

9.0 Summary and Conclusions

1 By letter dated July 30, 2002, Rochester Gas and Electric Corporation (RG&E) submitted an
2 application to the U.S. Nuclear Regulatory Commission (NRC) to renew the operating license
3 (OL) for the R.E. Ginna Nuclear Power Plant (Ginna) for an additional 20-year period
4 (RG&E 2002a). If the Ginna OL is renewed, New York State regulatory agencies and RG&E
5 will ultimately decide whether the plant will continue to operate based on factors such as the
6 need for power or other matters within the state's jurisdiction or the purview of the owners. If
7 the OL is not renewed, the plant must be shut down at or before the expiration of the current
8 OL, which expires September 18, 2009.

9
10 Section 102 of the National Environmental Policy Act (NEPA) (42 USC 4321) directs that an
11 environmental impact statement (EIS) is required for major Federal actions that significantly
12 affect the quality of the human environment. The NRC has implemented Section 102 of NEPA
13 in 10 CFR Part 51, which identifies licensing and regulatory actions that require an EIS. In
14 10 CFR 51.20(b)(2), the Commission requires preparation of an EIS or a supplement to an EIS
15 for renewal of a reactor OL; 10 CFR 51.95(c) states that the EIS prepared at the OL renewal
16 stage will be a supplement to the *Generic Environmental Impact Statement for License
17 Renewal of Nuclear Plants* (GEIS), NUREG-1437, Volumes 1 and 2 (NRC 1996, 1999).^(a)

18
19 Upon acceptance of the Ginna application, the NRC began the environmental review process
20 described in 10 CFR Part 51 by publishing a notice of intent to prepare an EIS and conduct
21 scoping (67 FR 63171 [NRC 2002a]) on October 10, 2002. The staff visited the Ginna site in
22 November 2002 and held public scoping meetings on November 6, 2002, in Webster, New York
23 (NRC 2002b). The staff reviewed the RG&E Environmental Report (ER) (RG&E 2002b) and
24 compared it to the GEIS, discussed it with other agencies, and conducted an independent
25 review of the issues following the guidance set forth in NUREG-1555, Supplement 1, the
26 *Standard Review Plans for Environmental Reviews for Nuclear Power Plants, Supplement 1:
27 Operating License Renewal* (NRC 2000). The staff also considered the public comments
28 received during the scoping process for preparation of this supplemental environmental impact
29 statement (SEIS) for Ginna. The public comments received during the scoping process and the
30 staff's responses to these comments are provided in Appendix A, Part 1, of this draft SEIS.

31
32 The staff will hold two public meetings near Ginna in August 2003 to describe the preliminary
33 results of the NRC SEIS, to answer questions, and to provide members of the public with
34 information to assist them in formulating their comments. When the comment period ends, the
35 staff will consider and disposition all of the comments received. These comments will be
36 addressed in Appendix A, Part 2, of the final SEIS.

(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 This SEIS includes the NRC staff's preliminary analysis that considers and weighs the
2 cumulative impacts of the action, the environmental effects of the proposed action, the
3 environmental impacts of alternatives to the proposed action, and mitigation measures available
4 for reducing or avoiding adverse effects. It also includes the staff's preliminary
5 recommendation regarding the proposed action.
6

7 The NRC has adopted the following statement of purpose and need for license renewal from
8 the GEIS:
9

10 The purpose and need for the proposed action (renewal of an OL) is to provide an
11 option that allows for power generation capability beyond the term of a current nuclear
12 power plant operating license to meet future system generating needs, as such needs
13 may be determined by State, utility, and, where authorized, Federal (other than NRC)
14 decisionmakers.
15

16 The goal of the staff's environmental review, as defined in 10 CFR 51.95(c)(4) and the GEIS, is
17 to determine
18

19 ... whether or not the adverse environmental impacts of license renewal are so great
20 that preserving the option of license renewal for energy planning decisionmakers would
21 be unreasonable.
22

23 Both the statement of purpose and need and the evaluation criterion implicitly acknowledge that
24 there are factors, in addition to license renewal, that will ultimately determine whether a licensee
25 continues to operate a nuclear power plant beyond the period of the OL.
26

27 NRC regulations (10 CFR 51.95(c)(2)) contain the following statement regarding the content of
28 SEISs prepared at the license renewal stage:
29

30 The supplemental environmental impact statement for license renewal is not required to
31 include discussion of need for power or the economic costs and economic benefits of
32 the proposed action or of alternatives to the proposed action except insofar as such
33 benefits and costs are either essential for a determination regarding the inclusion of an
34 alternative in the range of alternatives considered or relevant to mitigation. In addition,
35 the supplemental environmental impact statement prepared at the license renewal stage
36 need not discuss other issues not related to the environmental effects of the proposed
37 action and the alternatives, or any aspect of the storage of spent fuel for the facility

1 within the scope of the generic determination in 51.23(a) and in accordance with
2 51.23(b).^(a)

3
4 The GEIS contains the results of a systematic evaluation of the consequences of renewing an
5 OL and operating a nuclear power plant for an additional 20 years. In the GEIS, the NRC staff
6 evaluated 92 environmental issues using the NRC's three-level standard of significance –
7 SMALL, MODERATE, or LARGE – developed using the Council on Environmental Quality
8 guidelines. The following definitions of the three significance levels are set forth in the
9 footnotes to Table B-1 of 10 CFR Part 51, Subpart A, Appendix B:

10
11 SMALL – Environmental effects are not detectable or are so minor that they will neither
12 destabilize nor noticeably alter any important attribute of the resource.

13
14 MODERATE – Environmental effects are sufficient to alter noticeably, but not to destabilize,
15 important attributes of the resource.

16
17 LARGE – Environmental effects are clearly noticeable and are sufficient to destabilize
18 important attributes of the resource.

19
20 For 69 of the 92 issues considered in the GEIS, the staff made the following findings:

- 21
22 (1) The environmental impacts associated with the issue have been determined to apply either
23 to all plants or, for some issues, to plants having a specific type of cooling system or other
24 specified plant or site characteristics.
25
26 (2) A single significance level (i.e., SMALL, MODERATE, or LARGE) has been assigned to the
27 impacts (except for collective offsite radiological impacts from the fuel cycle and from high-
28 level waste and spent fuel disposal).
29
30 (3) Mitigation of adverse impacts associated with the issue has been considered in the analysis,
31 and it has been determined that additional plant-specific mitigation measures are likely not
32 to be sufficiently beneficial to warrant implementation.
33

34 The staff relied on conclusions as amplified by supporting information in the GEIS for all
35 69 issues designated as Category 1 in Table B-1 of 10 CFR Part 51, Subpart A, Appendix B.
36

(a) The title of 10 CFR 51.23 is "Temporary storage of spent fuel after cessation of reactor operations—
generic determination of no significant environmental impact."

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Of the 23 issues that do not meet the criteria set forth above, 21 are classified as Category 2 issues requiring analysis in a plant-specific supplement to the GEIS. The remaining two issues, environmental justice and chronic effects of electromagnetic fields, were not categorized. Environmental justice was not evaluated on a generic basis and must also be addressed in a plant-specific supplement to the GEIS. Information on the chronic effects of electromagnetic fields was not conclusive at the time the GEIS was prepared.

This SEIS documents the staff's evaluation of all 92 environmental issues considered in the GEIS. The staff considered the environmental impacts associated with alternatives to license renewal and compared the environmental impacts of license renewal and the alternatives. The alternatives to license renewal that were considered include the no-action alternative (not renewing the Ginna OL) and alternative methods of power generation. Based on projections made by the U.S. Department of Energy's Energy Information Administration, natural-gas and coal-fired generation appear to be the most likely power-generation alternatives if the power from Ginna is replaced. These alternatives were evaluated assuming that the replacement power generation plant is located at either the Ginna site or some other unspecified location.

9.1 Environmental Impacts of the Proposed Action – License Renewal

RG&E and the NRC staff have established independent processes for identifying and evaluating the significance of any new information on the environmental impacts of license renewal. RG&E did not identify any information that is both new and significant related to Category 1 issues that would call into question the conclusions in the GEIS. During the course of SEIS preparation, the staff considered mitigation measures for the continued operation of Ginna. Continued operation for an additional 20 years was considered as a whole, and all of the specific effects on the environment (whether or not "significant") were evaluated. The staff's preliminary conclusion found that the operations and facilities at Ginna provide mitigation for all impacts and no new mitigation measures are warranted. The staff relies upon the conclusions of the GEIS for all Category 1 issues that are applicable to Ginna.

RG&E's license renewal application presents analyses of the Category 2 issues that are applicable to Ginna and, additionally, environmental justice. The staff has reviewed the RG&E analysis for each issue and has conducted an independent review of each issue and chronic effects from electromagnetic fields. Six Category 2 issues are not applicable because they are related to plant design features or site characteristics not found at Ginna. Four Category 2 issues are not discussed in this draft SEIS because they are specifically related to refurbishment. RG&E (2002b) has stated that its evaluation of structures and components, as required by 10 CFR 54.21, did not identify any major plant refurbishment activities or modifications as necessary to support the continued operation of Ginna for the license renewal

1 period. In addition, any replacement of components or additional inspection activities are within
2 the bounds of normal plant component replacement and, therefore, are not expected to affect
3 the environment outside of the bounds of the plant operations evaluated in the *Final*
4 *Environmental Statement Related to the Operation of R.E. Ginna Nuclear Power Plant Unit 1,*
5 *Rochester Gas and Electric Corporation* (AEC 1973).
6

7 Ten Category 2 issues related to operational impacts and one related to postulated accidents
8 during the renewal term, as well as environmental justice and chronic effects of electromagnetic
9 fields, are discussed in detail in this draft SEIS. Five of the Category 2 issues and
10 environmental justice apply to both refurbishment and to operation during the renewal term and
11 are only discussed in this draft SEIS in relation to operation during the renewal term. All 11
12 Category 2 issues and environmental justice, the staff concludes that the potential
13 environmental effects are of SMALL significance in the context of the standards set forth in the
14 GEIS. In addition, the staff determined that appropriate Federal health agencies have not
15 reached a consensus on the existence of chronic adverse effects from electromagnetic fields.
16 Therefore, no further evaluation of this issue is required. For severe accident mitigation
17 alternatives (SAMAs), the staff concludes that a reasonable, comprehensive effort was made to
18 identify and evaluate SAMAs. Although two of the SAMAs appeared to be cost beneficial, they
19 do not relate to adequately managing the effects of aging during the period of extended
20 operation. Therefore, they need not be implemented as a part of the license renewal pursuant
21 to 10 CFR Part 54.
22

23 Mitigation measures were considered for each Category 2 issue. Current measures to mitigate
24 the environmental impacts of plant operation were found to be adequate, and no additional
25 mitigation measures were deemed sufficiently beneficial to be warranted.
26

27 Cumulative impacts of past, present, and reasonably foreseeable future actions were
28 considered, regardless of what agency (Federal or non-Federal) or person undertakes such
29 other actions. For purposes of this analysis, where Ginna license renewal impacts are deemed
30 to be SMALL, the staff concluded that these impacts would not result in significant cumulative
31 impacts on potentially affected resources.
32

33 The following sections discuss unavoidable adverse impacts, irreversible or irretrievable
34 commitments of resources, and the relationship between local short-term use of the
35 environment and long-term productivity.
36

37 **9.1.1 Unavoidable Adverse Impacts**

38

39 An environmental review conducted at the license renewal stage differs from the review
40 conducted in support of a construction permit because the plant is in existence at the license
41 renewal stage and has operated for a number of years. As a result, adverse impacts

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associated with the initial construction have been avoided, have been mitigated, or have already occurred. The environmental impacts to be evaluated for license renewal are those associated with refurbishment and continued operation during the renewal term.

The adverse impacts of continued operation identified are considered to be of SMALL significance, and none warrants implementation of additional mitigation measures. The adverse impacts of likely alternatives if Ginna ceases operation at or before the expiration of the current OL will not be smaller than those associated with continued operation of this unit, and they may be greater for some impact categories in some locations.

9.1.2 Irreversible or Irretrievable Resource Commitments

The commitment of resources related to construction and operation of Ginna during its current license period was made when the plant was built. The resource commitments to be considered in this SEIS are associated with continued operation of the plant for an additional 20 years. These resources include materials and equipment required for plant maintenance and operation, the nuclear fuel used by the reactors, and ultimately, permanent offsite storage space for the spent fuel assemblies.

The most significant resource commitments related to operation during the renewal term are the fuel and the permanent storage space. Ginna regularly replaces about one-third (44) of the fuel assemblies in the reactor core at approximately 18-month intervals (RG&E 2002b).

The likely power generation alternatives if Ginna ceases operation on or before the expiration of the current OL will require a commitment of resources for construction of the replacement plants as well as for fuel to run the plants.

9.1.3 Short-Term Use Versus Long-Term Productivity

An initial balance between short-term use and long-term productivity of the environment at the Ginna site was set when the plant was approved and construction began. That balance is now well established. Renewal of the OL for Ginna and continued operation of the plant will not alter the existing balance, but may postpone the availability of the site for other uses. Denial of the application to renew the OL will lead to shutdown of the plant and will alter the balance in a manner that depends on subsequent uses of the site. For example, the environmental consequences of turning the Ginna site into a park or an industrial facility are quite different.

9.2 Relative Significance of the Environmental Impacts of License Renewal and Alternatives

The proposed action is renewal of the OL for Ginna. Chapter 2 describes the site, power plant, and interactions of the plant with the environment. As noted in Chapter 3, no refurbishment and no refurbishment impacts are expected at Ginna. Chapters 4 through 7 discuss environmental issues associated with renewal of the OL. Environmental issues associated with the no-action alternative, and alternatives involving power generation and use reduction are discussed in Chapter 8.

The significance of the environmental impacts from the proposed action (approval of the application for renewal of the OL), the no-action alternative (denial of the application), alternatives involving nuclear, or coal- or gas-fired generation of power at the Ginna site and an unspecified "greenfield site," and a combination of alternatives are compared in Table 9-1. Continued use of a once-through cooling system at Ginna is assumed for Table 9-1, but a closed-cycle cooling system is assumed at an alternate site.

Substitution of a cooling tower for the once-through cooling system in the evaluation of the nuclear and gas- and coal-fired generation alternatives would result in some greater environmental impact differences in some impact categories. For example, use of cooling towers would have a greater aesthetic impact than once-through cooling.

Table 9-1 shows that the significance of the environmental effects of the proposed action are SMALL for all impact categories (except for collective offsite radiological impacts from the fuel cycle and from high-level waste and spent fuel disposal for which a single significance level was not assigned [Chapter 6.0]). The alternative actions, including the no-action alternative, may have environmental effects in at least some impact categories that reach MODERATE or LARGE significance.

9.3 Staff Conclusions and Recommendation

Based on (1) the analysis and findings in the GEIS (NRC 1996, 1999), (2) the Ginna ER (RG&E 2002b), (3) consultation with other Federal, State, and local agencies, (4) the staff's own independent review, and (5) the staff's consideration of public comments received during the scoping process, the preliminary recommendation of the staff is that the Commission determine that the adverse environmental impacts of license renewal for Ginna, including cumulative impacts, are not so great that preserving the option of license renewal for energy-planning decisionmakers would be unreasonable.

Table 9-1. Summary of Environmental Significance of License Renewal, the No-Action Alternative, and Alternative Methods of Generation^(a)

Impact Category	Proposed Action—License Renewal	No Action Alternative—Denial of Renewal	Coal-Fired Generation		Natural-Gas-Fired Generation		New Nuclear Generation		Combination of Alternatives	
			Ginna Site	Greenfield Site ^(b)	Ginna Site	Greenfield Site ^(b)	Ginna Site	Greenfield Site ^(b)	Ginna Site	Greenfield Site ^(b)
Land Use	SMALL	SMALL	MODERATE to LARGE	MODERATE to LARGE	SMALL to MODERATE	MODERATE	MODERATE to LARGE	MODERATE to LARGE	SMALL to MODERATE	SMALL to MODERATE
Ecology	SMALL	SMALL	MODERATE	MODERATE to LARGE	SMALL	SMALL to MODERATE	MODERATE	MODERATE to LARGE	SMALL to MODERATE	SMALL to MODERATE
Surface-Water Use and Quality	SMALL	SMALL	SMALL to MODERATE	SMALL to MODERATE	SMALL	SMALL to MODERATE	SMALL	SMALL to MODERATE	SMALL	SMALL to MODERATE
Groundwater Use and Quality	SMALL	SMALL	SMALL	SMALL to MODERATE	SMALL	SMALL to MODERATE	SMALL	SMALL to MODERATE	SMALL	SMALL to MODERATE
Air Quality	SMALL	SMALL	MODERATE	MODERATE	MODERATE	MODERATE	SMALL	SMALL	MODERATE	MODERATE
Waste	SMALL	SMALL	MODERATE	MODERATE	SMALL	SMALL	SMALL	SMALL	SMALL	SMALL
Human Health ^(c)	SMALL	SMALL	SMALL	SMALL	SMALL	SMALL	SMALL	SMALL	SMALL	SMALL
Socioeconomics	SMALL	SMALL to MODERATE	SMALL to MODERATE	MODERATE to LARGE	SMALL to MODERATE	SMALL to MODERATE	MODERATE to LARGE	MODERATE to LARGE	SMALL to MODERATE	MODERATE
Aesthetics	SMALL	SMALL	SMALL to MODERATE	MODERATE to LARGE	SMALL to MODERATE	MODERATE to LARGE	SMALL	SMALL to LARGE	MODERATE	MODERATE to LARGE
Historic and Archaeological Resources	SMALL	SMALL	SMALL to MODERATE	SMALL to MODERATE	SMALL to MODERATE	SMALL to MODERATE	SMALL to MODERATE	SMALL to MODERATE	SMALL to MODERATE	SMALL to MODERATE
Environmental Justice	SMALL	SMALL	SMALL	SMALL	SMALL	SMALL	SMALL	SMALL	SMALL	SMALL

- (a) Alternatives located at the Ginna site are assumed to utilize the existing once-through cooling system; alternatives located at an alternate site are assumed to use a closed-cycle cooling system with cooling towers.
- (b) A greenfield site is assumed, for the purpose of bounding potential impacts, to be an undeveloped site with no previous construction.
- (c) Excludes collective offsite radiological impacts from the fuel cycle and from high-level waste and spent-fuel disposal, for which a significance level was not assigned. See Chapter 6 for details.

9.4 References

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

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

Rochester Gas and Electric Corporation (RG&E). 2002a. *R.E. Ginna Nuclear Power Plant Application for Renewed Operating License*. Rochester, New York.

Rochester Gas and Electric Corporation (RG&E). 2002b. *R.E. Ginna Nuclear Power Plant Application for Renewed Operating License, Appendix E – Environmental Report*. Rochester, New York.

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

U.S. Atomic Energy Commission (AEC). 1973. *Final Environmental Statement Related to the Operation of R.E. Ginna Nuclear Power Plant Unit 1, Rochester Gas and Electric Corporation*. Docket No. 50-244, Washington, D.C.

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

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

U.S. Nuclear Regulatory Commission (NRC). 2000. *Standard Review Plans for Environmental Reviews for Nuclear Power Plants, Supplement 1: Operating License Renewal*. NUREG-1555, Supplement 1, Washington, D.C.

U.S. Nuclear Regulatory Commission (NRC). 2002a. “Rochester Gas and Electric Corporation, R.E. Ginna Nuclear Power Plant; Notice of Intent to Prepare an Environmental Impact Statement and Conduct Scoping Process.” Federal Register: Vol. 67, No. 197, pp. 63171-63173. October 10, 2002.

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- 1 U.S. Nuclear Regulatory Commission (NRC). 2002b. *Summary of Public Scoping Meetings to*
- 2 *Support Review of the R.E. Ginna Nuclear Power Plant License Renewal Application,*
- 3 December 17, 2002.
- 4
- 5