are included in State or local registers or inventories of historic and archaeological resources. Guidance can be found on the US. National Park Service (NPS) WWW at <<http://www.cr.nps.gov/nr/publications>>.
- The results of any consultation with Federal, State, local, and affected Indian tribal agencies.
- The comments from any organizations and individuals contacted by the applicant who provided significant information concerning the location and assessment of cultural and historic properties.
- Statement of the significance or importance of each cultural resource potentially affected.

6.3.10 Visual/Scenic Resources

The applicant/licensee provides information on the aesthetic and scenic quality of the site, which provides input to various sections including, but not limited to, Sections 6.4.9, *Visual/Scenic Resources Impacts* and 6.4.10, *Socioeconomic Impacts*.

The following information should be presented in the ER, as applicable. It may not be necessary for the evaluation of potential impacts from the proposed action to require all the information requested below:

- Boundaries of the viewshed or viewscape of the proposed action;
- Photos viewing the proposed site from different directions;
- Identification of local residents and/or regular visitors to the area who might be affected by aesthetic impacts;
- Information related to the landscape characteristics including open spaces, mountain ranges, ecological environment (e.g., flora, fauna, and ecosystems), bodies of water (e.g., waterfalls, waterways, and oceans), color of soils, recreational areas (e.g., parks wilderness areas), architectural features, aesthetic (e.g., historical, archaeological, cultural, and natural) features that would attract tourists, and uncultivated land;
- Location of constructed features including radar towers, transmission towers, and overhead power distribution line and production activities;
- Visibility from access roads (i.e., existing natural or constructed barriers, screens or buffers);
- Regionally or locally important or high quality views associated with proposed action sites;

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- Photos and information related to the view of the proposed action from different directions including views from roads, highways, homes, and recreational areas (e.g., forest and wilderness area and campgrounds);
- Regulatory information related to land-use zoning requirements of the local community or urban areas, sign ordinances or regulations of the local community or urban area, design guides of the local community or urban area, and buffer-zone (or greenbelt-zone) requirements of the local community or urban area;
- Summary of any coordination with appropriate local area community planners and/or urban planners; and
- Rating of the aesthetic and scenic quality of the site in accordance with the BLM Visual Resource Inventory and Evaluation System (BLM, 1984, 1986a, 1986b).

6.3.11 Socioeconomic

This section describes socioeconomic information. This section provides input to various sections including, but not limited to, Sections 6.4.10, *Socioeconomic Impacts*; 6.4.11, *Environmental Justice*; and 6.4.12, *Public and Occupational Health Impacts*. This section may also be linked to Sections 6.3.2, *Land Use*, 6.3.10, *Visual/Scenic Resources*, 6.4.1, *Land Use Impacts*, and 6.4.9, *Visual/Scenic Impacts* because of land use questions.

The following information should be presented in the ER, as applicable. It may not be necessary for the evaluation of potential impacts from the proposed action to require all the information requested below:

- Population characteristics (e.g., ethnic groups, and population density);
- Economic trends and characteristics, including employment and income levels;
- Housing, health and social services, educational, and transportation resources;
- Area's tax structure and distribution;
- Community attitudes and lifestyle (including organized community groups);
- Summary of any coordination with appropriate local and regional agencies or groups who collect these types of data;
- Map identifying places of significant population grouping, such as cities and towns;
- Population characteristics (trends) and projections (sources of information include the WWW at < www.census.gov>) and the bases for population projections;
- Areas where minority or low-income populations are disproportionately high (see Environmental Justice instructions in Appendix B); and

- Sources of information, assumptions and techniques used to develop information.

Current and projected population levels for the life of the facility should be determined. The population trends at the proposed site should be discussed along with historic and projected growth rates for the region. Appropriate governmental and industrial projections should be evaluated. Any unusual programs or developments in the region should be highlighted if they may have an impact on the area population.

6.3.12 Public and Occupational Health

This section provides input to various sections including, but not limited to, Section 6.4.12, *Public and Occupational Health Impacts*.

The following information should be presented in the ER, as applicable. It may not be necessary for the evaluation of potential impacts from the proposed action to require all the information requested below:

- Major sources and levels of background radiation exposure, including natural and man-made sources; express levels in mSv/yr (mrem/yr);
- Current sources and levels of exposure to radioactive materials;
- Major sources and levels of chemical exposure; express levels in appropriate units;
- Historical exposures to radioactive materials;
- Occupational injury rates and occupational fatality rates; and
- Summary of health effects studies.

6.3.13 Waste Management

This section should describe current waste generation rates and sources for all types of waste. This section provides input to various sections including, but not limited to, Section 6.4.13, *Waste Management Impacts*. This section may be linked to Sections 6.4.1, *Land Use Impacts*; 6.4.4, *Water Resources Impacts*; 6.4.5, *Ecological Resources Impacts*; 6.4.6, *Air Quality Impacts*; 6.4.12.2.1, *Pathway Assessment*; and 6.6, *Environmental Measurements and Monitoring Programs*.

The following information should be presented in the ER, as applicable. It may not be necessary for the evaluation of potential impacts from the proposed action to require all the information requested below:

- Descriptions of all (i.e. nonradioactive, radioactive, mixed, and hazardous) current waste systems, including quantities, composition, and frequency of waste generation. Effluent discharges do not need to be discussed if previously covered (i.e. air effluents in Air Quality section and liquid effluents in the Water Quality section).

- Information on current disposal activities including size and location of disposal sites as well as the plans for ultimate treatment and/or restoration of retired disposal sites (other than licensed commercial sites).
- Identification of all sources of radioactive liquid, solid, and gaseous waste material within the facility.
- Identification of direct radiation sources stored onsite as solid waste (e.g., independent fuel storage).

6.4 Environmental Impacts

Analyze and describe the impacts for each resource described in Section 6.3, *Description of the Affected Environment*, for the no action alternative, the proposed action, and each alternative. These impacts should consider normal operational events as well as reasonably foreseeable accidents (e.g. design basis events for Part 72 licensees, credible consequence events for Part 70 licensees).

6.4.1 Land Use Impacts

This section describes the impacts to land use for each alternative. The following information should be presented in the ER, as applicable. It may not be necessary for the evaluation of potential impacts from the proposed action to require all the information requested below:

- Land-use impact;
- Land-use impacts of any related Federal action that may have cumulatively significant impacts;
- Area and location of land that will be disturbed on either a long-term or short-term basis; and
- Impacts from institutional controls.

6.4.2 Transportation Impacts

This section describes the impacts to transportation corridors including the effects of transportation of radioactive materials. The following information should be presented in the ER, as applicable. It may not be necessary for the evaluation of potential impacts from the proposed action to require all the information requested below:

- Construction of access road or railroad to facility;
- Transportation route and mode for conveying construction material to the facility;
- Traffic pattern impacts (e.g from any increase in traffic from heavy haul vehicles);
- Impacts of construction transportation such as fugitive dust, scenic quality, and noise;

- Mitigation measures proposed by applicant; and
- Any consultations with Federal, State, and local agencies.

Transportation of Radioactive Material

The following information should be provided in the ER:

- Transportation mode (i.e., truck, rail, or barge) and routes from originating site to destinations;
- Estimated transportation distance from the originating site to the storage site;
- Treatment and packaging procedure for radioactive wastes;
- Radiological dose for incident-free scenarios to public and workers; and
- Impacts of operating transportation on the environment (e.g., fire from equipment sparking).

6.4.3 Geology and Soils Impacts

This applicant should summarize known and potential geological impacts, mitigation measures and cumulative effects in this section. The major analysis for this section should be found in the Supplemental Environmental Report for this action and only summarized in this section. Examples of geological environmental impacts include soil compaction, soil erosion, subsidence, landslides, and disruption of natural drainage patterns.

6.4.4 Water Resources Impacts

In this section, the applicant evaluates impacts on water use and water quality for each alternative. Identify potential impacts for both radiological and non-radiological effluents.

The applicant should consider surface-water and ground water uses that could affect or be affected by the construction and operation of the proposed project. The analysis includes consideration of impacts on such water uses as domestic, municipal, agricultural, industrial, mining, recreation, navigation, and hydroelectric power. The review should be limited to present and known future water uses.

Consider impacts on the physical, chemical, and biological water-quality characteristics of ground and surface water. Because water quality and water supply are interdependent, changes in water quality must be considered simultaneously with changes in water supply.

Compliance with environmental quality standards and requirements of the Clean Water Act is not a substitute for and does not negate the requirement for the applicant to weigh the environmental impacts of the proposed action, including any degradation of water quality, and to consider alternatives to the proposed action that are available for reducing the adverse impacts. Additionally, the State's standards should be considered because the United States Supreme Court granted the States additional authority to limit hydrological alterations beyond the State's role in regulating water rights.

1 The following information should be presented in the ER, as applicable. It may not be necessary for the
2 evaluation of potential impacts from the proposed action to require all the information requested below:
3

- 4 • Identification of waters receiving effluents and the expected average and maximum flow rates,
5 physical characteristics (e.g., temperature, sediment load, velocities), and composition of
6 radiological and non-radiological pollutants in these effluents.
7
- 8 • Impacts on surface water and ground water quality including comparison of predicted effluent
9 and receiving-water quality with applicable effluent limitations and water-quality standards for
10 both radiological and non-radiological constituents. Include conclusions regarding project
11 compliance with these standards, the physical impacts of consumptive water uses (e.g., ground
12 water depletion) on other water users, and adverse impacts on surface-oriented water users (e.g.,
13 fishing, navigation, etc.) resulting from facility activities.
14
- 15 • Identification of hydrological system alterations, including construction of cofferdams and storm
16 sewers; dredging operations; placement of fill material into the water; creation of shoreline
17 facilities involving bulkheads, piers, jetties, basins, or other structures or activities with potential
18 to alter existing shoreline processes; construction of intake and outfall structures; water-channel
19 modifications; construction of roads and bridges; operations affecting water levels (flooding);
20 dewatering activities; and activities contributing to sediment runoff (e.g., road construction,
21 clearing and grading, fill or spoil placement).
22
- 23 • Identification of hydrological system impacts, onsite and offsite (e.g., water quantity and
24 availability, water flow, and movement patterns), and erosion, deposition, and sediment
25 transport, water drainage characteristics, the flood handling capability of the floodplains, flow
26 and circulation patterns, subsidence resulting from ground water withdrawal, and erosion and
27 sediment transport.
28
- 29 • Withdrawals and returns of ground and surface water during all phases.
30
- 31 • Identification of impacted ground and surface water users, including descriptions of the site and
32 regional water bodies (including sole-source aquifers) and ground water aquifers (Section 5.3.5,
33 *Water Resources*), surface-water and ground water sources used, identification and locations of
34 ground water and surface water users and areas that could be impacted, the compatibility of
35 proposed water uses with existing and known water rights and allocations, descriptions of any
36 transfer of water rights (e.g., from irrigation use to facility consumptive use) and the impacts
37 associated with such transfers.
38
- 39 • Descriptions of any proposed practices and measures to control impacts to water quality and/or
40 quantity (e.g., protection of natural drainage channels and water bodies, protection of shorelines
41 and beaches, restrictions on access to and use of surface water, protection against saltwater
42 intrusion, and handling of fuels, lubricants, oily wastes, chemical wastes, sanitary wastes,
43 herbicides, and pesticides).
44
- 45 • Identification of predicted cumulative effects on water resources.
46

6.4.5 Ecological Resources Impacts

This section describes the ecological impacts for the proposed action and each alternative. The following information should be presented in the ER, as applicable. It may not be necessary for the evaluation of potential impacts from the proposed action to require all the information requested below:

- Site map showing proposed buildings, land to be cleared, areas to be cleared along stream banks, areas proposed for dredge material, areas to be dredged, and waste disposal areas;
- Proposed schedule of activities;
- Total area of land to be disturbed;
- Area of disturbance for each habitat type, and an estimate of the amount of these habitats that will be destroyed relative to the total amount present in the region;
- Maintenance practices such as use of chemical herbicides, roadway maintenance, and mechanical clearing that are anticipated to effect biota;
- Area to be used on a short-term basis during construction, and plans for restoration of this land;
- Any proposed activities expected to impact communities or habitats that have been defined as rare or unique or that support threatened and endangered species;
- Estimate of the potential impacts of elevated construction equipment or structures on species (e.g., birds collisions, nesting);
- Tolerances and/or susceptibilities of important biota to physical and chemical pollutants;
- Clearing methods, erosion, run-off and siltation control methods (both temporary and permanent), dust suppression methods, and other construction practices for impact control or minimization;
- Special maintenance practices used in important habitats (e.g., marshes, natural areas, bogs) including those that result in unique beneficial effects on specific biota;
- Wildlife management practices; and
- Practices and procedures or alternative designs to minimize adverse impacts.

6.4.6 Air Quality Impacts

This section describes the air quality impacts of the proposed action and each alternative. The following information should be presented in the ER, as applicable. It may not be necessary for the evaluation of potential impacts from the proposed action to require all the information requested below:

- Description of gaseous effluents (type, quantity, and origin);
- Table comparing effluent concentrations to regional air quality parameters (effluent concentrations should be provided for both short and long term impacts);
- Release point characteristics (i.e., elevation above grade, inside vent or stack diameter, physical shape, flow rate, effluent temperature, exit velocity, release frequency, or other appropriate information to allow calculation of transport and diffusion);
- Description of gaseous effluent control systems;
- Detailed descriptions of the models and assumptions used to determine normalized concentration and/or relative deposition. The meteorological data used in these models should be identified (Section 6.3.7, *Meteorology, Climatology, and Air Quality*);
- Normalized concentration and/or relative deposition at points of potential maximum concentration outside the site boundary, at points of maximum individual exposure, and at points within a reasonable area that could be impacted (Section 6.3.7, *Meteorology, Climatology, and Air Quality*);
- Description of visibility impacts;
- Description of mitigative measures for air quality impacts; and
- Description of cumulative air quality impacts.

6.4.7 Noise Impacts

This section describes noise impacts. The following information should be presented in the ER, as applicable. It may not be necessary for the evaluation of potential impacts from the proposed action to require all the information requested below:

- Predicted noise levels (sound contour maps are recommended), reported as energy equivalent sound levels or day-night average sound levels (L_{eq} or L_{dn}) using the dBA scale;
- Major point and line sources (for locations described above), including all models, assumptions and input data;
- Comparison to appropriate standards or guidelines (EPA, 1974; ASTM, 1996);
- Potential impacts to sensitive receptors (i.e., hospitals, schools, residences, wildlife);
- Mitigation measures to reduce impacts of noise; and
- Description of noise related cumulative impacts.

6.4.8 Historic and Cultural Resources Impacts

This section describes impacts to historic and cultural resources. Adverse effects occur when a proposed action's effect on a cultural resource diminishes the integrity of its location, design, setting, materials, workmanship, feeling or association. Adverse effects include, for example (i) physical destruction, damage, or alteration of all or part of the property; (ii) isolation of the property from or alternation of the character of the property's setting when that character contributes to the property's qualification of the *National Register*; (iii) introduction of visual, audible or atmospheric elements that are out of character with the property or alter its setting; (iv) neglect of a property resulting in its deterioration or destruction; and (v) transfer, lease or sale of the property.

The following information should be presented in the ER, as applicable. It may not be necessary for the evaluation of potential impacts from the proposed action to require all the information requested below:

- Overlay maps where a base map showing known and potential sites is overlain by maps identifying the nature and extent of the impacts from each alternative. For information on historical or cultural resources that may lead to vandalism or scavenging, summary information that does not include site-specific or property-specific data is appropriate;
- Impacts to historic and cultural resources during construction, operation, or decommissioning;
- Indirect impacts (e.g., vandalism on known cultural resource sites in the area of potential effects, visual impact, denial of access) resulting from land-use changes, secondary growth and development, or direct construction activities;
- Documentation of SHPO and/or Tribal Historic Preservation Officer consultations on the impact of the proposed project on significant cultural and historic resources as discussed in Section 4.2.4, *Consultations and Cooperating Agencies*;
- Reference to SHPO and/or Tribal Historic Preservation Officer comments on the impact of the proposed project on significant cultural and historic resources as discussed in Section 4.2.4, *Consultations and Cooperating Agencies*;
- State laws and plans for historic preservation, if needed;
- The potential for human remains to occur in the project area, and for complying with provisions of the Native American Graves Protection and Repatriation Act (NAGPRA) regulations in the event of an inadvertent discovery. An inadvertent discovery of such items during construction may necessitate a work stoppage of up to 30 days and consultation under NAGPRA procedures;
- Practices and procedures or alternative designs to minimize adverse impacts. Mitigation measures could include (i) limiting the magnitude of the undertaking; (ii) modifying the undertaking through redesign, reorientation or construction on the proposed action; (iii) repair, rehabilitation, or restoration of an affected historic property (as opposed, for instance, to demolition); (iv) preservation and maintenance operations for involved historic properties; (v) documentation (drawings, photos, histories) of building or structures that must be destroyed

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or substantially altered; (vi) relocation of historic properties; and (vii) salvage of archaeological or architectural information and materials; and

- Description of cumulative impacts on historic and cultural resources.

6.4.9 Visual/Scenic Resources Impacts

This section describes aesthetic impacts. The following information should be presented in the ER, as applicable. It may not be necessary for the evaluation of potential impacts from the proposed action to require all the information requested below:

- Photos of the site (6.3.10) with the alternatives superimposed;
- Rate the aesthetic and scenic quality of the site in accordance with BLM Visual Resource Management System (BLM, 1984, 1986a, 1986b);
- Significant visual impacts from each alternative, including;
 - Physical facilities that are out of character with overall existing architectural features;
 - Structures that may partially or completely obstruct views of existing landscape;
 - Structures that create visual intrusions in the existing landscape character (e.g., radar towers, power lines, etc.);
 - Structures that may require the removal of natural or built barriers, screens or buffers, thus enabling lower quality views to be seen;
 - Altering historical, archaeological or cultural properties or the character of the property's setting when that character contributes to the property's significance; and
 - Structures that create visual audible or atmospheric elements that are out of character with the site or alter its setting.
- A determination if the visual impact is compatible or in compliance with regulations, ordinances, and requirements;
- Potential mitigation measures; and
- Description of cumulative impacts to visual/scenic quality.

6.4.10 Socioeconomic Impacts

This section describes socioeconomic impacts such as impacts to housing or schools from an influx of additional workforce. The following information should be presented in the ER, as applicable. It may

not be necessary for the evaluation of potential impacts from the proposed action to require all the information requested below:

- Impacts to population characteristics (e.g., ethnic groups, and population density);
- Impacts to housing, health and social services, educational, and transportation resources;
- Impacts to area's tax structure and distribution;
- Summary of any coordination with appropriate local and regional agencies or groups who collect these types of data;
- Sources of information, assumptions and techniques used to develop information; and
- Description of cumulative impacts to socioeconomic resources.

6.4.11 Environmental Justice

This section evaluates environmental impacts on low-income or minority populations by proposed project activities if disproportionately high low-income or minority populations are identified in Section 6.3.11. Impacts that may have environmental justice implications may include health, ecological (including water quality and water availability), social, cultural, economic and aesthetic.

The ER should follow the detailed guidance provided in Appendix B. In general, the ER includes a discussion of the methods used to identify and quantify impacts on low-income and minority populations, the location and significance of any environmental impacts during construction on populations that are particularly sensitive, and any additional information pertaining to mitigation.

The following information should be presented in the ER, as applicable. It may not be necessary for the evaluation of potential impacts from the proposed action to require all the information requested below:

- An assessment (qualitative or quantitative, as appropriate) of the degree to which each minority or low-income population is disproportionately receiving adverse human health or environmental impacts during construction or decommissioning as compared with the entire geographic area. In addition, there should be an assessment comparing the impacts with the larger overall geographic area encompassing all of the alternative sites.
- An assessment (qualitative or quantitative, as appropriate) of the significance or potential significance of such environmental impacts on each low-income and minority population. Significance is determined by considering the disproportionate exposure, multiple-hazard, and cumulative hazard conditions.
- An assessment of the degree to which each low-income and minority population is disproportionately receiving any benefits compared with the entire geographic area.

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- A discussion of any mitigative measures for which credit is being taken to reduce environmental justice concerns.
- When alternative sites are being evaluated, the same reviews should be available for each site.
- A brief description of pathways by which any environmental impacts may result in disproportionate environmental impacts to low-income and minority populations.
- Description of cumulative impacts to low-income and minority populations.

6.4.12 Public and Occupational Health Impacts

This section describes public and occupational health impacts from both non-radiological and radiological sources.

6.4.12.1 Nonradiological Impacts

The following information should be presented in the ER, as applicable. It may not be necessary for the evaluation of potential impacts from the proposed action to require all the information requested below:

- Maps, in an appropriate scale, showing the distances from the proposed action to the following points or areas for radial sectors centered on the cardinal compass directions:
 - Nearest site boundary;
 - Nearest full time resident;
 - Nearest present drinking water intake (from Sections 6.3.2, *Land Use*, or 6.3.5, *Water Resources*); and
 - Nearest sensitive receptors (e.g., schools and hospitals).
- For liquid nonradioactive discharge to water or air, provide the basis for analysis and the following information (Section 6.4.4, *Water Impacts* and Section 6.4.6, *Air Quality Impacts*):
 - Transit time to the points of analysis;
 - The liquid stream discharge rate; and
 - The dilution factor at the points of analysis.
- Physical layout, including the location and orientation of non-radioactive materials that are expected to be present (Section 6.3.1, *Site and/or Facility Description* and 6.3.13, *Waste Management*).
- Location and characteristics of liquid and gaseous releases (from Sections 6.4.4, *Water Resources Impacts*, and 6.4.6 *Air Quality Impacts*).
- Measured non-radiological concentrations, airborne and waterborne, at specific locations where environmental monitoring data exist (Section 6.6, *Environmental Measurements and Monitoring Programs*).

- Calculated airborne and waterborne concentrations at specific locations important to exposure calculations where environmental monitoring data are not available, including a description of the methodology.
- Calculated exposure to the public or calculated average annual concentration of non-radioactive releases to air and water; including all models, assumptions, and input data in order to determine compliance (e.g, 40 CFR Parts 50, 59, 60, 61, 122, 129, 131, etc.).
- Number and principal locations of workers who will be exposed to the sources described above and the total amount of time per year that they will spend at those locations.
- Calculated exposure to the workforce including all models, assumptions, and input data in order to determine compliance with 29 CFR Part 1910.
- Description of mitigative measures.
- Description of non-radiological cumulative impacts to public and occupational health.

6.4.12.2 Radiological Impacts

This section describes public and occupational health impacts from radiological sources.

6.4.12.2.1 Pathway Assessment

The following information should be presented in the ER, as applicable. It may not be necessary for the evaluation of potential impacts from the proposed action to require all the information requested below:

- Maps, at an appropriate scale, showing the distances from the proposed action to the following points or areas for radial sectors centered on the cardinal compass directions:
 - Nearest site boundary;
 - Nearest full time resident;
 - Location of average member of critical group;
 - Other important receptors (i.e: milk and meat producing animals, and vegetable gardens) and locations;
 - Nearest present and known future locations from which an individual can obtain aquatic food and/or drinking water (Sections 6.3.5, *Water Resources* and 6.3.2, *Land Use*), transit time from the proposed action, and population served; and
 - Nearest present and known future areas designated for recreational purposes (Section 6.3.2, *Land Use*) and transit time from the proposed action.
- Potential pathways for releases.
- For each radioactive discharge to water or air, provide the basis for analysis and the following information (Sections 6.4.4, *Water Resources Impacts* and 6.4.5, *Air Quality Impacts*):
 - Transit time to the points of analysis;
 - Discharge rate; and

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- Dilution factor at the points of analysis.
- Distributional data for radial sectors centered on the cardinal compass directions for radial distances (immediate area to affected region) including:
 - Projected population during and after each alternative (Section 6.4.10, *Socioeconomic Impacts*);
 - Current annual meat production, current annual milk production, current annual vegetable production, and current commercial fish and invertebrate catch (Section 6.3.2, *Land Use*); and
 - Affected current and known future drinking water intake locations and the populations served and the daily water consumption at each location (Section 6.3.5, *Water Resources*).
- Crop yield, annual production, growing period, crop type, and amounts consumed and fractional ingestion of contaminated food and water for:
 - Irrigated land using water withdrawn within the affected region of the proposed action, include irrigation rate; and
 - Land affected by airborne emissions and deposition.
- Animal husbandry, facilities, agricultural practices, game harvests, or food processing operations having the potential for contributing incrementally to either individual or population doses.

6.4.12.2.2 Public and Occupational Exposure

The following information should be presented in the ER, as applicable. It may not be necessary for the evaluation of potential impacts from the proposed action to require all the information requested below:

- Physical layout of the site, including the location and orientation of radioactive materials that are expected to be present (Section 6.3.1, *Site and/or Facility Description*).
- Location and characteristics of radiation sources and liquid and gaseous radioactive effluent (Sections 6.4.4, *Water Resource Impacts*, and 6.4.6 *Air Quality Impacts*).
- Measured radiation dose rates, airborne radioactivity concentrations, and waterborne radioactivity concentrations at specific locations where environmental radiological monitoring data exist.
- Calculated radiation dose rates, airborne radioactivity concentrations, and waterborne radioactivity concentrations at specific locations important to dose calculations where environmental radiological monitoring data are not available, including a description of the methodology.
- Calculated total effective dose equivalent to an average member of the critical group or calculated average annual concentration of radioactive material in gaseous and liquid effluent; including all models, assumptions, and input data in order to determine compliance with 10 CFR Part 20 and 40 CFR Part 190.

- Number and principal locations of workers who will be exposed to the radiation sources described above and the total amount of time per year that they will spend at those locations.
- Calculated dose to the workforce including all models, assumptions, and input data in order to determine compliance with 10 CFR Part 20.
- Summary of external radiation monitoring and airborne radiation monitoring programs (Section 6.6, *Environmental Measurements and Monitoring Programs*).
- Description of mitigation measures.
- Description of cumulative impacts to public and occupational radiological exposure.

For accidents, include:

- The list of reasonably foreseeable (i.e. credible) accidents (e.g. design basis events for SFPO, credible consequence events for FCSS) identified as having a potential for releases to the environment and the analysis of the dose consequences from these accidents.

6.4.13 Waste Management Impacts

This section describes waste generation and management impacts. The following information should be presented in the ER, as applicable. It may not be necessary for the evaluation of potential impacts from the proposed action to require all the information requested below:

- Descriptions of the sources, types, quantities, composition of solid, hazardous, radioactive and mixed wastes expected from the proposed action
- Description of proposed waste management systems designed to collect, store, and dispose of all wastes generated by the proposed action
- Anticipated disposal plans for all wastes (i.e., transfer to an offsite waste disposal facility, treatment facility, or storage onsite).
- A waste-minimization plan that identifies process changes that can be made to reduce or eliminate waste. This should contain a description of methods to minimize the volume of waste.
- Description of waste management cumulative impacts.

6.5 Mitigation Measures

The ER should summarize mitigation measures that could reduce adverse impacts. These mitigation measures should be incorporated in the proposed action and alternatives (40 CFR 1502.14(f) and 1508.20). Address the anticipated effectiveness of these mitigation measures in reducing adverse impacts. Residual impacts or unavoidable adverse impacts which remain after mitigation measures have

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1 been applied should be analyzed, as well as any further impacts caused by the mitigation measures
2 themselves.

3 4 **6.6 Environmental Measurements and Monitoring Programs**

5
6 This section describes all environmental measurement and monitoring programs as they apply to
7 baseline, operation, and decommissioning conditions for the proposed action and each alternative.

8 9 **6.6.1 Radiological Monitoring**

10
11 The following information should be presented in the ER, as applicable. It may not be necessary for the
12 evaluation of potential impacts from the proposed action to require all the information requested below:

- 13
14 • Maps or aerial photographs of the site with proposed monitoring and sampling locations clearly
15 identified along with effluent release points
- 16
17 • Principal radiological exposure pathways (Section 6.4.12.2.1, *Pathway Assessment*)
- 18
19 • Location and characteristics of radiation sources and radioactive effluent (liquid and gaseous,
20 from Sections 6.4.4, *Water Resource Impacts*, and 6.4.6, *Air Quality Impacts*)
- 21
22 • Detailed description of the monitoring program including:
 - 23
24 - Number and location of sample collection points, measuring devices used, and pathway
25 sampled or measured
 - 26
27 - Sample size, sample collection frequency, and sampling duration
 - 28
29 - Method and frequency of analysis including lower limits of detection
- 30
31 • Discussion justifying the choice of sample locations, analyses, frequencies, durations, sizes, and
32 lower limits of detection
- 33
34 • Quality assurance procedures

35 36 **6.6.2 Physiochemical Monitoring**

37
38 The following information should be presented in the ER, as applicable. It may not be necessary for the
39 evaluation of potential impacts from the proposed action to require all the information requested below:

- 40
41 • Maps or aerial photographs of the site clearly identifying: proposed monitoring and sampling
42 locations, effluent release points, and parameter being measured/analyzed
- 43
44 • Chemical parameters (e.g., nitrogen dioxides or particulates from an industrial off-gas discharge
45 unit, chlorides or pH from a wastewater outfall)

- Detailed description of the monitoring program including:
 - Number and location of sample collection points, measuring devices used, and pathway sampled or measured
 - Sample size, sample collection frequency, and sampling duration
 - Method and frequency of analysis including lower limits of detection
 - Discussion justifying the choice of sample locations, analyses, frequencies, durations, sizes, and lower limits of detection (usually dictated by National Pollution Discharge Elimination System or Title V permit issued by the EPA or State)
 - Quality assurance procedures
 - Description of action levels and corrective action requirements
 - Physical parameters (e.g., air temperature, wind speed, ground water levels, surface water flow rates)
 - Map showing detailed topographic features of the site (as modified by the facility), including major structures and the meteorological tower/s (if applicable)

6.6.3 Ecological Monitoring

The following information should be presented in the ER, as applicable. It may not be necessary for the evaluation of potential impacts from the proposed action to require all the information requested below:

- Maps showing features of the site and transportation corridors that will be modified, including major ecological communities, important habitats, and sampling stations and monitoring locations.
- List and description of the important ecological resources that are likely to be affected.
- List of monitoring program elements or parameters including action or reporting levels for each element.
- Type, frequency, and duration of observations or samples taken at each location, and appropriate rationale and sampling design.
- Statistical validity of any existing or proposed sampling program. For quantitative descriptions of samples collected within each area of interest and each time of interest, descriptive statistics should include: the mean, standard deviation, standard error, and confidence interval for the mean. In each case, the sample size should be clearly indicated. If diversity indices are used to describe a collection of organisms, the specific diversity indices used should be stated. Also, the methods used for observing natural variations of ecological parameters should be described. If these methods involve indicator organisms, the criteria for their selection should be stated.

- Sampling equipment used.
- Method of chemical analyses, as applicable.
- Data analysis and reporting procedures.
- Documentation of applicant consultations with the FWS, appropriate State agencies (e.g., fish and wildlife agency), and Native American tribal agencies.
- Documentation of the environmental monitoring programs in policy directives designating a person or organizational unit responsible for reviewing the program on an ongoing basis.

Procedures should establish criteria for (as applicable):

- Data recording and storage;
- Reporting results to the NRC or consulting agency; and
- Actions to be taken for anomalous results or when results do not meet requirements.

6.7 Cost Benefit Analysis

This section describes the costs and benefits for the proposed action and each alternative. NUREG/BR-0058 and NUREG-1530 provide detailed guidance. The discussion of costs and benefits will include both the costs of each alternative and a qualitative discussion of environmental impacts. Provide assumptions and uncertainties in the analyses.

The following information (major costs and benefits) should be presented in the ER, as applicable. It may not be necessary for the evaluation of potential impacts from the proposed action to require all the information requested below:

- Qualitative discussion of environmental degradation (including air, water, soil, biotic, as well as socioeconomic factors such as noise, traffic congestion, overuse of public works and facilities, and land access restrictions);
- Decreased public health and safety;
- Capital costs of the alternative, including land and facilities;
- Operating and maintenance costs;
- Post-operation restoration (not applicable when the alternative is restoration);
- Post-operation monitoring requirements;
- Decreased property values; and

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- Other costs of the alternative (including lost tax revenue, decreased recreational value, degradations in transportation corridors as appropriate).
- Qualitative discussion of the environmental benefits;
- Increased public health and safety;
- Capital benefits of the alternative;
- Tax revenues received by local, State, and Federal governments;
- Incremental increases in regional productivity;
- Enhancement of recreational values;
- Creation and improvement of transportation corridors and facilities;
- Increased property values; and
- Other benefits.

6.8 Summary of Environmental Consequences

The following information should be presented in the ER, as applicable. It may not be necessary for the evaluation of potential impacts from the proposed action to require all the information requested below:

- Unavoidable adverse environmental impacts;
- Irreversible and irretrievable commitments of resources used in project construction, operation, and decommissioning;
- Short-term and long-term impacts; and
- Short-term uses of the environment and the maintenance and enhancement of long-term productivity.

6.9 List of References

To be completed by the applicant/licensee indicating items referenced in ER.

6.10 List of Preparers

To be completed by the applicant/licensee indicating personnel completing the ER.

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6.11 References

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APPENDIX A
APPLICATION OF THE GENERIC ENVIRONMENTAL
IMPACT STATEMENT ON THE LICENSE TERMINATION
RULE TO ENVIRONMENTAL ASSESSMENTS FOR
UNRESTRICTED RELEASE DECOMMISSIONING SITES

License Termination Rule GEIS Reference Facilities^{1,2} Checklist

The GEIS reference facilities were developed to broadly and generically represent categories of licensee facilities. Specific facilities will not exactly match the descriptions of the reference facilities. The primary purpose of comparing a specific facility to the reference facility with regard to dose assessment is to determine whether the specific facility has important contaminants, potential scenarios, or pathways that were not analyzed for the reference facilities or which may be sufficiently different from those in the GEIS to change conclusions regarding environmental impacts. In general, if a specific facility has contaminants, concentrations, and spatial distributions less than or generally equivalent to those used for the reference facilities, the GEIS should be applicable. Potential limitations of the GEIS dose assessments, as well as a summary of the characteristics of the reference facilities, are shown below.

1. GEIS Dose Assessment Scenarios: Potential Limitations

a. Building Occupancy (structures)

- i. Structures are assumed to have a 70-year life span following license termination. A shorter expected life span is acceptable. Expected life spans significantly longer than 70 years may require additional analysis if long-lived radionuclides are involved.
- ii. If Radon (Rn-222) due to licensee activities or co-mingled material is expected to approach or exceed the EPA guideline of 4 pCi/l indoor air concentration, additional dose assessment may be required.
- iii. Contamination significantly more extensive than that analyzed in the GEIS should be evaluated on a site-specific basis. Areas and concentrations analyzed in the GEIS are shown in the tables in the following sections.
- iv. Radionuclides present on the site that contribute significantly to dose but which were not analyzed in the GEIS for the subject facility type will need to be evaluated separately.

Checklist for Structures

Yes No

- | | | |
|--------------------------|--------------------------|--|
| <input type="checkbox"/> | <input type="checkbox"/> | Additional analysis required due to expected >70 year building lifespan following decommissioning <u>and</u> long-lived contaminants |
| <input type="checkbox"/> | <input type="checkbox"/> | Indoor Radon (Rn-222) concentration expected to approach or exceed the EPA guideline of 4 pCi/l |
| <input type="checkbox"/> | <input type="checkbox"/> | Contamination significantly more extensive than that shown in Tables 1 through 6 in the following sections |
| <input type="checkbox"/> | <input type="checkbox"/> | Radionuclides present that contribute significantly to dose, were not analyzed in the GEIS, and could change the conclusions in the GEIS regarding environmental impacts |

¹Overview from NUREG-1496, Volume 1, Section 3

²Note: The GEIS does not apply to uranium mills or tailings, low level waste, or high level waste.

2. Residential (soil)

- i. Assumes people live and work on site over a 1,000 year period.
- ii. If the site is subject to weather or other events (tornadoes, flash floods, etc) that could result in extensive redistribution or mass movement of contaminants, additional analysis may be required.
- iii. Pre-existing contamination of ground water must be evaluated on a site-specific basis.
- iv. 10 CFR 20.302/20.2002 or other burials or disposal areas may need additional site-specific evaluation.

Checklist for Soil

Yes No

- | | | |
|--------------------------|--------------------------|---|
| <input type="checkbox"/> | <input type="checkbox"/> | Site subject to weather or other events that could redistribute contaminants in ways not analyzed in the GEIS |
| <input type="checkbox"/> | <input type="checkbox"/> | Contaminated groundwater present |
| <input type="checkbox"/> | <input type="checkbox"/> | On-site burials or disposal areas |
-

3. Example fuel cycle facilities: power, test, and research reactors; uranium fuel fabrication; uranium hexafluoride conversion facilities; and independent spent fuel storage installations (ISFSI).

The power, test, and research reactors, and the ISFSI have been consolidated into a single analysis in the GEIS based on common radionuclide contaminants (^{60}Co and ^{137}Cs), and are represented by the analysis for the power reactor.

The uranium fabrication facility is used as the reference for both the fabrication and hexafluoride facilities.

Facility Characteristics Applicable to Dose Modeling

1. Soil Surface Activities for the Radionuclides of Interest ⁽¹⁾	
Radionuclide	Surface Concentration (pCi/g)
Co-60	60
Cs-137	20
Uranium	1,000

⁽¹⁾ From NUREG-1496, Table C.7.1.2

2. Total and Contaminated Surface Areas for Structures and Soils at Reference Sites ⁽¹⁾							
Reference Facility	Structures Radionuclide Activity ⁽²⁾ , dpm/100 cm ²	Structures Surface Areas				Soil Surface Area, ft ²	
		ft ²		% Contaminated			
		Floor	Wall	Floor	Wall	Total Site	Contaminated
PWR	7.5 x 10 ⁶ Co60 2.4 x 10 ⁶ Cs137	250,000	300,000	10	2	50 x 10 ⁶	3,000
Uranium Fuel Fab	18,000 U	240,000	240,000	50	5	4.7 x 10 ⁶	100,000

(1) The estimated surface areas listed above (reproduced from NUREG-1496, Appendix C) are based on limited information and in many cases represent an engineering judgment based on the size of the building structural facilities and types of operation. These estimates are considered to be conservatively large, i.e., they probably overestimate the actual areas involved.

(2) Radionuclide activity shown is for building surfaces. Radionuclide activity for soil surfaces is given below.

3. Contamination Distribution Used in the GEIS ¹					
Reference Facility	Soil Area	Soil Depth	Soil Volume	Below-Building Soil Depth	Below-Building Soil Volume
	ft ²	cm	m ³	cm	m ³
Nuclear Power Plant	3,000	4 - 100	12 - 250	3 - 21	15 - 100
Uranium Fuel Fabrication	100,000	44 - 300	4,000 - 28,000	18 - 29	82 - 129

⁽¹⁾ From NUREG-1496, Table C.1.10 and C.2.6

4. Example Non-Fuel-Cycle facilities: universities; medical institutions; sealed source manufactures; industrial users of radioisotopes; research and development laboratories; and rare metal refineries.

The sealed source manufactures and R&D laboratories are consolidated into a single analysis. The analysis of the rare metals processing facility is used to represent all other non-fuel-cycle facilities with low to medium to significant contamination.

Materials licensees who use only sealed sources or short-lived radioactive materials are not expected to require decontamination of buildings or soil, and therefore the impacts and costs of decommissioning are expected to be minimal. The GEIS does not include a detailed analysis of these licensees. If a licensee in this category does require more extensive analysis, the applicability of the GEIS should be evaluated by comparison to the other non-fuel-cycle reference facilities based on the radioisotopes and contamination levels involved.

Facility Characteristics Applicable to Dose Modeling

4. Total and Contaminated Surface Areas for Structures and Soils at Reference Sites ⁽¹⁾							
Reference Facility	Structures Radionuclide Activity ⁽²⁾ , dpm/100 cm ²	Structures Surface Areas				Soil Surface Area, ft ²	
		ft ²		% Contaminated			
		Floor	Wall	Floor	Wall	Total Site	Contaminated
Sealed Source Manufacturer	102,000 Co60 33,300 Cs137	6,000	4,600	10	5	40,000	5,000
Rare Metal Extraction	18,000 Thorium	150,000	180,000	40	10	740,000	100,000

(1) The estimated surface areas listed above (reproduced from NUREG-1496, Appendix C) are based on limited information and in many cases represent an engineering judgment based on the size of the building structural facilities and types of operation. These estimates are considered to be conservatively large, i.e., they probably overestimate the actual areas involved.

(2) Radionuclide activity shown is for building surfaces. Radionuclide activity for soil surfaces is shown below.

5. Soil Surface Activities for the Radionuclides of Interest ⁽¹⁾	
Radionuclide	Surface Concentration (pCi/g)
Co-60	60
Cs-137	20
Thorium	200

⁽¹⁾ From NUREG-1496, Table C.7.1.2

6. Contamination Distribution Used in the GEIS ¹					
Reference Facility	Soil Area	Soil Depth	Soil Volume	Below-Building Soil Depth	Below-Building Soil Volume
	ft ²	cm	m ³	cm	m ³
Sealed Source	5,000	4 - 90	20 - 425	3 - 21	0 - 2
Rare Metals Extraction	100,000	10 - 60	1,000 - 5,700	0 - 2	0 - 6
	Slag Pile Volume: 7,000 m ³				

⁽¹⁾ From NUREG-1496, Table C.3.6 and C.4.6

APPENDIX B
ENVIRONMENTAL JUSTICE PROCEDURES

ENVIRONMENTAL JUSTICE IN NMSS NEPA DOCUMENTS

V. BACKGROUND

On February 11, 1994, The President signed Executive Order 12898 "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations" which directs all Federal agencies to develop strategies for considering environmental justice in their programs, policies, and activities. Environmental justice is described in the Executive Order as "identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations." On December 10, 1997, the Council on Environmental Quality (the Council or CEQ) issued, "Environmental Justice Guidance Under the National Environmental Policy Act." The Council developed this guidance to, "...further assist Federal agencies with their National Environmental Policy Act (NEPA) procedures." As an independent agency, the Council's guidance is not binding on the NRC; however, the NRC considered the Council's guidance on environmental justice in this procedure.

VI. POLICY

This procedure provides guidance to the Office of Nuclear Materials Safety and Safeguards (NMSS) staff on conducting environmental justice reviews for proposed actions as part of NRC's compliance with NEPA. This guidance does not create any new substantive or procedural NEPA related requirements. The guidance is merely intended to improve internal NMSS management by helping to ensure that NRC is fully discharging its existing NEPA responsibilities.

It is the policy of NMSS to address environmental justice in every Environmental Impact Statement (EIS) and every supplement to an EIS that is issued by NMSS. Under most circumstances, no environmental justice review should be conducted where an Environmental Assessment (EA) is prepared. If it is determined that a particular action will have no significant environmental impact, then there is no need to consider whether the action will have disproportionately high and adverse impacts on certain populations. However, in special cases or circumstances, the reviewer may recommend to management that staff conduct an environmental justice analysis in preparing an EA. Such determinations will be made on a case-by-case basis and only where there is an obvious potential that the consideration of specific demographic information at the site may identify significant impacts that would not otherwise be considered. Management (Branch Chief level) will decide on a case-by-case basis when special cases or circumstances exist that require the staff to perform an environmental justice review for an EA.

The level of discussion on environmental justice will vary based on the circumstances of each action. The actual determination of impacts will not change, but the evaluation and analysis may be expanded. Each EIS or special case EA should contain a section that fully describes the environmental justice review process. Policy implementation guidance is provided in Section III. for licensing actions and Section IV for rulemakings.

III. POLICY IMPLEMENTATION FOR LICENSING ACTIONS

- E. 1. The first step in evaluating environmental justice potential is to obtain demographic data (census data) for the immediate site area and surrounding communities. Data for the state,

county, and town will also be necessary. The demographic data should consist of income levels and minority breakdown. In our experience, the recommended geographic area for evaluating census data is the census block group. The U.S. Census Bureau does not report information on income for blocks, the smaller geographic area, and census tracts are too large to identify minority or low income communities. A minority or low-income community may be considered as either a population of individuals living in geographic proximity to one another or a dispersed/transient population of individuals (e.g., migrant workers) where either type of group experiences common conditions of environmental exposure. For the purpose of this procedure, minority is defined as individual(s) who are members of the following population groups: American Indian and Alaska Native; Asian; Native Hawaiian and Other Pacific Islander; Black or African American (not of Hispanic or Latino origin); Some Other Race; and Hispanic or Latino (of any race). The 2000 Census introduced the multiracial category. Anyone who identifies themselves as white and a minority will be counted as that minority group. In the small number of cases where individuals identify themselves as more than one minority, count that individual in a "Two or More Races" group. Low-income is defined as being below the poverty level as defined by the U.S. Census Bureau (e.g., the U.S. Census Bureau's Current Population Reports, Series P-60 on Income and Poverty).

Guidelines for determining the area for assessment are provided in the following discussion. If the facility is located within the city limits, a radius of approximately 0.6 miles (1 square mile) from the center of the site is probably sufficient for evaluation purposes; however, if the facility itself covers this much area, use a radius that would be equivalent to approximately 0.6 miles from the site. If the facility is located outside the city limits or in a rural area, a radius of approximately 4 miles³ (50 square miles) should be used. These are guidelines; the geographic scale should be commensurate with the potential impact area, and should include a sample of the surrounding population, e.g., at least several block groups. The goal is to evaluate the "communities," neighborhoods, or areas that may be disproportionately impacted. One source of the census data is the Landview computer software by the U.S. Environmental Protection Agency and the U.S. Department of Commerce, Bureau of the Census. This software is updated after each 10-year census. Other sources include the applicant, local governments, state agencies, or local universities. It is recommended that you utilize the Census Bureau's 10-year census for data on minorities and income level. The reviewer should use the best available information. Present the minority and low-income population data for the block groups, county and state in a table in the EIS or EA.

2. The next step is to compare the area's percentage of minority population to the state and county percentage of minority population and to compare the area's percentage of economically stressed households to the state percentage of economically stressed households. Note that the jurisdiction that the area percentage is compared to is dependent on the geographic area used in describing the demographics. (It is possible that the geographic area could cross county and state lines and this should be considered when making comparisons.) If the area percentage significantly exceeds that of the state or county percentage (or the comparison base used) for either minority population or economically

³Because of the nature of NMSS facilities a 50 mile radius is not automatically required as is the case for NRR facilities.

stressed households, environmental justice will have to be considered in greater detail. As a general matter (and where appropriate), staff may consider differences greater than 20 percentage to be significant. Additionally, if either the minority or low-income population percentage exceeds 50 percent, environmental justice will have to be considered in greater detail. If neither criterion is met, no further evaluation is necessary. The reviewer should document the appropriate conclusion in the environmental justice section.

- B. Staff should look at the demographics of a site early in the review process. Scoping and public participation are a fundamental part of the NEPA process. Staff's approach will depend on the nature of the regulatory action and the demographics at the proposed location. When a potentially affected minority or low-income population is identified, NMSS staff should ensure that minority and low-income populations are given the opportunity to participate. The NRC's regulations require that any affected Indian tribe be invited to participate in the scoping process for an EIS. During scoping meetings for an EIS, for example, staff will solicit input on environmental issues, and the affected communities should be encouraged to develop and comment on possible alternatives to the proposed agency action. As with any scoping activities under NEPA, the measures staff may consider for increasing participation of minority and low-income populations include outreach through groups such as minority business and trade organizations, schools and colleges, labor organizations, or other appropriate groups.

In addition, if a representative(s) of the affected population has been identified such as an officer of an organized local group or community leader, the individual(s) should receive notices of meetings and copies of Federal Register notices.

When communicating with the public, NMSS staff should consider disseminating information through alternative media such as translating notices (and other documents) into a language other than English, where appropriate.

- C. 1. Once it is determined that a site does have a potential for an environmental justice concern, it is then necessary to determine if there is a "disproportionately high and adverse" impact (human health or environmental effect) to the minority or low-income population surrounding the site. Impacts of the proposed action are to be determined in the usual manner, including cumulative and multiple impacts, where appropriate. The impacts should be evaluated to determine those that affect these populations. In considering the impacts to the populations, differential patterns of consumption of natural resources should be considered (i.e., differences in rates and/or pattern of fish, vegetable, water, and/or wildlife consumption among groups defined by demographic factors such as socioeconomic status, race, ethnicity, and/or cultural attributes). The impacts to the local area surrounding the site should be summarized in the environmental justice section. It is not necessary to discuss the impacts at the same level of detail as in the impact sections. It is acceptable to briefly mention the impact and reference the section where it is discussed in greater detail.

Next, one should assess if the impacts disproportionately impact the minority or low-income population, i.e., Are the impacts greater for these populations? Are there any impacts experienced by these populations that are not experienced by others? To effectively visualize the impacts, it may be helpful to display the minority and low-income population

data spatially. In cases where the population is located next to the site, the impacts or potential for impact will likely be disproportionate for these populations. For instance, potential exposure to effluents may be greater to those living closest to the facility, noise and traffic may disrupt nearby residents to a greater extent than those living far from the site, and the potential risk due to accidents may be greater for nearby residents. If there are no disproportionate impacts, no further analysis would be needed. The reviewer should document the finding in the environmental justice section.

2. Finally, it is necessary to determine if the impacts are high and adverse. Another way of stating this: Are the impacts significant, unacceptable or above generally accepted norms such as regulatory limits or state and local statutes and ordinances. Each impact, and where appropriate, the cumulative and multiple effect of the impacts, should be reviewed for significance. If the statement can be made that no combination of the impacts are significant, then there are no disproportionate adverse and high impacts on the minority or low-income populations. The reviewer should document the conclusion in the environmental justice section.
- D. If there are significant impacts to the minority or low-income population, it is then necessary to look at mitigative measures and benefits. The reviewer should determine and discuss if there are any mitigative measures that could be taken to reduce the impact. To the extent practicable, mitigation measures should reflect the needs and preferences of the affected minority or low-income populations. The reviewer should discuss the benefits of the project to surrounding communities, even though benefits to a specific group may be difficult to determine, particularly economic benefits. The conclusion at this point is project specific. The conclusion may be that there are disproportionately high and adverse impacts to minority and low-income populations; however, factors such as the mitigative measures and/or the benefits of a project outweigh the disproportionate impacts. In any case, the facts should be presented so that the ultimate decision maker can weigh all aspects in making the agency decision. The Executive Order does not prohibit taking an action where there are disproportionate high and adverse impacts to minority and low-income populations.
- E. The results of an environmental justice evaluation should be documented in the EIS or special case EA. The results should indicate if a disproportionately high and adverse human health or environmental impact is likely to result from the proposed action and any alternatives, and should be written in non-technical plain language. The document should contain a distinct section on environmental justice even if the demographics do not indicate a potential for an environmental justice concern. If a site has already received an environmental justice evaluation, it is acceptable to reference the previous evaluation and provide a summary of the findings and then add any new information that results from the proposed action. For instance, if environmental justice is included in a license renewal, it would not need to be completely readdressed for a license amendment.

Following an EIS or EA, the NRC announces its decision in a Record of Decision (ROD) or a FONSI. (For NRC, the ROD is the issuance of the license or license amendment.) For an EIS or special case or circumstance EA, the ROD or FONSI should document the conclusion of the findings on environmental justice, including any mitigative measures that will be taken to reduce the impact.

IV. POLICY IMPLEMENTATION FOR RULEMAKING ACTIVITIES

1. The staff responsible for rulemaking should address environmental justice in the preamble to any proposed and final rules that require an EIS, a supplement to an EIS, generic EIS, or if warranted by a special case or circumstance EA/FONSI, as described in Section II., above.
2. If it is known in advance that a particular rulemaking might impact a specific population disproportionately, the NRC staff should ensure that the population knows about the rulemaking and is given the opportunity to participate. Measures to increase public participation are discussed in Section III. B. above.
3. If an environmental justice analysis is performed for a rulemaking activity, the staff should include language contained in NUREG/BR-0053, Revision 4, Section 3.13 and 5.13 to the Federal Register Notice to seek and welcome public comments on environmental justice. The staff should follow the "Policy Implementation for Licensing Actions," in Section III. above, to perform the environmental justice review.
4. Public comments on environmental justice issues should be addressed in the preamble to the final rule when published in the Federal Register. Environmental justice comments should be addressed at the same level of detail and in the same location as comments received on other parts of the rule.
5. When a rule is being modified or developed that contains siting evaluation factors or criteria for siting a new facility, the staff may consider including specific language in the rule or supporting regulatory guidance to state that an environmental justice review will be performed as part of the licensing process.

APPENDIX C

GLOSSARY

GLOSSARY

aquifer—A body of rock or soil that can conduct groundwater and can yield significant quantities of groundwater to wells and springs.

aquifer system—A heterogeneous body of interbedded permeable and poorly permeable material that functions regionally as a water-yielding unit; it comprises two or more permeable beds separated at least locally by confining beds that impede groundwater movement but do not greatly affect the regional hydraulic continuity of the system; includes both saturated and unsaturated parts of permeable material.

archaeological—Of or relating to the scientific study of material remains (as fossil relics, artifacts, and monuments) of past human life and activities.

as low as is reasonably achievable (ALARA)—ALARA (acronym for “as low as is reasonably achievable”) means making every reasonable effort to maintain exposures to radiation as far below the dose limits in 10 CFR Part 20 as is practical consistent with the purpose for which the licensed activity is undertaken, taking into account the state of technology, the economics of improvements in relation to state of technology, the economics of improvements in relation to benefits to the public health and safety, and other societal and socioeconomic considerations, and in relation to utilization of nuclear energy and licensed materials in the public interest (10 CFR 20.1003).

atmospheric diffusion—Refers to the dilution of pollutants in the atmosphere. Diffusion is largely a result of turbulence in the atmosphere and is dependent on the variability characteristics of the wind at the site.

atmospheric dispersion and transport—Refers to the movement or transport of pollutants horizontally or vertically by the wind.

atmospheric stability—An expression of the resistance of the atmosphere to vertical air motion, or dispersion. Stable air resists movement of air upward; unstable conditions result in good vertical dispersion. Atmospheric stability is important to the dispersion and dilution of air contaminants.

atmospheric stagnation—Persistent atmospheric conditions with limited vertical and horizontal air motion, resulting in an increase in the concentration of air contaminants.

benthic—Referring to bottom-dwelling aquatic organisms.

biota—The flora and fauna of an area.

climatology—The scientific study of climates (manifestation of weather) over long periods of time.

cofferdam—(i) A watertight enclosure from which water is pumped to expose the bottom of a body of water and permit construction (as of a pier). (ii) A watertight structure for making repairs below the waterline of a ship.

consumptive use—The total water loss from a water supply or system by evaporation or transpiration from a vegetated or nonvegetated surface, commercial or industrial process, and all domestic and municipal uses. The difference between the quantity of water withdrawn from a source and the quantity returned to the source or another source of usable water.

cumulative effects—See *cumulative impact*.

cumulative impact—The impact on the environment that results from the incremental impact(s) of an action when added to other past, present, and reasonably foreseeable future actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.

dBA (decibel, A-weighted)—A measurement of sound approximately the sensitivity of the human ear and used to characterize the intensity or loudness of sound.

decommissioning—The process of removing from service a facility in which nuclear materials are handled, reducing residual radioactivity to a level that permits release of the property for unrestricted use and termination of the NRC license.

defoliant—A herbicide designed to remove leaves from trees and shrubs or to kill plants.

density-induced current—A gravity-induced flow of one current through, over, or under another, owing to density differences. Factors affecting density differences include temperature, salinity, and concentration of suspended particles.

deposition—Material that is deposited; a deposit or sediment. The laying, placing, or throwing down of any material.

design basis flood—A flood event that is the largest flood against which the various components of a system or facility is protected.

dewatering—Physical removal of water by damming, pumping, diverting, etc.

dewpoint temperature—The temperature at which air becomes saturated with water vapor on being cooled.

dike—An embankment or ridge of either natural or man-made materials used to prevent the movement of liquids, sludges, solids, or other materials.

dredging—Scooping up or excavating (or removing) of earth material or sediment from the bottom of a body of water, raising it to the surface.

ecological—of or pertaining to the environment as it relates to living organisms.

effects—Include (i) direct effect, which are caused by the action and occur at the same time and place; (ii) indirect effects caused by the action and are later in time or farther removed in distance, but still reasonably foreseeable; and (iii) cumulative effects caused by the aggregate effects of past, present, and reasonably foreseeable future actions. Effects and impacts as used in these document are synonymous.

effluent—A liquid discharged as waste, such as contaminated water from a facility.

emission—Gases, particles, or liquids released into the atmosphere from smokestacks, other vents, and surface areas of commercial or industrial facilities.

endangered species—As defined in the Endangered Species Act (16 U.S.C. Section 1532, *Definitions*), an endangered species means any species that is in danger of extinction throughout all or a significant portion of its range other than a species of the Class Insecta determined by the Secretary to constitute a pest whose protection under the provisions of this chapter would present an overwhelming and overriding risk to man.

environmental impact statement—A detailed written statement as required by Section 102(2)(C) of the National Environmental Policy Act.

environmental impact statement (EIS) project manager—The project manager who is responsible for the environmental review and the EIS document. Generally, this individual will be a member of the Environmental and Performance Assessment Branch.

environmental justice—Identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of programs, policies, and activities on minority populations and low-income populations.

environmental monitoring—The process of sampling and analyzing environmental media in and around a facility to (i) confirm compliance with performance objectives and (ii) detect contamination entering the environment to facilitate timely remedial action.

environmental review—The process in which the NRC looks at environmental impacts/concerns and documents this review in a NEPA document.

erosion—The wearing away of land surface by wind or water, intensified by land-clearing practices related to farming, residential or industrial development, road building, or logging.

estuary—Region of interaction between rivers and near-shore ocean waters, where tidal action and river flow create a mixing of fresh and salt water. These areas may include bays, mouths of rivers, salt marshes, and lagoons. These brackish water ecosystems shelter and feed marine life, birds, and wildlife.

facility—The building, structure and all components associated with the applicant/licensee for conducting business. May also include other facilities, as necessary, for cumulative impact assessment.

flood—An event in which a river, lake, ocean, or other water feature to rise above normal limits.

floodplain—The lowland and relatively flat areas adjoining creeks, rivers, lakes, and coastal waters. This includes, at a minimum, that area subject to a 1 percent or greater chance of flooding in any given year. The base floodplain shall be used to designate the 100-yr floodplain (1-percent chance floodplain).

fugitive dust—Particulate matter composed of soil surface; can include emissions from haul roads, wind erosion of exposed soil surfaces, and other activities in which soil is removed or redistributed.

geologic—Of or related to a natural process acting as a dynamic physical force on the Earth (faulting, erosion, mountain building resulting in rock formations, etc.).

geologic repository—A system for disposing radioactive waste in excavated geologic media.

geotechnical—Related to geotechnics, a term currently employed to cover the fields of soil mechanics, rock mechanics, engineering geology, and ground improvement.

groundwater—Water contained in pores or fractures in either the *unsaturated zone* or *saturated zone* below ground level.

habitat—Area in which a plant or animal lives and reproduces.

hazardous material—A substance or material in a quantity and form which may pose an unreasonable risk to health and safety or property when transported in commerce.

hazardous waste—As defined in RCRA (42 U.S.C. Section 6903, *Definitions*), a hazardous waste is a solid waste, or a combination of solid wastes, that because of its quantity, concentration, or physical, chemical, or infectious characteristics may (i) cause, or significantly contribute to an increase in mortality or an increase in serious irreversible, or incapacitating reversible, illness; or (ii) pose a substantial present or potential hazard to human health or the environment when improperly treated, stored, transported, or disposed of, or otherwise managed (40 CFR 261.3).

herbicide—A chemical agent (often synthetic) capable of killing or causing damage to certain plants (usually weeds) without significant disruption of other plants.

hydraulic gradient—Refers to the flow of groundwater. Groundwater flows from areas of higher energy (or hydraulic *head*) to areas of lower hydraulic *head*. The change in hydraulic *head* per unit distance is the hydraulic gradient. Groundwater (and any contaminants moving with it) will flow from upgradient areas to downgradient areas. These terms are analogous to “upstream” and “downstream” flow of surface water.

hydrology—(i) The study of water characteristics, especially the movement of water. (ii) The study of water, involving aspects of geology, oceanography, and meteorology.

impact—The positive or negative effect of an action (past, present, or future) on the natural environment (land use, air quality, water resources, geological resources, ecological resources, aesthetic and scenic resources) and the human environment (infrastructure, economics, social, and cultural). (See *Effects*.)

impoundment—A body of water confined by a dam, dike, floodgate, or other barrier.

inversion—The condition in which air temperature increases with increasing altitude over a certain altitude range. The inversion layer can be at ground level or aloft. The condition results in a layer of warmer air above cooler air, a circumstance that inhibits atmospheric mixing and dispersion of pollutants.

L_{dn} (day-night sound level)—The 24-hr time of day weighted equivalent sound level, in decibels, for any continuous 24-hr period, obtained after addition of ten decibels to sound levels produced in the hours from 10p.m. to 7a.m.

L_{eq} (equivalent sound level)—The equivalent sound level, in decibels of the mean-square A-weighted sound pressure during a stated time period, with reference to the square of the standard reference sound pressure of 20 micropascals. It is the level of the sound exposure divided by the time period.

licensing project manager—The NMSS project manager who has responsibility for licensing the proposed action.

levee—(i) A ridge or embankment of sand and silt, built by a stream on its flood plain along both banks of its channel. (ii) An artificial embankment built along the bank of a watercourse or an arm of the sea, to protect land from inundation or to confine streamflow to its channel.

meteorology—The study of the atmosphere and weather conditions in the atmosphere. Knowledge of this science is required for an understanding of the movement and activities of pollutants released into the atmosphere.

mitigation—Actions and decisions that (i) avoid impacts altogether by not taking a certain action or parts of an action, (ii) minimize impacts by limiting the degree or magnitude of an action, (iii) rectify the impact by repairing, rehabilitating, or restoring the affected environment, (iv) reduce or eliminate the impact over time by preservation and maintenance operations during the life of the action, or (v) compensate for an impact by replacing or providing substitute resources or environments.

mixed waste—a type of waste that contains both hazardous and radioactive source, special nuclear, or byproduct material as defined by the Atomic Energy Act of 1954.

model—A simplified representation of an object or natural phenomenon. The model can be in many possible forms: a set of equations or a physical, miniature version of an object or system constructed to allow estimates of the behavior of the actual object or phenomenon when the values of certain variables are changed. Important environmental models include those estimating the transport, dispersion, and fate of chemicals in the environment.

mrem/yr (millirem per year)—One one-thousandth (0.001) of a *rem* per year.

mSv/yr—One one-thousandth (0.001) of a *sievert* per year.

non-attainment area—An area in which the maximum allowable air concentration of a given pollutant has been reached, therefore additional releases of the pollutant are not permitted.

permeability—The capacity of such media as rock, sediment, and soil to transmit liquid or gas. Permeability depends on the substance transmitted (oil, air, water, etc.) and on the size and shape of the pores, joints, and fractures in the medium and the manner in which they interconnect. “Hydraulic conductivity” means “permeability” in technical discussions relating to *groundwater*.

pH—A number indicating the acidity or alkalinity of a solution. A pH of 7 indicates a neutral solution. Lower pH values indicate more acidic solutions while higher pH values indicate alkaline solutions.

physiochemical—Being physical and chemical. Of or relating to chemistry that deals with the physiochemical properties of substances.

piezometric level—See *potentiometric surface*.

potentiometric surface—(i) The level to which water in a confined aquifer will rise under its own pressure in a borehole, the confining pressure having been removed. (ii) The level to which water will rise in a piezometer (a tube inserted into the ground so that the lower end, with a permeable tip, is at a position from which pre-pressure measurements are required).

preferred alternative—The alternative which the agency believes would fulfill its statutory mission and responsibilities, giving consideration to economic, environmental, technical and other factors. (CEQ's *Forty Most Asked Questions*.)

proposed action—Action under consideration.

radiation—Refers to the process of emitting energy in the form of rays or particles that are released by disintegrating atoms. NRC is responsible for regulating and licensing the use and possession of certain radioactive materials and the resulting radiation from byproduct and special nuclear materials.

radioactive waste—Solid, liquid, and gaseous materials from nuclear operations that are radioactive or become radioactive and for which there is no further use.

radioactivity—A property possessed by some elements, such as uranium, whereby alpha, beta, or gamma rays are spontaneously emitted.

radionuclide—A radioactive atomic nuclide, which is an atomic nucleus specified by atomic weight, atomic number, and energy state.

reasonable alternatives—Those alternatives that are practical or feasible from the technical and economic standpoint and using common sense.

region (socioeconomic)—The relevant region is limited to that area necessary to include social and economic base data for (i) the county in which the proposed facility would be located, and (ii) those specific portions of surrounding counties and urbanized areas from which the construction/refurbishment work force would be principally drawn, or that would receive stresses to community services by a change of residence of construction/refurbishment/decommissioning workers. Other social and economic impacts can generally be presumed to fall within the same area covered by this definition of the region.

rem—Rem is the special unit of any of the quantities expressed as dose equivalent equal to the absorbed dose in rads (rad is the special unit of absorbed dose) multiplied by the quality factor (10 CFR 20.1004).

reservoir—A natural or artificial lake used for the storage of water for industrial and domestic purposes and for the regulation of inland waterway levels. Service reservoirs store water for domestic supply

purposes under cover and regulate diurnal fluctuations in demand. Impounding reservoirs provide storage to cover seasonal or year-to-year variations in inflow. Such reservoirs (feeder reservoirs) may supply water for domestic or industrial use or for regulating water levels in rivers and canals.

saturated zone—The portion of the ground wholly saturated with water.

scope—Consists of the range of actions, alternatives, and impacts to be considered in an EIS.

scoping—An open process for determining the scope of issues to be addressed and for identifying issues related to a proposed action.

sediment—(i) Solid material that has settled down from a state of suspension in a liquid. (ii) Solid fragmental material transported and deposited by wind, water, or ice, chemically precipitated from solution, or secreted by organisms, and that forms in layers in loose unconsolidated form (e.g., sand, mud, till).

seepage—Percolation of water through the soil from unlined canals, ditches, laterals, watercourses, or water storage facilities.

seismicity—A seismic event or activity such as an earthquake or earth tremor; seismic action.

sewage—Wastewater from homes, businesses, or industries.

site—The area of land owned or controlled by the applicant for the principal purpose of constructing and operating a facility. As a general rule, the applicant's "site boundary" should be accepted as defining the site.

sievert (Sv)—The SI unit of radiation dose equivalent, equal to 1 joule of energy per kilogram of absorbing tissue. The sievert replaces the *rem* (1 Sv = 100 rem).

significantly—See definition in 40 CFR 1508.27 in Appendix F.

spoil—(i) The refuse or rubble that accumulates when soil, rock or sand is removed to allow access to mineral deposits. (ii) The material that is removed from a channel when it is dredged.

sole-source aquifer—An aquifer that supplies 50 percent or more of the drinking water of an area.

spawning area—An area used by species for reproduction or deposition of its offspring.

specific yield—The ratio of volume of water which the rock or soil, after being saturated, yields by gravity to the volume of the rock or soil.

storage coefficient—The volume of water an aquifer releases from or takes into storage, per unit surface area of the aquifer per unit change in head.

stratification—The arrangement of the waters of a lake in layers of differing density.

stratigraphy—The study of the formation, composition, and sequence of sediments, whether consolidated or not.

stressor—An agent, condition, or other stimulus that causes stress to an organism or other system.

subsidence—The sudden sinking or gradual downward settling of the Earth's surface with little or no horizontal motion.

suspended load—The part of the total stream load that is carried for a considerable period of time in suspension, free from contact with the stream bed; it consists mainly of clay, silt, and sand.

tectonic—Of or relating to *tectonics*.

tectonics—Geological structural features as a whole. A branch of geology concerned with the structure of the crust of a planet or moon and especially with the formation of folds and faults in it.

unsaturated zone—The area between the surface and the upper limit of the *saturated zone* (water table) where only some of the spaces (fractures and rock pores) are filled with water.

vector—An organism, often an insect or rodent, that carries disease.

vicinity—The surrounding area of the proposed action. Depending on the action and environmental media being considered this can range from less than one mile to 50 miles.

viewshed—The area on the ground that is visible from a specified location.

waste management—All activities associated with the disposition of waste products after they have been generated, as well as actions to minimize the production of wastes. DOE has defined waste management to include waste storage, treatment, and disposal (but not transportation), and the term is used interchangeably with “waste operations” in DOE planning documents.

water quality—(i) The fitness of water for use; and (ii) the physical, chemical, and biological characteristics of water.

water right—A legal right to the use of water.

weathering—The breakdown of rock through a combination of chemical, physical, geological, and biological processes. The ultimate outcome is the generation of soil.

well—An artificial excavation (pit, borehole, tunnel), generally cylindrical in form and often walled in, sunk (drilled, dug, driven, bored, or jetted) into the ground to such a depth as to penetrate water-yielding rock or soil and to allow the water to flow to or be pumped to the surface or recharged into the subsurface; a water well.

wetland—The U.S. Army Corps of Engineers and the EPA define wetlands as those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and

that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas.

wind rose—A graphic display of the distribution of the wind direction at a location during a defined period. It is a set of wind statistics that describes the frequency, direction, force, and speed. The characteristics patterns can be presented in either tabular or graphic forms.

APPENDIX D
EXAMPLE LETTERS AND DOCUMENTS

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MEMORANDUM OF UNDERSTANDING

DRAFT MEMORANDUM OF UNDERSTANDING BETWEEN THE UNITED STATES NUCLEAR REGULATORY COMMISSION AND THE COMMONWEALTH OF PENNSYLVANIA DEPARTMENT OF ENVIRONMENTAL PROTECTION

1. Purpose. This Memorandum of Understanding ("MOU") is intended to provide a framework for voluntary cooperation between the United States Nuclear Regulatory Commission ("NRC") and the Commonwealth of Pennsylvania, Department of Environmental Protection ("DEP") to facilitate the safe and timely remediation and decommissioning of Site Decommissioning Management Plan ("SDMP") and other decommissioning sites in Pennsylvania at which both agencies exercise regulatory authority.

2. Regulatory Authority. The NRC regulates radioactive material and related activities at SDMP sites and licensed nuclear facilities under authority of the Atomic Energy Act of 1954, as amended, 42 U.S.C. § 2011 et seq. The DEP administers and enforces Pennsylvania's environmental statutes, including the Solid Waste Management Act, 35 P.S. § 6018.01 et seq.; the Clean Streams Law, 35 P.S. § 691.1 et seq.; and the Radiation Protection Act, 35 P.S. § 7110.101 et seq.

3. Designation of Site Coordinators. Within ninety (90) days after execution of this MOU, each agency will designate a site coordinator for each SDMP site identified in Appendix A. Each agency shall notify the other, in writing, of the name, address, and telephone and facsimile numbers of each site coordinator. Each agency may also designate coordinators for other decommissioning sites. Any changes in the designation of a coordinator will be communicated in writing to the other agency.

4. Meetings and Conference Calls Between the Agencies. At the request of either agency, with reasonable notice, a meeting or conference call will be scheduled between the site coordinators and other agency representatives to discuss coordination of remediation and decommissioning activities.

5. Technical and Regulatory Consultation. At the request of either agency, with reasonable notice, representatives of each will be made available to discuss technical or regulatory matters pertaining to the SDMP site or other decommissioning sites.

6. Meetings With the Public. Except in response to site emergencies, each agency will notify the other, at least two weeks in advance, of any public meeting related to remediation or decommissioning activities at an SDMP or other decommissioning site.

7. Meetings With Other Regulatory Entities. At its discretion, an agency may invite representatives of the other agency to attend meetings with other regulatory entities who share some responsibility for the SDMP or other decommissioning site. At a minimum, an agency will keep the other agency informed of such meetings and the results of those meetings. It should be noted that the NRC has an Open meeting Policy which would require these meetings to be open to the public because they would almost always involve discussions concerning a specific licensee (Open meeting Statement of NRC Staff Policy, 59 Federal Register 48340, 9/20/94).

8. Notice of Site Inspections. Each agency will make a good faith effort to coordinate routine site inspections of SDMP sites and other decommissioning sites by providing advance notice to the other agency.

9. Dissemination of Information to Other Agencies. As necessary to effectively implement remediation and decommissioning of SDMP and other decommissioning sites, the agencies will coordinate pertinent and appropriate dissemination of information to other Federal, State and local Government agencies.

10. Exchange of Information Between Agencies.

A. The agencies will exchange information concerning the remediation and decommissioning of SDMP or other decommissioning sites as follows:

i. Within two weeks of receipt, the following information will be forwarded from one agency to the other: plans and reports relating to site assessment/characterization; remediation or decommissioning; and all available related analytic data generated through site remediation or decommissioning.

ii. Upon request, NRC will make available to DEP for review and copying any documents disclosable to the public under the Freedom of Information Act, 5 U.S.C. § 552, NRC regulations in 10 CFR Part 9, Public Records, and in 10 CFR Part 2.790, public inspections, exemptions, requests for withholding, and any other applicable Federal statute, regulation, or policy.

iii. Upon request, DEP will make available to the NRC for review and copying any documents disclosable to the public under the Public Right to Know Act, 65 P.S. § 66.1 et seq., DEP's public information policy, and any other applicable Pennsylvania statute, regulation, or policy.

B. All documents exchanged by the agencies will be addressed to the designated coordinator for the SDMP site.

C. Nothing in this MOU shall be construed as compelling either agency to produce information or documents which the agency deems confidential or privileged. If such documents are exchanged, each agency will respect the confidentiality of the information and will make every attempt to avoid disclosure in accordance with administrative procedures.

11. Disclosure of Information to the Public. The right of access by the public to information under Federal and State law, regulation, or policy is not affected by this MOU.

12. Review and Comment on Documents.

A. Each agency should expeditiously forward drafts of documents it has prepared, or copies of documents received from third persons which potentially impact remediation of hazards under the other agency's jurisdiction, to solicit the other agency's review and comments.

B. The agency requesting comments will specify the date by which a response is needed. The review and comments should be completed in a reasonable time (or approximately 30 days).

C. Comments will be returned within the specified response period. In cases where there are no comments, that information will be provided within the response period.

D. Requests for comments or responses will be addressed to the agency's site coordinator.

E. Final agency decisions and documents potentially impacting remediation of hazards under the other agency's jurisdiction will be transmitted by facsimile the same day these documents are sent to the facility management or released to the public.

13. Modifications. Any modifications or changes to this MOU shall only be effective if agreed to by the parties and set forth in writing as an amendment of this MOU.

14. Reservation of Rights. Nothing in this MOU shall affect the rights, duties and authority of either agency under the law. The agencies reserve their respective authority and rights to take any enforcement action which they deem necessary to fulfill their duties and responsibilities under the law.

15. Non-binding Memorandum. This memorandum is not intended to and does not create any contractual rights or obligations with respect to the NRC, DEP, or any other parties.

Carl J. Paperiello, Director
Office of Nuclear material Safety
and Safeguards
U.S. Nuclear Regulatory Commission
Washington, D.C.

Date

James W. Rue, Deputy Secretary
Air, Recycling and Radiation Protection
Commonwealth of Pennsylvania
Department of Environmental Protection
Harrisburg, PA

Date

SAMPLE LETTER OF AGREEMENT

LETTER OF AGREEMENT

This is to confirm the general agreement reached during a September 23, 1987 meeting between the U.S. Nuclear Regulatory Commission staff and two agencies of the State of New York, the Department of Labor and the Department of Environmental Conservation, regarding jurisdiction over activities at the Cintichem, Inc. facility in Tuxedo, New York and the impact of that jurisdiction on inspection and enforcement activities conducted by the respective agencies. As a result of that meeting and previous discussions, the agencies agreed that there was a need to formalize the understanding of NRC and State of New York jurisdiction at the Cintichem site and to establish a procedure for the interaction and coordination between the respective agencies on inspection and enforcement activities.

A. With regard to statutory authority it is understood that:

- (1) The NRC has exclusive jurisdiction over the Cintichem research reactor pursuant to 10 CFR Part 50 and NRC License No. R-81;
- (2) The possession and use of special nuclear material outside of the research reactor is covered by NRC License No. SNM-639 and is also under the exclusive jurisdiction of the NRC. This jurisdiction extends to any area of the Cintichem site where SNM is possessed or used.
- (3) The State of New York, through an agreement between the NC and the State pursuant to Section 274 of the Atomic Energy Act, has exclusive jurisdiction over the possession and use of byproduct material anywhere on the Cintichem site, exclusive of the reactor; and
- (4) Nothing in this Letter of Agreement changes or modifies in any way the statutory jurisdiction of the NRC and the State of New York.

B. Given the aforementioned jurisdictions, the following has been agreed to regarding inspection activities.

- (1) Reactor operations authorized under NRC License R-81 will continue to be inspected exclusively by NRC;
- (2) The possession and use of byproduct material under New York State License Number 729-0322, such as the production of

radiopharmaceuticals where the presence of SNM is not expected, will continue to be inspected exclusively by the State; and

- (3) The remaining areas of the Cintichem site, where the use of byproduct material under State license and special nuclear material under NRC License SNM-639 is not physically separable, will be subject to inspection by both the NRC and the State. Each of the three agencies will enforce their respective regulations, as applicable.

C. We further agree that, with respect to situation B.(3) above, the following procedures will govern the activities with regard to onsite inspections:

- (1) Each of the three agencies will notify the others of their intent to conduct an inspection at the Cintichem facility;
- (2) Each of the three agencies reserves the right to accompany the agency conducting the inspection, on the inspection;
- (3) The three agencies will coordinate enforcement actions on a case-by-case basis in order to minimize duplication or inconsistent inspection findings, citations, orders, civil penalties, etc., in areas of dual responsibility. Each of the three agencies reserves the right to pursue further enforcement action if it is required by law or otherwise deemed necessary; and
- (4) Copies of licensee responses to enforcement actions by the agency conducting the inspection will be provided to each of the other agencies. The three agencies will make a good faith, best efforts attempt to come to timely agreement as to the acceptability of the licensee's corrective actions. However, the agency conducting the inspection will have final responsibility for the acceptability of the corrective actions. Each agency reserves the right to obtain additional information from the licenses as permitted by law, if required or otherwise deemed necessary by that agency.

FOR THE U.S. NUCLEAR REGULATORY COMMISSION

Malcolm R. Knapp, Director Date
Division of Radiation Safety and Safeguards

FOR THE NEW YORK STATE DEPARTMENT OF LABOR

Francis J. Bradley
Principal Radiophysicist

Date

FOR THE NEW YORK STATE DEPARTMENT OF
ENVIRONMENTAL CONSERVATION

N. G. Kaul, Director
Division of Hazardous Substances Regulation

Date

ENDANGERED SPECIES CONSULTATION LETTERS

October 17, 1995

Carol Copeyon
U.S. Fish and Wildlife Service
315 South Allen Street
Suite 322
State College, PA 16801

Dear Carol Copeyon:

Re: Informal Section 7 consultation for proposed decommissioning of Parks Shallow Land Disposal Area in Parks Township, Armstrong County, PA

The NRC has received a proposal from Babcock and Wilcox (B&W), the licensee of the Parks Shallow Land Disposal Area (SLDA) located in Parks Township, Armstrong County, Pennsylvania to decommission the SLDA by stabilization of the waste on site in the trenches where it is currently located. The NRC is preparing an Environmental Impact Statement (EIS) on the proposed decommissioning action in accordance with the National Environmental Policy Act (NEPA) and the NRC's regulations implementing NEPA. In order to coordinate NEPA implementation with that required by Section 7 of the Endangered Species Act (ESA), this letter requests information for informal Section 7 consultation.

The SLDA is currently undergoing characterization in preparation for decommissioning because the industrial source of the wastes buried in the SLDA has ceased operations. The site has not been used for waste disposal since 1970. Based on available records, the wastes buried in the SLDA trenches consist of process wastes, scrap, and trash. The radioactive materials in the SLDA trenches include natural, enriched, and depleted uranium and lesser quantities of thorium.

The Parks SLDA is located near Leechburg in Armstrong County, Pennsylvania, approximately 37 km (23 miles) east-northeast of Pittsburgh on a hillside near the Kiskiminetas River. (See Figure 1.) The SLDA consists of ten waste disposal trenches comprising a total area of approximately 0.5 ha (1.2 acres) surrounded by a 16-ha (40-acre) fenced buffer area within a 45.5-ha (114-acre) area owned by B&W. The 16-ha (40-acre) fenced area consists principally of open field, with a wooded strip running along most of the northern boundary. A small intermittent stream on the north side of the site collects surface runoff from the site and several groundwater seeps along the hillside. The enclosed figures show the general features of the site (Figure 2) and the probable locations of waste materials on the site (Figure 3).

Land use in the vicinity of the site is a mix of agriculture and industry. In the immediate area there are scattered existing and newly developing residential areas and some idle farm and timber land. Vacant land owned by B&W bounds the fenced site on the northeast, and two wooded privately owned parcels adjoin the site on the southeast.

The action proposed by the licensee is the stabilization in place of the radioactive wastes contained in the trenches using an engineered cover and a system of hydrologic barriers and controls surrounding the trench areas to provide groundwater protection. Alternatives to be analyzed in the EIS include the same stabilization in place but with the addition of coal mine stabilization; excavation, treatment, and then stabilization of the wastes on site in a newly constructed disposal cell; excavation, treatment, and then shipment of the wastes to off-site facilities licensed for disposal; and no action. The no action alternative is not a viable alternative because it does not meet the NRC's requirements for decommissioning; it is analyzed simply to provide a baseline for comparison with the other alternatives.

In an Environmental Assessment (EA) prepared in September 1993 for a license renewal application, the following listed species were identified whose range includes the Parks SLDA: sloe or Allegheny plum (*Prunus allegheniensis*), southern bald eagle (*Haliaeetus leucocephalus leucocephalus*), American peregrine falcon (*Falco peregrinus anatum*), Kirkland's warbler (*Dendroica kirklandi*), and the Indiana bat (*Myotis sodalis*). Because of the development in the area and the past use of the site, the EA concluded that it was highly unlikely that any of those species were present on the site.

Please let me know of any information on listed and proposed threatened and endangered species, status review (i.e., candidate) species, proposed and designated critical habitats, wetlands, or cumulative effects which might affect our assessment. Thank you for your help. If you have any questions, please feel free to call me at 423-574-7315.

Sincerely,

Martha S. Salk, Ph.D.
Research Staff
Oak Ridge National Laboratory

Enclosures

cc: H. M. Astwood
J. A. Dickerman
J. T. Enslinger

March 21, 1996

Dr. Calvin DuBrock, Director
Bureau of Wildlife Management
Pennsylvania Game Commission
2001 Elmerton Ave.
Harrisburg, PA 17110-9797

Dear Dr. DuBrock:

I was referred to you by others in the Game Commission for help in obtaining information on state-listed sensitive wildlife and other fauna in the vicinity of a shallow land disposal facility in western Pennsylvania. I would greatly appreciate a search of your data bases or other information resources for information on sensitive or other important species on or near the site and environs of a shallow land disposal area in west Armstrong County about 1 km east of Leechburg, Pennsylvania, immediately adjacent to the north boundary of the village of Kiskimere, and immediately east of the Kiskiminetas River, as shown on the enclosed map derived from adjoining segments of the Leechburg and Vandergrift USGS 7.5-min topographical quadrangles. The area of concern is the 40-acre Parks Township shallow land disposal area that has been proposed for remediation, and the surrounding lands, wetlands, and surface waters (especially the Kiskiminetas River and Carnahan Run) up to about 1-2 km from the site. The actual area of the disposal trenches (some containing low level radiological waste) is about 1.2 acres. Information on habitat preferences/requirements of species that may reside in the area is also desired if available.

Thank you for your help.

Sincerely yours,

Gerald K. Eddlemon
Environmental Sciences Division
Oak Ridge National Laboratory

Enclosures

U.S. Fish and Wildlife Service
Attn: Michael Bartlett
22 Bridge Street
Concord, NH 03301

**SUBJECT: REQUEST FOR COMMENTS REGARDING ENDANGERED/THREATENED
SPECIES AND CRITICAL HABITAT FOR THE HADDAM NECK POWER PLANT LICENSE
TERMINATION PLAN**

Dear Mr. Bartlett,

The U.S. Nuclear Regulatory Commission's (NRC's) staff is requesting the U.S. Fish and Wildlife Service's comments regarding impacts to endangered and threatened species and critical habitat at the Haddam Neck Power Station. This letter is in follow-up to the phone conversation on November 21, 2000, between Michael Amaral of the FWS and Matt Blevins of the NRC's environmental review staff. As discussed, the NRC is considering Connecticut Yankee Atomic Power Company's (the licensee) request for license termination at the Haddam Neck Power Station. The Haddam Neck Power Station was licensed to generate power by the NRC under License Number DPR-61 from 1967 until 1996 when fuel was permanently removed from the reactor and the reactor was shut-down. The Haddam Neck site is located approximately 21 miles south-southeast of Hartford, CT on the east bank of the Connecticut River, Middlesex County. A site location map is provided in the attachment.

The licensee, in accordance with NRC decommissioning regulations, has submitted a License Termination Plan (LTP) for NRC approval. The LTP documents the actions that the licensee plans to undertake to decontaminate and decommission the Haddam Neck site. Principal decommissioning activities are dismantlement and decontamination of existing structures, excavation and remediation of contaminated soils in and around the plant structures, and off-site disposal of low-level radioactive waste. The licensee proposes to complete decommissioning of the facility by reducing residual radioactivity to levels that permit unrestricted release of the site as defined in the Code of Federal Regulations at 10 CFR 20.1402. Additional details on decommissioning activities and the site environment are provided in the attachment.

The LTP is currently being reviewed by NRC staff in order to assure compliance with NRC's environmental health and safety regulations. As part of the review, the NRC is required to complete an environmental assessment (EA) associated with the acceptance and approval of the LTP. The NRC requests your assistance in completing this EA.

The licensee stated that it has reviewed the state Natural Diversity Data Base and performs field walkdowns in decommissioning areas to verify that endangered or threatened species are not present. The licensee has also stated that decommissioning will minimize radiological

sources, eliminate thermal impact to the Connecticut River, reduce noise levels, and result in removal of hazardous materials and chemicals.

The NRC wishes to receive your comments regarding the presence of any endangered or threatened species or critical habitat that may exist at the Haddam Neck site. Also, the NRC would like to receive your comments regarding any impacts to relevant species or habitat that you identify from decommissioning the Haddam Neck site for incorporation into the EA. If impacts are identified, please provide acceptable measures to avoid or mitigate impacts.

If you have any comments regarding the NRC's license termination review at the Haddam Neck site, please provide them within 30 days so they may be fully considered. If you require additional information please contact Ronald Uleck at (301) 415-6722 or Matt Blevins at (301) 415-7684. Thank you for your assistance.

Sincerely,

Charlotte E. Abrams, Chief
Environmental and Low-Level Waste Section
Environmental and Performance Assessment
Branch
Division of Waste Management
Office of Nuclear Material Safety
and Safeguards

Docket No: 50-213
License No: DPR-61

cc: Dr. Edward L. Wilds, Jr., Director
Division of Radiation
Department of Environmental Protection
79 Elm Street
Hartford, CT 06106-5127

SHPO CONSULTATION LETTERS

Mr. Jim Dykman
Utah State Historic Preservation Office
300 Rio Grande
Salt Lake City, Utah 84101
(801) 533-3555

SUBJECT: REQUEST FOR COMMENTS REGARDING CULTURAL AND HISTORICAL
RESOURCES FOR THE PROPOSED SHOOTARING CANYON
RECLAMATION PLAN

Dear Mr. Dykman:

Plateau Resource Limited (PRL) has applied to the U.S. Nuclear Regulatory Commission (NRC) for a license amendment for the approval of a reclamation and decommissioning plan at the Shootaring Canyon Uranium Mill site in Garfield County, near Ticaboo, Utah. The PRL site is licensed by the NRC under Source Materials License SUA-1371 to possess byproduct material in the form of uranium waste tailings, as well as other radioactive waste generated by milling operations. However, under the current license, PRL is not authorized to produce uranium concentrate. The tailings and wastes referred to above were generated during the three months in 1982 in which the mill was operated. The mill has been on standby since that time, because of low demand for yellowcake.

The reclamation plan, dated December 18, 1996, was submitted for NRC approval on January 10, 1997. The plan is to be implemented after operations of the mill have come to a close and the site is ready to be decommissioned and the tailings reclaimed. The plan includes cover and stabilization for the tailings area, removal of mill structures and the re-grading of disturbed areas, replacement of stockpiled topsoil in selected areas for plant growth, and the re-vegetation of disturbed areas using native and introduced species. The plan is being reviewed by NRC staff in order to assure compliance and quality of reclamation. As part of that review, the NRC is required to complete an Environmental Assessment (EA) associated with the acceptance of the reclamation plan. The NRC requests your assistance in completing this EA.

The following paragraphs concerning historical and cultural resources were taken from the NRC EA associated with license renewal (Section 4.3 of the EA).

An historical survey was conducted in the project vicinity as part of the initial application, and no historical sites within 8 km (5 miles) of the site were identified. As noted previously in the Final Environmental Statement, only a small area of lithic scatter was identified prior to construction, and the artifacts were salvaged by the State of Utah.

The NRC determined, in consultation with the State Historical Preservation Officer (SHPO) that the project will not affect any properties included in or eligible for inclusion in the National Register (NRC, 1979, a).

The licensee will continue to be required to conduct, as a minimum, an archaeological artifact survey of areas not previously surveyed prior to their disturbance.

The above information will be used in the EA for the reclamation plan, unless any new information is found regarding this site. If you have any comments or questions regarding this request, please contact Kim Campbell, at (301) 415-6251 or kxc1@nrc.gov. A response within 30 days of receipt of this letter is appreciated. Thank you.

Sincerely,

N. King Stablein, Acting Chief
Uranium Recovery Branch
Division of Waste Management
Office of Nuclear Material Safety
and Safeguards

Docket No.: 40-8698
License No.: SUA-1371

cc K. Webber, PRL

Connecticut Historical Commission
Attn: Dave Poirier
59 South Prospect Street
Hartford, CT 06106

**SUBJECT: REQUEST FOR COMMENTS REGARDING CULTURAL AND HISTORICAL
RESOURCES FOR THE HADDAM NECK POWER PLANT LICENSE TERMINATION PLAN**

Dear Mr. Poirer,

The U.S. Nuclear Regulatory Commission's (NRC's) staff is requesting the Connecticut Historical Commission's comments regarding impacts to cultural and historical resources at the Haddam Neck Power Station. This letter is in follow-up to the phone conversation on November 16, 2000, with Matt Blevins of the NRC's environmental review staff. As discussed, the NRC is considering Connecticut Yankee Atomic Power Company's (the licensee) request for license termination at the Haddam Neck Power Station. The Haddam Neck Power Station was licensed to generate power by the NRC under License Number DPR-61 from 1967 until 1996 when fuel was permanently removed from the reactor and the reactor was shut-down. The Haddam Neck site is located approximately 21 miles south-southeast of Hartford, CT on the east bank of the Connecticut River in Middlesex County. A site location map is provided in the attachment.

The licensee, in accordance with NRC decommissioning regulations, has submitted a License Termination Plan (LTP) for NRC approval. The LTP documents the actions that the licensee plans to undertake to decontaminate and decommission the Haddam Neck site. Principal decommissioning activities are dismantlement and decontamination of existing structures, excavation and remediation of contaminated soils in and around the plant structures, and off-site disposal of low-level radioactive waste. The licensee proposes to complete decommissioning of the facility by reducing residual radioactivity to levels that permit unrestricted release of the site as defined in the Code of Federal Regulations at 10 CFR 20.1402. Additional details on decommissioning activities and the site environment are provided in the attachment.

The LTP is currently being reviewed by NRC staff in order to assure compliance with NRC's environmental health and safety regulations. As part of the review, the NRC is required to complete an environmental assessment (EA) associated with the acceptance and approval of the LTP. The NRC requests your assistance in completing this EA.

The licensee has stated that it is working with Connecticut Historical Commission archeologists to preserve the historic Venture Smith home site on the licensee's property. The NRC wishes to receive your comments regarding any historical and cultural resource impacts that may occur from decommissioning the Haddam Neck Power site for incorporation in the EA. If impacts are identified, please provide acceptable measures to avoid or mitigate impacts.

If you have any comments regarding the NRC's license termination review at the Haddam Neck site, please provide them within 30 days so they may be fully considered. If you require additional information please contact Ronald Uleck at (301) 415-6722 or Matt Blevins at (301) 415-7684. Thank you for your assistance.

Sincerely,

Charlotte E. Abrams, Chief
Environmental and Low-Level Waste Section
Environmental and Performance Assessment
Branch
Division of Waste Management
Office of Nuclear Material Safety
and Safeguards

Docket No: 50-213
License No: DPR-61

cc: Dr. Edward L. Wilds, Jr., Director
Division of Radiation
Department of Environmental Protection
79 Elm Street
Hartford, CT 06106-5127

REQUEST TO POTENTIAL COOPERATING AGENCY

August 31, 2000

Mr. Richard Boyle
Department of Transportation, Room 8422
400 Seventh Street, S.W.
Washington, DC 20590

SUBJECT: NATIONAL ENVIRONMENTAL POLICY ACT COOPERATING AGENCY FOR
SEQUOYAH FUELS

Dear Mr. Boyle:

I am inviting you, as a representative of your organization, to participate in the preparation of an Environmental Impact Statement (EIS) regarding the Sequoyah Fuels Corporation (SFC) uranium conversion facility near Gore, Oklahoma. From 1970 to 1993, SFC operated a uranium conversion facility to convert uranium oxide (yellowcake) to uranium hexafluoride; a second process to convert depleted uranium hexafluoride to depleted uranium tetrafluoride was started in 1987. These operations contaminated the Gore site with the radioactive materials uranium, radium, and thorium. In 1993, the U.S. Nuclear Regulatory Commission (NRC) listed the SFC facility in the Site Decommissioning Management Plan (57 FR 13389, April 16, 1992), because the NRC determined the site warranted special attention by the NRC to ensure timely and safe decommissioning.

SFC proposes to construct an on-site disposal cell for all remaining waste to satisfy the NRC's decommissioning requirements. The enclosed Notice of Intent describes NRC's intent to prepare an EIS. The NRC conducted a public scoping meeting in Gore, Oklahoma, in November 1995 to solicit public input on the scope of the EIS and published a scoping report in 1997. Another public outreach meeting is planned for October 17, 2000, in Webbers Falls, Oklahoma to share information concerning the status of the environmental review and obtain public input on the scope of the environmental review.

The NRC has identified a number of sites which are currently in the decommissioning process and which may necessitate license termination under restrictive conditions. These sites are listed in the enclosure. Due to the long-term impacts on land use, an EIS will be developed to fulfill our National Environmental Policy Act responsibilities at each of these sites. In the EIS, in addition to the licensee's preferred alternative of on-site disposal, another alternative is to dispose of the material off-site. This alternative requires an analysis of both local transportation impacts and potential transportation impacts in shipping the waste cross-country to a licensed disposal site.

Since there will be an analysis of potential transportation impacts, the NRC is inviting the Department of Transportation (DOT) to become a cooperating agency in the development of the Sequoyah Fuels EIS. The NRC regulations define "cooperating agency" as any Federal agency, other than the NRC, which has jurisdiction by law or special expertise with respect to

any environmental impact involved in a proposal (or reasonable alternative) for major Federal actions significantly affecting the quality of the human environment (10 CFR 51.14).

Participating as a cooperating agency would keep the DOT apprized of the issues associated with site remediation and provide a mechanism for the DOT to contribute its expertise to the review process, as well as ensure effective communication between our agencies.

We would like to meet with you at your earliest opportunity to discuss this invitation to become a cooperating agency for the Sequoyah Fuels EIS and for other restricted use sites. Please feel free to call me at 301-415-7238 or Phyllis Sobel at 301-415-6714.

Sincerely,

Thomas Essig, Chief **/RA/**
Environmental and Performance
Assessment Branch
Office of Nuclear Material Safety
and Safeguards

Enclosures: 1. Notice of Intent
2. Site Decommissioning Management Plan
Sites That Plan to Apply for Restricted Use
and Require Long-Term Stewardship,
Including Institutional Controls

NOTICE OF INTENT (NOI)

NUCLEAR REGULATORY COMMISSION

Notice of Intent to Prepare an Environmental Impact Statement for the Mixed Oxide Fuel Fabrication Facility

AGENCY: United States Nuclear Regulatory Commission

ACTION: Notice of Intent (NOI)

SUMMARY: The U.S. Nuclear Regulatory Commission (NRC) announces its intent to prepare an Environmental Impact Statement (EIS) for construction, operation and deactivation of a proposed Mixed Oxide (MOX) Fuel Fabrication Facility (Facility) to be constructed at the Department of Energy's (DOE) Savannah River Site (SRS) in South Carolina. The EIS is being prepared pursuant to the National Environmental Policy Act (NEPA) and will examine the potential environmental impacts of manufacturing MOX fuel from surplus weapons plutonium. The MOX fuel is eventually planned to be used in two existing domestic commercial reactors, thus helping to ensure that plutonium produced for nuclear weapons and declared excess to national security needs is converted to forms that are inaccessible and unattractive for nuclear weapons.

TENTATIVE DATES; FUTURE NOTICES OF OPPORTUNITY FOR HEARINGS: The public scoping process required by NEPA begins with publication of this NOI in the Federal Register and continues until May 21, 2001. Written comments submitted by mail should be postmarked by that date to ensure consideration. Comments mailed after that date will be considered to the extent practical. However, this May 21 date, and the proposed meeting dates listed below, are subject to change for the following reasons. The NRC is presently conducting its initial administrative acceptance review of the construction authorization request (CAR) regarding the MOX Facility. Following the acceptance review (if the CAR is acceptable), a detailed technical review of the CAR begins. The CAR was submitted to the NRC on February 28, 2001, by DCS (a consortium formed by Duke Engineering & Services, COGEMA, Inc., and Stone and Webster), the engineering firm which, if NRC grants approval, would build the MOX Facility. The acceptance review of the CAR is expected to take 30 days to complete. If the CAR is accepted and formally docketed, the EIS scoping process will continue. If, for any reason, the CAR is not accepted and formally docketed, the scoping process will be suspended, and a notice postponing the meetings listed below will be published in the Federal Register. Additionally, if the CAR passes the acceptance review, a notice of opportunity for hearing regarding the CAR will be published in the Federal Register.

DCS plans to submit to the NRC a separate license application requesting authority to operate the MOX Facility. This DCS request, which would also be subject to the NRC's acceptance review procedures, is expected in the summer of 2002. If this request is accepted and formally docketed, another notice of opportunity for hearing regarding operating authority would then be published in the Federal Register.

NRC will conduct public scoping meetings to assist it in defining the appropriate scope of the EIS, including the significant environmental issues to be addressed. NRC plans to hold scoping meetings in April 2001. Please note that meeting attendees will be requested to participate in the scoping process through small working groups within the larger meeting setting. (See Section entitled Scoping Meeting Format, below, for more details.) To effectively plan for this type of meeting, NRC staff will need to know how many participants to expect. If you do plan to attend any or all of the meetings, please help us by registering ahead of time. Contact information for registration is provided below in the section "Addresses." The meeting dates, times and locations are listed below. Prior to the Scoping Meetings, NRC staff will be available to informally discuss the MOX project and answer questions in an "open house" format.

April 17, 2001

North Augusta Community Center
496 Brookside Drive
North Augusta, SC

Scoping Meeting Time: 7:00 p.m. to 10:00 p.m.

Open House Time: 5:30 p.m. to 7:00 p.m.

April 18, 2001

Georgia Coastal Center
305 Martin Luther King Boulevard
Savannah, GA

Scoping Meeting Time: 7:00 p.m. to 10:00 p.m.

Open House Time: 5:30 p.m. to 7:00 p.m.

ADDRESSES: To register for a meeting, to provide comments or suggestions on the scope of the EIS, or to make requests for special arrangements to enable participation at scoping meetings (e.g., an interpreter for the hearing impaired), please contact: Tim Harris at (301) 415-6613 or Betty Garrett at (301) 415-5808.

FOR FURTHER INFORMATION CONTACT: For general or technical information associated with the license review of the MOX Facility, please contact: Tim Johnson at (301) 415-7299 or Drew Persinko at (301) 415-6522. For general information on the NRC NEPA process, please contact: Jennifer Davis at (301) 415-5874 or Tim Harris at (301) 415-6613.

AVAILABILITY OF DOCUMENTS FOR REVIEW:

Information and documents associated with the MOX project, including the DCS Environmental Report submitted in December 2000, and the CAR, may be obtained from the internet on NRC's MOX web page: <http://www.nrc.gov/NRC/NMSS/MOX/index.html> (case sensitive). In addition, documents are available for public review through our electronic reading room: <http://www.nrc.gov/NRC/ADAMS/index.html>. Documents may also be obtained from NRC's Public Document Room at U.S. Nuclear Regulatory Commission, Public Document Room, Washington, D.C. 20555.

DCS states that some of the detailed technical material in the CAR is confidential information which should be withheld from public disclosure. DCS has submitted an affidavit with its CAR, in support of its confidentiality statement. Until the NRC makes a determination as to whether

the information at issue can be properly withheld, the publicly available copy of the CAR will be an edited version.

SUPPLEMENTARY INFORMATION:

Background: In January 2000, the DOE issued its Record of Decision (ROD) for the Surplus Plutonium Disposition Final EIS [65 FR 1608]. The fundamental purpose of the DOE program is to ensure that plutonium produced for nuclear weapons and declared excess to national security needs is converted to forms that are inaccessible and unattractive for nuclear weapons. In its ROD, DOE announced that it had decided to use two approaches for the disposition of surplus weapons plutonium, and that the facilities would be located at its SRS. The first approach is immobilization of approximately 8.4 metric tons of surplus plutonium. The immobilization will consist of placing the weapons-grade plutonium into canisters that will be filled with vitrified glass from the SRS high-level waste tanks. The second approach will convert up to 25.6 metric tons of surplus plutonium into MOX nuclear reactor fuel. (The scoping process discussed in this notice is focused on this second approach.) A third facility to disassemble the plutonium pits (the current form) and convert the recovered plutonium into plutonium dioxide suitable for disposition will also be located at SRS, but will not be reviewed by NRC and is not included in this scoping meeting.

The DOE has selected DCS to provide the MOX fuel fabrication and reactor irradiation services. DCS submitted its Environmental Report for MOX fuel fabrication to NRC on December 19, 2000. DCS submitted its CAR to NRC on February 28, 2001. NRC will evaluate the potential environmental impacts associated with MOX fuel fabrication in parallel with the review of the CAR. This evaluation will be documented in draft and final Environmental Impact Statements in accordance with NEPA and NRC's implementing regulations at 10 CFR Part 51.

MOX Fuel Fabrication at SRS (New Construction)

The MOX Facility, if licensed, would produce completed MOX fuel assemblies for use in two domestic, commercial nuclear power reactors. Feed materials would be plutonium dioxide from the pit conversion facility at SRS, and uranium dioxide made from either the DOE stockpile of depleted uranium hexafluoride from another DOE site, or another source selected by DCS and approved by DOE. MOX fuel fabrication involves purification of the plutonium dioxide to remove other metals present in the weapons pit; blending the plutonium dioxide with depleted uranium dioxide; pressing the mixed oxide into pellets; sintering the pellets; loading the pellets into fuel rods; and assembling the fuel rods into fuel assemblies. Once assembled, the fuel assemblies would be transported to a domestic, commercial reactor for use. (The McGuire and/or the Catawba nuclear power plants near Charlotte, NC, have been tentatively selected.) Following irradiation to generate electric power, the MOX fuel would be removed from the reactor, and managed at the reactor site as spent nuclear fuel. Final disposition would be at a geologic repository in accordance with the Nuclear Waste Policy Act.

Purpose and Need for Agency Action

On October 17, 1998, Congress amended Section 202 of the Energy Reorganization Act, giving licensing authority to the NRC regarding any MOX Facility to be built (42 U.S.C. 5842(5)). Accordingly, in order for DCS to construct and operate the MOX Facility, it must be licensed/authorized by the NRC. Such action would be a major federal action, thus requiring NRC, pursuant to NEPA, to prepare an EIS for construction, operation and deactivation of the MOX Facility. The EIS will consider facility-specific environmental impacts (an earlier EIS prepared by DOE addressed generic impacts) associated with constructing and operating the

MOX Facility. The EIS prepared by NRC will also consider indirect effects from MOX fuel fabrication, such as transportation to the domestic, commercial reactors, MOX fuel use in those reactors, and eventual spent fuel disposal.

Alternatives to be Evaluated

No Action -- Do Not Issue Construction Authorization for MOX Fuel Fabrication Facility at SRS

Alternative 1 -- Issue Construction Authorization for MOX Fuel Fabrication Facility at SRS

Note that NRC is limited to issuing or denying the construction authorization and/or license to operate the MOX Facility at SRS. The DOE has already decided to pursue the two disposition approaches for surplus weapons plutonium, and has already decided to site the MOX Facility at SRS. These decisions will not be revisited by NRC. Other alternatives not listed here may be identified through the scoping process.

Environmental Impact Areas to be Analyzed

The following areas have been tentatively identified for analysis in the EIS. This list is neither intended to be all inclusive, nor is it a predetermination of potential environmental impacts. The list is presented to facilitate comments on the scope of the EIS. Additions to, or deletions from this list may occur as a result of the public scoping process.

- Health and Safety: potential public and occupational consequences from construction, routine operation, transportation, and credible accident scenarios;
- Waste Management/Pollution Prevention: types of wastes expected to be generated, handled, and stored; pollution prevention opportunities and the potential consequences to public safety and the environment;
- Hazardous Materials: handling, storage and use; both present and future;
- Background Radiation: cosmic, rock, soil, water, and air and the potential addition of radiation;
- Water Resources: surface and groundwater hydrology, water use and quality, and the potential for degradation;
- Air Quality: meteorological conditions, ambient background, pollutant sources, and the potential for degradation;
- Earth Resources: physical geography, topography, geology and soil characteristics;
- Land Use: plans, policies and controls;
- Noise: ambient, sources, and sensitive receptors;
- Ecological Resources: wetlands, aquatic, terrestrial, economically and recreationally important species, and threatened and endangered species;
- Socioeconomic: demography, economic base, labor pool, housing, transportation, utilities, public services/facilities, education, recreation, and cultural resources;
- Natural Disasters: floods, hurricanes, tornadoes, and seismic events;
- Cumulative Effects: impacts from past, present and reasonably foreseeable actions at, and near the site(s);
- Indirect Effects: transportation to the domestic, commercial reactors, MOX fuel use in those reactors, and eventual spent fuel disposal;
- Unavoidable Adverse Impacts;
- Natural and Depletable Resources: requirements and conservation potential; and

- Environmental Justice: any potential disproportionately high and adverse impacts to minority and low-income populations.

Alternatives other than those presented in this document may warrant examination, and new issues may be identified for evaluation.

Scoping Meetings

One purpose of this NOI is to encourage public involvement in the EIS process, and to solicit public comments on the proposed scope and content of the EIS. NRC will hold public scoping meetings in the SRS vicinity to solicit both oral and written comments from interested parties.

Scoping is an early and open process designed to determine the range of actions, alternatives, and potential impacts to be considered in the EIS, and to identify the significant issues related to the proposed action. It is intended to solicit input from the public and other agencies so that the analysis can be more clearly focused on issues of genuine concern. The principal goals of the scoping process are to:

- Ensure that concerns are identified early and are properly studied;
- Identify alternatives that will be examined;
- Identify significant issues that need to be analyzed;
- Eliminate unimportant issues; and
- Identify public concerns.

Scoping Meeting Format

Traditionally, scoping meetings begin with agency speakers, then attendees make oral comments. The scoping meetings for the MOX Facility will follow a different structure, which was recommended by the Council on Environmental Quality in its "Memorandum for General Counsels, NEPA Liaisons and Participants in Scoping," dated April 30, 1981.

...The first part of the meeting is devoted to a discussion of the proposal in general, covering its purpose, proposed location, design, and any other aspects that can be presented in a lecture format. A question and answer period concerning this information is often held at this time. Then... the next step is to break ...into small groups for more intensive discussion. At this point, ...numbers held by the participants are used to assign them to small groups by sequence, random drawing, or any other method. Each group should be no larger than 12, and 8-10 is better. The groups are informed that their task is to prepare a list of significant environmental issues and reasonable alternatives for analysis in the EIS. These lists will be presented to the main group and combined into a master list, after the discussion groups are finished.

A member of the NRC staff, or NRC contractor staff will be part of each group to answer questions and listen to the participants' concerns. The agency person will not lead the group discussions, but will serve as the recording secretary for each group. This will ensure he/she is listening to group views. Each group will choose a member to lead the group discussions.

In addition to the group discussions, participants will be able to express their oral views to a recording secretary in five minute blocks. NRC encourages those providing oral comments to also submit them in writing. Comment cards will also be available for anyone who prefers to submit their comments in written form.

Scoping Comments

Written comments should be mailed to:

Mike Lesar, Acting Chief
U.S. Nuclear Regulatory Commission
Rules & Directives Branch
Division of Administrative Services
Office of Administration
Mail Stop T6D59
Washington DC 20555

Comments will also be accepted by e-mail. Interested parties may e-mail their comments to teh@nrc.gov. Comments will be accepted by fax at 301-415-5398, Attention: Tim Harris.

NRC will make the scoping summaries and project-related materials available for public review through our electronic reading room: <http://www.nrc.gov/NRC/ADAMS/index.html>. The scoping meeting summaries and project-related materials will also be available on the NRC's MOX web page: <http://www.nrc.gov/NRC/NMSS/MOX/index.html> (case sensitive).

The NEPA Process

The EIS for the MOX Facility will be prepared according to the National Environmental Policy Act of 1969, the Council on Environmental Quality's Regulations for Implementing the Procedural Provisions of NEPA (40 CFR Parts 1500-1508), and NRC's NEPA Regulations (10 CFR Part 51).

The draft EIS is scheduled to be published in February 2002. A 45-day comment period on the draft EIS is planned, and public meetings to receive comments will be held approximately three weeks after distribution of the draft EIS. Availability of the draft EIS, the dates of the public comment period, and information about the public meetings will be announced in the Federal Register, on NRC's MOX web page, and in the local news media when the draft EIS is distributed. The final EIS, which will incorporate public comments received on the draft EIS, is expected in September 2002.

Signed in Rockville, MD, this 1st day of March 2001.

For the Nuclear Regulatory Commission

/RA/

Charlotte E. Abrams, Acting Chief
Environmental and Performance Assessment Branch
Division of Waste Management
Office of Nuclear Material Safety
and Safeguards

ENVIRONMENTAL ASSESSMENT AND FINDING OF NO SIGNIFICANT IMPACT (FONSI)

NUCLEAR REGULATORY COMMISSION

[License Number 13-26398-01]

Dow AgroSciences LLC -- Indianapolis, IN

Environmental Assessment, Finding of No Significant Impact, and
Notice of Opportunity for a Hearing.

The U. S. Nuclear Regulatory Commission is considering amending Dow AgroSciences Byproduct Materials License Number 13-26398-01 to authorize the use of carbon-14 (C-14) in field studies at the Dow AgroSciences Midwest U.S. Research Center located in Fowler, Benton County, Indiana.

ENVIRONMENTAL ASSESSMENT

Background

This environmental assessment (EA) is being performed to evaluate the environmental impacts of the proposed amendment to Dow AgroSciences Byproduct Materials license, 13-26398-01, to permit the use of radioactive materials in field studies at the Dow AgroSciences field research station known as the Midwest U. S. Research Center (hereafter referred to as the Center). The Center is located at 1736 N 1200 E in Fowler (Benton County), Indiana.

In 1993 and again in 1996, this licensee was approved for radiolabeled field studies at their former field research site known as the DowElanco Greenfield Field Research Station in Greenfield, Indiana. All radioisotope use ceased at the Greenfield Station and the site was decommissioned in 1998. Two previous Federal Register Notices, 58 FR 28638 and 61 FR 16937, have described the use of radioactive materials for field studies by this licensee. The purpose of the pesticide studies is explained in detail in each of these Federal Register Notices. The field use of radiolabeled chemicals described for the proposed amendment, including study

design, specific radioisotopes, amount used and training, is essentially unchanged from the previously licensed use at the Greenfield Station.

Proposed Action

The proposed action is to amend NRC Byproduct Material License No. 13-26398-01, issued to DowElanco (now known as Dow AgroSciences) on September 21, 1992 (as amended), to allow for the performance of outdoor field studies with C-14 radiolabeled chemicals having agricultural activity at the Center. The overall objective of the small plot field studies to be conducted with radiolabeled agrochemicals is to identify the metabolic pathway for a given chemical following application to a given crop or the soil in which the crop is grown. Once the metabolites have been isolated and structurally identified, it will then be possible to conduct non-radiolabeled studies using large scale field applications in order to provide quantitative data on the metabolic residues found in the plant.

Need for the Proposed Action

The current amendment request proposes to perform studies at the Center similar to those field studies that were performed at the Greenfield Research Station. The studies at the Center are required by the Environmental Protection Agency (EPA) in order to make regulatory decisions relative to the registration of biologically active chemicals as pesticides according to the criteria set forth in the amended Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA). The use of radiolabeled materials is specifically required in 40 CFR 158.240 and 158.290 to determine (1) the nature of residue in crops after treatment with a biologically active chemical and (2) the uptake of a soil-applied, biologically active chemical by crops grown in the treated soil. The analytical sensitivity afforded through the use of radioisotope labels in field studies is essential for isolation and identification of metabolites present in trace amounts in complex biological matrices. In the absence of such radiolabeled molecules, it would be extremely difficult to trace, isolate, and identify a single chemical in these complex matrices.

The EPA specifically identifies the use of radiolabeled test materials in 40 CFR 158.240 for nature of residue studies and no alternatives are given.

The studies are being completed, as required by the EPA, for registering the pesticide and permitting sale in the United States and abroad. Specifically, pesticides intended for use on agricultural commodities must be registered by EPA under FIFRA (as amended), as required by the Federal Food, Drug, and Cosmetic Act (as amended).

Site Characteristics

The Center's land is fully owned by Dow AgroSciences, and as a private land, it does not have a U. S. Bureau of Land Management designation. It is located in rural agricultural Benton County, Indiana. The Center's location consists of the following legal description: NE1/4 of S 9, T 25 N, R 6 W, and E1/2 of N1/4 S 9, T 25 N, R 6 W, and S1/2 of SW1/4 Section 4, T 25 N, R 6 W. It is bordered on the north by privately owned farm land used for growing row crops. The eastern portion of the Center property is bordered by County Road 1200 E, a moderately traveled country road. To the south, the Center's property abuts privately owned farmland used for growing row crops. Jackmon Ditch (county drainage ditch) divides approximately 3/4 of the south border. The west border abuts private farmland used for growing row crops. Big Pine Creek runs through a portion of the approximate 80 acres of the Center's property that lie north of County Road 200 N.

The Center is approximately 310 acres. The crop area covers 240 acres, while the non-crop areas cover 70 acres which includes a 6.5 acre man-made basin used to contain irrigation water. There are approximately 7.25 acres of apples and grapes. The buildings and lawn take up approximately 7.5 acres and the grassed alleys and ditch bank cover approximately 56 acres. At any one time, less than 1 percent of the land is designated for radiolabeled field studies. Two areas within the borders of the Center will be designated for radiolabeled field studies. The northwest corner of section W6 will be designated for radiolabeled row crop

studies and individually identified trees in the orchard area, N1, may occasionally be used as well.

The Center is Class I and II capability agricultural land, according to the U. S. Department of Agriculture Soil Conservation Service. The site ecosystem is tilled farmland and the property has been in agricultural production for as long as records have been kept in Benton County, IN. A geological investigation was made in 1997 when the present domestic water well was installed. The Center's soil consists of thick deposits of glacial origin. Extensive glaciers of Illinoian and Wisconsin age covered this area during the Pleistocene period.

The geographically closest human community to the Center is Otterbein, located approximately 10 miles to the south in Benton County, IN. The population of Otterbein is 1,291 (1990 Census). The population of Benton County is 9,441 (1990 Census). The location of the maximally exposed individual is 450 meters (1475 ft) to the north of N1. The nearest farms (property line) are located 955 ft to the west of W6 plot and 70 ft to the north of N1.

Environmental Impacts of the Proposed Action

As stated above, the location of the closest human dwelling is 450 meters to the north of N1 and the maximum radioactivity released in one year will be 1,110 MBq (30 mCi). Using this information, impacts to water supplies and the dose to the maximally exposed individual is calculated. The radiological impact from the performance of field studies with radiolabeled materials at the Center has been calculated using both the EPA's Gaussian Dispersion model, SCREEN 3, and the EPA's COMPLY model.

Impact on Food Chain

The plants grown in radiolabeled studies will not be available for incorporation into the food chain. Test areas will be enclosed by a 7-foot chain link fence and wire mesh or bird netting will be used to restrict bird and small rodent access to grain crops. All plant material generated will be used for laboratory research purposes or disposed of as radioactive waste.

All contaminated soil will be removed from the site following harvest and disposed as radioactive waste. Due to the precautions taken during application, the physical barriers in place to prevent wildlife access, and the removal of all soil and plant materials at the conclusion of the study, it is not reasonable to assume that the radiolabeled plant material will enter the food chain by the ingestion process.

Groundwater Impacts

The following profile of soil layers is provided by the domestic Well Log for the Center: 0-2 feet of topsoil, 2-38 feet of clay, 38-46 feet of coarse sand and gravel, 46-54 feet of gray clay, 54-61 feet of coarse sand and gravel. The well is screened at 56-62 feet. The underlying geography for the site does not include a principal aquifer (Ground Water Atlas of the U.S., Segment 10, Hydrogeological Investigations Atlas 730-K, U.S. Geological Survey, 1995).

The fields at the Center are equipped with drainage tiles, spaced approximately 18 meters (60 ft) apart and 91-122 cm (36-48 in.) deep. The tile system providing drainage for W6 slopes to the east and dumps into Jackmon Ditch approximately 40 feet south of Co. Rd. 200 N, which eventually dumps into Big Pine Creek. The tile system providing drainage for the orchard (N1) flows west into a trunk line that flows south and dumps into Big Pine Creek. Big Pine Creek is supplied by runoff from farms and roadways both upstream and downstream from the Center, which would significantly dilute any contribution from the Center.

The tile system would remove the majority of water which infiltrates the soil, minimizing that which enters the ground or well water supplies. As a result of the precautions taken during application of the radiolabeled test materials (e.g., 3-6 foot wide sheets of plastic placed on the ground outside the plot borders during application; applications made only when wind speeds are <3 mph; etc.), 100% of the applied

radioactivity is initially accounted for on the soil and/or plants within the test plot. Since wood borders extending 6 inches above the soil surface and 4-6 inches below surface surround the immediate plot area, there is minimal chance for lateral movement of the applied radioactivity due to runoff. Combustion analyses of soil samples collected from outside plot borders at the Greenfield station at the termination of each study conducted there confirmed that no radioactivity was ever found outside the plots. Based on those results, it is not anticipated that any of the applied radioactivity will be found in the soil outside of the test plots at the Center.

Vertical movement of radioactivity in the soil column within a treated plot was monitored at the Greenfield site in order to give an idea of the potential for movement of radioactivity into subsurface water. For most materials at the time the plots were remediated, the bulk of the applied radioactivity (75-90%) remained in the top 6-inches of the soil profile, while most of the remaining residues were usually accounted for in the 6-12 inch segments. For more mobile compounds, small amounts of the total applied radioactivity (1-10%) were sometimes observed in the 12-18 and 18-24 inch segments. No significant levels of radioactivity were ever accounted for at depths below 24 inches. These results indicate that radioactivity in typical study plots would not move deep enough in the soil profile to get into groundwater or be transported by the field tiles. Periodic monitoring of water in the field tiles that drained the radioactive plot area at the Greenfield location showed no detectable radioactivity in the drainage water. Based on those results, and the fact that the soil type at the new proposed site is also considered to have a low vulnerability to leaching, it is not anticipated that any of the applied radioactivity will be found in the water from the plot area. Past radiolabeled tests at the Greenfield location showed only minimal amounts of radiolabeled material at a maximum depth of 18-24 inches in the soil profile, and no radiolabeled material

was ever found in grab samples collected from the field tile drainage water. Given these observations, it is not considered likely that radiolabeled material from the Center will contaminate ground water.

Surface Water Runoff

An unrealistic worst case of radioactivity that could be released by surface runoff can be predicted based on a severe rainfall event which washes all of the applied activity from the plant or soil. A release of all of the applied activity could occur only if the crop was completely loaded and washed from the plot with the soil. The maximum activity to be used per application is 370 MBq (10 mCi) and per year is 1,110 MBq (30 mCi). The 30-year average rainfall in the nine counties in the northwest district including Benton County is 37.86 inches, usually evenly distributed over the course of the year. The greatest monthly rainfall from 1972 to 1996 occurred in June 1993 when 10.15 inches were recorded. If 10.15 inches of rain were to fall over the 70 meter by 70 meter W6 research plot where 1,110 MBq (30 mCi) of C-14 had been applied, a volume of 1.26×10^9 cubic centimeters (milliliters) of water would leave the Center as surface runoff through the tile system. If 100% of a 1,110 MBq (30 mCi) application were lost to surface runoff during this rainfall, the activity concentration of this surface runoff would be 8.88×10^{-6} MBq/mL (2.4×10^{-5} uCi/mL). This is below 1.11×10^{-5} MBq/mL (3×10^{-5} uCi/mL), the C-14 water effluent limit in 10 CFR 20 (Appendix B, Table II, Column 2). This runoff would be significantly diluted upon leaving the Center property when it entered the Big Pine Creek, which would also contain a large volume of runoff from the remainder of the Center property, the road and surrounding farms. It is reasonable to assume that significant dilution would occur.

Dose to the Maximally Exposed Individual

The SCREEN model employs worst case scenario parameters, such as unrealistically constant meteorological conditions, to estimate potential worst-case concentrations of C-14 at a specific receptor, the nearest resident, positioned in the downwind direction from the test plot area at the Center. In the modeling scenario it is assumed that the maximum amount of C-14 applied in one year is 1,110 MBq (30 mCi) and that 100% of the applied C-14 is emitted as CO₂ from the small section of field designated for radiolabeled studies during the one year until the next growing season. Under these conditions a worst case annual air concentration of 1.5×10^{-12} uCi/mL (3.45×10^{-7} ug/m³ of air) and annual limit of intake (ALI) of 0.011 uCi was calculated for an individual at the nearest receptor (450 meters). These values are just a fraction of the 10 CFR Part 20 limits for CO₂ effluent and annual intake of 3.0×10^{-7} uCi/mL and 2×10^5 uCi, respectively.

The COMPLY model was also used to evaluate dose to the general public. This computer simulation calculates the maximum dose to an individual residing outside of the facility and considers dose from all pathways including inhalation, ingestion of contaminated food, immersion, and ground deposition to estimate worst case calculations. With the assumption that 1,110 MBq (30 mCi) of C-14 was released over one year, at a distance of 450 meters from the nearest residence, the COMPLY program, level 2, calculated the maximum effective whole body dose for the maximally exposed individual to be 0.69 uSv/yr (0.069 mrem/yr), an amount well below and in compliance with the regulatory limit of 100 mrem/yr.

NOTE: Both the SCREEN and COMPLY models are linear therefore using a 370 MBq (10 mCi) release would calculate an exposure one-third of that determined for a 1,110 MBq (30 mCi) release.

Further evaluation of the offsite analysis was not considered necessary.

Endangered Species

There are no federally listed endangered species within Benton County, Indiana.

Alternatives to the Proposed Action

As required by Section 102(2)(E) of NEPA (42 USC 4322(2)(E)), possible alternatives to the final action have been considered. One possible alternative to the field studies is the treatment of greenhouse grown plants with the radiolabeled research chemical. However, this alternative is not feasible for two reasons. First, not all plants can be grown successfully in a greenhouse. Second, the studies to be conducted at the Center are required by the Environmental Protection Agency (EPA). The studies required by the EPA must evaluate the behavior of agricultural chemicals under normal agriculture conditions. The licensee is authorized to conduct studies on greenhouse grown plants with radiolabeled research chemicals at the Dow AgroSciences Indianapolis research facility; however, this is not an alternate means of collecting data generated by outdoor field studies. Greenhouse studies provide an unnaturally stable environment void of normal weathering field conditions, which traditionally leads to non-representative metabolic profiles. Photolysis, heat, humidity, and other conditions influence the degradative processes which occur in the soil and on the plant surface. It is the identity of the degradates formed as a result of these natural outdoor conditions which is required by the EPA.

Agencies and Persons Contacted

Heidi Dixon-White, the Radiation Safety Officer for Dow AgroSciences, provided clarifying information. Additionally, the NRC contacted Michael Litwin of the Bloomington, Indiana field office of the U.S. Fish & Wildlife Service who provided information regarding federally listed endangered species. The NRC also contacted Rex Bowser, Radiation Specialist with the State of Indiana Department of Health Indoor & Radiological Health Division, by telephone on July 17, 2000 regarding the proposed action. The State of Indiana Department of Health Indoor & Radiological Health Division is in agreement with the proposed action and had no additional comments.

Identification of Sources Used

6. Letter dated September 10, 1999 from Dow AgroSciences to U.S. NRC Region III, Lisle, IL, requesting amendment of Broad Scope License Number 13-26398-01.
7. Letter dated May 3, 2000 from Dow AgroSciences to U.S. NRC, Washington, DC, providing clarification to the amendment request.
8. Federal Register Notice, Volume 58, pages 28638-28645, "Environmental Assessment, Finding of No Significant Impact, and Notice of Opportunity for a Hearing Related to Amendment of Material License 13-26398-01, DowElanco," Washington, DC, 1993.
9. Federal Register Notice, Volume 61, pages 16937-16940, "DowElanco, Environmental Assessment: Finding of No Significant Impact and Notice of Opportunity for Hearing Related to Amendment of Material License Number 13-26398-01," Washington, DC, 1996.

FINDING OF NO SIGNIFICANT IMPACT

Pursuant to the National Environmental Policy Act of 1969 (NEPA) and the Commission's regulations in 10 CFR Part 51, the Commission has determined that there will not be a significant effect on the quality of the human environment resulting from the use of C-14 in field studies at the Center. Accordingly, the preparation of an Environmental Impact Statement is not required for the proposed amendment to Byproduct Material License No. 13-26398-01, which will authorize the use of C-14 in field studies at the Center. This determination is based on the foregoing Environmental Assessment performed in accordance with the procedures and criteria in 10 CFR Part 51, "Environmental Protection Regulations for Domestic Licensing and Related Regulatory Functions."

Dow Agrosiences amendment request and related documents are available for inspection and copying for a fee in the Region III Public Document Room, 801 Warrenville Road, Lisle, IL 60532-4351. The documents may also be viewed in the Agency-wide Documents Access and Management System (ADAMS) located on the NRC website at www.nrc.gov

OPPORTUNITY FOR A HEARING

Any person whose interest may be affected by the issuance of this action may file a request for a hearing. Any request for hearing must be filed with the Office of the Secretary, U.S. Nuclear Regulatory Commission, Washington, DC 20555, within 30 days of the publication of this notice in the Federal Register; be served on the NRC staff (Executive Director for Operations, One White Flint North, 11555 Rockville Pike, Rockville, Maryland 20852), and on the licensee (Dow AgroSciences, LLC, 9330 Zionsville Road, Indianapolis, IN 46268-1054); and must comply with the requirements for requesting a hearing set forth in the Commission's regulations, 10 CFR Part 2,

Subpart L, "Information Hearing Procedures for Adjudications in Materials Licensing Proceedings."

These requirements, which the request must address in detail, are:

1. The interest of the requestor in the proceeding;
2. How that interest may be affected by the results of the proceeding (including the reasons why the requestor should be permitted a hearing);
3. The requestor's areas of concern about the licensing activity that is the subject matter of the proceeding; and
4. The circumstances establishing that the request for hearing is timely -- that is, filed within 30 days of the date of this notice.

In addressing how the requestor's interest may be affected by the proceeding, the request should describe the nature of the requestor's right under the Atomic Energy Act of 1954, as amended, to be made a party to the proceeding; the nature and extent of the requestor's property, financial, or other (i.e., health, safety) interest in the proceeding; and the possible effect of any order that may be entered in the proceeding upon the requestor's interest.

Dated at Rockville, Maryland, this day of August, 2000.

FOR THE NUCLEAR REGULATORY COMMISSION.

John W. N. Hickey, Chief,
Material Safety and Inspection Branch,
Division of Industrial and Medical Nuclear Safety,
Office of Nuclear Material Safety and Safeguards.

APPENDIX E

CATX CHECKLIST

CATX Checklist

Action Name:

Action Location:

Action Description:

CATX Category:

	YES	NO	Need Data
A. Is the action likely to significantly affect any aspect of the natural environment?			
B. Is the action likely to significantly affect any aspect of the cultural environment including those that might be related to environmental justice?			
C. Is the action likely to generate a great deal of public interest about any environmental issue?			
D. Is there a high level of uncertainty about the action's environmental effects?			

CONCLUSIONS:

- ☐ 1. The action is a CATX and requires no further environmental review.
- ☐ 2. The action is a CATX but requires further review under one or more other environmental authorities (list).
- ☐ 3. The action requires an EA.
- ☐ 4. The action requires an EIS.

Licensing Project Manager Date

INSTRUCTIONS

- Action Name: Give the project name and license and docket number.
- Action Location: For actions with specific or general locations, give the address. In other cases it may be necessary to provide other information such as county or township name or latitude/longitude.
- Action Description: Be as brief as possible but provide sufficient information to determine the CATX category in which the proposed action fits and to complete the rest of the checklist.
- CATX category: List the categorical exclusion applicable to the action.

The checklist consists of four questions about the likelihood that a particular kind of environmental consequence will result from the proposed action. The licensing project manager may consult with technical staff and EPAB, as necessary.

Based on internal review, external review (where appropriate), and research, check "YES," "NO," or "NEED DATA" for each question. Attach documentation as needed to support the answer. If the "NEED DATA" box is checked, the licensing project manager may consult with the EPAB project manager about what data are needed and/or how to get it. The following sections provide considerations when completing the checklist.

Checklist Question A: Is the action likely to significantly affect any aspect of the natural environment?

Consider whether the proposed action is likely to affect/alter:

- Endangered or threatened species, or its critical habitat;
- Natural ecosystems;
- Water supplies of humans, animals, or plants;
- Wetlands; or
- Any other environmental media or resource not listed above.

Checklist Question B: Is the action likely to significantly affect any aspect of the cultural environment including those that might be related to environmental justice?

Consider possible impacts on historic, cultural, and scientific resources. Consider whether the action is likely to have physical, visual, or other effects on:

- Districts, sites, buildings, structures and objects that are included in the *National Register*, or a State or local register of historic places;
- Places of traditional cultural value for Native American group or other community;
- Known archeological sites, or land identified by archeologists consulted by NRC as having high potential to contain archeological resources;
- Any practice of religion (e.g., by impeding access to a place of worship); or
- Minority or low income groups that are out of proportion with its impacts on other groups. Consider, for example, whether the action is likely to:
 - Result in the storage or discharge of pollutants in the environment that will disproportionately affect such a group; or
 - Have adverse economic impacts on such a group.

Checklist Question C: Is the action likely to generate a great deal of public interest about any environmental issue?

Consider whether the proposed action is likely to generate a great deal of public interest. If so, consider whether this public interest is likely to have an environmental element. For example, a proposal for research and development activities near a National Park area may be of interest to national activist groups, but this is not an environmental issue unless it can be reasonably argued that the location of this proposed action will generate effluents or have some other impact on the natural or cultural environment. Public interest can be raised on a number of issues: impacts on historic buildings, archeological sites, and other cultural resources.

Checklist Question D: Is there a high level of uncertainty about the proposed action's environmental impacts?

Consider whether there is anything not known about the proposed action's potential impacts, and then whether this information gap has any significance. For example, when considering installation of monitoring equipment, it might not be known whether there are archeological sites in the vicinity. If the installation will result in ground disturbance, this uncertainty should be resolved before proceeding with the installation. If the installation will not result in ground disturbance, there may be no need to resolve the uncertainty.

BIBLIOGRAPHIC DATA SHEET

(See instructions on the reverse)

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(Assigned by NRC, Add Vol., Supp., Rev.,
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NUREG-1748

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Washington, DC 20555-0001

9. SPONSORING ORGANIZATION - NAME AND ADDRESS (If NRC, type "Same as above"; if contractor, provide NRC Division, Office or Region, U.S. Nuclear Regulatory Commission, and mailing address.)

Same as above.

10. SUPPLEMENTARY NOTES

11. ABSTRACT (200 words or less)

This guidance document provides general procedures for the environmental review of licensing actions regulated by the Office of Nuclear Material Safety and Safeguards (NMSS). Divisions within NMSS and their Regional counterparts may have supplemental guidance that is specific to facilities they regulate. Although the main focus of this guidance is the NRC staff's environmental review process, it also contains related information which applicants and licensees may find useful. Chapter 1 provides a summary and overview of the guidance. This chapter briefly discusses whether an applicant or licensee's request is a categorical exclusion or whether the staff needs to prepare an environmental assessment (EA) or environmental impact statement (EIS), early planning for an EA or EIS, and methods of using previous environmental analyses related to the proposed action. Chapter 2 discusses the categorical exclusions and the basis of their use. Chapter 3 discusses the EA process, including preparation and content of the EA, agencies to be consulted, and preparation of the Finding of No Significant Impact. Chapter 4 discusses the process of preparing an EIS, from developing a project plan through scoping, consultations and public meetings, to preparing the Record of Decision. Chapter 5 discusses the content of the EIS, and Chapter 6 discusses environmental information that should be considered by applicants and licensees in preparing their environmental report.

12. KEY WORDS/DESCRIPTORS (List words or phrases that will assist researchers in locating the report.)

NMSS NEPA guidance, environmental review guidance, National Environmental Policy Act, Environmental Assessment, EA, Environmental Impact Statement, EIS, Categorical Exclusion, CATX

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