

1.0 Introduction

Under the Nuclear Regulatory Commission's (NRC) environmental protection regulations in Title 10 of the Code of Federal Regulations (CFR) Part 51, which implement the National Environmental Policy Act (NEPA) of 1969, renewal of a nuclear power plant operating license (OL) requires the preparation of an environmental impact statement (EIS). In preparing the EIS, the NRC staff is required first to issue the statement in draft form for public comment and then issue a final statement after considering public comments on the draft. To support the preparation of the EIS, the staff has prepared a *Generic Environmental Impact Statement for License Renewal of Nuclear Plants* (GEIS), NUREG-1437, Volumes 1 and 2 (NRC 1996, 1999).^(a) The GEIS is intended to (1) provide an understanding of the types and severity of environmental impacts that may occur as a result of license renewal of nuclear power plants under 10 CFR Part 54, (2) identify and assess the impacts that are expected to be generic to license renewal, and (3) support 10 CFR Part 51 to define the number and scope of issues that need to be addressed by the applicants in plant-by-plant renewal proceedings. The GEIS guides the preparation of complete plant-specific information in support of the OL renewal process.

The Rochester Gas and Electric Corporation (RG&E) operates the R.E. Ginna Nuclear Power Plant (Ginna) in northwestern New York, under OL DPR-18 issued by the Atomic Energy Commission. This OL will expire on September 18, 2009. On July 30, 2002, RG&E submitted an application to the NRC to renew the Ginna OL for an additional 20 years under 10 CFR Part 54. RG&E is a *licensee* for the purposes of its current OL and an *applicant* for the renewal of the OL. Pursuant to 10 CFR 54.23 and 51.53(c), RG&E submitted an Environmental Report (ER) (RG&E 2002), in which RG&E analyzed the environmental impacts associated with the proposed license renewal action, considered alternatives to the proposed action, and evaluated mitigation measures for reducing adverse environmental effects.

This report is the draft, plant-specific supplement to the GEIS (i.e., the supplemental EIS [SEIS]) for the RG&E license renewal application for Ginna. This SEIS is a supplement to the GEIS because it relies, in part, on the findings of the GEIS. The staff will also prepare a separate safety evaluation report in accordance with 10 CFR Part 54.

1.1 Report Contents

The following sections of this introduction (1) describe the background for the preparation of this SEIS, including the development of the GEIS and the process used by the staff to assess

(a) The GEIS was originally issued in 1996. Addendum 1 to the GEIS was issued in 1999. Hereafter, all references to the "GEIS" include the GEIS and its Addendum 1.

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1 the environmental impacts associated with license renewal, (2) describe the proposed Federal
2 action to renew the Ginna OL, (3) discuss the purpose and need for the proposed action, and
3 (4) present the status of RG&E's compliance with environmental quality standards and
4 requirements that have been imposed by Federal, state, regional, and local agencies that are
5 responsible for environmental protection.

6
7 The ensuing chapters of this SEIS closely parallel the contents and organization of the GEIS.
8 Chapter 2 describes the site, power plant, and interactions of the plant with the environment.
9 Chapters 3 and 4, respectively, discuss the potential environmental impacts of plant
10 refurbishment and plant operation during the renewal term. Chapter 5 contains an evaluation of
11 potential environmental impacts of plant accidents and includes consideration of severe
12 accident mitigation alternatives. Chapter 6 discusses the uranium fuel cycle and solid waste
13 management. Chapter 7 discusses decommissioning, and Chapter 8 discusses alternatives to
14 license renewal. Finally, Chapter 9 summarizes the findings of the preceding chapters and
15 draws conclusions about any adverse impacts that cannot be avoided, the relationship between
16 short-term uses of the environment and the maintenance and enhancement of long-term
17 productivity, and any irreversible or irretrievable commitment of resources. Chapter 9 also
18 presents the staff's preliminary recommendation with respect to the proposed license renewal
19 action.

20
21 Additional information is included in appendixes. Appendix A contains public comments
22 received on the environmental review for license renewal and staff responses. Appendixes B
23 through G, respectively, list the following:

- 24 • the contributors to the supplement
- 25
- 26 • the chronology of environmental review correspondence related to RG&E license renewal
27 for the Ginna OL
- 28
- 29 • the organizations contacted during the development of this SEIS
- 30
- 31 • RG&E's compliance status in Table E-1 (this appendix also contains copies of consultation
32 correspondence prepared and sent during the evaluation process)
- 33
- 34 • GEIS environmental issues that are not applicable to Ginna
- 35
- 36 • the NRC staff's safety evaluation of severe accident mitigation alternatives for Ginna.
- 37
- 38
- 39

1.2 Background

Use of the GEIS, which examines the possible environmental impacts that could occur as a result of renewing individual nuclear power plant OLS under 10 CFR Part 54, and the established license renewal evaluation process support thorough evaluation of the impacts of renewal of the OLS.

1.2.1 Generic Environmental Impact Statement

The NRC initiated a generic assessment of the environmental impacts associated with the license renewal term to improve the efficiency of the license renewal process by documenting the assessment results and codifying the results in the Commission's regulations. This assessment is provided in the GEIS, which serves as the principal reference for all nuclear power plant license renewal EISs.

The GEIS documents the results of the systematic approach that was taken to evaluate the environmental consequences of renewing the licenses of individual nuclear power plants and operating them for an additional 20 years. For each potential environmental issue, the GEIS (1) describes the activity that affects the environment, (2) identifies the population or resource that is affected, (3) assesses the nature and magnitude of the impact on the affected population or resource, (4) characterizes the significance of the effect for both beneficial and adverse effects, (5) determines whether the results of the analysis apply to all plants, and (6) considers whether additional mitigation measures would be warranted for impacts that would have the same significance level for all plants.

The NRC's standard of significance of impacts was established using Council on Environmental Quality (CEQ) terminology for "significantly" (40 CFR 1508.27, which requires consideration of both "context" and "intensity"). Using the CEQ terminology, the NRC established three significance levels – SMALL, MODERATE, or LARGE. The definitions of the three significance levels are set forth in a footnote to Table B-1 of 10 CFR Part 51, Subpart A, Appendix B, as follows:

SMALL – Environmental effects are not detectable or are so minor that they will neither destabilize nor noticeably alter any important attribute of the resource.

MODERATE – Environmental effects are sufficient to alter noticeably, but not to destabilize, important attributes of the resource.

LARGE – Environmental effects are clearly noticeable and are sufficient to destabilize important attributes of the resource.

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1 The GEIS assigns a significance level to each environmental issue, assuming that ongoing
2 mitigation measures would continue.

3
4 The GEIS includes a determination of whether the analysis of the environmental issue could be
5 applied to all plants and whether additional mitigation measures would be warranted. Issues
6 were then assigned a Category 1 or a Category 2 designation. As set forth in the GEIS,
7 **Category 1** issues are those that meet all of the following criteria:

- 8
9 (1) The environmental impacts associated with the issue have been determined to apply either
10 to all plants or, for some issues, to plants having a specific type of cooling system or other
11 specified plant or site characteristic.
12
13 (2) A single significance level (i.e., SMALL, MODERATE, or LARGE) has been assigned to the
14 impacts (except for collective offsite radiological impacts from the fuel cycle and from high-
15 level waste and spent fuel disposal).
16
17 (3) Mitigation of adverse impacts associated with the issue has been considered in the analysis,
18 and it has been determined that additional plant-specific mitigation measures are likely not
19 to be sufficiently beneficial to warrant implementation.

20
21 For issues that meet the three Category 1 criteria, no additional plant-specific analysis is
22 required in this SEIS unless new and significant information is identified.

23
24 **Category 2** issues are those that do not meet one or more of the criteria of Category 1, and
25 therefore, additional plant-specific review for these issues is required.

26
27 In the GEIS, the staff assessed 92 environmental issues and determined that 69 qualified as
28 Category 1 issues, 21 qualified as Category 2 issues, and 2 issues were not categorized. The
29 last two issues, environmental justice and chronic effects of electromagnetic fields, are to be
30 addressed in a plant-specific analysis. Of the 92 issues, 11 are related only to refurbishment,
31 6 are related only to decommissioning, 67 apply only to operation during the renewal term, and
32 8 apply to both refurbishment and operation during the renewal term. A summary of the
33 findings for all 92 issues in the GEIS is codified in Table B-1 of 10 CFR Part 51, Subpart A,
34 Appendix B.

35 36 **1.2.2 License Renewal Evaluation Process**

37
38 An applicant seeking to renew its OLS is required to submit an ER as part of its application.
39 The license renewal evaluation process involves careful review of the applicant's ER and
40 assurance that all new and potentially significant information not already addressed in or

1 available during the GEIS evaluation is identified, reviewed, and assessed to verify the
2 environmental impacts of the proposed license renewal.

3
4 In accordance with 10 CFR 51.53(c)(2) and (3), the ER submitted by the applicant must

- 5
6 • contain a description of the proposed action, including the applicant's plans to modify the
7 facility or its administrative control procedures as described in accordance with
8 10 CFR 54.21
- 9
10 • describe in detail the modifications directly affecting the environment or affecting plant
11 effluents that affect the environment
- 12
13 • discuss the environmental impacts of alternatives and any other matters described in
14 10 CFR 51.45
- 15
16 • contain analyses of the environmental impacts of the proposed action, including the impacts
17 of refurbishment activities, if any, associated with license renewal
- 18
19 • describe the impacts of operation during the renewal term, for those issues identified as
20 Category 2 issues in 10 CFR 51, Subpart A, Appendix B.

21
22 In accordance with 10 CFR 51.53(c)(2), the ER does not need to discuss

- 23
24 • issues not related to the environmental effects of the proposed action and the alternatives
- 25
26 • any aspect of the storage of spent fuel for the facility within the scope of the generic
27 determination in 51.23(a) and in accordance with 51.23(b)
- 28
29 • the need for power or the economic costs and economic benefits of the proposed action or
30 of alternatives to the proposed action except insofar as such costs and benefits are either
31 essential for a determination regarding the inclusion of an alternative in the range of
32 alternatives considered or relevant to mitigation
- 33
34 • other issues not related to the environmental effects of the proposed action and the
35 alternatives
- 36
37 • any aspect of the storage of spent fuel for the facility within the scope of the generic
38 determination in 51.23(a) and in accordance with 51.23(b).

39
40 New and significant information is (1) information that identifies a significant environmental
41 issue not covered in the GEIS and codified in Table B-1 of 10 CFR Part 51, Subpart A,

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1 Appendix B, or (2) information that was not considered in the analyses summarized in the GEIS
2 and that leads to an impact finding that is different from the finding presented in the GEIS and
3 codified in 10 CFR Part 51.

4
5 In preparing to submit its application to renew the Ginna OL, RG&E developed a process to
6 ensure that information not addressed in, or available, during the GEIS evaluation regarding the
7 environmental impacts of license renewal for Ginna would be properly reviewed before
8 submitting the ER and that such new and potentially significant information related to renewal of
9 the licenses for Ginna would be identified, reviewed, and assessed during the period of NRC
10 review. RG&E reviewed the Category 1 issues that appear in Table B-1 of 10 CFR Part 51,
11 Subpart A, Appendix B, to verify that the conclusions of the GEIS remained valid with respect to
12 Ginna. This review was performed by personnel from RG&E and its support organization who
13 were familiar with NEPA issues and the scientific disciplines involved in the preparation of a
14 license renewal ER.

15
16 The NRC staff also has a process for identifying new and significant information. That process
17 is described in detail in *Standard Review Plans for Environmental Reviews for Nuclear Power
18 Plants, Supplement 1: Operating License Renewal*, NUREG-1555, Supplement 1 (NRC 2000).
19 The search for new information includes (1) review of an applicant's ER and the process for
20 discovering and evaluating the significance of new information; (2) review of records of public
21 comments; (3) review of environmental quality standards and regulations; (4) coordination with
22 Federal, state, and local environmental protection and resource agencies; and (5) review of the
23 technical literature. New information discovered by the staff is evaluated for significance using
24 the criteria set forth in the GEIS. For Category 1 issues where new and significant information
25 is identified, reconsideration of the conclusions for those issues is limited in scope to the
26 assessment of the relevant new and significant information; the scope of the assessment does
27 not include other facets of the issue that are not affected by the new information.

28
29 Chapters 3 through 7 discuss the environmental issues considered in the GEIS that are
30 applicable to Ginna. At the beginning of the discussion of each set of issues, a table identifies
31 the issues to be addressed and lists the sections in the GEIS where the issue is discussed.
32 Category 1 and Category 2 issues are listed in separate tables. For Category 1 issues for
33 which there is no new and significant information, the table is followed by a set of short
34 paragraphs that state the GEIS conclusion codified in Table B-1 of 10 CFR Part 51, Subpart A,
35 Appendix B, and the staff's analysis and conclusion. Section 4.7 contains a discussion of
36 shoreline erosion. For Category 2 issues, in addition to the list of GEIS sections where the
37 issue is discussed, the tables list the subparagraph of 10 CFR 51.53(c)(3)(ii) that describes the
38 analysis required and the SEIS sections where the analysis is presented. The SEIS sections
39 that discuss the Category 2 issues are presented immediately following the table.

1 The NRC prepares an independent analysis of the environmental impacts of license renewal
2 and compares these impacts with the environmental impacts of alternatives. The evaluation of
3 the RG&E license renewal application began with publication of a notice of acceptance for
4 docketing and opportunity for a hearing in the *Federal Register* (NRC 2002a) on September 30,
5 2002. The staff published a notice of intent to prepare an EIS and conduct scoping (NRC
6 2002b) for Ginna on October 10, 2002. Two public scoping meetings were held on November
7 6, 2002, in Webster, New York. Comments received during the scoping period were
8 summarized in the *Environmental Impact Statement Scoping Process: Summary Report – R.E.*
9 *Ginna Nuclear Power Plant, New York* (NRC 2003). These comments are presented in Part 1
10 of Appendix A.

11
12 The staff followed the review guidance contained in *Standard Review Plans for Environmental*
13 *Reviews for Nuclear Power Plants, Supplement 1: Operating License Renewal*, NUREG-1555,
14 Supplement 1 (NRC 2000). The staff and its contractors retained to assist the staff visited
15 Ginna during November 5-7, 2002, to gather information and to become familiar with the site
16 and its environs. The staff also reviewed the comments received during scoping and consulted
17 with Federal, state, regional, and local agencies. A list of the organizations contacted is
18 provided in Appendix D. Other documents related to Ginna were reviewed and are referenced.

19
20 This draft SEIS presents the staff's analysis that considers and weighs the environmental
21 effects of the proposed renewal of the Ginna OL, the environmental impacts of alternatives to
22 license renewal, and mitigation measures available for avoiding adverse environmental effects.
23 Chapter 9, "Summary and Conclusions," provides the NRC staff's preliminary recommendation
24 to the Commission on whether or not the adverse environmental impacts of license renewal are
25 so great that preserving the option of license renewal for energy-planning decisionmakers
26 would be unreasonable.

27
28 A 75-day comment period will begin on the date of publication of the U.S. Environmental
29 Protection Agency Notice of Filing of the draft SEIS to allow members of the public to comment
30 on the preliminary results of the NRC staff's review. During this comment period, two public
31 meetings will be held near Ginna in August 2003. During these meetings, the staff will describe
32 the preliminary results of the NRC environmental review and answer questions to provide
33 members of the public with information to assist them in formulating their comments.

34 35 **1.3 The Proposed Federal Action**

36
37 The proposed Federal action is renewal of the OL for Ginna, which is located in the town of
38 Ontario, New York, in the northwest corner of Wayne County and on the south shore of Lake
39 Ontario. The plant has a pressurized water reactor with the capability to produce 490 net
40 megawatts of electric power. Plant cooling is provided by a once-through cooling system to

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1 remove waste heat from the reactor steam-electric system. Cooling water is withdrawn from
2 Lake Ontario. Ginna produces enough electricity to supply the needs of approximately
3 560,000 residential customers. The current OL expires on September 18, 2009. By letter
4 dated July 30, 2002, RG&E submitted an application to the NRC (RG&E 2002) to renew this OL
5 for an additional 20 years of operation (i.e., until September 18, 2029).
6

7 **1.4 The Purpose and Need for the Proposed Action**

8
9 Although a licensee must have a renewed license to operate a reactor beyond the term of the
10 existing OL, the possession of that license is just one of a number of conditions that must be
11 met for the licensee to continue plant operation during the term of the renewed license. Once
12 an OL is renewed, state regulatory agencies and the owners of the plant will ultimately decide
13 whether the plant will continue to operate based on factors such as the need for power or other
14 matters within the state's jurisdiction or the purview of the owners.
15

16 Thus, for license renewal reviews, the NRC has adopted the following definition of purpose and
17 need from GEIS Section 1.3 (NRC 1996):
18

19 The purpose and need for the proposed action (renewal of an operating license) is to
20 provide an option that allows for power generation capability beyond the term of a
21 current nuclear power plant operating license to meet future system generating needs,
22 as such needs may be determined by State, utility, and where authorized, Federal (other
23 than NRC) decisionmakers.
24

25 This definition of purpose and need reflects the Commission's recognition that, unless there are
26 findings in the safety review required by the Atomic Energy Act of 1954 or findings in the NEPA
27 environmental analysis that would lead the NRC to reject a license renewal application, the
28 NRC does not have a role in the energy-planning decisions of state regulators and utility
29 officials as to whether a particular nuclear power plant should continue to operate. From the
30 perspective of the licensee and the state regulatory authority, the purpose of renewing an OL is
31 to maintain the availability of the nuclear plant to meet system energy requirements beyond the
32 current term of the plant's license.
33

34 **1.5 Compliance and Consultations**

35
36 RG&E is required to hold certain Federal, state, and local environmental permits, as well as
37 meet relevant Federal and state statutory requirements. In its ER, RG&E provided a list of the
38 authorizations from Federal, state, and local authorities for current operations as well as

1 environmental approvals and consultations associated with Ginna license renewal. A full list of
2 authorizations and consultations related to the proposed OL renewal action is provided by
3 RG&E and included in Appendix E.

4
5 The staff has reviewed the list and consulted with the appropriate Federal, state, and local
6 agencies to identify any compliance or permit issues or significant environmental issues of
7 concern to the reviewing agencies. The New York State Department of Environmental
8 Conservation submitted comments regarding shoreline erosion. This issue is discussed in
9 Section 4.7. RG&E states in its ER that it is in compliance with applicable environmental
10 standards and requirements for Ginna.

11 12 **1.6 References**

13
14 10 CFR Part 50. Code of Federal Regulations, Title 10, *Energy*, Part 50, “Domestic Licensing
15 of Production and Utilization Facilities.”

16
17 10 CFR Part 51. Code of Federal Regulations, Title 10, *Energy*, Part 51, “Environmental
18 Protection Regulations for Domestic Licensing and Related Regulatory Functions.”

19
20 10 CFR Part 54. Code of Federal Regulations, Title 10, *Energy*, Part 54, “Requirements for
21 Renewal of Operating Licenses for Nuclear Power Plants.”

22
23 40 CFR Part 1508. Code of Federal Regulations, Title 40, *Protection of Environment*, Part
24 1508, “Terminology and Index.”

25
26 Atomic Energy Act of 1954 (AEA). 42 USC 2011, et seq.

27
28 National Environmental Policy Act of 1969 (NEPA). 42 USC 4321, et seq.

29
30 Rochester Gas and Electric (RG&E). 2002. *R.E. Ginna Nuclear Power Plant Application for
31 Renewed Operating License, Volume 2, Appendix E – Environmental Report*. Rochester,
32 New York.

33
34 U.S. Nuclear Regulatory Commission (NRC). 1996. *Generic Environmental Impact Statement
35 for License Renewal of Nuclear Plants*. NUREG-1437, Volumes 1 and 2, Washington, D.C.

36
37 U.S. Nuclear Regulatory Commission (NRC). 1999. *Generic Environmental Impact Statement
38 for License Renewal of Nuclear Plants Main Report*, “Section 6.3 – Transportation, Table 9.1,
39 Summary of findings on NEPA issues for license renewal of nuclear power plants, Final
40 Report.” NUREG-1437, Volume 1, Addendum 1, Washington, D.C.

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- 1 U.S. Nuclear Regulatory Commission (NRC). 2000. *Standard Review Plans for Environmental*
2 *Reviews for Nuclear Power Plants, Supplement 1: Operating License Renewal*. NUREG-1555,
3 Supplement 1, Washington, D.C.
4
- 5 U.S. Nuclear Regulatory Commission (NRC). 2002a. "Rochester Gas and Electric
6 Corporation, R.E. Ginna Nuclear Power Plant; Notice of Acceptance for Docketing of the
7 Application and Notice of Opportunity for a Hearing Regarding Renewal of License No. DPR 18
8 for an Additional 20-Year Period." *Federal Register*. Vol. 67, No. 189, pp. 61354-61355
9 (September 30, 2002).
10
- 11 U.S. Nuclear Regulatory Commission (NRC). 2002b. "Rochester Gas and Electric Corporation
12 R.E. Ginna Nuclear Power Plant; Notice of Intent to Prepare an Environmental Impact
13 Statement and Conduct Scoping Process." *Federal Register*. Vol. 67, No. 197, pp. 63171-
14 63173 (October 10, 2002).
15
- 16 U.S. Nuclear Regulatory Commission (NRC). 2003. *Environmental Impact Statement Scoping*
17 *Process: Summary Report – R.E. Ginna Nuclear Power Plant, Webster, New York*.
18 Washington, D.C.