

Environmental Review Acceptance Checklist for Early Site Permit and Combined License Applications

Contents

Acceptance Review Framework	1
Regulatory Requirements	2
Early Site Permit Requirements - Contents of Applications - (10 CFR Part 52, Subpart A, Early Site Permits)	2
Combined License Requirements - Contents of Applications - (10 CFR Part 52, Subpart C, Combined Licenses)	3
Environmental Report Requirements	3
Sufficiency Review	7
Bases for the Sufficiency Review	8
Review Structure	9
Appendices	10
Appendix A - Accidents	A-1
Appendix B - Alternatives	B-1
Appendix C - Cultural and Historical Resources	C-1
Appendix D - Decommissioning	D-1
Appendix E - Ecology	E-1
Appendix F - Hydrology	F-1
Appendix G - Land Use	G-1
Appendix H - Meteorology	H-1
Appendix I - Need for Power and Benefit-Cost Balance	I-1
Appendix J - Radiological Health	J-1
Appendix K - Site and Technical Overview	K-1
Appendix L - Socioeconomics and Environmental Justice	L-1
Appendix M - Transmission Lines	M-1
Appendix N - Transportation	N-1
Appendix O - Uranium Fuel Cycle	O-1
Appendix P - Waste Systems	P-1

Environmental Review Acceptance Checklist for Early Site Permit and Combined License Applications

Acceptance Review Framework

After receiving an applicant's Environmental Report (ER) for an Early Site Permit (ESP) or Combined License (COL), the staff will perform an acceptance review to determine whether the information is sufficiently complete to begin the NRC's National Environmental Policy Act (NEPA) review.

In a Staff Requirements Memorandum (SRM) dated June 22, 2007, the Commission directed that :

the scope and duration of the COL application acceptance review [is] to include completeness and technical sufficiency reviews. The staff should ensure that the criteria used for this expanded scope of review are clear and transparent. In extending the duration of the application for acceptance review from 30 to 60 days, the staff should consider the start of the safety and environmental reviews from the date when the application is docketed (i.e., after the acceptance review when the application is determined to be complete and technically sufficient), not when the application is initially submitted by the applicant.

The sufficiency review standard is neither the same as the previous acceptance review standard, nor the even-more-detailed adequacy review standard. The Commission expects that this determination regarding the technical sufficiency of the (partial) application would lead to enhancements in effectiveness and efficiency during the conduct of its reviews. Consequently, where the NRC staff normally conducted a high-level assessment of the application to determine whether it satisfied the requirements specified 10 CFR Parts 51 and 52, this new direction expands the schedule to 60 days and the scope to include a judgement on sufficiency for every application. The acceptance review for completeness and sufficiency will be conducted by the NRC environmental review team made up of experienced staff and contractors cognizant of the requirements in 10 CFR Parts 51 and 52 and of the technical bases and analyses that would be included in the NRC's environmental review. Again, the purpose for this more detailed assessment is to determine the completeness and technical sufficiency rather than merely the acceptability of the application.

The guidelines for the reviews of the environmental portions of applications for ESPs are found in Title 10 of the Code of Federal Regulations (10 CFR) Part 52, Subpart A, and reviews of applications for COLs are found in 10 CFR Part 52, Subpart C. The general requirements for the contents of the ER are found in 10 CFR 51.45, 51.50, 51.51 and 51.52. Under the 30-day review period, an application would be deemed acceptable for the purposes of docketing if all the requirements in these regulations were satisfied and information was presented in a format and with the content in conformity with regulatory guidance. Each NRC environmental review team member reviewer is to be guided by the regulatory requirements, which are outlined below. If there is a conflict between the

1 information listed below and the current regulations, then the regulations in 10 CFR
2 govern; this guidance is expected to be updated to ensure that it reflects current
3 statutory and regulatory requirements, and experience gained in use of this guidance.
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6 **Regulatory Requirements**

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9 **Early Site Permit Requirements - Contents of Applications - (10 CFR Part 52,** 10 **Subpart A, Early Site Permits)**

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12 **Section 52.17 describes the information that must be contained in the application. The**
13 **information requirements specific to the application must contain a description and**
14 **safety assessment of the site on which the facility is to be located. The application**
15 **should include descriptions of the following:**

- 16 • **the specific number, type, and thermal power level of the facilities, or range**
17 **of possible facilities, for which the site may be used**
 - 18 • **the boundaries of the site**
 - 19 • **the proposed general location of each facility on the site**
 - 20 • **the anticipated maximum levels of radiological and thermal effluents each facility**
21 **will produce**
 - 22 • **the type of cooling systems, intakes and outflows that may be associated with**
23 **each facility**
 - 24 • **the location and description of any nearby industrial, military, or transportation**
25 **facilities and routes; and**
 - 26 • **the existing and projected future population profile of the area surrounding the**
27 **site**
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36 **The application must include a complete environmental report as required by 10 CFR**
37 **51.50(b).**

38
39 **If the applicant requests authorization to perform activities at the site, which are**
40 **identified in 10 CFR 50.10(e)(1), after issuance of the early site permit and without a**
41 **separate authorization under 10 CFR 50.10(e)(1), the applicant must identify the activities**
42 **that are requested, and propose a plan for redress of the site in the event that the**
43 **activities are performed and the early site permit expires before it is referenced in an**
44 **application for a construction permit or a combined license. The application must**
45 **demonstrate that there is reasonable assurance that redress carried out under the plan**
46 **will achieve an environmentally stable and aesthetically acceptable site suitable for**
47 **whatever non-nuclear use may conform with local zoning laws.**
48
49

1 **Combined License Requirements - Contents of Applications - (10 CFR Part 52,**
2 **Subpart C, Combined Licenses)**

3
4 **Section 52.80 describes the information that must be contained in the application. One**
5 **of the required portions of the application is a complete environmental report as**
6 **required by 10 CFR 51.50(c).**
7

8 **If the applicant wishes to be able to perform the activities at the site allowed by 10 CFR**
9 **50.10(e) before issuance of the combined license, the applicant must identify and**
10 **describe the activities that are requested and propose a plan for redress of the site in the**
11 **event that the activities are performed and either construction is abandoned or the**
12 **combined license is revoked. The application must demonstrate that there is reasonable**
13 **assurance that redress carried out under the plan will achieve an environmentally stable**
14 **and aesthetically acceptable site suitable for whatever non-nuclear use may conform**
15 **with local zoning laws.**
16
17

18 **Environmental Report Requirements**

19
20 **These general requirements for the ER include the following considerations (excerpts**
21 **from 10 CFR 51.45, 51.50, 51.51, and 51.52)**
22

23 **10 CFR 51.45 Environmental considerations.**

24
25 **The environmental report shall contain a description of the proposed action, a statement**
26 **of its purposes, a description of the environment affected, and discuss the following**
27 **considerations:**
28

- 29 • **The impact of the proposed action on the environment. Impacts shall be**
30 **discussed in proportion to their significance;**
- 31
32 • **Any adverse environmental effects which cannot be avoided should the proposal**
33 **be implemented;**
- 34
35 • **Alternatives to the proposed action. The discussion of alternatives shall be**
36 **sufficiently complete to aid the Commission in developing and exploring,**
37 **pursuant to Section 102(2)(E) of NEPA, "appropriate alternatives to recommended**
38 **courses of action in any proposal which involves unresolved conflicts concerning**
39 **alternative uses of available resources." To the extent practicable, the**
40 **environmental impacts of the proposal and the alternatives should be presented**
41 **in comparative form;**
- 42
43 • **The relationship between local short-term uses of man's environment and the**
44 **maintenance and enhancement of long-term productivity; and**
- 45
46 • **Any irreversible and irretrievable commitments of resources which would be**
47 **involved in the proposed action should it be implemented.**
48

49 **Analysis. The environmental report shall include an analysis that considers and**
50 **balances the environmental effects of the proposed action, the environmental impacts of**
51 **alternatives to the proposed action, and alternatives available for reducing or avoiding**

1 adverse environmental effects. Except for environmental reports prepared at the early
2 site permit stage
3 under 10 CFR 51.50(b), the analysis in the environmental report should also include
4 consideration of the economic, technical, and other benefits and costs of the proposed
5 action and of alternatives. The analyses for environmental reports shall, to the fullest
6 extent practicable, quantify the various factors considered. To the extent that there are
7 important qualitative considerations or factors that cannot be quantified, those
8 considerations or factors shall be discussed in qualitative terms. The environmental
9 report should contain sufficient data to aid the Commission in its development of an
10 independent analysis.

11
12 **Status of compliance.** The environmental report shall list all Federal permits, licenses,
13 approvals and other entitlements which must be obtained in connection with the
14 proposed action and shall describe the status of compliance with these requirements.
15 The environmental report shall also include a discussion of the status of compliance
16 with applicable environmental quality standards and requirements including, but not
17 limited to, applicable zoning and land-use regulations, and thermal and other water
18 pollution limitations or requirements which have been imposed by Federal, State,
19 regional, and local agencies having responsibility for environmental protection. The
20 discussion of alternatives in the report shall include a discussion of whether the
21 alternatives will comply with such applicable environmental quality standards and
22 requirements.

23
24 **Adverse information.** The information submitted should not be confined to information
25 supporting the proposed action but should also include adverse information.

26
27 **10 CFR 51.50 Early Site Permit.**

28
29 For an early site permit environmental report, 10 CFR 51.50(b) requires that the applicant
30 submit the following information in addition to that required by 10 CFR 51.45, 51.51, and
31 51.52:

- 32
33 • The environmental report must include an evaluation of alternative sites to
34 determine whether there is any obviously superior alternative to the site
35 proposed.
- 36
37 • The environmental report may address one or more of the environmental effects
38 of construction and operation of a reactor, or reactors, which have design
39 characteristics that fall within the site characteristics and design parameters for
40 the early site permit application, *provided however*, that the environmental report
41 must address all environmental effects of construction and operation necessary
42 to determine whether there is any obviously superior alternative to the site
43 proposed. The environmental report need not include an assessment of the
44 economic, technical, or other benefits (for example, need for power) and costs of
45 the proposed action or an evaluation of alternative energy sources.
- 46
47 • For other than light-water-cooled nuclear power reactors, the environmental
48 report must contain the basis for evaluating the contribution of the environmental
49 effects of fuel cycle activities for the nuclear power reactor.
- 50

- 1 • Each environmental report must identify the procedures for reporting and keeping
2 records of environmental data, and any conditions and monitoring requirements
3 for protecting the non-aquatic environment, proposed for possible inclusion in
4 the license as environmental conditions in accordance with 10 CFR 50.36b.
5

6 **10 CFR 51.50 Combined License - General.**
7

8 For an environmental report for a combined license application, 10 CFR 51.50(c) requires
9 that an applicant submit the following information in addition to that required by 10 CFR
10 51.45, 51.51, and 51.52:
11

- 12 • For other than light-water-cooled nuclear power reactors, the environmental
13 report shall contain the basis for evaluating the contribution of the environmental
14 effects of fuel cycle activities for the nuclear power reactor.
15
16 • Each environmental report shall identify procedures for reporting and keeping
17 records of environmental data, and any conditions and monitoring requirements
18 for protecting the non-aquatic environment, proposed for possible inclusion in
19 the license as environmental conditions in accordance with 10 CFR 50.36b.
20

21 **10 CFR 51.50 Combined License Referencing an Early Site Permit.**
22

23 There are additional requirements if the application references an early site permit.
24 Specifically, if the combined license application references an early site permit, then the
25 “Applicant’s Environmental Report—Combined License Stage” need not contain
26 information or analyses submitted to the Commission in “Applicant’s Environmental
27 Report—Early Site Permit Stage,” or resolved in the Commission’s early site permit
28 environmental impact statement, but must contain, in addition to the environmental
29 information and analyses otherwise required:
30

- 31 • Information to demonstrate that the design of the facility falls within the site
32 characteristics and design parameters specified in the early site permit;
33
34 • Information to resolve any significant environmental issue that was not resolved
35 in the early site permit proceeding;
36
37 • Any new and significant information for issues related to the impacts of
38 construction and operation of the facility that were resolved in the early site
39 permit proceeding;
40
41 • A description of the process used to identify new and significant information
42 regarding the NRC’s conclusions in the early site permit environmental impact
43 statement. The process must use a reasonable methodology for identifying such
44 new and significant information; and
45
46 • A demonstration that all environmental terms and conditions that have been
47 included in the early site permit will be satisfied by the date of issuance of the
48 combined license. Any terms or conditions of the early site permit that could not
49 be met by the time of issuance of the combined license, must be set forth as
50 terms or conditions of the combined license.
51

1 **10 CFR 51.50 Combined License Referencing a Standard Design Certification.**

2
3 If the combined license references a standard design certification, then the combined
4 license environmental report may incorporate by reference the environmental
5 assessment previously prepared by the NRC for the referenced design certification. If the
6 design certification environmental assessment is referenced, then the combined license
7 environmental report must contain information to demonstrate that the site
8 characteristics for the combined license site fall within the site parameters in the design
9 certification environmental assessment.

10
11 **10 CFR 51.50 Combined License Referencing a Manufactured Reactor.**

12
13 If the combined license application proposes to use a manufactured reactor, then the
14 combined license environmental report may incorporate by reference the environmental
15 assessment previously prepared by the NRC for the underlying manufacturing license. If
16 the manufacturing license environmental assessment is referenced, then the combined
17 license environmental report must contain information to demonstrate that the site
18 characteristics for the combined license site fall within the site parameters in the
19 manufacturing license environmental assessment. The environmental report need not
20 address the environmental impacts associated with manufacturing the reactor under the
21 manufacturing license.

22
23 **10 CFR 51.51 Table of Uranium Fuel Cycle Environmental Data.**

24
25 Under 10 CFR 51.50, every environmental report prepared for the construction permit
26 stage or early site permit stage or combined license stage of a light-water-cooled
27 nuclear power reactor shall take Table S-3, Table of Uranium Fuel Cycle Environmental
28 Data, as the basis for evaluating the contribution of the environmental effects of uranium
29 mining and milling, the production of uranium hexafluoride, isotopic enrichment, fuel
30 fabrication, reprocessing of irradiated fuel, transportation of radioactive materials and
31 management of low level wastes and high level wastes related to uranium fuel cycle
32 activities to the environmental costs of licensing the nuclear power reactor. Table S-3
33 shall be included in the environmental report and may be supplemented by a discussion
34 of the environmental significance of the data set forth in the table as weighed in the
35 analysis for the proposed facility. Table S-3 can be found in 10 CFR 51.51.

36
37 **10 CFR 51.52 Transportation of fuel and radioactive wastes to and from the reactor.**

38
39 Under 10 CFR 51.50, every environmental report prepared for the construction permit
40 stage or early site permit stage or combined license stage of a light-water-cooled
41 nuclear power reactor shall contain a statement concerning transportation of fuel and
42 radioactive wastes to and from the reactor. That statement shall indicate that the reactor
43 and this transportation either meet all of the conditions in paragraph (a) or all of the
44 conditions of paragraph (b) of 10 CFR 51.52. Information on the data that needs to be
45 included in the statement is found in 10 CFR 51.52.

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47
48 **Sufficiency Review**

1 Whereas the earlier acceptance review concept was based on regulatory requirements
2 and conformity with regulatory guides, an application is now deemed sufficient if, in
3 addition to addressing the regulatory requirements, the technical issues are addressed
4 with the depth and breadth and the quality that would allow the staff to perform its
5 environmental review of the technical issues for which guidance is provided in the NRC
6 staff's standard review plans. The sufficiency review is described below. This more
7 detailed staff assessment of an environmental report deals with the thoroughness and
8 reliability of the technical information in the environmental report (ER). After the
9 judgement has been made that the information in the applicant's ER for an ESP or COL
10 satisfies the regulatory requirements, the next step in the review process is to conduct a
11 sufficiency review of the information and analyses that are provided in the ER.
12

13 The sufficiency review is the start of a process that will continue throughout the entire
14 environmental review process; it is not in lieu of the environmental review process nor
15 can it displace the detailed independent evaluation and the staff's ultimate assessment
16 of the reliability of all information required of the NRC staff in its environmental impact
17 statement (EIS). In this initial stage of the environmental review, the sufficiency review
18 provides the basis for capturing information to be used in the analysis from the
19 applicant's ER as well as from any readiness assessment pre-application activities
20 conducted by the NRC. The results of this initial sufficiency review are then used to
21 focus the project reviewers' attention to areas that need further information and
22 clarification. This sufficiency review permits the environmental review team members to
23 begin developing questions and information requests earlier in the review process,
24 assists the team member in focusing on those areas that appear to be most important
25 for the action and those areas that may have technical challenges, and assists the team
26 member in developing the list of the information sources (either documents or agencies)
27 that should be investigated during the subsequent review process. The results of the
28 sufficiency review will (1) assure that the NRC has appropriate information to initiate the
29 review of the application, (2) identify those issues that appear to warrant more detailed
30 interactions, and (3) guide the reviewers on the significance of the impact areas to shape
31 the scope and depth of the site audit and the environmental review.
32

33 The sufficiency review will also be used to assist the review team members in making
34 the linkages that are needed with other review areas to ensure completeness and
35 consistency in the data found in the ER and other sources. The sufficiency review will
36 provide the preliminary bases for subsequent requests for additional information (RAIs)
37 as well as the foundation for tracking the information to be used in the EISs.
38
39

40 **Bases for the Sufficiency Review**

41
42 The staff's review of the ER and preparation of the EIS will be guided by Regulatory
43 Guide 4.2, Revision 2, and NUREG-1555. Regulatory Guide 4.2, Revision 2, *Preparation*
44 *of Environmental Reports for Nuclear Power Stations* (NRC 1976) provides the applicants
45 with guidance on the information that should be included in an ER to address the
46 environmental impacts of construction and operation of the proposed action. NUREG-
47 1555, Volumes 1 and 2, *The Environmental Standard Review Plan (ESRP) for*
48 *Environmental Reviews for Nuclear Power Plants*, is a companion to Regulatory Guide
49 4.2 that provides a series of instructions for the NRC staff to use when conducting
50 environmental reviews of nuclear power plant applications. It is important to note that

1 regulatory guides and NUREG documents are not substitutes for regulations, and
2 applicant compliance with them is not required.

3
4 The ESRPs (1) provide specific instructions to the NRC staff responsible for conducting
5 environmental reviews, (2) provide detailed descriptions of the manner in which the NRC
6 reaches judgments on the kinds of environmental impacts caused by construction and
7 operation of nuclear power plants, and (3) specify the means for determining the
8 significance of these impacts. Use of ESRPs by the NRC staff in the environmental
9 review process will ensure the following:

- 10
- 11 • Data essential to a specific environmental review and subsequent decisionmaking
12 process provided in the applicant's submittal are reviewed.
- 13 • Appropriate consideration, including coordination and consultation, is given to
14 requirements of other Federal, State, regional, local, and affected Native American
15 tribal agencies applicable to a particular environmental review.
- 16
- 17 • The analysis and evaluation procedures for review of a given technical area are
18 standardized, thus achieving uniformity of approach.
- 19

20 The ESRP provides useful information for the environmental review team member
21 because the ESRP is the standard against which an applicant's ER is evaluated for
22 sufficiency. Use of these guides helps ensure the completeness of the information
23 provided, assists the staff and others in locating the information, and shortens the
24 review process.

25 26 27 **Review Structure**

28
29 The following appendices contain the specific elements of the sufficiency review for
30 each of the sixteen technical areas. Each appendix contains a sufficiency review
31 checklist, which is based on the information from the ESRPs.

32
33 The technical areas covered by the appendices are as follows:

- 34
- 35 **A. Accidents**
- 36 **B. Alternatives**
- 37 **C. Cultural and Historical Resources**
- 38 **D. Decommissioning**
- 39 **E. Ecology**
- 40 **F. Hydrology**
- 41 **G. Land Use**
- 42 **H. Meteorology**
- 43 **I. Need for Power and Benefit-Cost Balance**
- 44 **J. Radiological Health**
- 45 **K. Site and Technical Overview**
- 46 **L. Socioeconomics and Environmental Justice**
- 47 **M. Transmission Lines**
- 48 **N. Transportation**
- 49 **O. Uranium Fuel Cycle**
- 50 **P. Waste Systems**
- 51

1 **Each appendix is meant to stand alone, in that a specific environmental review team**
2 **member should focus her or his attention on the appendix related to the detailed**
3 **technical area she or he is responsible to assess. However, the appendices interlink and**
4 **each project reviewer is directed to share (or receive) the appropriate information from**
5 **the other review team members and for the cross-cutting issues; e.g., Appendices B, I**
6 **and K.**

1 **Environmental Review Acceptance Checklist**
2 **for Early Site Permit and**
3 **Combined License Applications**
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9 **Appendices**

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11	Appendix A	-	Accidents	A-1
12	Appendix B	-	Alternatives	B-1
13	Appendix C	-	Cultural and Historical Resources	C-1
14	Appendix D	-	Decommissioning	D-1
15	Appendix E	-	Ecology	E-1
16	Appendix F	-	Hydrology	F-1
17	Appendix G	-	Land Use	G-1
18	Appendix H	-	Meteorology	H-1
19	Appendix I	-	Need for Power and Benefit-Cost Balance	I-1
20	Appendix J	-	Radiological Health	J-1
21	Appendix K	-	Site and Technical Overview	K-1
22	Appendix L	-	Socioeconomics and Environmental Justice	L-1
23	Appendix M	-	Transmission Lines	M-1
24	Appendix N	-	Transportation	N-1
25	Appendix O	-	Uranium Fuel Cycle	O-1
26	Appendix P	-	Waste Systems	P-1

Appendix A - Accidents

Sufficiency Review Checklist

ESRP Section or Regulation Number	Sufficiency review question	YES: ER provides the prescribed information (note location in ER section or page)	NO: ER provides partial or no information, but the information is easy to obtain (perhaps requires RAI?)	NO: ER does not provide the prescribed information, and it is difficult or time consuming for the staff to obtain. (requires RAI)
7.1	Is the exclusion area boundary definition consistent throughout the ER and Site Safety Analysis Report (SSAR) or Final Safety Analysis Report (FSAR)? If other nuclear facilities are located on the site, is the proposed exclusion area boundary (EAB) consistent with EAB definitions for the other facilities?			
7.1 10 CFR 100	Is the exclusion area boundary definition appropriate?			
7.1	Is the low population zone definition consistent throughout the ER and SSAR/FSAR? If other nuclear facilities are located on the site, is the proposed low population zone consistent with low population zone definitions for the other facilities?			
7.1 10 CFR 100 NUREG- 0654	Is the low population zone definition appropriate?			
7.1	Are the meteorological data used to calculate X/Qs for DBA analyses the same as the data used to calculate X/Q for routine releases?			
7.1 Regulatory Guide 1.145	Are the X/Q values used for DBA analyses, for representative (50%) meteorological conditions? If so, were the procedures used to calculate the X/Q values consistent with NRC guidance?			
7.1	Have the meteorological data on which the X/Q values are based been provided to NRC?			
7.1	Does the ER list the name, version number, and date for any computer code used to calculate the X/Qs used for DBAs?			
7.1	Has the applicant provided NRC with electronic copies of the input to and output from these codes?			
7.1	Does the ER contain a list of DBAs, and are they the same as the DBAs in the SSAR/FSAR?			
7.1	If the reactor design is certified or undergoing certification, are the DBAs the set of DBAs covered in the design control document or FSAR? If the reactor design is not certified or undergoing certification, are the DBAs listed in ESRP 7.1 Appendix A, included in the DBA analysis in the ER?			
7.1 10 CFR 50 Appx K SRP 15.6.5	Are DBA doses calculated for a reactor operating at 102% of design power (design power +2% for power measurement uncertainties, where required (e.g., LOCA)?			
7.1	Are isotopic source terms provided for each DBA?			
7.1 Regulatory Guides 1.3, 1.4, 1.183	Do the DBA doses appropriately account for changes in breathing rates?			

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7.1	Does the ER appropriately reference a document that describes each DBA and underlying assumptions? If not, does the ER provide a description of each DBA?			
7.1 10 CFR 50.34(a)(1)(i) Regulatory Guide 1.183	Are EAB doses calculated for the two-hour period giving the highest dose? Is the two-hour period identified?			
7.1	Are the EAB DBA doses given in the ER consistent with doses calculated from the isotopic source terms?			
7.1 10 CFR 50.34 SRP 15	Are EAB DBA doses less than dose limits and criteria set for safety reviews?			
7.1 Regulatory Guide 1.3, 1.4, 1.145, 1.183	Are DBA LPZ doses calculated for four time periods as indicated in ESRP 7.1, and Regulatory Guides 1.3, 1.4, 1.145, etc.			
7.1	Are the LPZ X/Qs calculated consistently with NRC guidance?			
7.1	Are the LPZ DBA doses given in the ER consistent with doses calculated from the isotopic source terms?			
7.1 10 CFR 50.34 SRP 15	Are LPZ DBA doses less than dose limits and criteria set for safety reviews?			
7.2	Does the ER contain a site-specific evaluation the potential impacts of severe accidents based results of a recognized tool such as the MACCS2 code?			
7.2	If so, what are the name, version, date, etc. for the code used?			
7.2	What meteorological data were used in the evaluation? Are they the same data used in evaluation of the impacts of normal operation and DBAs? If not, why not? (Check with meteorology project reviewer)			
7.2	What population data were used in the evaluation? Are the data consistent with data presented in the demographic discussion? Are population projections based on the most recent census and appropriate projection techniques? (Check with socioeconomic project reviewer)			
7.2	What land use data were used in the evaluation? Were they adjusted for potential changes in land use? (Check with land use project reviewer)			
7.2	Does the ER contain a list of surface water users within 50 miles of the site, including all public water supplies and major industrial and agricultural users? Does the list include location and withdrawal rate of each user? (Check with hydrology project reviewer)			
7.2	Does the ER contain a list the postulated severe accidents, their descriptions, and their respective core damage frequencies? If so, is the list consistent with accidents considered in a design control document or FSAR for the reactor type?			
7.2	Has the applicant provided electronic copies of the input to and output from the computer code?			
7.2	Does the severe accident analysis in the ER consider the atmospheric, surface water, and groundwater pathways?			

1	7.2	Does the severe accident analysis include output for socioeconomic, individual and population health effects?			
2	7.2	If the application references a reactor design other than a certified design, does the ER list the dominant severe-accident sequences.			
3	7.2	Are these effects adequately reflected in the ER in terms of risk.			
4	7.3	Does the ER (or SSAR/FSAR) contain a list of leading contributors to (1) core damage frequency, (2) large release frequency, and (3) dose consequences with and without mitigation?			
5	7.3	Does the ER (or SSAR/FSAR) contain a description of the method, rationale, or process used to identify, screen, and select design alternatives and procedural modifications?			
6	7.3	Does the ER contain the estimated cost, risk reduction, and value impact ratios for the selected SAMAs along with the underlying assumptions?			
7	7.3	A list of SAMAs that have been or will be implemented to prevent or mitigate the impacts from severe accidents or to reduce the risk of a severe accident?			

8

Appendix B - Alternatives

Sufficiency Review Checklist

ESRP Section or Regulation Number	Sufficiency review question Is the following material found and cited in the Environmental Report or Site Redress Plan?	YES: ER provides the prescribed information (note ER section or page)	NO: ER provides partial or no information, but the information is easy to obtain. (perhaps requires RAI?)	NO: ER does not provide the prescribed information, and it is difficult or time consuming for the staff to obtain. (requires RAI)
9.1	Discussion of the no-action alternative.			
9.2.1	The administrative structure of the current generating supply system in the relevant regional grid and the applicant's relationship to this structure in terms of current and projected power supply. Full account should be taken of non-discriminatory access rules as promulgated by the Federal Energy Regulatory Commission (FERC).			
9.2.1	The projected regional system reserve margins of relevant electric utilities and other generators should be for a six-year period starting with the first year of commercial operation of the proposed facility.			
9.2.1	The projected peak loads of the electric utilities in the area being served, load duration curve, and baseload for the same six-year period.			
9.2.1	Transmission intertie capability within the relevant region's facility and between the systems identified in the first bulleted item in this list during the initial years of facility operation.			
9.2.1	A list of the facilities in the relevant service area scheduled for retirement during the period extending from date of application through the sixth year of commercial operation of the proposed project, including existing nuclear power facilities within the relevant region that are near the end of their license and are candidates for license renewal. Power facilities available for reactivation should also be considered.			
9.2.1	The expected facility generating capacity, projected availability factor, environmental impacts, and operating costs (including capital costs required to put the unit back online) of any facilities with the potential for reactivation or extended operation.			
9.2.1	The potential for energy conservation within the relevant service area.			
9.2.2	For alternatives that have not yet achieved commercial acceptance, U.S. Department of Energy research, development, and demonstration/ commercialization schedules and projected capability as a source of central station power.			
9.2.2	For nonrenewable fuels (coal, natural gas, and petroleum fuels), the fuel quality, availability to the applicant, rate of consumption estimates, potential environmental restrictions and impacts, and emissions and definition of U.S. national policy, if any, with respect to new uses of these fuels.			
9.2.2	For renewable fuels (wind, geothermal, hydroelectric, wood waste and municipal solid waste, energy crops, and solar), availability to the applicant, quantities needed, potential environmental restrictions, amount of land that would be occupied, and amount of the fuel available.			
9.2.3	Decommissioning cost for the proposed project and for each alternative.			

1	9.2.3	Where relevant, the fixed charge rate for the utility or consortium of utilities.			
2	9.2.3	Fuel cost estimates at time of application for the proposed project and for other alternatives.			
3	9.2.3	The operation and maintenance cost estimates (fixed component and variable component) at time of application for the proposed project and each alternative.			
4	9.2.3	The escalation rates from date of application through facility lifetime (30-year life) for the components of operation and maintenance and fuel for the proposed project and each alternative.			
5	9.2.3	The discount rate for the proposed project and each alternative.			
6	9.3	The objectives of the alternative site selection process.			
7	9.3	The basic constraints and limitations (e.g., rules, regulations, and laws), giving the basis and rationale for the alternative site selection process.			
8	9.3	The selection procedures for the region of interest (ROI), candidate areas, potential sites, candidate sites, and proposed site.			
9	9.3	The basis for establishing the geographical scope of the ROI.			
10	9.3	The factors considered at each level of the selection process, parameters by which these factors were measured, and criteria used to define levels of quality (e.g., numerical limits or decision standards).			
11	9.3	The criteria used to screen potential sites.			
12	9.3	The methodologies used in the candidate site comparison process, including (when used) factors such as (1) importance factors, (2) preference functions, (3) utility functions, (4) weighing factors, (5) ranking scales, (6) scoring schemes, (7) rating systems, and (8) sensitivity analyses.			
13	9.3	A description of the geographic area considered by the applicant, including the following: <ul style="list-style-type: none"> • major centers of population • areas predicted to be deficient in power • economic, demographic, and community characteristics • minority and low-income populations • water bodies available for cooling • railroads, highways, and waterways (existing and planned) • topographic features • major land-use classifications (e.g., residential, agricultural) and areas reserved for specific uses • location and description of existing and planned primary electrical generating stations 			
14	9.3 (cont'd)	<ul style="list-style-type: none"> • existing and planned transmission network • transmission interconnections with other utilities • natural and man-made features (e.g., zones of seismic activity, unusual geologic features, military installations) constituting potential hazards to construction or operation of a nuclear power facility. 			
15	9.3	Descriptions of the following: <ul style="list-style-type: none"> • ROI • potential sites (including all sites within the ROI with an operating nuclear power facility or a construction permit for a nuclear power facility) • candidate sites • alternative sites. 			

1	9.3	Descriptions of how the site- selection process was used to identify and select the ROI and potential, candidate, and alternative sites.			
2	9.3	Data sources used in the site-selection process, including results of site-specific field investigations.			
3	9.4.1	The proposed heat dissipation system for each potential alternative, as follows, is necessary: <ul style="list-style-type: none"> • land-use requirements • water-use requirements • operating and maintenance experience for similar units • capital, maintenance, and operating costs • effect on generating efficiency • predicted thermal and physical effects, e.g., thermal plume and scouring • predicted atmospheric effects, e.g., fogging, icing, and drift • predicted operating noise levels • predicted aesthetic effect, e.g., visual plumes • predicted recreational benefits. 			
4	9.4.2	For intake systems, the following information is required: <ul style="list-style-type: none"> • sketches or preliminary designs and operational characteristics of alternative intake systems, showing the intake design and its relationship to water surface, bottom geometry, shoreline, and discharge structure • alternative pumping facilities, if proposed • alternative locations of the proposed intake system and pumping facility on the same waterbody • alternative procedures and schedules for intake defouling, including any use of defouling chemicals • descriptions and operational characteristics of any alternative trash racks, traveling screens, trash baskets, or fish return systems • predicted physical impacts from hydrologic alternatives and impacts to aquatic ecosystems, including entrapment, impingement, and entrainment, for each alternative intake system • capital, maintenance, and operating costs for each alternative intake system and costs associated with system adaptation to the proposed site. 			
5	9.4.2	For discharge systems, the following information is required: <ul style="list-style-type: none"> • sketches or preliminary designs and operational characteristics of alternative discharge systems showing the discharge design, its location with respect to the 			
6	9.4.2 (cont'd)	receiving water body, and its relationship to water surface, bottom geometry, intake structure, and shoreline <ul style="list-style-type: none"> • description of alternative discharge lines (or canals) from the heat dissipation system to the receiving water body • description of alternative locations of the proposed discharge system on the same water body • estimated physical impacts from hydrologic alterations and impacts to aquatic biota for each alternative discharge system • capital, maintenance, and operating costs for each alternative discharge system and costs associated with system adaptation to the proposed site. 			
7	9.4.2	For the water supply, the following information: <ul style="list-style-type: none"> • description of potential alternative sources of water and their availability, including location of water supply source with respect to the facility site • economic and environmental cost data for water delivered from each alternative source. 			
8	9.4.2	For water treatment, the following information is			

		required:			
9		<ul style="list-style-type: none"> • description and purpose of alternative water treatment systems for the circulating water system and the facility (service) water system • chemicals and additives (or mechanical treatment) to be used in each alternative water treatment system • operating cycles for each alternative water treatment system • capital, maintenance, and operating costs for each alternative water treatment system. 			
	9.4.2	Capital, maintenance, and operating costs for the proposed intake system, discharge system, and water treatment system, and water costs for the proposed water supply.			
10	9.4.3	<p>For alternative transmission corridor routes:</p> <ul style="list-style-type: none"> • maps or aerial photographs showing alternative transmission corridors from the station site to interconnecting points on the existing high voltage system and identifying corridor characteristics (e.g., new lines/towers on existing corridors, widening of existing corridors, and new corridors). • maps or aerial photographs showing existing and known future generating stations and transmission networks for the service area or affected region. For existing transmission corridors not proposed as alternatives to the proposed system, reasons why they were not considered (e.g., system reliability) should be provided. • lengths and widths of corridors for each alternative segment or corridor. • number and approximate location of known historic/archaeological sites within 2 km of the alternative corridor. • maps or aerial photographs showing the approximate locations of Federal, State, or private wildlife refuges or other areas dedicated to ecological preservation, management, or study that are within 1 km of alternative corridors. • corridor proximity to airports, roads, railroads, or other transportation facilities. • general land-use characteristics along the alternative corridors, expressed as percentages of total corridor length and in terms of the intensity of use (e.g., residential 			
11	9.4.3 (cont'd)	<p>density) for the following classifications:</p> <ul style="list-style-type: none"> ▸ agricultural ▸ forest, woodland ▸ rangeland ▸ recreational or ecologically sensitive areas such as parks, wildlife preserves/refuges or management areas, wetlands, wild and scenic rivers ▸ urban or residential areas ▸ commercial or industrial areas ▸ other potentially significant classifications (e.g., Federally owned lands, Native American tribal lands, ethnic enclaves, or areas of high minority population) ▸ potential geologic hazards (e.g., active faults) that could affect transmission system reliability. 			
12	9.4.3	<p>For alternative system design, construction, and maintenance practices, the following information:</p> <ul style="list-style-type: none"> • alternative voltage levels and transmission frequency that are compatible with the existing service area/regional transmission network • alternative tower designs for areas of potential visual impact • alternative tower heights and conductor-to-ground clearances • alternative conductor designs • underground placement in areas of potentially high 			

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	<p>impact</p> <ul style="list-style-type: none">• alternative construction practices, including vegetation clearing; erosion control; revegetation; access road design, location, and maintenance; tower placement, foundations, and installation; and conductor installation• alternative maintenance practices• alternative location of auxiliary transmission facilities, e.g., substations, microwave relay stations.			
9.4.3	<p>For the alternative transmission selection process and cost data, the following information is required:</p> <ul style="list-style-type: none">• discussion of the selection process used to evaluate transmission line routes and the rationale and criteria used to select the proposed route• acquisition cost data for the proposed and alternative route corridors• construction and maintenance costs for the proposed system and for principal system alternatives• estimated transmission line losses for the proposed system and for principal alternatives.			

14

Appendix C - Cultural and Historic Resources

Sufficiency Review Checklist

ESRP Section or Regulation Number	Sufficiency review question Is the following material found and cited in the Environmental Report, Site Safety Analysis Report, or Site Redress Plan?	YES: ER provides the prescribed information (note location in ER section or page)	NO: ER provides partial or no information, but the information is easy to obtain (perhaps requires RAI?)	NO: ER does not provide the prescribed information, and it is difficult or time consuming for the staff to obtain. (requires RAI)
4.1.3	A description and National Register evaluation of cultural resources within the site boundary.			
4.1.3	A description and National Register evaluation of cultural resources within 15 km (9 mi) of the proposed site or 2 km (1.2 mi) of proposed transmission corridors, access corridors, and offsite areas.			
4.1.3	The State Historic Preservation Officer's (SHPO's) comments on the impact of the proposed project on important historic properties (from consultation with State agencies and Native American tribal agencies).			
4.1.3	State laws and plans for historic preservation.			
4.1.3	The applicant's procedures for identifying the potential for human remains to occur in the project and for complying with provisions of the Native American Graves Protection and Repatriation Act in the event of an inadvertent discovery.			
4.1.3	The applicant's finding on whether important cultural and historical resources will be affected. During construction.			
2.5.3	A detailed description of any archaeological or historical surveys of the proposed site, transmission line routes, or access corridors, including the physical extent of the survey, including why areas were not surveyed; techniques used; qualification of the surveyor; and findings.			
2.5.3	Comments of any organizations contacted by the applicant to locate and assess archaeological and historic resources located on or near the proposed station site.			
2.5.3	A description of cultural resources within the proposed site, proposed transmission line routes, or access corridors, and offsite areas that are in or eligible for inclusion in the National Register or are included in State or local registers or inventories of historic and archaeological resources.			
2.5.3	A description of cultural resources within 16 km (10 mi) of the proposed site, or 2 km (1.2 mi) of proposed transmission line routes, or access corridors, and offsite areas that are in or eligible for inclusion in the National Register or are included in State or local registers or inventories of historic and archaeological resources.			
2.5.3	A list of organizations and individuals contacted by the applicant also provided significant information concerning the location of cultural and historical properties.			
4.1.3	The applicant's finding on whether important cultural and historical resources will be adversely affected.			
4.1.3	The applicant's proposed avoidance measures to avoid impact to important cultural and historical resources during construction.			
5.1.3	A description and National Register evaluation of cultural resources within the site boundary.			

1	5.1.3	A description and National Register evaluation of cultural resources within 15 km (9 mi) of the proposed site or 2 km (1.2 mi) of proposed transmission corridors, access corridors, and offsite areas.			
2	5.1.3	The SHPO's comments on the impact of the proposed project on important historic properties.			
3	5.1.3	State laws and plans for historic preservation.			
4	5.1.3	The applicant's finding on whether important cultural and historical resources will be affected during operations.			
5	3.7	Basic electrical design parameters, including transmission design voltage or voltages, line capacity, conductor type and configuration, spacing between phases, minimum conductor clearances to ground, maximum predicted electric-field strength(s) at 1 m above ground, the predicted electric field strength(s) at the edge of the corridor in kilovolts per meter (kV/m), and the design bases for these values.			
6	3.7	Predicted noise levels resulting from transmission-system operation.			
7	3.7	Basic structural design parameters, including illustrations and descriptions of towers, conductors, and other structures, with dimensions, materials, color, and finish.			
8	3.7	The applicant should provide siting data for all potential corridors identified by the applicant utilizing topographic maps (7.5- or 15-minute scale as a rule) or aerial photographs showing the proposed corridor or corridors and all existing major high voltage corridors in the region.			
9	3.7	Lengths, widths, and area of corridors, including modification and/or use of existing corridors and other facilities for the proposed project.			
10	3.7	General methods of construction (e.g., tower foundations, stringing, location of access roads, span length, and clearing of corridors).			
11	3.7	When available, tower and substation locations.			
12	4.1.1	Has the applicant addressed transportation of construction materials to the site? For example, will rail service need to be established, restored, or otherwise reconditioned to accommodate the industrial loads expected during facility construction? If so, have these activities been characterized?			
13	4.1.1	Will the applicant be making use of currently abandoned rail lines?			
14	4.1.1	Will dredging of barge slips or other channels be required to facilitate construction? If so, where will the dredge spoils be deposited and what volume of spoil is projected?			
15	4.1.1	Will borrow pits be constructed (or expanded)? If so what volumes of borrow will be transported and used in construction?			
16	4.1.1	Has the applicant detailed the extent of the planned construction footprint in terms of amount of disturbed ground?			
17	4.1.1	Will local roads or highways need reconditioning to handle the expected loads?			
18	4.1.1	To what degree is the construction labor force expected to locate in the vicinity of the proposed facility? Will there be temporary housing communities during construction?			

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4.1.1	Is the applicant seeking a Limited Work Authorization (LWA) as part of an ESP application? If so, the LWA authorizes a significant amount of ground-disturbing activities at the site to prepare for eventual reactor building construction. These activities should be clearly identified in the application as part of the Site Redress Plan, and the applicant should demonstrate that cooperation with relevant permitting agencies is underway or expected.			
4.1.2	Highways, railroads, and utility corridors that will be crossed by transmission lines and access corridors			
4.1.2	Description of construction techniques and the associated impact on land use.			
4.1.2	Area and location of land within the corridors and offsite areas that will be disturbed by construction on either a long-term or short-term basis.			
4.1.2	Planned control actions during construction that will restrict land use in the corridors and offsite areas.			
4.1.2	Do proposed corridors cross land zoned for residential or recreational uses?			
4.1.2	Has the applicant addressed the visual impact of constructing new corridors or widening existing corridors?			
5.1.1	Depending on the site and the level of applicable demographic research, land use impacts could be projected to result from demand for new housing of operations workers. Only in rare cases would it be expected that enough research would be available to predict the degree that new housing would have land use impacts in the vicinity. The applicant should acknowledge the operations impact on housing and similar impacts that may occur from outage operations.			
5.1.1	Potential agreement or conflict with local land use plans should be addressed by the applicant. The applicant needs to show how the operation of a new nuclear unit either compliments or conflicts with existing land use plans. Evidence of communication to this effect between the applicant and relevant agencies should be apparent.			
5.1.1	The land use area also includes the impacts of salt drift from cooling tower steam plumes on crops and vegetation in the vicinity. The LR GEIS provides clear metrics for determining impact significance in this area, and it should be referenced in this context by the applicant preparing the ER.			
5.1.2	The applicant should provide a detailed characterization of typical transmission corridor maintenance activities.			
5.1.2	Has the applicant addressed the question of impacts from seasonal access to transmission corridors that cross land in agricultural or other productive use?			

Appendix D - Decommissioning

Sufficiency Review Checklist

ESRP Section or Regulation Number	Sufficiency review question Is the following material found and cited in the Environmental Report, Site Safety Analysis Report, or Site Redress Plan?	YES: ER provides the prescribed information (note location in ER section or page)	NO: ER provides partial or no information, but the information is easy to obtain (perhaps requires RAI?)	NO: ER does not provide the prescribed information, and it is difficult or time consuming for the staff to obtain. (requires RAI)
5.9	A report as specified in 10 CFR 50.75(b)(l) and required by 10 CFR 50.33(k) containing a certification that financial assurance for radiological decommissioning will be provided.			

Appendix E - Ecology

Sufficiency Review Checklist

ESRP Section or Regulation Number	Sufficiency review question	YES: ER provides the prescribed information (note location in ER section or page)	NO: ER provides partial or no information, but the information is easy to obtain (perhaps requires RAI?)	NO: ER does not provide the prescribed information, and it is difficult or time consuming for the staff to obtain. (requires RAI)
2.4.1	Has the applicant identified the species and habitats that will be considered “important” ecological resources of the site, vicinity, transmission corridors, and offsite areas for evaluation of potential impacts on them? Did the applicant include a map that identifies “important” terrestrial habitats on and in the vicinity of the site?			
2.4.1	Did the applicant describe any “important” species and their spatial and temporal distributions on and in the vicinity of the site, including, as appropriate, their relative abundance, critical habitat, and their life histories—critical life stages, biologically significant activities, seasonal habitat requirements and population fluctuations, food chain, and other interspecific relationships?			
2.4.1	Has the applicant consulted with local offices of the appropriate Federal, State, regional, local, and affected Native American tribal agencies to determine the possible presence of such species?			
2.4.1	Did the applicant identify and describe the species’ composition, the spatial and temporal distribution, abundance, and other structural and functional attributes of biotic assemblages that could be impacted by the proposed action?			
2.4.1	Did the applicant identify and describe the location of wildlife sanctuaries and natural areas that might be impacted by the proposed action?			
2.4.1	Did the applicant list of species that are of concern as disease vectors or pests?			
2.4.1	Did the applicant describe the natural and man-induced effects (e.g., farming, logging, grazing, and burning), preexisting environmental stresses (e.g., infestations, epidemics, and catastrophes), and the current ecological conditions that are indicative of such stresses?			
2.4.1	Did the applicant describe the location of any ecological or biological studies of the site or its environs that are recent or currently in progress?			
2.4.1	Did the applicant identify any important waterfowl areas in the proposed transmission lines cross, a list of descriptions of these areas and data on the local abundance and distribution of waterfowl, their seasonal status, and local flight patterns?			
2.4.1	Is the available site-specific data adequate, accurate, and complete?			
4.3.1	Has the applicant determined the areal extent and location of potential impacts, including the total area of land to be disturbed? Did the applicant provide a site map showing proposed buildings, the land to be cleared, borrow areas, waste disposal areas, the construction zone, and the site boundary and the vegetation communities/habitats that will be impacted?			

1	4.3.1	Does the applicant have a proposed schedule of construction activities and does the applicant plan to complete any of these construction activities under a limited work permit or as part of pre-construction? If so, which ones?			
2	4.3.1	Does the applicant have a site redress plan?			
3	4.3.1	Did the applicant describe the clearing methods; temporary and permanent erosion, runoff, and siltation control methods; dust suppression methods; and other construction practices for control or suppression specific to the site and to the transmission line corridors? Are best management practices being considered in the planning to mitigate construction activities?			
4	4.3.1	Did the applicant provide an estimate of the potential for bird collisions with cooling towers, other elevated construction equipment or facility structures or with transmission towers or lines?			
5	4.3.1	Did the applicant identify the construction activities that impact "important" species and habitats of the site and vicinity, transmission corridors, and offsite areas (e.g., construction activities that will dewater any wetlands, ponds, or seepages or alter surface drainage patterns supporting terrestrial biota/wetlands)?			
6	4.3.1	Has the applicant identified the area to be used on a short term basis during construction, and plans for restoration of this land?			
7	4.3.1	Has the applicant identified any noise impacts on "important" species?			
8	5.3.3.2	Has the applicant identified the concentration and chemical composition of dissolved and suspended solids in cooling tower basins or spray canals on a seasonal basis?			
9	5.3.3.2	Has the applicant considered the impacts of drift deposition on facilities? Has the applicant identified isopleths of deposition at ground levels on a seasonal basis? Have they described natural and managed facility communities on the site and offsite that occur in isopleths above 20 kg/ha/yr?			
10	5.3.3.2	Has the applicant description "important" terrestrial species and habitats that may be affected by the heat-dissipation system?			
11	5.3.3.2	Has the applicant considered the detrimental effects increased fogging/icing could have on local vegetation?			
12	5.3.3.2	Has the applicant considered the impact to terrestrial biota when new shoreline habitats are created along ponds and reservoirs built for cooling purposes?			
13	5.3.3.2	Has the applicant considered impacts to existing shoreline if flows are changes due to increased withdrawals?			
14	5.3.3.2	Has the applicant identified adverse impacts of cooling-system heat dissipation to terrestrial ecosystems and any measures or controls to limit adverse impacts?			
15	5.6.1	Has the applicant described the maintenance practices, such as use of chemical herbicides, roadway maintenance, and mechanical clearing, that are anticipated to affect terrestrial biota, including sensitive agricultural crops?			
16	5.6.1	Does the applicant use any special maintenance practices used in important habitats (e.g., marshes, natural areas, and bogs), including those that result in unique beneficial effects on specific terrestrial biota?			
17	5.6.1	Does the applicant partake in any wildlife-management practices?			

1	5.6.1	Has the applicant identified any potential adverse impacts resulting from operation and maintenance activities include soil erosion, runoff or uncontrolled release of defoliants and herbicides, barriers to wildlife movements created by clear-cutting of trees, and subtle effects of high energy electrical fields on the behavior of animals?			
2	5.6.1	Has the applicant identified the operational and maintenance activities associated with transmission facilities that could impact "important" terrestrial species and habitats?			
3	5.6.1	Has the applicant identified a list of the impacts for which there are measures or controls to limit adverse impacts and the associated measures and controls? Has the applicant made a commitment to limit these impacts?			
4	6.5.1	Did the applicant complete any pre-application monitoring to examine the distribution and abundance of "important" species and habitats? Critical life history information should include parameters such as feeding areas, wintering areas, and migration routes to the extent that the proposed project is expected to affect these parameters.			
5	6.5.1	Is the applicant planning on completing pre-operational/ operational monitoring related to terrestrial resources? If so, what will each program entail (both in schedule and scope)?			
6	6.5.1	Has the applicant supplied a basis for the decision to conduct/not conduct monitoring (pre-application/pre-operational/ operational)?			
7	Cumulative Impacts (No ESRP Section)	Has the applicant identified the activities of other agencies that have occurred/will occur in the potential impact area that may contribute to a cumulative impact on terrestrial or aquatic resources?			
8	Cumulative Impacts (No ESRP Section)	Has the applicant identified projects in the region that may contribute to a cumulative impact on "important species" or habitat?			
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15	2.4.2	Has the applicant identified the species and habitats that will be considered "important" ecological resources of the site, vicinity, transmission corridors, and offsite areas for evaluation of potential impacts on them? Did the applicant include a map that identifies "important" aquatic habitats or bodies of water on and in the vicinity of the site?			
16	2.4.2	Did the applicant describe any "important" species and their spatial and temporal distributions on and in the vicinity of the site (discharge area and receiving water body), including, as appropriate, their relative abundance, critical habitat, and their life histories—critical life stages, spawning areas, nursery grounds, food habits, feeding areas, wintering areas, migration areas?			
17	2.4.2	Has the applicant consulted with local offices of the appropriate Federal, State, regional, local, and affected Native American tribal agencies to determine the possible presence of such species? Determine when was the last time there was consultation with agencies.			
18	2.4.2	Did the applicant identify and describe the species composition, the spatial and temporal distribution, abundance, and other structural and functional attributes of biotic assemblages that could be impacted by the proposed action?			
19	2.4.2	Did the applicant identify and describe the location of wildlife sanctuaries and natural areas that might be impacted by the proposed action?			

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2.4.2	Did the applicant list species that are of concern as disease vectors or pests? Did the applicant list any nuisance or invasive species of concern (e.g., <i>Corbicula</i> sp. or <i>Mytilus</i> sp.)? These species are capable of blocking or bio-fouling the cooling water intake system or can cause other significant problems.			
2.4.2	Did the applicant describe the natural and man-induced effects (e.g., farming, logging, grazing, burning), preexisting environmental stresses (e.g., infestations, epidemics, catastrophes), and the current ecological conditions that are indicative of such stresses?			
2.4.2	Did the applicant describe the location of any ecological or biological studies of the site or its environs that are recent or currently in progress?			
2.4.2	Is the available site-specific data adequate, accurate, and complete?			
4.3.2	Has the applicant identified the construction activities that could impact "important" aquatic species and habitats of the site and vicinity, transmission corridors, and offsite areas? Is there a map available that shows the areal extent and location of the construction activities?			
4.3.2	Is there information available that can be used to determine how construction activities will impact "important" species and their habitats (e.g., those resulting from scouring and siltation, dredging and soil disposal, and interference with shoreline processes)? Is there information that can be used to estimate the magnitude and duration of such impacts? Consider potential disturbances of benthic areas by the following construction activities: <ul style="list-style-type: none"> • placement of intake and discharge structures • channel modifications for navigation or flow control • placement and removal of cofferdams • construction of bulkheads, piers, jetties, basins, and storm sewers • direct dredging, including the area that may be affected by resulting siltation and turbidity • percent of the water body cross section that might be 			
4.3.2 (cont'd)	obstructed by construction activity at any time <ul style="list-style-type: none"> • time and duration of such obstruction • potential changes to water quality caused by exposure of substrate to contaminants during construction (e.g., dredging for intake channels, cofferdam construction). 			
4.3.2	Is there information available that can be used to assess the potential for reversibility of impacts following completion of construction? Are there plans for environmental improvement following construction?			
4.3.2	Are there plans for limiting impacts during construction (e.g., the maintenance of siltation ponds or catchment basins)? Are recognized best management practices cited as means for limiting impacts?			
4.3.2	Are there plans for mitigation of a predicted impact using appropriate measures, which could include alternative placement of structures, alternative schedules, or alternative construction practices? Have any activities been evaluated that will result in adverse impacts that cannot be mitigated? Alternatives to mitigate adverse impacts could include using a fish hatchery or habitat restoration to increase natural fish production.			
4.3.2	If dredging is involved, are there plans for disposal of dredged material and placement of fill material?			
4.3.2	Are there plans for dewatering wetlands?			

1	4.3.2	If a cooling pond is at the site or being considered in future construction, is there information about the aquatic species expected to become established in the cooling ponds?			
2	4.3.2	If the applicant wishes to accelerate the start of construction, than evaluate that the applicant has included in the ER an initial evaluation of environmental impacts based on an analysis of at least six months of field data related to the proposed facility and suitable projections of the remaining seasonal periods if information has already been provided on the critical life stages and biologically significant activities (e.g., spawning, migration) that increase the vulnerability of the potentially affected biota at the proposed site.			
3	5.3.1.2	Has the applicant identified adverse impacts of cooling system intake operation to aquatic ecosystems?			
4	5.3.1.2	Have measures or controls to limit adverse impacts been identified?			
5	5.3.1.2	Has the applicant provided a current NPDES permit with a 316(b) determination, if appropriate, or equivalent State permits and supporting documentation?			
6	5.3.1.2	Has the applicant identified the “important” aquatic organisms and their life stages susceptible to entrapment, impingement, or entrainment?			
7	5.3.1.2	Is there information available to estimate the levels of susceptibility for fish or shellfish species to be entrapped or impinged by the cooling system, in either qualitative or quantitative terms? Is there information about the design and proposed operation of any proposed systems (e.g., screen wash or fish return system) and how the potential for entrapment and impingement with that system?			
8	5.3.1.2	Is there information on the cooling system concerning the potential for altered hydrodynamic characteristics induced by inlet system operation (e.g., altered circulation patterns) to affect attraction and entrapment of aquatic biota? What is the extent and seasonal variation of any such alterations? Are there plans for recirculation of heated effluent from the facility discharge system, which has the potential for increased impacts of entrapment, entrainment, and impingement?			
9	5.3.1.2	Has the applicant estimated the magnitude of the potential impingement and entrainment impacts on the species populations and the aquatic ecosystem?			
10	5.3.2.2	Has the applicant identified adverse impacts of cooling system discharge operation on aquatic biota? Have thermal, chemical, and physical alterations to the receiving water body been identified that may affect impacts? Will there be alterations in the discharge area (the mixing zone) or changes that will extend over a larger portion of the receiving-water body that might effect biota that are transported through, migrate through, or are attracted to the mixing zone?			
11	5.3.2.2	Have measures or controls to limit adverse impacts been identified?			
12	5.3.2.2	Has the applicant provided a current NPDES permit with a 316(a) determination (if required) or equivalent State permits and supporting documentation?			
13	5.3.2.2	Are there “important” aquatic species present? Are the types, life stages, and relative abundance of impacted “important” biota described? Is there a description of the specific aspects of the proposed discharge-system operation responsible for the impacts on the biota?			

1	5.3.2.2	Are the aquatic species susceptible to heat shock resulting from facility cooling-system discharges to the receiving water bodies? Is there information to determine if the effects will be detectable or may destabilize or noticeably alter population levels?			
2	5.3.2.2	Has the applicant considered the biological effects of thermal, chemical, and physical alterations to the receiving water body on the identified "important" aquatic species? Are there estimates of survival from these discharge system impacts, and estimates of the relative or absolute losses of the impacted populations?			
3	5.6.2	Has the applicant identified operational and maintenance activities associated with transmission facilities that could adversely affect "important" aquatic species and habitats? The resources to be considered include marshlands, wetlands, impoundments, and water bodies.			
4	5.6.2	Have potential impacts on these resources been identified? These could include heating of water bodies from removal of shade trees, siltation and turbidity resulting from increased runoff and erosion, runoff of defoliant and herbicides, recreational access by the public, and high energy electrical fields associated with underwater transmission facilities.			
5	5.6.2	If adverse impacts of sufficient magnitude have been identified, has the applicant identified the potential mitigating actions or alternative practices to limit or avoid the impacts?			
6	6.5.2	Did the applicant complete any pre-application monitoring to examine the distribution and abundance of "important" species and habitats? Critical life history information should include parameters such as spawning areas, nursery grounds, food habits, feeding areas, wintering areas, and migration routes to the extent that the proposed project is expected to affect these parameters.			
7	6.5.2	Is the applicant planning on completing preoperational/operational monitoring related to aquatic resources? If so, what will each program entail (both in schedule and scope)?			
8	6.5.2	Has the applicant supplied a basis for the decision to conduct/not conduct monitoring (preapplication/preoperational/operational)?			
9	Cumulative Impacts (No ESRP Section)	Has the applicant identified the activities of other agencies that have occurred/will occur in the potential impact area that may contribute to a cumulative impact on terrestrial or aquatic resources?			
10	Cumulative Impacts (No ESRP Section)	Has the applicant identified projects in the region that may contribute to a cumulative impact on "important species" or habitat?			
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Appendix F - Hydrology

Sufficiency Review Checklist

ESRP Section or Regulation Number	Sufficiency review question Is the following material found and cited in the Environmental Report, Site Safety Analysis Report, or Site Redress Plan?	YES: ER provides the prescribed information (note location in ER -section, page)	NO: ER provides partial or no information, but the information is easy to obtain (perhaps requires RAI?)	NO: ER does not provide the prescribed information, and it is difficult or time consuming for the staff to obtain. (requires RAI)
2.3.1 and 2.3.2	<p>Maps (including digital databases such as a Geographic Information System [GIS]) of sufficient detail to show the relationship of the site to major hydrological systems that could affect or be affected by plant construction or operation. These should include:</p> <ul style="list-style-type: none"> maps showing the relationship of the site to surface-water bodies that could affect or be affected by plant water use maps (and cross sections where feasible) showing those portions of groundwater aquifer systems that could be affected by plant withdrawals and/or discharges 			
2.3.1	For surface-water bodies used as a heat sink, maximum, average-maximum, average, average-minimum, and minimum monthly temperature of the water body			
2.3.1	For surface-water bodies and wetlands, estimated erosion characteristics and sediment transport, including rate, bed, and suspended load fractions, and gradation analyses; a description of the floodplain and its relationship to the site; a description of wetlands and their relationship to the site; the design-basis flood (DBF) elevation; and, where applicable, the DBF discharge.			
2.3.1 (fresh water streams only)	<ul style="list-style-type: none"> a list of major streams, size of drainage areas, and gradient maximum, average maximum, average, average minimum, and minimum monthly flow flood frequency distributions, including levee failures flood control measures (reservoirs, levees, flood forecasting) historical drought stages and discharges by month, and the 7-day once-in-10-years low flow important short-duration flow fluctuations (e.g., diurnal release variations from peaking operation of upstream hydroelectric project) within the influence of the intake and discharge structures, velocity distribution (horizontal and vertical), bathymetry at and near the intake structure, bathymetry at and downstream of the discharge structure, and stream cross-sections other hydrographic modifications (e.g., diversion dams, channelization) a list of wetlands and flood plains and their seasonal characteristics 			

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2.3.1 (lakes and impoundments only)	<ul style="list-style-type: none"> a description of lake or impoundment where influenced by the intake or discharge structures, or vice versa, size, location, and elevation of outlets a summary description of reservoir operating rules annual yield and dependability variations in inflows, outflows, water surface elevations, and storage volumes and retention time net loss, including evaporation and seepage current patterns, including frequency distributions of current speed, direction, and persistence temperature distribution (horizontal and vertical) and stratification and seasonal variations of density-induced currents detailed bathymetry in vicinity of station intake and outfall 			
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2.3.1 (estuaries and oceans only)	<ul style="list-style-type: none"> shoreline and bottom descriptions, including seasonal variations due to sediment transport tidal current patterns (velocities and phases), range, and excursion nontidal circulation patterns, including frequency distributions of current speed, direction, and persistence temperature and salinity distribution (horizontal and vertical), including temporal variations detailed bathymetry in the vicinity of the station intake and outfall for estuaries, maximum, average maximum, average, average minimum, and minimum monthly river discharge and flushing characteristics 			
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2.3.1 (ground-water)	<ul style="list-style-type: none"> the areal extent of aquifers, recharge and discharge areas, elevation and depth, and geologic formations piezometric contour maps and hydraulic gradients (historical, if available, and current) flow travel times soil properties, including permeabilities or transmissivities, storage coefficients or specific yields, total and effective porosities, clay content, and bulk densities interactions between site surface and ground waters historical and seasonal trends in groundwater elevation or piezometric levels; interactions between different aquifers recharge rates, soil moisture characteristics, and moisture content in vadose zone existence of any local aquifers designated or proposed to be designated as "sole source aquifers." 			
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2.3.2	<p>Quantitative description of present and known future surface-water uses (withdrawals, consumptions, and returns) that are within the hydrological system in which the site is located and that may affect or be affected by the plant. This should include a quantitative description of any water uses that provide potential liquid pathways for both radiological and nonradiological effluents. The following should be included for each withdrawal or discharge:</p> <ul style="list-style-type: none"> locations of diversions and returns with respect to the site and the water body (from the site visit, the general 			
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2.3.2 (cont'd)	<ul style="list-style-type: none"> literature, and consultation with Federal, State, regional, local, and affected Native American tribal agencies) identification of the water body (from the ER and the general literature) the average monthly withdrawal and return rate for each diversion by use category 			
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1	2.3.2	<p>Quantitative and qualitative description of recreational, navigational, instream, and other nonconsumptive present and known future water uses. For a 10-km (6-mi) radius, this should include the following (from the ER, site visit, peer-reviewed technical literature, and consultation with Federal, State, regional, local, and affected Native American tribal agencies):</p> <ul style="list-style-type: none"> • identification of water bodies and locations with respect to the site (maps may be useful) • the kind and location of activity on the water body (maps may be useful) • the use rate with time variation. 			
2	2.3.2	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			
3	2.3.2 and	<p>A water-use diagram for the plant showing:</p> <ul style="list-style-type: none"> • flow rates to and from the various water systems (e.g., circulating water system, sanitary system, radwaste and chemical waste systems, service water systems) • points of consumption • source and discharge locations <p>A water-use diagram of other station water uses (i.e., all facilities not associated with the proposed plant) showing:</p> <ul style="list-style-type: none"> • flow rates to and from the facility • average water consumption • maximum water consumption <p>Data and narrative description for:</p> <ul style="list-style-type: none"> • various plant water systems, their interconnections, and their operational interdependence and coordination • maximum water consumption • water consumption during periods of minimum water availability • average operation by month and by plant operating status; 			
4	3.3.1				
5	2.3.3	<p>The mean, range, and temporal and spatial variations of the surface-water and groundwater-quality characteristics.</p> <p>For surface waters: water temperature, suspended solids, total dissolved solids, hardness, turbidity, color, odor, conductivity, dissolved oxygen, biological oxygen demand (BOD), chemical oxygen demand (COD), phosphorus forms (total and orthophosphate), nitrogen forms (ammonia, nitrate, nitrite, organic), alkalinity, chlorides, sulfate, sodium, potassium, calcium, magnesium, heavy metals (e.g., Hg, Pb), pH, phytoplankton (chlorophyll <i>a</i>), and indicator microorganisms (e.g., total coliform, fecal coliforms, fecal streptococci)</p> <p>For groundwaters: the above surface-water data, minus phytoplankton and with silica, iron, carbon dioxide, and bicarbonate added</p>			
6	2.3.3	Descriptions, such as 303(d) lists, of pre-existing aquatic environmental stresses and their effects on surface or groundwater quality for waters that interact with the plant (e.g., water bodies at or near the site that do not meet established water-quality standards)			
7	2.3.2	Descriptions of pollutant sources with discharges to water that may interact with the plant, 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			
8	3.3.1	A narrative description of the various plant water systems, their interconnections, and their operational interdependence and coordination			

1	3.3.2	<p>A description and purpose of the water treatment systems used in the plant including:</p> <ul style="list-style-type: none"> • identification, quantities, and points of addition of chemicals and additives to be used by each system • operating cycles for each water treatment system for normal modes of plant operation (e.g., full power operation, shutdown/refueling, and startup) 			
2	3.4.1	<p>Descriptions of anticipated operational modes and the estimated periods of time that the system will operate in each mode including:</p> <ul style="list-style-type: none"> • for each anticipated operational mode, quantities of heat generated, dissipated to the atmosphere, and released in liquid discharges • for each operational mode, water source and quantities of water withdrawn, consumed, and discharged. 			
3	3.4.1	Status of the NPDES permit and any 316(a/b) demonstrations			
4	3.4.2	<p>For INTAKE SYSTEMS, include:</p> <ul style="list-style-type: none"> • a drawing of the intake structure showing the relationship of the structure to the water surface, bottom geometry, and shoreline • a description of the cooling water pumping facility • a description of the trash racks, traveling screens, trash baskets, and fish return devices • performance characteristics (e.g., flow rates, intake velocities) for the operational modes identified by the reviewer for ESRP 3.4.1 • performance characteristics for specific intake-related functions, such as de-icing, trash rack clearing, screen washing, trash basket removal, or fish return system operation • the location and description of components for the addition of chemicals (e.g., corrosion inhibitors, antifouling agents) to the intake system 			
5	3.4.2	<p>For DISCHARGE SYSTEMS, include:</p> <ul style="list-style-type: none"> • drawings of the outfall structure, showing its location in the receiving water body, relationship to water surface, bottom geometry, and shoreline • a description of discharge canal or discharge lines 			
6 7	3.4.2 (cont'd)	<ul style="list-style-type: none"> • performance characteristics (e.g., discharge flow rates, discharge velocities, discharge temperatures, and temperature differentials) for the operational modes identified by the reviewer for ESRP 3.4.1 • descriptions of specific discharge related components (e.g., diffusers, fish barriers) 			
8	3.4.2	<p>For HEAT DISSIPATION SYSTEMS, include:</p> <ul style="list-style-type: none"> • the location of heat dissipation system components relative to other site features • the design details of heat dissipation system components affecting system performance including the cooling towers, cooling lakes and ponds, spray ponds or canals, and condensers (once-through systems) (see Table 3.4.2-1 and -2 of the ESRP) • site-specific meteorological data (from ESRP 2.7) • site-specific water supply data (from ESRP 2.3.1) • heat dissipation system performance analyses based on the manufacturer's design data and site-specific meteorological and hydrological data 			

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3.6.1	<p>The following list of data should be obtained:</p> <ul style="list-style-type: none"> descriptions of nonradioactive effluent treatment facilities average, maximum, and seasonal variations of principal constituents of intake and receiving waters and any minor or trace materials that may be of environmental relevance a list of chemicals processed through each system (e.g., corrosion inhibitors, antifouling agents), and total amounts used per year, frequency of use, and concentrations of these chemicals or their products in each waste stream the concentration factor on a seasonal basis for evaporative cooling systems the average and maximum concentration of natural materials in effluent streams the operating cycles for each effluent treatment system for normal modes of plant operation (e.g., full power operation, shutdown/refueling, startup). 			
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3.6.2	<p>The following list of data should be obtained:</p> <ul style="list-style-type: none"> a description of the systems (both temporary and permanent) to be provided anticipated quantity and characteristics of treated effluents the ultimate disposal of treated effluents standards for the proposed sanitary system effluents a copy of the NPDES permit (if available). 			
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3.6.3	<p>The following list of data should be obtained:</p> <ul style="list-style-type: none"> estimates of gaseous effluents (e.g., from diesel engines, gas turbines, heating plants, incinerators) released during plant operation, the location and elevation of release points, the frequency of their release and their treatment before release, and the total quantity of SO_x, NO_x, hydrocarbons, and suspended particulates to be discharged annually applicable Federal, State, and tribal regional standards concerning atmospheric emissions from consultation with Federal, State, regional, local, and affected Native American tribal agencies 			
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3.6.3 (cont'd)	<ul style="list-style-type: none"> information concerning nonradioactive wastes not considered in ESRPs 3.6.1 and 3.6.2. Examples include laboratory wastes, storm drainage, trash, hazardous wastes, and debris from bars or screens on the cooling water intake. The description should include estimates of the quantities of wastes, their pollutant concentrations at points of release as appropriate to the system, and other relevant data procedures for any offsite disposal of wastes procedures by which all effluents will be treated, controlled, and discharged to meet State and EPA effluent limitation guidelines and new source performance standards 			
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4.2.1	<p>The following list of data should be obtained:</p> <ul style="list-style-type: none"> descriptions of the physical characteristics of the surface-water bodies and groundwater aquifers identification and description of project related construction activities expected to result in hydrologic alterations at the site, transmission corridors, and offsite areas. Activities include construction of cofferdams and storm sewers; dredging operations; placement of fill material into the water; creation of shoreside facilities involving bulkheads, piers, jetties, basins, or other structures or activities with potential to alter existing shoreline processes; construction of intake and outfall structures; water channel modifications; construction of roads and bridges; operations affecting water levels (flooding); dewatering activities; and construction activities contributing to sediment runoff, e.g., road construction, clearing and grading, fill or spoil placement 			
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4.2.1	<p>The following list of data should be provided:</p> <ul style="list-style-type: none"> identification of water sources used during construction and the average and maximum use rates of these waters identification of water bodies receiving construction effluents and the expected average and maximum flow rates and physical characteristics (temperature, sediment load, velocities) of these effluents identification of hydrologic alterations expected to result from the project related construction activities listed previously. identification and location of groundwater and surface-water users and areas that could be affected by project related hydrologic alterations descriptions of proposed practices and measures to limit or minimize expected hydrologic alterations Federal, State, regional, local, and affected Native American tribal agencies' best management practices and regulations descriptions of proposed means to ensure construction activity compliance with applicable hydrological standards and regulations. 			
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4.2.2	<p>The following data should be provided:</p> <ul style="list-style-type: none"> identification and locations of groundwater and surface-water users and areas that could be impacted by project related construction activities affecting water use 			
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4.2.2 (cont'd)	<ul style="list-style-type: none"> predicted impacts on the water users identified in the previous item descriptions of any proposed practices and measures to control construction related water-use impacts. Factors to be considered include flooding, drainage, groundwater elevation, erosion, sedimentation, water quality, protection of natural drainage channels and water bodies, protection of shorelines and beaches, restrictions on access to and use of surface water, protection against saltwater intrusion, and handling of fuels, lubricants, oily wastes, chemical wastes, sanitary wastes, herbicides, and pesticides consultations with Federal, State, regional, local, and affected Native American tribal regulators descriptions of proposed means to ensure construction activity compliance with water-quality and water-use standards and regulations water-quality requirements for key elements of aquatic ecosystem and domestic users 			
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<p>4.2.2</p>	<p>The following list of data should be provided:</p> <ul style="list-style-type: none"> • descriptions of the site and vicinity water bodies and aquifers (including sole-source aquifers) • descriptions of hydrologic alterations and their related construction activities • the physical effects of hydrologic alterations • comparisons of water quantity available to other water users with existing and known future water rights and allocations • identification of water bodies receiving construction effluents (e.g., sanitary wastes, cleaning wastes, dust control, fuels and lubricants, chemical, herbicides, pesticides) and the expected average and maximum flow rates and composition of these effluents • baseline water-quality data for surface-water and groundwater sources used during construction and impacted by construction activities • potential changes to surface-water and groundwater quality (e.g., heavy metal contamination) resulting from substrate exposure during construction 			
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<p>5.2.1</p>	<p>The following list of data should be provided:</p> <ul style="list-style-type: none"> • a quantitative description of present and known future groundwater withdrawals on the site and for distances great enough to cover aquifers that may affect plant water availability or be affected by plant water use. The following should be included for each use : (a) location, depth, and elevation of wells (total and cased) and water levels with respect to the plant, (b) identification of aquifers (c) average monthly withdrawal rates. • operational activities expected to result in hydrologic alterations within the site and vicinity, along transmission corridors, or at offsite areas. These activities can include dredging operations, operations affecting water levels, and dewatering activities. • identification and description of the hydrological alterations resulting from the identified operational activities. These can include changes in the flood handling capability of the floodplain, flow and circulation patterns, erosion subsidence, water availability, and sediment transport 			
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<p>5.2.1</p>	<p>The following list of data should be provided:</p> <ul style="list-style-type: none"> • descriptions of the physical characteristics of the surface-water bodies and groundwater aquifers • quantitative descriptions of proposed water sources, including groundwater sustained yield, 7-day once-in-10-years low flow, flows (including reverse and regulated) and yields during the drought of record, and low lake levels; estimates of frequency and duration of water-supply shortages • withdrawals and returns of surface water and groundwater used for plant operation, including rates and sources of water. This should include the different operational modes of the plant. The information should also include plant effluent quantity and physical characteristics as a function of the different operational modes. • a quantitative description of present and known future surface-water uses (diversions, consumptions, and returns) that are within the hydrological system in which the plant is located and that may affect plant water availability or be affected by plant water use. The following should be included for each use: (a) locations of diversions and returns with respect to the plant intake system (b) identification of water bodies (c) average monthly withdrawal and consumption rate. 			
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5.2.1	<p>The following list of data should be provided:</p> <ul style="list-style-type: none"> • identification and locations of surface-water and groundwater users (including aquatic ecosystems) and water-use areas that could be affected by hydrologic alterations resulting from plant operation • a summary of statutory and other legal restrictions relating to plant water use and water consumption • descriptions of proposed means to ensure compliance with standards and regulations affecting plant water use and water consumption, and proposed practices and measures to limit or minimize operational hydrologic alterations. 			
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5.2.2	<p>The following list of data should be provided:</p> <ul style="list-style-type: none"> • descriptions of the site and vicinity water bodies and groundwater aquifers • descriptions of hydrologic alterations and their related operational activities • the physical effects of hydrologic alterations • a quantitative description of present and known future surface-water uses, including any station water <p>Uses not associated with the proposed project, that are within the hydrological system in which the plant is located and that may be adversely affected by the plant. The following should be included for each use: (a) identification of the water body, (b) locations of diversions and returns with respect to the plant. Diversions located between the plant discharge and the region of complete dilution should be further characterized by location with respect to the water body, (c) average monthly withdrawal and consumption rate for each division by use category (e.g., domestic, municipal, agriculture).</p>			
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5.2.2	<p>The following list of data should be provided:</p> <ul style="list-style-type: none"> • a quantitative description of present and known future groundwater withdrawals on the site and for distances great enough to cover aquifers that may be adversely affected by the plant 			
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5.2.2 (cont'd)	<p>The following should be included for each use: (a) withdrawal location, (b) depth and elevation of wells (total and cased depth) and water levels, (c) identification of aquifers, and (d) average monthly withdrawal rates by use category.</p> <ul style="list-style-type: none"> • comparisons of water quantity available to other water users with existing and known future water rights and allocations • a quantitative and qualitative description of recreational, navigational, and other nonconsumptive known future water uses. For a 10-km (6-mi) radius, this should include the following: (a) identification of water bodies and location with respect to the plant, (b) kind and location of activity on the water body, (c) use rate with time variation • identification of water bodies receiving plant effluents and the expected average and maximum flow rates and composition of these effluents • predicted impacts to water users or water-use categories described in the "Data and Information" section of this ESRP • baseline water-quality data for surface-water and groundwater sources used for and impacted by plant operation (from ESRP 2.3.3) 			
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5.2.2	<p>The following list of data should be provided:</p> <ul style="list-style-type: none"> • baseline water-quality data for surface-water and groundwater sources used for and impacted by plant operation • descriptions of any proposed practices and measures to control or limit operational water-use impacts • summary of statutory and other legal restrictions relating to water use or specific water-body restrictions on water use imposed by Federal, State, regional, local, or affected Native American tribal regulations • Federal, State, regional, local, and affected Native American tribal standards and regulations applicable to water quality and water use (from consultation with Federal, State, regional, local, and affected Native American tribal agencies) • descriptions of proposed means to ensure operational compliance with water-quality and water-use standards and regulations 			
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5.3.1.1	<p>The following list of data should be provided:</p> <ul style="list-style-type: none"> • bathymetry and sediment characteristics in the vicinity of the intake structure(s) • maps depicting station layout with respect to the water body, including locations of all intakes and discharges • intake flow rates and velocities as a function of plant operating conditions • detailed drawings of the intake structure(s), including the relationship of the structure to the water surface (normal and minimum levels) • ambient current patterns in the vicinity of the proposed intake structure(s) • descriptions of other intake system design and performance characteristics affecting hydrodynamics (e.g., horizontal and vertical approach velocities, geometry of intake canals, submerged riprap) 			
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5.3.1.1 (cont'd)	<ul style="list-style-type: none"> • descriptions of spatial and temporal alterations of the ambient flow field and of any other physical hydrologic effects induced by intake-system operation 			
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5.3.2.1	<p>The following list of data should be obtained on the RECEIVING SURFACE water bodies:</p> <ul style="list-style-type: none"> • bathymetry of the water bodies that may be affected by operation of the plant discharge system, with detailed data in the vicinity of the discharge • maps depicting station layout with respect to water bodies, including the locations of all intakes and discharges • maximum, average maximum, average, average minimum, and minimum monthly temperatures in the water bodies • erosion characteristics and sediment transport (including rate, bed and suspended load fractions, and gradation analyses) • for freshwater streams: maximum, average-maximum, average, average minimum, and minimum monthly flow rates; historical drought stages and flow rates by month, 7-day once-in-10-years low flow; important short duration fluctuations (e.g., diurnal release variations from peaking operation of upstream hydroelectric plant, diurnal temperature variations); velocity and temperature distributions (horizontal and vertical) near the discharge structure and downstream to the area of total mixing 			
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1	5.3.2.1	<p>The following list of data should be obtained on the RECEIVING SURFACE water bodies:</p> <ul style="list-style-type: none"> for lakes and impoundments: description of the lake or impoundment geometry; location and elevation of impoundment outlets; elevation area capacity curves; summary description of operating rules; maximum, average maximum, average, average minimum, and minimum monthly inflow and outflow rates; temperature distributions (horizontal and vertical); and seasonal variations of density induced currents for estuaries and oceans: seasonal variations in the shoreline and bottom geometry due to sediment transport; tidal current patterns (velocities and phases), range, and excursion; nontidal circulation patterns including frequency distributions of current speed, direction, and persistence; and temperature and salinity distribution (horizontal and vertical) including temporal variations. For estuaries, maximum, average maximum, average, average minimum, and minimum monthly river discharge and flushing characteristics 			
2	5.3.2.1	<p>The following list of data should be obtained on the METEOROLOGY:</p> <ul style="list-style-type: none"> onsite meteorological data National Oceanographic and Atmospheric Administration (NOAA) National Climatic Data Center meteorological data for the nearest National Weather Service (NWS) station the elevation of instruments measuring wind speeds, wet bulb temperatures, and humidities 			
3	5.3.2.1	<p>The following list of data should be obtained on the DISCHARGE STRUCTURE:</p> <ul style="list-style-type: none"> detailed drawings of the discharge structure(s), including relationship of structure(s) to the water 			
4 5	5.3.2.1 (cont'd)	<ul style="list-style-type: none"> surface (normal and minimum) and water body bathymetry water flow rates, velocities, and temperatures in the discharge stream(s) as a function of operating conditions 			
6	5.3.2.1	<p>The following list of information on the applicant's models, if used:</p> <ul style="list-style-type: none"> for numerical models: (a) theory, assumptions, and basis for applicability (b) procedures used to estimate model parameters (e.g., diffusion coefficients) (c) model verification (d) the applicant's predicted temperature distributions, areas for isotherms, dilution rates, and time of passage through plume. for physical models: (a) physical model facilities (e.g., dimensions of the plume and flow rates), (b) modeling techniques and scaling relationships, (c) data collection and analysis techniques (e.g., number and locations of temperature probes, infrared mapping), (d) prototype verification (if any), (e) the applicant's flow fields and temperature distributions for critical and average hydrological conditions 			
7	6.1	<p>The following list of data describing the THERMAL MONITORING should be provided:</p> <ul style="list-style-type: none"> maps showing: (a) features of the plant and site, including the boundaries and bathymetry of all water bodies adjacent to the site both before and after construction activities, (b) the location of all thermal, hydrological, or aquatic biological monitoring stations, and (c) the predicted extent of the thermal plume the type and frequency of temperature measurements taken at each location, as well as the duration of each monitoring program descriptions of the monitoring equipment used descriptions of the data analysis procedures used 			

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6.3	<p>The following list of data describing the HYDROLOGICAL MONITORING should be provided:</p> <ul style="list-style-type: none"> maps showing (a) features of the plant and site, including the boundaries and bathymetry of all surface-water bodies (including springs) adjacent to 			
6.3	<p>the site both before and after construction activities, (b) the locations of all hydrological (including groundwater monitoring wells), thermal, and aquatic biological monitoring stations, (c) locations of all wells potentially influenced by plant construction and operation, and (d) major geomorphic features (e.g., floodplains) and regional geology</p> <ul style="list-style-type: none"> site vicinity surface and groundwater average and extreme velocities and flow rates sediment transport (suspended and bed load) characteristics and erodability of the site soil the type and frequency of data collected at each location as well as the duration of each monitoring program descriptions of the monitoring equipment used descriptions of the data analysis procedures used documentation of data quality objectives (if any) 			
6.6	<p>The following list of data describing the CHEMICAL MONITORING should be provided:</p> <ul style="list-style-type: none"> systems to be sampled location of sampling stations type of sample (e.g., surface grab or depth composite), number of replicates, and method of collecting the sample time of day, time period, and frequency of sampling methods of preserving the samples analytical methods used description of automated monitoring systems used reference or calibration standards used to verify accuracy of methods statistical methods used to interpret results quantitative data on chemical characteristics of surface-water and/or groundwater in the site and vicinity, including seasonal ranges and averages and historical extremes. data quality objectives quality assurance procedures. 			

Appendix G - Land Use

Sufficiency Review Checklist

ESRP Section or Regulation Number	Sufficiency review question	YES: ER provides the prescribed information (note location in ER section or page)	NO: ER provides partial or no information, but the information is easy to obtain (perhaps requires RAI?)	NO: ER does not provide the prescribed information, and it is difficult or time consuming for the staff to obtain. (requires RAI)
2.2.1	Land areas (hectares) devoted to major uses within the site boundary.			
2.2.1	Maps showing major land uses in the site vicinity with land uses classified consistently with standard U.S. Geological Survey categories.			
2.2.1	Egress limitations from the area surrounding the site.			
2.2.1	Mineral resources (e.g., sand and gravel, coal, oil, natural gas, and ores) adjacent to or within the site boundary presently being exploited or of known commercial value.			
2.2.1	Special land uses (e.g., recreation) other than major land uses in the site and vicinity that could be significantly affected by construction of the proposed project (from consultation with local agencies).			
2.2.1	Ownership of mineral resources (i.e., whether the mineral resources are owned by the surface landowner or by another owner).			
2.2.1	Land-use plans that include the site and vicinity within their scope (from applicable Federal, State, regional, local, and affected Native American tribal planning agencies).			
2.2.2	Proposed routes for corridors that will be used for construction of transmission lines from the station site to an interconnecting point or points on the existing high-voltage transmission systems.			
2.2.2	Proposed routes of access corridors to serve the proposed station.			
2.2.2	Transmission corridor lengths, widths, and areas.			
2.2.2	Land-use restrictions, if any, contained in any easements (from consultation with land resource agencies).			
2.2.2	Land use within the transmission corridors using the categories defined by the U.S. Geological Survey. Land-use information should be subdivided into corridor segments having predominantly similar land-use types (from consultation with applicable Federal, State, regional, local, and affected Native American tribal agencies).			
2.2.2	Identification of offsite areas by land use, size, and location (from site visit, and consultation with Federal, State, regional, local, and Native American tribal agencies).			
2.2.2	Local and regional land-use plans of State, regional, and local agencies (from consultation with Federal, State, regional, local, and affected Native American tribal agencies).			
2.2.2	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, floodplains, wildlife refuges, and wilderness areas) (from consultation with Federal, State, regional, local, and affected Native American tribal agencies).			

1	2.2.3	Maps showing major land use within the region. Land-use categories should be consistent with those defined by the U.S. Geological Survey (from consultation with resource agencies).			
2	2.2.3	Land areas devoted to major uses within the region.			
3	2.2.3	Principal agricultural products of the region and average annual yields.			
4	2.2.3	Maps showing the major transportation and utility networks within the region.			
5	2.2.3	Maps showing major public and trust land areas in the region.			
6	2.8	Descriptions of Federal actions associated with acquisition and/or use of the proposed site and transmission corridors or of any other offsite property needed for the proposed project.			
7	2.8	Descriptions of planned Federal projects that will be required either to provide an adequate source of facility cooling water or to ensure an adequate supply of cooling water over the operating lifetime of the facility (from consultations with Federal, State, local, and affected Native American tribal agencies).			
8	2.8	Descriptions of any other planned Federal projects or activities that must be completed as a condition of facility construction or operation (from consultations with appropriate Federal agencies).			
9	2.8	Federal agency plans or commitments that will result in significant new power purchases within the applicant's service area that have been used to justify a need for power (from consultation with appropriate Federal agencies).			
10	2.8	Descriptions of planned Federal projects that are contingent on facility construction and operation (from consultation with appropriate Federal agencies).			
11	3.7	Basic electrical design parameters, including transmission design voltage or voltages, line capacity, conductor type and configuration, spacing between phases, minimum conductor clearances to ground, maximum predicted electric-field strength(s) at 1 m above ground, the predicted electric field strength(s) at the edge of the corridor in kilovolts per meter (kV/m), and the design bases for these values.			
12	3.7	Predicted noise levels resulting from transmission-system operation.			
13	3.7	Basic structural design parameters, including illustrations and descriptions of towers, conductors, and other structures, with dimensions, materials, color, and finish.			
14	3.7	The applicant should provide siting data for all potential corridors identified by the applicant using topographic maps (7.5- or 15-minute scale as a rule) or aerial photographs showing the proposed corridor or corridors and all existing major high voltage corridors in the region.			
15	3.7	Lengths, widths, and area of corridors, including modification and/or use of existing corridors and other facilities for the proposed project.			
16	3.7	General methods of construction (e.g., tower foundations, stringing, location of access roads, span length, and clearing of corridors).			
17	3.7	When available, tower and substation locations.			

1	4.1.1	Has the applicant addressed transportation of construction materials to the site? For example, will rail service need to be established, restored, or otherwise reconditioned to accommodate the industrial loads expected during facility construction? If so, have these activities been characterized?			
2	4.1.1	Will the applicant be making use of currently abandoned rail lines?			
3	4.1.1	Will dredging of barge slips or other channels be required to facilitate construction? If so, where will the dredge spoils be deposited and what volume of spoil is projected?			
4	4.1.1	Will borrow pits be constructed (or expanded)? If so what volumes of borrow will be transported and used in construction?			
5	4.1.1	Has the applicant detailed the extent of the planned construction footprint in terms of amount of disturbed ground?			
6	4.1.1	Will local roads or highways need reconditioning to handle the expected loads?			
7	4.1.1	To what degree is the construction labor force expected to locate in the vicinity of the proposed facility? Will there be temporary housing communities during construction?			
8	4.1.1	Is the applicant seeking a Limited Work Authorization (LWA) as part of an ESP application? If so, the LWA authorizes a significant amount of ground-disturbing activities at the site to prepare for eventual reactor building construction. These activities should be clearly identified in the application as part of the Site Redress Plan, and the applicant should demonstrate that cooperation with relevant permitting agencies is underway or expected.			
9	4.1.2	Highways, railroads, and utility corridors that will be crossed by transmission lines and access corridors			
10	4.1.2	Description of construction techniques and the associated impact on land use.			
11	4.1.2	Area and location of land within the corridors and offsite areas that will be disturbed by construction on either a long-term or short-term basis			
12	4.1.2	Planned control actions during construction that will restrict land use in the corridors and offsite areas.			
13	4.1.2	Do proposed corridors cross land zoned for residential or recreational uses?			
14	4.1.2	Has the applicant addressed the visual impact of constructing new corridors or widening existing corridors?			
15	5.1.1	Depending on the site and the level of applicable demographic research, land-use impacts could be projected to result from demand for new housing of operations workers. Only in rare cases would it be expected that enough research would be available to predict the degree that new housing would have land-use impacts in the vicinity. The applicant should acknowledge the operations impact on housing and similar impacts that may occur from outage operations.			
16	5.1.1	Potential agreement or conflict with local land-use plans should be addressed by the applicant. The applicant needs to show how the operation of a new nuclear unit either compliments or conflicts with existing land-use plans. Evidence of communication to this effect between the applicant and relevant agencies should be apparent.			

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5.1.1	The land-use area also includes the impacts of salt drift from cooling tower steam plumes on crops and vegetation in the vicinity. The LR GEIS provides clear metrics for determining impact significance in this area, and it should be referenced in this context by the applicant preparing the ER.			
5.1.2	The applicant should provide a detailed characterization of typical transmission corridor maintenance activities.			
5.1.2	Has the applicant addressed the question of impacts from seasonal access to transmission corridors that cross land in agricultural or other productive use?			

Appendix H - Meteorology

Sufficiency Review Checklist

ESRP Section or Regulation Number	Sufficiency review question Is the following material found and cited in the Environmental Report, Site Safety Analysis Report, or Site Redress Plan?	YES: ER provides the prescribed information (note location in ER section or page)	NO: ER provides partial or no information, but the information is easy to obtain (perhaps requires RAI?)	NO: ER does not provide the prescribed information, and it is difficult or time consuming for the staff to obtain. (requires RAI)
2.7	A description of the general climate of the region with respect to the type of air masses, synoptic features, general air flow patterns, temperature and humidity characteristics, precipitation, and relationships between synoptic and mesoscale conditions.			
2.7	A description of the regional air quality, including nonattainment or maintenance areas.			
2.7	A description of severe weather phenomena and its frequency.			
2.7	Monthly and annual air temperature and dewpoint temperature summaries, including averages, extremes, and diurnal range.			
2.7	Monthly and annual summaries, including natural variability, occurrences of heavy fog, and appropriate summaries of other relevant parameters to support the description of impacts resulting from the operation of a closed-cycle heat dissipation system.			
2.7	Estimated monthly mixing-height data, including frequency and duration (persistence) of inversion conditions and the methods used to provide the estimates.			
2.7	Monthly and annual wind roses at all height(s) at which data on wind characteristics are applicable.			
2.7	Monthly and annual summaries of atmospheric stability.			
2.7	Short- and long-term diffusion estimates of normalized concentration (χ/Q) and/or relative deposition (D/Q) and the period of onsite meteorological data used in the calculations.			
5.3.3.1	Evaluation of the potential impacts caused by the heat dissipation system, such as weather modification due to cloud development and increased precipitation, shadowing and drift caused by the condensed plume, increased local humidity, and increased fogging and icing.			
6.7	Description of the onsite meteorological measurement program including a description of the local topography of the site and the location of the meteorological tower(s).			
6.7	Discussion of the meteorological measurements, instrumentation, and elevation of the instruments above grade.			
6.7	Discussion of instrument calibration and maintenance procedures, output and recording systems, and data analysis procedures, including quality control.			

Appendix I - Need for Power and Benefit-Cost Balance

Sufficiency Review Checklist

ESRP Section or Regulation Number	Sufficiency review question Is the following material found and cited in the Environmental Report?	YES: ER provides the prescribed information (note location in ER section or page)	NO: ER provides partial or no information, but the information is easy to obtain (perhaps requires RAI?)	NO: ER does not provide the prescribed information, and it is difficult or time consuming for the staff to obtain. (requires RAI)
8.1	Description of the relevant service area(s), including (1) a map of the service area showing the location of the proposed facility relative to the service area, (2) how the output from the facility will be connected to the transmission and distribution grid system, (3) transmission and intertie, including capacity, constraints within the service area, and (4) new transmission capacity if required.			
8.1	Number and types of customers and major electrical load centers in the relevant service area.			
8.1	System factors that are unique to the power system (e.g., power pool agreements and reserve margin requirements).			
8.2.1	Methodology, assumptions, and information sources used to develop the forecasts of electricity consumption, peak load demand, and load factor.			
8.2.1	Chart or table of historical and projected yearly electricity consumption, system peak-load demand, and load factor for the relevant service area(s) and principal reasons for the increase in consumption/ demand and shifts in the load factor.			
8.2.1	Results of any independent assessments of the forecasted electricity consumption and peak load demand.			
8.2.1	Comparison of forecasted electricity consumption and peak load demand to other independent forecasts and reasons for significant differences.			
8.2.1	Identification of expected customers (or firm power sales) for the power to be supplied by the proposed facility and any signed agreements for the purchase of the power; obtain estimate of forecasted power sales by the applicant in the relevant service area [Note: this information is likely to be business sensitive and/or proprietary information].			
8.2.2	Historical and projected economic, weather, price of electricity, energy mix, and demographic/population trends that are driving the growth in electricity demand.			
8.2.2	Methodology and information sources used to develop the forecast of economic, weather, price of electricity, energy mix, and demographic/population trends.			
8.3	Description of the electricity supply mix in the relevant service area, historical and projected contribution of each to total annual electricity consumption and peak-load demand, and factors driving the change in electricity supply mix.			
8.3	Description of the methodology, assumptions, and information sources used to develop the forecast of electricity supply mix.			
8.3	Identification of offsite areas by land use, size, and location (from site visit, and consultation with Federal, State, regional, local, and Native American tribal agencies)			

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8.3	Identification of existing power facilities that serve the relevant service area, and their associated electricity generation capacity, whose retirement has been announced or is anticipated within a few years before and after start of operation of the applicant's proposed facility.			
8.3	Identification of firmly committed new facilities and proposed new facilities that will serve the relevant service area, and their associated electricity generation capacity, that are expected to start operation between a few years before and after start of operation of the applicant's proposed facility.			
8.3	Estimate of forecasted electricity supply by the applicant in the relevant service area and source of the supply (e.g., existing facilities co-owned by the applicant, purchased power, and new capacity) area [Note: this information is likely to be business sensitive and/or proprietary information].			
8.4	Historical and projected reserve margin for the relevant service area.			
8.4	Applicant's historical and projected reserve margin, and how this changes with the proposed new facility; identify any agreements with government/semi-government entities to maintain a minimum reserve margin and/or reserve margin range in the relevant service area.			
10.4.1	The annual average electrical-energy generation (kW-hr) and the annual production of any other beneficial or revenue-producing products. [ESRP 3.2]			
10.4.1	Data on other benefits, quantified to the extent possible (e.g., annual local, State, and Federal tax payments, number and type of jobs, and total annual wages paid). [ESRPs 4.4.2, 5.8.2]			
10.4.1	Description of other nonquantifiable or nonmonetary benefits (e.g., new recreational facilities). [ESRPs 4.1.1 through 5.8.3]			
10.4.1	Description of differences in benefits between alternatives and system configurations. [ESRPs 9.4.1, 9.4.2, 9.4.3]			
10.4.2	Estimates of the capital cost, annual operating and maintenance costs, decommissioning costs, and any other internal costs of the proposed facility, including alternative modifications. [ESRP 9.4.1, 9.4.2, 9.4.3]			
10.4.2	Description of differences in costs between alternatives and alternative system configurations. [ESRPs 9.4.1, 9.4.2, 9.4.3]			
10.4.2	Comparison of the estimated costs of the proposed facility with other independent or applicant-commissioned cost estimates and reasons for significant differences.			

Appendix J - Radiological Health

Sufficiency Review Checklist

ESRP Section or Regulation Number	Sufficiency review question Is the following material found and cited in the Environmental Report, Site Safety Analysis Report, or Site Redress Plan?	YES: ER provides the prescribed information (note location in ER section or page)	NO: ER provides partial or no information, but the information is easy to obtain (perhaps requires RAI?)	NO: ER does not provide the prescribed information, and it is difficult or time consuming for the staff to obtain. (requires RAI)
4.5	The physical layout of the site, including the location and orientation of onsite or adjacent nuclear fuel cycle facilities that are expected to be operating during construction of the proposed facility.			
4.5	The location and characteristics of external radiation sources and radioactive effluent emission sources at nearby facilities.			
4.5	Measured or estimated radiation dose rates and airborne radioactivity concentrations at the construction site.			
4.5	The number and locations of construction workers who will be exposed to the radiation sources at the site and the amount of time per year that they will spend at those locations.			
4.5	The estimated annual collective dose to the construction work force, including models assumptions, and input data used for the dose estimates.			
5.4.1	Distances from the proposed reactor to the following points or areas for each of the 22½-degree radial sectors centered on the 16 cardinal compass directions: <ul style="list-style-type: none"> - Nearest site boundary - To a distance of 8 km (5 mi), each receptor and its location for the nearest residence, milk cow, milk goat, meat animal, and vegetable garden larger than 50 m² - If the applicant proposes elevated releases of radioactive effluents as defined in Regulatory Guide 1.111, the location of all milk cows, milk goats, meat animals, residences, and vegetable gardens larger than 50 m² out to a distance of 5 km (3 mi). 			
5.4.1	For the applicable locations noted above, the grazing seasons and fraction of daily intake of cows, meat animals, and milk goats derived from pasture or fresh forage during the grazing season.			
5.4.1	Fraction of the year that leafy vegetables are grown and the average absolute humidity in grams per cubic meter during the growing season.			
5.4.1	The nearest present and known future locations from which an individual can obtain aquatic food and/or drinking water.			
5.4.1	The nearest present and known future shoreline areas that an individual can use for recreational purposes.			
5.4.1	For the two locations noted immediately above, the transit time of each facility discharge stream containing liquid radwaste discharge from the point at which the stream enters			
5.4.1 (cont'd)	an unrestricted area to the identified location, and the estimated stream dilution at that location.			
5.4.1	For each liquid radwaste discharge, the transit time from input to a facility discharge stream to the point at which the stream enters an unrestricted area, and the stream discharge in cubic meters per second.			

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5.4.1	The following distributional data for each of the 22½-degree radial sectors centered on the 16 cardinal compass directions for radial distances of 2, 4, 6, 8, 10, 20, 40, 60, and 80 km (1.2, 2.5, 3.7, 5, 6.2, 12, 25, 27, and 50 mi) from the reactor: <ul style="list-style-type: none"> - Projected population for five years from the time of the licensing action under consideration - Present annual meat production (kg/yr) - Present annual milk production (liter/yr) - Present annual vegetable production (kg/yr) - Estimate of direct radiation doses from sources within the site. 			
5.4.1	The present commercial fish and invertebrate catch (in kg/yr) from waters within 80 km (50 mi) downstream (or 80-km [50-mi] radius for lake or coastal sites) of the facility radwaste discharge; major catch locations, their distance from the facility radwaste discharge, and the amount caught within 80 km (50 mi) of the facility that is consumed; transit time from the point at which the discharge stream enters an unrestricted area to each major catch location, the estimated dilution at each location, and the basis for calculating transit time and dilution.			
5.4.1	Present and known future drinking water intake locations within 80 km (50 mi) of the facility radwaste discharge (downstream or radius); the transit time and estimated dilution at each major location, the basis for calculating transit time and dilution, and the populations served or the daily water consumption at each location.			
5.4.1	The irrigation rate (liter/m ² /month), crop yield (kg/m ²), annual production (kg/yr), and growing period (days) for irrigated land using water withdrawn within 80 km (50 mi) of the facility radwaste discharge (downstream or radius) when crop production has the potential for contributing 10% or more to individual or population doses because of liquid effluents; the crop type and its use (e.g., human consumption and meat animals), total crop production (by type) within the 80-km (50-mi) distance, and the amounts consumed within an 80-km (50-mi) radius of the facility; transit time from the point at which the discharge stream enters an unrestricted area to the points of withdrawal, estimated dilution at each withdrawal point, and the bases for calculating transit times and dilution factors.			
5.4.1	Unusual animals, plants, agricultural practices, game harvests, or food processing operations having the potential to contribute 10% or more to either individual or population doses in areas affected by liquid effluents, and food-processing operations involving large quantities of water.			
5.4.2	Information related to exposure pathways, including <ul style="list-style-type: none"> - receptor locations - population distribution - meteorological dispersion data - hydrological dilution data. 			
5.4.2	Gaseous and liquid effluent data.			
5.4.2	Exposure rates associated with onsite out-of-plant storage of solid waste.			
5.4.2	Applicant calculated dose data.			
5.4.2	Occupational radiation dose estimates.			
5.4.3	Data on water use to support the analysis of public dose from waterborne sources.			
5.4.3	Estimated individual and collective doses.			
5.4.3	Maximum site-specific doses to members of the public.			

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5.4.3	Dose consequences and health effects associated with normal operational effluents.			
5.4.3	Summary of the maximum individual and collective dose estimates.			
5.4.3	Radiation dose data including <ul style="list-style-type: none"> - Maximum individual doses from liquid effluents - Maximum individual doses from gaseous effluents - Maximum individual doses from direct radiation sources - Collective doses to the population within 80 km (50 mi) of the facility - Occupational collective doses. 			
5.4.3	Natural radiation doses that are generally applicable to the site.			
5.4.4	A list of the biota to be considered in this evaluation.			
5.4.4	Site-specific pathways for radiation exposure to biota.			
5.4.4	Doses to the maximally exposed individual.			
6.2	A map or aerial photograph of the site vicinity with proposed monitoring and sampling locations identified and indicating the medium sampled at each location. The map or photograph should be suitable to show distance and direction of each location from the facility, particularly with regard to the effluent release points.			
6.2	A description of the proposed monitoring program including: <ul style="list-style-type: none"> - number and location of sample collection points and measuring devices and the pathway sampled or measured - sample size, sample collection frequency, and sampling duration - type and frequency of analysis - general types of sample collection and measuring equipment - lower limit of detection for each analysis - the approximate date on which the proposed program will be effective - the quality-assurance program for radiological environmental monitoring programs. 			
6.2	A discussion justifying the choice of sample sites, analyses, sampling frequencies, sampling and measuring durations, sample sizes, and lower limits of detection.			

Appendix K - Overview, Cumulative Impacts, and Mitigation and Monitoring

Sufficiency Review Checklist

ESRP Section or Regulation Number	Sufficiency review question Is the following material found and cited in the Environmental Report or Site Redress Plan?	YES: ER provides the prescribed information (note ER section or page)	NO: ER provides partial or no information, but the information is easy to obtain. (perhaps requires RAI)	NO: ER does not provide the prescribed information, and it is difficult or time consuming for the staff to obtain. (requires RAI)
1.1	Full names of all organizations (e.g., utilities and municipalities) sharing ownership of the proposed project.			
1.1	Name of the organization designated as the applicant. This organization is the contact with NRC during the licensing process and will be responsible for construction and operation of the proposed project .			
1.1	Site location with respect to nearby towns and natural features.			
1.1	Number and type of reactors, highest anticipated gross thermal megawatt output, and net electrical output.			
1.1	Cooling system description (intake type, heat dissipation type, discharge type, source of cooling water).			
1.1	Transmission system description (kilometers of new corridors, new towers or conductors on existing corridors).			
1.1	The nature of the proposed action and the constraints that are placed on the review because of the type of action.			
1.1	Proposed dates for start and completion of major activities.			
1.2	The name of each related authorization, including the responsible agency and the applicable law, ordinance, or regulation.			
1.2	The date of application/initiation and scheduled date of issuance of each authorization.			
1.2	The current status of each authorization (from consultation with Federal, State, regional, local, and affected Native American tribal agencies).			
1.2	The principal environmental factors to be covered by the authorization.			
2.1	Site location: State; county; latitude and longitude Universal Transverse Mercator (UTM) coordinates; and township, range, and section(s).			
2.1	Area of the site.			
2.1	Distance and direction from the nearest major city.			
2.1	Distance and direction from several nearby towns and readily recognized landmarks, including major nearby highways, rivers, or other bodies of water, within 10 km (6 mi) of the facility site.			

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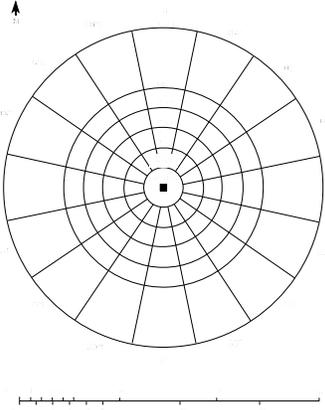
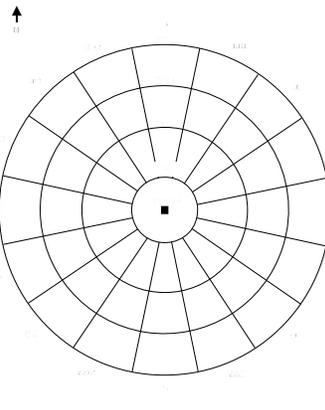
2.1	For geographical orientation, simplified maps (based on an official source of information such as a State highway map) centered on the facility site: one general map with about an 80-km (50-mi) radius and a second map with about a 10-km (6-mi) radius of the facility (orient true north at the top of the map).			
2.1	High-oblique aerial view or perspective drawing of the site with an indication of the facility boundary (facility site should occupy about 10% of the view) (from the ER upon request [reproducible copy] from the applicant).			
2.8	The ER or SSAR/FSAR should provide some indication of other nearby industrial facilities, other nuclear facilities in the region, or other Federal projects existing in the region or that might be required to construct and operate the proposed facility.			
3.1	Topographic maps of the site and vicinity (refer to ESRP 2.2) showing facility and station layout, the exclusion area, site boundary, liquid and gaseous release points (and their elevations), meteorological towers, the construction zone, land to be cleared, waste disposal areas, and other buildings and structures (both temporary and permanent) associated with the project.			
3.1	Description of the station, including proposed plans to seclude and screen the facilities and to architecturally integrate the buildings and landscaping into the environs.			
3.1	Aesthetic principles and concepts used in the facility design and layout.			
3.1	Representative ground-level photographs of the site on which major station features are super imposed. These should be taken from among the following typical vantage points when a visual impact from that location can be expected: <ul style="list-style-type: none"> - residential - commercial - industrial - educational - transportation corridors (air, auto, rail, pedestrian) - cultural (recreational, historic, archaeological). 			
3.1	Low, oblique aerial photograph of the site and vicinity on which major station features are super imposed.			
3.1	An architectural rendering of the proposed project to include landscaping and all major station features.			
4.6	Data and information related to the applicant's commitments to measures and controls to limit potential impacts should consist of the following three elements: (1) identification of the impact, (2) the planned control program, including monitoring, and (3) the control procedures - for the following areas: <ul style="list-style-type: none"> - noise - erosion - dust - traffic 			
4.6 (cont'd)	<ul style="list-style-type: none"> - effluents and wastes - surface-water impacts - groundwater impacts - land-use protection/restoration - water-use protection/restoration - terrestrial ecosystem impacts - aquatic ecosystem impacts - socioeconomic impacts - radiation exposure to construction workers - other site-specific impacts. 			

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5.10	Listing of potentially adverse impacts: - noise - erosion - effluents and wastes - surface-water impacts - groundwater impacts - terrestrial ecosystem impacts - aquatic ecosystem impacts - socioeconomic impacts - other site-specific impacts.			
5.10	Proposed design or planned control program in each of the above areas.			
5.10	Proposed control or operational procedures in each of the above areas.			
6.7	Site preparation and construction monitoring commitments.			
6.7	Preoperational monitoring commitments.			
6.7	Operational monitoring commitments.			
RG 4.2, Rev 2: Page 5-1	Assess the proposed action for cumulative and projected long-term effects from the point of view that each generation is trustee of the environment for each succeeding generation.			
RG 4.2, Rev 2: Page 5-3	Information concerning any cumulative buildup of radionuclides in the environment, such as in sediments.			

Appendix L - Socioeconomics and Environmental Justice

Sufficiency Review Checklist

ESRP Section or Regulation Number	Sufficiency review question	YES: ER provides the prescribed information (note location in ER section or page)	NO: ER provides partial or no information, but the information is easy to obtain (perhaps requires RAI?)	NO: ER does not provide the prescribed information, and it is difficult or time consuming for the staff to obtain. (requires RAI)
2.5.1	<p>Sector chart superimposed on a map of the site vicinity extending to a 16-km (10-mi) radius:</p> 			
2.5.1	<p>Sector chart superimposed on a map of the site region extending to an 80-km (50-m) radius:</p> 			
2.5.1	<p>Table appropriately keyed to Figures 1 and 2 that provides the projected populations within each sector of the chart.</p>			

1	2.5.1	Demographic Characteristics of the 0-km to 80-km (0-mi to 50-mi) Enclosed Population. This should include specific reporting of population characteristics and projections for the emergency planning zone defined as the area within a 16-km (10-mi) radius of the facility. Demographic characteristics and projections should also be shown for the “low-population zone” or “exclusion area” populations. Demographic characteristics should include age and sex distribution, transient or migrant population, racial and ethnic background, and income distribution (from the ER, latest decennial Census, other local/regional demographic sources such as planning commissions).			
2	2.5.2	Information related to the area’s economic base, including: <ul style="list-style-type: none"> - important regional industry by category, including employment - size and description of the heavy construction industry and construction labor force within the region - total regional labor force - regional unemployment levels and future economic outlook - characterization of incremental onsite labor, peak number of workers and duration of the peak, the number of workers expected to commute daily, the number of workers expected to require temporary and permanent housing, and the inventory of rental and of permanent housing within 80 km of the site. 			
3	2.5.2	information related to the area’s political structure, including <ul style="list-style-type: none"> - regional political jurisdictions and tax districts identifying those tax districts that will be directly affected by facility construction or operation - local and regional planning and administrative organizations. 			
4	2.5.2	Social-structure information, including major community structures.			
5	2.5.2	Housing information, including the sales and rental market in the region, number and types of units, turnover and vacancy rates, and trends in addition to housing stock, adequacy of structures, and location of existing and projected housing.			
6	2.5.2	Information about the local educational system (regional primary and secondary schools and higher education institutions), including capacity and present percentage of use.			
7	2.5.2	Public and private recreational facilities and opportunities, including present and projected capacity and percentage of use.			
8	2.5.2	Regional tax structure and distribution of the present revenues to each jurisdiction and district.			
9	2.5.2	Local plans concerning land use and zoning that are relevant to population growth, housing, and changes in land-use patterns.			
10	2.5.2	Social services and public facilities, including: <ul style="list-style-type: none"> - present and projected water and sewer/sewage disposal facilities, including present capacity and projected percentage of use 			
11	2.5.2 (cont’d)	<ul style="list-style-type: none"> - present and projected police and fire capabilities, and emergency planning responsibilities - location of hospitals, number of medical doctors, and specialized health facilities, including present and projected capacity. 			

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2.5.2	Information on highways and transportation systems, for example: <ul style="list-style-type: none"> - regional and local highway systems, including carrying capacity and condition of roads and highways - availability and type of public transportation - modifications that might affect traffic flow to and from the station site. 			
2.5.2	Information about distinctive communities, including the characteristics of the State, Native American tribes, and the local region that may identify them as distinctive communities (e.g., historic districts, tourist attractions, cultural resources, and visual resources).			
2.5.4	Comments of any organizations contacted by the applicant that locate and assess uniquely vulnerable minority and low-income communities located on or near the proposed station site.			
2.5.4	General description (with maps) of the location of all minority and low-income populations within the environmental impact area of each alternative site, including offsite areas that can expect significant environmental impact as a result of the proposed project construction or operation.			
2.5.4	More specific description of any unique minority or low-income communities within each environmental-impact area that are likely to be disproportionately affected by the proposed project construction or operation.			
4.4.1	Distribution of people, buildings, roads, and recreational facilities vulnerable to impact from construction-related activities.			
4.4.1	Applicable standards for levels of noise, dust, and gaseous pollutants.			
4.4.1	Predicted noise levels at sensitive areas identified in the first item listed above.			
4.4.1	Predicted air pollutant levels at sensitive areas identified in the first item listed above.			
4.4.2	Annual expenditures within the region for materials and services during construction.			
4.4.2	Plans to supplement public facilities and services to support construction and agencies responsible for facility expansion.			
4.4.2	Taxes by type and jurisdiction to be paid during construction.			
4.4.2	Annual construction labor force requirements (for each quarter year, if possible) over the construction period. Where necessary, requirements by major construction craft may be reported.			
4.4.3	Pathways where any environmental (including socioeconomic) impact during construction may interact with cultural or economic facts that may result in disproportionate environmental impacts on minority and low-income populations.			
4.4.3	Any assessment (qualitative or quantitative, as appropriate) of the degree to which each minority or low-income population would disproportionately experience adverse human health or environmental (including socioeconomic) impacts during construction as compared with the entire geographic area. In addition, information should be obtained on any assessment comparing the impacts with the larger overall geographic area encompassing all of the alternative sites.			

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4.4.3	Any assessment (qualitative or quantitative, as appropriate) of the significance or potential significance of such environmental impacts on each minority and low-income population.			
4.4.3	Any assessment of the degree to which each minority and low-income population would disproportionately receive any benefits compared with the entire geographic area.			
5.8.1	Distribution of people, buildings, roads, and recreational facilities that are vulnerable to impact by facility operation (from the ER).			
5.8.1	Predicted noise levels and nonradiological air pollutant levels at sensitive areas as identified above.			
5.8.1	Applicable standards for levels of noise and gaseous pollutants.			
5.8.1	Applicant's proposed methods to reduce visual impacts and impacts of noise and other pollutants.			
5.8.2	Expenditures within the region for materials and services during operation.			
5.8.2	Plans to adjust public facilities and services during the transition period from the construction to the operation phase and agencies responsible for accomplishing this adjustment.			
5.8.2	Taxes by type and jurisdiction to be paid annually during operation.			
5.8.2	Annual operation labor force.			
5.8.3	Pathways where any environmental (including socioeconomic) impact during operations may interact with cultural or economic facts that may result in disproportionate environmental impacts on minority and low-income populations.			
5.8.3	Any assessment (qualitative or quantitative, as appropriate) of the degree to which each minority or low-income population would disproportionately experience adverse human health or environmental (including socioeconomic) impacts during operations as compared with the entire geographic area. In addition, information should be obtained on any assessment comparing the impacts with the larger overall geographic area encompassing all of the alternative sites.			
5.8.3	Any assessment (qualitative or quantitative, as appropriate) of the significance or potential significance of such environmental impacts on each minority and low-income population.			
5.8.3	Any assessment of the degree to which each minority and low-income population would disproportionately receive any benefits compared with the entire geographic area.			

Appendix M - Transmission Lines

Sufficiency Review Checklist

ESRP Section or Regulation Number	Sufficiency review question Is the following material found and cited in the Environmental Report, Site Safety Analysis Report, or Site Redress Plan?	YES: ER provides the prescribed information (note location in ER section or page)	NO: ER provides partial or no information, but the information is easy to obtain (perhaps requires RAI?)	NO: ER does not provide the prescribed information, and it is difficult or time consuming for the staff to obtain. (requires RAI)
2.2.3	Maps showing the major transportation and utility networks within the region.			
3.7	Basic electrical design parameters, including transmission design voltage or voltages, line capacity, conductor type and configuration, spacing between phases, minimum conductor clearances to ground, maximum predicted electric-field strength(s) at 1 m above ground, the predicted electric field strength(s) at the edge of the corridor in kilovolts per meter (kV/m), and the design bases for these values.			
3.7	Predicted noise levels resulting from transmission-system operation.			
3.7	Basic structural design parameters, including illustrations and descriptions of towers, conductors, and other structures, with dimensions, materials, color, and finish.			
3.7	The applicant should provide siting data for all potential corridors identified by the applicant utilizing topographic maps (7.5- or 15-minute scale as a rule) or aerial photographs showing the proposed corridor or corridors and all existing major high voltage corridors in the region.			
3.7	Lengths, widths, and area of corridors, including modification and/or use of existing corridors and other facilities for the proposed project.			
3.7	General methods of construction (e.g., tower foundations, stringing, location of access roads, span length, and clearing of corridors).			
3.7	When available, tower and substation locations.			

Appendix N - Transportation

Sufficiency Review Checklist

ESRP Section or Regulation Number	Sufficiency review question Is the following material found in the ER?	YES: ER provides the prescribed information (note location in ER section or page)	NO: ER provides partial or no information but is easy to obtain (perhaps requires RAI?)	NO: ER does not provide the prescribed information and it is difficult or time consuming to obtain (requires RAI)
3.8	Does the applicant compare the proposed reactor's core thermal power level to the condition specified in 10 CFR 51.52(a)(1) (i.e., 3,800 MW(t))?			
3.8	Does the applicant compare the fuel form and enrichment levels to the conditions specified in 10 CFR 51.52(a)(2) (i.e., the reactor fuel is in the form of sintered uranium dioxide pellets having a uranium-235 enrichment not exceeding 4% by weight and the pellets are encapsulated in zircalloy rods)?			
3.8	Does the applicant compare the average irradiation level of the fuel to the conditions specified in 10 CFR 51.52(a)(3) (i.e., average level of irradiation of the irradiated fuel from the reactor does not exceed 33,000 mega-watt per metric ton and no irradiated fuel assembly is shipped until at least 90 days after it is discharged from the reactor)?			
3.8	Does the applicant state that, with the exception of irradiated fuel, all radioactive waste shipped from the reactor is packaged and in solid form (10 CFR 51.52(a)(4))?			
3.8	Does the applicant state that the unirradiated fuel is shipped to the reactor by truck; irradiated fuel is shipped from the reactor by truck, rail, or barge; and radioactive waste other than irradiated fuel is shipped from the reactor by truck or rail (10 CFR 51.52(a)(5))?			
3.8	If the proposed reactor and fuel designs and operations do not meet all the conditions in 10 CFR 51.52(a)(1) through (a)(5), does the applicant provide an analysis of the environmental impacts of transportation of fuel and waste to and from the reactor with respect to normal conditions of transport and possible accidents (10 CFR 51.51(a)(6))?			
3.8	Does the applicant estimate the heat load in a spent fuel shipping cask and compare the result to 10 CFR 51.52 Table S-4 conditions (i.e., 225,000 Btu/hr (~66 kW))?			
3.8	Does the applicant evaluate the weights of shipments of fuel and waste and compare that to the shipment weights in 10 CFR 51.52, Table S-4 (i.e., governed by Federal or State restrictions; 73,000 lbs. per truck, 100 tons per cask per rail car)?			
3.8	Does the applicant estimate traffic density for fuel and waste shipments and compare the result to the Table S-4 condition (i.e., one truck shipment per day or three rail shipments per month)?			
3.8	Does the applicant estimate the radiation dose to transport workers and compare the result to the Table S-4 condition (i.e., individual radiation doses in the range from 0.01 to 300 millirem per reactor year, population doses are 4 person-rem per reactor year)?			
3.8	Does the applicant calculate routine radiation doses to the general public - onlookers and compare the results to			

		the Table S-4 conditions (i.e., routine radiation doses to onlookers – individual radiation doses in the range 0.003 to 1.3 millirem per reactor-year and population doses 3 person-rem per reactor year)?			
20	3.8	Does the applicant calculate routine radiation doses to the general public along the route and compare the results to Table S-4 conditions (i.e., individual radiation doses in the range 0.0001 to 0.06 millirem per reactor-year and population doses 3 person-rem per reactor year (includes doses to onlookers).			
21	3.8	Does the applicant demonstrate that the radiological effects of accidents are SMALL as stated in Table S-4?			
22	3.8	Does the applicant estimate the non-radiological impacts of accidents and compare the results to Table S-4 condition (i.e., non-radiological accidents result in one fatal injury per 100 reactor years, 1 non-fatal injury in 10 reactor years, and \$475 in property damage per year)?			
23	7.4	Does this section contain a statement about the comparison of the applicant's spent fuel characteristics with respect to the 10 CFR 51.52(a) conditions?			
24	7.4	Does this section specify the estimated distance from the proposed reactor site to the spent fuel disposal facility?			
25	7.4	If the spent fuel is not in compliance with 10 CFR 51.52(a), does the ER contain an analysis of the environmental effects of transportation accidents that could occur?			
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Appendix O - Uranium Fuel Cycle

Sufficiency Review Checklist

ESRP Section or Regulation Number	Sufficiency review question	YES: ER provides the prescribed information (note location in ER section or page)	NO: ER provides partial or no information, but the information is easy to obtain (perhaps requires RAI?)	NO: ER does not provide the prescribed information, and it is difficult or time consuming for the staff to obtain. (requires RAI)
5.7	Comparison of estimated impacts from the proposed facility to those listed in ESRP 5.7, Appendix A containing the current amendments to Table S-3 of Paragraph (a) of 10 CFR 51.51, as given in 49 FR 9381 and 49 FR 10922.			
5.7	As applicable, a discussion of features of the proposed facility that could result in environmental impacts that differ substantially from those estimated by the NRC for model LWRs. Evaluation of the impacts from the proposed facility demonstrating they are bounded by the impacts listed in the ESRP.			

Appendix P - Waste Systems

Sufficiency Review Checklist

ESRP Section or Regulation Number	Sufficiency review question Is the following material found and cited in the Environmental Report, Site Safety Analysis Report, or Site Redress Plan?	YES: ER provides the prescribed information (note location in ER section or page)	NO: ER provides partial or no information, but the information is easy to obtain (perhaps requires RAI?)	NO: ER does not provide the prescribed information, and it is difficult or time consuming for the staff to obtain. (requires RAI)
3.5	Sources of radioactive liquid and gaseous waste within the facility.			
3.5	Description of liquid and gaseous radioactive waste management and effluent control systems.			
3.5	Process flow diagrams for liquid and gaseous radioactive waste management and effluent control systems.			
3.5	Identification of principal release points for radioactive materials to the environment.			
3.5	Identification of direct radiation sources within or onsite out-of-plant as solid waste (e.g., independent fuel storage).			
3.5	Information relevant to estimating radioactive liquid and gaseous effluents.			
3.5	For ESP reviews, additional information from the applicant is needed to further define the radiological effluent information submitted pursuant to 10 CFR 52.17(a)(1)(iv).			
3.6.1	Descriptions of nonradioactive effluent treatment facilities.			
3.6.1	Average, maximum, and seasonal variations of principal constituents of intake and receiving waters and any minor or trace materials that may be of environmental relevance.			
3.6.1	A list of chemicals processed through each system (e.g., corrosion inhibitors and antifouling agents) and total amounts used per year, frequency of use, and concentrations of these chemicals or their products in each waste stream.			
3.6.1	The concentration factor on a seasonal basis for evaporative cooling systems.			
3.6.1	The average and maximum concentration of natural materials in effluent streams.			
3.6.1	The operating cycles for each effluent treatment system for normal modes of facility operation (e.g., full power operation, shutdown/refueling, and startup).			
3.6.2	A description of the systems (both temporary and permanent) to be provided.			
3.6.2	Anticipated quantity and characteristics of treated effluents.			
3.6.2	The ultimate disposal of treated effluents.			
3.6.2	Standards for the proposed sanitary system effluents.			
3.6.2	The National Pollutant Discharge Elimination System (NPDES) permit.			

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3.6.3	Estimates of gaseous effluents (e.g., from diesel engines, gas turbines, heating plants, and incinerators) released during facility operation, the location and elevation of release points, the frequency of their release and their treatment before release, and the total quantity of SO _x , NO _x , hydrocarbons, and suspended particulates to be discharged annually.			
3.6.3	Applicable Federal, State, and tribal regional standards concerning atmospheric emissions from consultation with Federal, State, regional, local, and affected Native American tribal agencies.			
3.6.3	Information concerning nonradioactive wastes not considered in ESRPs 3.6.1 and 3.6.2, such as laboratory wastes, storm drainage, trash, hazardous wastes, and debris from bars or screens on the cooling water intake. The description should include estimates of the quantities of wastes, their pollutant concentrations at points of release as appropriate to the system, and other relevant data.			
3.6.3	Procedures for any offsite disposal of wastes.			
3.6.3	Procedures by which all effluents will be treated, controlled, and discharged to meet State and U.S. Environmental Protection Agency effluent limitation guidelines and new source performance standards.			
5.5.1	Descriptions of nonradioactive waste systems, including quantities, composition, and frequency of waste discharges to water, land, and air.			
5.5.1	For discharges to water, waste concentrations at the point of discharge, predicted dilution in the receiving water body, and estimates of concentrations at various distances from the discharge point.			
5.5.1	Ambient concentrations in the receiving water body of the chemicals and other materials contained in the waste discharges.			
5.5.1	Receiving water body water-quality criteria for domestic, industrial, agricultural, and recreational uses.			
5.5.1	Water use for the receiving water bodies.			
5.5.1	Aquatic ecology for the receiving water bodies.			
5.5.1	For discharges to land (other than at licensed commercial waste disposal sites), size and location of disposal sites, quantity and composition of wastes, and method of disposal (e.g., burial, combustion, and evaporation).			
5.5.1	Terrestrial ecology at disposal sites other than licensed commercial sites.			
5.5.1	Soil data for disposal site (other than licensed commercial sites), and potential for transport of wastes to ground and surface waters.			
5.5.1	Plans for ultimate treatment and/or restoration of retired disposal sites (other than licensed commercial sites).			
5.5.1	Applicable Federal, State, regional, local, and affected Native American tribal criteria or standards for air quality and for solid-waste disposal to land areas.			
5.5.1	Other site-specific waste-disposal activities (e.g., spoils from intermittent dredging activities).			
5.5.1	Applicant's NPDES permit and water quality certification or their status if not issued.			
5.5.2	Descriptions of systems that create mixed wastes, including quantities of waste produced.			

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5.5.2	Anticipated disposal plans for the mixed wastes (i.e., disposal at a mixed waste disposal facility, shipment to a treatment facility, or storage onsite).			
5.5.2	Estimated environmental impacts, including health effects resulting from exposure to the chemical constituents and those resulting from radiological exposures that are estimated to be received by workers as a result of mixed-waste testing and storage.			
5.5.2	A waste minimization plan that identifies process changes that can be made to reduce or eliminate mixed wastes.			