



U.S. NUCLEAR REGULATORY COMMISSION

ENVIRONMENTAL STANDARD REVIEW PLAN

4.1.1 THE SITE AND VICINITY

REVIEW RESPONSIBILITIES

Primary— Organization responsible for the review of land use information

Secondary— None

I. AREAS OF REVIEW

This environmental standard review plan (ESRP) directs the staff's assessment of direct impacts of construction on land use at the site and in the vicinity of the site.^(a) The scope of the review directed by this plan includes analysis and evaluation of construction activities in sufficient detail to determine the significance of potential land-use impacts and to recommend how these impacts should be treated in the licensing process (e.g., consideration of alternative designs or practices that would mitigate adverse environmental impacts). The scope of the review directed by this plan should be limited to consideration of potential land-use impacts at the site and in the site vicinity, and does not include transmission line and access corridor impacts. These impacts are considered in ESRP 4.1.2.

Review Interfaces

The reviewer for this ESRP should obtain input from or provide input to the reviewers for the following ESRPs, as indicated:

- ESRPs 2.2.1, 2.3.1, 2.8, 3.1, and 4.2.2. Obtain input to aid the assessment of direct impacts of construction on land use at the site and in the vicinity. Obtain new and significant information, if applicable, related to ESRP 4.1.1.

(a) The terms *site* and *vicinity* are defined in ESRP 2.2.1.

Revision 1 - July 2007

4.1.1-1

NUREG-1555

USNRC ENVIRONMENTAL STANDARD REVIEW PLAN

This Environmental Standard Review Plan has been prepared to establish guidance for the U.S. Nuclear Regulatory Commission staff responsible for environmental reviews for nuclear power plants. The Environmental Standard Review Plan is not a substitute for the NRC's regulations, and compliance with it is not required.

These documents are made available to the public as part of the Commission's policy to inform the nuclear industry and the general public of regulatory procedures and policies. Individual sections of NUREG-1555 will be revised periodically, as appropriate, to accommodate comments and to reflect new information and experience. Comments and suggestions for improvement will be considered and should be sent to the U.S. Nuclear Regulatory Commission, Office of New Reactors, Washington, D.C. 20555-0001.

Requests for single copies of ESRP sections (which may be reproduced) should be made to the U.S. Nuclear Regulatory Commission, Washington, DC 20555, Attention: Reproduction and Distribution Services Section, or by fax to (301) 415-2289, or by email to DISTRIBUTION@nrc.gov. Electronic copies of this section are available through the NRC's public Web site at <http://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr1555/> or in the NRC's Agencywide Documents Access and Management System (ADAMS) at <http://www.nrc.gov/reading-rm/adams.html>, under Accession number ML071690217.

- ESRP 4.1.3. Provide a list of construction land use impacts that could affect historic/archaeological sites.
- ESRPs 4.3 and 4.4. Provide information on land-use impacts at the site and its vicinity that should be considered for potential ecological or socioeconomic impacts.
- ESRP 4.6. Provide a list of applicant commitments and staff recommendations of practices to limit adverse environmental impacts of construction.
- ESRP 6.5.1. Provide a list of any construction activities that should be part of the applicant's monitoring program.
- ESRP 6.7. Provide a discussion of any deficiencies in the applicant's proposed site preparation and construction monitoring program that should be corrected by additional monitoring provisions.
- ESRPs 9.3 and 9.4. Provide the reviewers for ESRPs 9.3 and 9.4 with information about proposed land-use changes if those changes are determined to be adverse and should be avoided. This information would enable the reviewers to consider alternative plant designs or locations that would avoid the impacts.
- ESRP 10.1. Provide a summary of the unavoidable impacts that are predicted to occur as a result of changes in land use during construction.
- ESRP 10.2. Provide a summary of irreversible and irretrievable commitments of land-use resources that will occur during construction.
- ESRP 10.4. Provide a productivity assessment for such land, if the land committed for site construction meets the statutory definition of prime or unique, with a relative value rating that places it within the top half of land within the local government jurisdiction, or with a capability classification of I or II (see the "Review Procedures" in this ESRP).

Data and Information Needs

The type of data and information needed will be affected by site- and station-specific factors, and the degree of detail should be modified according to the anticipated magnitude of the potential impacts. The following data or information should be obtained:

- map showing land-use categories within the site boundary (from ESRP 2.2.1).
- land areas devoted to major uses within the site boundary (from ESRP 2.2.1)
- map(s) showing major land uses in the site vicinity (from ESRP 2.2.1)

- land areas devoted to major uses in the site vicinity (from ESRP 2.2.1)
- highways, railroads, and utility rights-of-way that cross the site and vicinity (from ESRP 2.2.1)
- special land uses, such as recreation, within the site and vicinity (from ESRP 2.2.1)
- mineral resources adjacent to or within the site boundary presently being exploited or of known commercial value (from ESRP 2.2.1)
- Federal, State, regional, local, and affected Native American tribal land-use plans for the site and vicinity (from ESRP 2.2.1)
- land-use impacts of any related Federal action that may have cumulatively significant impacts with the construction activities at the site and in the vicinity proposed by the applicant (from ESRP 2.8)
- area and location of land in the site and vicinity that will be disturbed by construction on either a long-term or short-term basis (from ESRP 3.1)
- construction activities to be located in a floodplain^(a) or on wetlands^(b) (from ESRPs 2.3.1 and 4.2.2)
- information from the U.S. Department of Agriculture's Natural Resources Conservation Service (NRCS) Land Evaluation and Site Assessment system (NRCS 2007) on the relative value of the proposed site if it involves farmland
- in the case of a construction permit (CP), operating license (OL), early site permit (ESP), or combined license (COL) application withdrawal or termination request, a description of proposed site restoration and management actions. Some examples are recontouring or grading, permanent landscaping, revegetation of disturbed areas, restoration of stream flows, establishment of recreational areas, and other specific actions (from the environmental report [ER] and on request from the applicant) (from ESRP 4.8).

II. ACCEPTANCE CRITERIA

Acceptance criteria for the review of land-use impacts at the site of the nuclear power station and in its vicinity are based on the relevant requirements of the following:

- 10 CFR 51.71(d) with respect to analysis requirements to be included in draft environmental impact statements (EISs) prepared by NRC

(a) The term *floodplain* is defined at 10 CFR 72.3.

(b) The term *wetland* is defined in Executive Order 11990.

- 10 CFR 51, Appendix A(7), with respect to discussion in EISs prepared by NRC of possible conflicts between alternatives and the objectives of applicable land-use plans
- guidance and requirements for particular land types shown in Table 4.1.1-1.

Table 4.1.1-1. Federal Sources to be Consulted for Various Special Land Types

| Land Type | Sources to be Consulted |
|------------------------|--|
| Coastal Zones | <ol style="list-style-type: none"> 1. Coastal Zone Management Act (16 USC 1451-1464) 2. National Oceanic and Atmospheric Administration regulations implementing the Coastal Zone Management Act (15 CFR 923) |
| Farmland | <ol style="list-style-type: none"> 1. Farmland Protection Policy Act (7 USC 4201) 2. U.S. Department of Agriculture regulations on Prime and Unique Farmlands (7 CFR 657) 3. U.S. Department of Agriculture regulations implementing the Farmland Protection Policy Act (7 CFR 658) 4. Council on Environmental Quality (CEQ) memorandum on “Analysis of Impacts on Prime and Unique Agricultural Lands in Implementing the National Environmental Policy Act” (45 FR 59189) |
| Floodplains | <ol style="list-style-type: none"> 1. Executive Order 11988, “Floodplain Management” (42 FR 26951) 2. U.S. Water Resources Council, “Floodplain Management Guidelines” (40 FR 6030) |
| Wetlands | <ol style="list-style-type: none"> 1. Executive Order 11990, “Protection of Wetlands” (42 FR 26961) as amended by Executive Order 12608 (52 FR 34617) |
| Wild and Scenic Rivers | <ol style="list-style-type: none"> 1. Wild and Scenic Rivers Act (16 USC 1271-1287) 2. CEQ memorandum on “Procedures for Interagency Consultation to Avoid or Mitigate Adverse Effects on Rivers in the Nationwide Inventory” (45 FR 59191-59192) |

Regulatory positions and specific criteria necessary to meet the regulations identified above are as follows:

- Regulatory Guide 4.7, Rev. 2, *General Site Suitability for Nuclear Power Stations* (NRC 1998), with respect to land-use considerations rendering a proposed site unsuitable for a nuclear power station.

Technical Rationale

The technical rationale for evaluating the applicant’s description of potential land-use impacts to the site and vicinity is discussed in the following paragraphs:

The NRC's regulations implementing NEPA provide that NRC EISs are to include a section discussing the environmental consequences of alternatives (10 CFR 51, Appendix A[7]). The section is to include a discussion of "possible conflicts between the alternatives and the objectives of Federal, State, regional, and local (and in the case of a reservation, Native American tribal) land-use plans, policies and controls for the area concerned." In addition, the regulations provide that due consideration is to be given in an EIS to compliance with applicable zoning and land-use regulations [10 CFR 51.71(d)].

Guidance on (1) what constitutes a land-use plan or policy, and (2) how an agency should handle potential conflicts between a proposal and the objectives of land-use plans is provided by the CEQ in Question 23 of "Forty Most Asked Questions Concerning CEQ's National Environmental Policy Act Regulations" (CEQ 1981). With regard to what constitutes a land-use plan or policy, CEQ states that

the term "land-use plans" includes all types of formally adopted documents for land-use planning, zoning, and related regulatory requirements. Local general plans are included, even though they are subject to future change. Proposed plans should also be addressed if they have been formally proposed by the appropriate government body in a written form, and are being actively pursued by officials of the jurisdiction. Staged plans, which must go through phases of development ... should also be included even though they are incomplete.

With regard to how an agency should handle potential conflicts between a proposal and the objectives of land-use plans, CEQ states that

the agency should first inquire of other agencies whether there are any potential conflicts. If there would be immediate conflicts, or if conflicts could arise in the future when the plans are finished ... the EIS must acknowledge and describe the extent of those conflicts. If there are any possibilities of resolving the conflicts, these should be explained as well. The EIS should also evaluate the seriousness of the impact of the proposal on the land-use plans and policies, and whether, or how much, the proposal will impair the effectiveness of land-use control mechanisms for the area. Comments from officials of the affected area should be solicited early and should be carefully acknowledged and answered in the EIS.

Guidance in NRC's Regulatory Guide 4.7, Rev. 2 (1998) provides procedures for evaluating land-use impacts where

- there are either no conflicts between the applicant's proposed facility and the objectives of Federal, regional, State, and local (and in the case of proposed location on a reservation, Native American tribal) land-use plans, or
- if there are or are likely to be conflicts, the extent of the conflicts, the possibilities of resolving the conflicts, and the seriousness of the impact of the applicant's proposal on land-

use plans and policies and the effectiveness of land-use control mechanisms for the area can be adequately evaluated and discussed in the EIS or other environmental document.

III. REVIEW PROCEDURES

Because some portions of land-use impacts are covered in ESRP 4.1.3, "Historic/Archaeological Sites"; ESRP 4.3.1, "Terrestrial Ecosystems"; and ESRP 4.4, "Socioeconomic Impacts"; this ESRP is limited to those direct physical changes and restrictions on land use at the site and vicinity due to plant construction. For each of these, the impact analysis should include consideration of the potential changes in land use as a result of the siting decision and the direct physical impacts on the site and vicinity as a result of construction activities.

The reviewer should direct the analysis toward conclusions with respect to the following:

- long-term restrictions of land use that would result from the licensing action and long-term physical changes in land use of the site and vicinity
- short-term physical changes in land use of the site and vicinity and the applicant's plans for mitigation of adverse impacts
- construction impacts on the geologic environment.

The reviewer should take the following steps:

(1) Evaluate Long-Term Restrictions of Land Use that would Result from the Licensing Action and Long-Term Physical Changes in Land Use of the Site and Vicinity:

- (a) Identify changes in land use that would occur as a consequence of the licensing action.

Consider land-use changes in the context of the amount and quality of land affected after proposed measures, if any, have been implemented.

Review restrictions on the use of farm land, recreational areas, housing areas, and other similar areas.

Consider any restrictions or modifications of lands classified as floodplain, wetlands, or coastal zone.

- (b) If appropriate, analyze the degree of change and its acceptability by comparing changes in land use with existing standards, guides, regulations, or legislation; or to Federal, State, regional, local, and affected Native American tribal land-use plans and zoning ordinances, consulting with these sources, and ensuring consistency with them where required or desirable.

- Refer to the Federal sources listed in Table 4.1.1-1 (and comparable State sources applicable to the applicant's proposed site) for particular types of land.
 - If there are no relevant standards, guides, regulations, legislation, or land-use plans, analyze the severity of the impact without these aids.
- (c) Analyze the restriction on the use of land such as farmland or forests in the context of the amount and quality of the land in the vicinity of the plant.
- Removal of less than 2% of such land, or up to 500 hectares (1235 ac), generally has minor effects, particularly if the land is not unique or otherwise distinguished.
 - When larger land areas are to be committed for a proposed nuclear station (e.g., greater than 500 hectares (1235 ac)) or if the reviewer for ESRP 2.2.1 indicates that the proposed land areas are unique or otherwise distinguished, further analysis is needed to determine the quality of the land.

There are three indices of land quality that may be used for guidance. The first is the definitions of prime and unique farmland in the Farmland Protection Policy Act of 1981. The second is the land relative value rating prepared by the NRCS. The third and oldest index is the land capability classification system first published by the U.S. Department of Agriculture (Klingebiel and Montgomery 1961). The indices are further defined as follows:

- Prime and Unique Farmland. The terms "prime farmland" and "unique farmland" are defined in the Farmland Protection Policy Act of 1981. Prime farmland is defined to be

land that has the best combination of physical and chemical characteristics for producing food, feed, fiber, forage, oilseed, and other agricultural crops with minimum inputs of fuel, fertilizer, pesticides, and labor, and without intolerable soil erosion, as determined by the Secretary of Agriculture. Prime farmland includes land that possesses the above characteristics but is being used currently to produce livestock and timber. It does not include land already in or committed to urban development or water storage.

Unique farmland is defined in the Act to be

land other than prime farmland that is used for production of specific high-value food and fiber crops, as determined by the Secretary of Agriculture. It has the special combination of soil quality, location, growing season, and moisture supply needed to economically produce sustained high quality or high yields of specific crops when

treated and managed according to acceptable farming methods. Examples of such crops include citrus, tree nuts, olives, cranberries, fruits, and vegetables.

- Relative Value Rating. The NRCS will compute a relative value rating for a tract of land upon request from a Federal agency. Procedures are described at 7 CFR 658.4 and 658.5. The rating is based on a variety of data, including soil potential, productivity ratings, and land capability classifications (see below). The reviewer of ESRP 4.1.1 can request that NRCS prepare a relative value rating for a proposed site involving farmland.
- Land Capability Classification. This classification places land in one of eight categories based on soil characteristics (Klingebiel and Montgomery 1961). The eight classifications are listed in Table 4.1.1-2. Land in capability Classes I and II is usually the most productive and, therefore, should be subject to the most detailed analysis when it is to be committed. Commitment of land in Classes III through VIII is less important.

Table 4.1.1-2. Land Capability Classes

| Land Capability Class | Description |
|------------------------------|---|
| I. | Soils have few limitations that restrict their use. |
| II. | Soils have some limitations that reduce the choice of plants or require moderate conservation practices. |
| III. | Soils have severe limitations that reduce the choice of plants, require special conservation practices, or both. |
| IV. | Soils have very severe limitations that reduce the choice of plants, require very careful management, or both. |
| V. | Soils have little or no erosion hazards but have other limitations, impractical to remove, that limit their use largely to intensive pasture or range, woodland, or wildlife food or cover. Limitations can include wet soil, stones, or shallow bedrock. |
| VI. | Soils have severe limitations that make them generally unsuited to cultivation and limit their use largely to pasture or range, woodland, or wildlife food or cover. |
| VII. | Soils have very severe limitations that make them unsuitable for cultivation and limit their use largely to grazing, woodland, or wildlife. |

| | |
|-------|--|
| VIII. | Soils and landforms have limitations that preclude their use for commercial plant production and restrict their use to recreation, wildlife, water supply, or to aesthetic purposes. |
|-------|--|

(d) If the land at the proposed site (1) meets the statutory definition of prime or unique, (2) has a relative value rating placing it within the top half in terms of agricultural production in the local government jurisdiction, or (3) has a land capability classification of I or II, the reviewer should assess the productivity of the land to provide input to the benefit-cost balance in ESRP 10.4. The reviewer should consider a State's published documents on agricultural statistics, including crop and animal production statistics and land areas by county, and consult with State and local agricultural, soil conservation, and cooperative extension agencies to complete this assessment.

(2) Analyzing the Short-Term Physical Changes in Land Use of the Site and Vicinity and the Applicant's Plans for Mitigation of Adverse Impacts:

(a) Consider mitigation measures for adverse impacts. Matters that can be assessed include earth leveling, revegetation, landscaping, cleanup and disposal of debris, erosion control structures, land management practices, stabilization of spoil piles, and stabilization of dikes on cooling lakes.

(3) Analyzing the Construction Impacts on the Geologic Environment:

(a) Consult with the staff safety evaluation reviewers for geology (ESRP 2.6) for an evaluation of the impact of station construction on the geologic environment and for appropriate licensing/permit conditions.

(b) Determine whether construction of the plant would prevent the exploitation at the proposed site or in the vicinity of mineral resources (e.g., sand and gravel, coal, oil, natural gas, or ores) of commercial value.

(c) Determine if any such mineral extraction is currently in process or is planned, and the extent to which plant construction would affect such operations.

(d) Consult with the staff's safety evaluation reviewers for geology for assistance in this review and for an analysis of any other impacts of plant construction on the geologic environment.

IV. EVALUATION FINDINGS

Evaluation of each identified impact results in one of the following three possible determinations, which should be addressed as indicated:

- *The impact is minor, and mitigation is not required.* When all impacts are of this nature, the reviewer should include a statement in the environmental impact statement of the following type:

The staff reviewed the available information on the land-use impacts of construction and refurbishment. Based on this review, the staff concludes that there are no significant environmental impacts. The staff concludes that the appropriate characterization for the impacts reviewed under this ESRP is _____ [SMALL, MODERATE, or LARGE].

- *The impact is adverse but can be mitigated by specific design or procedure modifications that the reviewer has identified and determined to be practical.* For these cases, the reviewer should consult with the Environmental Project Manager (EPM) and the reviewers for ESRP 10.4 for verification that the reviewer's conclusions are practical and would lead to an improvement in the benefit-cost balance. The reviewer should prepare a list of verified modifications and potential measures and controls to limit the corresponding impact. These lists should be provided to the reviewer for ESRP 4.6.
- *The impact is adverse, cannot be successfully mitigated, and is of such magnitude that it should be avoided.* When impacts of this nature are identified, the reviewer should inform the reviewers for ESRP 10.4 that an analysis and evaluation of alternative designs or procedures is required. The reviewer should participate in any such analysis and evaluation of alternatives that would avoid the impact and that could be considered practical. If no such alternatives can be identified, the reviewer should provide this information to the reviewer for ESRP 10.1.

The following general criteria should be considered by the reviewer.

- If the amount of land to be committed is on the order of 500 hectares (1235 ac) or less and does not involve land that (1) meets the statutory definition of prime or unique, (2) has a relative value rating placing it within the top half in terms of agricultural production in the local government jurisdiction, or (3) has a land capability classification of I or II, or has special resources that would be affected, then it may be concluded that the expected impacts of construction on land use are not of major significance and there are no land-use changes that would influence the decision on a construction permit.
- If the amount of land to be committed is on the order of 500 to 5000 hectares (1235 to 12,350 ac) and does not involve land that (1) meets the statutory definition of prime or unique, (2) has a relative value rating placing it within the top half in terms of agricultural production in the local government jurisdiction, or (3) has a land capability classification of I or II, it may be concluded that the expected land-use changes could be adverse, and alternative means to mitigate the impact should be considered. The reviewer should ensure that potential means to mitigate the impact have been considered, that any recommended means have been verified by the project manager and the reviewers for ESRP 9.3, and that the verified recommendations have been provided to the reviewer for ESRP 4.6.

- If the amount of land to be committed is in excess of 5000 hectares (12,350 ac), or if the land (1) meets the statutory definition of prime or unique, (2) has a relative value rating placing it within the top half in terms of agricultural production in the local government jurisdiction, or (3) has a land capability classification of I or II, it may be concluded that the expected land-use changes are sufficiently adverse to require mitigation or the consideration of alternatives to avoid the impact. If this conclusion is reached, the reviewer should ensure that potential means to mitigate the impact have been considered, that any recommended means have been verified by the EPM and the reviewers for ESRP 9.3 and that the verified recommendations have been provided to the reviewer for ESRP 4.6. If mitigation is not practical, the reviewer should supply detailed supporting information to the reviewers of ESRP 9.4 and assist them in determining if appropriate alternatives to avoid the impact can be identified. When no alternatives that could be imposed as conditions to the construction permit can be identified, a detailed summary of the land-use changes and their impacts should be provided to the reviewer of ESRP 10.1.

The review performed under this ESRP should document the following objectives: (1) public disclosure of major direct land-use consequences of the proposed construction project activity, (2) presentation of the basis of staff analysis of the project, and (3) presentation of staff conclusions, recommendations, and conditions regarding land use.

Public disclosures may be accomplished by presenting a brief description of construction within the site and vicinity and a discussion of the land-use changes resulting from construction activities. This section should be understandable to a nontechnical reader. Extensive descriptive material may be incorporated by reference and need not be duplicated in the EIS.

The staff's analysis may be presented in a narrative summary by highlighting important aspects of the impacts resulting from potential land-use changes. The discussion should include identification of important effects and mitigating actions. Minor issues should receive minor treatment. Important or disputed issues should be discussed in detail.

The safety evaluation reviewers for geology should provide any necessary input to the EIS with regard to the impact of construction on the geologic environment.

V. IMPLEMENTATION

The method described in this ESRP should be used by the staff in evaluating conformance with NRC requirements, except in those cases in which the applicant proposes an acceptable alternative for complying with specified portions of the requirements.

VI. REFERENCES

7 CFR 657, “Prime and Unique Farmlands.”

7 CFR 658, “ Farmland Protection Policy Act.”

10 CFR 51, Appendix A(7), “Environmental consequences and mitigating actions.”

10 CFR 51.71, “Draft environmental impact statement—contents.”

10 CFR 72.3, “Definitions.”

15 CFR 923, “ Coastal Zone Management Program Regulations .”

Coastal Zone Management Act, 16 USC 1451-1465.

Council on Environmental Quality (CEQ) memorandum on “Analysis of Impacts on Prime and Unique Agricultural Lands in Implementing the National Environmental Policy Act,” 45 *Federal Register* 59189 (1980).

Council on Environmental Quality (CEQ) memorandum on “Procedures for Interagency Consultation to Avoid or Mitigate Adverse Effects on Rivers in the Nationwide Inventory,” 45 *Federal Register* 59191-59192 (1980).

Council on Environmental Quality (CEQ). 1981. “Forty Most Asked Questions Concerning CEQ’s National Environmental Policy Act Regulations,” 46 *Federal Register* 18026-18037 (1981).

Executive Order 11988, “Floodplain Management,” 42 *Federal Register* 26951 (1977).

Executive Order 11990, “Protection of Wetlands,” 42 *Federal Register* 26961 (1977), as amended by Executive Order 12608, 52 *Federal Register* 34617 (1987).

Farmland Protection Policy Act, 7 USC 4201 et seq.

U.S. Department of Agriculture, Natural Resources Conservation Service (NRCS). 2007. “Land Evaluation and Site Assessment.”

U.S. Nuclear Regulatory Commission (NRC). 1998. *General Site Suitability for Nuclear Power Stations*. Regulatory Guide 4.7, Rev. 2, Washington, D.C.

U.S. Water Resources Council. "Floodplain Management Guidelines for Implementing E.O. 11988,"
40 *Federal Register* 6030 (1978).

Wild and Scenic Rivers Act, 16 USC 1271 et seq.

PAPERWORK REDUCTION ACT STATEMENT

The information collections contained in the Environmental Standard Review Plan are covered by the requirements of 10 CFR Part 51, and were approved by the Office of Management and Budget, approval number 3150-0021.

PUBLIC PROTECTION NOTIFICATION

The NRC may not conduct or sponsor, and a person is not required to respond to, a request for information or an information collection requirement unless the requesting document displays a currently valid OMB control number.
